UT Southwestern Medical Center

Facilities Management Design Guidelines

THE UNIVERSITY OF TEXAS SOUTHWESTERN MEDICAL CENTER

FACILITIES MANAGEMENT DEPARTMENT

DESIGN GUIDELINES

JUNE 19, 2020 – Revised 12/18/2025

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DOCUMENT HISTORY

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06/30/2021	Q2 2021 Updates	EV
03/25/2022	Addition of ARC SDG sections, Other Section Revisions	MR
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06/26/2023	Q2 2023 Update: new sections, section name changes, and page number adjustments	EV
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06/27/2025	Q2 2025 Update	EV
12/18/2025	Q4 2025 Update	EV

INTRODUCTION

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INTRODUCTION

I. General Information

A. The Facilities Management Department Design Guidelines are intended as guidance for the project Architect/Engineer (A/E) team and the Contractor team during the planning, design, and construction processes for The University of Texas Southwestern Medical Center (UTSW) Capital Improvement Projects (CIP) and Renovation Projects. The content also covers specific design criteria, design processes, and administrative processes for permanent buildings on UTSW Campuses, renovations of buildings on UTSW campuses, and renovations in leased spaces.

B. Renovations in buildings not owned by UTSW will incorporate the requirements of the respective city in which the project is located. Requirements of the Office of Safety and Business Continuity (OSBC) shall be incorporated into all of these renovations.

C. Many, but not all, requirements for each Campus or Off-Site Leased Spaces are covered. The Project A/E, CM-R or D-B shall also refer to items covered in their respective Services Agreement and the Project Scope.

D. In the event of conflict between these guidelines and specific project requirements, the A/E, CM-R or D-B shall contact the UTSW Project Manager (UTSW PM) who shall coordinate clarification by the Director of Planning, Design, and Construction

E. The guidelines in this document are not intended to prohibit the use of alternative methods, systems, products, or devices not covered in this document. All alternatives shall be documented by the A/E, CMAR and D-B and submitted to for approval by the Director of Planning, Design, and Construction.

F. Throughout these Guidelines and under Campus Specific Information, there are references to single products and/or manufacturers. These are NOT intended to be sole source items unless specifically noted. The project A/E is required to identify and include in the Contract Documents at least three (3) comparable products and/or manufacturers.

II. Historically Underutilized Business Program

A. The University of Texas Southwestern Medical Center Office of Facilities Management Department is committed to promoting the participation of minority, women-owned, and small businesses through the Historically Underutilized Business (HUB) Program for the procurement of goods and/or services. The procurement process utilized by UTSW seeks to provide equal opportunity and equal access in the design and construction opportunities on projects managed by the Facilities Management Department.

End of Introduction

DOCUMENT HISTORY

Issue Date	Description	Editor
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DESIGN PHILOSOPHY

SECTION A DESIGN PHILOSOPHY

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SECTION A – DESIGN PHILOSOPHY

I. Design Philosophy

A. The University of Texas Southwestern Medical Center Facilities Management Department (FM) is committed to excellence in the design of capital projects for new and existing buildings for the UTSW various campuses. To accomplish this, the institution is committed to the highest quality of aesthetics in meeting the requirements of the various buildings while at the same time delivering a project that is cost-effective to operate and maintain throughout its useful life.

B. All capital projects shall be designed with flexibility and adaptability as a core objective. Over the life of campus buildings, the functions will change, and spaces will be reconfigured or repurposed.
   1. The Design process is not an isolated one and the Project A/E shall work with the UTSW PM to schedule early involvement from campus stakeholders. These groups include specific project Users, Facilities Management teams, Office of Safety and Business Continuity (OSBC) and Design Team per project.
   2. The Project A/E shall guide and educate campus stakeholders on code compliant solutions as well as best practice design solutions in each project. The Project A/E is the design professional responsible for compliance with all applicable codes, standards, and jurisdiction as noted in UTSW requirements.
   3. These campus stakeholders will be part of the review and approval process per phase to ensure designs continue to meet campus requirements.
   4. Early involvement of UTSW teams can enhance design solutions, address problems in earlier phases, and help the Project A/E provide stronger solutions.
   5. Each project A/E shall ensure that required spaces described in these guidelines are planned and implemented to successfully support all campus stakeholder groups.

II. Campus Design Standards

A. Capital project designs shall conform to the guidelines in this document and the guidelines and standards established by the University Institutional Design and Branding Committee (IDBC).

B. In limited instances, leadership may approve a project with special elements or features outside of the campus standards. These items must be presented to the IDBC for review and approval.
   1. Examples include upgraded fixtures, furnishings, or building systems.
   2. In all cases, these elements shall conform to requirements for Campus Codes/Regulations, safety, privacy, acoustics, and be easily maintainable.
   3. For the review, the A/E shall include product cut sheets identifying standard manufacturer information, materials, compliance with Codes and Regulations, information on replacement components, information on required maintenance, dimensions, and utility requirements.

C. Capital projects shall conform to the UTSW master plan guidelines. In the event of a conflict between these Design Guidelines, the UTSW master plan, and the standards established by the IDBC, the Director of Planning, Design, and Construction will coordinate with the Vice President of the Facilities Management Department for a resolution.

III. Operating and Building Maintenance

A. Systems and materials incorporated into capital projects should be selected based on life cycle operations and maintenance costs. The design should incorporate ease and efficiency of operation and allow for easy, safe, and cost-effective maintenance and repair. Standardization of equipment, parts, and components is also the key to reducing maintenance costs and allows for stocking of common replacement parts.

B. The Project A/E should obtain constant feedback from the Facilities Management Department during design. Detailed instructions from the Project A/E stating the design intent for capital projects or modification of all building systems and the operating/maintenance procedures are required during the design process.

C. Refer to other Design Guideline sections for additional requirements in the design process.

D. Design preference is for buildings to have parapets designed to comply with OSHA requirements for fall protection. If a parapet is not provided, the design shall provide alternative safety systems such as an engineered davit system to comply with OSHA.

IV. Codes and Standards

A. Compliance with all state and federal laws applicable to construction is expected. As authorized by the VP of FM, Design and Renovations, the Project A/E and the UTSW PM shall coordinate with municipalities as necessary.

B. The Project A/E shall design projects to comply with current editions of the codes and standards indicated in Section B and advise the Owner of code revisions having impact on the project design. The Office of Safety and Business Continuity (OSBC) is the Authority Having Jurisdiction (AHJ) for NFPA for on-campus projects.

C. Refer to Section B – Codes and Standards for a complete list of UTSW applicable codes and standards and the approved editions.
   1. Projects shall meet the minimum requirements of OSHA, but specific project situations may dictate additional safety requirements above these minimums. In these cases, A/Es shall request a review with OSBC so they may assess and make further recommendations.
   2. Project A/E shall ensure that review and direction from OSBC is documented and coordinated with all disciplines. Early involvement with OSBC is highly encouraged as it will aid in overall design as well as life safety areas.

V. Texas State Energy Conservation Office

A. The Texas State Energy Conservation Office (SECO) was created by the State Legislature to establish minimum energy standards for state agencies and institutions of higher education. SECO has created and references minimum guidelines to be incorporated into new construction and "major renovations".
B. SECO compliance forms shall be completed by the A/E team and submitted to the UTSW PM.
C. The UTSW PM will review and submit to the Director of Facilities Planning, Design, and Construction for submission to SECO.
    1. All documentation submitted to an outside entity must be reviewed and approved from release by the Executive Vice President of Business Affairs.
D. Refer to Section B – Codes and Standards for a complete list of SECO codes and standards and the approved editions.

VI. Regulation Requirements

A. The A/E will provide a summary of any permits required from the local, state, and federal government agencies to the UTSW PM for review and approval. The City of Dallas, Texas Department of Highways and Public Transportation, and the Texas Health Department are an example of local municipalities that may require permits. The cost of any permits will be borne by the Owner.
B. The Project A/E is required to submit sealed documents for an accessibility review per State requirements. The required review should be accomplished by a Registered Accessibility Specialist (RAS) located near the project site.
    1. The same RAS will be utilized for the plan review and the post-construction inspection unless otherwise approved by UTSW PM.
C. Upon receipt of the completed plan review, the A/E shall provide a corrective action plan to the UTSW PM that addresses all non-compliant issues within the A/E scope. This plan shall ensure the design is code compliant and shall be reviewed with the UTSW PM for approval. Issues outside of A/E scope shall be identified by the A/E to UTSW PM. Upon final direction from UTSW PM, the A/E shall confirm when all items have been corrected in the documentation through the issuance of updated documents showing completion of the corrective action plan.
D. Refer to Section C – Submittal Requirements for Design Documents, "Deliverables Required for All Projects" for additional information.
E. For any projects defined as "mission critical" by the Texas Government Code Title 10, Chapter 2311, A/E shall conduct feasibility study to consider the technical opportunities and economic value of implementing a Combined Heating and Power (CHP) technology.
    1. The feasibility study shall show financial cost estimate with expected energy savings of CHP over a minimum of a 20-year period including initial costs, operation, and maintenance. The feasibility study must include all requirements of SECO/CHP/TAC Title 10 Chapter 2311.

2. A/E shall provide a template of the deliverables format to UTSW Utilities for approval prior to finalizing the study.
3. If CHP is feasible, the design of CHP system shall comply.

VII. Environmental Practices: Sustainability, Energy, and Water Conservation Design

A. The capital project design will be required to conform to LEED criteria wherever possible, as determined in consultation with the project Steering Committee or VP FM. Sustainable practices, materials, and goals should be considered for each project as appropriate. The A/E shall coordinate with the UTSW PM for what should be recommended to the project Steering Committee or VP FM.

B. Designs following these applicable principles improve the building's performance while enhancing the occupant's health, safety, and welfare.

C. The energy performance and water conservation designs incorporated into new buildings and "major renovations" shall conform to requirements and codes as adopted by the Texas State Energy Conservation Office (SECO). The A/E shall coordinate with UTSW PM for what should be considered for each project.

D. Energy Efficiency for Whole Building Design:
   1. Provide design with at least 5-percent above the minimum requirements outlined in 90.1 ASHRAE and IECC or most up to date energy code.
   2. For projects required to comply with SECO or which include energy conservation scope: Employ a life cycle cost study to determine Return on Investment (ROI) timeline and present the results to UTSW.
      a. Perform the analysis including up- front costs, energy costs, maintenance costs, and end of life costs, for at least 4 of these concepts, or for other energy efficient measures under consideration:
         i. High-performance envelopes and glazing (required).
         ii. Active building shading.
         iii. Heat and/or energy recovery options (required).
         iv. Heat pump chiller options (required).
         v. Thermal energy storage (required).
         vi. Photovoltaics.
         vii. AHU condensation recovery.
      b. For renovation projects, confirm concepts with UTSW PM and Utilities prior to modeling.
   3. Demonstrate compliance with 5-percent improvement via a whole-building energy model for the Envelope, Mechanical Systems, and Lighting shown in the project scope.
      a. Provide output of energy model for base building design and ECM strategies, annual usage profile for electric and gas from the model.
      b. Provide template of the format of final deliverables to UTSW PM and Utilities for approval prior to study.

   c. Provide final study with expected equipment in construction documents or at IFC.
4. Energy Star appliances are required.
5. Potential strategies to improve energy performance include, but are not limited to:
   a. Orienting buildings East-West direction.
   b. Improved insulation levels.
   c. Improved glazing performance.
   d. Higher performing mechanical equipment.
   e. Colored roof materials.
   f. Improved access to daylighting with daylight sensors and/or occupancy sensors to reduce lighting needs.
   g. High performance lighting.
   h. Light-colored exterior paving.
   i. Air changes / ventilation.

VIII. Water Efficiency

A. A goal of 20-percent indoor water use reduction beyond the Energy Policy Act (EPAct) of 1992.
B. Employ a life cycle cost study to determine Return on Investment (ROI) timeline and present the results to UTSW. Perform the analysis with up-front costs, usage costs, maintenance costs, and end of life costs.
C. Demonstrate compliance with the minimum 20-percent reduction by one of the following:
   1. Provide interior water use reduction calculator demonstrating 20-percent reduction.
   2. Ensure that all eligible fixtures carry the EPA's WaterSense label.
   3. All eligible products on site have flush/flow rates at or below these thresholds:
      a. Water Closet - 1.28 GPF
      b. Urinal - 0.125 GPF
      c. Private Faucet - 1.75 GPM
      d. Public Faucet - 0.4 GPM
      e. Breakroom/Kitchen Faucet - 1.75 GPM
      f. Shower - 1.8 GPM
   4. If applicable, 30-percent exterior water use reduction.
   5. Comply with the most recent "Water Conservation Design Standards for State Buildings and Institutions of Higher Education Facilities" adopted by the Texas Legislature (34 Tex. Admin. Code §19.32) and The State Energy Conservation Office (SECO).
   6. Before beginning construction of a new state building or state-supported higher education facility, a water conservation compliance certification form must be completed and submitted to SECO to document compliance with the standards.

7. Confirm which water reuse strategy (Rainwater Harvesting, treated graywater, condensate collection or cooling tower blowdown, or a combination of these strategies) is to be employed on this project if the project exceeds a 10,000-square foot roof per SECO requirements.

IX. Environmental Practices: Daylighting

A. To maintain a relationship between the building occupants and the outdoors, direct views of the outside should be provided or maintained for most of the regularly occupied areas unless the needs of the spaces dictate otherwise.

X. Environmental Practices: Building Materials

A. Wherever possible, products and materials with recycled-content and no volatile organic compounds (VOC) should be specified in capital project design according to VOC levels in Section 01 81 13 “Sustainable Design Requirements.” A/E team shall ensure that non-fibrous materials are specified.
B. Reference product submittal and closeout requirements for products with no asbestos, lead, and hazardous materials in Section 01 81 13 “Sustainable Design Requirements.”

XI. Environmental Practices: Indoor Air Quality

A. FM capital projects designs shall comply with ASHRAE 62.1- latest edition.

XII. Environmental Practices: Commissioning

A. All FM capital projects shall employ appropriate commissioning practices to assure delivery of program goals and related performance requirements. The project A/E shall coordinate commissioning practices with the UTSW PM, the UTSW Utilities Department, the Commissioning Authority (if contracted) and the contractor (if the delivery method is construction manager at risk or design-build) during design.
B. Commissioning scope and practices are to comply with Section 01 91 00 “General Commissioning Requirements” with associated specification sections included per project scope.
C. A/E shall provide guidance to UTSW PM as part of the collaborative effort to advise on when a project would benefit from commissioning including key systems, equipment, or processes to be included.

XIII. Radiation and MRI Safety

A. Refer to Section B - Codes and Standards, “Radiation Safety Control” for code requirements in the UTSW Design Guidelines and to “MRI Design and Requirements” later in Section A.

B. The UTSW Medical Physics group will provide a shielding design based on the machine type and project specifics to the UTSW PM and A/E in most projects. Specialty machines or purposes may require outside shielding consultants working with UTSW Medical Physics and OSBC Radiation Safety. Shielding designs provided shall be used for coordination of infrastructure needs.
   1. Medical Physicist / Shielding Report shall be included in project manual as reference for the construction team.
   2. Shielding materials may include lead sheet, RF cages, concrete, high-density materials, or combinations determined by the project Medical Physicists.
      a. On renovation projects with existing shielding, Medical Physicists will evaluate existing shielding for validation.
      b. In renovation projects with existing shielding, confirm with UTSW if the original shielding consultants/contractors shall be involved on the project due to their expertise with the existing conditions.
   3. When the contractor has completed the shielding installation, but before walls are closed, the UTSW Medical Physics team and OSBC Radiation Safety shall be notified for inspection. The Medical Physics team shall inspect and verify if the shielding design was followed. Walls shall only be closed once the installation is verified.
   4. After construction, the UTSW Medical Physics team will perform source testing prior to the project receiving the Certificate of Occupancy (COO).

C. The UTSW OSBC Radiation Safety Team will provide review and direction for projects with radioactive equipment and materials. Equipment types include, but are not limited to, X-ray, MRI, Linac, PET, and CT.
   1. Projects under the Radiation Safety Team may include compliance with 25 TAC 289.256, 25 TAC 289.229 and 10 CFR 35. Confirm requirements for back-up power, interlocks, and other safety requirements per project.

D. MRI spaces shall include the following in their projects:
   1. Utility Requirements:
      a. Required equipment includes power conditioners and Computer Room Air Conditioning (CRAC) units. Confirm requirements with UTSW User representatives, equipment manufacturer, UTSW PM, and other groups indicated per project.
   2. Life Safety Requirements:
      a. Special life safety requirements include providing non-ferrous sprinkler systems.
      b. For MRI and imaging life safety considerations refer to UTSW Design Guideline Section 21 13 13 “Automatic Fire Sprinkler Systems.”
   3. Badge readers – refer to Section 28 10 00 “Access Control.”

4. Signage:
    a. A lighted sign shall be above the door to the MRI Zone IV (or Zone III as applicable). If this location is not feasible, an alternative location shall be determined by the UTSW OSBC's Director of Radiation Safety or their representative.
    b. The sign shall be wired to the building electrical system in accordance with NFPA 70 (2014 ed.). If primary power is lost, the sign shall have battery backup providing not less than 24 hours of internal illumination or be wired to the emergency electrical backup generator if the building has generator backup.
    c. The sign shall be internally illuminated with the words "Magnet Always On" and be red in color on a contrasting white background.
    d. The sign shall be fastened to the wall according to the manufacturers' specifications.
    e. Refer to Section "10 14 00 Signs and Graphic Elements" in the UTSW Design Guidelines and Master Specifications.
5. Refer to other sections of the UTSW Design Guidelines:
    a. Fire Sprinkler Systems – Refer to Division 21.
    b. Quench Ventilation – Refer to Division 23 for Special Exhaust Systems.
    c. Fire Alarm Devices – Refer to Division 28 for Addressable Fire Alarm Systems.
    d. Fire Extinguisher – Refer to Division 10 for Fire Protection Specialties.

XIV. Environmental Safety Design

A. UTSW Offices of Safety and Business Continuity (OSBC) advises and directs in matters of safety for projects.
    1. Laboratory and any project with hazardous materials shall be reviewed in design development by appropriate OSBC teams, refer to UTSW Design Guidelines Section B: "campus protocols: OSBC," "Radiation Safety Control," and "MRI Safety Control."
        a. A/E shall add project specific code requirements from OSBC review to the project, refer to **EXHIBIT B.3 Code Compliance Confirmation Review** and refer to the code information noted within the drawing set.
    2. Refer to Section "10 14 00 Signs and Graphic Elements" in the UTSW Design Guidelines and Master Specifications.

B. Site Projects: Refer to UTSW Design Guideline Division 31 00 00 and **EXHIBIT C.4 Storm Water Pollution Prevention Plan** for UTSW requirements.

C. Building Projects:
    1. Dry Ice Storage:
        a. Refer to Design Guidelines Section 23 09 00 Instrumentation and Control for HVAC for specific ventilation and monitoring requirements.
        b. Fixed gas monitoring considerations should be given to both CO2 and O2 to ensure the ventilation levels are maintained.

c. Storage equipment provided for dry ice shall slow sublimation of dry ice while allowing for expansion. Tightly sealed devices for dry ice storage are not allowed.
d. Areas with dry ice storage shall provide additional storage space for safety supplies including scoops, tongs, lab coats, safety glasses/goggles, thermally insulated gloves supplies and storage accommodations to ensure appropriate usage.
e. Signage: indicating the presence of positive pressure gases shall be posted on the exterior of the space, near the entrance. Confirm signage required with UTSW Signage Shop, OSBC, and the UTSW Comprehensive Interior Signage Manual.

2. Natural Gas Piping – Within Education and Research Spaces:
   a. In newly constructed research labs, installation of natural gas piping is no longer allowed.
      i. Any exceptions must be approved in writing by the Office of the Provost and OSBC.
   b. In existing facilities with existing natural gas piping, reconfiguration and extensions of the system may be permitted.
   c. All natural gas piping shall be painted as required in UTSW Master Specification Section "22 05 53 Plumbing Identification."
3. Additional considerations may be required to safely store items including but not limited to inert gases, oxygen, nitrogen gas, and liquid nitrogen.

XV. Healthcare Regulations

A. Projects in healthcare settings shall comply with regulations appropriate to that facility as confirmed by UTSW Leadership.
B. Coordination and conflict resolution between healthcare regulation and other requirements, such as ADA and TAS, shall be confirmed with UTSW per project.
   1. Example: JCAHO and NIOSH have higher mounting height for sharps containers than ADA and TAS.

XVI. Building Core Elements: Partition Standards

A. Partitions:
   1. Full height partitions to the underside of structure shall be used in Animal Resource Center (ARC) spaces, clinical spaces, laboratory spaces, and where required by code.
   2. Partitions with gypsum board stopping 6-inches above the ceiling shall be standard in other space types unless greater noise control or privacy are required.
      a. Where additional acoustic control is required but budget constraints or existing conditions prevent partitions from extending to the underside of deck, the A/E shall provide additional strategies for review and cost implications.

3. Design and construction of partitions shall allow access for maintenance and minimize repair costs. Locate access panels at regular intervals and at all equipment access points.

XVII. Building Core Elements: Entries

A. All stoops, porches, ramps, docks, and steps, either exterior and interior, shall have non-slip surfaces and nosings, where applicable.
   1. Slope exterior porches and treads as allowed by ADA and Texas Accessibility Standards (TAS) to drain water.
   2. Ponding of water in these areas is unacceptable.

B. Primary entry floors or heavy patient traffic areas are not preferred to be constructed using brick or pavers. These finishes are trip hazards for persons with mobility issues, they create maintenance issues over time and are excessively noisy when carts are used.

C. Granite curbs are not preferred as they have long-term maintenance issues and become slip hazards when wet.

D. Truncated domes are not acceptable on campus except to comply with public right of way, platform boarding edges or other TAS requirements.

E. All control joints shall be constructed at minimum widths to prevent trip hazards with maintained elevations between separate surfaces. Control joints shall have backer rod and sealant.

F. Full height glazing adjacent to entries or along corridors shall have visible safety indicators or cross mullions. Refer to Section “08 80 00 Glazing” in the Design Guidelines for additional information.

XVIII. Building Core Elements: Egress Stairs

A. Doors entering egress stairs from within a building shall not be locked or prevent access.
   1. Locked exit doors at egress stairs with card readers in the stair area shall be connected to the fire alarm system and release the door for occupant egress during a general alarm.

B. Egress doors shall open to follow the direction of the path of travel or as required by code.

XIX. Building Core Elements: Emergency Command Center

A. Hi-rise buildings shall have an exterior entrance to the Emergency Command Center.

B. Where required, an Emergency Command Center shall contain a minimum of the following equipment required in the Code and shall also include the following:
   1. Table and chair.
   2. Building Plans: Architecture, Mechanical, Electrical, Plumbing, and all Fire Protection Plans.
   3. Floor map of each floor.
   4. Smoke Control Board, where applicable.

5. All lighting and electrical outlets shall be on emergency generator power.
6. Data ports and/or WIFI in the room.

XX. Building Core Elements: Mechanical Rooms

A. All mechanical rooms added or modified during FM capital projects must be designed with adequate aisle space and clearances around equipment to accommodate maintenance from the floor and replacement of items. All design shall be reasonably planned for human access.
   1. Clearances shall include 3-foot wide by 7-foot 6-inch clear height minimum walk path for safe exiting from the space, permanently marked on the floor.
   2. There must be a defined pathway from all mechanical rooms to the building exterior of adequate size to permit the replacement of equipment. Means of removal of equipment shall be by the most cost-efficient path approved by UTSW PM and UTSW FM.
   3. The A/E shall indicate all required clearances and pulls required for maintenance and repair of equipment for coordination purposes.

B. The overall design of mechanical areas shall assure safe maintenance access to all pieces of equipment. Run piping underground or overhead rather than floor-mounting to prevent trip hazards. All mechanical rooms must be designed to control noise transmission to adjacent spaces including corridors.
   1. Sound transmission through mechanical room walls shall not cause adjacent space's noise levels to be exceeded per values indicated in Acoustic Design sections. A/E shall coordinate requirements for walls, slabs, penetrations, and door hardware to meet acoustic requirements.

C. Depress the floor of all mechanical rooms 1-1/2-inches and uniformly slope the entire floor to the required number of 4-inch floor sinks connected to the building sanitary sewer system as required by code or as directed by UTSW PM and UTSW FM. Slopes shall follow requirements from Division 22 in the UTSW Design Guidelines.
   1. Mechanical rooms are preferred to be recessed or have integral curbs to allow fluids up to 4-inches in height. These areas to have a waterproofing system to seal all sides of the floor and wall construction.
      a. System shall have primer, topcoat, and traction components as part of topcoat to prevent slippage. During construction, these areas shall be tested to prove water-tight construction.
      b. Floor drains and sinks shall be placed in a location that is accessible for maintenance, near air handling units and pumps.
      c. Layout of mechanical spaces shall consider how maintenance crews can move equipment into the space considering the elevation change. Ramping to assist with equipment movement is preferred if reasonably possible with spatial requirements.
   2. Housekeeping pads are required for floor-mounted equipment installed in mechanical rooms.

   a. Housekeeping pads to be sealed to match floor waterproofing system.
3. Housekeeping pad edges to be painted Safety Yellow. Confirm locations for inertia Equipment pads to reduce vibration, excessive movement, vibration isolation and longevity.

D. Refer to Electrical Rooms/Closets for space requirements for electrical panel boards including access and egress.
E. Refer to Divisions 22, 23, and 26 in the UTSW Design Guidelines.

XXI. Building Core Elements: Air-Handling Rooms

A. Air Handler rooms added in FM capital projects should be designed so that NO wall is centered on a structural beam that would interfere with vertical risers.
B. The spaces must be arranged and sized to provide maintenance staff with safe access to all pieces of equipment for routine maintenance. Clearances shall include 3-foot wide by 7-foot 6-inch clear height minimum walk path for safe exiting from the space, permanently marked on the floor.
   1. Housekeeping pads are required for floor-mounted equipment installed in mechanical rooms.
      a. Housekeeping pads to be sealed to match floor waterproofing system.
      b. Housekeeping pad edges to be painted Safety Yellow.
C. Access to air handler rooms must be from within the building from the corridor system and not through any other space. Door should open out from space to maximize usable interior floor and wall area.
D. Provide a minimum of 2-foot clearance on two sides and one end of the air handlers. Provide clearance for removing coils and filters.
E. Air handler rooms shall be insulated for sound. Refer to Mechanical Rooms above in Section A for requirements on sound transmission and spaces required for electrical equipment.
F. Refer to Divisions 22 and 23 in the UTSW Design Guidelines.

XXII. Building Core Elements: Electrical Rooms/Closets

A. Electrical rooms/closets added in FM capital projects must be designed so that NO wall is centered on a structural beam that would interfere with vertical risers.
B. Do not route mechanical or plumbing utilities capable of conveying air or liquids through or above electrical rooms/closets. The only exception allowed is the branch sprinkler line serving only the sprinkler head in an electrical room/closet.
C. Access to electrical rooms/closets must be from within the building and not through any other spaces. Doors should open out from the rooms into the corridor system to maximize usable interior floor and wall area.
   1. Clearances shall include 3-foot wide by 7-foot 6-inch clear height minimum walk path for safe exiting from the space, permanently marked on the floor.

2. The overall design of electrical areas shall assure safe maintenance access to all pieces of equipment. Run piping underground or overhead rather than floor-mounting to prevent trip hazards.

D. Electrical rooms with electrical equipment rated 1,200 amperes and over is considered "large equipment" and:
   1. Required to have two means of exit.
   2. Required to have one door at each end of room.
   3. Required to have panic hardware on doors with one being a double door entrance for oversized equipment. Or single door as allowed by NEC 110.
   4. Doors shall open in the direction of the path of travel.

E. Housekeeping pads are required for floor-mounted equipment installed in electrical rooms.
   1. Housekeeping pads to be sealed to match floor waterproofing system.
   2. Housekeeping pad edges to be painted Safety Yellow.

F. Enlarged plans for all electrical rooms/closets, at a scale not less than 1/4-inch = 1-foot shall be prepared for each electrical/closet room.

G. Sound transmission through electrical room walls shall not cause adjacent space's noise levels to be exceeded per values indicated in Acoustic Design.

H. Lighting in electrical rooms and at panel boards located in other spaces shall not be controlled by automatic means only per NEC 110.26.

I. Refer to Division 26 in the UTSW Design Guidelines.

XXIII. Building Core Elements: Rooftop Requirements

A. The design of building rooftops shall be discussed in early programmatic stages to assist in determining building heights and building systems appropriate for the project. UTSW Building Envelope Coordinator shall be included as a stakeholder from these early stages.

B. The roofing membrane systems shall provide long-term, high-performance protection for the building. Membrane selection shall consider the potential chemical output from rooftop equipment such as exhaust fans. Design of slopes and drains shall promote positive runoff from the building in a rapid manner, preventing ponding.

C. The overall design of roof areas shall assure safe maintenance access to all pieces of equipment as well as to the entire roofing surface for inspection and repair of the membrane.
   1. Roof layouts and drawings shall include equipment clear floor areas as well as required clearances for proper operation.
   2. Locations of equipment, piping, rooftop hoists, access points, davits, roof drains, etc. shall be organized in a holistic design that optimizes access and membrane preservation.
   3. One example is to minimize piping runs crossing the main walking path which can be trip hazards as well as causing damage to the membrane.

D. UTSW preference is for an elevator to open at roof levels to allow easy access for equipment repairs and updates. The elevator, opening, and hoist way shall be protected from weather infiltration to protect the machines from damage.
E. If UTSW determines that elevator access is not possible, a stairway shall extend up to the roof.
F. Rooftop areas shall provide OSHA required fall protection or prevention systems in all areas. Any elevation variations between roof areas shall be accessed with either a permanent ladder or roof hatch with a permanent ladder.
G. A/E shall designate walk paths to reach all pieces of equipment and access points. Additional walk-path areas shall be designed adjacent to and around large pieces of equipment to allow for lay-down or tool placement during repairs.
H. Roof surfaces with equipment shall be screened with parapets or engineered equipment screens.
    1. Aesthetics, maintenance, and cost shall be considered in the design of screening elements to ensure a long-term, positive solution.
    2. Screens shall not limit access to equipment or restrict manufacturer required clearances for service or air flow.
    3. Structural requirements including bracing shall be designed in a manner to minimize roof penetrations while meeting the code requirements for wind and safety.

XXIV. Building Core Elements: Technology Room (TR) / IDF Requirements

A. Information Resources (IR) Technology Rooms (TR) added in FM capital projects must be designed so that NO wall is centered on a structural beam that would interfere with vertical risers.
B. A TR shall be provided on each floor and located so cable length complies with requirements. Refer to Division 27 in the UTSW Design Guidelines and Specifications.
C. Access to TR must be from within the building and from the corridor system; openings from intermediate spaces are not allowed.
D. Door should open out from the TR to maximize usable interior floor and wall area. In limited locations, when an outward opening door would impede corridor width, A/E shall carefully coordinate door placement with IR to maximize interior space and wall space.
E. TR/IDF spaces require air conditioning to maintain the temperature/humidity required by the electronic equipment installed.

XXV. Building Core Elements: Restrooms

A. Restrooms added in FM capital projects must be located on each floor and should be located within 200 feet of every occupied space unless code requirements dictate otherwise.
B. Restrooms should be grouped with janitorial closets and electric water coolers for ease of maintenance and to reduce plumbing runs.

C. Due to the wide array of spaces and services on campus, there may be many types of restrooms on campus.
   1. Patient rooms with toilet rooms shall have smooth flooring transitions without lip or raised strips.

D. Types utilized shall be determined for each project and naming shall follow the UTSW Comprehensive Interior Signage Manual. Each type shall follow the numbering formula as noted in **EXHIBIT A.1 UTSW Room Numbering Standards**.

E. Restrooms should be sized to accommodate a minimum fixture count determined by the International Plumbing Code (IPC) and accessibility based on the Texas Accessibility Standards (TAS) . Restrooms serving assembly areas must accommodate short-term, high-volume traffic and will require higher fixture counts.
   1. The number of fixtures for women's restrooms shall be higher than the minimum determined by the IPC and to comply with the Texas "Parity Pottie law."
   2. The increase will vary according to project and campus, up to a fixture ratio of 1/3 men to 2/3 women.
   3. Confirm fixture count with the FM Maintenance Department through the UTSW PM.

F. Thoughtful lay out shall prevent the direct or reflected lines of sight into restrooms and dressing rooms from the corridor, as these are prohibited.
   1. All high traffic restrooms on the ground floor shall provide space for queuing as well as adequate trash capacity for the expected volume.

G. Changing Stations:
   1. Public toilet rooms in building lobbies and main floors shall provide baby changing stations in both men's and women's toilet rooms.
      a. Projects within patient focused areas shall confirm locations of baby changing stations within both public spaces and clinic spaces (if required).
      b. Baby changing stations are not required in spaces where children are not allowed per UTSW operations.
      c. A/E shall propose layout of toilet rooms and location of baby changing station to provide efficient use of space while meeting requirements of ADA/TAS.
      d. Baby changing station locations may be installed as a built-in element or as a manufactured unit.
      e. Refer to Section "10 28 00 Toilet and Bath Accessories" in this document for additional information.
   2. Confirm per project requirements for special needs changing stations.

H. A/E shall utilize current Standard Toilet Accessories and preferences as seen in Section 10, Master Specification 10 28 00 and **EXHIBIT C.10 Responsibility Matrix** of the UTSW Design Guidelines. Locate accessories in a manner that prevents protruding objects as identified by ADA/TAS.

XXVI. Building Core Elements: Maintenance Spaces

A. Building Maintenance Workstation and Storage:
   1. This space shall be created to support the building(s) as determined with BMO and UTSW PM. Size shall be determined per project requirements to successfully support the building.
   2. Locations near freight elevators or on a transition floor are preferred.
   3. Components to discuss include:
      a. Workstation for computer(s).
      b. Space for maintenance cart(s).
      c. Attic stock and repair materials storage.
      d. Ladder(s).
      e. Hand tools with secure storage.
      f. Janitor or handwashing sink.
      g. Door size minimum 3-foot 6-inch.

B. Janitor / Housekeeping Management:
   1. Provide a small office with a workstation and computer connected to housekeeping breakroom.
   2. Provide a key box.
   3. Provide breakroom area with space for tables and chairs, sink, counter, microwave, metal lockers, and refrigerator. Size shall be determined according to project requirements.

C. Janitor / Housekeeping Closets:
   1. Janitorial Closets in FM capital projects should consist of 80 square foot minimum floor space with a minimum clear width of six feet. A closet of this size can serve a floor area up to 50,000 gross square feet.
      a. Building designs with floor areas larger than 50,000 gross square feet shall require more than one janitorial closet per floor.
      b. Janitor closets shall be located near restrooms on each floor.
      c. Janitor closets shall have a waterproofing flooring system with integrated base up to 4-inches minimum in height. This system is to seal all sides of the floor and wall construction.
         i. System shall have primer, topcoat, and traction component as part of topcoat to prevent slippage.
   2. A janitorial closet shall contain the following:
      a. Standard 2-foot square by 8-inch-tall floor corner mounted mop sink located close to door. Refer to Division 22 Plumbing for fixture information.
         i. Wall surface materials around the mop sink must be water resistant, such as stainless steel or FRP. Extend this finish to 24-inches above the top of the mop sink and extend 12-inches beyond each side of the mop sink.
      b. Provide six mop hangers above the mop sink and twelve mop and broom hangers along the wall near the mop sink.
         i. A hanger with an integrated shelf should be mounted 72-inches minimum above finish floor.

c. Provide shelving on one side wall with a minimum of 4 shelves that are 12-inch deep. Space shelves 16- to 18-inches apart with the bottom one mounted approximately two feet above the floor.
    i. Adjustable heavy duty shelving systems are acceptable.
d. Overhead LED lighting shall be controlled from wall switch just inside door.
e. Locate one electrical GFI duplex outlet on each side wall installed at 48-inch AFF.
f. Install a wall hung lavatory near the door.
g. An eye wash is required in some locations where concentrated hazardous chemicals are stored or dispensed. Confirm requirements with OSBC.

3. The door should open out from closet to maximize usable interior floor and wall area.
4. Janitorial closets shall not contain telephone, cable television, data, mechanical or electrical cables or equipment.
5. Janitorial closets should not have roof access or under floor access.
6. Janitor closets not less than fifty (50) square feet with a minimum clear width of five feet may be approved by BMO and UTSW PM in small buildings.
    a. Small closets will have the basic items such as mop sink, shelving, mop, and broom hangers.
    b. Provide space to store a cart and expected floor cleaning equipment.
    c. The door shall open out.

D. Janitor / Housekeeping Storage:
1. This space shall be created to support the building(s) as determined with BMO and UTSW PM.
2. Locations near elevators or on a transition floor are preferred.
3. Items for discussion shall include:
    a. Size of space needed to serve building(s) area required.
    b. Storage and holding for carts and gondolas.
    c. Storage of equipment including vacuums, cleaning equipment, wet vacuums, and others required per project needs. Considerations include a washer and dryer.
    d. Power receptacles for equipment and charging including additional power and circuits for future needs.
    e. Storage and/or shelving for supplies to serve the building.
    f. Floor sinks and/or drains.
    g. Wall mounted chemical mixing dispenser(s).
    h. Double door for access.
    i. Cart wash - refer to “Loading Docks and Receiving Requirements.”

XXVII. Food Service

A. A/E shall discuss project scope needs with UTSW PM to determine the need for an outside food service consultant as well as an external sanitarian to review projects.

B. On campus food service, is managed by the Hospital through Nutrition Services and by Auxiliary Enterprises through the Food Service Group. Include representatives from these groups starting at early design discussions throughout construction and value engineering to maintain design and operational intent.
   1. The Auxiliary Enterprises group or Real Estate manages food service operators in non-hospital buildings including convenience stores and performs the Health Department Inspections for the campus.
   2. The Hospital food services includes dining, coffee, and convenience locations at various buildings across campus which follow Title 25 Texas Administrative Code, Chapter 133, Hospital Licensing Rule and are not considered business occupancy type.

C. Design consideration to be discussed per project:
   1. Infrastructure shall be designed and coordinated between scope, regulation, code and between disciplines to address complexities of these spaces. Coordination between equipment layouts and engineering is critical.
      a. Examples include that shut-off locations meet codes, floor sinks are accessible while not located under planned equipment, that ductwork has required access points, required safety equipment including eye wash and hand wash locations are approved by OSBC, and that the end-product will pass inspections.
      b. Ensure user representatives have opportunities to review layouts, utilities, and spatial relationships. Identify any potential future opportunities that need to be included in scope.
      c. Design exhaust and hood performance for all cooking equipment to ensure safe operation, code compliance, and to ensure all fumes leave the building.
   2. Lighting levels shall meet or exceed code requirements.
   3. Floors shall slope from wall to drains or floor sinks with consideration that drain locations will not hinder cart traffic.
   4. Projects to provide emergency eye wash per code.
   5. Sizes of storage and electrical capacity shall include requirements for future growth.
   6. Technology requirements include Point-of-Sale (POS) systems; safe(s) security cameras for cash and access points; panic/duress buttons at cash areas; and digital signage requirements. Refer to Design Guideline Section 11 97 00 “Security Equipment.”
   7. Security and requirements to close off food services areas.
   8. UTSW provides large food service equipment, refer to Design Guideline Section "11 40 00 “Food Service Equipment” for more information.
   9. A/E shall review and suggest if recessed sprinkler heads are appropriate for project scope to minimize cleaning costs while reducing the potential for head damage.

D. Finishes and spaces shall meet requirements as determined by the Texas Department of State Health Services and Hospital Licensing Rules per project.

1. All finishes shall be reviewed with and approved by UTSW Users, PM, and Design Team.
2. All finishes shall be highly durable, smooth, and easily cleanable.
    a. Wood finishes, wood, or plastic laminate doors are not preferred.
    b. Where surfaces meet, such as a counter meeting a wall or a floor meeting a wall, they shall be coved to ensure ease of cleaning.
    c. All permanent equipment affixed to walls in food service areas shall be caulked at the walls to prevent growth of bacteria.
3. Back of house finishes can include:
    a. Walls: Ceramic tile, FRP, stainless steel, diamond plate (receiving areas).
    b. Floors:
        i. Non-slip products including urethane and polyvinyl flooring systems with integrated base are allowable.
        ii. Offices shall not have carpet.
    c. Ceilings: Gypsum and food service safe ceiling tiles.
    d. Equipment and Tables: Stainless steel.
    e. Wall protection shall be metal and able to stand up to cart traffic.
4. Wet areas shall have rust proof fixtures including doors, hardware, sprinklers, air vents and other items. Bs shall be fiberglass.
5. Movable furniture, fixtures and storage are preferred to millwork.

E. Support spaces required include:
1. Cart wash, refer to “Loading Docks and Receiving Requirements.”
2. Janitor closet with mop sink, water spigot, mop racks, storage, etc. Refer to requirements in Design Guidelines A “Maintenance Spaces.”
    a. Food service chemical storage and exhaust requirements to be assessed and coordinated by A/E.
3. Single person accessible toilet room(s) located near food service spaces.
4. Hospital projects may require locker areas.
5. Receiving area and dry storage area:
    a. Hospital storage areas shall have code minimum ceiling height, but taller heights are preferred.
6. Access to gondola wash at that building.
7. Grease barrel storage:
    a. Interior storage locations must not have floor drains near enough for a spill to reach the drain.
    b. Exterior storage locations must be beneath a well-constructed, sturdy, and permanent roof structure.
    c. Secondary containment is required.

XXVIII. Parking and Garages

A. Refer to Design Guideline Division 32 for Paving Specialties.
   1. Refer to Section 21 17 23 “Pavement Markings” for Texas Administrative Code requirements.
B. Parking on campus is managed by Auxiliary Enterprises through Parking Services. This team shall be interfaced at early stages to confirm space requirements, garage technologies, facility layout and current parking demands on campus.
C. Design considerations include:
   1. Capacity levels and future expansion potential.
   2. Open-air and above ground parking are preferred to facilities that require mechanical exhaust.
   3. Inclusion of services such as valet.
   4. Typical equipment in garages includes Parking Guidance System, card readers through UTSW Access Control, pay stations, and security cameras through UTSW Access Control and the UTSW Police.
   5. Typical MEP considerations include prewiring 30-amp capacity for electric charging and water locations on each level for cleaning.
      a. Locked covers are preferred on utilities to prevent unauthorized access.
D. Provisions to support valet services include power and secured space for key storage.
E. Elevator enclosures in exterior locations shall be waterproofed. Consider including conditioned lobbies at levels with greatest chance of water infiltration to provide the best protection for elevator equipment.

XXIX. Accessibility

A. On UTSW campus, all spaces shall be designed with accessibility and best practices in mind.
B. Wherever possible, UTSW preference is to provide the minimum 12-inches clear push-side or 18 inches clear pull-side to doors in work and non-work areas.
   1. Wherever possible, provide minimum clearances at all doors, hallways, stairs, etc. in both work and non-work areas as best practice.
C. Provide maneuvering clearances as a standard in projects as this could lessen future compliance concerns.

XXX. Space Standards

A. Refer to UTSW Policies FSS-310 and FSS-310P for guidance on space standards.
B. UTSW follows the following sources for space assignments and area calculation requirements for State reporting requirements.
   1. Texas Administrative Code

      Title 19: Education
      Part 1: Texas Higher Education Coordinating Board

Chapter 17: Resource Planning
Subchapter A: General Provisions
Rule: §17.3 Definitions

2. Postsecondary Education Facilities Inventory and Classification Manual, U. S. Department of Education, Office of Educational Research and Improvement, NCES 92165, November 1992.
3. Texas Higher Education Facilities Inventory Procedures Manual 1983, Coordinating Board, Texas College and University System.

C. Campus Room Standards and Space Assignments:
   1. UTSW maintains standard space sizes as seen in "Furniture Typical and Layouts for Campus Space Use" (FSS-310P-01). A/E and UTSW PM shall confirm with UTSW Planning Team and Design Team for the appropriate sizes to be used within each project.

XXXI. Pharmacy Design and Requirements

A. UTSW operated pharmacies must comply with the Texas Pharmacy Act, Chapters 133, 281 – 315 of the Texas Administrative Code, Texas Health and Safety Code chapters including 241, 243, 577, Federal Food, Drug and Cosmetic Act (FD&C Act), Texas Controlled Substance Rules, United States Pharmacopeia (USP) 795, 797, and 800. Confirm other codes and updates per project.
   1. Texas State Board of Pharmacy inspections and outside inspectors may review spaces for required certification including clean rooms.
   2. Confirm controlled substances expected and any additional security requirements required.

B. User groups shall include Pharmacy representatives, Police Department, Access Control, Facilities Management, Supply Chain Management, Information Technology, and other groups as determined per project.

C. UTSW operates the following pharmacy types:
   1. Class A – Community
   2. Class AS – Community and Sterile
   3. Class B - Nuclear
   4. Class C – Institutional

D. Space planning of each pharmacy shall include studies for operational and patient proximity, delivery pathways, required equipment, building services, and controlled access to the space and medications.
   1. Within employee work areas, discuss workflow efficiencies for pharmacy tasks, storage types and depths, countertop heights, office requirements, employee break and locker areas, and other needs identified.
   2. Each project shall include considerations for existing infrastructure and required modifications for new equipment including capacity requirements, structural requirements, and utility requirements.

E. The design of pharmacy spaces shall include design strategies and technology solutions to maximize the safety and security of the spaces.

1. Design components shall ensure visibility across both employee and patient spaces to minimize opportunities for crime. Visibility into the pharmacy shall be limited and staff shall have the ability to prevent views with shades or other devices as required.
2. Pharmacy envelope construction shall be confirmed with site specific security requirements. Considerations include automatic overhead roll-down doors at pharmacy windows, security partition types, shatter-resistant glazing, etc.
3. Security components of pharmacies may include access control components, card readers, panic buttons, specialized key control cabinets, intrusion panels, and IP camera requirements. Refer to UTSW Design Guideline Section 28 10 00 "Access Control" and Specification Section 08 71 00 "Door Hardware."
    a. Coordinate the security of each pharmacy location with unique elements such as dumbwaiters and elevators.

F. Electrical Systems:
1. Locations of electrical services and panels shall ensure limited access to the pharmacy systems.
2. Emergency Power and Notifications:
    a. CDAS is required for refrigerators, freezers, and incubators.
    b. Emergency power or backup power is required for refrigerators, freezers, incubators, automated dispensing systems, HVAC and power for clean rooms, and computer systems.
    c. Confirm additional power and CDAS requirements per project.
3. Lighting systems and controls shall ensure safe operations during pharmacy working hours. Dimming is not required to ensure consistent security.

G. Mechanical Systems:
1. Design of mechanical systems shall incorporate regulation, licensing requirements, and best practices for the various space types within each pharmacy.
    a. Design N+1 redundant equipment to ensure maintenance and repairs may be made while space conditions are maintained.
2. Design for required positive and negative air pressures shall include all components to properly maintain needed pressurization include sealants, gaskets, etc.
3. Temperature and humidity requirements to be confirmed within pharmacy and medication storage areas. Provide system components, monitoring, and controls to ensure compliance. Temperature and humidity sensors shall have logging capabilities.

H. Plumbing:
1. Provide a sink with hot and cold water in the pharmacy space.
2. Confirm requirements for staff toilet room access.

I. Technology Requirements:
1. Typical elements include data, phones, IP addresses (security system, cameras, desktops), special equipment, and printers. Confirm needs per project.

J. Potential Special Equipment:
1. Pharmacy special equipment may include: medicine carousels, pneumatic tube systems, incubators, freezers, refrigerators, automated dispensing systems, clean rooms, pass-through cabinets, biosafety cabinets, fume hoods, medication dispensing

robots, IV Workflow Management System, Point of Sale (POS) systems, and conveyor systems.

2. Special care shall be given to understand the noise levels created by the expected equipment and design to ensure work area ambient noises are within standard Noise Criteria (NC) design ranges.

K. Finishes:
   1. Pharmacy spaces shall be compliant with regulations and licensing requirements, be easy to clean, and hold up to wear and tear.
      a. Clean room finishes shall be carefully detailed and documented.
   2. Where higher levels of equipment noise may be present, consider higher CRC ceiling tiles and products.

L. Furniture:
   1. Considerations with furniture layouts shall include maximizing workflow, preventing injuries, and addressing project specific requirements.
   2. Anti- fatigue mats shall be planned for work areas.

XXXII. MRI Design and Requirements

A. The design and implementation of MRI suites is a complex process, requiring thorough planning for successful projects.

B. Reference Section A “Radiation and MRI Safety” and Section B “MRI Safety Control” for shielding, signage, and regulatory requirements.

C. The overall design and size considerations are determined by:
   1. Magnet type: procedure, diagnostic, or combination.
   2. Machine: attached or detached table.
   3. Clinical Applications: inpatient or outpatient location.
      a. Inpatient locations shall comply with TJC/FGI classification and size for procedure room types.
   4. Processes: imaging only, imaging and procedures, or procedures only.
      a. The planned procedures and exams will determine the types, sizes, and numbers of coils as well as the storage for these items.

D. Structural Considerations:
   1. Early investigations may include vibration and structural studies.
   2. Projects shall account for the weight and size of the magnet within the suite and along a travel path to allow for future changes.
   3. Knock out panels may be designed for future changes as part of the travel path.
   4. Structural elements and equipment located outside of the MRI space may affect the performance of the magnetic field. These should be indicated for shielding studies.

E. Zone 4: Zone IV is considered the MRI scanner suite itself (magnet room). Access to Zone 4 is controlled by the MR Technologist with screening prior to entering the space.
   1. Zone 4 should be clearly labeled with signage to indicate the potential hazards of entering this area. Refer to Section A “Radiation and MRI Safety.”
   2. Shielding Considerations: Shielding will be designed by a third-party shielding vendor to meet machine and project requirements.

   a. Adjacent spaces to the MRI room may be within magnetic fields. Usages shall be studied to prevent health, safety, and noise issues.
   b. All doors, windows, and frames shall comply with shielding design.
      i. Specialty doors are preferred with designed notch for IV tubing and special MRI safe door hardware. Pneumatic controls will require power connection in zone 3
      ii. Glazing shall provide radio frequency interference and be nonferrous.
3. Utility Considerations:
   a. HVAC requirements will be determined by the manufacturer for both ambient temperature and humidity.
      i. Provide separate monitors for temperature, humidity, and oxygen monitoring.
      ii. The thermostat for the suite will be in Zone 3, near the Zone 4 door.
   b. Quench ventilation shall be coordinated with vendor and existing conditions.
   c. Chilled water is required to cool the magnet. Independent chillers or hospital facility chilled water loop are preferred.
      i. Back-up loops will use a manual switch and may not be served by city water.
   d. MRI-safe lighting must not interfere with the magnet's operation. Dimmable lights are required to ensure all necessary processes, including cleaning and starting IVs, have full light levels.
      i. Emergency lights are required for safe exiting during power outages.
      ii. Controls will be located in Zone 3, next to the Zone 4 door.
   e. Emergency power is required at inpatient locations, which operate 24/7.
   f. Data will be required for camera and CPU locations.
   g. Medical gas may include oxygen and vacuum.
4. Life Safety Considerations:
   a. Fire Sprinkler types and layout to be confirmed with MRI team and OSBC Fire Safety. Sidewall mounted heads may be considered due to conflicts with ceiling mounted objects.
   b. Smoke Detection will be air sampling types.
5. Finish Considerations
   a. Flooring is preferred to be seamless with the ability to have multiple color options to demarcate the gauss lines.
   b. Walls may include wall protection panels since damage is common from moving equipment.
   c. Ceiling design discussions can include features including ceiling pictures and mood lighting in Zone 4.
6. Storage Considerations: Provide nonferrous millwork storage for coils, linens, and additional supplies.
7. Additional Considerations:
   a. Where procedures are planned, space requirements may vary from intensive, with the space acting as an operating room, to limited, providing biopsies or injections. Clear documentation of design requirements is needed.

b. Special Procedures:
    i. HIFU – High-Intensity Focused Ultrasound.
    ii. TULSA – Prostate biopsy.
    iii. Anesthesia – Required for some procedures.
    iv. Breast biopsy – Outpatient.
    v. IMRI – Intraoperative Magnetic Resonance Imaging.
    vi. Pacemaker Remote Access – Dedicated laptop required.
c. Additional utilities and equipment may include anesthesia, injectors, medical gas (oxygen, vacuum), compressors (elastography), HIFU, and emergency power.
d. Installed tethers may be required to keep conditional equipment stays away from the magnet.
e. Penetration panels may be required for other connections and usages.

F. Zone 4 to Zone 3 Access Point:
1. UTSW prefers installation of a ferromagnetic detector for screening and inspection prior to entering zone 4.
2. The door will be accessed with a physical key and a retractable, nonferrous traffic control “belt” attached at the doorway.
3. The window between the control room and the patient area shall include either blinds or electronically switchable glass.
4. Signage requirements include a UTSW / OSBC Safety Signage and a lit “Magnet Always On.” Refer to Section A “Radiation and MRI Safety”

G. Zone 3: This is the control room and the computer room. It may contain patient dressing room(s), patient holding, and/or prep area(s). This area is outside the five (5) gauss line. Occupants include screened MRI Patients and MR Personnel:
1. At this point, patient(s) must remove all ferrous objects from their person and leave all personal belongings.
2. Design and Size Considerations
    a. From the control room desk, the technologist shall be able to view the patient in the MRI through the window while monitoring the Zone 4/3 door and Zone 3/2 door. This ability is essential for security and safety.
        i. UTSW requires full bore visual from the control desk for patients.
    b. For each project, confirm optimal workstation layout with manufacturers and users. Confirm if vendor furniture or casework increases functionality.
        i. Storage types and sizes shall be designed to meet project specific needs.
        ii. The control desk shall be coordinated to ensure continuous visual monitoring of the patient, appropriate layout of computers, screens, phones, other required equipment, and utility connections.
        iii. When procedures are planned, the control and zone 3 may become tight. Coordination with an understanding of processes and equipment are critical.
        iv. Remote cockpit cameras shall be coordinated for view and required data receptacles in the ceiling.

   c. The size and layout of the control room, casework, and equipment shall ensure the various teams can complete their tasks. Users may include technologists, radiologists, nurses, vendors, and others.
3. Controls and Buttons:
   a. The quench button shall be clearly labelled and have a cover to prevent accidental activation. It shall be located to ensure ease of access while complying with all codes and regulations.
   b. All controls, including EOC and door release, shall be clearly labelled.
4. Equipment may include medical dispensing unit, blanket warmer(s), waste, sharps, biological waste, and others to meet space requirements.
   a. A medical dispensing unit requires emergency power and CDAS or RTLS.
   b. Blanket warmer(s) require CDAS or RTLS.
   c. MRI safe fire extinguishers are required. Confirm locations and best practices with UTSW OSBC.
   d. A metal detecting wand is to be used prior to entering zone 3.
5. Utility Considerations:
   a. Lighting shall provide dimming.
      i. Emergency light fixtures provided shall not prevent operations in the control room. Dimming fixtures are preferred when standard power is in operation.
      ii. Controls and switching shall be discussed with users to confirm best practices.
   b. Data requirements are very intensive so additional, unassigned plugs are required.
   c. Hand sinks may be located in this area, as determined by procedures and processes expected. Discuss best practice for fixtures including foot pedal operation, size, requirements for splash guards, etc.
6. Finish Considerations
   a. Wall finish to include wall protection panels since damage is common from moving equipment.
   b. Flooring to be seamless.
   c. Employee lockers shall be included in Zone 3 with push button locks. Standard types include 12-inch x 12-inch and Z-lockers.
   d. Storage shall be locked with push button locks.
7. Equipment Room:
   a. The equipment room shall be located in close proximity and adjacent to the scan room with a cable link connection to comply with manufacturer distance requirements. Size and clearances shall comply with manufacturers' requirements and best practices.
   b. This room will open into Zone 3 or 2 with badge access or a keypad.
   c. HVAC requirements are critical for the equipment operation. Provide a thermostat to monitor temperature and humidity.
   d. Provide dedicated CRAC units.

e. Provide dedicated power conditioner for MRI electrical supply. Provide electrical study to determine if chiller and additional equipment will need to be on a power conditioner.

H. Zone 3 to Zone 2 access point:
   a. The door will be accessed with a card reader and have an auto operator.
   b. UTSW / OSBC safety signage shall be installed on the door.

I. Zone 2 – This area acts as a buffer between Zones 1 and 3 with MR personnel supervising and screening patients.
   1. This area may include a hallway outside Zone 3 with space types varying based on inpatient and outpatient locations.
      a. Size and number of patients provided for will be determined by how many scanners/machines are being served.
      b. A patient holding / recovery area may have curtains or walls. The size will be determined based on planned procedures and processes for the facility.
         i. For inpatient areas, one holding area shall be large enough for 2 stretchers to provide an area for code events.
         ii. Any IV will be started in this location.
      c. Dressing area size and quantity shall be determined for each project.
      d. Lockers area for patient storage will have push button locks and the size will be determined for each project.
      e. Provide patient toilet room(s).
      f. Confirm if lockers for firearm storage with lock and key will be required.
   2. Equipment:
      a. Crash Cart (Inpatient) or Rapid Response Cart (Outpatient).
   3. Utilities:
      a. Lighting shall be dimmable and zoning to be determined per project.
      b. Hand sinks may be located in this area, as determined by procedures and processes expected.
   4. Finish options: Confirm finishes per project since they can vary between inpatient and outpatient.
      a. Wall finish to include wall protection panels.
      b. Flooring to be seamless.

J. Zone 2 to Zone 1 access point:
   1. This door will be accessed with keycard access control.
   2. UTSW / OSBC safety signage shall be installed on the door.

K. Zone 1: This area of the MRI department is accessible to all. It may include admitting, lobbies, waiting areas, parking lots, as well as but not limited to hallways surrounding the Imaging department. These areas are described as having zero net magnetic attraction from Zone 4 and do not require supervision by MR personnel.
   1. The spaces may include:
      a. Reception/check-in: Includes employee workstation(s), arm band printer, and other equipment determined per project.
      b. Waiting area: this will include seating options, access to water or coffee bar, mounted TV, and patient toilet(s).

2. UTSW PM will provide finish standards to the A/E.

L. Zone 1 access point:
   1. This door will be a standard access point based on the facility.

XXXIII. Loading Docks and Receiving Requirements

A. Dock design and renovation discussions shall include Supply Chain Management, Facilities Management, OSBC, Police Department, Access Control, ARC (if applicable), and other user groups identified per project.
   1. A covered and protected dock provides the best solution for efficient deliveries and best waste practices.
      a. Dock and receiving areas shall be designed to prevent fumes from lingering in the space and prevent fumes from entering buildings or intake systems.
      b. Provide signage communicating that no engine idling is allowed.
   2. Types of delivery vehicles, delivery frequency, and expected delivery sizes shall be determined during initial planning.
      a. Identify dock heights needed for deliveries and compactor usage.
      b. The height of overhead doors and overhangs shall ensure semitrucks can fully utilize docks at overhead doors.
      c. Identify dock usage types.
      d. Identify equipment required such as hydraulic lifts, air doors, grilles, etc.
      e. Identify delivery volume to determine speed/type of overhead coiling doors. Refer to USW Design Guideline Section 08 32 23 “Overhead Coiling Doors” for additional requirements.
   3. Security components shall include access control components, card readers, and IP camera requirements, refer to UTSW Design Guideline Section 28 10 00 “Access Control.”
   4. Dock and receiving areas shall include striping for no parking areas, identification signage for docks, identification and safety signs for compactors/dumpsters, and other communication to ensure a compliant dock.
   5. Dock areas shall meet requirements for the Texas Commission on Environmental Quality, TPDES Permits, and best practices for all drains and runoff.

B. Usage Types:
   1. Management:
      a. A dedicated space or small office with window overlooking dock area for dock management.
   2. Receiving:
      a. Receiving areas shall provide the ability for semi-truck tractor trailer delivery as well as hydraulic lifts for smaller vehicle delivery.
      b. Receiving areas shall include interior space for secure delivery holding areas. Wire mesh partitions with locking gates and floor to ceiling panels may be considered for storage.

3. Waste:
    a. Loading docks shall include space for dumpster and compactor locations at a lower elevation for ease of use.
    b. Covers:
        i. Dumpsters must be under cover or have an individual cover.
        ii. Provide covered area for compactors at dock.
        iii. ARC bedding dumpster must be secure, covered, and enclosed.
    c. Waste streams requiring permanent dock space include standard waste compactor, recycling compactor, autoclave compactor (where required), and ARC bedding (where required).
        i. CUH utilizes a transvac system for waste, which requires a dedicated space for the vacuum system with compactors below.
        ii. Confirm expected sizes for compactors per project.
    d. Waste streams requiring dock access for waste pick-up includes chemical waste and regulated medical waste pick-up.
    e. Provide area for temporary construction dumpsters and parking. Parking considerations include deliveries and maintenance vehicles.
    f. Provide ample space for the delivery and removal of dumpsters and compactors.
    g. Provide a holding area for pallets and other delivery items.
4. Cart and Gondola Wash:
    a. Building requirements for cart wash and gondola wash shall be determined per project with users including BMO, OSBC, and UTSW PM.
    b. Provide a covered enclosure with washing equipment and chemical dispensing (if required).
    c. The wash area must drain to the sanitary sewer with a curb designed to separate wash water and rainwater. The curb design must allow for a smooth rollover with large, heavy trash gondolas. The CUH wash area curb may be used as an example.
5. Utilities:
    a. Where required, pressurized tanks for gas storage shall be located behind bollards and out of the main traffic pattern.

C. For additional ARC dock requirements, refer to UTSW Design Guideline Section A2, Design.

XXXIV. Assignment of Room Numbers

A. Refer to Section A, **EXHIBIT A.1 UTSW Room Numbering Standards**.

XXXV. Assignment of Room Names

A. Refer to UTSW Signage Manager for nomenclature standards.

XXXVI. Institutional Design and Branding Committee

A. All projects shall be submitted to the Institutional Design and Branding Committee (IDBC) for alignment with the campus standards and specifications.
B. The exterior and interior design and materials shall be presented to the IDBC beginning with Schematic Design, continuing during the Design Development and Construction Document phases as needed.
C. At each review, the IDBC will provide approvals, comments, and direction.
D. After the final Construction Document review, when all items have been presented and approved by the IDBC, the project can proceed to the bidding phase.
E. Final executive leadership approval may be necessary and is determined on a project-by-project basis.

XXXVII. Nursing Mother Rooms

A. Nursing mother rooms shall be provided with an accessible counter and a sink but no refrigerator.
B. Quantity of stations provided shall be 2 stations per 250 female employees. Stations for patients/visitors to be confirmed per project. A/E to discuss requirements with UTSW PM and user representative per project.
C. Provide ceiling supported privacy curtains for each individual location inside a larger room offering more than one nursing seating location.
D. Provide a quad electrical receptacle at each individual nursing seating location.
E. Provide overhead dimmable light fixtures. In spaces with multiple stations, provide one light fixture at the sink switched separately from other ceiling mounted light fixtures.
F. Furniture to include comfortable chair, bulletin board, full length mirror, and coat hook(s).
G. Provide vacant/occupied visual lock on doors for patients/visitors. Confirm locking requirements for employees per project. Refer to UTSW Specification Section 08 71 01 “Master Door Hardware Sets”

XXXVIII. Vending Standards

A. Vending areas and machine locations shall be located on plans and coordinated with UTSW Auxiliary Enterprises.
B. Finishes:
    1. Carpet shall not be installed in rooms containing vending machines.
    2. In larger rooms, provide a hard floor surface such as VCT under the machines and extending out 6-feet from the vending machines.
C. Provide a GFCI breaker in the panel to protect each vending machine.
D. Provide one data drop at each bank of vending machines.

XXXIX. Vibration Criteria in Buildings

A. Individual buildings and floors within buildings shall be designed to treat vibration according to intended use and equipment.
B. Low vibration will be required where sensitive equipment is expected including labs, hospital, and clinical spaces.
C. A/E shall advise UTSW PM and user representative on recommended vibration criteria using industry standard as well as manufacturer guides to assure expected performance.

End of Section A

EXHIBIT A.1 UTSW Room Numbering Standards

Project A/E shall use the following room numbering standards in all capital projects. Floor plans with room number and room names shall be submitted for review to the UTSW Planning / Masterbooks team and the FM Signage Manager during Schematic Design and Design Development (DD) for review and approval. After the DD review, all room numbers in design documents shall adhere to the approved standard numbering system. Any plan changes following DD shall be reviewed by the UTSW Planning Team for compliance.

Room numbering system shall always make sense to the end user while creating a natural flow for users and guests. Room Numbering should facilitate visitor, employee, and faculty wayfinding. Room numbers shall be assigned using a holistic approach that considers how differing floor levels can still relate within a building. One way to do this is to have numbers 'stack' from floor to floor, where possible.

UTSW PM will provide A/E with existing facility CAD plan, identifying room numbers prior to the room numbering process undertaken for the project.
Project A/E shall assist departments with cubicle numbering as shown in **Figure A.1-5 – Cubicle Numbering Formula.**

Overall Room Numbering Review Process:

I. A/E begins with current Facility CAD Plan sent from UTSW PM to review the entire plan area. Consideration shall be given to the context around the project area as changes must be done in relationship with existing spaces.
II. Review the existing numbers of all the spaces affected by the renovation.
III. Use the standards in this exhibit to apply new numbers.
IV. In large capital projects, end-user operational processes, and workflows would need to be considered for numbered spaces to remain or change.
V. During Schematic Design, the A/E shall submit a PDF of the demolition and proposed plans to the UTSW Planning / Masterbooks team for review and comment on room number convention.
VI. During Schematic Design, A/E is to consult with UTSW PM if whole floor room numbering is required.
VII. Sufficient notice is to be given to other end-users not involved in the scope of the project by the UTSW PM that room re-numbering will occur.
VIII. Prior to the final DD meeting, the A/E shall submit a PDF of the demolition and proposed plans for UTSW Planning / Masterbooks team for coordination and compliance with UTSW Room Numbering Standards
    A. Any plan changes during design milestone reviews by the A/E shall be digitally scanned and emailed to the UTSW Planning / Masterbooks team for record-keeping.
IX. Room numbers shall go through a final review at the Design Development stage by the UTSW Planning / Masterbooks team via the UTSW PM.
    A. Any room number and name corrections shall be digitally scanned and emailed to the A/E via the UTSW PM
    B. A/E shall include corrections in Construction Documents
X. UTSW PM may solicit consultation from the UTSW Planning / Masterbooks team and the Signage Manager to guide the Architect or Designers on room numbering and room nomenclature for complex wayfinding questions.

EXHIBIT A.1 (Continued)

Room Numbering Guidance:

I. Space numbers begin at Main Elevator/Entrance and flow clockwise, where possible, around the building, including stairwells
   A. Note – Elevators are not given room numbers. They are simply designated as "Elevator 1," "Elevator 2," etc.
   B. Elevators can be assigned room numbers for finish schedules but are not part of the overall room numbering sequence.

II. Spaces opening onto main and suite corridors alternate back and forth across the corridor, utilizing even numbers, like a hotel corridor.

III. Main Elevator Lobby is number 100 (see **Figure A.1-1 – Existing and Small Renovation**)
   a. Room number process near the main elevator lobby can be as followed 100A, 100B, 100C, etc.
   b. If there are additional spaces on 100A, such as a Vestibule, Guest Services, or Wheelchair Storage, room numbering can begin as 100AA, 100AB, 100AC, etc.

IV. Corridors:
   a. Existing and Small Renovations: The longest, most visible corridor is 1 from the main elevator lobby. Otherwise, the corridors begin at the Main Entrance and either flow clockwise OR are numbered with main corridors having 1, 2, on horizontal axis then secondary vertical axis corridors 3, 4, etc. (see **Figure A.1-1 – Existing and Small Renovation**)
      i. Corridor numbers shall only go up to 9. For example, Corridors 1.1, 1.2, 1.3, etc., up to 1.9.
      ii. If additional corridor numbers are needed, a letter could follow behind corridor numbers such as 1.1a, 1.1b, and 1.1c. These additional corridors should be located near their main 1.1 corridor.
   b. New Buildings and Major Renovations: The longest, most visible corridor is C01 from the main elevator lobby. Otherwise, the corridors begin at the Main Entrance and either flow clockwise OR are numbered with main corridors having C02, C03, on horizontal axis then secondary vertical axis corridors C04, C05, etc. (see **Figure A.1-1a – New Building and Major Renovation and Figure A.1-10 – Corridor Number Example ND-5**)
      i. Corridor numbers shall only go up to 90. For example, Corridors C01, C02, C03, etc., up to C90.
      ii. If additional corridor numbers are needed, a letter could follow behind corridor numbers such as C01a, C01b, and C01c. These additional corridors should be located near their main C01 corridor. If alcoves are located along the corridors, they will be identified as C01A, C01B, CO1C, etc.

V. Rooms are numbered on the even numbers to allow for growth. For large areas that could be subdivided into smaller rooms later, skip several numbers in the sequence to prevent having to renumber the spaces not affected by renovations.

VI. Rooms are numbered based on the hallway that they open into, even if they are generally accessed from an interior room. Opening onto a corridor overrides general use.

EXHIBIT A.1 (Continued)

VII. Rooms within a suite are typically numbered/lettered with direction depending on the point of main entry.

VIII. Subspaces receive the same number as the room they open from with a sub-letter designation (ex. 400 has 400A, 400B, etc.) (**Figure A.1-2 – Subspace Letter Designation**)
   a. Subspaces within subspaces continue to add letters up to 3 letters (ex. 400A has 400A and that has 400AA and 400AAA)
   b. Subspaces do NOT carry an “I” or an “O” designation to avoid confusion between “1” or a “0”

IX. Existing core and shell spaces will maintain their original room numbers, such as mechanical rooms, stairs, etc. whenever possible.

EXHIBIT A.1 (Continued)

Figure A.1-1 – Existing and Small Renovation: Example showing main elevator lobby and corridor numbering.

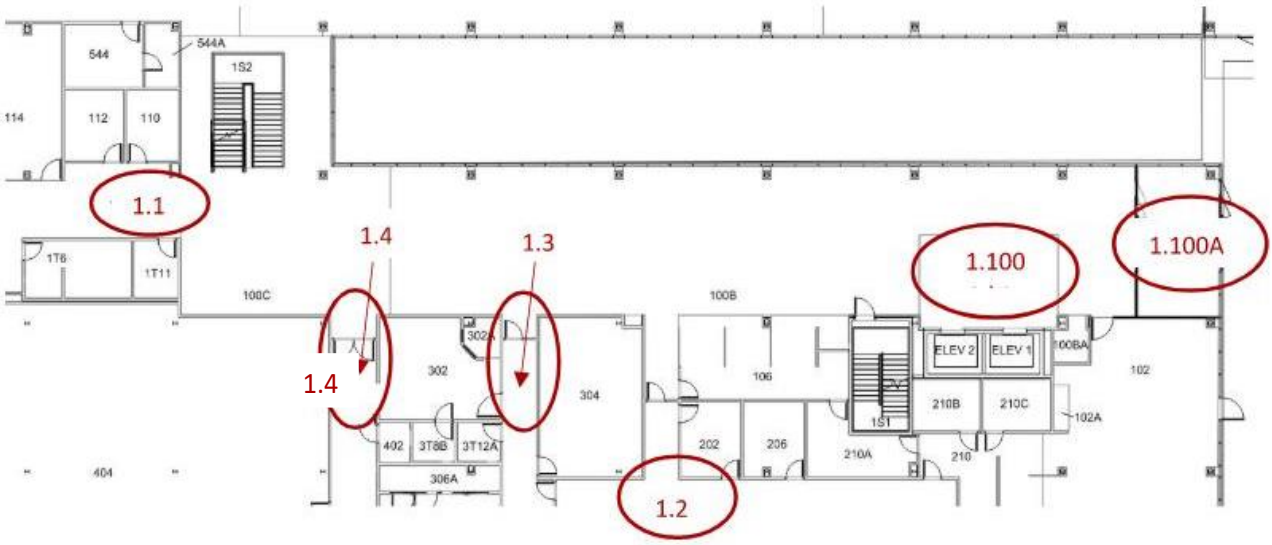


Figure A.1-1a – New Building and Major Renovation: Example showing main elevator lobby and corridor numbering.

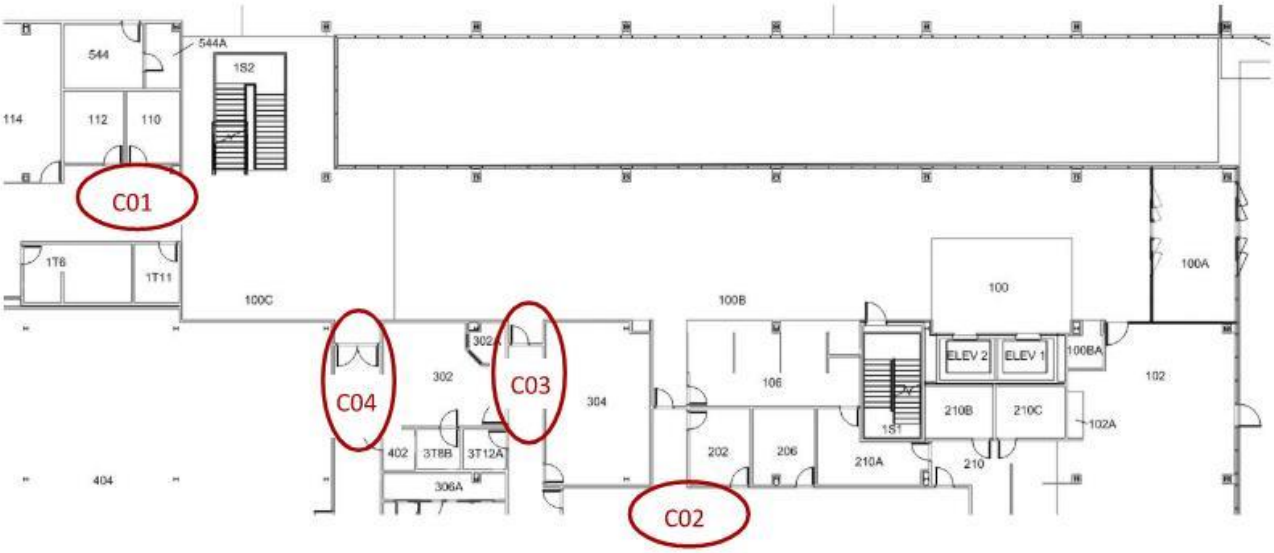


EXHIBIT A.1 (Continued)

Figure A.1-2 – Subspace Letter Designation - Example showing subspaces with sub-letter designation.

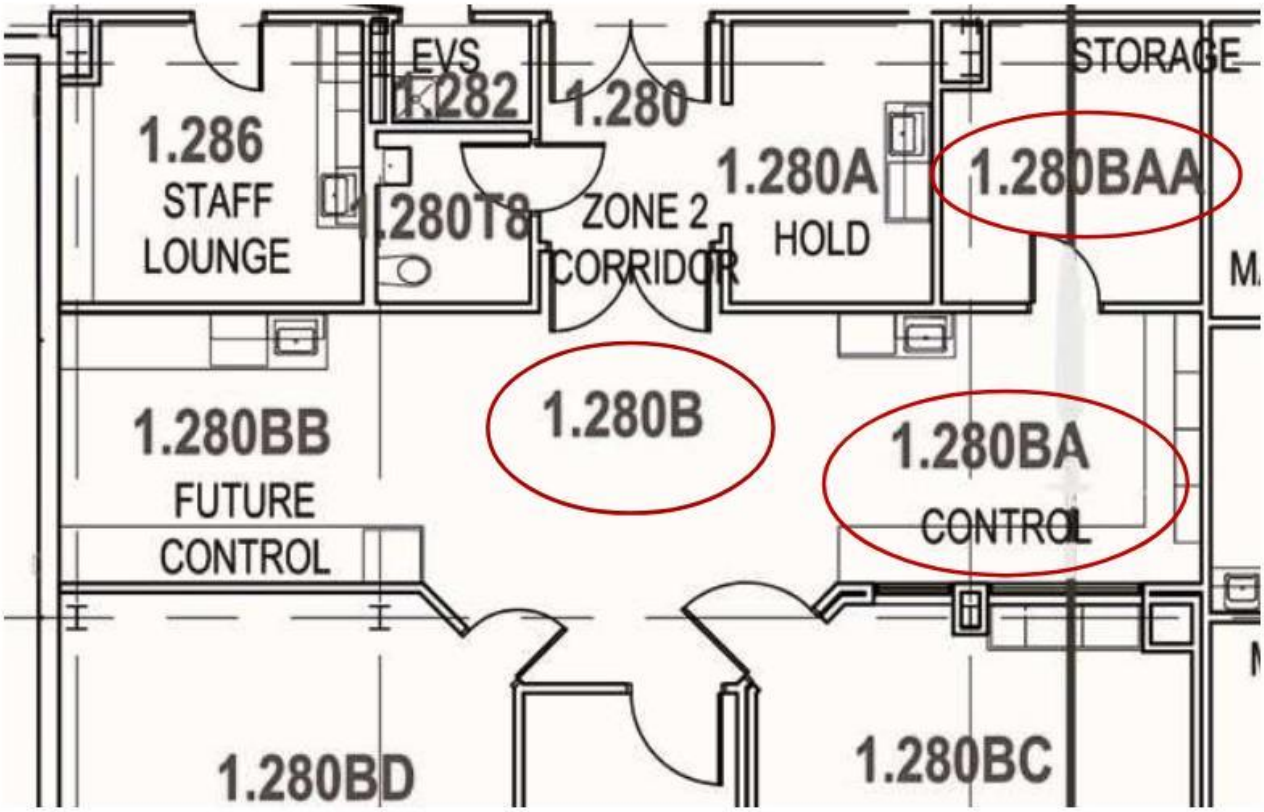


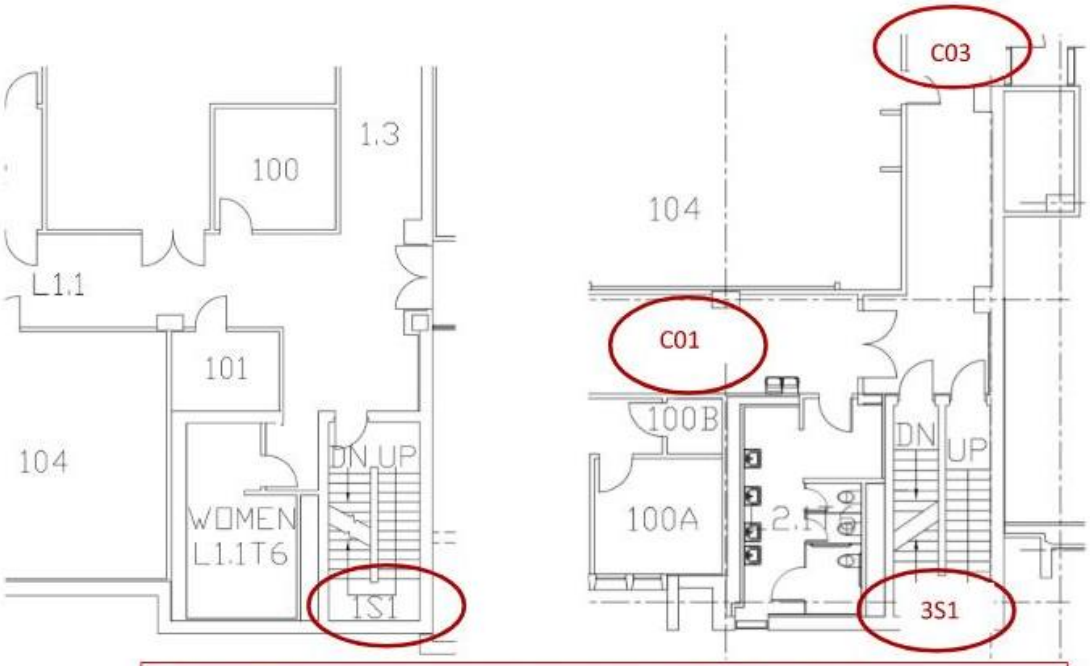
EXHIBIT A.1 (Continued)

Stairs follow the formula below:

I. Stairs are numbered in a new building project and will not be modified during renovations.

II. L1.1S1
   - A. L = Building Designate
   - B. 1 = Floor or Level
   - C. .1 = Corridor Number the stair opens from on the current floor (this number can change between levels)
   - D. S = Designation for a Stairwell
   - E. 1 = Stair Number – This MUST remain constant between floors (S1 is ALWAYS S1 even if it begins with 1, 2, 3, etc. per floor. This is an OSBC-Fire Safety requirement)
     1. Example **Figure A.1-3 – Stair Number Example** – same building, same stair number, different leading numbers based on corridors.

Figure A.1-3 – Stair Number Example - Floorplans showing the stairs formula



Two building levels showing the same stairwell. The first-floor stair number was based on the corridor number. The stair numbers above will match that numbering.

EXHIBIT A.1 (Continued)

Restrooms follow the formula below:

I. For restrooms, refer to Building Core Elements: Restrooms earlier in Section A

II. RB1.7T12
   - A. RB = Building Designate for Redbird as an example
   - B. 1 = Floor or Level
   - C. .7 = Corridor Number the room is accessed from or Number Series of the room the toilet is a sub-room to
   - D. T = Designation for a toilet room / restroom
   - E. 12 = Use number of the toilet room as indicated in the UTSW Comprehensive Interior Signage Manual. In this example, a unisex staff, ADA restroom. It is unusual, but you can have more than one T12 in the same corridor/room. In this instance, the T number will have a letter suffix added (i.e., RB1.7T12A, RB1.7T12B, etc.)
     1. Example **Figure A.1-4 – Restroom Formula** – Toilet RB1.7T12A opens from corridor 1.7 and followed by restrooms following an alphanumeric sequence.

III. If a restroom is added to an existing building, provide the next letter suffix in the "T" series depending on what corridor number it opens into.

Figure A.1-4 – Restroom Formula – Floorplan showing the restroom formula for numbering multiple restrooms off the same corridor.

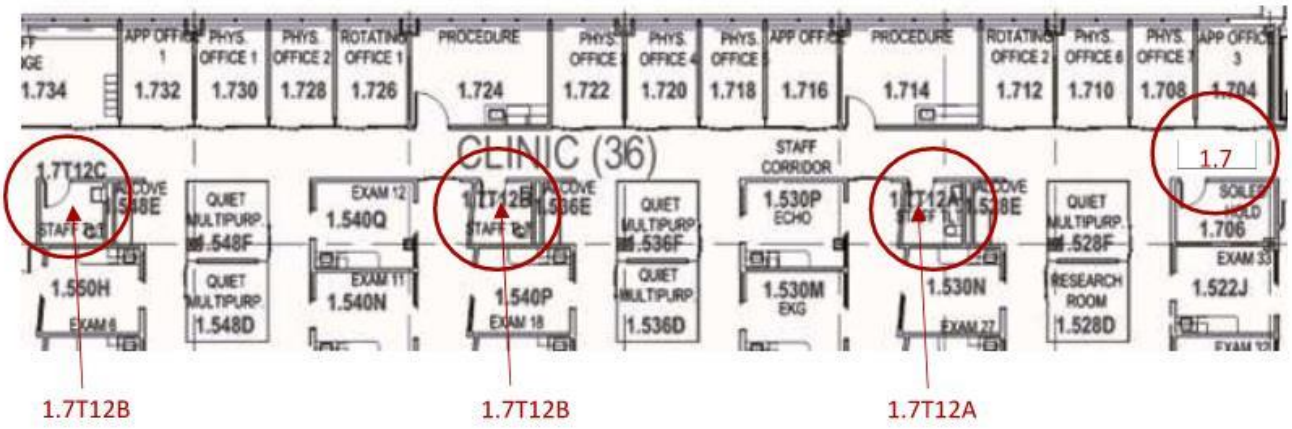
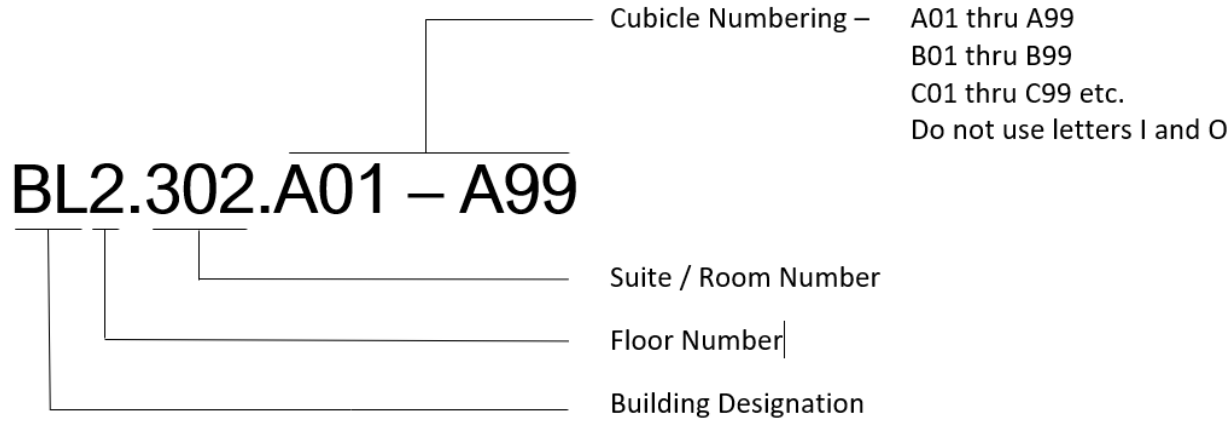


EXHIBIT A.1 (Continued)

Figure A.1-5 – Cubicle Numbering Formula – For reference:



I. Refer to the UTSW Comprehensive Interior Signage Manual for cubicle sign type.
II. Cubicle numbering is for individual Departments' use and reference only and may not be reflected in the Facilities CAD Plans.

Exceptions to Standard Room Numbering

Labs and Open Offices pose specific challenges to numbering. Examples like the ones shown below in **Figure A.1-6 – Dividing Open Spaces** documents the process for applying space divisions where elements like walls are not present.

Labs:

I. Divisions within the larger spaces associated with benches and between hard walls carry a single room number.
II. The shared space that functions as a corridor is divided between adjacent room numbers, typically to the center of the area between as shown below.

Figure A.1-6 – Dividing Open Spaces – Floorplan showing the division of open spaces between labs

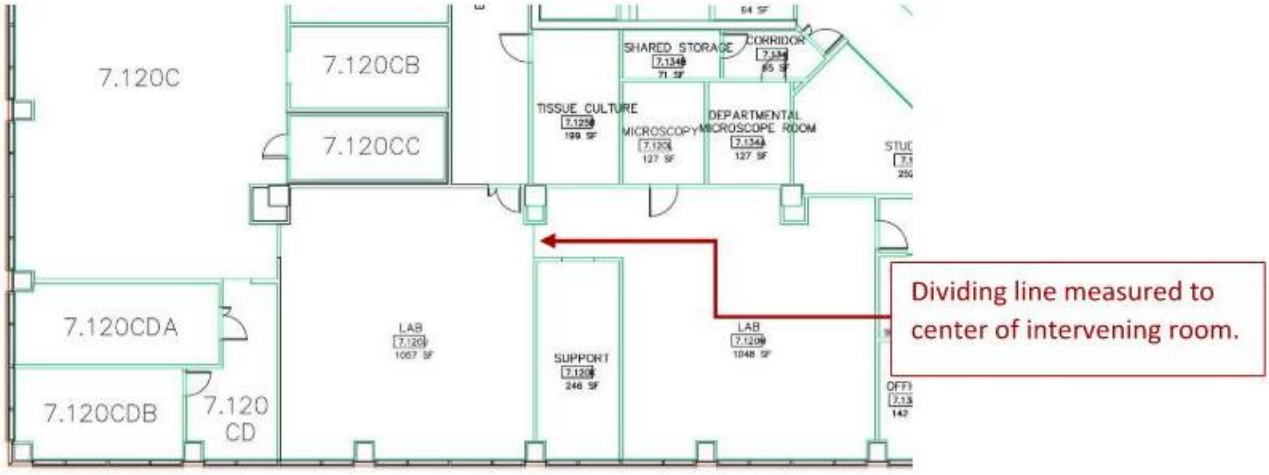


EXHIBIT A.1 (Continued)

Open Office

UTSW may provide additional subspace designations to break larger lab or office spaces into smaller sizes.

Figure A.1-7 – Dividing Open Spaces 2 - Example showing dividing spaces in open offices with polylines located along column lines to further divide a larger space.

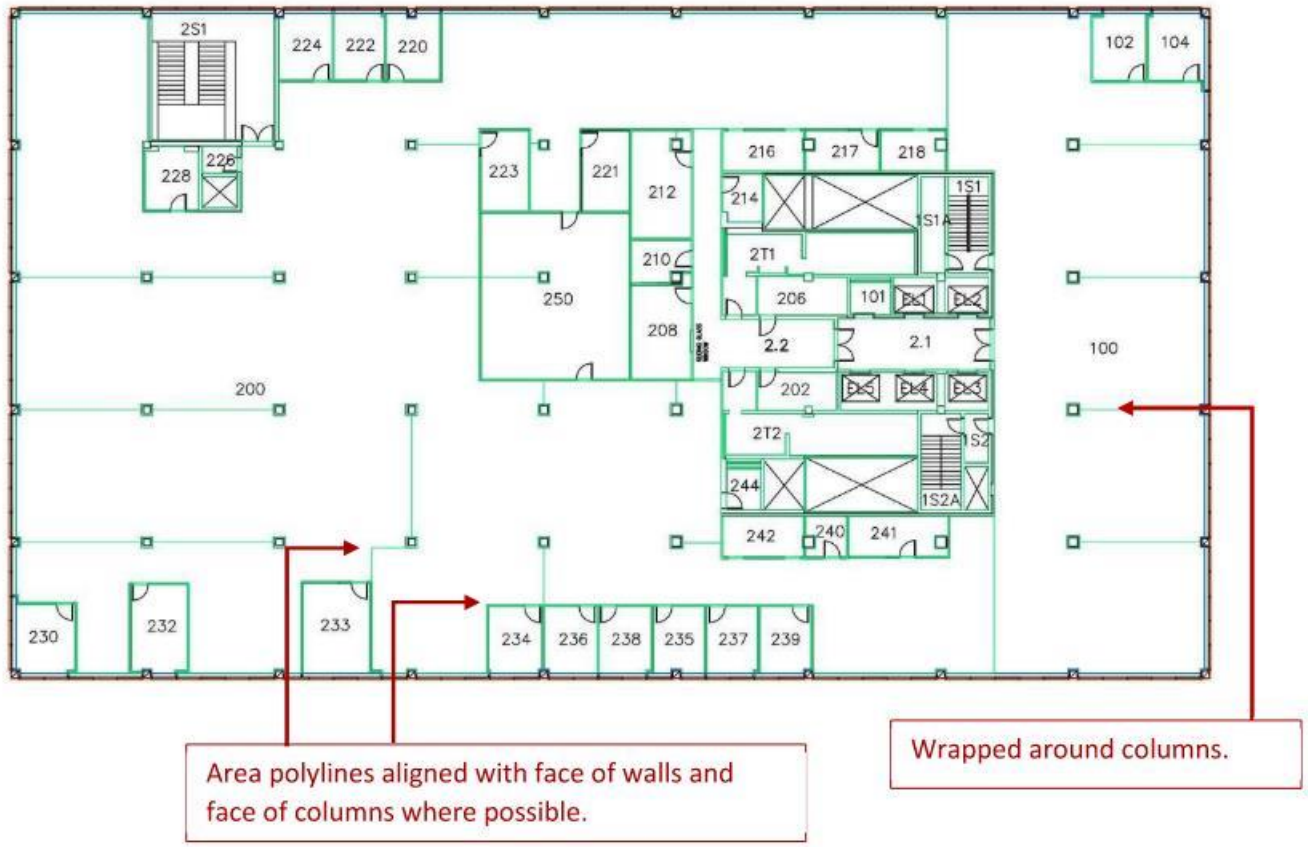


EXHIBIT A.1 (Continued)

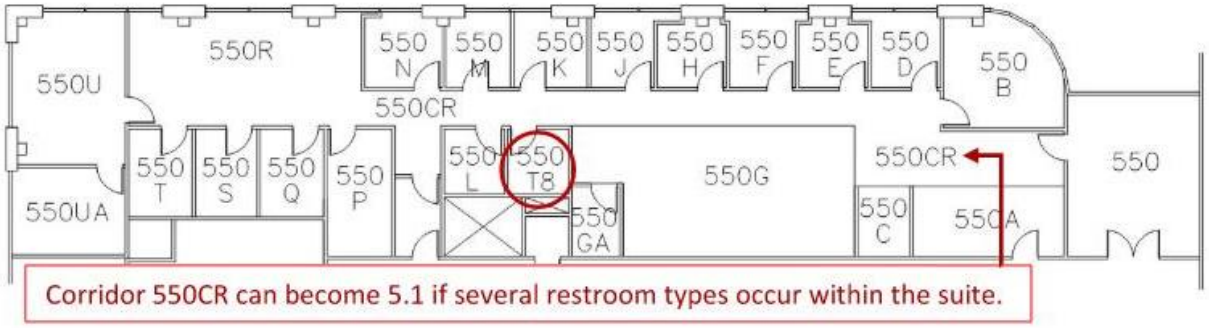
Leased Suites:

I. Begin with a room number usually provided by Associate Director, UTSW PM, and/or Director of Real Estate Services who is familiar with the new and/or leased clinic either on campus or remote location.
   a. For example, Suite 550 will usually be the Health Care Public Waiting Room or a main room entrance to a clinic. Refer to **Figure A.1-8 – Lease Corridor Numbering Example.**

II. A letter will follow behind each suite's room (550A, 550B, 550C etc.). A reminder to never use letters O and I.
   a. Corridors will usually be labeled CR, in this case 550CR
   b. Restroom's room numbering in Suites will follow the UTSW Comprehensive Interior Signage Manual. Refer to Restroom formula in previous A.1 section. An example in **Figure A.1-8 – Lease Corridor Numbering Example** is a unisex ADA patient restroom would be 550T8.

III. There are a few existing clinics and suites around UTSW campus which follow the same process for the suite exception. If there are renovation plans for existing clinic or hospital suites, here are some important items to remember:
   a. Review the existing numbers of all the spaces affected prior to designing and/or modifying the function of a room.
   b. Review the new assigned numbers with the UTSW PM and Drafting Technician (Planning).

Figure A.1-8 – Lease Corridor Numbering Example. This plan shows that there are two options for numbering the corridor. It can be 550CR or 5.1 depending on the number of toilet rooms.



Due to software limitations of UTSW Facility Management Software, toilet room numbers may occasionally be changed by UTSW during the numbering process. **The following pages illustrate a variety of examples of room numbering within the context of the entire floor.**

EXHIBIT A.1 (Continued)

Figure A.1-9 – Corridor Numbering Example F2 - This plan shows Building F2 as an example for overall numbering strategy of corridors and stairs.

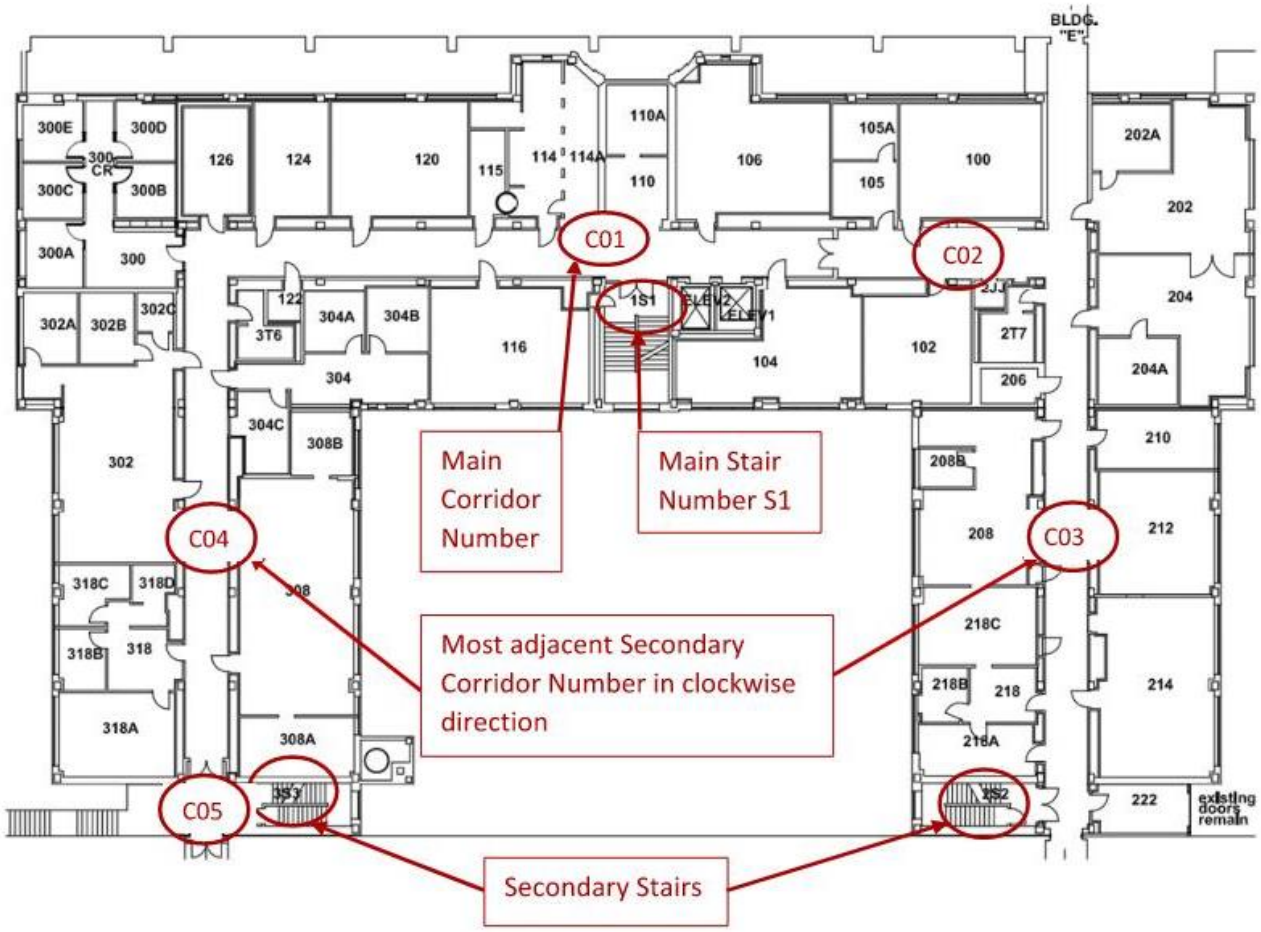
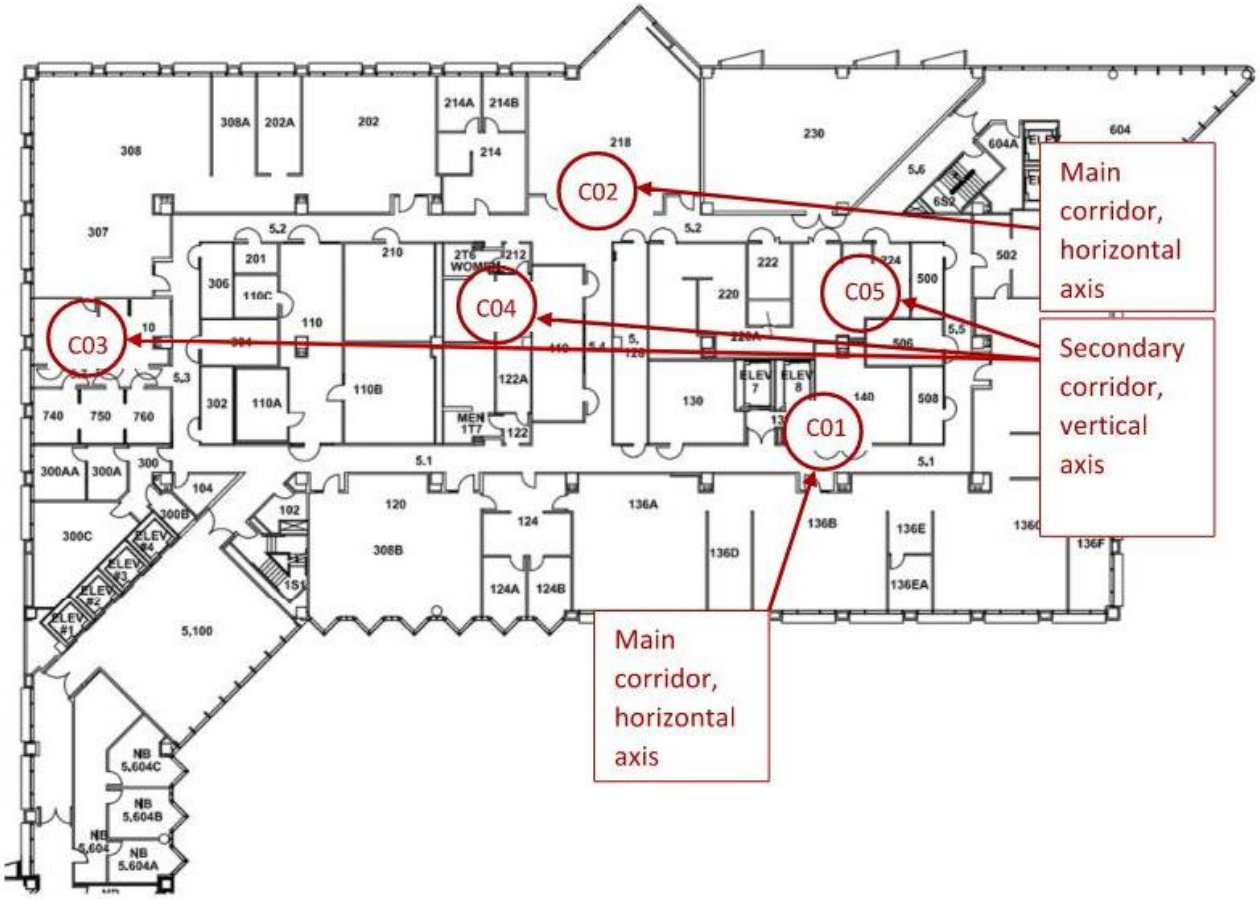


EXHIBIT A.1 (Continued)

Figure A.1-10 – Corridor Number Example ND-5 - Example of ND-5 showing corridor numbering



DOCUMENT HISTORY

Issue Date	Description	Editor
06/19/2020	June 19, 2020 Print	MR
10/09/2020	Update Environmental Practices in VII, Nomenclature change	MS
03/30/2021	Q1 2021 Update	EV
06/30/2021	Q2 2021 Update, Building maintenance updates	EV
03/25/2021	Removed Sections referencing nomenclature in signage standards, Clarifications-Section A, Exhibit A.2-Room Numbering Standards and figures updated	MR
10/03/2022	Q3 2022 Update, Overall section revisions	EV
06/26/2023	Q2 2023 Update	EV
12/15/2003	Q4 2023 Update	EV
06/13/2024	Q2 2024 Update	EV
12/20/2024	Q4 2024 Update	EV
06/27/2025	Q2 2025 Update	EV
12/18/2025	Q4 2025 Update	EV

DESIGN CRITERIA

SECTION A1 MASTER SPECIFICATIONS

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SECTION A1 – MASTER SPECIFICATIONS

I. General Information

A. UT Southwestern Medical Center provides campus Master Specification sections for use by Architects/Engineers on campus projects.

B. UTSW utilizes RIB SpecLink to manage the campus Master Specifications in a cloud-format. At the beginning of a new project, the UTSW PM shall provide the A/E with contact information, links, and access to the UTSW Master Specifications.

C. The A/E shall utilize the campus Master Specifications as the framework for their project specifications. As the Design Professional, the A/E is responsible for and ensures specifications are finished to provide each project with the required elements for a completed design.
   1. The A/E shall review the UTSW Master Specifications then share questions, concerns, and proposed deviations with the UTSW PM and Design Team.
   2. The A/E will finalize specifications by editing all required sections to include all project scope.
   3. The A/E shall remove items from the project specification that are not within the project scope.

D. While the information is housed on the SpecLink cloud, each A/E determines if they will utilize the SpecLink application for production or if production will take place in another software platform. Regardless of the production, the A/E shall confirm adherence to the Master Specification requirements.

E. The A/E may suggest product substitutions to those noted in the Master Specifications with the UTSW PM.
   1. Consultation with the UTSW PM and Design Team along with review of the UTSW Design Guidelines are required for substitutions.
   2. The General Contractor will be required to provide pricing for any substitutions with cost and/or quality implications.

F. Master Specifications shall be updated by UTSW Facilities Management and notifications shall be sent to A/Es on the Design IDIQ and on CIP contracts.

II. IR Specification Guide

A. A/E shall confirm the following scope assignments in early design phase with UTSW IR and PM.
   1. Pathways: Always provided by General Contractor.
   2. Low Voltage Scope for IR cabling and clinical USB cabling:
      a. On Campus Renovations: IR will manage cabling unless directed otherwise in writing by UTSW IR.
      b. Off Campus Renovations: Cabling will be determined by project contract. UTSW PM shall confirm.
      c. Capital Improvement Projects (CIP) and large projects: Cabling will be by General Contractor unless directed otherwise in writing by UTSW IR.

B. IR Scope will be determined per project and the A/E shall confirm specification sections for inclusion with UTSW PM and IR for each project during the design phase meetings.

C. See **EXHIBIT A1.1 IR Specification Guide for Renovation Projects** and **EXHIBIT A1.2 IR Specification Guide for CIP Projects** to assist on IR scope per project.

III. Specification Inclusion

A. The Project A/E shall confirm overall sections for inclusion with UTSW PM per project.
B. Where possible, UTSW will confirm minimum sections to include per project type.
C. Renovation Projects shall include:
   1. Division 01:
      a. Section 01 10 00 - Summary
      b. Section 01 21 00 – Allowances (if required)
      c. Section 01 22 00 - Unit Prices (if required)
      d. Section 01 23 00 - Alternates (CSP Only) (if required)
      e. Section 01 25 00 - Substitution Procedures
      f. Section 01 25 00.01 – Substitution Request Form
      g. Section 01 31 00 - Project Management and Coordination
      h. Section 01 32 00 - Project Planning and Scheduling
      i. Section 01 33 00 - Submittal Procedures
      j. Section 01 35 13 – Hospital Project Procedures
      k. Section 01 35 16 – Alteration Project Procedures
      l. Section 01 35 23 - Project Safety Requirements
      m. Section 01 41 00 - Regulatory Requirements
      n. Section 01 42 00 - References
      o. Section 01 45 00 - Project Quality Control
      p. Section 01 50 00 - Temporary Facilities and Controls
      q. Section 01 57 19 – Airborne Contaminants Control
      r. Section 01 60 00 - Product Requirements
      s. Section 01 71 23 - Field Engineering
      t. Section 01 73 00 - Execution
      u. Section 01 73 29 - Cutting and Patching
      v. Section 01 74 19 - Construction Waste Management and Disposal
      w. Section 01 77 00 - Closeout Procedures and Submittals
      x. Section 01 79 00 - Demonstration and Training
      y. Section 01 81 13 - Sustainable Design Requirements
      z. Section 01 91 00 - General Commissioning Requirements
   2. Division 02
      a. Section 02 41 00 - Demolition
   3. Division 26 required sections:
      a. Section 26 00 00 Basic Electrical Requirements
      b. Section 26 00 10 UTSW Electrical Design Requirements
      c. Section 26 05 00 Basic Electrical Materials and Methods
      d. Section 26 05 01 Electrical Demolition
      e. Section 26 05 53 Electrical Identification
      f. Section 26 08 00 Commissioning of Electrical Systems (if required)

EXHIBIT A1.1 IR Specification Guide for On-Campus Renovation Projects

Confirm With UTSW IR Per Project During Design Phase Meetings.

Sections Under the Scope of the GC are Standard Text.

Sections Under the Scope of IR/IR Vendor are *italic*.

Division 26 – Electrical

26 33 53	*Uninterruptible Power Systems*
26 36 00	Transfer Switches
26 36 23	Medium Voltage Automatic Transfer Switches
26 41 13	Lightning Protection System
26 43 13	Surge Protection Devices
26 51 00	Lighting Fixtures

Division 27 – Communications

27 05 00	Common Work Results for Communications
27 05 26	Grounding and Bonding for Communications Systems
27 05 28.15	Floorboxes and Poke-Thrus
27 05 28.29	Hangers and Supports for Communications Systems
27 05 28.33	Conduits and Boxes for Communication Systems
27 05 28.36	Cable Trays for Communications Systems
27 05 53	*Identification for Communications Systems*
27 07 00	*Communications Testing*
27 11 00	*Communications Room Fit-Out*
27 11 13	Communications Entrance Protection
27 11 16	*Communications Cabinets, Racks, Frames, And Enclosures*
27 11 19	*Communications Termination Blocks and Patch Panels*
27 11 23	*Communications Cable Management*
27 11 26	Communications Rack Mounted Power and Power Strips
27 13 13	*Communications Copper Backbone Cabling*
27 13 13.13	*Communications Copper Cable Splicing and Terminations*
27 13 22	*Communications Optical Fiber Backbone Cabling*
27 13 23	*Communications Optical Fiber Backbone Cabling, Exterior*
27 13 23.13	*Communications Optical Fiber Splicing and Terminations*

EXHIBIT A1.1 (Continued)

27 13 33	*Communications Coaxial Backbone Cabling*
27 15 13	*Communications Copper Horizontal Cabling*
27 15 33	*Communications Coaxial Horizontal Cabling* (Confirm Per Project)
27 15 43	*Communications Faceplates and Connectors*
27 16 19	*Communications Patch Cords and Station Cords*
27 41 00	*Common Work Results for Audiovisual Systems and Equipment* (If required per scope)
27 41 16	*Integrated Audiovisual Systems and Equipment* (if required per scope)
27 51 14	*Television Distribution Equipment*
27 51 19	Sound Masking System (If required per scope)
27 52 23	Nurse Call System (if required per scope)
27 52 24	USB Vitals Monitoring System (if required per scope)
27 53 13	Clock Systems (If required per scope)
27 53 13.13	Wireless Clock System (If required per scope)
27 53 18	*WLAN*
27 53 19	*Internal Cellular and Antenna Systems*
27 84 13	Communications Penetration Firestopping

EXHIBIT A1.2 IR Specification Guide for CIP Projects

Confirm With UTSW IR Per Project During Design Phase Meetings.

Sections Under the Scope of the GC are Standard Text.

Sections Under the Scope of IR/IR Vendor are *italic* .

Division 26 – Electrical

26 33 53	Uninterruptible Power Systems
26 36 00	Transfer Switches
26 36 23	Medium Voltage Automatic Transfer Switches
26 41 13	Lightning Protection System
26 43 13	Surge Protection Devices
26 51 00	Lighting Fixtures

Division 27 – Communications

27 05 00	Common Work Results for Communications
27 05 26	Grounding and Bonding For Communications Systems
27 05 28.15	Floorboxes and Poke-Thrus
27 05 28.29	Hangers and Supports for Communications Systems
27 05 28.33	Conduits and Boxes for Communication Systems
27 05 28.36	Cable Trays for Communications Systems
27 05 53	Identification for Communications Systems
27 07 00	Communications Testing
27 11 00	Communications Room Fit-Out
27 11 13	Communications Entrance Protection
27 11 16	Communications Cabinets, Racks, Frames, And Enclosures
27 11 19	Communications Termination Blocks and Patch Panels
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EXHIBIT A1.2 (Continued)

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End of Section A1

DOCUMENT HISTORY

Issue Date	Description	Editor
06/19/2020	June 19, 2020 Print	MDR
12/30/2020	Q4 2020 Revision	EV
03/25/2022	Removed quarterly in Section F.	MR
10/3/2022	Q3 2022 Update, Overall section revisions.	EV
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12/20/2024	Q4 2024 Update	EV
06/27/2025	Q2 2025 Update	EV
12/18/2025	Q4 2025 Update	EV

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DESIGN CRITERIA

SECTION A2 ANIMAL RESOURCE CENTER (ARC) DESIGN REQUIREMENTS

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SECTION A2 – ANIMAL RESOURCE CENTER (ARC) DESIGN REQUIREMENTS

I. General Information

A. Animal Resource Center (ARC) spaces on the campus shall be designed to follow the building codes as well as tenets of the several organizations and regulations in which they follow.
   1. A/E shall confirm specific requirements with ARC Leadership before design work begins on each ARC project.
   2. Projects shall utilize the NIH Design Requirements Manual (most recent edition), The Guide from the NRC, and the Biosafety in Microbiological and Biomedical Laboratories (BMBL)(CDC).
   3. All projects shall adhere to AAALAC standards.
   4. Where conflict arises between Federal, State, or Local requirements, A/E shall provide a comparison document identifying differences and compliance strategies. ARC Leadership and UTSW FM VP will provide final compliance decisions.
   5. All projects shall follow requirements and regulations from UTSW Office of Safety and Business Continuity (OSBC) including Fire Safety, Chemical Safety, Biological Safety and other teams as required.

B. ARC projects can consist of several different types of facilities. ARC Leadership, OSBC Biological Safety, and OSBC Chemical Safety will all take part in determining the codes, strategies, and requirements for laboratory safety.
   1. Facility types include but are not limited to:
      a. Conventional facilities.
      b. Barrier facilities with a systemic approach to prevent pathogen contamination.
      c. Containment facilities with biocontainment strategies to isolate dangerous biological agents. UTSW projects utilizes Animal Biological Safety Levels (ABSL) 2 and 3.

C. UTSW ARC leadership approvals are required for design, systems, equipment, and finishes starting from design phases and continuing through construction phases.
   1. ARC designs shall be approved by UTSW ARC leadership in writing before progressing into new design phases and before progressing into construction.
   2. A/E shall ensure submittal requirements for all ARC project specifications document that all submittals shall be provided to ARC leadership.
      a. A/E shall confirm with ARC leadership which submittals shall be reviewed and approved in writing by ARC. At a minimum, submittals for commissioning, doors, door hardware, access control, finishes, equipment, Animal Monitoring and Watering Systems (AMWS), HVAC, and lighting shall be included.

D. Design and construction of these facilities, which operate 24 hours a day / 7 days per week, shall contribute to safety and wellbeing for workers, animals, and the community.
   1. Design and layout considerations include containment and contamination control, which include ideas of clean and dirty areas/processes.
   2. Design considerations for animals specifically are the creation of spaces that are safe from environmental fluctuations including the transmission of noise and vibration.

E. ARC spaces rely heavily on a complex Animal Monitoring and Watering Systems (AMWS). The coordination between disciplines to correctly document and implement the project specific requirements shall include ARC Leadership and vendor representative to provide

guidance on standards and best practices. Refer to Design Guideline Section A2, 13 31 13 and master specification for requirements.

F. Refer to **EXHIBIT C.10 Responsibility Matrix** for standard identification of equipment, accessories, and other items per specification division.

II. Design

A. Each ARC space will be assigned an Animal Biosafety Level (ABSL) by UTSW OSBC. Project A/Es shall use this to guide their design solutions. The descriptions below are from the "UT Southwestern Biosafety Manual" version Date: December 2023.

1. ABSL1 is suitable for work involving well characterized agents that are not known to cause disease in immunocompetent adult humans, and present minimal hazards to personnel and the environment. ABSL1 facilities should be separated from the general traffic patterns of the building and restricted as appropriate. Special containment equipment or facility design may be required as determined by an appropriate risk assessment. Personnel must have specific training in animal facility procedures and must be supervised by an individual with adequate knowledge of potential hazards and experimental animal procedures. Staff must don, at a minimum, institutional required PPE prior to animal operations.
2. ABSL2 builds upon the practices, procedures, containment equipment, and facility requirements of ABSL1. ABSL2 is suitable for work involving laboratory animals infected with agents associated with human disease and pose moderate hazards to personnel and the environment. ABSL2 addresses hazards from ingestion as well as from percutaneous and mucous membrane exposure.
    a. ABSL2 requires that: 1) access to the animal facility is restricted; 2) personnel must have specific training in animal facility procedures, the handling of infected animals, and the manipulation of pathogenic agents; 3) personnel must be supervised by individuals with adequate knowledge of potential hazards, microbiological agents, animal manipulations, and husbandry procedures; and 4) procedures involving the manipulation of infectious materials, or where aerosols or splashes may be created, should be conducted in BSCs or by use of other physical containment equipment. Staff must don, at a minimum, institutional required PPE prior to animal operations to reduce exposure to infectious agents, animals, and contaminated equipment. Implementation of employee occupational health programs should be considered.
3. ABSL3 involves practices suitable for work with laboratory animals infected with indigenous or exotic agents that present a potential for aerosol transmission and agents causing serious or potentially lethal disease. ABSL3 builds upon the standard practices, procedures, containment equipment, and facility requirements of ABSL2. ABSL3 laboratories have special engineering and design features.
    a. ABSL3 requires that: 1) access to the animal facility is restricted; 2) personnel must have specific training in animal facility procedures, the handling of infected animals, and the manipulation of potentially lethal agents; 3) personnel must be supervised by individuals with adequate knowledge of potential hazards, microbiological agents, animal manipulations, and husbandry procedures; and 4) procedures involving the manipulation of infectious materials, or where aerosols or splashes may be created, must be conducted in

BSCs or by use of other physical containment equipment. Staff must don, at a minimum, institutional required PPE prior to animal operations to reduce exposure to infectious agents, animals, and contaminated equipment. Implementation of employee occupational health programs should be considered.

B. Building Design:
   1. Buildings shall conform to the Americans with Disabilities Act (ADA) and the Texas Accessibility Standards (TAS) .
      a. Within animal and work areas, levels of accommodation shall be discussed in programming with ARC Leadership and UTSW PM.
   2. Flexibility and adaptability shall be considered in overall design so future growth and changes can be accommodated.
      a. Confirm required future growth strategies for each project for each MEP discipline and provide oversized chases, units, panels, etc. as confirmed with ARC Leadership.
      b. Due to the special nature of ARC spaces, HVAC and exhaust systems capacities can easily become limiting factors in the life of a building. Provide future expansion possibility for all mechanical systems above the needs of the design for day one.
      c. Placement of cage processing equipment including autoclaves should be peripheral in the animal facility design for ease of future renovation or replacement of equipment. Provide a planned access pathway for future modifications including considerations for knock-out panels.
   3. Refer to Section B, Codes and Standards, for specific acoustic requirements for ARC spaces in “Acoustical Design” for both noise criteria of equipment and sound transmission.
      a. ARC areas shall have full height partition to structure as standard.
   4. Additional structural loading requirements shall be discussed with the user representative and UTSW PM for items including equipment and equipment travel paths.
   5. Building Service:
      a. Separate loading docks for ARC services are preferred apart from standard building utilities and service functions.
      b. Entry locations and path for delivery of animals shall be determined per project requirements including an entry width providing 48-inches minimum.
      c. Refer to Design Guideline Section A, Building Core Elements: Rooftop Requirements. The location of a roof-top utility crane is preferred for future equipment replacement if elevators cannot be used for units designed in the project scope.

C. Circulation shall guide the layout of the ARC beginning in early programming discussions to confirm facility requirements.
   1. ARC circulation paths shall not converge with patient circulation paths, including patient building entries and patient elevator access.
   2. Access into ARC animal areas shall be designed to control access into the animal facility.
      a. Access into containment spaces shall follow regulations as indicated by ARC Leadership and OSBC.

3. Within the facility, clean and dirty process and spaces shall be separated to prevent contamination. Discuss requirements including HVAC supply, pressurizations, and exhaust.
    a. Dirty spaces shall be located along the waste removal pathway either at the barrier perimeter or outside of the barrier. These shall be negatively pressurized.
4. Corridors:
    a. Corridors shall be sized to wide enough for equipment movement and two-way traffic. All doorways shall be tall enough for standard equipment heights. Plan for 48-inches wide and 84-inches high.
    b. The height of double doors across corridors shall be no lower than animal room door frame heights and provide clear width without any central mullion to allow for cage movement.
    c. All areas of cage traffic have strict wall protection requirements which effect corridor design. Refer to ARC Design Guideline Section 10 26 00 and Master Specification for wall protection requirements.
5. Elevators:
    a. Clean and dirty elevators shall be located near the associated spaces.
    b. Elevator vestibules shall minimize airflow and/or pressurization control issues.
    c. Areas around elevators shall be sized to provide turning radii and marshaling areas.
    d. Building freight elevators may serve both ARC spaces and non-ARC spaces if security card access provides controlled entry into the ARC areas.

D. ARC spaces shall be designed to provide researchers and staff with the ability to perform their work within controlled environments. Spaces that may be present in the facility types include:
1. Animal housing:
    a. Animal rooms must be separated from unrestricted traffic flow within their buildings using access control.
        i. Risk assessment of individual spaces shall determine additional requirements for design and engineering within the facility.
    b. Animal holding spaces shall be designed to provide proper housing areas for animals which are free of loud noises, uncontrolled light, and vibration. The spaces shall operate at required temperatures and humidity for the animal species indicated.
        i. Document the components required of the AMWS for each project including animal watering distribution, access control, lighting control (white), temperature and humidity monitoring.
        ii. Document additional requirements including ventilated rack air supply and direct exhaust, lighting, red lights and controls.
        iii. Preferred room size for rodent rooms shall accommodate six UTSW designated ventilated racks.
        iv. Additional sizing standards will be confirmed with ARC leadership.
    c. Required components within an animal housing room include a glove dispenser, mop holder, and wall protection.
        i. Small animal holding spaces do not require plumbing fixtures.

ii. Large animal holding spaces require hose bibs and floor drains. Refer to design guideline Section 22 11 19 “Plumbing Specialties.”

2. Specialty Spaces include procedure rooms, surgery facilities, and associated support spaces.
   a. Locations shall minimize traffic flow and potential contamination to and from animal housing spaces.
   b. Procedure rooms:
      i. Procedure rooms shall be distributed so one is adjacent to three holding rooms and the size shall match animal holding rooms sizes to provide future flexibility.
      ii. Provide AMWS components to match holding rooms including access control, lighting control (white), temperature and humidity monitoring.
      iii. Document additional project requirements, which could include lighting controls, red lights, red-light controls, euthanasia and anesthesia machines.
      iv. Rooms shall include stainless steel countertops, metal casework, stainless steel sinks, wall phone, and surface mounted waterproof raceway for power and data. Equipment may include ducted Biological Safety Cabinets (BSCs) and with back draft ducted exhaust.
   c. Specialty holding rooms:
      i. These spaces may serve multiple functions including holding rooms and euthanasia spaces.
      ii. Provide AMWS components to match standard holding room including animal watering distribution, access control, lighting control (white), temperature and humidity monitoring.
      iii. Document additional requirements, not limited to ventilated rack supply and direct exhaust, lighting, red lights and controls, CO_2 service, and additional equipment.
      iv. Locations and sizes will be determined by facility. Usage for euthanasia shall consider the waste removal pathway.
   d. Necropsy
      i. The size of the space and location shall be confirmed per facility to ensure this space aligns with building waste removal pathways.
      ii. This room shall be designed to be negatively pressurized per project specific needs.
   e. Protection within imaging spaces shall be provided to users for all imaging spaces with designs approved by UTSW Medical Physicist and OSBC Radiation Safety.
   f. Behavioral studies areas shall be given special attention to minimize airborne transmission of noise, ground borne transmission of noise, and other intrusions to the testing environment.
3. Cage processing and sterilizing areas:
   a. Locations of clean and dirty cage processing shall prevent cross traffic and shall not cause disruptive noise for animal rooms.

      i. Size these areas for equipment space including clearances, marshaling space, pre-wash areas, and areas specific to the cleaning processes.

ii. Additional processes required include dirty bedding disposal, clean bedding distribution, and cage set-up.
iii. Design for 15 – 20-percent of caging census shall be in marshaling areas.

b. Wall protection shall be located throughout cage wash areas to protect the walls. Refer to ARC Section 10 26 00 "Wall Protection" for specific requirements. The operational process will vary depending on the type of facility and must be confirmed for each project.
c. Chemical storage of cage wash chemicals are preferred to be pumped from a secondary location, such as remote storage or the dock.

4. ADA/TAS compliant locker facilities with toilets and showers are required in both barrier and conventional ARC spaces for men and women.
   a. These may be used as transitions between personnel and barrier zones if they include anterooms and changing rooms.
   b. Gowning vestibules shall provide sufficient PPE storage racks, disposal bins, circulation, changing, and egress.
5. Laundry Rooms shall provide space for laundry equipment, workspace, mobile rack spaces, built-in storage, and required clearances.
   a. Laundry room sizes and needs shall be confirmed with ARC Leadership per project requirements.
   b. Utility requirements include floor drains, hot and cold-water service, exhaust, and appropriate power supply for required equipment.
   c. Finishes shall include chemical resistant resinous flooring and epoxy paint.
6. Janitor closets shall be located along corridors and be sized large enough to hold necessary equipment for routine cleaning.
   a. Rooms shall hold shelving, mop racks, water source, chemical proportioners, and chemically resistant floor-mounted mop sink.
   b. A/E to confirm location(s) for chemical proportioners required in janitor closets throughout project and coordinate all required utilities.
   c. Chemical proportioners shall be "owner provided, contractor installed" and fully coordinated in the A/E documents including blocking requirements.
   d. Walls shall be protected from damage, water, and chemicals.
7. Receiving:
   a. ARC facilities may have separate receiving areas from general building dock areas. Locations may be adjacent to other building group's receiving spaces.
   b. General ARC deliveries include supplies, feed, and bedding.
   c. Receiving may include small animal transfer stations and staging area, as approved by ARC Leadership. Confirm HVAC requirements per species planned for within holding areas.
8. Storage:
   a. Clean storage
      i. Food storage areas shall have stable temperatures and be kept below 70F and at or below 50-percent humidity to meet regulatory requirements. Ensure building systems maintain these requirements at all times of day and through all seasons.
   b. UTSW preference is for cage wash process bulk detergents and disinfectants to be located near the loading dock and pumped to the point of use. There shall be a secondary containment device or curb to prevent leakage.

c. Dirty storage:
    i. Separate refrigerated storage shall be provided for storage of dead animals and animal tissue waste below 7°C (44.6°F).
    ii. Waste holding areas.

E. Office and administrative spaces may be provided within or outside of the ARC zone. Natural lighting and exterior views are preferred for employee work areas.
1. Space types could include offices, training rooms, break area, and conference room.

III. Section 03 00 00 Concrete

A. In ARC spaces, floor flatness shall adhere to ACI 117 unless more stringent requirements are necessary.
B. Exposed concrete surfaces are not preferred in ARC spaces. Any instances must be skim-coated with cementitious filler to provide a non-porous substrate with finishes applied to match ARC requirements.

IV. Section 04 20 00 Concrete Unit Masonry

A. Concrete unit masonry may be used for walls in large animal spaces or other areas as indicated by project requirements.
1. Walls in large animal areas shall be constructed of concrete masonry units with a seamless finish that will be impact-, hose-, spray-, and chemical-resistant.
2. Finishes for wet or chemical areas with block walls shall be confirmed with UTSW PM and ARC Leadership.

B. Preferred finishes include a minimum of two coats of block filling and industrial-grade epoxy paint over masonry units. All CMU shall be smooth finished, impervious to water.
C. FRP panels or other systems that meet requirements may be considered for use in renovation projects, refer to Design Guidelines section 06 83 16 “Fiberglass Reinforced Paneling.”

V. Section 05 40 00 Cold-Formed Metal Framing

A. Utilize structural framing for partitions as required by AISI S220.

VI. Section 06 83 16 Fiberglass Reinforced Paneling

A. Fiberglass Reinforced Paneling (FRP) may be used at approved locations in ARC renovation spaces.

VII. Section 07 90 00 Joint Protection

A. All penetrations in floors, walls and ceilings shall be sealed including structural joints to minimize flooding as well as passage of vermin, refer to Design Guidelines section 07 90 00 “Joint Protection.”

B. Any installed equipment, components, casework, or element installed in animal spaces shall have all penetrations, cracks, and joints sealed to prevent the passage of vermin.

VIII. Section 08 10 00 Doors and Frames

A. Doors into animal areas shall provide controls required per space including but not limited to acoustic, light, and air conditioning. Refer to Design Guidelines section 08 10 00 "Doors and Frames."
B. Door sizes shall allow easy passage of racks and equipment with 48-inch width by 84-inch height considered the minimum clearance.
C. Door construction and finish shall be corrosion resistant, easily cleaned and disinfected while holding up to equipment movement and abuse. Doors shall be solid construction or solidly foam filled. Painted metal doors are typically used.
    1. Doors to animal holding and procedure rooms shall have hinged, magnetic closing doors/shutters and red film located on all lites. Refer to UTSW Specification sections 08 11 13 Hollow Metal Doors and Frames and Section 08 11 14 "Interior Hollow Metal Doors" for requirements.
    2. Armor plate shall be located on doors facing animal corridors and where cart traffic is expected.
    3. Any thresholds must provide for easy movement of carts and animals as well as adhering to TAS.

IX. Section 08 31 13 Access Doors and Frames

A. Stainless steel or painted metal gasketed access doors and frames shall be provided at ARC locations.

X. Section 08 71 00 Door Hardware

A. Lock and access control strategies require close coordination between ARC Leadership, UTSW Access Control, AMWS Vendor, door hardware consultant, and A/E.
    1. Access into ARC facilities requires badge access on the ARC segment within the campus-wide Lenel access control system.
        a. All external doors shall be self-closing and self-locking with seals to prevent the passage of pests.
    2. Within the ARC facility, internal doors shall be self-closing. A/E shall closely coordinate the AMWS system requirements with door hardware requirements.
        a. Door hardware components include soft-close, tight fitting sound seals, integral door sweeps, door closers with friction hold open, and seals. Seals shall dampen door closing sounds, prevent light leakage, prevent air leakage, and prevent the movement of pests.
        b. Doors with the passage of cages and carts shall have armor plate installed facing the corridors, 48-inches high, and continuous across the width of the door surface.

c. Doors to animal spaces or spaces where infectious items are located shall open inward and be self-closing.
d. Doors will have narrow viewing lites with metal shutters and application of a red film to limit light spectrum required for diurnal light cycle adherence.
e. Spaces with AMWS system pin code locks may include animal holding, procedure rooms, imaging spaces, bedding storage, and feed storage. Closely coordinate door hardware from both AMWS vendor and door hardware consultant
f. Spaces with standard UTSW door hardware and access control may include: offices, toilet rooms, janitor closets, laundry, electrical rooms, mechanical rooms, IDF rooms, RO rooms, and the bedding dumpster enclosure. Access shall be coordinated for each project.

XI. Section 08 71 13 Automatic Door Operators

A. Automatic openers and power assist operators may be located on doors in ARC spaces where cages are transported at high-traffic transport areas.
   1. Openers are required to have mechanical (pushbutton) operation.
   2. Jamb guards shall be installed at any opening along the path of travel.
   3. Placement of automatic openers and pushbuttons shall be confirmed with ARC Leadership.

XII. Section 08 80 00 Glazing

A. Film shall be installed on the door lites for animal spaces to protect diurnal lighting. Locations shall include animal housing, procedure spaces, and others as confirmed by A/E with ARC users per project. Refer to UTSW Specifications for red dyed polyester film information.

XIII. Section 09 00 00 Finishes

A. All finishes used in ARC spaces must comply with the applicable standards and references.
   1. Floors, walls, and ceilings shall be moisture-resistant, non-absorbent, impact-resistant, chemical resistant, and smooth to allow proper disinfection and cleaning.
   2. Walls and floors shall be monolithic.
   3. Moisture resistant drywall in ARC ceilings shall have impervious finish.
   4. Regular cleaning and sanitizing will be carried out on all surfaces including floors, walls and ceilings. Materials must stand up against scrubbing, impact, and cleaning agents for long-term reliability while ensuring infection control.
   5. High pressure sprays and hot water will be used in large animal spaces and cage wash areas. Ensure finishes will hold up to these harsher requirements.
   6. Design of walls, surfaces, and details including mounted casework and equipment shall not create recesses, cracks, or other openings.
B. Paints and finishes shall be non-toxic.

C. Refer to individual sections in the Design Guidelines and Master Specifications for specific product requirements.

XIV. Section 09 29 00 Gypsum Board

A. Reference NFPA 101 and Specification Section 09 29 00 “Gypsum Board” for required “Partition Identification” labels and locations as well as requirements for construction, fire-resistance ratings, and fire protection of existing and new fire-rated walls, partitions, compartments, assemblies, and smoke partition assemblies.
   1. Renovation and remodel projects shall include revisions to existing partition identification when the wall conditions are modified.
   2. Renovation and remodel projects shall include partition identification be added where missing and as indicated by OSBC.

B. Wallboard Types:
   1. Type-X, fire-resistant, gypsum board shall be used at any locations requiring greater than 1/2-inch thickness.
   2. Use cement backer board for tile and wet installations.
   3. Impact resistant panels to be used in ARC spaces including small animal holding spaces, procedure rooms, and recovery rooms. Confirm with UTSW PM and ARC User the extent of panels in other ARC spaces.
   4. Abuse resistant panels for high traffic areas will only be used in ARC spaces with approval from UTSW PM and ARC Leadership.
   5. Finishes for ARC walls and ceilings shall be moisture-resistant, non-absorbent, impact-resistant, and smooth, without applied texture. Sample/mock-up shall be approved by A/E and ARC Leadership.

XV. Section 09 22 16 Non-Structural Metal Framing

A. In high-abuse spaces, such as cage-wash areas, utilize a heavy-duty galvanized steel grid system.

XVI. Section 09 50 00 Ceilings

A. ARC ceiling surfaces shall be moisture-resistant, nonabsorbent, impact resistant, and smooth to ensure easy disinfection and cleaning
   1. Design of ceilings shall take room pressurization into account with design of finish and attachments to prevent sagging and deflection over time.

B. Refer to Design Guideline Section 08 31 13 “Access Doors and Frames.”

XVII. Section 09 60 00 Flooring

A. ARC leadership shall approve flooring samples.
B. ARC floor surfaces shall be moisture-resistant, nonabsorbent, impact resistant, resistant to chemicals, and smooth for easy disinfection and cleaning. Slip resistance shall meet OSBC requirements.
   1. Integral cove bases carried up 6-inches and seamless systems are a UTSW requirement.
   2. When finalizing floor types, confirm locations where extreme temperatures and high-pressure spray will be utilized.
C. Large animal rooms and spaces with high abuse shall have seamless floors with a minimum thickness of 3/16-inch – 1/4-inch (5 – 6 mm).
D. Flooring types common in small animal spaces and other spaces within the animal facility include epoxy, quartz resinous flooring, and methyl methacrylate (MMA) dependent on the project specific needs.
E. Offices and rooms located in non-ARC zones shall follow UTSW Design Guidelines.

XVIII. Section 09 91 23 Interior Painting

A. Epoxy paint shall be utilized within ARC spaces and laundry rooms. Refer to Specification Section 09 91 23 “Interior Painting” for ARC paint types.
   1. Installation of epoxy coatings shall follow or exceed manufacturer’s recommendations.

XIX. Section 10 26 00 Wall and Door Protection

A. Provide dual height, wall-mounted, aluminum crash rails along corridor walls in facility areas to protect walls from carts. Mounting heights to be determined per project requirements. See specification Section 10 26 00 “Wall and Door Protection,” for “Metal Crash Rail.”
B. Within animal housing areas, rubber bumper rails shall be mounted at heights appropriate to equipment requirements. See specification Section 10 26 00 “Wall and Door Protection,” for “Bumper Rail.”
C. Carefully coordinate design and installation of wall protection to include wall-mounted elements throughout the ARC zone such as fire extinguisher cabinets.
D. For general area protection requirements, refer to UTSW Design Guidelines Section 10 26 00 and the Master Specification.

XX. Section 10 44 00 Fire Protection Specialties

A. Provide recessed or semi-recessed fire protection cabinets within ARC spaces.

XXI. Section 10 50 00 Storage Specialties

A. Refer to Design Guideline Section 10 50 00 “Storage Specialties” for standard locker requirements.
B. Wire rack shelving will be required in many areas such as anterooms storing PPE and within food storage rooms. Confirm requirements with user representative.

XXII. Section 11 00 00 Equipment

A. Layout of equipment shall comply with manufacturer recommendations and best practices. Refer to Design Guideline Division 11 for UTSW requirements.
    1. Installation of equipment in ARC spaces shall not create recesses, cracks, or other openings. Enclosures, joint sealant, and trim pieces shall be used to close all openings.
B. Confirm requirements for emergency power as well as connection to the Central Data Acquisition System (CDAS) for critical equipment.
C. Cages and Racks: Refer to Section 11 53 19 “Laboratory Specialty Equipment.”
D. Cage Processing Equipment:
    1. Cage processing equipment will be compatible with standard ARC cage processing facilities to allow for efficient transferrable usage across ARC animal facilities and minimize down time with repairs by local sourcing of parts.
    2. Cage processing equipment must be easily maintained and all aspects of the equipment and layout shall be accessible for repairs or preventative maintenance.
    3. Utilities required may include domestic cold/hot water, chilled water, steam, reverse osmosis water, dry compressed air, exhaust ducting, steam ducting, drains, condensate drains, and others identified per project.
        a. To protect equipment, heat exchangers, process equipment loops, and other safeties may be included.

    Equipment:
    4. Bulk Autoclave: This unit shall be sized for the equipment and expected capacities of each facility. Pits are required below these units with services including steam, water and compressed air.
    5. Bedding Disposal: This vacuum system will be piped from the dirty cage wash space to a bedding dumpster located in the dock area.
        a. Separate dock space is required for the dirty bedding dumpster outside of the building. This area must be accessible to the waste contractor for removal and replacement of these dumpsters, with connections to the vacuum system.
    6. Rack Washer: These large units wash the holding racks used for animal cages. Pits are required below these units with services including steam, water and compressed air.
    7. Tunnel Washer: These large units wash the smaller equipment and cages. These units require floor sinks, due to the large water requirements, with services including steam, water and compressed air.
    8. Bedding Dispensing: This vacuum system provides dust-controlled bedding dispensing within the clean processing area. Piping for this system will go from a remote bedding storage area to the cage wash.

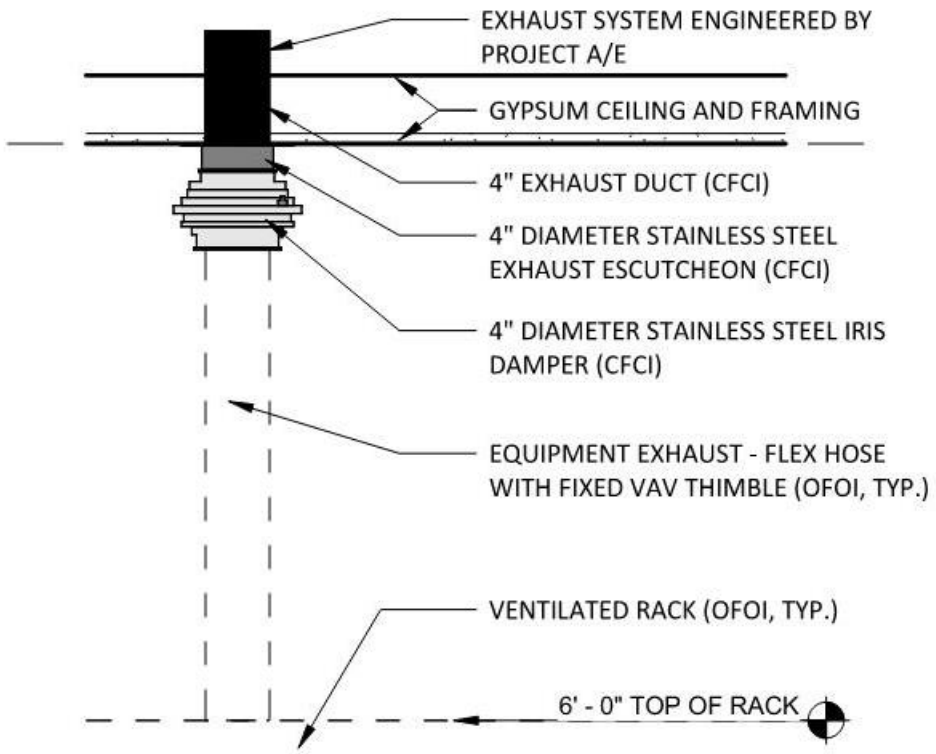
9. Animal Watering: Additional equipment may include bottle fillers and rack/hose flush stations. Water served to animals shall be reverse osmosis or filtered, as identified by ARC Leadership.

E. Refer to Design Guideline Section 11 13 00 “Loading Dock Equipment.”

XXIII. Section 11 53 19 Laboratory Specialty Equipment

A. Refer to Design Guideline Section 11 53 19 “Laboratory Specialty Equipment” for lab requirements including tank restraints.
B. All utilities shall be clearly marked for fire safety.
C. Cages and Racks shall be determined based on ARC campus standards.
   1. Ventilated racks require water supply, air supply, ducted exhaust, and back-up power from the emergency generator.
      a. Coordinate with Animal Ventilated Housing manufacturer for design and installation. Exhaust for ventilated housing shall be 4-inch diameter stainless steel duct, unless indicated otherwise. Infrastructure shall provide stainless steel escutcheon at ceiling with iris damper at each location to interface with equipment. Refer to Specification Section 11 53 19 “Laboratory Specialty Equipment” and **EXHIBIT A2.1 Ventilated Housing Exhaust Requirements**.
   2. A 3-foot minimum wide aisle shall be provided between racks or cages from the rear of a space to allow for emergency egress.

EXHIBIT A2.1 Ventilated Housing Exhaust Requirements



NOTE: LOCATION OF IRIS DAMPER AND LENGTH OF EXHAUST DUCT SHALL COMPLY WITH MANUFACTURER REQUIREMENTS.
ALIGN WITH SPECIFICATION SECTION 11 53 19 - LABORATORY SPECIALTY EQUIPMENT.

XXIV. Section 11 53 53 Biological Safety Cabinets

A. Refer to Design Guideline and specification section for requirements including OSBC practices.

XXV. Section 12 35 53 Laboratory Casework

A. Casework within ARC spaces shall be powder-coated metal units or stainless steel when required. Refer to Design Guideline and specification Section 12 35 53 “Laboratory Casework” for UTSW requirements.
B. Installation of casework in ARC spaces shall not create recesses, cracks, or other openings. Enclosures, joint sealant, and trim pieces shall be used to close all openings.

XXVI. Section 12 36 00 Countertops

A. Countertops shall be impervious to water and resistant to heat, organic solvents, acids, alkalis and other chemicals.
B. Stainless steel countertops are used for procedure rooms and locations within animal spaces. Integral sinks and integral splashguards are standard.

XXVII. Section 12 50 00 Furniture

A. Furniture within ARC spaces including chairs shall be easily cleaned and disinfected.

XXVIII. Section 13 31 13 Animal Monitoring and Watering Systems (AMWS)

A. Refer to Master Specification section for additional requirements.
B. Animal Monitoring and Watering Systems (AMWS) include the following integrated systems:
    1. Animal room water distribution system includes stainless steel distribution piping to connect to all animal racks and components for cleanliness of the system.
    2. A reverse osmosis water system may be included to ensure water quality.
    3. A pressure reducing station ensures water system pressures.
    4. Monitoring and control systems include environmental monitoring, access control, and light system controls.
C. The AMWS provides many critical elements to the ARC operations. Maintaining the environment, services, and security helps to ensure validity of research results in these spaces.
D. Due to the complexity and critical importance of AMWS it is required to involve ARC leadership and vendor representative in all areas of the design of this system. A/E shall coordinate contract document contents to ensure ARC Leadership is included in specification review, submittal approval, preconstruction meetings, testing, commissioning, and all close-out components.
E. Testing and Commissioning are critical to coordinate building system testing and commissioning prior to AMWS testing and commissioning. A/E to work with commissioning agent, engineering teams, ARC Leadership, and AMWS vendor to provide documentation that identifies the strategies required.

XXIX. Section 14 00 00 Conveying Equipment

A. Elevator Service:
    1. Elevators serving ARC spaces shall not serve patient traffic.
        a. Building freight elevators may serve both ARC spaces and non-ARC spaces if security card access controls entry into the ARC areas.
        b. Elevator controls shall include badge access to allow for controlling of access to the animal facility and include key operated emergency switch to allow for priority service.
        c. Elevators and elevator equipment shall have vibration breaks installed in ARC areas.

B. Elevator sizes shall be determined with consideration to hold the tallest racks as well as having the ability to hold two racks side-by-side.
C. Elevator size and weight capacities should consider the ability to change out equipment over time.

XXX. Section 21 00 00 Fire Suppression

A. Risk assessment shall be run by A/E to determine where fire sprinklers are required within containment spaces. This assessment shall include which hazard is greater, a facility without a sprinkler or the contamination due to discharge with a sprinkler.
B. Areas with storage and/or use of hazardous materials shall offer greater protections as determined by risk assessment.
C. Fully recessed sprinkler heads are preferred.
D. High temperature sprinkler heads are required in cage processing and autoclave areas.

XXXI. Section 22 00 00 Plumbing

A. All ARC washroom sanitary and vent to be piped in solvent weld schedule 40 CPVC or fusion poly propylene to the building sewer.
   1. Floor sinks shall be stainless steel.
   2. No cast iron piping allowed in ARC facilities.
B. Drains:
   1. Trench drains are utilized in large animal areas located along the wall.
   2. Small animal holding rooms shall not have drains nor sloped floors due to operation concerns and maintenance issues.
   3. Drains in cage processing or autoclave areas shall be coated to stand up to high temperatures.
C. Water type and quality used for animal drinking systems shall be confirmed per project to work with the animal watering system. Refer to Section 13 31 13 “Animal Monitoring and Watering Systems” for water distribution system, reverse osmosis system, and watering system requirements.
   1. RO systems may be required for rodent spaces and filtered water systems for larger animal spaces.
   2. A/E shall confirm requirements during the programming phase for required water treatment.
D. Cage wash spaces shall have oversized, acid-resistant waste piping as well as hose stations and floor drains.
E. For general plumbing requirements, refer to UTSW Design Guidelines Division 22.

XXXII. Section 22 11 19 Plumbing Specialties

A. Backflow preventors installed in ARC areas shall be located out of animal housing and procedure locations in a manner to ensure cleaning, inspection, and sanitation requirements are maintained.

XXXIII. Section 22 40 00 Plumbing Fixtures

A. ARC lab zones shall have chemical resistant hand sinks with hands-free operation. Locations near exit doors will be confirmed with user representative and UTSW PM.
B. Allowable finishes include stainless steel or epoxy-coated resins.

XXXIV. Section 23 00 00 Heating, Ventilating, and Air Conditioning (HVAC)

A. A/E shall advise UTSW and ARC User on project specific conditions and limitations as the ideal HVAC system is determined.
B. For non-ARC spaces and for renovation projects, refer to Design Guidelines Division 23.
C. HVAC systems shall be designed for reliability, ease of maintenance, energy conservation, and redundancy as required while meeting the changing needs of the animals.
    1. Humidification controls shall be determined based on species housed in the space.
    2. HVAC systems shall be designed to ensure there are no extraneous noises generated including ultrasonic frequencies. Additionally, systems shall be designed to minimize the creation of air noise.
    3. Barrier facilities shall have high-level filtration systems and pressurization to maintain the barrier to other spaces. Pressurization strategies shall be discussed with ARC leadership and documented.
    4. HVAC system must provide 100 percent fresh air and non-recirculated air.
    5. In case of HVAC failure, system design should provide the minimum air supply at a reduced level while maintaining critical pressurization gradients.
    6. The design of chillers for animal rooms shall be N+1, where N is the number of best size of chillers for the installation.
    7. Temperature and humidity controls shall be located to minimize variations between spaces and animal rooms shall have individual controls.
    8. HVAC systems design must provide acceptable working environments for technicians in cage processing and sterilizing areas, accounting for excessive heat and steam creation.
    9. The VAV terminals with hot water reheat coils serving Animal Resource Center (ARC) should maintain the Entering Water Temperature (EWT) of 120 deg. F min/150 deg. F max to avoid nuisance high temperature alarms from the Animal Monitoring and Watering System (AMWS) controls when hot terminal air hits the AMWS room temperature sensors located at a higher wall elevations.
D. The AMWS System will monitor the ARC animal spaces. Design of HVAC supply locations must be coordinated to be at least 4 feet away from AMWS sensors.
E. Animal Spaces:
    1. Animals shall not be exposed to high velocity air.
    2. Consideration for air pressure differentials shall be discussed with users to confirm a range of activities that can be accommodated while meeting current scope requirements.
    3. Systems shall ensure directional airflow, create controlled access zones, and provide airlocks as needed to provide proper containment.
    4. Air pressures for animal rooms should be negative to the corridor dependent on the project requirements.

5. Animal rooms shall be capable of temperatures adjusting between 65°F and 84°F with a relative humidity range between 30 and 70 percent. Fresh air shall be at least 15 changes per hour.
6. HVAC systems must take the requirements of ventilated racks and any ducted biosafety cabinets into consideration as well as their layout.

Dry-bulb Temperatures	±1°C (±2° F)	
Relative Humidity	30 - 70 Percent	Maintained within ±10 Percent of set point

F. Exhaust:
1. Building exhaust air shall not be discharged near supply air intakes or occupied areas.
2. Exhaust systems shall be designed to provide adequate exhaust for rooms, equipment, necessary air changes, pressurizations while allowing for future growth. System design shall not allow for airflow reversal under failure conditions.
3. Exhaust for ABSL-3 spaces must be exhausted directly to the outside.
4. Exhaust ducts shall be made pressure tight including at all joints and seams for contaminated air.
5. Use of type 304 Stainless Steel for exhaust ducts shall be determined per code and discussed with user representative and UTSW PM.
6. Coordinate with ventilated rack manufacturer for design and installation. Exhaust for ventilated racks shall be 4-inch diameter stainless steel duct, unless indicated otherwise. Infrastructure shall provide stainless steel escutcheon at ceiling with iris damper at each location to interface with equipment. Refer to Specification Section 11 53 19 “Laboratory Specialty Equipment.”

XXXV. Section 26 00 00 Electrical

A. The preferred power distribution system is a secondary selective radial, or double-ended system.
B. The AMWS system shall be coordinated to provide ease of use for ARC and UTSW Utilities.
1. The AMWS relay panel shall be flush or recessed mounted next to room doors.
2. Design the power feed so each relay panel has disconnecting means for service to prevent hot work.
3. Light fixture wiring will run through AMWS relay panel and A/E shall design a disconnecting means at each unit.
4. Timers, automatic timeouts, and warning lights for over-ride usage shall be discussed to ensure proper care of the animals.
C. Back-up power shall be determined with ARC leadership and UTSW PM and shall include critical services. Critical services are typically considered:
1. HVAC system.
2. Ventilated cage systems.
3. Life-support requirements for other species.
4. Freezers and isolators.
5. Support functions in animal rooms operating suites and other essential areas.

6. Typical ARC requirements:
    a. Animal housing and procedure rooms do not require back-up lighting.

D. A/E shall confirm equipment requiring data connection to CDAS.

E. Power:
1. Review power locations with ARC Leadership for approval per project to ensure sufficient power locations for equipment and space usage.
2. Confirm locations and quantities for above-counter raceways in procedure rooms.
3. Animal spaces shall have additional convenience waterproof duplex GFCI outlets located throughout with “flip-lid” type covers with gaskets which are inaccessible to the animals.
4. Weatherproof while-in-use covers shall not be used due to the chance of hazards created when they are broken.

F. In large animal holding rooms, do not install conduit and device boxes below 48-inches AFF to prevent damage from animals.

G. Containment spaces in some existing facilities may have exposed conduit only with approval from UTSW PM and user representatives. If such a design is proposed, the A/E shall present a design, for the approval of UTSW, which prevents the circulation of air within or around the conduit to any 1) non-containment areas, 2) any containment areas of different levels.

H. All portions of conduit, junction boxes, and other electrical components shall be sealed to other spaces with seals installed to allow ready access for inspection and maintenance.

I. Some conduit, fittings, and safety switches may be exposed in biomedical facilities for the hard wiring of equipment. These safety switches shall be NEMA 4x stainless steel with hinged gasketed covers.

J. Aluminum rigid conduit is allowed when not installed below 24-inches above the floor. Boxes for devices shall be cast aluminum boxes with cast aluminum covers for devices. Junction boxes installed subject to moisture or water sprays shall be NEMA 4X stainless steel with hinged covers.

K. Junction boxes shall contain an equipment ground bar with at least 20 percent spare spaces. Each equipment ground conductor shall be terminated in a separate lug on the equipment ground bar.

XXXVI. Section 26 51 00 Interior Lighting Fixtures

A. Lighting requirements for animal spaces (procedure, holding, etc.) shall include AMWS for room lighting controls. All lighting levels are to be approved by ARC leadership.
1. Combination white and red-light fixtures will be provided and installed through the General Contractors (GC) scope.
    a. Red light is GC wired to local GC provided manual timed control. Daisy chain all red-light driver dimming wires to the controller. Locate inside the AMWS controller housing.
    b. White light – Dual control (low to high) with a step controller will be GC wired to AMWS controls and tap switch.
2. Controls:
    a. All off

b. Red on, local timer.
c. White on AMWS controls schedule, dual control (low to high) through AMWS tap switch.

3. Light fixtures in animal areas shall be installed in a manner to prevent dust accumulation and to minimize maintenance. Recessed fixtures shall have triple gaskets and lenses shall be smooth side out to aid with cleaning.

B. Non-animal spaces including hallways, offices, toilet areas, etc. shall have standard light fixtures and will be wired to main building lighting control system by GC. Refer to UTSW Design Guideline Division 26.

C. While these facilities are operating continuously, the lighting levels of non-animal areas shall be designed to operate at the lowest levels possible during the night-time.

XXXVII. Section 27 00 00 Communications

A. Ruggedized outlets and patch cords shall be indicated in wet areas such as cage washrooms.

XXXVIII. Section 28 00 00 Electronic Safety and Security

A. All animal holding spaces shall have a specialty fire alarm system that does not generate noise in the ultrasonic range, sometimes called “rodent friendly.”
B. A/E shall confirm any additional safety or security requirements per project.
C. Any areas with cryogen gases shall have oxygen sensors and provide the ability to increase room ventilation.

DOCUMENT HISTORY

Issue Date	Description	Editor
06/19/2020	June 19, 2020 Print	MDR
12/30/2020	Q4 2020 Revision, 09 20 00 revision	EV
03/25/2022	Q1 2022 Revisions	MR
10/03/2022	Q3 2022 Update, Overall section revisions.	EV
12/15/2023	Q4 2023 Revisions	EV
06/13/2024	Q2 2024 Revisions	EV
12/20/2024	Q4 2024 Revisions	EV
06/27/2025	Q2 2025 Revisions	EV
12/18/2025	Q4 2025 Revisions	EV

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DESIGN CRITERIA

SECTION A3 CLINICAL DESIGN REQUIREMENTS

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SECTION A3 – CLINICAL DESIGN REQUIREMENTS

I. General Information

A. Design of clinics and clinic renovations shall include representatives from User Group, UTSW Clinical Programming & Facility Development, UTSW Medical Equipment Planning, Infection Prevention, and Design Team.
   1. Throughout design, additional UTSW teams will be invited to participate including but not limited to UTSW IR PMO, UTSW Access Control, OSBC Fire Safety, OSBC Environmental/Chemical/Biological Safety/Radiation, and others as required.
   2. Facility Management teams include Key Control Shop, Electrical Shop, Refrigeration, HVAC Shop, Elevator Shop, and others as required.

B. Clinics may be located within UTSW owned properties or leased properties. The A/E shall confirm contract specific requirements in lease spaces for the following at a minimum:
   1. Door hardware.
   2. Provider of toilet accessories including paper towel dispenser, toilet paper dispenser, and soap dispenser.
   3. Signage: confirm requirements for signage within leased suites and outside of UTSW lease spaces.

C. Regulations for clinical projects will vary between on-campus and off-campus locations. Refer to UTSW Specification 01 41 00 Regulatory Requirement for on-campus requirements. Off campus requirements include but are not limited to:
   1. Non-hospital-based clinics: Jurisdiction Codes, IBC, ADA/TAS.
   2. Hospital based clinics: Jurisdiction Codes, IBC, ADA/TAS, and JCAHO.

II. Design

A. The design of clinical spaces shall consider the project guiding principles, current regulations, codes, best practices, budgets, flexibility over time, and longevity of materials.
   1. Design discussions shall include users representing each space type to confirm processes, patient types, workflows, relationships, space needs, budgets, accessibility, storage, equipment, waste types, and considerations for growth.
      a. Exam room discussions shall include differing patient requirements, patient-focused layouts, spatial needs, workflow, workstation types, privacy, equipment, and storage at a minimum.
      b. Include discussions for special requirements such as humidity/temperature monitoring, back-up utility needs, lighting variations, individual thermostat control, ….
   2. Acoustical privacy discussions shall include code/regulation requirements, HIPPA, partition construction, door types, adjacencies, noise creating activities, and quiet zones.
   3. Employee spaces shall include discussions for overall layout and adjacencies, workflows, deliveries, break room(s), nursing mother room(s), personal storage, staff toilets, workstation requirements, meeting spaces, IR spaces, and support spaces.

B. Design shall consider patient comfort, ease of wayfinding, and provider efficiencies.

C. UTSW has Space Design Guidelines (SDG) created to guide design discussions for various space types. Spaces not documented in the SDG may be identified in “Spaces” below.

D. Project A/E shall confirm patient arrival point and path of travel. Discussions shall include parking, valet (if applicable), wayfinding, guest and patient services, and other project specific topics. Refer to "circulation path plan" for interior circulation.
E. The Project A/E shall identify and document deviations from UTSW standards. Deviations shall be reviewed with UTSW User Group, UTSW Clinical Team, and others as identified. Acceptance of deviations shall be documented and approval in writing by UTSW is required.

III. Design Review Process and Documents

A. Circulation Path Plan:
   1. All patient focused project types shall include a circulation path plan overlay. Scale of drawing must be easily readable for clarity and sign-off by Owner.
   2. Circulation path plan shall be submitted at any partial Design Development issuances, at final Design Development submittal with plan(s) on full-size sheets.
   3. At a minimum, it shall have differing line types to indicate the following circulation types:
      a. Public / General Circulation.
      b. Patient Unescorted Circulation.
      c. Patient Escorted Circulation.
      d. Staff Open Circulation.
      e. Restricted Staff Circulation.
      f. Specialty Circulation based on Project Specifics.
   4. Related discussions shall include door types, visibility/privacy, access control, door hardware types, automatic door openers, and other project specific requirements.

IV. Spaces

A. Office – Follows the UTSW standard office layout. Include a wall-mounted coat hook mounted behind the door or in a location as indicated by clinical leadership.
B. Telehealth Room – A standard, small private office size with door lock to prevent interruption.
C. Dressing Room – An accessible, private space for patients to undress for procedures.
   1. Size and layouts shall be determined per project including existing conditions.
   2. The opening width at doorways shall be 42 inches minimum with hardware providing easy access for clinic staff to enter, in case of emergency.
   3. Each cubicle shall include a seat or bench as well as a 2-foot by 6-foot mirror located 1 foot above the floor.
   4. Lighting controls shall have {vacancy vs occupancy} sensors.
   5. Lockers may be included in some instances or be within a larger gowned, sub-waiting area.
   6. Wall surfaces/
   7. Do not provide glazed components to ensure ultimate privacy.
D. Isolation Spaces
   1. Shall include a designated patient toilet.

E. Imaging – These areas shall not have daylighting.
   1. Imaging Rooms – may include MRI, X-ray, CT, and others per project. Confirm special requirements including shielding, loading/structure, access control, HVAC ranges, humidity ranges, lighting, etc.
   2. Read Rooms – Dedicated work areas for viewing imaging results with strict lighting requirements. UTSW PM will provide special finish requirements.

F. Medication Room, Medication Storage –
   1. An access-controlled space for dispensing and storage of medications. Temperature and humidity must be controlled according to the location's regulatory requirements. Confirm operational requirements for views into these spaces and if blinds or other privacy devices are needed.
   2. Confirm if medication disposal is required. Provide security camera(s) to monitor both medication dispensing and disposal units.
   3. Millwork requirements may include splash guards, 30-inch-deep countertops over equipment, and full panel supports underneath medication dispensing units.

G. Vitals Alcove – A small room or alcove used for initial vitals that will not impede circulation. Any cased openings shall have 42-inch clear openings minimum.
   1. Components may include wheelchair scale, individual scale, and small table or chair for patient possessions.

H. Blood Draw – Includes private stations or alcoves for individual patient specimen taking.
   1. FRP wall finish is standard to chair-rail height.

I. Laboratory – Various types of laboratories may be present including Point-of-Care (POC) and processing.
   1. Millwork requirements may include splash guards, 30-inch-deep countertops over equipment, clean and dirty work areas, storage, and workflow considerations.

J. Wheelchair Storage – An area for easy access to wheelchairs for patient escort. Walls, corners, and jambs shall be protected from damage. Ensure door clear widths are sufficient for the largest wheelchair size expected. Confirm door hardware requirements including locks.

K. Workspaces – Areas for employees may include individual or shared workstations, lockers, coat hooks, and other items determined per clinic.

L. Lockers – Types of locks will be determined per clinic.
   1. Patient Lockers
   2. Employee Lockers

M. Check-In / Check-Out –
   1. Areas set aside for patients to queue for paperwork, arm bands, payment, scheduling, etc.
   2. Confirm privacy requirements and heights of partitions per clinic.
   3. Confirm locations for posting required statements as part of the signage packages.
   4. Confirm security requirements for cameras, access control, locked casework, and duress buttons.

N. Clean Supply – A room for storage of supplies for patient care. May include refrigerators and other equipment. For storage of sterile instruments, confirm requirements for humidity and temperature control.

O. Specialty Spaces Not Listed – For unique spaces, A/E shall confirm requirements for each type, not limited to regulations, special processes, lighting requirements, temperature, humidity, exhaust, finishes, security, etc.

P. Behavioral Health Space Considerations
   1. Observation areas – Confirm the privacy requirements, direction of camera views, and the usage security cameras versus observation cameras
   2. Duress button locations.
   3. Secure pathway requirements including traffic flow
   4. Safety requirements and considerations in any patient spaces

V. Section 06 40 23 Interior Architectural Woodwork

A. Millwork shall be coordinated with equipment, utilities, and circulation pathways for proper operation. Locations shall not decrease code compliance.

B. Materials and fabrication shall conform to Architectural Woodwork Institute specification. Use “Custom Grade” for standard casework and “Premium Grade” for unique and special features.

C. Hard wood nosing or edge banding where plastic laminate is used on panels. Tape banding is not preferred.

D. UTSW preference is for plywood construction for casework and millwork.
   1. MDF or particleboard is only to be used if approved in writing by UTSW.
   2. Products used for panels or doors shall have good screw holding face to hold up over time. Refer to Table 4-007 – Characteristics of Core Performance in AWI’s standards.

E. Flat / Low-Profile Countertop Brackets
   1. Concealed brackets are preferred. Brackets shall provide a minimum loading of 300 pounds per bracket.
   2. All brackets shall be flat or low-profile to provide maximum knee space and flexibility for changes in undercounter equipment.

F. Restrooms and Breakrooms:
      1. No particleboard is allowed.
      2. In wet areas, including breakroom sinks, UTSW preference is the use of high-grade plywood to construct lower cabinets with finished interiors such as plastic laminate for protection.
      3. Solid surface countertops and front panels are preferred for longevity and lower maintenance.
      4. Front panels shall be designed with clip-system attachment for maintenance.
      5. Stainless steel is the preferred finish for any visible hardware.

G. Casework hardware standards include: Refer to UTSW Design Guideline and Specifications for 06 41 00 Architectural Woodwork.
      6. Drawer glides – ball bearing with minimum 100-pound capacity.
      7. Wire pulls – 3-1/2-inch or 4-inch with brush chrome finish or to match existing.
      8. Locks: Confirm project requirements and, for each type included, document locking strategy.
         a. Cam Lock 1-3/16-inch, bright nickel or to match existing

b. Digital, Combination, or Push Button Lock – Confirm project requirements and document locations.

9. Shelf Standards, extra heavy duty in an anochrome finish.
10. Shelf Brackets, extra heavy duty in an anochrome finish.
11. Hinges, 120 degree opening angle, full overlay, concealed with wing plate.

VI. Section 06 80 13 Resin Composite Paneling

A. Typical installations include panels as space dividers or dividers at reception/check-out areas.
B. Any proposed product shall be submitted with a minimum 12-inch square sample to the UTSW PM and UTSW Design Team.

VII. Section 06 83 16 Fiberglass Reinforced Paneling

A. Fiberglass Reinforced Paneling (FRP) may be used at approved locations to address heavy wear and tear. Areas may include wheelchair storage, equipment storage, and blood draw bays.
B. All panels shall be moisture-, chemical-, and abuse-resistant panel systems. Seams and fasteners shall be fully gasketed, sealed and designed to adequately prevent sagging or delamination when rooms are pressurized.
C. System shall include heavy-duty corrosion resistant clips. Installation techniques, such as glue, shall be determined to maximize the lifespan of the installation.
D. Heights of installations, textures, colors, and surface options shall be approved by UTSW Design Team. Accessories including trim and moldings shall match FRP color.
E. All components shall be sealed firmly with continuous sealant behind all components, caps and trims.
F. Design documents shall show panel layout with dimensions indicated. Installations shall limit the number of cut panels used per applied surface.

VIII. Section 07 90 00 Joint Protection

A. All penetrations in floors, walls and ceilings shall be sealed including structural joints to minimize flooding and, be easy to clean/disinfect, refer to Design Guidelines Section 07 90 00 “Joint Protection.”

IX. Section 08 10 00 Doors and Frames

A. Patient toilet rooms shall have smooth flooring transitions without lip or raised strips (thresholds).
B. Clinical Entries:
    1. All entry points into clinical suites and clinical pods shall have a 42-inch minimum wide opening with an automatic wave plate operator.

a. Provide an access control card reader with wave plate operated automatic door opener located at doors from the patient waiting to treatment areas. Access control shall be located on the egress side of the doors.
b. Architect shall confirm with Health Systems Administration staff other opening requirements in clinics.

2. All entry points along the pathway of clinical service to the patient shall be 42-inch minimum in width.
3. Doors from the waiting room to the clinical areas shall be wide style with full panel glass.

C. Wall-mounted doorstops are preferred in Clinical areas with strong in-wall blocking to prevent wall damage or overhead stops.

X. Section 08 34 00 Special Function Doors

A. When sliding or barn doors are desired the UTSW preference in clinical spaces is the use of interior aluminum-framed top-hung sliding doors. Refer to specification Section 08 34 00 "Special Function Doors."
B. A/E shall confirm acoustic privacy requirements and document STC minimum for each usage.

XI. Section 08 71 00 Door Hardware

A. UTSW prefers out-swinging single toilet doors. Any in-swinging patient toilet doors shall be dual swinging with rescue hardware. Ensure privacy is provided along both hinge and latch conditions.
B. All door hardware within UTSW spaces shall comply with the UTSW Specifications. The UTSW Key Shop shall review all door hardware packages prior to the Issue for Construction and shall provide approval.
C. Automatic opener locations, purposes, and styles shall be confirmed in each project. Each location shall be confirmed for timing requirements to prevent injury.
    1. Wheelchair / ADA Automatic opener: At public locations including main building entry, waiting room entry, public restrooms, and as indicated.
    2. Automatic opener: Typically locate at secure locations with access control. This may include clinic access to the waiting rooms.
    3. Wave plates: Typically located within secured areas for hands free access through corridor doors or smoke compartment boundaries.

XII. Section 08 80 00 Glazing

A. Refer to UTSW Master Specification for privacy film.
B. Refer to Design Guideline 08 80 00 "Glazing" for Visual Safety Indicators with areas of full glazing.

XIII. Section 09 00 00 Finishes

A. Materials must meet applicable regulation requirements, stand up against scrubbing, impact, and cleaning agents for long-term reliability while ensuring infection control.

XIV. Section 09 22 16 Non-Structural Metal Framing

A. Wall blocking for toilet areas shall address potentiality of patients of size and provide additional blocking capacities for grab bars.
B. Provide blocking at wall mounted door stops, locations for wall mounted equipment, casework, guard rails, handrails, and where indicated.

XV. Section 09 29 00 Gypsum Board

A. Reference NFPA 101 and Specification Section 09 29 00 “Gypsum Board” for required “Partition Identification” labels and locations as well as requirements for construction, fire-resistance ratings, and fire protection of existing and new fire-rated walls, partitions, compartments, assemblies, and smoke partition assemblies.
    1. Joint Commission projects do not allow scab patches.
    2. Renovation and remodel projects shall include revisions to existing partition identification when the wall conditions are modified.
    3. Renovation and remodel projects shall include partition identification be added where missing and as indicated by OSBC.
B. Wallboard Types:
    1. Type-X, fire-resistant, gypsum board shall be used at any locations requiring greater than 1/2-inch thickness.
    2. Use cement backer board for tile and wet installations.
    3. Abuse resistant panels to be used in high traffic areas as confirmed by UTSW PM.
C. Wallboard Finish Levels:
    1. The level of finish on walls in public areas shall be level 4 as standard.
    2. Level 5 finish is recommended for public areas with a significant amount of natural light, dark paint or paints with sheen or gloss, and walls that receive graphics.
        a. A/E shall document level 5 and specialty finish locations in finish schedules at each drawing issuance.
    3. Refer to the Gypsum Associations’ GA-210-10e “Recommended Levels of Gypsum Board Finish” document for guidelines for non-public and service areas.
D. Wall Textures:
    1. Walls in public areas shall have a light texture applied only after sample/mock-up approval from A/E.
E. Refer to Section B, Codes and Standards the “Acoustical Design” in the UTSW Design Guidelines for required acoustic Sound Transmission Class (STC) ratings.
    1. Where walls intersect with mullions, sound barrier mullion cap products, to isolate sound, are preferred solutions. STC rating of product shall match requirements of wall.

XVI. Section 09 30 00 Tiling

A. For tile installations on floors and walls in restrooms of healthcare and heavy use spaces, utilize water-cleanable epoxy grout complying with ANSI A118.3.
   1. Design considerations in these spaces include infection prevention, chemical resistance, stain resistance, color consistency, lower maintenance requirements, and durability.

XVII. Section 09 50 00 Ceilings

A. Clinical Space considerations include:
   1. A mock-up is recommended to be built with conditions that will achieve the STC required in patient settings as seen in Design Guidelines Section B, **Figure B.3 – Room Adjacency and Sound Transmission Class STC Minimums** and according to additional project code and jurisdictional requirements.
      a. A/E to confirm mock-up requirements with UTSW PM and User Representative per project.
      b. Utilize white noise to meet code requirements with design provided by acoustic design consultant.
   2. Design walls constructed to deck in exam rooms with MEP systems coordinated among A/E Team.
      a. Where walls cannot extend to deck, install sound batt insulation above ceiling, extending 3-foot minimum from each wall.
   3. Utilize products with higher acoustical performance with NRC 0.70-0.75 / CAC 35+ at a minimum.
   4. When an open return air plenum is present, utilize coordinated sound boots at supply and return air grilles at exam rooms and adjacent corridors.
   5. Additional acoustical control may include door hardware solutions, acoustic wall putty in electrical and data outlets, installing perimeter gasketing, and other solutions as determined by the A/E.
   6. Toilet rooms shall have gypsum ceilings.

XVIII. Section 09 60 00 Flooring

A. Ambulatory spaces shall meet requirements to minimize infection control including code requirements and best practices.
B. All flooring shall comply with requirements for moisture vapor emissions in concrete and be installed per manufacturer's recommendations.
C. Building entry doors shall have walk-off areas protected from weather. This can include surface walk-off carpet or owner provided walk-off mats. A/E to review entry suggestions with UTSW Design Team.

XIX. Section 09 65 00 Resilient Flooring

A. Healthcare areas shall have seamless systems including heat or chemically welded floor joints for infection control in areas such as procedure rooms, operating rooms, recovery, soiled hold, sterilization, isolation rooms, and observation rooms.
B. Exam rooms, corridors and similar spaces may have LVT products without joint welding unless required by code.

XX. Section 09 90 00 Painting and Coating

A. UTSW preference is for finishes to have no volatile organic compounds (VOC). When required finish is not available without VOC content, a low VOC product shall be used. Air quality shall be of prime importance especially in occupied spaces and those near healthcare areas.
B. CMU surfaces minimum finish shall have block filler applied according to manufacturer's recommendations.
C. Any temporary coatings shall be removed according to manufacturer's instructions with new finishes applied with specified primers and surface preparation.
D. Repainting of existing spaces shall include jobsite inspection and evaluation of the existing surface prior to issuing construction documents. Project documentation shall ensure entire walls, surfaces, planes, etc. have a consistent surface texture, finish, and clean aesthetic upon completion.

XXI. Section 09 91 23 Interior Painting

A. Paint Sheen:
    1. Wall surfaces in public spaces may be eggshell or satin in finish.
    2. Metal frames, metal trims, doors, and door frames shall be semi-gloss finish.
    3. Private spaces such as offices shall have eggshell finish.
    4. Accent walls shall have satin finish.
    5. Gypsum ceilings shall be flat.
    6. Dark rooms and reading rooms shall have flat paint but, otherwise, flat paints are prohibited at UTSW.

XXII. Section 10 14 00 Signs and Graphic Elements

A. Signage: Types:
    1. Orientation - Includes building directory, floor directory, and maps.
    2. Directional – Includes overhead, bulkhead, wall mounted and floor mounted locations.
    3. Primary Identification Signs – Includes logos, clinic identification, and other types.
    4. Room Identification – Includes room/space types as well as workstation identification.
    5. Regulatory and Informational - Stairwell signage, elevator egress, regulatory, and other messaging.

a. Due to the varied space types required by UTSW, additional regulatory signs may include fire safety, lab safety, biological and chemical safety information, access limitations, MRI and magnet safety, AED locations, Stop the Bleed locations, audiology booth messaging, and others as determined by project requirements. These types and locations will be coordinated by the UTSW Signage Shop with OSBC.

6. Donor Recognition Signage: – Locations will be identified by the UTSW Signage Shop.

B. Room Numbering:
   1. Room numbering by A/E shall follow the system as seen in Section A, **EXHIBIT A.1 - Room Numbering Standard**.
   2. Room numbers shall be sent to the UTSW Planning/Masterbooks Team prior to the DD meeting for review and approval.
   3. Projects under development shall only have one numbering system, which follows the UTSW system. Coordination with Facilities Management early in the design phase shall be done by the A/E.

XXIII. Section 10 21 23 Cubicle Curtain and Track

A. Curtain:
   1. Curtains shall be washable and anti-microbial. Provide a continuous seam where applicable.
   2. Provide a 12 by 12-inch sample for review to UTSW Design Team prior to final approval.
   3. Cubicle curtains shall be 12-inches above the ground with mesh height variable per project.
   4. Shower curtains shall be 1-inch above the ground.

B. Track:
   1. Aluminum track shall have a proven track record in health care environments.
   2. Coordinate track locations with the UTSW PM and user representative. Refer to UTSW Specification 10 21 23 Cubicle Curtains and Track for preferred products.

C. Design Considerations:
   1. Coordinate track layout with light fixtures to ensure:
      a. Individual room light layouts and switching provide lighting in all zones.
      b. Multi-person and multi-use rooms light layouts and switching provide required light levels and functionality in each zone.
   2. Curtain layout shall include where curtain to curtain connections are required to ensure privacy in larger spaces. Document requirements in the drawings or specifications clearly.
   3. Coordinate curtain stacking location to prevent interference with space processes and wall-mounted equipment.

XXIV. Section 10 26 00 Wall and Door Protection

A. Confirm per project to address high-traffic locations.
B. Reference Design Guideline and Master Specification for specific requirements and product information.

XXV. Section 10 28 00 Toilet and Bath Accessories

A. Standard toilet accessories, soap dispensers, hand sanitizers, and paper towel dispensers will be specified in project toilet rooms and for clinical spaces. Project A/E shall confirm contract requirements for furnishing these items and user requirements per space type.
    1. Refer to **EXHIBIT C.10 Responsibility Matrix** for preferred procurement per project type.
B. Clinic coordination shall include paper towel dispensers, soap dispensers, hand sanitizers, and trash can locations at a minimum.
    1. All elements required at the same location shall be coordinated fully with millwork and processes to meet design needs with User groups, UTSW Medical Equipment Team, and UTSW PM.
    2. Coordinate plumbing fixtures, emergency plumbing fixtures, and splash guards to ensure full operation of each accessory.
C. Toilet room coordination shall include ADA/TAS compliance for accessories located within the spaces and stalls.
    1. Coordinate point-of-care lab requirements with patient toilet rooms for location and specimen pass-throughs.
D. Under lavatory Guards:
    1. A/E to confirm the look of lavatory counter/casework desired for each project with project leadership champion. In all instances, lavatories shall meet all TAS/ADA requirements for safety and access.
        a. Clinical areas may utilize casework or aprons.
E. Baby Changing Stations:
    1. Provide baby changing stations in common/public area toilet room locations. Confirm with UTSW for locations within clinical toilet rooms.
    2. Baby changing stations must be installed in a place where they will not become a protruding object, not project into required clearances or walkways, will not hinder door usage, and will not restrict the use of an accessible toilet.
        a. Baby changing tables within a restroom or single person toilet room cannot be located within the required clear floor space of other objects in the toilet room including the door, toilet, and sink.
        b. Baby changing tables may be installed inside an accessible stall but it's open and closed condition cannot restrict the function of the toilet stall and must have the forward approach for the changing table. The clear floor space of the changing table may overlap the toilet clear floor space.
            i. This is not an ideal location because it limits both the use of the accessible toilet stall and the changing station.

c. Manufactured units with an opening and closing function shall be located in manner so a malfunctioning unit shall not prevent access and function of the toilet room.

F. Confirm per project requirements the requirement for special needs changing stations.

XXVI. Section 10 50 00 Storage Specialties

A. P-lam casework furrdowns, sloped tops or gypsum furrdown are required in healthcare areas to prevent any dust build-up.

B. Lockers are typically provided for employees without assigned offices or guests undergoing procedures. Confirm sizes, type, and quantity per project requirements.
   1. Patient locker areas are typically plastic laminate construction or metal.
      a. Areas where locks are required may include digital lock options. Confirm requirements with User Representatives and UTSW PM.
   2. Employee areas could be metal or plastic laminate with metal in any wet areas.
      a. Provide hasps for these locker areas.

C. Locker Construction:
   1. All lockers must be wall anchored, positioned on a base, and provide a toe kick.
   2. Recessed and flush handles are acceptable if they comply with ADA and TAS
   3. Identification numbers shall be permanently affixed to the surface of the lockers. Standard numerical sequences are preferred.
      a. If a project had central lockers on multiple floors, consider differentiating the numbers to include a floor number proceeding the locker number.
   4. Lockers shall have hangers inside each unit, including ADA accessible units, to meet TAS requirements.

XXVII. Section 11 00 00 Equipment

A. Layout of equipment shall comply with manufacturer's recommendations and best practices including all required clearances. Coordinate utility requirements with UTSW Medical Equipment Planning and manufacturer data.

B. All equipment to be coordinated with millwork and circulation.

C. Confirm requirements for emergency power as well as connection to the Central Data Acquisition System (CDAS) for critical equipment.

D. Refer to Design Guideline Section 11 13 00 "Loading Dock Equipment."

XXVIII. Section 11 70 00 Healthcare Equipment

A. Specific compliance requirements shall be confirmed for all projects. UTSW Medical Equipment Planning shall be involved in all equipment discussions.
   1. Equipment shall be coordinated with millwork, utilities, and circulation pathways for proper operation. Locations shall not decrease code compliance.
   2. For any projects with healthcare equipment, including OFCI and CFCI, utilize UTSW Master Specification Section 11 70 00 "Healthcare Equipment."

B. A/E shall confirm the codes, regulations, and certifications required for each project.
    1. Sterile compounding spaces shall follow USP 800.
C. A/E shall verify quantities of current and future Alcohol-Based Hand Rubs (ABHR) storage and dispensers with Facilities Owner and User Representative during Design Development.
    1. A/E shall determine the fire protection design criteria based on planned quantities and dispenser locations.
        a. Dispensers installed directly over carpet surfaces are only permitted in sprinklered smoke compartments.
    2. A/E shall ensure dispenser locations/types are coordinated on drawings and comply with ADA/TAS accessibility requirements.
D. Equipment in Project A/E's scope:
    1. A/E shall confirm equipment requiring emergency power and/or data connection to CDAS. Discuss requirements for dedicated circuits.
    2. For Pass-Through Cabinets, confirm requirements including but not limited to:
        a. Type: Biological vs Environmental vs Clean Room, Proper functions and sizes/dimensions required for operation, Fire rated vs non-fire rated, view windows vs solid, Finish and requirements for decontamination, Seamless vs Welded, Self-closing hinges, Ventilated vs Not Ventilated, HEPA filter requirements, Electromagnetic interlock vs mechanical interlock, handle vs paddle latch, etc.
        b. Confirm any requirements for emergency power.
        c. Confirm utilities access and document access panel location(s). and document.
    3. Countertop ice machines shall be installed with easy to access filters located within casework below. Copper drain lines shall connect the ice machine to the filter and drain with grommets located within the countertop for a clean installation.

XXIX. Section 12 05 13 Fabrics

A. Use of fabric in patient areas shall be in approved areas only, such as therapeutic counseling rooms, by UTSW Design Team, OSBC, and Infection Prevention.
    1. Upholstery shall withstand and be warrantied against specific cleaning solvents used by UTSW EVS teams. A list of cleaners can be provided by UTSW EVS.
    2. As part of closeout requirements, a cleaning manual shall be provided which includes information for each fabric.
    3. High-density foam is required.

XXX. Section 12 36 00 Countertops

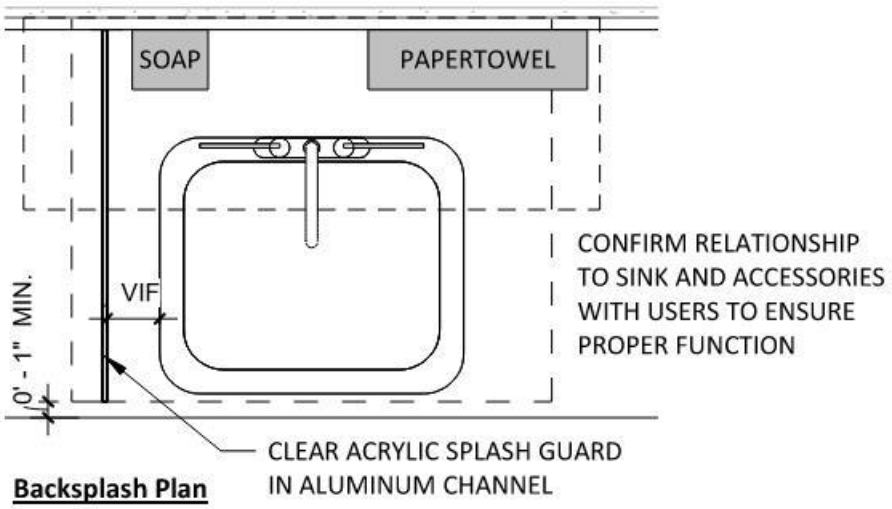
A. Countertops shall be impervious to water and resistant to heat, organic solvents, acids, alkalis, and other chemicals.
B. Stainless steel countertops are utilized in central sterile.

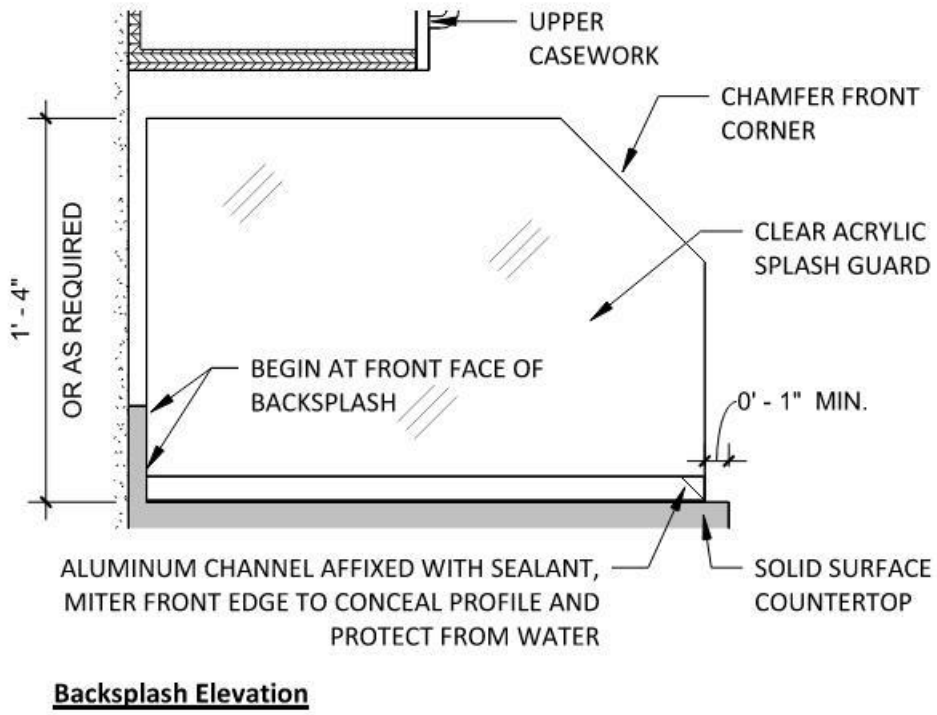
C. Patient areas, including but not limited to check-in, receptions, exam rooms, procedure rooms, and utility rooms shall have countertops that allow for effective cleaning and decontamination.
   1. Solid surface or manufactured products are preferred over natural products, which require regular sealant applications.
   2. Products shall not require specialty maintenance.

D. Clear acrylic splash guards in aluminum channels shall be provided at sink locations including point-of-care labs, phlebotomy spaces, medication dispensing, and as indicated by clinical staff.
   1. Depth: From face of backsplash to front edge of sink minimum but no closer than 1 in. to front edge of countertop.
   2. Height: Top edge shall be below upper cabinets or 16 in.
   3. Profile: Chamfer front, upper corner
   4. Aluminum channel shall have miter joint to conceal front edge.
   5. Location: To be confirmed per sink to allow for easy cleaning and locating accessories.

E. Flat or low-profile countertop brackets are required. Concealed brackets are preferred, and brackets shall have a minimum loading of 300 pounds per bracket.

Figure A3.1-1 Splash Guard Basic Design





XXXI. Section 13 21 66 Audiology Booths

A. Refer to UTSW Design Guideline Division 13 for campus requirements.

XXXII. Section 13 49 00 Radiation Protection

A. Refer to UTSW Design Guideline Section Division 13 for campus requirements.

XXXIII. Section 12 50 00 Furniture

A. Furniture shall be easily cleaned and disinfected and meet UTSW standards.
B. Furniture layouts shall be proposed by the UTSW furniture vendor for use in the A/E drawings.
   1. The furniture vendor will schedule Customer meetings for initial understanding and for presenting options.
   2. The furniture vendor will provide A/E with an initial layout in CAD with furniture specifications for products planned.
   3. For construction documentation, the furniture vendor will provide final layout drawings with power requirements in CAD.

XXXIV. Section 14 00 00 Conveying Equipment

A. Refer to UTSW Design Guideline Division 14 for campus elevator requirements.

XXXV. Section 21 00 00 Fire Suppression

A. Refer to UTSW Design Guideline Division 21 for campus requirements.

XXXVI. Section 22 00 00 Plumbing

A. Refer to Design Guideline Division 22 for campus requirements.

XXXVII. Section 22 40 00 Plumbing Fixtures

A. Toilet Rooms:
   1. Lavatories located in public and staff washrooms shall be provided with electronic sensor activated faucets.
   2. All electronic flush valve sensors shall be provided with a manual override button.
   3. Project A/E shall confirm requirements for patients of size to ensure toilet models are correct for the need.

B. Specimen Collecting Toilet Rooms:
   1. Lavatory faucets shall be provided with AC powered electronic sensors that are controlled by a wall switch located outside of the toilet room.

2. Flush valves shall not have manual override buttons and shall have AC powered electronic sensors that are controlled by a wall switch located outside of the toilet room.
3. Coordinate with Owner's staff for exact location of wall switches.

C. Patient Areas:
1. All lavatories and sinks within patient care areas shall be provided with a spout having an outlet a minimum of five inches above the flood level rim of the fixture.
2. Lavatories located in patient room toilets shall be provided with manually operated four-inch wrist blade handles and gooseneck spouts.
3. Gooseneck spout outlets shall terminate 5-inches minimum and 6-1/2-inches maximum above top of rim of lavatory sink. The horizontal dimension from spout inlet to spout outlet shall be a minimum of 5-1/2-inches.

D. Employee Areas:
1. Sinks and lavatories primarily used for hand washing in nurse stations, examination, and treatment rooms shall be provided with:
   a. Electronic sensor activated faucets.
   b. Grid strainer drain, drain stoppers or crumb-cup strainers will not be acceptable.
2. Sinks and lavatories used for procedural hand/arm scrubbing shall be trimmed with foot, knee, or electronic sensor controls. Coordinate specific types with project requirements.
3. Faucets used by medical and nursing staff for cleanup or general use shall be trimmed with valves that can be manually operated without the use of hands.
   a. Wrist blade handles are acceptable for this purpose and shall be four inches in length.
   b. Locations include nurse lounge, nourishment station, soiled utility, clean utility, film processing, etc.
4. Clinical sinks used for bedpan cleansing shall be provided with manually operated faucets having six-inch elbow blade handles and manually operated flush valves having integral bedpan washer.
5. Emergency fixtures shall be provided per code and regulation requirements. Locations for emergency eye wash fixtures include medication dispensing, labs, sterilization, and others as required per project.

XXXVIII. Section 23 00 00 Heating, Ventilating, and Air Conditioning (HVAC)

A. Refer to UTSW Design Guideline Section Division 23 for campus and renovation requirements.

XXXIX. Section 23 09 00 Instrumentation and Control for HVAC

A. Safety: Additional monitoring may be required per project and shall be confirmed with Clinical Leadership and OSBC. Monitoring may include CDAS or RTLS. Confirm requirements per location.
   1. CDAS Equipment Monitoring:
      a. Central Data Acquisition System (CDAS) is a campus-wide, central monitoring station. This is physically located in the Facilities Management Office Building.
      b. Equipment monitored by CDAS includes refrigerators, freezers, blanket warmers (could require 1 or 2), medication dispensing units, and other equipment as indicated per project.
      c. Provide the following for each CDAS monitoring location:
         i. In-wall box and faceplate shall be connected to conduit that is stubbed out above the ceiling.
         ii. The cabling type shall be confirmed per project. Typical cables include multi-conductor twisted pair 22 o4 18AWG plenum rated or vendor proprietary types.
         iii. The controls contractor will provide items identified for CDAS.

XL. Section 26 00 00 Electrical

A. Refer to UTSW Design Guideline Section Division 26 for campus requirements.

XLI. Section 26 51 00 Lighting Fixtures

A. Confirm lighting requirements with Users and UTSW PM to ensure both specialty spaces and standard spaces meet the needs of each project.
   1. Discussions shall include dimming requirements, zones, coordination with curtain track(s), fixture types, patient comfort, and controls.
B. Refer to UTSW Design Guideline **EXHIBIT 26.1 Recommended Commonly Used Light Schedule** for basis of design fixture types.
   1. Where lease requirements identify light fixture types, discuss differences and preferences with UTSW.
C. Preferences for Light Fixtures: Refer to **EXHIBIT 26.2 Lighting Control Matrix**.
D. Lighting controls shall meet energy code requirements. Refer to Section 26 09 13 “Networked Lighting Control System.”

XLII. Section 27 00 00 Communications

A. UTSW IR PMO shall be involved and direct communications solutions.
B. Refer to UTSW Design Guideline Section Division 27 for campus requirements including Technology Room / IDF guidelines.

XLIII. Section 27 52 23 Nurse Call System

A. Nurse call systems vary according to project and application type. Refer to UTSW Master Specifications for notes on existing hospital systems and clinical preferences.
B. Nurse call system design and elements are determined by applicable regulations for each project and application. If no regulation entity exists, the A/E shall confirm UTSW preferences and requirements.
    1. Nurse call system scope shall be identified in schematic design for pricing. Begin documentation of locations and elements in Design Development with finalization during Construction Documents.
C. Ambulatory / Clinical
    1. Stakeholders shall include Clinical leadership, User representative, Nurse Call Committee (if applicable), and UTSW PM.
    2. Components will include nurse consoles (base station with annunciation), staff terminals (staff assistant button), emergency pull stations with annunciation, and dome lights at each location. Clinical installations will not have audio communication elements, code blue, or rapid response components.
    3. Standard locations include patient restrooms, procedure rooms including stress test rooms, EKG rooms, Echo rooms, and infusion rooms. Confirm additional locations per project.
D. Additional nurse console locations, console types, and other elements shall be confirmed per project.
E. Location of Nurse Master Station is typically at a nurse station but to be confirmed per project.

XLIV. Section 28 00 00 Electronic Safety and Security

A. A/E shall confirm any additional safety or security requirements per project.
    1. Any areas with cryogen gases shall have oxygen sensors and provide the ability to increase room ventilation.
B. Spaces with security requirements:
    1. Duress Buttons:
        a. Check-in/Check Out, Guest and patient services.

XLV. Section 28 10 00 Access Control

A. UTSW Access Control, User Group, Clinical Programming & Facility Development, and other UTSW teams shall be involved in access discussions.
B. Additional controls and locations shall be determined per project requirements.
C. Card Readers:
    1. Medication Rooms, soiled holding, clean/soiled utility, TR closet, Patient waiting to patient care, employee entry/exit.
D. Security Keypads:
    1. Mother’s rooms.

XLVI. Section 28 20 00 Video Surveillance

A. UTSW Access Control, User Group, Clinical Programming & Facility Development, and other UTSW teams shall be involved in surveillance discussions.

B. Security Cameras are required in:

1. Medication dispensing units, medication rooms, medicine disposal units, and spaces with controlled substances.

C. Observation Cameras may be used. Refer to Psychology in “spaces” above.

End of Section A3

DOCUMENT HISTORY

Issue Date	Description	Editor
12/15/2023	2023 Q4 Update – Section added.	EV
06/13/2024	Q2 2024 Update	EV
12/20/2024	Q4 2024 Update	EV
06/27/2025	Q2 2024 Update	EV
12/18/2025	Q4 2025 Update	EV

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DESIGN CRITERIA

SECTION A4 LABORATORY DESIGN REQUIREMENTS

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SECTION A4 – LABORATORY DESIGN REQUIREMENTS

I. General Information

A. Design of laboratories shall include representatives from the project user group, Office of Safety and Business Continuity (OSBC) teams, Facility Management, Utilities, and Design Team. Throughout design, additional UTSW teams will be included to address project scope and special requirements.
   1. Design of laboratory spaces shall follow the NIH Design Requirements Manual (most recent edition) from planning through construction practices.

B. Project A/E shall provide solutions that meet standard best practices as well as specific project requirements. Confirm expected weights for wall mounted items, acoustic privacy desired, vibration considerations, and air pressures expected to provide partitions that meet design and regulatory requirements.

C. UTSW Laboratories are typically negatively pressurized compared to corridors with tissue culture labs negatively pressurized to any adjoining lab. Confirm project and building requirements.

D. On Renovation projects, the A/E shall document an understanding of the existing conditions including partitions, rated construction, utilities, and existing system constraints. Design solutions shall include all affected systems in the project scope, documenting existing capacities, known performance/quality/loads, and indicate alterations required to meet design requirements.

II. Laboratory Design: Codes and OSBC

A. The design and renovation of laboratory spaces shall comply with all UTSW Regulatory Requirements as indicated in the master specification Section 01 41 00 “Regulatory Requirements” and as indicated by UTSW OSBC.

B. Code considerations for laboratory design:
   1. Following NFPA 45 – The Standard of Fire Protection for Laboratories Using Chemicals requires a minimum of 1 hour fire rated walls for all renovations and new construction.
      a. A/E shall document user’s planned chemical types and amounts in project drawings.
      b. A/E will identify Laboratory Unit Fire Hazard Classification for each project and document required ratings.
   2. Laboratories with more than 1,000 square feet shall have a minimum of two exits.
   3. Compressed gas cylinders, cryogenic containers, or explosion hazards must be at least 10-feet away from primary entrances and egress paths. Project A/E shall consult with the UTSW AHJ for review and approval.

C. UTSW PM and Project A/E shall ensure compliance with appropriate OSBC teams for each project. Refer to UTSW Design Guideline Section B, “Campus Protocols: OSBC” for descriptions of each team and the area of focus.

III. Laboratory Design: Biosafety Level

A. Each laboratory space will be assigned a Biosafety Level (BSL) by UTSW OSBC. Project A/Es shall use this to guide their design solutions. The descriptions below are from the "UT Southwestern Biosafety Manual" version Date: December 2023.
   1. "Biosafety Level 1. BSL1 is suitable for work involving well-characterized agents (including animal work) not known to consistently cause disease in immunocompetent adult humans. BSL1 agents present minimal potential hazards to laboratory personnel and the environment. BSL1 laboratories are not necessarily separated from the general traffic patterns in the building. Work is typically conducted on open bench tops using standard accepted microbiological practices. Special containment equipment or facility design is not required but may be used as determined by appropriate risk assessment. "
   2. "Biosafety Level 2. BSL2 builds upon BSL1. BSL2 is suitable for work involving agents that pose moderate hazards to personnel and the environment. It differs from BSL1 in that: 1) laboratory personnel have specific training on containment, manipulation, cultivation, and disposal of pathogenic agents and are supervised by scientists competent in handling these agents; 2) access to the laboratory is restricted when work is being conducted and the door must remain closed at all times; and 3) all procedures in which aerosols or splashes may be created are conducted in BSCs or other physical containment equipment."
   3. "Biosafety Level 3. BSL3 builds upon BSL1 and BSL2. BSL3 is applicable to clinical, diagnostic, teaching, research, animal research, or production facilities where work is performed with indigenous or exotic agents that may cause serious or potentially lethal disease following exposure. Laboratory personnel have specific training on containment, manipulation, cultivation, and disposal of high-risk pathogenic agents and must be supervised by scientists competent in handling these agents. All procedures involving manipulation of infectious materials must be conducted within BSCs, other physical containment devices, or by personnel wearing appropriate PPE. A BSL3 laboratory has special engineering and design features."
   4. "Biosafety Level 4. BSL4 builds upon BSL1, BSL2, and BSL3. Currently, UT Southwestern does not have facilities that support BSL4 containment. "

B. Creation or renovation of BSL3 spaces will result in additional requirements which will be identified by OSBC. OSBC Biological and Chemical Safety teams will document design requirements and special testing requirements.

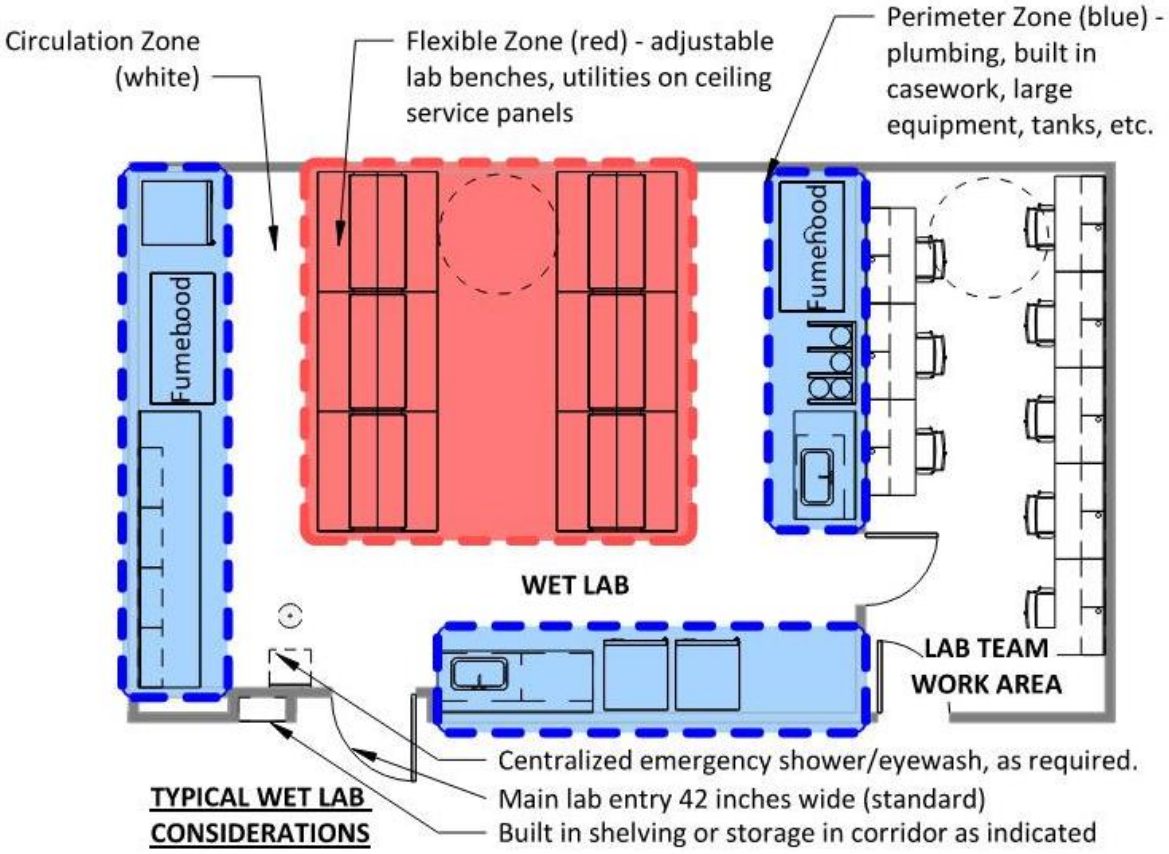
IV. Laboratory Design: Space Planning

A. UTSW prefers laboratories to be flexible and adaptable spaces wherever possible.
   1. Modular laboratories utilize UTSW standard casework and benching. Refer to **EXHIBIT A4.1 Laboratory Space Planning** for reference and information.
      a. Built-in casework, plumbing elements, and free-standing equipment can be in the perimeter zone and along partitions.
      b. Free standing and adjustable benching can be located through the interior of the space, with minimum 5-foot-wide aisles in a flexible zone.
         i. Within the flexible zone, utilities for aisles will come from ceiling service panels mounted in/at the ceiling.

B. Lab Benching and Casework:
   1. Existing built-in lab benching on campus is typically wood casework.
      a. Renovation projects with existing wood casework to remain shall work with UTSW PM, User, and OSBC to determine any condition issues, safety concerns, and remediation requirements.
   2. The standard for new laboratory benching is free standing and adjustable metal products. Documentation is in the UTSW Design Guidelines and Master Specifications. Refer to Division 12 00 00, for Sections including 12 35 53 "Laboratory Casework" and Section 12 36 00 "Countertops."
   3. All wall-mounted laboratory casework or equipment shall be securely attached. A/E shall confirm expected loading on/in these components.
      a. Confirm code requirements for these superimposed axial loads and design blocking and partitions to comply.
      b. Refer to UTSW Specifications for Sections 05 40 00 "Cold-Formed Metal Framing" and 09 22 16 "Non-Structural Metal Framing."

C. Typical lab requirements include:
   1. Provide a minimum of one door into a lab with at least 42-inches clear width for the movement of equipment.
   2. A minimum of one hand sink, emergency shower, and eyewash centrally located near the main traffic flow, as required by code and OSBC.
   3. Fume hoods and Biosafety Cabinets (BSCs) shall be located away from doors, traffic flow, HVAC supply, and other sources of air movement. Follow OSBC placement requirements in renovation and new projects.
   4. Flammable cabinets, flammable objects, cryogenic containers, and compressed gas cylinders shall be stored at least 10 feet from the lab primary entry and main egress path.
   5. Existing laboratories may operate with work areas located inside the lab space. When renovation of these spaces is designed, the AE shall propose built-in storage, adjacent to the entry door, within the corridor, these storage locations will be contingent on existing building constraints. Refer to **EXHIBIT A4.2 Laboratory Entry Storage** for reference.
      a. Where storage is installed in rated partitions, all materials shall comply with the currently adopted NFPA.
      b. Storage shall be permanently affixed and not protrude into the required egress width.
      c. Storage locations shall be coordinated with the required room and safety signage as well as, but not limited to, fire extinguishers, electrical panels, and ADA clear floor requirements.

EXHIBIT A4.1 Laboratory Space Planning



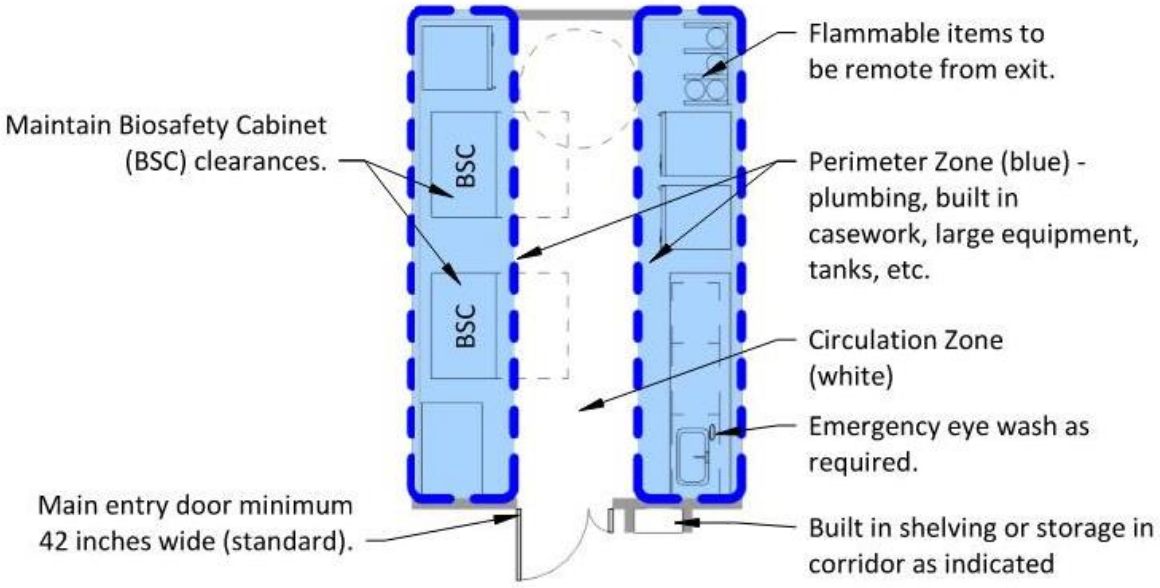
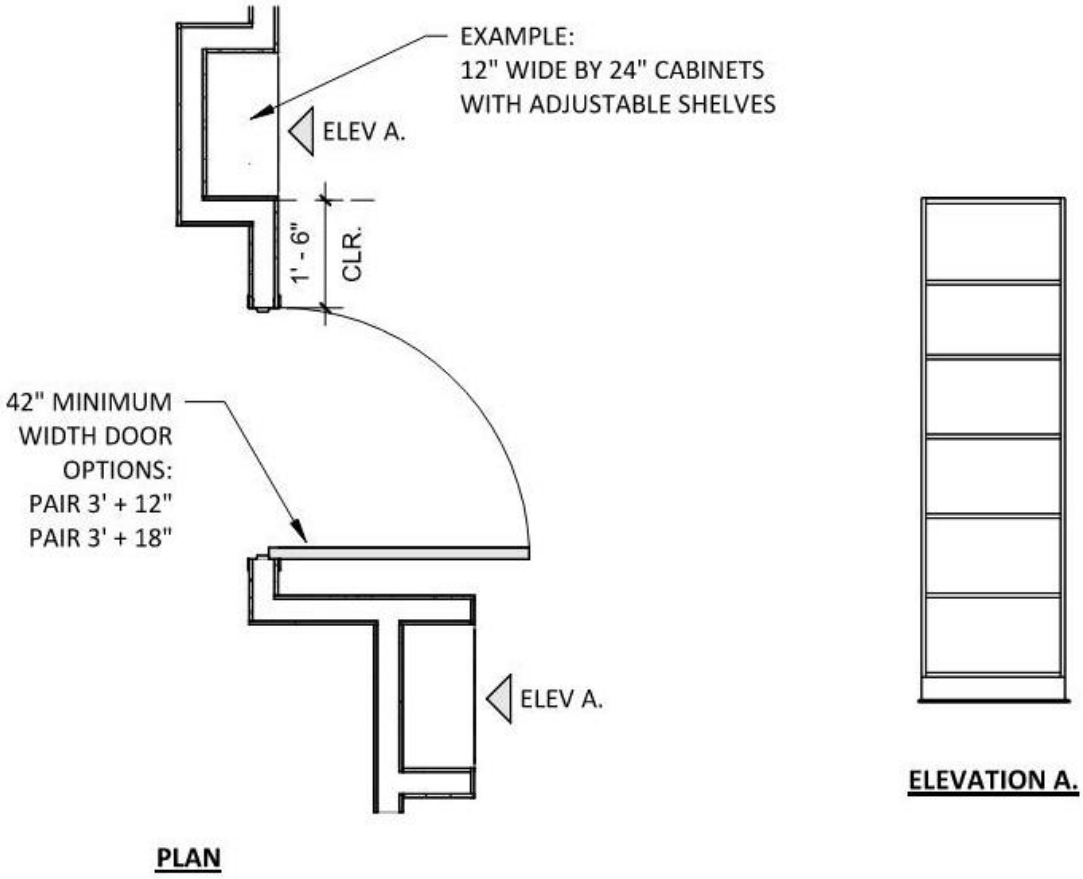


EXHIBIT A4.2 Laboratory Entry Storage



V. Laboratory Design: Utilities

A. Flexibility and adaptability shall be considered in utility overall designs so future growth and alterations can be accommodated.
   1. Confirm required future growth strategies for each project for each MEP discipline and provide oversized chases, units, panels, etc., as confirmed with department leadership.
   2. Lab spaces utilize tremendous HVAC and exhaust for proper operation. System capacities can easily become limiting factors in the life of the laboratory. Discuss expansion requirements for systems above the needs of the design for day one.

B. Confirm the utility types serving the project including the quality and quantity available for projects in existing buildings.
   1. The quantity/quality of building chilled water, process chilled water and compressed air shall be confirmed, compared to both manufacturer and lab requirements. The process chilled water piping loop should be equipped with plate frame heat exchanger to avoid circulation of campus chilled water through laboratory process equipment. Proposed design solutions shall be confirmed and validated with users.
   2. Presence and quantity of emergency power is variable throughout the campus and shall be confirmed.

C. Communication is critical for utilities and services in laboratories.
   1. Clearly label pipes where all services come into the laboratory space.
   2. Label each power receptacle to indicate its circuit reference.
   3. Label data receptacles to match IR requirements.

D. Gas service for equipment and processes may be implemented utilizing manifolds or tank switchers. Confirm preferences per project for any new service. Refer to Section 22 62 19 "Medical Gas and Vacuum Systems" for additional information.

E. Ceiling service panels typical services may include vacuum, power, and data. Provide pre-punched spaces for future service.

VI. Laboratory Design: Finishes

A. Unless noted otherwise, standard finishes include painted gypsum wallboard, and scrubbable finish acoustic ceiling tiles. All finishes shall comply with the applicable codes and regulations.

B. Laboratory Flooring - Provide non-porous flooring with a minimum thickness of 3 mm.
   1. Typical wet-laboratory flooring shall be rubber sheet flooring and rubber base, refer to UTSW Master Specification Section 09 65 00 "Resilient Flooring." Historically, VCT has been the standard flooring in these spaces. A/E to work with UTSW PM to confirm when existing flooring shall be replaced with new flooring in renovations.
   2. Laboratories with greater chemical or abuse resistance requirements, extreme temperatures, and pressurized sprays shall utilize seamless resinous flooring. Refer to Section 09 67 23 "Resinous Flooring."
   3. For BSL-2 laboratories, floors shall be slip resistant, impervious to liquids, and resistant to chemicals.
   4. For BSL-3 and higher laboratories, flooring shall be seamless resinous flooring systems.

C. Laboratory window coverings shall be horizontal metal blinds and follow the building standard. Where blackout solutions are required, work with UTSW Design Team for approved solutions.

D. For standard finishes of casework, refer to Design Guidelines Divisions 12 00 00 and UTSW Master Specifications for Section 12 35 53 "Laboratory Casework" and Section 12 36 00 "Countertops."

E. UTSW standards shall be followed for non-laboratory specific components. Follow typical UTSW requirements for offices, meeting rooms, etc. as noted in other areas of this document.

VII. Laboratory Space Types

A. The following spaces are not exhaustive and do not document every special condition. A/E to document unique project conditions and requirements to provide indicated design solutions.

B. Wet Bench Research:

1. Standard equipment may include fume hoods, refrigerators, -20 freezers, microwaves, and BSLs.
2. Standard utilities may include sinks, emergency eyewash and shower units, DI water, vacuum, power, and data.

C. Tissue Culture Room:
1. On UTSW campus, most tissue culture rooms are defined as BSL-2 spaces.
2. Standard equipment may include Biological Safety Cabinets (BSC), incubators, microscopes, and gas tanks, when required.
3. Standard utilities shall include sinks, emergency eye wash, emergency showers (where required by OSBC), power, C02, and dimmable light fixtures.

D. Microscope Rooms / Laser Rooms:
1. To understand the risks around lasers, follow the requirements from OSBC Laser Safety and UTSW Laser Committee including ANSI Z136.1. For each project, document laser class and what precautions are required.
2. Spaces where lasers may be used include, but are not limited to optics labs, microscopy labs, linear equipment labs, and electrophysiology.
3. Use of lasers may require additional safety measures including interlocking doors, door locking strategies, higher level MEP filters, and safety signage.
4. Special attention is required:
   a. Mechanical supply and exhaust to laser spaces shall be carefully designed to ensure air movement does not restrict proper laser operation.
   b. Design lighting fixtures and levels to be completely controlled and turned off. Refer to **EXHIBIT 26.2, Lighting Control Matrix**.
   c. Finishes and materials utilized in laser spaces shall not create reflections and shall be approved by User, UTSW Design Team, and OSBC.

E. Cold Rooms:
1. These purchased/prefabricated units are designed and installed within buildings. Where possible, a recessed slab is preferred to provide flat floor condition at doors. Where ramping is required, provide ADA compliant solutions.
2. Finishes include stainless steel panels and easily cleanable floor finishes are preferred.
3. Refrigeration units shall be reviewed with UTSW Refrigeration Shop to ensure systems, controls, and refrigerant type adhere to campus best practices.

F. Freezer Galley and Equipment Galley:
1. This space will typically house larger equipment which produces greater noise and exhaust amounts.
2. Provide acoustic control at partitions and doors to reduce noise transmission.
3. Standard utilities will include power through wall mounted raceways. Confirm requirements for back-up power and alerts to CDAS.
4. Standard flooring will include resinous flooring and base. Refer to UTSW Specification Section 09 67 23 “Resinous Flooring” for preferred products.

G. Autoclaves:
1. This space will include high temperature autoclaves for sterilization. Special attention is required to address the steam created with high exhaust capacity and stainless-steel ceiling panels.
2. Finishes shall be high temperature rated such as resinous flooring.
3. Standard utilities will include stainless steel sink, water, steam, power, and compressed air.

H. Accessory Spaces: May include chemical storage, dry ice storage, gas storage, etc. For these spaces, discuss MEP and finish requirements with the Users, UTSW FM, and UTSW OSBC Teams including Fire Safety, Biological Safety, and Chemical Safety.

I. Work Areas – Typical workspaces may include offices, shared open office, meeting rooms, break rooms and other standard requirements. Follow UTSW guidelines for sizes, layout preferences, finishes, and required furnishings.

VIII. Section 08 00 00 Openings

A. Refer to Design Guideline Section 08 10 00 “Doors and Frames” and Specification Sections 08 71 00 “Door Hardware” and 08 71 01 “UTSW Master Door Hardware Sets” for standard requirements.

B. Laboratory doors layouts shall ensure the safety of occupants as well as the expected movement of larger equipment.
   1. Discuss additional preferences with users including utilizing piano hinges to maximize clear openings.

C. Laboratory doors shall be self-closing while the laboratory space provides the as-designed air pressures and air changes per hour.

D. Where greater safety requirements exist due to Biosafety Level, comply with applicable regulations to provide interlocks,

E. Access control into laboratory spaces is predominately standard campus keyed locks or push button electronic locks. Badge access control is limited due to the high cost.

F. Glazing:
   1. Use of glazing into laboratory spaces shall not impede required processes or procedures.
   2. Risk assessment must be included to determine if special glass types are required to comply with Building Codes or NFPA.

IX. Section 11 53 13 Laboratory Fume Hood

A. Refer to Design Guideline Division 11 00 00 and UTSW Master Specification.

X. Section 11 53 19 Laboratory Specialty Equipment

A. For all equipment indicated to meet the design requirements of a project, the A/E is responsible for coordinating utilities, clearances, and manufacturer requirements for proper operation.

B. For primary containment equipment (fume hoods, BSCs, etc.), the A/E is responsible for verifying correct placement with respect to air devices, doors, and traffic patterns. This includes the requirements indicated in this guideline and OSBC documents.

C. Centrifuges – These require sturdy and stable surfaces due to their high weight. Provide clearance above to ensure the top fully opens. Requires dedicated power for each unit.

D. DI Water – Depending on building services, DI water may be provided from a building system or from local system. DI Water is required in all labs.

E. Reverse Osmosis (RO) Water – RO water may be provided from a building system or local system.
F. Incubators – These require CO2 connections and power. Many are double stacked.
G. Ice Machines - Floor drains with trap seals shall be located at large ice machine locations.
H. Millipore – This system provides higher purity water than DI water. It is only located where required. This will be connected to the DI water system for source water. The valve will be located next to a central lab sink and may be shared between labs.
I. Microwaves – Where located, they require a dedicated circuit.
J. Refrigerators and Freezers – At a minimum, these require extra dedicated circuits with no more than two on a single circuit.
K. Safety Showers and Eyewash – These are required where bulk hazardous chemicals are handled or as indicated by UTSW OSBC Chemical Safety. Refer to UTSW Specifications and Design Guideline Division 22, Section 22 40 00 "Plumbing Fixtures."
L. Tanks: All gas cylinders shall be secured with wall mounted tank restraints. Refer to UTSW Specification section 11 53 19 "Laboratory Specialty Equipment" for UTSW standard design.

XI. Section 11 53 53 Biological Safety Cabinets

A. Refer to Design Guideline Division 11 and UTSW Master Specification.

XII. Section 12 35 53 Laboratory Casework

A. Refer to Design Guideline Division 12 and UTSW Master Specification.

XIII. Section 11 53 43 Laboratory Service Fittings

A. Refer to Design Guidelines Division 11 and UTSW Master Specification.

XIV. Section 13 21 01 Controlled Environmental Rooms

A. Refer to Design Guideline Division 13 and UTSW Master Specifications.

XV. Section 21 00 00 Fire Suppression

A. Refer to Design Guideline Division 21 and UTSW Master Specification.

XVI. Section 22 00 00 Plumbing

A. Refer to Design Guideline Division 22 and UTSW Master Specification.

XVII. Section 23 00 00 Heating, Ventilation, and Air-Conditioning

A. Refer to Design Guideline Division 23 and UTSW Master Specification.
B. Laboratory spaces shall be maintained at negative air pressure with respect to the surrounding spaces.
C. In renovation projects, existing conditions shall be determined and documented as part of the design process to ensure final conditions satisfy design requirements.

XVIII. Section 26 00 00 Electrical

A. Refer to Design Guideline Division 26 and UTSW Master Specification.
B. In renovation projects, existing conditions shall be determined and documented as part of the design process to ensure final conditions satisfy design requirements.

XIX. Section 27 00 00 Communications

A. Refer to Design Guideline Division 27 and UTSW Master Specification.
B. In renovation projects, existing conditions shall be determined and documented as part of the design process to ensure final conditions satisfy design requirements.

End of Section A4

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DESIGN CRITERIA

DIVISION 0 PROCUREMENT & CONTRACTING GUIDELINES

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DIVISION 00 00 00 – PROCUREMENT & CONTRACTING REQUIREMENTS

I. General Information

A. The following Division 0 Sections have been developed by the University of Texas Southwestern Medical Center (UTSW) and are to be utilized on all UTSW FM capital projects.

B. The UTSW PM will provide the Project A/E with a final copy of all Division 0 Sections for insertion into the project specifications.

C. If the Project A/E has additional sections or changes to these sections, these items shall be brought to the attention of the UTSW PM.
   1. The UTSW PM will coordinate with VP of FM and with the Office of Supply Chain Management for a resolution.
   2. If the additions or changes are agreed upon then the final copy supplied by the UTSW PM will reflect the agreed upon items.

D. In no event will the Project A/E modify the final Division 0 Sections approved by UTSW.

E. The following is a listing of the standard Division 0 Sections for Construction Manager at Risk (CM-R) and Design-Build delivery methods:
   1. Request for Qualifications.
   2. Request for Competitive Sealed Proposals from Shortlisted Firms.
   3. Presentations by Shortlisted Firm.
   4. Guaranteed Maximum Price Proposal.
   5. Performance Bond, Form C-6A.
   6. Payment Bond, Form C-6B.
   7. Uniform General and Supplemental Conditions, Form C-8.
   8. Special Conditions and Wage Rates.
   9. Soil Investigation Data.

F. The following is a listing of the standard Division 0 Sections for Competitive Sealed Proposal (CSP) delivery method:
   1. Request for Competitive Sealed Proposal (CSP).
   2. Instructions for Competitive Sealed Proposal, Form C-3 CSP.
   3. Supplemental Instructions for Competitive Sealed Proposal.
   4. Bid/Proposal Bond, Form C-2.
   5. Part 1, Competitive Sealed Proposal.
   6. Part 2, Proposer's Qualifications.
   7. Part 3, HUB Subcontracting Plan.
   8. Post Proposal Amendment.
   9. Addenda.
   10. Contract, Form C-5a.
   11. Performance Bond, Form C-6A.
   12. Payment Bond, Form C-6B.
   13. Uniform General and Supplemental Conditions, Form C-8.
   14. Special Conditions and Wage Rates.
   15. Soil Investigation Data.

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10/03/2022	Q3 2022 Update	EV

DESIGN CRITERIA

DIVISION 1 GENERAL INFORMATION

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DIVISION 01 00 00 – GENERAL INFORMATION

I. General Information

A. The following Division 1 Specifications have been developed to work with the University of Texas System Uniform General and Supplemental Conditions and the Special Conditions and are to be utilized on all UT Southwestern Medical Center (UTSW) projects. The UTSW Project Manager (UTSW PM) will work with the Office of Supply Chain Management to complete Section 01 11 00 "Summary of Work" and Section 01 23 00 "Alternates." The UTSW PM will provide the A/E with a final copy of all Division 1 Sections for insertion into the project specifications.

B. If the A/E has additional sections or changes to these sections, these items shall be brought to the attention of the UTSW PM. The UTSW PM will work with Procurement for revisions to Section 01 11 00 and 01 23 00, but Procurement is the final authority on these documents. If the additions or changes are agreed upon, then the final copy supplied by UTSW PM will reflect the agreed upon items.

C. In no event will the A/E modify the final sections unless approved by the UTSW PM.

D. The following is a listing of the standard Division 1 Sections:

01 10 00 - Summary
01 21 00 - Allowances
01 22 00 - Unit Prices
01 23 00 - Alternates (CSP Only) – there are some cases where they develop alternates for CM-R projects.
01 25 00 - Substitution Procedures
01 25 00 - Contract Modification Procedures
01 29 00 - Payment Procedures
01 31 00 - Project Management and Coordination
01 31 26 - Electronic Communications
01 31 50 - Project Meetings
01 32 00 - Project Planning Scheduling
01 35 23 - Project Safety Requirements
01 33 00 - Submittal Procedures
01 41 00 - Regulatory Requirements
01 42 00 - References
01 43 00 - Quality Assurance
01 45 00 - Project Quality Control
01 50 00 - Temporary Facilities and Controls
01 57 23 - Temporary Storm Water Pollution Control
01 60 00 - Product Requirements
01 71 23 - Field Engineering
01 73 00 - Execution
01 73 29 - Cutting and Patching
01 74 19 - Construction Waste Management

01 77 00 - Closeout Procedures and Submittals
01 79 00 - Demonstration and Training
01 81 13 - Sustainable Design Requirements
01 91 00 - General Commissioning Requirements

II. Acronyms

ANSI American National Standards Institute
ASHRAE American Society of Heating, Refrigeration and Air Conditioning Engineers
ASME American Society of Mechanical Engineers
ADA Americans with Disabilities Act
A/E Architectural and/or Engineer
AHJ Authority Having Jurisdiction
CIP UTSW Facilities Management Capital Improvement Program
CM-R Construction Manager at Risk
CMR Construction Manager at Risk
CSP Competitive Sealed Proposal
D-B Design Build
FPDC UTSW – Facilities Planning, Design, and Construction
FM UTSW Facilities Management
FML Factory Mutual Laboratories (Normally FM)
FSC Forestry Stewardship Council
GFCI Ground Fault Circuit Interrupter Receptacle
GMP Guaranteed Maximum Price
HUB Historically Underutilized Business
IESNA Illuminating Engineering Society North America
IDIQ Indefinite Delivery-Indefinite Quantity
IR UTSW Information Resources
IDBC Institutional Design and Branding Committee
IDF Intermediate Distribution Frame (aka TR)
IBC International Building Code
IECC International Energy Conservation Code
IFC Issue for Bid Construction Documents
MDF Main Distribution Frame
NFPA National Fire Protection Association
NRTL National Recognized Testing Laboratory
NRCA National Roofing Contractors Association
OFM Office of Facilities Management
OSBC Office of Safety and Business Continuity
RID Texas Registered Interior Designer
RFP Request for Proposals
RFQ Request for Qualifications
PE Texas Licensed Professional Engineer
PM UTSW Facilities Management Project Manager

POC	Point of Contact
RAS	Texas Registered Accessibility Specialist
RA	Texas Registered Architect
RPLS	Texas Registered Professional Land Surveyor
SECO	Texas State Energy Conservation Office
TR	Technology Room / IDF
TAS	Texas Accessibility Standards
TDLR	Texas Department of Licensing and Regulation
UL	Underwriters Laboratories
UTSW	University of Texas Southwestern Medical Center Dallas, Texas
UTS	University of Texas System Austin, Texas

End of Division 1

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12/18/2025	Q4 2025 Update	EV

DESIGN CRITERIA

DIVISION 2 EXISTING CONDITIONS

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DIVISION 02 00 00 – EXISTING CONDITIONS

I. General Information

A. UTSW has many buildings constructed in a variety of material types and from many different eras. Each existing building will pose unique design challenges and opportunities for the A/E to understand while providing appropriate project solutions.

II. Design Review Submittal Requirements

A. Refer to Section C in the UTSW Design Guidelines.

III. Section 02 21 00 Survey

A. A topographic survey will be performed for each project involving new construction and for FM capital projects, where necessary, by a surveyor licensed in the State of Texas.
B. The survey shall include information for, but not limited to, topography, existing construction (buildings, roads, sidewalks, etc.), existing utilities on site including closest point of connection if not on site, significant vegetation, easements, etc.
C. Refer to Section C for specific deliverable information in the UTSW Design Guidelines.

IV. Section 02 26 00 Hazardous Materials Assessment

A. UTSW PM shall inform A/E of any hazardous items and provide copy of all reports for project area.
B. Should unforeseen hazardous materials be discovered, work shall stop, and the affected area be properly sealed off.
    1. The UTSW PM and Office of Safety and Business Continuity (OSBC) shall be immediately informed.
    2. A/E and UTSW PM shall confirm required drawing updates.

V. Section 02 32 00 Geotechnical Investigations

A. If included as a reimbursable service in the A/E Services Agreement, the A/E shall include the services of a qualified Geotechnical firm.
B. Proposal for Geotechnical Services may include the following but additional services may be needed as discussed with UTSW PM.
    1. Subsurface Drilling and Sampling.
        a. Borings proposed by the geotechnical engineer are to be indicated on a map with depths.
        b. Where drilled piers are involved, provide a separate hourly rate and not to exceed cost (based upon 1 trip and 8 hours of time) to be onsite during the first day of pier drilling to verify bearing stratum and other field conditions.

c. Schedule of rates shall be available for review.
d. Drilling and sampling in accordance with current applicable ASTM standards.
e. Samples taken at ground surface, at two feet below existing grade and at each change in soil stratification or soil consistency, but not further apart than five feet in each of the borings unless specified.
f. Rock cores, if applicable, are not to be less than 1 3/8-inch in diameter.
g. Samples shall be preserved and filed logs prepared by an experienced soil technician.
h. Make any necessary pavement repairs of like material and repair areas of soil disturbed from the process.

2. Field & Laboratory Reports.
   a. Refer to Section C in the UTSW Design Guidelines for specific deliverable information.
3. Foundation Evaluation & Recommendations
   a. Foundation support of the structure and slab, including soil bearing pressures, bearing elevations foundation design recommendations, including drilled piers/auger cast piles, potential vertical rise, and anticipated settlement.
   b. PE to recommend native soil types that facilitate positive drainage.
   c. Anticipation and management of groundwater.
   d. Lateral earth pressures for design of walls below grade, including backfill, compaction and sub drainage and associated requirements.
   e. Soil material and compaction requirements for site fill, construction backfill and for the support of structures and pavements.
4. Pavement Design.
   a. Design criteria for temporary excavation, temporary protection such as sheet piling, underpinning and temporary dewatering system.
5. Stability of Slopes.
   a. Analysis of soils to ascertain presence of potentially expansive soils, deleterious soils, chemically active or corrosive materials in soils, or the presence of gas in soils.

VI. Section 02 41 00 Demolition

A. All site demolition shall be indicated on a separate demolition plan indicating all items to be turned over to the UTSW FM and all trees and vegetation that shall remain and be protected during construction.
B. Perform all demolition of existing surface and underground facilities/improvements as required to construct the project.
C. Demolition plans and/or details shall be included in the design drawings.
D. Provide adequate tree protection around all trees in the project site that are to remain. Refer to Division 1 in the UTSW Design Guidelines for additional information.

E. Underground facilities shall be removed as required to clear construction in accordance with good, prudent practice and considering potential future construction.
   1. At a minimum, all structures shall be removed to a point 3-feet below natural ground. All cavities left below ground shall be filled with compacted native material or a flowable fill material.
   2. PE shall identify any underground drainpipes to remain and/or repair affected by the demolition.
   3. The portions of piping systems remaining in place shall be neatly cut and capped and/or plugged. Where partial demolition occurs, the remaining portions shall be left in a finished functional condition.
   4. Civil Engineer shall make recommendations of backfill materials.

F. Fill all voids left by clearing and demolition operations with native material compacted in maximum 8-inch lifts to a density equal to that of the surrounding undisturbed soil.

VII. Section 02 80 00 Facility Remediation

A. While the A/E will not be involved in remediation processes, the UTSW provided hazardous material report will identify known hazards expected during construction.

B. Should unforeseen hazardous materials be discovered, work shall stop, and the affected area be properly sealed off. The UTSW PM and Office of Safety and Business Continuity (OSBC) shall be immediately informed. A/E and UTSW PM shall confirm required drawing updates.

C. Post-remediation project plans shall be provided to OSBC through the Chemical Safety Program.

End of Division 2

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DESIGN CRITERIA

DIVISION 3 CONCRETE

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DIVISION 03 00 00 – CONCRETE

I. General Information

A. All concrete shall be designed, transported, placed, finished, and cured in accordance with American Concrete Institute (ACI) requirements. All components of the concrete mix shall meet applicable ANSI/ASTM requirements.
   1. Mix requirements and strength shall be specified by the A/E for each item of construction.
   2. A/E shall limit the number of mix strengths specified as much as practical.

B. Refer to UTSW Design Guideline A2, in Section 03 00 00 “Concrete” for ARC requirements.

C. General Floor Loading - Design floor live loads on all institutional buildings to carry a minimum of 100 pounds per square foot unless greater is required by Code and/or use for a particular use. This allows flexibility of future design when the building is renovated.
   1. Floor design must be sufficiently rigid to prevent objectionable vibration.
   2. For all other buildings, the design live loads shall be by the building code.
   3. Where mobile lifts are expected for maintenance inside buildings, the A/E team shall coordinate expected weights for machines in the space as well as provide a pathway with sufficient floor loading from an entry location.

D. Reinforcement shall be engineered and specified for project requirements.

E. Crawl space:
   1. Within buildings and crawl spaces, all penetrations shall be sealed to prevent the movement of water and pests.
   2. Provide a 2-inch-thick, 2500 psi unreinforced mud slab, properly sloped and drained, when a crawl space is included.

F. Any exposed concrete columns shall be sealed to prevent stains and shall be protected during construction to maintain intended finish.
   1. Base shall be installed up to 4-inch minimum on all sides of columns.

G. UTSW prefers that precast panels or brick do not extend below grade due to long-term waterproofing issues. If any material or structure extends below grade, it shall be completely waterproof. Refer to specifications for warranty requirements.

H. Concrete Flooring:
   1. All flooring surfaces must provide slip resistance at wet and dry conditions of .5 or better with tribometer testing.
      a. OSBC shall be contacted to confirm coefficient of friction requirements have been achieved for new sidewalks, pavement, and broom finish levels.
      b. Exposed concrete floors in mechanical or service bays shall provide slip-free surfaces for employees such as broom finish.
   2. Refer to specification Section 03 30 00 “Cast-In-Place Concrete” for finish requirements.
   3. While polished and stained concrete are not UTSW preferences, due to the creation of slip hazards, any exposed concrete finished work shall be accomplished in two pours or as recommended by the structural engineer.

   a. The first pour shall be structural, and the second shall be a two-inch minimum finish topping slab poured near completion of project.

I. Sidewalks and Site Features:
   1. UTSW prefers sidewalks to be sized wide enough for the variety of visitors and users to the campus. Walkway widths shall be 4-foot minimum and wider dependent on code requirements and user discussion.
      a. Installation of poles within sidewalks shall not encroach into the width of pedestrian walkway.
      b. Sidewalks shall be designed to provide easy, continuous traffic flows.
      c. Entry sidewalks shall be doweled to building foundation.
   2. Concrete sidewalks shall be completely enclosed by formwork at all edges and to the full depth during pouring and curing.
   3. Sidewalks near buildings shall be designed with positive slopes.
   4. Sidewalks shall be finished and sloped to prevent ponding of water and comply with TAS.
   5. Concrete or gravel/rock mow strips are acceptable on campus.
      a. Where concrete mow strips are planned, provide a 1-foot-wide x 4-inch-thick continuous reinforced concrete mow strips around a building adjacent to areas expected for mowing.
      b. The mow strip shall be doweled to the building foundation near all door locations. At all other locations the mow strip shall not be doweled to the building foundation unless approved otherwise by the UTSW PM.
      c. Include mow strips along the backs of curbs for head-in parking areas adjoining grass areas with expected overhanging by car bumpers. These shall be doweled to the back of the curbs and sloped in the direction of positive drainage. Joints shall align with the adjoining curb.
   6. Landscape Edges:
      a. In pedestrian areas, landscape edges are preferred to be poured in place concrete. Metal landscaping strips are not preferred in pedestrian areas.
      b. Metal landscaping strips are acceptable in landscaping areas located away from pedestrian traffic.
   7. Concrete planters or raised beds shall have waterproofing membranes and seals to prevent damage and mold. These elements shall not be located on top of structural components that could cause waterproofing issues or rust in the long term.

II. Design Review Submittal Requirements

A. Refer to Section C in the UTSW Design Guidelines.

III. Section 03 10 00 Concrete Forming and Accessories

A. Concrete formwork shall meet applicable ACI requirements.
   1. Use materials suitable for exterior exposure and which have the strength to produce required tolerances.
   2. Materials in contact with concrete shall not react with fresh concrete to cause loss of strength or durability.
   3. Form materials shall not stain concrete surfaces that are exposed to view.

B. All forms and pieces of wood shall be removed once construction processes no longer require them.
   1. No wood shall be left behind as it attracts pests and moisture in the long term.

C. Void space below grade beams shall have soil retainers located at the face of grade beams to form a void of sufficient depth to prevent pressure on the bottom of beams from earth expansion.

D. Form ties may be snap off metal ties of fixed length with plastic cones, designed to prevent spalling of concrete upon removal. Provide units that will leave no metal within 1-inch of concrete surface.

E. Locations of utility lines, sleeves and pipes underneath sidewalks, driveways, parking, or other paving shall be permanently marked with utility identification.
   1. Utility markers shall be of brass, stainless steel, or other rugged metal construction that is drilled and adhered into the pathway near the perimeter or edge.
   2. Markers shall have wording on the top with a general description of items buried as well as arrows indicating direction.

IV. Section 03 20 00 Concrete Reinforcing

A. Concrete reinforcement material, design, and placement shall meet the applicable requirements of ACI and the Concrete Reinforcing Steel Institute (CRSI) along with associated ASTM requirements.
   1. Reinforcing bars shall typically be Grade 60.
   2. No welded wire fabric reinforcing is allowed except in topping slabs or unique situations as approved by the UTSW PM.
   3. Main reinforcing bars to be minimum No. 4 in size.
   4. Limit No. 3 bars (Grade 40) to ties and dowels.

V. Section 03 30 00 Cast-in-Place Concrete

A. Admixtures to the concrete mix meeting applicable ANSI/ASTM specifications may be used as recommended by the Structural Engineer to improve concrete workability, for wear/weather resistance, and to better meet project conditions.
   1. Pozzolan Admixtures should only be used within the limits recommended by the Structural Engineer and shall be approved by the UTSW PM and FM.

B. Expansion and control joints:
   1. Locations of expansion and control joints shall be indicated on structural, architectural, and finish plans.
   2. Design locations of expansion and control joints to minimize the number of times control joints cross traffic paths, such as hallways.
C. All concrete shall be properly vibrated to remove air pockets and provide smooth finish surfaces.
D. Any concrete for stair treads with embedded nosing must specify a mix with small aggregate such as 3/8-inch or chipped rock to ensure proper installation of nosing.
E. Any thin layers or skim coats added to resurface new concrete shall include waterproofing component, primer, and must be an epoxy-based product.

VI. Section 03 35 00 Concrete Finishing

A. The project specifications shall clearly establish finish measurement tolerances, suitable standards, exposure qualities, and provide quality control requirements to ensure a suitable installation.
B. Generally, cement finished floors are to receive hardener and sealant.
   1. Any concrete sealant shall provide additional grip topping to prevent slippery surfaces and meet OSBC requirements.
   2. Flooring protection is to be provided in areas with exposed concrete to prevent staining and chipping during construction work.
   3. Slick finishes are not allowed.
C. For any special finished concrete in the project, the Specification shall require a sample panel or other area constructed as specified for approval consideration for UTSW PM.

VII. Section 03 39 00 Concrete Curing

A. The curing compound manufacturer shall provide certification that their product is compatible with the finish flooring scheduled for the space.

VIII. Section 03 40 00 Precast Concrete

A. A/E may determine additional consultants, such as precast consultants, are needed depending on project scope.
B. On projects designed for precast, tilt-up and/or special finished concrete panels, the Specification shall require a sample panel, constructed as specified, or at least 42 square feet to be erected at the jobsite for approval consideration by the UTSW PM.
   1. The approved panel shall remain on the jobsite as a visual criterion that the final construction must match.
   2. Mock-up shall include samples of standard conduit constructed within panels and any other special conditions present in the project.
C. Expansion and control joints shall be indicated on building elevations.

D. Conduit locations within precast panels shall be permanently marked with metal utility markers located within the panel surface.

IX. Section 03 50 00 Cast Decks and Underlayment

A. Concrete is the preferred material for flat roof decks.
   1. Shaped rigid board insulation is not permitted.
   2. Where the roof is supported by a combination of structural steel, steel joists and steel deck, the topping shall be normal weight concrete.

B. The main slope for the roof shall be accomplished by the structural system. Only secondary slopes can be accomplished by the roof system and any tapered insulation component.

End of Division 3

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10/03/2022	Q3 2022 Update	EV
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DESIGN CRITERIA

DIVISION 4 MASONRY

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DIVISION 04 00 00 – MASONRY

I. General Information

A. Materials and processes for Masonry construction shall comply with the ICC Chapter 21 Masonry section and follow current best practice guidelines to provide masonry surfaces that will require minimal maintenance over time while maintaining positive aesthetics.
   1. Important considerations include design, installation techniques and location of drip edge flashings to protect the building infrastructure while providing appealing aesthetics.
   2. Design shall effectively use weep holes and stepping brick ledges at differing slope levels.
   3. Use of brick within buildings should not prevent access to items that need periodic maintenance, such as plumbing devices.

B. Brick and stones as building walls are not currently standard for campus new construction.
   1. Existing building renovations, which modify areas of existing brick, will be reviewed by UTSW FM.

C. Pavers or bricks as flooring surface at primary entry floors or heavy patient traffic areas are not preferred.

D. For landscaping, poured edging or gabions are preferred. Dry stack installations are not preferred for use in landscaping.

II. Design Review Submittal Requirements

A. Refer to Section C in the UTSW Design Guidelines.

III. Section 04 20 00 Unit Masonry

A. Concrete Masonry Units (CMU)
   1. Concrete masonry units shall be used wherever feasible as substrate for exterior face brick.
   2. Use as an interior wall includes areas such as high traffic service areas, service and wet areas, Animal Resource Center (ARC) large animal spaces or as further indicated by project requirements.
      a. Refer to UTSW Design Guideline A2, in Section 04 20 00 “Unit Masonry” for ARC requirements.
   3. A/E shall confirm appropriate block filling products are used on new construction. A minimum of two coats of block filler with a high-performance coating system is a minimum requirement.
   4. Concrete masonry units shall comply with ASTM C90 as a minimum.
   5. Use concrete masonry unit shapes as required for reinforcing and openings.

6. Expansion joints and control joints shall be appropriately detailed and shown in drawings.

B. Brick
   1. Exterior brick is not currently a standard across the entire UTSW campus. Brick masonry is to be designed and constructed per the standards of the Brick Industry Association.
   2. Brick will be selected during project design and presented to the IBDC for review and approval.
   3. Face Brick shall be ASTM C216; Type FBS grade SW.
   4. For masonry veneer, Mortar Type N with concave tooled joints shall be used.
   5. Brick coursing shall stop above grade to ensure positive drainage with consideration given to stain prevention. Use of mow strips, stone landscaping and other techniques shall be considered to ensure longevity of the installation.
   6. Joints:
      a. Horizontal control joints with corresponding masonry support shelf angle shall be located at each elevated level but is not needed between the top floor and roof parapet.
      b. Control joints shall be located at each side of masonry openings. Vertical control joints shall be located at a maximum of approximately 30 feet on center in planer exterior walls.
      c. Expansion joints and control joints in masonry veneer walls shall be appropriately detailed and shown on building elevations.
      d. Architect and Structural Engineer shall coordinate locations of these joints.
   7. Shelf angles and lintels shall be designed by the Structural Engineer to support the full weight of masonry which it holds including lintels above all wall openings. The design of these supports shall follow best practice, be protected from corrosion and a schedule of angles and shelves shall be provided in the documents.
   8. For large projects or as indicated by the UTSW PM, the A/E shall provide drawings and details that indicates the size of the brick mock-up panel that will also contain all exterior materials such as stone, cast stone, curtain wall, glazing, sealants, flashings etc. for final approval of brick color as well as all exterior colors for the project.
   9. The A/E shall ensure the specification requires the Contractor erects a 300-brick sample panel in mortar, placed in full sunlight at the jobsite for UTSW review prior to the final brick order.
      a. The approved panel shall remain on the jobsite as a visual criterion which the final construction must match.

C. Masonry Accessories
   1. Mortar net or a comparable mortar collection product shall be utilized in brick or concrete masonry walls to prevent clogging of weep holes.
   2. Weep holes shall be spaced at 24-inches O.C. maximum at flashing and 16-feet O.C. with wicks located above flashing.
   3. Use hot dipped galvanized brick ties.

IV. Section 04 40 00 Stone Assemblies

A. Stone as a building wall finish is not currently standard or preferred on campus.
B. If allowed in a project, marble and granite shall be domestic.
C. Surfaces shall be sealed according to best practice recommendations.
D. All stone shall be presented in early design for review and approval by the IBDC.
E. Use of stone as flooring in or near high-traffic entry vestibules and lobbies shall be done thoughtfully in ways to prevent slick surfaces and address long-term maintenance concerns.
F. Anchors, dowels, and other accessories used in setting stone shall be stainless steel.

End of Division 4

DOCUMENT HISTORY

Issue Date	Description	Editor
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DESIGN CRITERIA

DIVISION 5 METALS

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DIVISION 05 00 00 – METALS

I. General Information

A. Materials and processes shall comply with applicable codes including ICC Chapter 16 and 22 as well as current best practices, including the American Institute of Steel Construction (AISC), American Welding Society (AWS) and American Society for Testing and Materials (ASTM).

B. UTSW preferred structural systems include composite structural steel and concrete structures. Avoid the use of touching dissimilar metals conditions in all structural situations. Use compatible metals or provide isolation materials.

C. Ensure lightning protection system is designed to prevent galvanic corrosion between dissimilar metals. Do not use a combination of materials that form an electrolytic couple. Refer to Division 26.

D. The Engineer shall include the following language in the notes and specifications for Structural Steel and Concrete Reinforcing:

1. Domestic Iron and Steel Certification. Pursuant to Sections 2252.201 – 2252.205 of the Texas Government Code, the Contractor certifies that it complies with the requirement that any iron or steel product produced through a manufacturing process and used in the Project is produced in the United States.

II. Design Review Submittal Requirements

A. Refer to Section C in the UTSW Design Guidelines.

III. Section 05 10 00 Structural Metal Framing

A. The Contractor shall be required to provide an affidavit, at the completion of the project, that the structural steel framing is plumb and level within the normal tolerances specified in the AISC Code of Standard Practice.

B. The main slope for the roof shall be accomplished by the structural system. Secondary slopes can be accomplished by the roof system.

C. Any exposed column baseplates shall be designed to prevent trip hazards and not unduly collect dirt. Flooring shall be installed to butt cleanly against any exposed steel.

IV. Section 05 12 13 Architecturally-Exposed Structural Steel Framing

A. Any Architecturally-Exposed Structural Steel (AESS) shall be clearly identified on the construction documents. Show on plan with shading, labels, or other means to indicate AESS. Provide appropriate specifications and details. To the extent possible, fabricate and assemble AESS in the shop.

B. Fabricate AESS with exposed surfaces smooth, square and of surface quality consistent with the approved mock-up. Grind exposed edges of sheared, punched or flame-cut steel to remove burrs and marks to match approved mock-up. Requirements for a potential mock-up shall be determined with UTSW PM and A/E. Mock-ups shall be minimized due to the potential for additional associated costs with its usage.

V. Section 05 30 00 Metal Decking

A. The metal deck shall be recommended by the Structural Engineer as the best product for the application.

VI. Section 05 40 00 Cold-Formed Metal Framing

A. Cold-formed metal wall framing shall be spaced 16-inches on center, maximum or as determined by code requirements.

VII. Section 05 50 00 Metal Fabrications

A. All exterior exposed ferrous metals shall be hot dip galvanized unless they are exterior grade painted.
B. Wherever dissimilar metals come into physical contact, they must be separated with an approved layer of bituminous coating or with other best practice solutions.

VIII. Section 05 51 00 Metal Stairs

A. Treads and Landings:
   1. Metal stairs with concrete, terrazzo, or other similar treads that provide code required slip resistance are acceptable.
      a. Refer to specification Section 03 30 00 “Cast-In-Place Concrete” for “slip-resistive finish” requirements.
   2. Treads:
      a. Embedded abrasive nosings may be installed where recommended for safety and longevity. Refer to specification Section 05 51 00 “Metal Stairs” for requirements.
      b. Rubber stair treads may be used as approved by IDBC where advantageous to the project.
      c. Grated treads are permissible with approval from PM and BMO.

B. Metal Structure:
   1. All metal stairs shall have components, including welds, properly cleaned and primed for long-term finish system application.
   2. Construction of stairs shall include a support/brace at the middle of risers to provide long-term support.
   3. End caps shall be used to prevent water intrusion and minimize rust.

4. Concrete pan treads shall have seams fully sealed to prevent water intrusion into the pan.

C. Metal Finishes:
   1. Refer to Sections 09 91 13 “Exterior Painting” and 09 91 23 “Interior Painting.” Finishes shall be rust-inhibiting epoxy systems.
   2. Galvanized finishes may be used in exterior or back-of-house conditions.

IX. Section 05 52 00 Metal Railings

A. Design of metal railings shall comply with applicable codes including Chapter 7, Means of Egress of NFPA 101 and TAS.

B. Design of guards and rails shall follow code requirements, maximize safety, and minimize long-term maintenance.

C. Rail Types:
   1. Metal type and finish chosen per stair type and location shall provide a low maintenance solution.
   2. Exterior rail finishes shall be electrostatic epoxy painted or galvanized unless approved by IDBC and BMO.

End of Division 5

DOCUMENT HISTORY

Issue Date	Description	Editor
06/19/2020	June 19, 2020 Print	EV
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DESIGN CRITERIA

DIVISION 6 WOOD, PLASTICS, AND COMPOSITES

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DIVISION 06 00 00 – WOOD, PLASTIC, AND COMPOSITES

I. General Information

A. Consider specifying products from sustainable sources such as FSC (Forestry Stewardship Council) Certified Wood or regionally available from abundant sources. Avoid use of imported or exotic species of wood.
B. Contractor shall provide certifications of wood types, including UL labeling for fire retardant materials, certifications for preservative treatment and any inspections.
C. All products shall be free of arsenic and chromium.
D. All interior installations shall match campus preferences for no or low-VOC content for products and adhesives.

II. Design Review Submittal Requirements

A. Refer to Section C in the UTSW Design Guidelines.

III. Section 06 10 00 Rough Carpentry

A. Wood used in conjunction with roofing installations and wood which is installed in contact with concrete or masonry shall be pressure treated with an approved preservative to meet AWPS Standards.
B. UTSW preference is to minimize the use of wood that could create issues with insects and rot. Wood installations shall receive prime coats suitable for finishes specified as soon as installation is complete. Back prime wood where dampness or warping is anticipated.
C. Blocking shall be indicated on drawings where extra support is required for items such as toilet accessories, handrails, door stops, millwork, equipment, mounting devices, etc.
    1. Blocking shall be documented to extend beyond the size of the item to be installed to account for construction tolerances.
    2. Blocking shall comply with NFPA and regulatory requirements.
    3. Where fire-rated plywood is utilized, the stamp shall remain visible and not be painted.

IV. Section 06 16 00 Sheathing

A. Exterior walls with cold form stud construction shall have glass-mat sheathing material. Sheathing shall provide added shear strength, resist water, and resist air infiltration, such as glass-mat or glass-faced gypsum sheathing.
B. All installations shall follow manufacturer recommendations including nailing schedule and sealing joints.
C. All panels shall butt fully together.
D. Sheathing layer does not negate the need for waterproofing layer dependent on system indicated for design.

V. Section 06 20 23 Interior Finish Carpentry

A. Materials and fabrication for Millwork shall conform to Architectural Woodwork Institute "Quality Standards" specification. Use "Custom Grade" for standard millwork and "Premium Grade" for unique and special features.
B. The design of the upper cabinetry shall prevent dust accumulation.
C. A/E shall identify locations for under cabinet light with UTSW PM and coordinate within architecture and electrical drawings.

VI. Section 06 40 23 Interior Architectural Woodwork

A. Materials and fabrication shall conform to Architectural Woodwork Institute specification. Use "Custom Grade" for standard casework and "Premium Grade" for unique and special features.
B. UTSW preference is for plywood construction for casework and millwork.
    1. MDF or particleboard only to be used if approved in writing by UTSW.
    2. Products used for panels or doors shall have good screw holding face to hold up over time. Refer to Table 4-007 – Characteristics of Core Performance in AWI's standards.
C. For stained natural wood finish, plywood shall be veneer core, A-1 grade. Standard stained wood finish is Red Oak plain slice (R. Oak VC A1 PL SL). Drawer boxes shall be 1/2-inch or 9-ply Baltic Birch Plywood.
D. Restrooms and Breakrooms:
    1. No particleboard is allowed.
    2. In wet areas, including breakroom sinks, UTSW preference is the use of high-grade plywood to construct lower cabinets with finished interiors such as plastic laminate for protection.
    3. Solid surface countertops and front panels are preferred for longevity and lower maintenance.
    4. Front panels shall be designed with clip-system attachment for maintenance.
    5. Stainless steel is the preferred finish for any visible hardware.
E. Casework hardware standards include:
    1. Drawer glides – ball bearing with minimum 100-pound capacity.
    2. Wire pulls – 3-1/2-inch or 4-inch with brush chrome finish or to match existing.
    3. Cam Lock 1-3/16-inch, bright nickel or to match existing. Refer to Design Guideline Section 08 70 00 "Hardware" for additional lock information.
    4. Shelf Standards, extra heavy duty in an anochrome finish.
    5. Shelf Brackets, extra heavy duty in an anochrome finish.
    6. Hinges, 120 degree opening angle, full overlay, concealed with wing plate.

VII. Section 06 80 13 Resin Composite Paneling

A. Resin composite panels are acceptable to be used on campus.
B. Typical installations include space dividers or dividers at reception/check-out areas.
C. Any proposed product shall be submitted with a minimum 12-inch square sample to the UTSW PM and UTSW Design Team.

VIII. Section 06 83 16 Fiberglass Reinforced Paneling

A. Fiberglass Reinforced Paneling (FRP) may be used at approved locations including labs, kitchens, janitor closets, ARC renovation spaces, and back-of-house areas.
B. All panels shall be moisture-, chemical-, and abuse-resistant panel systems. Seams and fasteners shall be fully gasketed, sealed and designed to adequately prevent sagging or delamination when rooms are pressurized.
C. System shall include heavy-duty corrosion resistant clips. Installation techniques, such as glue, shall be determined to maximize the lifespan of the installation.
D. Heights of installations, textures, colors, and surface options shall be approved by UTSW Design Team. Accessories including trim and moldings shall match FRP color.
E. All components shall be sealed firmly with continuous sealant behind all components, caps and trims.
F. Design documents shall show panel layout with dimensions indicated. Installations shall limit the number of cut panels used per applied surface.

End of Division 6

DOCUMENT HISTORY

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DESIGN CRITERIA

DIVISION 7 THERMAL AND MOISTURE PROTECTION

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DIVISION 07 00 00 – THERMAL AND MOISTURE PROTECTION

I. General Information

A. Building Envelope shall comply with State Energy Conservation Office codes and ASHRAE 90.1. Refer to Section B of the UTSW Design Guidelines for current editions of codes and standards.
B. A method to clean all exterior glazing must be incorporated into the project. Verify method with Project Manager.
C. Roof systems for new and existing facilities shall meet International Building Code (IBC) and National Roofing Contractors Association (NRCA) to address the specific design requirements of each building considering the following criteria:
   1. Life Cycle Cost.
   2. Sustainability.
   3. Roof Penetrations.
   4. Roof Traffic to access and repair/maintain roof-mounted equipment.
   5. Maintainability of Roof System.
   6. Differential movement.
   7. Historical Requirements.
   8. Visibility from Adjacent Facilities/Aesthetics.
D. Specified roof systems shall carry a manufacturer's 20-year warranty.
E. Roof systems shall be designed to protect the roof from chemicals, grease, and other contaminants that are detrimental to the life of the roof.

II. Design Review Submittal Requirements

A. Refer to Section C in the UTSW Design Guidelines.

III. Section 07 10 00 Damp Proofing and Waterproofing

A. Use of damp proofing and waterproofing systems from a single manufacturer in lieu of components from multiple manufacturers are required.
B. For each project with elevator pits as part of project scope, either new construction or elevator renovation, confirm the waterproofing of pit is acceptable. Include remediation discussions with UTSW FM if waterproofing has failed.

IV. Section 07 18 00 Traffic Coatings

A. The use of traffic coatings on campus shall consider long-term maintenance requirements including reapplication as part of the overall analysis. Any installation shall follow best practices including priming and sealing per manufacturer's recommendations.

V. Section 07 21 00 Thermal Insulation

A. Maximize insulation value of the building envelope to conserve energy and incorporate an air barrier. Do not provide insulation materials containing formaldehyde. Consider insulation types with recycled content.
B. Non-combustible or Factory Mutual Approved insulation is recommended in place of foam-based products (polyurethane, polystyrene, etc.), and is especially important in unprotected, concealed spaces, such as attics and crawl spaces, or in hollow-core walls that will be penetrated by electrically rated equipment.
C. Performance requirements coordinated with specifications.

VI. Section 07 25 00 Weather Barriers

A. Use of weather barrier systems from a single manufacturer in lieu of components from multiple manufacturers is required.

VII. Section 07 42 00 Wall Panels

A. Wall panels shall be a system from a single manufacturer.

VIII. Section 07 50 00 Membrane Roofing

A. UTSW requires Nuclear Scanning, Core Sampling, and Thermal Imaging to ensure roofing systems are installed correctly.
B. The roofing system shall be determined by Facilities Management or as indicated in this Division.
C. Roof Components:
    1. Specify service walkways (minimum 24-inches in width) appropriately located to service all roof top equipment from the roof access. Walk-paths and lay-down areas for equipment replacement shall be provided at a minimum.
    2. Carefully detail roof expansion joints and flashing to conform to SMACNA detailing.
    3. Completely detail all parapet walls, caps, coping and scuppers. Top of coping should slope toward roofs.
    4. Detail roof edges sufficiently high to prevent water from spilling over and spotting walls and fascia where roof drains are used.
    5. Provide drips on overhangs, ledges, window stools and coping to prevent discolorations of fascia, soffits, and walls.
    6. Ensure that sealants specified are to be used within their limitations. When pre-cast concrete wall panels are used, ensure proper compatibility between the surface sealant and the concrete panel when caulking a joint.
    7. Flashing materials for permanent type buildings to be aluminum, stainless, or copper (not galvanized metal).

D. Slope roof adequately to drain (minimum 1/4-inch/foot. slope).
   1. Design primary roof slopes for new buildings into the structural frame and not by roof insulation.
   2. Crickets to roof drains may be sloped with insulation.
   3. All roofs shall be designed with sufficient slope or camber to assure adequate drainage after long-time deflection from dead load or shall be designed to support maximum loads including possible ponding due to deflection.

E. Lightweight concrete insulating fill roof decks will not be used in conjunction with urethane roof system. Lightweight structural concrete is allowed.

IX. Section 07 60 00 Flashing and Sheet Metal

A. Provide complete flashing and trim details for all thermal and moisture protection systems to include assemblies, system transitions, and termination points.

X. Section 07 70 00 Roof and Wall Specialties and Accessories

A. All roof areas shall be designed with safe access such as ladders or hatches in initial designs. Rappelling shall not be utilized for normal maintenance or service of a roof area or roof-mounted equipment.

B. Walkways shall be provided for roof-mounted machinery so that equipment may be serviced without traffic directly on the roof surface.

C. Roof-mounted equipment shall be accessible by a stair or ladder.
   1. Hatches without stairs or requirements for use of external ladders are not acceptable.

D. Roof mounted conduit and piping shall be minimized wherever possible to prevent tripping hazards as well as maintenance difficulties.
   1. Where other structural elements are present, such as AHU framing, run conduits overhead instead of along the roof surface.

XI. Section 07 80 00 Fire and Smoke Protection

A. Fire and smoke protection components shall be in compliance with UTSW code requirements and the AHJ.
   1. Joint commission projects do not allow scab patches. Repairs shall comply with regulatory requirements.

B. Refer to Division 27 for all penetration fire stopping requirements for communications and its associated components.

C. Suggested fire stopping and penetration fire stopping elements shall match UTSW preferences as much as possible. This preference includes solutions that minimize long-term maintenance while allowing for modifications.
   1. UTSW preference for non-communications cables is the use of a pre-formed firestop sleeve.

XII. Section 07 90 00 Joint Protection

A. Joint protection shall be chosen to ensure protection from the passage of air, water and other elements and be compatible with surface and material conditions.
B. Interior sealants shall be easily cleaned and decontaminated.

XIII. Section 07 95 00 Expansion Control

A. Expansion joints shall be indicated on drawings for interior and exterior conditions at vertical and horizontal locations.
    1. Expansion joint covers shall be sized to meet the differentials as determined by the structural engineer.
    2. Exterior locations shall be designed to maintain a waterproof envelope using appropriate materials to interface with envelope construction.
    3. Interior expansion joint covers shall be easily cleaned and provide hygienic surfaces.
    4. Floor Expansion Control:
        a. All expansion joints at the floor shall comply with ADA and TAS.
        b. Recessed assemblies that provide a smooth or no-bump installation are preferred in new construction.
        c. Expansion joint covers in floors shall be determined according to project specific needs including providing a clean aesthetic, minimizing maintenance, preventing safety hazards, providing a minimal height difference, and minimizing loud sounds from cart movement.
        d. Location of expansion joints shall minimize the number of times these cross areas of traffic, such as hallways.
B. Expansion joint cover assemblies shall include appropriate insulation and/or fire protective insulation to meet code requirements.

End of Division 7

DOCUMENT HISTORY

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06/19/2020	June 19, 2020 Print	MDR
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DESIGN CRITERIA
DIVISION 8 OPENINGS

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DIVISION 08 00 00 – OPENINGS

I. General Information

A. Building fenestration shall comply with Texas State Energy Conservation Office (SECO) code, ASHRAE 90.1, including assembly U values, assembly Solar Heat Gain Coefficient (SHGC), and percentage of glass. Refer to Section B for current edition.

B. A/E shall design openings to minimize long-term maintenance, assuring long-term operability of doors, windows, and frames.
   1. A method to clean all exterior glazing must be incorporated into the project. Verify method with Project Manager.
   2. Ensure that windows, doors, and louvers are designed for adequate wind loading and velocity pressures per International Building Code (IBC) and Texas Windstorm requirements as applicable.
   3. Wind loads and air pressure issues, including site wind pressures, shall be reviewed, and utilized in the design of entries, closures, and hardware to ensure that components stand up to site conditions.

C. All general use-building entrances shall have a vestibule sized to apply with applicable code requirements with a design to minimize air pressure differentials.
   1. Doors shall meet opening force maximums as required in current campus Codes and Standards.
   2. UTSW prefers the design of vestibules to having automatic sliders.
   3. In new construction, vestibules shall be located inside the main building envelope with an awning or covering at the exterior door to minimize waterproofing issues.
   4. Vestibules shall have sufficient lighting.

D. Building Entries:
   1. At least one door at primary building entrances shall be power operated with a visible and easily accessible automatic door operator.
   2. Primary entrances shall be designated through the UTSW PM and shall comply with TAS, ADA, and building code requirements.
   3. Provide visible safety indicators or cross mullions at locations with full height glazing at entries or along corridors. Refer to Section 08 80 00 “Glazing” for additional information.

E. Refer to Design Guideline Section A3 Clinical Design Requirements for Clinical entry requirements.

F. Daylighting in the building design is strongly encouraged.
   1. The use of skylights is only allowed with written approval by the Facilities Management Department or as required per code.
   2. Use of protected clerestory glazing is allowed.

G. Specialty Doors and Entries:
   1. Doors to spaces with magnetic resonance equipment shall be electromagnetically shielded and swing outward to allow operability in case of overpressure.

2. Spaces with radiation-emitting equipment may require radiation shielded doors to be approved by qualified medical physicist.

H. Refer to UTSW Design Guideline A2, Section 08 71 00 “Door Hardware” for ARC requirements.

II. Design Review Submittal Requirements

A. Refer to Section C in the UTSW Design Guidelines.

III. Section 08 10 00 Doors and Frames

A. UTSW preference is for entries to provide easy access for patients and staff with varying health and mobility issues.
   1. No locks shall be located at floor level or outside the accessible reach ranges per ADA and TAS.
   2. Design issues to be considered in design of doors shall include usage groups, traffic amounts, traffic types, automatic entry considerations, security considerations, finish, door weight, and long-term maintenance.

B. UTSW preference is to design the building around standard height and width doors and openings.
   1. Exterior and interior personnel doors shall not be taller than 7 feet high unless approved by the UTSW FM and UTSW PM.

C. Design of Door Layouts:
   1. Doors swinging into hallways is not preferred.
   2. Doors may be sliding or swinging, as appropriate to the building use and design, with safeguards and handicapped accessibility as necessary.
   3. One-way or two-way door types may be used, depending upon traffic.

D. Doors:
   1. All doors shall accept standard UTSW door hardware.
   2. Door types, materials, hardware, and sensors shall be established designs with proven field experience under similar usage.
      a. Consideration shall be given to local availability of trained service technicians and spare parts.
   3. Interior swinging doors are preferred to be wood, stainless steel, or metal depending on best type for the conditions.
   4. Patient room and corridor pathway doors including patient toilet room doors shall be a minimum of 42-inch wide by 84-inch tall.
   5. Laboratory spaces shall include at least one door that provides a 42-inch wide by 84-inch-tall door for the movement of equipment.
   6. All UL rated doors and frames shall be permanently identified with the UL assembly number, fire-resistance rating in hours and maximum temperature rise.
      a. UL information shall not be painted over, obscured, or removed.

E. Door Frames:
   1. One or more entrance doors may require card reader access. The door frames shall be prepared as a part of the design and construction of the building.
   2. Door frames shall be fully welded; knock-down frames are not allowed.

F. Restrooms:
   1. Restroom entrances, doors, and hardware for restrooms in patient areas need to allow easy access for patients with reduced mobility and strength.
      a. All patient restroom openings shall be 42-inch in width.

G. Doorstops: Confirm with user representative, UTSW FM, and UTSW PM the appropriate doorstops for the project.
   1. The use of back check on closers should be considered to lessen the potential of wall damage.
   2. Clinical areas prefer wall-mounted stops with strong in-wall blocking to prevent wall damage or overhead stops.
   3. In non-clinical and non-laboratory areas, floor dome stops are preferred.

H. At a minimum, the following information shall be part of the parametric data associated with door frames and doors:
   1. Room number (Refer to **EXHIBIT A.1 UTSW Room Numbering Standards** in the UTSW Design Guidelines).
   2. Room name.
   3. Frame material.
   4. Frame finish.
   5. Frame gauge.
   6. Door type.
   7. Door material.
   8. Door finish.
   9. Door gauge.
   10. Door swing.
   11. Door hand.
   12. Hardware listed individually not by set.
   13. Threshold.
   14. Fire rating and UL listing.
   15. Power requirement.

IV. Section 08 11 13 Hollow Metal Doors and Frames

A. Exterior doors shall be “Extra Heavy Duty” with interior doors as “Heavy Duty” unless otherwise directed.

B. Doors shall have hardware reinforcements for hinges, closures, locks, and exit devise at a minimum.

V. Section 08 11 14 Interior Hollow Metal Doors

A. Doors shall have hardware reinforcements for hinges, closures, locks, and exit devise at a minimum.
B. For ARC special requirements, refer to UTSW Design Guideline Section A2 and UTSW Master Specifications.

VI. Section 08 14 16 Flush Wood Doors

A. Interior wood doors shall be at least 1-3/4-inch thick to accommodate hardware and locks.
B. Interior wood doors are generally flush type, solid core, hardwood with lifetime warranty. The campus standard is typically plain sliced red oak.
    1. Renovation projects may require matching existing conditions such as other wood grains and plastic laminate. UTSW Design Team shall approve all proposed A/E selections.
C. Exotic wood veneers are prohibited.

VII. Section 08 30 00 Specialty Doors and Frames

A. High-speed doors (8 feet per second) are not preferred since they do not hold up overtime and require extensive maintenance.

VIII. Section 08 31 13 Access Doors and Frames

A. Access doors shall be provided for fire-related partitions, wet conditions and standard wall partition types as needed to efficiently maintain building services.
    1. All panels shall be designed and installed in a manner to allow for panel removal and reinstallation without damaging components of the system.
    2. Access panels shall be located and sized to provide access to equipment and fixtures above the ceiling. UTSW preference is a minimum of 2- by 2-foot but not greater than 4- by 4-foot. Smaller sizes must be approved by UTSW FM.
    3. UTSW preference is for access panels to have latching mechanisms in lieu of screws to secure panels except where greater security or control is needed.
    4. Panels shall be labeled.
    5. Any pressurized spaces shall have fully gasketed access doors with hold-down clips to compress the gasket.
B. Stainless steel or painted metal access doors and frames shall be provided at laboratory and ARC locations. Wet conditions shall utilize stainless steel.

IX. Section 08 33 23 Overhead Coiling Doors and Grilles

A. Design of dock area openings shall provide adequate clearance for delivery and semi-trucks expected to enter the building envelope.
   1. Doors with high frequency use shall have electric operation with manual override and safety sensors.

B. Coiling overhead doors shall be steel construction for vehicle access and all components shall be fully integrated and/or welded to building steel structural system.

C. Vehicle Door Types:
   1. UTSW preference for vehicle entrance areas that are locked down after hours and require badge access is a medium speed door (4 foot per second). These locations may require badge access or ground loop activation for entry/exit.
   2. Vehicle entrances that are left open during standard business hours are preferred to be standard speed overhead doors.

D. Mount electric disconnects and operators accessible from the floor level to avoid use of a ladder and to maintain operator safety.

E. Dock doors shall have mechanically activated air curtains.

X. Section 08 34 00 Special Function Doors

A. UTSW preference in clinical spaces is the use of interior aluminum-framed top-hung sliding doors when sliding or barn doors are desired. Refer to specification Section 08 34 00 “Special Function Doors.”

B. Refer to specification section for directional signage or indicators to be provided.

XI. Section 08 40 00 Entrances, Storefronts, and Curtainwalls

A. Select aluminum entrances, storefronts, and curtainwalls to meet project requirements and finishes to meet campus standard. Wherever possible utilize storefront systems instead of curtainwall systems.
   1. UTSW preference is to consider the following during selection of systems: life safety, durability, serviceability, finish, thermal consideration, and accessibility.
   2. Door locksets shall be located within TAS and ADA accessible reach ranges. **Locks are not permitted at floor levels.**

B. Exterior:
   1. Curtain walls shall be designed using a delegated-design submittal by a qualified professional structural engineer.
   2. Main exterior entrances for patient areas are preferred to be automatic aluminum sliding doors.
   3. Metal framed glazed entrance assemblies shall have stiles of sufficient width and structural support to receive locksets and/or panic hardware.
      a. Sliding and folding glass doors shall be top hung, thermally broken with insulating glazing in an aluminum framed folding panel system.

b. Provide visible safety indicators or cross mullions at locations with full height glazing at entries or along corridors. Refer to Section 08 80 00 ”Glazing” for additional information.

C. Interior:
1. Usage of storefront or aluminum frames within clinical or research areas shall not preclude achievement of minimum acoustical and/or privacy requirements. Refer to Section B – Acoustical Design in the UTSW Design Guidelines.
2. Swinging doors are preferred for offices, meeting rooms, and other spaces requiring acoustic controls. Refer to UTSW Space Design Guidelines for office spaces and the Private Office Storefront System.
3. Provide visible safety indicators or cross mullions at locations with full height glazing at entries or along corridors. Refer to Section 08 80 00 “Glazing” for additional information.

D. Doors, Mullions and Rails:
1. Bottom rail shall be a minimum of 10-inches, complying with TAS requirements, and top rail shall be a minimum of 6-inches.
2. Custom styled doors with vision panels may be used.
3. Specifications shall include steel reinforcing inserts in the hinge jamb section of doors in aluminum storefront systems.

E. Frameless Systems:
1. UTSW preferences for frameless glass doors and entrances:
a. Locations include Suite entrances but not acceptable for office, conference room, or huddle room locations.
b. Doors to have full bottom rails.
c. Locks to be located on handles with top locking/latching bolt. Center patch may be considered with sign-off by UTSW FM. In-floor locking bolts not allowed.
d. Closers shall be top, top concealed, or floor concealed types.
e. Acoustical properties of system proposed by A/E shall be discussed with UTSW User to ensure the system will meet User needs and expectations.
f. Provide visible safety indicators or cross mullions at locations with full height glazing at entries or along corridors. Refer to Section 08 80 00 “Glazing” for additional information.

XII. Section 08 50 00 Windows

A. Design windows with maintenance, waterproofing, and pest control in mind and include provisions for cleaning windows above third floor level.

B. Heads, jambs, and sills of windows in walls shall be flashed and shall be caulked or sealed during the window installation, prior to the placement of snap-on moldings or covers, to ensure that concealed surfaces are properly sealed against the penetration of wind and water.
1. Flashing shall include pre-molded end dams.
2. All windows should have drips at heads and sills.

C. Projected and casement type windows, and flush mounted windows are difficult to maintain watertight and their use is discouraged.

XIII. Section 08 71 00 Door Hardware

A. The hardware schedule shall be included in the project specifications.

B. Architect/Engineer shall verify hardware specifications with UTSW Key Control and Building Maintenance Team during each project design phase. Building Maintenance participants shall be confirmed through Assistant Director of Building Maintenance per project but could include Construction and Maintenance Shop, Clinical Facilities Team, and others as identified.
   1. A/E shall request approval in writing for hardware prior to issue for construction documentation.
   2. The finish of door hardware shall comply with specifications as approved by UTSW Key Control.
   3. Do not specify pivot hinges, concealed closers, concealed rods, concealed pulls, offset door pulls, offset door hinges or pivot doors.

C. Hardware shall provide openings that comply with codes as noted in Section B in the UTSW Design Guidelines, including Texas Accessibility Standard (TAS) .

D. Locks and Keys:
   1. Mortise locks shall not be used on any new installations.
   2. Any existing mortise locks in a project that must be maintained shall provide Sargent or Best per the specifications.
   3. Hardware for furniture, casework, millwork and other shall provide single bitted keys and non-restricted keyways for all locks.

E. Exterior:
   1. A minimum of one pair of exterior double doors per building shall have a keyed, removable mullion for equipment access.
   2. Use of thresholds and weather stripping at all exterior doors is required to prevent air, water and pest infiltration while complying with accessibility requirements.
   3. All entrance doors and frames shall be hinge and strike reinforced for “High Frequency” use.

F. Door Protection:
   1. All protective plates shall be attached to doors with countersunk screws and shall comply with the requirements of TAS 404.2.10 regardless of type or height of protective plate on the push sides of doors.
   2. Areas with high cart traffic shall have armor plates up to 48-inches high, continuous across the width of door surface.
      a. A/E shall discuss the potential for power-assist doors located in high cart areas, to prevent damage to panic hardware.
   3. All doors having closers shall be protected from the wear of wheelchairs with a minimum of 10-inch high, smooth finish, kick plates, continuous across width of door surface.

4. Edge guards are preferred to be U-shaped.
5. Mop plates shall be located on doors facing hard-surfaced floors where mopping will occur.

G. Barn door type hardware shall be recommended only after thorough review of specific hardware components for usability, safety, and longevity. Hardware sets shall be adequate for frequent and long term use due to panel weight and fastener failure.

H. Electronic Access:
1. Doors, where electronic access is required and magnetic locks are going to be used, shall include an internal signal switch to break lock power.
2. Only Sargent 88 series or Von Duprin QUE-99 series electric panics are acceptable wherever electric panics are specified.

I. Acoustics:
1. Door seal kits shall be specified for door assemblies installed in clinical areas to achieve the required STC. Refer to Section B, **Figure B.3 – Room Adjacency and Sound Transmission Class STC Minimums,** of Design Guidelines for clinical settings.
2. Doors to MEP or equipment spaces shall provide the required acoustical seals and elements to prevent sound transmission into adjacent spaces.

J. Key Control Cabinets:
1. Provide Key Control Cabinets as indicated by UTSW FM and Access Control.
2. Special requirements for security and access shall be discussed with User Representatives and UTSW FM. Pharmacy locations and other spaces, as identified, will have independent cabinets due to licensing requirements.

XIV. Section 08 71 13 Automatic Door Operators

A. Automatic openers may be located at restrooms and in clinical areas. Other locations shall be reviewed with UTSW PM.

B. Doors with automatic closures shall have electrified trim or electrified strike.

XV. Section 08 80 00 Glazing

A. Provide visible safety indicators or cross mullions across all full height glazing at entries and adjacent to circulation.
1. Meet requirements of "Model Safety Glazing Code" and "Consumer Product Safety Commission."
2. Visible safety indicators using glazing film shall start with the lowest point at 36 inches, plus or minus three inches, and the highest point at 58 inches, plus or minus three inches.
3. The contrast from the film shall make the glazing location apparent from the background as well as from both sides of the panel in all lighting conditions.
4. The film shall not provide light transmission greater than 85 percent. Refer to approved film in UTSW Specification Section 08 80 00 “Glazing,” within the Decorative Plastic Film article.

5. If the Project A/E proposes a design pattern, this must be approved by the UTSW PM and, where required, the IDBC.
    a. Any repeated patterns, signs, or graphics shall not have portions shorter than 6 inches in height.
    b. Bands or lines may not be shorter than 2-inches in height.

B. High performance glazing is strongly encouraged with a tint to match surrounding buildings.
1. Highly reflective (mirror) glass and dark tinted glass are not allowed.
2. Choice of glazing systems and components shall meet project requirements which include durability, architectural appearance, serviceability, and insulating R-values.
3. Glazing tint shall be approved by UTSW.

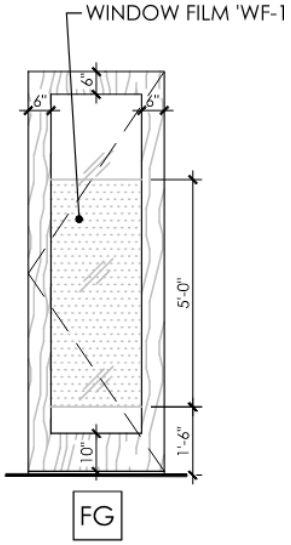
C. Design of glazing shall indicate IBC required locations for safety glazing, including but not limited to glazing in doors, adjacent to doors, in windows, etc.

D. Partial shading of insulating glass can cause stress breakage. Manufacturers consider this a design error and will not replace glass broken by temperature differential stresses. Avoid partial shading of large panes.

E. Warranty Requirements:
1. Provide manufacturer's written guarantee that for ten (10) years from date of Substantial Completion a replacement will be provided for any insulated glass unit which develops edge separation or other defects which materially obstruct vision through the glass or safety or affects the insulating qualities. Guarantee shall not cover glass breakage from physical abuse, storm, or similar causes.
2. Unit sizes shall comply with manufacturer warranty requirements. All design shall comply with IBC requirements.

F. Glazing Film:
1. Confirm current basis of design film and manufacturer in UTSW master specifications, within Section 08 80 00 "Glazing."
2. Film heights for standard privacy in office, education, and other types as indicated in image below:

Figure 8.1-1 – Standard Film Design: Example of a wood door with glass panel, showing typical location and elevations.



SOLID CORE,
FLUSH PANEL WOOD
SINGLE DOOR W/
CLEAR GLASS INSET

XVI. Section 08 90 00 Louvers and Vents

A. Steel or aluminum louvers and vents shall provide required air performance as determined by A/E team. Components shall be considered for durability, architectural appearance, serviceability and insulating R-values.

B. Insect and/or bird screens shall be indicated as needed and shall comply with The International Mechanical Code.

C. Design consideration shall be given to draining any water out of the installation including drain pans.

End of Division 8

DOCUMENT HISTORY

Issue Date	Description	Editor
06/19/2020	June 19, 2020 Print	EV
03/25/2022	Section 08 00 00 General Information, Opening widths, 08 10 00 Doors and Frames, Section 08 34 00 Special Function Doors, Section 08 33 00 Coiling Doors and Grilles, 08 40 00 Folding Glass Doors, Section 08 70 00 Hardware	MR
10/03/2022	Q3 2022 Update	EV
06/26/2023	Q2 2023 Update	EV
12/15/2023	Q4 2023 Update	EV
06/13/2024	Q2 2024 Update	EV
12/20/2024	Q4 2024 Update	EV
06/27/2025	Q2 2025 Update	EV
12/18/2025	Q4 2025 Update	EV

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DESIGN CRITERIA
DIVISION 9 FINISHES

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DIVISION 09 00 00 – FINISHES

I. General Information

A. Design reviews by the UTSW PM and UTSW Design Team are required for finish selections.
   1. All specified materials must have a demonstrated history in a similar institutional setting for at least five years while complying with jurisdiction, code, licensing, and regulatory requirements as well as best practices.
   2. Refer to Section A, Design Philosophy for "Environmental Practices" including recommendations for sustainable products and VOC requirements in the UTSW Design Guidelines and specification Section 01 81 13 "Sustainable Design Requirements."

B. Considerations of standard UTSW cleaning methodology and maintenance shall be made with all product recommendations as well as considering safety and infection prevention. This information shall be confirmed with users for each project.
   1. Materials shall not require routine sealing or other significant specialized maintenance for general upkeep.
   2. **Avoid custom-designed colors and finish materials.**

C. Flooring:
   1. All flooring surfaces must provide slip resistance at wet and dry conditions of 0.5 or better with tribometer testing. OSBC is to be contacted to confirm requirements for coefficient of friction for sidewalks, pavements including broom finish levels, and flooring surfaces.
      a. Flooring products that require waxing are not preferred as they decrease the slip resistance of the product.
   2. Flooring shall be extended under equipment and casework to be wall-to-wall. Where spaces have hose stations, the floor shall slope to drains at a minimum of 1-percent. Greater slopes shall be considered at large animal holding areas but cannot create unsafe conditions. In all cases, floor slopes and threshold conditions shall be coordinated to prevent uneven conditions.
   3. Special consideration should be given to the design of floors in areas with high temperatures and steam, such as cage wash spaces, to prevent thermal shock and damage at drain locations.

D. Flooring transitions shall be designed with minimal profiles for compliance with current codes, ADA, and TAS.
   1. Patient rooms with toilet rooms shall have smooth flooring transitions without lip or raised strips.
   2. The transitions strips shall prevent trip hazards, protect the ends of flooring surfaces, and minimize maintenance repairs while providing a long service life.
   3. Materials used shall hold up to the anticipated mechanical and/or chemical stresses expected at each location.
   4. Material transitions at doors shall be located underneath the door panel, in closed position.

E. For expansion joint control, refer to Section 07 95 00 “Expansion Control” in the UTSW Design Guidelines.

II. Design Review Submittal Requirements

A. Refer to Section C in the UTSW Design Guidelines.
B. Drawings shall clearly identify partition types to show required fire ratings, acoustic levels, and other specialty board types.
   1. UL designs for fire resistance ratings shall be indicated for all partition, floor, and ceiling constructions as well as appropriate joint designs.
C. Drawings shall include details for items such as corner guards, specialty trims and reveals, showing coordination with other elements such as base, expansion joints, soffits, etc. to prevent gaps and holes.

III. Section 09 22 16 Non-Structural Metal Framing

A. Refer to UTSW Master Specification Section 09 22 16 “Non-Structural Metal Framing” under “Performance Requirements” for minimum gauges, sizes, and spacing.
   1. Partition thickness and construction shall be additionally determined using acoustical requirements, as noted in Section B, Codes and Standards in “Acoustical Design” in the UTSW Design Guidelines.
   2. Minimum thickness of furring strips shall be 1-1/2-inch to allow for electrical devices.
   3. Furring on columns may be 7/8-inch thickness on two sides with alternate sides providing 1-1/2-inch thickness.
B. UTSW preference is to use metal for blocking in lieu of wood. A/E shall confirm and document mounting heights of blocking required for each project.
   1. Refer to Section 09 22 16 “Non-Structural Metal Framing” for “Flat Strap and Backing Plate.”
   2. Typical lab blocking to consider is the use of 4-inch wide, 1/16-inch minimum gauge sheet metal straps. Top of strap heights include 6-inch, 12-inch, 30-inch, 36-inch, 66-inch, and 90-inch.
   3. Steel blocking shall be 18-gauge minimum in areas with partition-mounted items or where they may be expected in the future.
   4. Blocking shall be located wherever wall-mounted equipment or casework is expected including tracks for medical equipment.
   5. Wall blocking for toilet areas shall address potentiality of patients of size and provide additional blocking capacities for grab bars.
   6. Provide blocking behind locations for any wall-mounted doorstop.
C. Lateral bracing shall follow ASTM C754, Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products with bracing and reinforcing designed to support wall-mounted objects.

IV. Section 09 24 22 Gypsum Plaster Repair / Section 09 24 23 Portland Cement Plaster / Section 09 24 24 Cement Plaster Repair

A. Use of plaster in new wall assemblies is prohibited.
   1. FM capital projects involving any existing plaster assemblies shall be discussed with UTSW PM if existing plaster is a component of the project.
   2. This includes the use in exterior conditions for soffits, planters, and wall surfaces.

V. Section 09 29 00 Gypsum Board

A. Reference NFPA 101 and Specification Section 09 29 00 “Gypsum Board” for required “Partition Identification” labels and locations as well as requirements for construction, fire-resistance ratings, and fire protection of existing and new fire-rated walls, partitions, compartments, assemblies, and smoke partition assemblies.
   1. Joint commission projects do not allow scab patches.
   2. Renovation and remodel projects shall include revisions to existing partition identification when the wall conditions are modified.
   3. Renovation and remodel projects shall include partition identification be added where missing and as indicated by OSBC.

B. Wallboard Types:
   1. Type-X, fire-resistant, gypsum board shall be used at any locations requiring greater than 1/2-inch thickness.
   2. Use cement backer board for tile and wet installations.
   3. Refer to UTSW Design Guideline Section A2 for ARC special requirements.
   4. Abuse resistant panels to be used in high traffic areas as confirmed by UTSW PM.

C. Wallboard Finish Levels:
   1. Level of finish on walls in public areas shall be level 4 as standard.
   2. Level 5 finish is recommended for public areas with a significant amount of natural light, dark paint or paints with sheen or gloss, and walls that receive graphics.
      a. A/E shall document level 5 and specialty finish locations in finish schedules at each drawing issuance.
   3. Refer to the Gypsum Associations’ GA-210-10e “Recommended Levels of Gypsum Board Finish” document for guidelines for non-public and service areas.

D. Wall Textures:
   1. Walls in public areas shall have a light texture applied only after sample/mock-up approval from A/E.

E. Refer to Section B, Codes and Standards the “Acoustical Design” in the UTSW Design Guidelines for required acoustic Sound Transmission Class (STC) ratings.
   1. Where walls intersect with mullions, sound barrier mullion cap products, to isolate sound, are preferred solutions. STC rating of product shall match requirements of wall.

VI. Section 09 30 00 Tiling

A. Restroom wall finish shall be tile at wet walls and adjacent walls to at least 6-foot aff.
   1. Tile pattern shall consist of whole tiles with a minimum of 12-inches painted gypsum board remaining below the ceiling.
   2. Porcelain and ceramic tiles are acceptable with approval by UTSW Design Team.
   3. In toilet rooms, tiles shall be sized at least 12- by 12-inches in size but not greater than 12- by 24-inches.
   4. In existing toilet rooms, matching existing conditions may not be applicable. A/E to discuss with UTSW Design Team to confirm building standards and best solutions.

B. Accessories: A/E shall identify metal trim and edging profiles in the finish schedule.

C. Grout:
   1. For tile installations on floors and walls in restrooms of healthcare and heavy use spaces, utilize water-cleanable epoxy grout complying with ANSI A118.3.
      a. Design considerations in these spaces include infection prevention, chemical resistance, stain resistance, color consistency, lower maintenance requirements, and durability.
   2. For other restrooms that are not heavily trafficked or not utilized by patients, the cost of epoxy grout may not be feasible. In such cases, a polymer-modified grout complying with ANSI A118.7 shall be utilized. The design considerations include better stain resistance, lower maintenance, and durability.
   3. If tile is utilized in food service areas, the grout shall be epoxy grout complying with ANSI A118.5 with higher chemical and temperature resistance.
   4. All new tile installations shall be sealed according to the manufacturer's recommendations if required.
   5. Grout colors to be approved by the UTSW Design Team.

VII. Section 09 50 00 Ceiling

A. Acoustical ceiling tiles products are recommended to be two-foot square or two-foot by four-foot with the exception of feature areas. Panels that are large, unique, or difficult to lift cause long-term maintenance issues for UTSW and are not preferred but would be considered for feature areas.
   1. Grids shall be laid out symmetrically.
   2. Suspended ceilings shall be supported by the building structure. Hangers shall be located to completely support light fixtures while not interfering with HVAC maintenance areas.
   3. Lay-in ceiling systems in exterior locations or near entries shall use stainless steel hanger wires and hold-down clips. Areas near entries, in vestibules and other spaces that experience pressure differentials shall have hold-down clips installed.

B. All ceilings shall be designed to be easily accessible for above ceiling maintenance and other access requirements, such as future installations. Additionally, the size and layout shall be considered for longevity to minimize sagging as well as other typical maintenance issues.
   1. Follow industry standard to ensure STC and NRC ratings as required per space.
   2. Lighting design in restrooms shall allow for easy maintenance for repair and replacement of fixtures.
   3. Ceiling tiles with heavy textures are not preferred, as they are difficult to maintain over time.

C. Refer to Design Guideline Section A3 Clinical Design Requirements for Clinical requirements.

D. Restroom ceilings are required to be gypsum board with access panels located for maintenance.

E. Food service areas to have cleanable ceiling tiles in standard sizes.

F. Acoustical Fabric-Faced Panel Ceilings and Acoustical Wood Ceilings are approved products, where applicable.

VIII. Section 09 60 00 Flooring

A. All flooring shall comply with requirements for moisture vapor emissions in concrete and be installed per manufacturer's recommendations.

B. Building entry doors shall have walk-off areas protected from weather. This can include surface walk-off carpet or owner provided walk-off mats. A/E to review entry suggestions with UTSW Design Team.

C. Space Requirements:
   1. Elevator cabs shall be designed with low-maintenance resilient flooring.
   2. Laboratories are required to use chemical resistant flooring. The thickness of seamless floors shall be 1/8-inches or 3 mm minimum in general.
   3. Spaces with large equipment and heavy traffic shall be resinous flooring to meet project requirements.
   4. Non-animal laboratory spaces shall have non-waxed, low-maintenance flooring in lieu of VCT.
   5. For ARC requirements, refer to UTSW Design Guideline Section A2.

D. Prohibited Materials:
   1. New masonry flooring is not permitted as it has significant maintenance requirements.
   2. Bamboo or cork flooring materials are not permitted by UTSW.
   3. Real wood is not permitted by UTSW.

E. Typical base types used on campus include rubber base, stainless steel base or other coved bases dependent on flooring. All vertical surfaces that intersect with a floor shall have a base applied including concrete columns.

IX. Section 09 65 00 Resilient Flooring

A. Resilient sheet and tile flooring are commonly used on campus.
B. Refer to Design Guidelines Section A3 Clinical Design Requirements.
C. Static-dissipative resilient flooring shall be used in IR closets or other spaces where static control is required.
D. Rubber and resilient base are typically used across campus. All vertical surfaces that intersect with a floor shall have a base applied.
E. Any resilient flooring used in food service areas shall be highly durable to stand up to the high temperatures, chemicals, and heavy traffic of these spaces.
F. Flooring that requires coatings or additional processes to achieve a final wear surface shall be specified with all required procedures and materials to provide the finished surface.

X. Section 09 66 23 Terrazzo Flooring

A. Terrazzo flooring shall have all metal edging.
    1. Plastic edging or divider strips are not permitted.
B. Control joints shall have backer rods to match the color of the flooring around it.

XI. Section 09 67 23 Resinous Flooring

A. Resinous flooring shall be used where seamless floors are required to hold up to traffic, maintenance, infection prevention, and provide chemical resistance. All installation shall follow the manufacturer's guidelines to assure warranty, including moisture vapor emission control testing and remediation if required.
B. Resinous Flooring shall be anti-microbial, chemical resistant, puncture resistant, slip resistant, and thermal shock resistant.
C. All products shall be approved by UTSW Design Team and UTSW PM.
D. Spaces with resinous flooring includes ARC spaces, laboratories, equipment galleys, operating rooms, and spaces with needs for infection prevention control.

XII. Section 09 68 00 Carpeting

A. Tile and Broadloom carpeting are utilized at UTSW in areas approved for carpet such as business office areas. Type of carpet and sizes shall be determined by design intent.
    1. UTSW preference is for 24- by 24-inch modular ashlar pattern, which provides an easy replacement for maintenance staff.
    2. Use of broadloom carpet shall be used sparingly and to be approved by the UTSW Design Team.
    3. Carpet shall not be used in food service office areas.
B. Carpet can be easily contaminated with infectious materials present in blood and bodily fluid. It can also harbor dust, debris, insects, and fungal spores. In such cases, these

products cannot be effectively decontaminated to inactivate viable microorganisms present in infectious materials or be adequately cleaned to remove stains.

C. Carpet shall not be used in the following spaces:
   1. Exam Rooms.
   2. Procedure Rooms.
   3. Lab Rooms and Spaces.
   4. Dirty and Clean Utility Rooms.
   5. Storage Rooms (for patient supplies).
   6. Soiled utility rooms or other types of waste storage rooms.
   7. Hallways within clinical space that connect patient care areas.
   8. Wellness rooms (nursing mother's rooms).

D. Waiting rooms should avoid carpet if the clinical staff express concerns over cleanability or infection control. In waiting rooms, carpet will be considered in limited use with approval from the IDBC.

E. In clinical areas, carpet may be used in private offices and approved patient areas such as therapeutic counseling rooms.

F. Questions about the appropriateness of carpet for a particular usage shall be directed to Infection Prevention, Facilities / UTSW Design Team, and Office of Safety & Business Continuity.

G. Products shall have proven success in similar installations and UTSW prefers a minimum 10-year manufacturer's warranty and stain-resistant products.

XIII. Section 09 70 00 Wall Finishes

A. Wall finishes shall have proven track record in similar installations for longevity, appearance, and ease of maintenance.
   1. Venetian plaster and similar finishes are not permitted.

B. No porous products shall be installed that would cause infection control, maintenance concerns, or other health issues.

C. Products used shall comply with all Life Safety, Health Code Regulations, and Building Codes requirements for wall installations.

D. Wall finishes in food service areas shall consider durability as well as aesthetics between back and front of house areas.

XIV. Section 09 72 00 Wall Coverings

A. Wall covering selections should be able to withstand heavy duty, commercial grade traffic.
   1. UTSW requires Type II or III minimum.

B. Wall and corner protection must be provided in public areas and any areas where carts, gurneys, or wheelchairs shall be regularly used.
   1. Additional protection shall be determined and documented per project requirements.

C. Medium density fiberboard (MDF) is not permitted as a wall finish.

XV. Section 09 73 00 Wall Carpeting

A. Wall carpeting used as acoustic wall treatments may be utilized as required for project requirements. All products and finishes shall be approved by UTSW Design Team with consideration for infection control and potential future space reallocation.
B. Acoustic wall coverings such as wall carpet complying with ASTM E84 as Class A or Class 1 may be considered.

XVI. Section 09 90 00 Painting and Coating

A. UTSW preference is for finishes to have no volatile organic compounds (VOC). Where the required finish is not available without VOC content, a low VOC product shall be used. Air quality shall be of prime importance especially in occupied spaces and those near healthcare areas.
B. CMU surfaces minimum finish shall have block filler applied according to manufacturer's recommendations.
C. Any temporary coatings shall be removed according to manufacturer's instructions with new finishes applied with specified primers and surface preparation.
D. Repainting of existing spaces shall include jobsite inspection and evaluation of the existing surface prior to issuing construction documents. Project documentation shall ensure entire walls, surfaces, planes, etc. have a consistent surface texture, finish, and clean aesthetic upon completion.

XVII. Section 09 91 13 Exterior Painting

A. Considerations:
    1. Preparation of surfaces is critical to ensure longevity of finish and minimize maintenance between new coating applications.
    2. Coordination shall take place between applications of water repellent sealers or concrete stains and any additional paint finishes ensuring proper adhesion.
    3. All exterior painting products specified shall take into consideration level of traffic, level of exposure, long-term maintenance, aesthetics and expected life span.

XVIII. Section 09 91 23 Interior Painting

A. Paint Sheen:
    1. Wall surfaces in public spaces may be eggshell or satin in finish.
    2. Metal frames, metal trims, doors, and door frames shall be semi-gloss finish.
    3. Private spaces such as offices shall have eggshell finish.
    4. Accent walls shall have satin finish.
    5. Gypsum ceilings shall be flat.
    6. Dark rooms and reading rooms shall have flat paint but, otherwise, flat paints are prohibited at UTSW.
    7. Epoxy paint shall be utilized within restrooms, ARC spaces, and laundry rooms.

XIX. Section 09 96 00 High-Performance Coatings

A. Installation of any abrasion-resistant coatings or other high-performance coatings shall follow or exceed manufacturer recommendations to ensure proper installation.

XX. Section 09 97 00 Special Coatings

A. Dry erase coatings are not preferred on campus, but any application will require a level 5 finish wall.

End of Division 9

DOCUMENT HISTORY

Issue Date	Description	Editor
06/19/2020	June 19, 2020 Print	EV
03/25/2022	Added 09 51 00 Ceiling Tile at Clinical Spaces	MR
10/03/2022	Q3 2022 Update	EV
06/26/2023	Q2 2023 Update	EV
12/15/2023	Q4 2023 Update	EV
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12/20/2024	Q4 2024 Update	EV
06/27/2025	Q2 2025 Update	EV
12/18/2025	Q4 2025 Update	EV

DESIGN CRITERIA
DIVISION 10 SPECIALTIES

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DIVISION 10 00 00 - SPECIALTIES

I. General Information

A. Design reviews by the UTSW PM and UTSW Design Team are required for finish selections.
   1. All specified materials must have a demonstrated history in a similar institutional setting for at least five years.
   2. Refer to Section A, Design Philosophy for "Environmental Practices" including recommendations for sustainable products and VOC requirements in the UTSW Design Guidelines and Section 01 81 13 "Sustainable Design Requirements."

B. Considerations of standard UTSW cleaning methodology and maintenance shall be made with all product recommendations as well as considering safety and infection prevention. This information shall be confirmed with users for each project.

C. Avoid custom-designed colors and finish materials.

II. Design Review Submittal Requirements

A. Refer to Section C in the UTSW Design Guidelines.

III. Section 10 10 00 Information Specialties

A. Installation of all information specialties shall follow the ADA and Texas Accessibility Standards (TAS) .

B. Coordinate requirements for extra materials (attic stock) with UTSW PM.

IV. Section 10 11 00 Visual Display Units

A. Glassboards are the campus standard for wall-mounted writing surfaces. Refer to UTSW master specifications for acceptable manufacturers.
   1. Other types of markerboards and glassboards require approval by the UTSW Design Team.

B. Provide blocking in wall where possible in renovation. Blocking shall be coordinated in new construction.

C. Glassboards shall be wall-mounted using stand-offs.

D. For installations, a marker tray in satin anodized finish is required. Detachable or integrated units are acceptable, but trays shall not be built into the wall.

E. For mobile glassboards, refer to specifications for acceptable manufacturers. Design consideration for use of mobile glassboards shall include ease of transport and storage requirements for mobile units.

V. Section 10 11 23 Tackboards

A. Tackboards are acceptable in spaces where bulletin boards are needed. Refer to UTSW master specifications for acceptable manufacturers.
B. Boards may be frameless or have aluminum frame. All corners shall be eased or have a radius. No sharp edges are allowed.
C. Installation preference is the z-clip type installation to prevent destruction of wall surface from adhesives.
D. Coordinate locations with room signage, donor plaques, artwork, thermostats, life safety elements, and other graphics scheduled to be in the same location.
E. Finishes chosen shall not create infection control issues.

VI. Section 10 12 00 Display Cases

A. Freestanding display cases may be used, refer to UTSW master specifications for acceptable manufacturers.
B. Cases shall be compliant with ADA and TAS.
C. Finishes chosen shall not create infection control issues.

VII. Section 10 13 00 Directories

A. Building Directories shall be provided, A/E to confirm locations such as near elevators and the main entrance(s) of each building.
B. Appearance shall be coordinated with the building signage standards and the UTSW Comprehensive Interior Signage Manual.

VIII. Section 10 14 00 Signs and Graphic Elements

A. UTSW has a standardized signage system for all spaces including room numbering, wayfinding, safety, and other signage needs.
    1. The project A/E is responsible for documenting signage requirements through collaboration with UTSW Sign Shop. The Sign Shop will coordinate with OSBC on required signage to be included during the submittal process.
    2. A/E will provide the signage schedule using the UTSW format in **EXHIBIT C.9 Sign: Schedule Template** and a signage plan with each sign location identified.
        a. Project signage will typically be a Contractor provided item and the UTSW PM will communicate when variation is expected.
    3. Resources:
        a. Guides include the UTSW Comprehensive Interior Signage Manual and UTSW Comprehensive Garage Signage Manual.
        b. Projects located within leased buildings will typically follow the building's standard in public spaces and adhere to the UTSW standards within lease spaces upon confirmation with UTSW PM.

c. Special plaques, memorial information, and donor recognition shall be developed and approved by the Institutional Design and Branding Committee.

B. Signage: Types:
1. Orientation - Includes building directory, floor directory, and maps.
2. Directional – Includes overhead, bulkhead, wall mounted and floor mounted locations.
3. Primary Identification Signs – Includes logos, clinic identification, and other types.
4. Room Identification – Includes room/space types as well as workstation identification.
5. Regulatory and Informational - Stairwell signage, elevator egress, regulatory, and other messaging.
   a. Due to the varied space types required by UTSW, additional regulatory signs may include fire safety, lab safety, biological and chemical safety information, access limitations, MRI and magnet safety, AED locations, Stop the Bleed locations, audiology booth messaging, and others as determined by project requirements. These types and locations will be coordinated by the UTSW Signage Shop with OSBC.
6. Donor Recognition Signage – Locations will be identified by the UTSW Signage Shop.

C. Room Numbering:
1. Room numbering by A/E shall follow the system as seen in Section A, **EXHIBIT A.1 Room Numbering Standard**.
2. Room numbers shall be sent to the UTSW Planning/Masterbooks Team prior to the DD meeting for review and approval.
3. Projects under development shall only have one numbering system, which follows the UTSW system. Coordination with Facilities Management early in the design phase shall be done by the A/E.

IX. Section 10 21 13 Stainless Steel Toilet Compartments

A. UTSW campus standard is for ceiling mounted, stainless steel toilet compartments. Any other types must be approved by UTSW Design Team and the IDB Committee.
1. Mounting hardware shall be stainless steel to prevent rust. Any stainless steel shall be Type 304 minimum.
2. Design of stalls shall provide privacy to occupants with minimal gaps or openings into the units. Refer to Design Guidelines Section A “Design Philosophy” for additional design criteria for restrooms.
3. Urinals shall have wall-mounted privacy panels.
4. Coordinate the location of toilet partitions and floor drains. Avoid locating drains in accessible stalls.

B. Accessories:
1. Latches with color occupancy/privacy indicators are preferred for single use toilet rooms and stalls in clinical or hospital spaces. A/E to confirm per project.
2. All accessible compartments shall provide required handles and other accessories for ADA and TAS compliance.

3. Provide coat hook on back of each toilet partition door. Refer to UTSW master specification for basis-of-design product.
4. Additional coordination shall occur to locate accessories in a manner that will not diminish usability of the stalls.

X. Section 10 21 23 Cubicle Curtain and Track

A. Curtain:
   1. Curtains shall be washable and anti-microbial. Provide a continuous seam where applicable.
   2. Provide a 12- by 12-inch sample for review to UTSW Design Team prior to final approval.
   3. Cubicle curtains shall be 12-inches above the ground with mesh height variable per project.
   4. Shower curtains shall be 1-inch above the ground.

B. Track:
   1. Aluminum track shall have a proven track record in health care environments.
   2. Coordinate track locations with the UTSW PM and user representative. Refer to UTSW Specification 10 21 23 “Cubicle Curtains and Track” for preferred products.

C. Accessories: Discuss additional requirements with users including tiebacks, snaps/connectors, and rehanging tools.

XI. Section 10 22 19 Demountable Partitions

A. Demountable partitions are not preferred on campus. If desired, the A/E must first present a comparison study to the UTSW PM for review and approval including cost implications.

XII. Section 10 22 23.23 Movable Panel Systems

A. For conference or classroom areas, movable panels systems shall be designed with delegated design services of a licensed structural engineer.
B. Panels shall provide indicated acoustical performance per project requirements and have steel welded frame for strength.
C. Considerations to include durability, safe exiting, signage (follow ADA, TAS, NFPA and IBC), ease of operation, pleasant aesthetics, and easy maintenance.
D. Panels and doors shall have sound seals to ensure acoustic performance.
E. Acceptable finishes include vinyl and fabric as confirmed by the UTSW Design Team.

XIII. Section 10 22 39 Folding Panel Partitions

A. Includes Folding Glass-Panel Partitions and Sliding Partitions.
B. All systems shall be designed with the delegated design services of a licensed structural engineer.

C. Panels shall provide indicated acoustical performance per project requirements.
D. Considerations to include durability, safe exiting, signage (follow ADA, TAS, NFPA and IBC), ease of operation, pleasant aesthetics, and easy maintenance.
E. Panels and doors shall have sound seals to ensure acoustic performance as needed for project.
F. Acceptable finishes include glass and aluminum as confirmed by the UTSW Design Team.

XIV. Section 10 25 13 Patient Bed Service Walls

A. Patient bed service walls will delegate design services of a licensed architect, structural engineer, and MEP engineer.
   1. Surface or flush mounting options are acceptable.
B. Service wall colors and finishes shall coordinate with room finishes as determined by the UTSW Design Team.
   1. Provide color and finish samples to UTSW Design Team for final approval.

XV. Section 10 26 00 Wall and Door Protection

A. All products, colors, styles, and manufacturers shall be approved by UTSW Design Team and UTSW PM.
   1. Custom colors of wall protection are not preferred due to increased costs and lead times.
B. Plastic, aluminum, and stainless-steel wall and door protection which are scratch and stain resistant are acceptable according to project requirements.
C. Corner Guards:
   1. The top height of corner guards is 4-foot A.F.F. unless additional requirements are determined and reviewed with the UTSW PM.
   2. Install corner guards on corners of corridor walls with heavy pedestrian traffic.
   3. Set a consistent datum line so the top heights of all guards align.
      a. Plastic corner guards shall begin 1/2-inch to 1-inch above the top of base and extend up to 6-foot aff minimum.
      b. Stainless steel corner guards shall be installed at the floor level, extending up to 6-foot aff minimum.
D. Wall protection and rails:
   1. Install wall protection and rails where carts, gurneys, or wheelchairs shall be regularly used including within equipment storage areas.
   2. Design and location of wall and door protection shall include protection for wall-mounted accessories.
   3. Where possible, blocking shall be installed within wall construction to support weights and forces from use.
E. Protective Corridor Handrails:
   1. Install in areas with high pedestrian traffic for clinical and hospital areas.
   2. Blocking shall be installed within wall construction to support weights and forces from use. Consideration shall be made for areas where patients of size are expected.

3. Corridor handrails must be ADA complaint.

F. For ARC requirements, refer to UTSW Design Guidelines Section A2.

G. In food service areas, specify metal wall, corner, and door protection.

XVI. Section 10 28 00 Toilet and Bath Accessories

A. Standard toilet and bath accessories will be specified in projects.
   1. Refer to **EXHIBIT C.10 Responsibility Matrix** for UTSW preferences.
   2. Refer to the UTSW Master Specification for standard toilet accessories .

B. A/E shall locate toilet accessories to comply with ADA and TAS.
   1. A/E shall coordinate locations of accessories within stalls to ensure all stalls are equally functional.

C. Accessories typically provided by the Contractor (CFCI) from various manufacturers include but not limited to the following. Refer to UTSW master specifications for approved manufacturers and basis of design types.
   1. Glass mirror with stainless steel frame.
   2. Grab bars.
   3. Robe/Coat hook.
   4. Sanitary napkin disposal.
   5. Sanitary napkin vending unit.
   6. Specimen pass through cabinet (recessed) for a clinic or laboratory restroom.
   7. Loose and built-in waste cans.
   8. Paper towel dispenser:
      a. Roll-paper with touch free or automatic units with stadium setting shall be lockable.
      b. Consider installation within a semi-recessed unit partnered with a waste receptacle that ensures no protruding objects.
   9. Soap Dispenser.
   10. Hand Sanitizer.

D. Under lavatory Guards:
   1. A/E to confirm the look of lavatory counter/casework desired for each project with project leadership champion. In all instances, lavatories shall meet all TAS/ADA requirements for safety and access.
      a. Non-clinical areas will typically utilize wall-mounted lavatories with pipe insulation.
      b. Clinical areas may utilize casework or aprons.

E. Baby Changing Stations:
   1. Baby changing stations must be installed in a place where they will not become a protruding object, not project into required clearances or walkways, will not hinder door usage, and will not restrict the use of an accessible toilet.
      a. Baby changing tables within a restroom or single person toilet room cannot be located within the required clear floor space of other objects in the toilet room including the door, toilet, and sink.

b. Baby changing tables may be installed inside an accessible stall but it's open and closed condition cannot restrict the function of the toilet stall and must have the forward approach for the changing table. The clear floor space of the changing table may overlap the toilet clear floor space.
    i. This is not an ideal location because it limits both the use of the accessible toilet stall and the changing station.

2. Baby changing station locations may be installed as a built-in element or as a manufactured unit.
    a. Manufactured units with an opening and closing function shall be located in manner so a malfunctioning unit shall not prevent access and function of the toilet room.
3. Confirm per project requirements the requirement for special needs changing stations.

XVII. Section 10 43 00 Emergency Aid Specialties

A. Emergency aid specialties including Automated External Defibrillators (AED), Stop the Bleed (STB) Kit and evacuation chairs are required by UTSW OSBC, Emergency Management.
    1. Each element shall be located and/or installed in a manner that follows the ADA and Texas Accessibility Standards (TAS) as well as life safety requirements in NFPA and IBC.
    2. Project Requirements:
        a. The Project A/E and UTSW PM shall confirm and coordinate requirements with Emergency Management for each project using **Figure 10 43 00.1 – UTSW Requirements for Emergency Aid Specialties** for minimum campus requirements.
        b. The A/E shall propose locations and quantities for OSBC approval.
        c. Installation locations shall not be in high-profile or highly visible spots such as wall space where artwork or signage would be expected.
    3. Refer to UTSW master specification Section 10 43 00 "Emergency Aid Specialties" for specific campus requirements.
        a. The coordination of Emergency Aid Specialties within healthcare projects shall be confirmed and finalized with UTSW Medical Equipment Planning. Within MEQ scope these will typically be documented as "Owner Furnished, Contractor Installed" (OFCI).
        b. In non-healthcare projects, Project AE shall coordinate and document these items as "Contractor Furnished, Contractor Installed" (CFCI), confirming specification requirements with OSBC.

B. Cabinets and elements shall not create protruding objects and not restrict required exit widths.
    1. Fully recessed or semi-recessed cabinets are preferred.
    2. Each AED shall be located within its own cabinet.
    3. Each large STB kit shall be located within its own cabinet.

4. Each small STB kit shall be planned to be within the AED cabinet.
5. Per project requirements, other cabinet types or styles will be considered with approval from Emergency Management.

C. A/E to coordinate any exterior locations of specialty items to include cabinets or other means of protection from the elements.

D. Signage requirements to identify emergency aid specialties shall include signs at each location in buildings and in parking garages. Refer to Section 10 14 00 "Signs and Graphic Elements" in the UTSW Design Guidelines and Master Specifications.

Figure 10 43 00.1 – UTSW Requirements for Emergency Aid Specialties

Building Type	Definition	AED	STB Kit	Evac Chair
Single Story Building	1 Floor	Minimum of 1	1 Large Kit	N/A
Multi-Story Building	2 – 5 Floors	Minimum of 2 with 1 AED on 2nd to Top Floor	1 Large Kit on First Floor with 1 Small Kit in Each AED Cabinet	Minimum of 1
High Rise Building	More Than 5 Floors	Minimum of 2 with 1 AED on 2nd to Top Floor	1 Large Kit on First Floor with 1 Small Kit in Each AED Cabinet	Minimum of 2
Leased Whole Floor	UTSW is Sole Occupant of Whole Floor(s) Within a Leased Building	1 Per Floor	1 Small Kit in AED Cabinet	Minimum of 1 if Space is Used for Patient Care
Leased Partial Floor/Suite	UTSW Occupies Part of a Floor(s) Within a Leased Building	1 in Occupied Space Per Floor	1 Small Kit in AED Cabinet	Minimum of 1 if Space is Used for Patient Care

XVIII. Section 10 44 00 Fire Protection Specialties

A. Provide a building design that provides for Life Safety and complies with NFPA 101 as adopted by Texas State Fire Marshal.

B. Emergency lighting and exit signage shall be on a separate circuit and on emergency generator power, where a generator is provided.

C. Provide an Emergency Command Center in High-Rise buildings, refer to Section A of the UTSW Design Guidelines.

D. Fire extinguishers and recessed or semi-recessed cabinets shall be incorporated into the design as required by the code.
   1. Fire extinguisher cabinets shall be uniformly sized in buildings on campus and shall not create protruding objects according to ADA and Texas Accessibility Standards (TAS) requirements.
   2. Fire extinguishers selection and installation shall conform to the requirements of NFPA 10 *Standard for Portable Fire Extinguishers* or other codes as applicable and approved by OSBC.
      a. A/E to confirm that any special use fire extinguishers will fit inside the cabinets for each location as these units may be larger than standard extinguishers used elsewhere.
      b. Layout of fire extinguishers shall be approved by OSBC.
   3. Installation of Fire Extinguisher Preferences:
      a. In all public spaces, UTSW prefers installation with a cabinet.
      b. In ARC spaces, provide recessed or semi-recessed cabinets.
      c. In parking garages and on roof areas, fire extinguisher cabinets shall be used to protect extinguishers from the weather.
      d. In maintenance and back-of-house areas, including IR rooms, electrical rooms, etc., installation with a bracket is preferred.
      e. Signage requirements to identify fire extinguishers shall include signs at each location within buildings and parking garages. Refer to Section 10 14 00 “Signs and Graphic Elements” in the UTSW Design Guidelines and Master Specifications.
   4. Fire extinguishers located in or near the MRI room shall comply with the UTSW Master Specifications, be of all nonferrous construction, and have “MRI Safe,” MRI CONDITIONAL,” or similar logo printed on the extinguisher by the fire extinguisher manufacturer. These shall be equivalent to a ten-pound nominal capacity extinguisher.

E. Refer to UTSW master specification Sections 10 44 13 “Fire Extinguisher Cabinets” and 10 44 16 “Fire Extinguisher.”

XIX. Section 10 50 00 Storage Specialties

A. Lockers are typically provided for employees without assigned offices or guests undergoing procedures. Confirm sizes, type, and quantity per project requirements.
   1. Patient locker areas are typically plastic laminate construction or metal.
      a. Areas where locks are required may include digital lock options. Confirm requirements with User Representatives and UTSW PM.
   2. Employee areas could be metal or plastic laminate with metal in any wet areas.
      a. Provide hasps for these locker areas.

B. Locker Construction:
   1. All lockers must be wall anchored, positioned on a base, and provide a toe kick.
   2. Recessed and flush handles are acceptable if they comply with ADA and TAS

3. Identification numbers shall be permanently affixed to the surface of the lockers. Standard numerical sequences are preferred.
    a. If a project had central lockers on multiple floors, consider differentiating the numbers to include a floor number proceeding the locker number.
4. Lockers shall have hangers inside each unit, including ADA accessible units, to meet TAS requirements.

XX. Section 10 56 00 Storage Shelving

A. Storage shelving may be required in some areas, including janitor closets. Type and material construction for storage shelving is based on project requirements.
B. A/E shall confirm chemicals to be stored in storage areas to coordinate correct finish and coordinate safety signage needs with campus OSBC and Signage Manager. Refer to Section 10 14 00 “Signs and Graphic Elements” in the UTSW Design Guidelines and Master Specifications.
C. MDF is prohibited as a component of storage shelving.
D. Coordinate life safety clearances for sprinkler heads with all installations and planned storage areas so no component is located within 18-inches of a sprinkler head.

XXI. Section 10 81 00 Pest Control Devices

A. Refer to Design Guidelines Section B – Codes and Standards.
B. UTSW utilizes several types of pest control devices on campus.
    1. Designing structures without recesses, gaps, or flat parapets is the best way to deter pests on campus.
        a. Sloped edges or parapets will help prevent birds from sitting and overhangs shall not provide roosting spots.
        b. Electronic or sonic bird deterrents have not been effective on campus and are not preferred.
    2. Vents and openings into buildings shall have covers or screens of gauges appropriate to prevent entrance of pests. Heavier gauge screens are required closer to the ground for mammals.
    3. Weep holes shall have screens or devices to prevent the entrance of pests while allowing the movement of water. The minimum height above finished grade shall be 6-inches unless A/E recommends otherwise to UTSW PM.
    4. Exterior doors shall have solid sweeps and closures.
    5. Dock doors shall have mechanically activated air curtains.

XXII. Section 10 81 01 Knox Boxes / Emergency Key Boxes

A. Fire Department Emergency Key Boxes (Knox Boxes) shall be installed on all new buildings and buildings being renovated that do not currently have a key box.
B. The key box shall be located as indicated in the UTSW master specifications or as directed by OSBC.
C. Color to be confirmed with UTSW and size of key boxes confirmed with UTSW Key Control.

End of Division 10

DOCUMENT HISTORY

Issue Date	Description	Editor
06/19/2020	June 19, 2020 Print	MS
10/09/2020	Revision to 10 28 13	EV
03/30/2021	Q1 2021 Update	EV
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10/03/2022	Q3 2022 Update	EV
06/26/2023	Q2 2023 Update	EV
12/15/2023	Q3 2024 Update and exhibit updates	EV
06/13/2024	Q2 2024 Update	EV
12/20/2024	Q4 2024 Update	EV
06/27/2025	Q2 2025 Update	EV
12/18/2025	Q4 2025 Update	EV

DESIGN CRITERIA

DIVISION 11 EQUIPMENT

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DIVISION 11 00 00 – EQUIPMENT

I. General Information

A. Project equipment requirements should be assessed with user representatives early in the scope development process. The elements noted below are not exhaustive.

B. Critical considerations include regulation requirements, compliance, project needs, manufacturer recommended layouts, as well as longevity and maintenance.
   1. Assessments of current infrastructure shall take place to support new technology.
   2. Equipment shall comply with UTSW Sustainability goals, including Energy Star equipment, where possible.
   3. A/E shall confirm equipment with emergency power requirements as well as data connection to the Central data Acquisition System (CDAS) for monitor of critical items.

C. Design and Layouts:
   1. Equipment layouts shall provide manufacturer recommended clearances, safe conditions, and best practice considerations.
   2. Layouts and planned traffic patterns shall minimize disruption of air curtains, including HVAC supply and return design.
   3. Layouts shall provide access for replacement of filters, repairs, and maintenance.
   4. Where equipment requires cooling water, A/E shall discuss existing building systems, and each process equipment cooling requirement with UTSW Utilities team to determine the project solution. Any connection to existing systems shall be approved in writing by UTSW Utilities.
      a. A plate and frame heat exchanger may be required in the process chilled water loop to avoid circulation of house chilled water through process equipment.
   5. UTSW preference is to provide disconnecting means for individual hard-wired equipment at readily accessible or accessible locations per code.
   6. For ARC special requirements, refer to UTSW Design Guideline Section A2.

II. Design Review Submittal Requirements

A. Refer to Section C in the UTSW Design Guidelines.

III. Section 11 12 00 Parking Control Equipment

A. Standard equipment in parking areas include parking gates, entrance control terminals, and exit control terminals. Coordination is required to provide required data, power, and grounding per manufacturer requirements.

IV. Section 11 13 00 Loading Dock Equipment

A. Equipment for a new or remodeled loading dock area shall include discussion with Facilities Management to determine appropriate equipment including dock levelers or dock lifts.
B. Coordinate with UTSW FM mounting location of electric disconnects and operators accessible from the floor level to avoid use of a ladder to maintain operator safety.
C. At ARC facilities, loading docks shall have at least one lift that will accommodate sizes and weights associated with feed pallets, animal caging racks and/or large animal transport carts, and bulk trucks.
    1. The weight capacity shall be 3,000 pounds minimum with platform size 6-foot wide by 8-foot-long minimum.

V. Section 11 24 23 Roof Safety Systems

A. UTSW preference is to have anchors and functional davits for safety and maintenance at roofing areas of buildings.
        1. These items shall be fully coordinated with structural requirements as well as envelope requirements.
        2. All components of facility fall protection shall be fully waterproofed with the roofing system.
B. A minimum of 42-inch barriers around roof edges or openings including guard rails or signage to indicate fall hazards is preferred.
C. Roof safety systems shall provide the ability to access, maintain, and clean the envelope of the building. These designs shall ensure easy, safe, and cost-effective maintenance and repair.
    1. For non-standard envelope design with deep overhangs, design of a suspended access anchorage system or similar system is preferred. The design shall ensure ease of access under overhang.

VI. Section 11 30 00 Residential Equipment

A. Breakrooms and equipment layouts documented by A/E shall ensure compliance for all users. All appliances used on campus shall be ADA/TAS compliant.
B. Breakrooms may have refrigerators with icemakers, utilities for coffee service, water filtration, and microwaves as standard. These shall be approved by the user representative and UTSW PM.
C. UTSW policy prohibits the addition of garbage disposals, ice machines, and dishwashers in coffee or break areas according to Policy FSS-310 “Academic, Research, and Clinical Space.”
        1. Garbage disposals are prohibited outside of food service kitchens. Any variance within a project must be approved in writing by UTSW FM, Infection Prevention, and Department Leadership, Director or above.

VII. Section 11 40 00 Food Service Equipment

A. UTSW purchases large equipment for food service locations on campus.
   1. A one-year warranty is preferred with start at substantial completion to be confirmed with Food Service.
   2. UTSW PM shall confirm the purchasing strategy per project.
   3. Equipment shall be National Sanitation Foundation (NSF) certified for all kitchens.

B. Equipment can include walk-in coolers, walk-in freezers, ice machines, 3-compartment sinks, garbage disposals, dishwashers, grease traps, ovens, bulk sterilizers, rack washers, tunnel washers, etc.

C. Gas and steam are utilized in food service areas. All utilities to be confirmed and coordinated.

D. Natural gas fueled cooking equipment shall have a wire tether restraint in place which is less than the length of the natural gas line to prevent unintended damage to or disconnection of the gas line while equipment is being moved.

E. All wheeled cooking equipment shall have metal wheel stops and / or locks permanently secured to the floor. The intention of this is so that kitchen hood equipment can be properly realigned under the fire suppression system after it is removed for cleaning.

F. Floor drains with trap seals shall be located at large ice machine locations.

VIII. Section 11 52 00 Projection Screens

A. Where project scope requires recessed projection screens, they shall be motorized and controlled by a non-keyed switch.

B. UTSW preference is owner furnished and owner installed with Project A/E and GC coordination

IX. Section 11 53 13 Laboratory Fume Hoods

A. OSBC shall review laboratory equipment such as fume hoods and special hoods. The OSBC's Chemical Safety Program shall review manufacturer information and installation plans.
   1. Fume hood testing and certification shall be done by the fume hood manufacturer or by an independent certifying firm and be done after the installation of the fume hood in coordination with OSBC.
   2. A list of approved certification companies is available from the Office of Safety and Business Continuity (OSBC).

B. Codes:
   1. All laboratory hoods shall meet the National Fire Codes, NFPA 45, "Fire Protection for Laboratories Using Chemicals."
   2. Hoods handling radioactive material shall meet NFPA 801, "Recommended Fire Protection Practice for Facilities Handling Radioactive Materials."
   3. Fume hood systems shall also meet the current requirements of ANSI Z9.5 Standard/ASHRAE 110 Test.

a. If the requirements below conflict with those of the most recent versions of these national standards, the national standards shall prevail.

C. A/E shall coordinate with OSBC for any laboratory hood installation and follow the minimum design requirements:

1. Fume hoods must not be in high traffic areas, located near supply air grills, and must be at least 10 feet away from a primary entrance door.
2. Hood construction materials should be selected to meet the requirements of hood use. Finish materials may include stainless steel and epoxy coated material.
3. Hood design shall incorporate airfoil jamb and airfoil sill to reduce airflow turbulence.
4. A variable volume or constant volume hood system design is preferred, depending upon the HVAC system design.
5. For constant air volume hoods, bypass or balanced air feature should be considered to provide an inlet for air to be drawn into the top of the hood as the sash is lowered, still maintaining the velocity through the face opening at 100 FPM. Hoods will be an integral part of the HVAC system.
6. Auxiliary Air Make-Up Hoods with make-up air externally supplied above and on the outside of the hood face are not permitted.
7. Utilities:
   a. Utility valves and switches shall be external and shall be in conformance with applicable codes and standards. All service valves shall be easily accessible for maintenance personnel and clearly marked. Fixture outlets inside the hood shall be corrosion resistant or have a corrosion resistant finish.
   b. Hood lighting shall be vapor or explosion proof, depending upon the intended purpose of the hood.
   c. Lighting elements shall be changeable from outside of the hood.
8. The hood sash shall be transparent, easily removable, horizontal sliding, or vertical rising panel that will close off the hood face.
   a. All parts and counterbalance mechanisms shall be of corrosion-resistant material and finish.
   b. The sash panel shall be safety glass or plastic that has a flammability rating of 25 or less.
   c. Fume hoods with vertical sashes shall have stops at 18-inches. Whenever the sash is beyond 18-inches a visual alarm shall be activated.
9. Face Velocity Requirements:
   a. For hood selection, establish the maximum degree of hazard anticipated for present and future use.
   b. National standards recognize that the acceptable face velocity requirement for toxic materials used in research laboratories is an average face velocity of 100 fpm with the hood sash fully open (100-percent) and a minimum at any point of 80 fpm. These performance parameters shall be met.
   c. Fume hood testing shall be accordance with ANSI/ASHRAE 110.
10. Airflow Measuring Device:
    a. An airflow measuring device shall be permanently installed on each fume hood. The device shall continuously monitor airflow face velocity, shall give a digital

readout of face velocity, and shall sound an alarm for low-flow conditions or whenever the face velocity drops below 80 fpm.

11. Exhaust Duct:
    a. Fume hoods may be designed with either an independent exhaust duct system or a manifold system.
    b. Hood exhaust system design should provide for 10-percent minimum flow through exhaust duct when hood is not in service. The hood exhaust may be used as part of or as all the required exhaust from the laboratory room.
    c. Exhaust fans are to be located to the exterior of the building envelope and the pressure in the duct shall always be negative relative to the building.
    d. A high transport velocity of at least 2000 fpm is needed so that dust and aerosol-size materials are not deposited in the joints, cracks, or corners in the duct system.
    e. Stainless steel duct systems shall only be used where required by OSBC.
    f. Normally all exhaust ducts will be constructed of Type 316L Stainless Steel, except where hydrofluoric acid or fluorides in general are used, with all TIG welded or mechanically fastened joints sealed with mineral impregnated woven fiber taper which is further impregnated with an activator/adhesive of the polyvinyl acetate type as manufactured by Hardcast, Inc. or equal.
    g. Ducts should be routed vertically with a minimum number of turns. Alternate duct materials will be considered in some applications.

D. Special Hoods:
    1. Perchloric acid hoods:
        a. Perchloric acid hoods require a “wash down” feature for the exhaust fan, ductwork, and hood plenum after each use.
            i. Only one manual valve will control the wash down water.
            ii. The valve handle shall be outside of the hood enclosure.
            iii. Each Perchloric Acid hood shall have an automatic five-minute wash down cycle activated when the fume hood fan is de-energized.
        b. Perchloric acid hoods shall have a completely welded exhaust duct system. Duct shall be routed by the shortest and straightest path to the roof.
            i. Horizontal runs are not permitted.
            ii. Flange joints and acid-resistant gaskets may be used when required for construction and shall be approved by UTSW PM.
            iii. Do not manifold Perchloric hoods.
            iv. Perchloric acid hood exhaust outlets shall be flanged and furnished with a companion flange for welding to the exhaust duct.
    2. Radioisotope requires special construction to permit easy cleaning.
        a. Filtration requirements of the exhaust air and fume hood construction shall be determined on a case-by-case basis in consultation with the System Member Environmental Health and Safety Department’s Radiological Safety Officer.

E. Biological Hoods:
    1. Meet NIH 03-112C Performance Specifications and shall be in accordance with National Sanitation Foundation Standard, NSF 49, and be listed by NSF.

2. Hood shall be listed by UL and CSA for electrical safety Use HHS Publication No. (CDC) 93-8395, “Biosafety in Microbiological and Biomedical Laboratories.” for guidelines and filtration requirements.
3. Hoods shall be of steel or stainless-steel construction with stainless steel interior and coved corners.
    a. All seams and welds to be ground smooth and polished.
    b. Sliding view window shall be 1/4-inch safety or tempered glass.
4. Supply and exhaust HEPA filters shall be front loading and shall be 99.99-percent efficient for 0.3-micron sized particles.
5. Utilities:
    a. Minimum of one petcock.
    b. Minimum of one GFI duplex outlet.
    c. LED light fixture shall be changeable from outside the hood.
    d. Additional utilities may be identified per project.
6. Certification of unit after installation is required and must be performed by an approved certification company in coordination with OSBC.

X. Section 11 53 19 Laboratory Specialty Equipment

A. Refer to Design Guideline Section A4 – Laboratory Design Requirements for standard lab equipment found on UTSW Campus.
B. Safety Showers and Eyewash – These are required where bulk hazardous chemicals are handled or as indicated by UTSW OSBC Chemical Safety. Refer to UTSW Specifications and Design Guideline Division 22, Section 22 40 00 “Plumbing Fixtures.”

XI. Section 11 53 53 Biological Safety Cabinets

A. Biological Safety Cabinet (BSC) shall comply with NSF / ANSI 49 and be reviewed and approved by OSBC Biological Safety Team.
    1. The layout of a laboratory including BSC units shall follow the NIH DRM Appendix A: Biological Safety Cabinet (BSC) Placement Requirements for New Buildings and Renovations and ANSI Z9.14, Section 8.3.7.
    2. Refer to UTSW Specification Section 11 53 53 “Biological Safety Cabinets.”
B. Within BSC units the electrical outlets shall be supplied by independent circuits and have ground fault circuit interrupters.
C. Typical utilities include vacuum lines on the right side.

XII. Section 11 70 00 Healthcare Equipment

A. Refer to UTSW Design Guideline Section A3 Clinical Design Requirements and 11 70 00 “Healthcare Equipment.”

XIII. Section 11 97 00 Security Equipment

A. Security cameras, panic/duress buttons, and other security requirements shall be confirmed for project scopes including retail, executive level suites, psychiatric wards, or other areas of safety concerns.

B. Security cameras are required in retail and food service areas including cash locations and access points.
   1. Locations at products shall be reviewed with retail and food service representative and UTSW Police Department.

C. Panic/duress buttons are required at all food service cash areas, including cashier locations, and shall be reviewed with food service representative and UTSW Police Department.

D. Panic Button/Duress Buttons are required at all cash registers and cash handling locations.
   1. Locations shall be reviewed by the area owner and UTSW Police Department.
   2. All other requested panic/duress buttons will be assessed on a case-by-case basis.

E. IP Security cameras with licenses shall be installed to view all Panic Button/Duress Buttons.

F. The OSBC Biological Safety / Chemical Safety Director must be consulted to discuss security for locations that will store extremely hazardous materials.

End of Division 11

DOCUMENT HISTORY

Issue Date	Description	Editor
06/19/2020	June 19, 2020 Print	MDR
10/09/2020	Revision to panic buttons 11 97 00, House vacuum added to 11 53 00	EV
03/25/2022	11 13 00 Loading Dock Equipment, 11 24 23 Roof Safety Systems, Section 11 40 00 Food Service Equipment, Section 11 70 00 Alcohol-Based Hand Rubs, Exhibit 11.1-Media Technology Contacts	MR
10/03/2022	Q3 2022 Update	EV
12/15/2023	Q4 2023 Update	EV
06/13/2024	Q2 2024 Update	EV
12/20/2024	Q4 2024 Update	EV
06/27/2025	Q2 2025 Update	EV
12/18/2025	Q4 2025 Update	EV

DESIGN CRITERIA

DIVISION 12 FURNISHINGS

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DIVISION 12 00 00 – FURNISHINGS

I. General Information

A. Furniture layouts shall be proposed by the UTSW furniture vendor for use in the A/E drawings.
   1. The furniture vendor will schedule Customer meetings for initial understanding and for presenting options.
   2. The furniture vendor will provide A/E with an initial layout in CAD with cut sheets for products planned.
   3. For construction documentation, the furniture vendor will provide final layout drawings with power requirements in CAD.

B. For each project, A/E shall have access to UTSW "Furniture: Standards and Layouts" from UTSW PM to understand campus standards.
   1. Design considerations for each project shall include employee personal storage, coat hooks, and other operational requirements. Propose coat hook installations for use by employees, patients, and visitors to align with best practice solutions.
   2. Within offices, a coat hook is typically installed on the wall behind the door. In employee work areas, confirm locations with users.

C. Furnishings shall:
   1. Have standard maintenance requirements. Significant specialized maintenance is not allowed.
   2. Have a demonstrated history in a similar UTSW setting or be approved by the Institutional Design and Branding Committee (IDBC).
   3. Shall be contract grade with a minimum warranty of 10 years.
   4. Have standard sizes and finishes. Any exceptions must be approved by UTSW Design Team.
   5. Systems type furniture must have minimum of one cable entry access point for the furniture located near a wall or post.
   6. Power and data requirements shall be coordinated with the appropriate consultants to ensure successful layouts.
      a. Communications cables must be home run directly to the furniture jacks.
      b. Patch cords will not be allowed to connect furniture to the walls.

II. Design Review Submittal Requirements

A. Refer to Section C in the UTSW Design Guidelines.

III. Section 12 05 13 Fabrics

A. Use of fabric in patient areas shall be in approved areas only, such as therapeutic counseling rooms, by UTSW Design Team, OSBC, and Infection Prevention.
   1. Upholstery shall withstand and be warrantied against specific cleaning solvents used by UTSW EVS teams. A list of cleaners can be provided by UTSW EVS.

2. As part of closeout requirements, a cleaning manual shall be provided which includes information for each fabric.
3. High-density foam is required.

B. Preferred Characteristics:
   1. Avoid fabrics in white or cream tones for seats or surfaces.
   2. Avoid fabrics with large and/or loose weaving that could easily snag.
   3. All fabrics must include a stain-resistant finish/coating for cleanability and be bleach cleanable in high-traffic and clinical areas.
   4. Any exceptions must be approved by UTSW Design team.
   5. All upholstery shall have abrasion requirements with a minimum of 100,000 double rubs Wyzenbeek and minimum 45 Martindale cycles.

C. Lightfastness Requirements:
   1. Lightfastness must meet ACT minimum of 200 hours and/or Grade 5 for any furnishings placed directly by or within close vicinity to exterior windows.
   2. For all polyurethanes, lightfastness must meet ACT minimum of Grade 5 and/or 200 hours.

D. Polyurethane Physical Characteristics:
   1. Meets a minimum Hydrolysis Testing of 5 weeks without evidence of cracking, peeling or delamination.
   2. Never railroad polyurethanes.

E. Prior to ordering, coordinate and specify upholstery techniques between the furniture manufacturer and textile manufacturer, to prevent issues with puddling, puckering and seam slippage. These include but aren't limited to:
   1. Top stitching is not allowed.
   2. Double-stitch seams.
   3. Requirements in this section.

IV. Section 12 10 00 Art

A. All art shall be approved by the UTSW Art Curator and IDBC.
B. Materials shall be appropriate for each unique setting (i.e., Behavioral Health, Pediatrics).
C. A/E coordination drawings shall identify installation location and any required structural support.
D. Confirm additional requirements with the UTSW Art Curator.
E. Locations:
   1. All art shall be coordinated with other space requirements, including but not limited to thermostat locations, switches, life safety elements, and outlets.
   2. Art shall not cover up any utility elements.

V. Section 12 20 00 Window Treatments

A. Window treatments shall be in harmony with the building exterior and interior.
B. Power requirements shall be coordinated where motorized treatments are used.

C. Motorized window shades may be considered for larger public spaces, large conference spaces, and taller space installations.
D. Locations, control plan, and controller locations(s) to be reviewed and approved by UTSW PM and User Representative.
E. Horizontal blinds and roller shades are preferred.
F. Horizontal blinds shall be aluminum.
G. Black-out shades shall be provided as required for space utilization.
H. All fabric selections shall be coordinated with UTSW Building Finish Standards. Where questions arise, they shall be reviewed with the UTSW Design Team.

VI. Section 12 30 00 Casework

A. Project specific requirements shall drive the finish, style, and manufacture of casework.
B. All casework units shall be designed for ease of installation, reuse, longevity, and ease of cleaning.
C. Installation:
   1. All casework shall have appropriate fillers to conceal mounting hardware and/or gaps.
   2. All joints shall be properly caulked and sealed.
   3. Levelers to have 2-inch minimum adjustability, where provided.
D. Design:
   1. Casework design and installation shall not create a “shelf” for storage within 18-inches of the ceiling to comply with OSBC requirements.
   2. Casework design and installation in healthcare and laboratory areas shall comply with best practices to minimize dust and germ spread.
   3. No recessed pulls allowed.
E. Refer to design guideline Section 08 71 00 “Door Hardware.”

VII. Section 12 35 53 Laboratory Casework

A. General Requirements for high-quality steel cabinet specifically designed for the laboratory environment, meeting the performance requirements described in SEFA 8-M Class 1, Fixed casework. All metal casework shall be self-supporting.
   1. UTSW utilizes a laboratory casework contract on campus for standardization.
      a. A/E to confirm contract requirements with UTSW PM.
   2. A/E shall plan labs to be in conformance with UTSW standards, project requirements, SEFA recommendations, and other regulations as required. Refer to UTSW Design Guidelines Section A4 – Laboratory Design Requirements.
      a. The campus standard layout shall be 5-foot lengths for mobile benching/workspace units.
         i. Lengths of 4- or 6- foot units may be indicated for certain project or equipment requirements.
         ii. Designs utilizing a majority of 4- or 6- lengths shall be approved by UTSW Design Team and Project User Representative.

B. Finishes to be confirmed with UTSW PM and UTSW Building Finish Standards.

C. Casework Types
   1. Base cabinets shall have a minimum of 500-pounds loading per lineal foot.
   2. Mobile cabinets shall not have hard connections.
   3. Suspended and wall hung cabinets units shall have a minimum 300-pounds loading.
      a. Wall cases shall be able to mount to frame supports (uprights) of benching or be wall hung.
   4. Full height, wall-hung units shall have a minimum 40-pounds up to 200-pounds loading.

D. Requirements:
   1. Cabinet types shall fit under standard lab bench countertops.
   2. Installation of casework shall not create recesses, cracks, or other openings. Enclosures, joint sealant, and trim pieces shall be used to close all openings.
   3. Steel shall be 12-gauge maximum and 20-gauge minimum U.S. Standard.
      a. Cold rolled steel shall be prime grade; roller leveled and shall be treated at the mill to be free of scale, ragged edges, deep scratches, or other injurious effects.
      b. Stainless steel shall be type 304. Stainless steel shall be supplied with a #4 finish free of burrs, weld marks, or other imperfections.
   4. Countertop surfaces include stainless steel and epoxy resin. Use of phenolic to be approved by UTSW Design Team.
      a. Campus finish standards to be confirmed per project.
   5. Minimum Gauges:
      a. Drawer and Doors outer and inner pan – 20-gauge.
      b. Aprons – 18-gauge.
      c. Bottom Panels – 18-gauge.
      d. Drawer bodies – 20-gauge.
      e. Back Panel – 18-gauge.
      f. Shelving – 18-gauge.
      g. Shelf Support Brackets – 14-gauge.
      h. Side Panels – 18-gauge.
      i. Legs – 18-gauge, 2-inch tube.
      j. Table Frames – 18-gauge.
      k. Front and Back rails – 18-gauge.
      l. Gusset Plates – 14-gauge (welded construction).
   6. Composition core plywood composition core plywood shall be 3-ply and compliant with ANSI A208.1-199 and/or ANSI A208.2-1994.

E. Standard Element Requirements:
   1. Sink units shall include both ADA/TAS accessible units and non-accessible units.
   2. Drawer glides shall have a minimum 100-pound loading and be full extension.
   3. Drawers shall be anti-tipping, allowing only one drawer to open at a time, and shall provide the option for dust covers as well as waterproofed drawers.
   4. Under counter lights shall be LED with an easily accessible driver, separate from any wire mold. Switch for lights shall be located for easy use.
   5. Hardware shall be manufacturer's standard pulls in chrome plated or stainless steel, dependent on project requirements.

6. Locks shall be single-bitted (one-sided) with no restricted keyways and be manufacturer's standard lock cylinders.

VIII. Section 12 35 70 Healthcare Casework

A. Refer to Design Guidelines Section A3 Clinical Design Requirements.

IX. Section 12 36 00 Countertops

A. General requirements
   1. UTSW PM to provide building finish standards.
      a. No custom finishes allowed.
   2. Countertops shall be designed for full support over the entire length and depth of surface with a minimum load of 50-pounds per linear foot.
   3. For wall-mounted counters, UTSW prefers metal support brackets securely fastened to the wall structure and spaced at manufacturer recommended distances but not greater than 4-feet. Visible brackets shall be finished to match wall paint.
      a. Finishes include shop finished baked enamel or powder coated finish.

B. Countertop materials:
   1. Countertops and backsplashes must be a continuous surface with minimal seams whenever possible. If a continuous surface is not possible, follow best practice guidelines for minimizing seams.
   2. For clinical sink locations such, refer to Section A3 – Clinical Design Requirements for splash guard requirements.
   3. Patient areas, including but not limited to check-in, receptions, exam rooms, procedure rooms, and utility rooms shall have countertops that allow for effective cleaning and decontamination.
      a. Solid surface or manufactured products are preferred over natural products, which require regular sealant applications.
      b. Products shall not require specialty maintenance.
   4. Laboratories – Refer to Section 12 56 53 "Laboratory Furniture."
   5. Wet areas shall have non-porous solid surface countertops and backsplashes.
   6. Plastic laminate counters are acceptable in non-wet work areas.
   7. Installation of countertops shall not create recesses, cracks, or other openings. Joint sealant shall be used to seal corners and intersections with other surfaces.

C. Standard Element Requirements:
   1. Grommet locations shall be documented in drawings for wire management and trash disposal.
      a. No custom colors permitted.
   2. Workstation Grommets:
      a. Standard grommets shall be 2 1/2-inch diameter in metallic silver or plastic finish.
      b. Specialty units shall be coordinated with IR requirements.
   3. Trash Grommets:

a. Minimum diameter of 10-inches with finish per project requirement.

X. Section 12 46 00 Furnishing Accessories

A. Refer to UTSW Master Specification Section 12 46 00 “Furnishing Accessories” for interior basis of design products.
B. Refer to Section 32 33 00 “Site Furnishings” for exterior accessories.
C. Waste and Recycling Container Placement Guidelines:
   1. Ideal planning will result in side-by-side waste and recycling in prominent, convenient, and visible locations. Locations near entry points or determined based on traffic flow, transition points, expected work types, and space utilization are preferred.
      a. Spaces to consider include public spaces, lobbies, hallways, office areas, break rooms, printing areas, and eating areas.
   2. Where side-by-side locations are not possible, place recycling containers so they are visible from waste containers.
D. In new construction, waste and recycling shall be matching units with labeling to identify recycling with text and/or the white triangular arrow symbol for recycling.
E. In existing construction, identify existing building standard receptacles to be reused or identify additional units for purchase in the project scope. Ensure recycling units are identified for the addition of white recycling messaging.

XI. Section 12 46 19 Clocks

A. Refer to design guideline Section 27 53 13 “Clocks.”
B. Where clocks are required, the final decisions shall be evaluated and confirmed with UTSW User, PM, and UTSW Design Team.

XII. Section 12 48 00 Rugs and Mats

A. In some seating areas, the appearance of rugs may be desired for patient comfort. These installations shall utilize standards carpets with metal trims and / or transitions pieces to prevent tripping. Refer to design guideline Section 09 68 00 “Carpeting.”
B. Open area rugs shall be avoided due to trip hazards.
C. Walk-off mats may be utilized at entries to minimize moisture and contaminants entry into a building.

XIII. Section 12 50 00 Furniture

A. UTSW has furniture standards per building. A/E shall receive Building Finish Standards from UTSW PM for each project.
   1. Non-Standard furniture shall be reviewed by the Institutional Design and Branding Committee (IDBC) before final consideration.

B. Preferred Characteristics:
   1. Work surfaces to be high-pressure laminate (HPL) with matching edge banding in PVC/urethane. Do not specify low-pressure laminate (LPL), thermally fused laminate (TFL) or self-edges.
   2. Work surface laminates to be non-textured unless requested otherwise.
   3. Work surfaces to have appropriate grommet holes/wire management to access power/data locations.
   4. Office furniture should always be coordinated by A/E to address switch and thermostat locations.

C. Lockable storage to be keyed alike by office. Refer to design guideline Section 08 71 00 “Door Hardware” for standard lock information.

XIV. Section 12 56 53 Laboratory Furniture

A. General requirements:
   1. Refer to design guideline Section 12 35 53 “Laboratory Casework” for steel requirements and cabinet requirements.
   2. Adaptable table systems (lab benching) shall meet SEFA 8-M Class 7, Free-Standing Workstation, and performance requirements.
   3. Movable furniture elements shall meet SEFA 8-M Class 8, Mobile Workstation performance requirements.

B. Finishes to be confirmed with the UTSW PM and UTSW Building Finish Standards.
   1. Approved materials must be heat resistant and stand up to chemicals including bleach. These include manufacturer’s standard finish options in powder coated cold rolled steel, stainless steel, phenolic, and Epoxy Resin.
   2. Composition Core Plywood Composition core plywood shall be 3-ply and shall be compliant with ANSI A208.1-199, and/or ANSI A208.2-1994.

C. Performance Requirements:
   1. Loading:
      a. All tables, including tables attached to rear framing structure, free-standing, and perimeter supported tables shall have a uniform load of 1,500 pounds.
      b. Shelves supported by uprights (columns) or horizontal cross supports shall have loading of 40-pounds per square foot up to 200-pounds.
   2. Minimum Gauges:
      a. Leg structure supports, where required, 2 1/2-inch tubing, 12-gauge hot rolled steel.
      b. Front and side aprons: 14-gauge.
      c. Back Panel/ Modesty Panel: 16-gauge.
      d. Support Brackets, Apron Rails, and support rails: 12-gauge.

e. Steel weldments: 14-gauge.
f. Frame Uprights (Columns): single and double sides, 12-gauge square tubing with 14-gauge steel weldments.
g. Horizontal cross supports: 11-gauge.
h. Shelving supports, shelves: 12-gauge.

3. System Components:
   a. System shall be available in single-sided and double side (shared frame assembly) structures and shall be universally flexible to the system without handing.
      i. Attached table back panels shall be installed between upright framing to allow support for the rear of the work surface and prevent side to side racking of the frame.
      ii. Frame supports (uprights) shall allow for plumbing, electrical and data connections installed in a manner allowing onsite and post installation modifications to these services.
      iii. Frames (uprights) shall have holes machined on 1-inch increments for mechanical fastening of shelves, overhead cabinets and accessories starting at nominal 53-inch A.F.F. to within 2 1/2-inch of the top of the upright.
   b. Self-supporting workstation tables with provisions for shelving uprights shall work with other components of the system.
   c. Shelving:
      i. Each standard bench shall include 2 levels of shelving across the width of the bench. Additional shelving needs shall be confirmed per project.
      ii. Shelving options shall include a 1-inch curb between shelves at double bench locations and the ability to divide shelving above individual benches.
      iii. Shelving may be mounted to frame supports (uprights) of benching or wall mounted.
4. Overall Dimensions:
   a. Table:
      i. Height: 29-inches to 36-inches and adjustable in 1-inch increments.
      ii. Depth: 30-inches per single side, 60-inches per double sided unit.
      iii. Width: 48-inches, 60-inches, or 72-inches standard.
   b. Shelving shall be standard sizes offered by manufacturers with UTSW approved shelf depths of 12-inches, 16-inches, and 18-inches and adjust in 1-inch increments.
   c. Overall system height: Height options of 77-inch and 84-inch including options for feet, casters, etc.)
5. Hardware and Accessories:
   a. Provide backstop under main table surface for under counter cabinets.
   b. Specify glides, casters, or heavy-duty leveling casters as project flooring and use dictate.
   c. Grommets shall be easy to clean, adjust and maintain. Preferred material shall be natural rubber, nitrile rubber, EPDM, silicone, neoprene and FKM in fit in standard oval hole sizes.
   d. Under counter light shall be LED with easily accessible driver that is separate from the wire mold. Shall provide method for turning lights on/off easily.

D. Utilities:
   1. Provide a maximum for three plumbing services per side, housed in integral raceway to top of frame (upright).
   2. Electrical and data shall be hosted vertically within frame and allow horizontal modules and re-configuration throughout the life of the product.
   3. Provide a minimum of three electrical circuits with two above the work surface and one below. Carry a minimum of two circuits in horizontal modules.

XV. Section 12 59 00 Systems Furniture

A. Preferred Specifications:
   1. Hardwired power/data to be in the base of the panel, unless requested otherwise, and shall be capable of pass-through data.
   2. Workstations to have a minimum of three (3) duplex power receptacles and two (2) data cutouts.
   3. Six to eight standard workstations may connect to one circuit with a 20-amp circuit breaker.
   4. Workstations with special equipment that require more power must be coordinated with electrical engineer/electrician to ensure proper distribution of circuits.
   5. Coordinate building power and data locations with the final design of workstation layouts.

XVI. Section 12 61 00 Fixed Audience Seating

A. Fixed audience seating must meet all applicable codes and specifications shall be reviewed by the UTSW Design Team and finishes to be approved by the IDBC.
B. Design:
   1. Floor mount only.
   2. Stagger seating to aid with sightlines.
   3. Structure for seat construction shall be steel or cast iron, plastic is not permitted.
C. Finishes:
   1. Outer back of chairs shall be a hard surface in darker, neutral colors.
   2. Arms shall be non-upholstered.
   3. Seats shall be upholstered with vents required for breathability. Refer to Design Guidelines Section 12 05 13 “Fabrics.”
   4. Tablet Arms: Refer to Design Guidelines Section 12 68 00 “Tablet Arm Seating.”

XVII. Section 12 64 00 Booths

A. Design booths to include a non-upholstered crumb catcher element.
B. All textiles and finish design shall be approved by the UTSW Design Team.
C. Dimensions:
    1. Allow for the table edge to align vertically with the outer edge of the booth seat.
    2. Allow for minimum clearance of 16-inches from the seat back to the front edge of the table.
    3. In a split booth configuration, allow 22-inch between tables.
    4. Seat height shall be between 16-inch and 18-inch.
    5. Seat depth not to exceed 23-inch.

XVIII. Section 12 93 00 Public Space Furnishings

A. Site/Outdoor Furnishings:
    1. Materials used should be weather resistant, with low thermal conductivity.
    2. Exposed metals should have powder coat finish.
    3. Specify perforated seat/back and furniture must have adequate means of draining water.
    4. No umbrellas permitted.
    5. Individual furniture pieces shall have a minimum weight of 25 pounds.
B. Do not bolt furniture down unless specifically directed by UTSW Design Team.

End of Division 12

DOCUMENT HISTORY

Issue Date	Description	Editor
06/19/2020	June 19, 2020 Print	EV
10/09/2020	Update to 12 48 00	EV
3/30/2021	Q1 2021 Update –Revisions throughout section	EV
10/03/2022	Q3 2022 Update	EV
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06/27/2025	Q2 2025 Update	EV
12/18/2025	Q4 2025 Update	EV

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DESIGN CRITERIA

DIVISION 13 SPECIAL CONSTRUCTION

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DIVISION 13 00 00 – SPECIAL CONSTRUCTION

I. General Information

A. For the design of specialty spaces, the A/E shall provide the UTSW PM and users with recommendations for solutions that will meet the needs required while minimizing long-term maintenance requirements.
B. Solutions that offer standardization are preferred to one-of-a-kind solutions.
C. Confirm requirements for backup power as well as a connection to the Building Automation System (BAS) for all special construction.

II. Design Review Submittal Requirements

A. Refer to Section C in the UTSW Design Guidelines.

III. Section 13 21 01 Controlled Environmental Rooms

A. Rooms defined as clean rooms, cold room, warm rooms, environmental rooms, insectary rooms, plant growth chambers, etc. shall be specified as complete units with controls from a single manufacturer.
   1. All products and designs shall provide ADA/TAS/TAS accessible solutions.
B. The design of refrigeration systems for environmental rooms and growth chambers shall be reviewed by the Mechanical Professional Engineer for coordination with the building mechanical systems.
   1. System design shall provide 100 percent redundant refrigeration. Components shall include condensing unit, evaporative coil(s), controller, and emergency power.
   2. Remote condensers located within mechanical rooms are preferred. Alternate locations must be approved in writing by UTSW Utilities.
   3. Refrigerant type shall be R448A or latest EPA approved version.
   4. System design and installation shall comply with code requirements including clearances and access around all equipment.
C. A/E shall specify that the equipment manufacturer shall submit a detailed test procedure.
D. Safety signage shall be posted in a visible area outside of the room and as directed by OSBC.
   1. Sign shall indicate that hazardous chemicals cannot be stored in a controlled environmental room. Hazardous chemicals are defined in the UT Southwestern Chemical Safety Manual.
   2. Refer to Section 10 14 00 “Signs and Graphic Elements” in the UTSW Design Guidelines and Master Specifications.
E. Special Considerations:
   1. Biocontainment laboratories (BSL1-3).
   2. Gas cylinder rooms.
   3. 90-days hazardous storage rooms.

4. Medical Waste Rooms.
5. Chemical storage areas within chemistry laboratories.
6. Dehumidification requirements: Where requested by User as required for research, dehumidification shall be provided. Design shall include a vestibule sized to maintain humidity requirements.

IV. Section 13 21 66 Audiology Booths

A. Audiology booths on campus includes manufactured single- or double-wall audiology booths for testing hearing sensitivity, speech understanding, and other conditions.
   1. Models utilized and sizes shall be determined per project requirements and with guidance from UTSW Audiology for determining acoustic criteria.
   2. Models must meet ANSI standards for permissible ambient noise levels (ANSI 1986).

B. General Design Considerations:
   1. Installations shall be compliant with ADA and TAS requirements to provide a wheelchair accessible solution. New construction is preferred to include structural slab recesses, so the floor of the booth is level with the floor level.
   2. A/E shall use UTSW preferences from this section and the Space Design Guidelines to advise UTSW on the best layout per project including design considerations for access into the booth from either the control room or the corridor.
   3. Locations per project shall consider adjacencies and traffic patterns to provide "quieter" installations.
      a. Locate booths away from main pedestrian areas, hallways, elevators, heating, ventilating, and air conditioning systems, and other noise producing spaces.
      b. Locate booths away from transformers, X-ray equipment, magnetic field generating equipment, etc.
      c. Space created for the booth and associated control area shall be confirmed with and approved by UTSW Audiology. Elements include partition construction, ceiling, and slab considerations, as well as any shielding considerations.
   4. Confirm sound attenuation requirements in the HVAC system to ensure vent noise is minimized.
   5. Lighting and lighting controls shall ensure that testing and user group requirements are met.
      a. UTSW preference is for both sound booths and technician areas to have dimming functions without timers. Ensure vendor provided controls are confirmed by UTSW User Group.
   6. Manufacturer shall design ventilation to meet comfort and code requirements. Vent ducts shall be designed, sized, and placed to minimize vent noise.
   7. An audio-vestibular diagnostic room shall be electrically shielded, free of 60 cycle interference with an isolated ground. Shall be shielded from electromagnetic interference including cell phones and Wi-Fi.

C. Construction Considerations:
   1. Design shall have a minimum STC of 40 for all walls. All penetrations shall be sealed to maintain the acoustical performance of the designed partition.

2. Doors, hardware, and other openings shall be designed to provide a minimum STC of 34. Where greater control is needed, A/E shall provide specialty acoustic doors to review with UTSW PM and user. Confirm all requirements with UTSW Audiology.
3. A/E design shall address all utility requirements as required by the BOD manufacturer's requirements. Careful documentation is needed to assist the general contractor and manufacturer's installer to provide a coordinated installation.
4. Fit-out of the control area shall be timed after construction of audio booth is complete.

D. OSBC Recommendations:

1. Sprinkler Types:
   a. Flexible fire sprinkler pipe shall be required at the entry penetration to the booth. A mounting bracket shall be utilized to allow the pipe to move with the booth for physical and acoustic isolation. If unavailable from the booth manufacturer, the sprinkler pipe manufacturer shall provide.
   b. Specify concealed fire sprinkler heads.
   c. Ferrous fire sprinkler pipe for audiometry is permitted.
   d. Utilize non-ferrous fire sprinkler pipe to minimize radio frequency disturbance for auditory brainstem response (ABR) testing or electroencephalogram (EEG) testing.
2. Specify the booth with a knockout in the ceiling panel(s) for fire sprinkler pipe, sprinkler heads, and fire alarm devices.
   a. For single wall construction, the knockout would be in the single panel of the ceiling.
   b. For double wall construction, the knockouts would be in both exterior and interior ceiling panels.
   c. If booth manufacturer does not provide knockouts, ensure the booth manufacturer specifies the location for drilling the hole(s) for fire sprinkler pipe during manufacture of the booth so the location is clearly marked upon delivery to the Owner.
   d. Request stabilization bracket from the manufacturer for sprinkler pipe to be attached to the booth, if available.
3. Request a rubber coated pipe sleeve from the manufacturer to isolate sprinkler pipe from the booth.
   a. If a pipe sleeve is unavailable, utilize acoustic caulk to seal the exterior booth ceiling penetration.
   b. The sprinkler pipe shall be centered in the hole and not touching the booth prior to caulking.
   c. The sprinkler pipe shall not be permitted to move in the hole or be permitted to touch the booth after caulk is applied.
4. Installation of strobe devices on the ceiling of a booth is preferred to a wall installation.
5. Confirm additional signage requirements with OSBC for audiology booths. Refer to Section 10 14 00 "Signs and Graphic Elements" in the UTSW Design Guidelines and Master Specifications.

E. Space Considerations:
   1. Booth size will be determined per project, but an inside width of 9-foot and length of 10-foot should be a minimum consideration.
      a. Booth will contain a chair for the patient and a guest chair at a minimum.
   2. Control area shall include workspace centered on booth and window into booth.
      a. Provide access from work area to jack panel for booth.
      b. Work area shall include work surface, chair, telephone, multiple computer stations, and storage for needs of technicians.

V. Section 13 49 00 Radiation Protection

A. All projects with radiation components must strictly adhere to State regulations as well as local policy and procedures.
B. The Radiation Safety Advisory Committee (RSAC) is the official institutional standing committee charged with the control and safe use of sources of radiation in facilities under the authority of UTSW Broad Scope License issued by the Texas Department of State Health Services.
C. Requirements for radiation protection shall be determined on a case-by-case basis by the Medical Physics Department. A/E shall work with UTSW PM to obtain shielding design and coordinate into the design documents.
D. The Radiation Safety Officer (RSO), UTSW Medical Physicist, and OSBC must review and approve all projects to ensure they comply with the campus license and regulations.
   1. Refer to Section A for design criteria and Section B for code information in the UTSW Design Guidelines.
   2. Physicist / Shielding Report shall be included in project manual as reference for construction team.

VI. Section 13 49 46 MRI Radio Frequency Enclosure

A. All MRI installations shall include thorough discussions and implementations of a complete Radio Frequency (RF) enclosure system. This shall include all components, not limited to shielding, delegated design shielding design and support, window with frame, door, door hardware, and ferromagnetic detection.

End of Division 13

DOCUMENT HISTORY

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DESIGN CRITERIA

DIVISION 14 - CONVEYING EQUIPMENT

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DIVISION 14 00 00 – CONVEYING EQUIPMENT

I. General Information

A. A strong elevator solution starts with early communication between the A/E, UTSW, Facilities Management and other user groups. Design assist in early stages can lead to stronger coordination and understanding, minimizing costly issues during construction.

B. The vertical transportation system equipment for new facilities and modernizations shall be included in the general contract with specification sections prepared for each elevator system.

C. Codes and Requirements:
   1. Refer to UTSW Design Guidelines Section B – Codes and Standards for additional requirements.
   2. Elevators shall be designed and built to have a minimum component service life of 30 years.
   3. All components of an elevator system shall provide the required clearances to meet or exceed Texas Elevator Safety and Licensing Administrative Rules.
      a. Design of elevators for braille signage, wheelchair access, gurney access or other requirements shall follow requirements of TAS.
   4. The size and quantity of elevators shall comply with campus codes and regulations.
   5. Vertical transportation systems shall be provided in all facilities having two or more floors and shall be designed for the pedestrian and cargo traffic anticipated.
   6. Where groups of elevators serving identical floors are required in two or more locations, the elevators shall provide a minimum carrying capacity to allow for migration between the groups of elevators.

D. Elevator Types:
   1. Elevators shall be traction or hydraulic type depending on facility requirements. Electric operated elevators are required.
   2. Machine-Room-Less Elevators are not allowed without approval from UTSW PM and Facilities Management.
   3. Elevators for limited special use are economically undesirable and shall not be specified unless they can be fully justified to UTSW PM.

E. Design Considerations:
   1. The location of passenger elevators shall promote clear circulation patterns, be easy for visitors to navigate, provide shorter travel distances to reach elevators, and provide open site lines for safety and security.
      a. UTSW preference is to avoid placing elevators over occupied spaces.
      b. Freight elevators shall be near the building loading dock or delivery entrance with clear access to the main corridor.
         i. Access to the main corridor through usable or rentable spaces is not allowed.
   2. Elevator machine rooms without access to an elevator shall have an equipment hatch open to the floor below. Hoist beam within the machine room shall allow for equipment passage without the use of cranes or similar methods.

3. Elevators shall serve all floors that require service, including basement, sub-basement(s), interstitial spaces(s), roof, and overhead mechanical space(s).
   a. Provide access control to prevent unauthorized access to ancillary locations.
4. Refer to Design Guidelines Section A2 for ARC requirements.

II. Design Review Submittal Requirements

A. Refer to Section C in the UTSW Design Guidelines.

III. General Requirements

A. A building's elevator quantity, sizes, and types shall be determined per project to address the building population, waiting time, and other specific issues.

B. Lobbies:
   1. Elevator lobbies shall be well lit and be acoustically designed to provide a comfortable waiting area.
   2. Ventilated and conditioned vestibules are preferred in unconditioned spaces, such as a parking garages, to protect the elevator.
   3. Elevators shall be grouped in banks of adjacent elevators or banks of elevators facing each other:
      a. Do not exceed three (3) service elevators in-line, three (3) passenger elevators in-line, and not more than six (6) cars in a group of three (3) facing three (3).
      b. The lobby width between two banks of passenger elevators shall not be less than 12-feet for passenger elevators and 14-feet for service elevators.
      c. Elevators not serving most of the same floors shall be in another lobby, away from the main group of elevators.

C. Elevator Components:
   1. In clinical and high-traffic areas, A/E shall consider the use of 3D area sensors at the door to minimize door strikes.
   2. Door restrictors shall be used per specification.
   3. Elevator shall be specified to receive an electronic door safety device that extends the full height of the cab. The electronic door safety device shall be a 3D type to allow operation prior to crossing the threshold.
      a. Mechanical safety edge or traditional two-beam photo-electric eyes are not acceptable.

D. Cab Sizes:
   1. Wherever elevators are provided, ensure a minimum of one elevator cab will accommodate, at a minimum, a stretcher that is 24 by 84-inches with not less than 5-inch radius corners.
   2. A/E shall discuss with UTSW PM and user representative potential requirements for higher weight capacities for patients of size, larger cab sizes, and larger door sizes to handle oversized gurneys and/or wheelchairs in both clinical and public spaces.
   3. If special service elevators for patients of size are required, these shall be located so patients are not taken into back-of-house areas.

E. Elevator Speed:
   1. Rated speeds are dependent upon elevator type and usage and shall be verified with the end user of the facility.
   2. Unless specific requirements are provided, the rated speed for elevators shall be a minimum of:
      a. 125 feet per minute (fpm) for travel distances of less than 15 feet.
      b. 200 fpm for travel distances from 15 to 40 feet.
      c. 350 fpm for travel distances from 40 to 100 feet.
      d. 500 fpm or greater for travel distances greater than 100 feet.

F. Loads:
   1. Maximum size and weight of equipment representative of the building use shall be determined before selecting elevator size and capacity. Any known future usage plans that could impact elevator design criteria, should be discussed in early planning.
   2. The minimum elevator capacity shall be 3,500 pounds.
   3. Passenger and service elevators shall be sized to accommodate transport equipment in accordance with Texas Department of Licensing and Regulation (TDLR) Texas Accessibility Standards (TAS) .
      a. Passenger elevators shall be ASME A17.1 Class A loading as a minimum requirement for transportation of visitors, employees, and students.
      b. Service elevators shall be ASME A17.1 Class C3 loading as a minimum requirement for transportation of employees and equipment.
      c. Freight elevators shall be ASME A17.1 Class C1 loading for transportation of freight with minimal passengers.
      d. All elevators with capacities and load carrying requirements greater than ASME A17.1 Class A general freight loading shall be provided with a load weighing device which prevents overloading of the elevator. This automated system will detect an overweight condition and indicate with a visible or audible alarm within the cab.
   4. The use of slow speed elevators for the transport of animals, the transport of hazardous materials, or mortuary use shall be considered on a case-by-case basis.
      a. Specialized traffic as described above shall be separated from other traffic.

IV. Traction Elevators

A. Traction elevators shall use gearless machines unless prior approval is obtained from UTSW Facilities Management.
   1. If a geared machine is used, the transmission shall not reduce the efficiency of the combined motor-transmission below that for the gearless system.

B. Use minimum 1/2-inch x 8-inch x 19-inch or 1/2-inch x 8-inch x 25-inch preformed traction steel hoist ropes.

V. Hydraulic Elevators

A. Hydraulic elevators shall be supplied with a petroleum-based oil that includes an additive package to prevent oxidation, corrosion, and wear.
   1. Vegetable-based or blended oils are not acceptable without prior approval from UTSW Facilities Management.
   2. Oil hydraulic elevators are not acceptable unless written permission has been obtained from UTSW PM and Facilities Management.

B. Components:
   1. Electronic motor starters are required and shall use a solid-state drive to regulate the speed with either closed or open loop feedback.
   2. Hydraulic elevators shall be equipped with viscosity control and oil coolers with the down over-speed shut-off valve located next to the cylinder head.
   3. Oil line manual shut-off valves shall be in the pit and machine room.
   4. Rupture valves shall be installed per code.
   5. Oil return scavenger pump shall be in the elevator pit and power units shall be provided with secondary containment for the full capacity of the oil tank.
   6. Piston packing shall be replaced at closeout, after completion of construction or modernization project.
   7. Locate the elevator machine room as close as feasible to the elevators.
      a. Areas where hydraulic lines are located above a finished ceiling shall be verified with UTSW PM, OSBC and Facilities Management for noise abatement and leakage prevention.

VI. Elevator Components

A. Elevators shall use non-proprietary controls for operational, motion, and motor controls; any ancillary equipment shall also be non-proprietary.
   1. Controller manufacturer shall provide factory training, engineering, and technical support to the Owner’s Elevator Maintenance Service Provider including all manuals, wiring diagrams, and tools necessary for adjusting, maintaining, repairing, or testing of equipment.
   2. The design of elevator systems shall give preference to parts that will minimize the cost of future replacement parts.

B. Elevator Controls:
   1. Provide a microprocessor system with absolute position and speed feedback to control dispatching, signal functions, door operation, hoist motor, and pump motor control.
      a. Complete details of the components, together with a complete operational description, shall be submitted for approval.
      b. Microprocessor system shall evaluate building traffic demand including number of elevators in service, hall calls, car calls, elevator position, direction of travel, load in elevator, door status, and select an elevator to answer hall calls for least possible passenger wait times.

2. The elevator controller shall interface with the existing remote monitoring systems and card-reader security systems that may be present on site.
3. The driving machine brake, emergency brake, rope gripper, or a combination thereof shall have a provision to seal the means of adjusting the holding capacity to prevent changing the adjustment without breaking the seal.

C. Elevator Motors:
1. Elevator motors shall have Class IE2 or higher efficiency rating. Motors shall be rated for elevator duty, 120 starts per hour, and have class H or better insulation of the windings.

D. Elevator Hoistway and Construction:
1. Hoistways and machine rooms shall be plumb with concrete and steel works required for fire rated and hoistways shall use tolerances of +/- 1/2-inch in 50-foot rise.
2. Structure:
   a. Supports to carry all structural reaction, impact and uplift loads imposed by the elevator equipment including guide rail supports, machine beam supports, buffer supports.
   b. For car weights greater than 11,000 pounds, hoisting points capable of supporting the weight of the car plus 1 ton shall be installed centerline of the car guide rails and 12 inches towards the center from each car guide rail face.
   c. Intermediate guide rail supports shall be provided between floors to that maximum spacing between supports does not exceed 14 feet.
   d. All guide rails (car and counterweight) for traction and hydraulic elevators shall be machined or planed.
   e. Should the structural drawings not provide adequate support points for guide rails or other components, the elevator manufacturer shall bring this to the attention of the UTSW PM immediately.
   f. All welding for hoistway components shall be considered structural and shall conform to welding requirements of ASME A17.1 Section 8.8, welding of parts, except for tack welds later incorporated into finished welds, shall be undertaken by welders qualified in accordance with the requirements of AWS D1.1.
3. Hoistway walls shall be flush on all sides and the interior faces of the hoistway walls shall have a smooth, flush, and non-dust producing surface.
   a. Any projections over 4-inches shall be provided with a beveled angle not less than 75 degrees with the horizontal.
   b. All screws or other items projecting into the elevator shaft shall be made flush with the inside hoistway walls.
   c. Cutouts in hoistway walls to accommodate elevator entrances, cabs and fixtures shall be plumb and coordinated.
4. Fire Protection:
   a. Elevator hoistways and machine rooms shall provide required fire resistance ratings per UTSW accepted code standards with all penetrations sealed.

b. Fire alarm initiating devices shall be installed in elevator lobbies, tops of hoistways, and elevator machine rooms as well as other code required locations.
c. Heat detectors and sprinklers shall meet the requirements of NFPA 13, ASME A17.1, and IBC.
d. If the hoistway is required to be sprinkled, a means to remove power to the elevator before the application of water from the sprinkler shall be provided and a smoke detector shall be installed in the hoistway.
    i. Provide a heat detector beside each sprinkler head.
e. Exposed spray-on fireproofing shall not be used in the elevator hoistway without prior approval by UTSW PM and OSBC.
f. Hoistway shall have all holes and penetrations, including at the top of the hoistway, fire caulked, or have an approved fire stop system installed to meet fire rating of the hoistway.
g. Doors into machine room shall be fire-resistive, self-closing, self-locking while allowing the door to be opened from inside without a key.
h. Machine rooms shall have a smoke detector, and a class “ABC” fire extinguisher located on the strike side of the access door.
i. Hoistway shall be vented to prevent accumulation of smoke and hot gasses according to requirements of the Building Code.

5. Only equipment that serves or is associated with the elevator may be installed in any elevator hoistway including electrical conduit, plumbing, drain lines, communications equipment, ductwork, etc. per the requirements of ASME A17.1.

E. Elevator Pits:
1. A pit shall be provided for every elevator, each with a permanent lighting fixture, pit ladder, and ground fault interrupter (GFI) receptacle.
2. Provide at least minimum light level at floor of each pit of each elevator.
3. Access to all pits by means of the lowest hoistway door or separate pit access door shall be provided.
    a. A fixed vertical ladder made of noncombustible material shall be installed when the pit is more than 35-inches deep.
    b. The ladder shall extend not less than 48-inches above the floor-level access point.
4. Provide two stop switches in the pit: above the landing at the top of the pit ladder and above the pit floor adjacent to the pit ladder when the pit depth exceeds 67-inches.
5. Permanent provisions shall be made to prevent accumulation of water in the pit
    a. Sump pumps shall be capable of removing 3,000 gallons per hour per elevator. Flush mounted steel grating shall be mounted over each sump pit.
    b. Drains or sumps shall not be directly connected to the sewer line.

VII. Elevator Electrical Requirements

A. Each elevator shall be provided with a surge suppressor and separate fused or circuit breaker electrical disconnect within sight of the Motor Controller in the respective machine room.
   1. The supply shall terminate at the respective elevator controller.
   2. The elevator power supply shall be a dedicated main feeder using the shortest practicable run and a continuous ground conductor.

B. Specify that each elevator shall be provided with one set of "as built" electrical wiring diagrams laminated on both sides of each sheet with heat applied clear plastic and one electronic copy of the "as built" wiring diagrams.

C. The emergency power supply shall have the capacity to operate a minimum of one elevator per group. Nonoperational elevators within a group shall return to the floor as designated by UTSW PM and OSBC and the doors shall open.
   1. Provide two dry contacts in each machine room to indicate loss of formal power and change in source of power in either direction at least 20 seconds prior to change in power source (i.e., normal to stand by or standby to normal).

D. Provide a circuit breaker panel or disconnect switches lockable in the "off" position in each machine room for emergency power circuit for car lights, fan and alarm, circuit for the machine room GFI receptacles, circuit for the hoistway lights, circuit for hoistway GFI receptacles, and circuit for the scavenger pump in the pit for hydraulic elevator.
   1. Provide supplementary disconnect switches at remote locations.
   2. Provide necessary outlets or feeder wires to controllers as necessary for signal circuit, car lights, fans and, in pit, for pit light in accordance with NEC.

E. Provide power through a failsafe relay that is energized to turn off lights and fan.

F. Car lights and fan in the elevator shall shut-off when elevator is idle and unoccupied.

G. Arrange circuits so that power to the lights and outlets on top and bottom of elevator shall not be interrupted.

H. Each elevator shall be provided with a listed demarcation box with optional back panel and standard coin latch (or equivalent approved by OSBC). The box shall include:
   1. Terminals for connecting fire alarm inputs.
   2. A separate branch circuit supplying two (2) 110VAC duplex receptacles.
   3. Terminals for connection to card reader security.
   4. Terminals for connection to car telephone.
   5. Terminations of data cables required for card reader security, and for remote monitoring of elevator controls.

I. Conduit:
   1. Electrical conduit connections related to the elevator systems shall be made with compression fittings.
   2. Conduit outside of hoistways and machine rooms shall be a minimum of 2-inches in diameter that are run to the Fire Command Center and shall be routed from the Fire Command Center to pit of one elevator in each group.

J. Lighting:
   1. Provide manual light controls located adjacent to access doors.

2. Occupancy sensors and timers shall not be used.
3. Light levels shall be verified with elevator equipment in place to ensure code minimums are provided, including in front of each controller.
4. Hoistway lights shall be stacked vertically in the rear of the hoistway near the corner for a single elevator or on the back wall between the divider beams of a duplex or triplex installation.
    a. The extreme top and bottom fixtures shall be mounted to illuminate the pit area when the car is at the bottom landing and the car top when the car is at the top landing.
    b. Hatch three-way light switches shall be located such that every elevator in the bank shall have access to a light switch at the top of shaft access points and overhead equipment spaces.
    c. Hatch three-way light switches shall be located such that every elevator in the bank shall have access to a light switch at the bottom shaft access points, located next to each ladder and at walk in pits, if so designed.
    d. Hatch lighting system shall illuminate all adjacent shafts, pits, and overhead areas simultaneously.

VIII. Machine Room Design

A. Machine rooms shall be provided for each individual elevator or group of elevators.
    1. Groups of elevators shall be in the same machine room.
    2. Designs with multiple elevators in shared machine rooms shall allow for removal of major equipment components of each elevator for repair without dismantling components of other elevators.
    3. At all times, designs for machines and components shall provide all clearances to follow minimum code requirements. Design drawings shall indicate these clearances from the Design Development phases.

B. Elevator machine rooms shall have an independent climate control system to meet manufacturer specifications and remain between 50 degrees F and 90 degrees F with no more than 90-percent relative humidity.

C. Machine rooms shall be aligned with the hoistway and include hoist beam(s) to allow for safe maintenance.
    1. The machine room for traction elevators shall align with the top of the hoistway and extend beyond the hoistway to allow for safe maintenance.
    2. Elevator machine rooms without access to an elevator shall have an equipment hatch open to the floor below. Hoist beam within the machine room shall allow for equipment passage without the use of cranes or similar methods.
    3. The machine room for hydraulic elevators should be located adjacent to and at the lowest possible landing.
    4. A/E shall provide greater than minimum clearances above cabs for maintenance staff to access all equipment.

5. Structural beams should not be arranged above elevator equipment unless additional clearance is added.
6. Each machine room shall include a hoist beam(s) above each traction machine. Traction overhead machine hoisting beams shall be installed between four and six feet above the center of the machine drive sheave.
7. Elevators that are cabled in a 2:1 ratio shall have their hitch plates raised a minimum of eight inches above the floor for enabling access to the underside of the hitch plates from the motor room or secondary level floor where they are installed.

D. In the machine room, the disconnecting means shall be in the line of sight of the motor controller.

E. A/E shall provide greater than minimum clearances above each piece of equipment in the machine room ensuring adequate clearance for maintenance staff to access all equipment.
1. Design railings to be located around elevated machine room spaces where the elevation difference is 16-inches or greater.

F. Acoustics and Vibration:
1. Machine rooms shall provide soundproofing to surrounding space, preventing the passage of audible sound to 65 dBA or less when measured outside of the room.
2. The acoustic output of any equipment in the machine room shall not be greater than 80 dBA, measured at any point within the room.
3. Equipment shall be installed with vibration breaks to prevent unwanted vibration especially in critical areas including hospitals and ARC spaces.

G. For buildings over two-stories with substantial equipment located on or above the rooftop, the design professional shall consult UTSW PM to verify requirements for elevator access to the roof, mechanical penthouses, or both for maintenance purposes.
1. If the elevator is to extend to the roof or mechanical penthouses, an exit path to a stair shall be required at the roof level.

H. Due to the sensitivity of the electronics, elevators located in unconditioned areas, such as garages, must still be weatherproofed and have conditioned hoistways.

IX. Elevator Enclosure

A. Elevator cabs shall have a clear minimum interior height of 8 feet or greater with minimum door opening height of 7 feet.

B. Provide an elevator with a quiet ride and with little machine or operation noise. Where possible, provide acoustical backer panels or other items to reduce noise levels within the cab.

C. Doors:
1. Elevator cars shall be front entrance or front and rear entrance.
2. Doors for passenger elevators shall be center opening with entrance width a minimum of 42-inches.
3. Service elevators shall have center or side-open doors with a minimum width of 48-inches.
4. In all cases, larger openings, heights, or dimensions may be required dependent upon facility function, expected users, and future considerations.

D. Door Operators:
   1. Door operator systems shall provide power door operation and be closed loop.
   2. Freight elevators shall have automatic power operated doors.
   3. Entrance jambs and sills shall be grouted solid while door frames shall be sealed.

E. Elevator Finishes
   1. Finishes shall comply with IBC with a flame spread and smoke development of Class B or better.
   2. All finishes shall be approved by the IDBC.
   3. The cab shall have stainless steel rails on three sides with panels consisting of finishes that will stand up to heavy usage.
   4. Specify each elevator to have a set of protective elevator panels with hooks or clamps for secure installation.
   5. Panel finishes shall stand up to expected traffic, scratches, damage, and meet maintenance requirements while maintaining a finished look.
      a. A/E shall confirm all finishes with Elevator Manufacturer or Elevator Designer to ensure weights do not adversely impact elevator capacity.
      b. Glass used in or around elevators must be laminated, marked, and meet applicable UTSW standards. Additional requirements for fire resistive or fire protective glass shall be reviewed with UTSW PM and OSBC.
      c. In freight elevators, all surfaces, including flooring and rails, shall be heavy duty materials, such as diamond plate, and be easy to clean. Provide rails on 3 sides.
   6. Flooring Finishes:
      a. In high traffic areas, high-quality luxury vinyl tile (LVT) is a preferred option.
      b. Carpet may be utilized in some non-clinical spaces with approval from UTSW PM and UTSW Design Team.
      c. Tile and similar flooring must be approved by the UTSW PM and UTSW Design Team. Product weight must be included in weight calculations for the cab design.
   7. Car subfloors shall be marine grade plywood with the final flooring material to be specified by the architect.
      a. Alternative subfloors may be suggested based on project specific requirements such as flooring type or extreme loading but must be approved by UTSW FM.
      b. Flooring thickness shall be coordinated to ensure correct finished floor elevation.
   8. Cab Lighting:
      a. Elevators shall be well lit.
      b. Light fixtures shall be serviced from within the cab, be vandal proof, and shall not allow for trash or dust accumulation.

X. Signaling

A. Elevators shall use both visual and audible indicators.
B. Each elevator car shall have public address speaker on top of the car.
C. Visual Signaling:
    1. Visual indicators shall be located so persons of different demographics and health levels can clearly receive status updates from various locations around the elevator doors.
    2. Call buttons shall contain integral registration white LED lights, which shall illuminate upon registration of a call and shall extinguish when the call is answered.
    3. Provide each terminal landing with “UP” or “DOWN” indicators, lanterns a minimum height of 2 1/2-inches, and each intermediate landing with “UP” and “DOWN” digital arrow lanterns.
        a. Each lens shall be LED illuminated of proper intensity, so shielded to illuminate individual lens only.
        b. Lanterns shall signal in advance of car arrival at the landing indicating the direction of travel.
        c. Corridor lanterns shall not be illuminated when a car passes a floor without stopping.
        d. Car riding lanterns are not acceptable.
D. Operating Devices:
    1. All instructions and pictographs shall be engraved and sized to follow ASME 17.1.
    2. Corridor push buttons shall be installed with the centerline at 42-inches above the finished corridor floor.
        a. The direction of each button shall be legibly and indelibly identified by arrows not less than 1/2-inch high.
        b. Provide a corresponding Braille plate beside each button.
    3. Provide emergency power indicator light, medical emergency card reader/key switch and indicator light, fire service recall key switch, indicator light, and fire recall instruction, communication failure light, audible enunciator, and reset key switch in a fixture at the designated main floor.
E. Audible Signaling:
    1. The audible indicators shall be at tones and volumes to ensure hearing users of all ages are receiving status updates.
    2. An audible signal shall be provided at each hoistway entrance to indicate which car is answering a call.
        a. Audible signals shall sound once for the up direction and twice for the down direction or shall have verbal annunciators that say “up” or “down.”
        b. Audible signals shall not sound when a car passes the floor without stopping. Provide adjustable sound level on the audible signal.

XI. Safety

A. Provide a TAS-compliant telephone or intercom, which connects to a 24-hour maintained location, in each elevator cab.
   1. Telephone shall operate for a minimum of 4 hours when normal power is lost.
   2. Provide the ability to verify the operability of the telephone line.
   3. Confirm with elevator manufacture if phone line is to be analog or digital prior to installation of phone line.

B. Elevators shall be provided with an audible signaling device, operable from a switch marked “ALARM” located adjacent to the button to activate the phone.
   1. The audible device shall have a sound pressure rating of not less than 80 dBA and not greater than 90 dBA at 10-feet and shall be located to be audible inside the car and outside the hoistway.
   2. For elevators with travel greater than 100-foot, provide an audible device, mounted on the car with a duplicate device mounted at the designated level. The device shall be capable of operating for a minimum of 4 hours if normal power fails.

C. For buildings where the occupied floors are more than 120-feet above the lowest level of fire department vehicle access, fire service elevators shall be provided per requirements of IBC.

D. In buildings where an occupied floor is more than four stories above or below a level of exit discharge, at least one elevator shall comply with the emergency operation and signaling device requirements of ASTM 17.1.

E. In the event of an emergency:
   1. Non-emergency elevators shall return to the designated egress floor, the doors shall open, and the elevators shall deactivate.
   2. Emergency elevators are to remain available for emergency or fire fighter use.

F. Ensure smoke detectors are located in each elevator lobby.

G. Signage shall be located beside hall button fixtures with “IN CASE OF FIRE” directives.

XII. Escalators

A. Escalators are not allowed.

End of Division 14

DOCUMENT HISTORY

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06/19/2020	June 19, 2020 Print	MDR
03/25/2022	Q1 General formatting	MR
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DESIGN CRITERIA

DIVISION 21 FIRE SUPPRESSION

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DIVISION 21 00 00 – FIRE SUPPRESSION

I. General Information

A. Automatic fire sprinklers are provided in most of the buildings owned or leased by UT Southwestern Medical Center.

B. In buildings where automatic fire sprinklers are installed, they shall remain in service and be renovated or updated as part of any construction project to maintain the appropriate level of life safety in the building.

C. The A/E shall identify on all drawings, based upon the users' requirements; any area that may be classified as hazardous in accordance with the Life Safety Code. These areas shall be communicated as necessary to the project design teams to ensure the appropriate level of fire protection as required by NFPA 1: The Uniform Fire Code or NFPA 101: The Life Safety Code.

II. Design Review Submittal Requirements

A. Refer to Section C in the UTSW Design Guidelines.

III. Section 21 13 13 Automatic Fire Sprinkler Systems

A. The automatic fire sprinkler system shall be designed in accordance with NFPA 13: The Standard for Installation of Sprinkler Systems by an individual appropriately licensed in accordance with the requirements of the Texas State Fire Marshal.
   1. The Contract Documents developed by the AE shall be further developed and submitted for approval by a licensed fire sprinkler company in accordance with NFPA13 to the UTSW Fire Marshal.
   2. All equipment and materials shall be installed in accordance with NFPA 13 and UTSW fire suppression design specifications Section 21 13 00 "Fire-Suppression Sprinkler System."

B. The A/E shall document proposed locations of the fire sprinkler room, riser, and standpipe locations for coordination with other design disciplines removal of fire sprinkler heads per demolition scope of work.

C. UTSW prefers concealed sprinkler heads in offices, exam rooms, workrooms, and common areas to prevent the accumulation of dust.

D. Fire Sprinkler Design:
   1. The layout of sprinkler heads shall be in symmetrical patterns that related to ceiling features such as grid, beams, light fixtures, diffusers, etc. Where applicable, heads shall be located symmetrically and centered in two directions.
   2. Imaging projects:
      a. Imaging projects may have ceiling obstructions including gantries, overhead tracks, shielding, or other specialty systems which require greater coordination

for fire sprinkler systems. Sidewall mounted sprinkler designs and preaction systems may be discussed.

b. MRI projects shall have non-ferrous systems, including all components and materials.
c. A/E shall schedule discussions for imaging projects which include UTSW OSBC Fire Safety, Imaging Users, UTSW PM, UTSW Medical Equipment Team, and imaging vendor(s).

3. All piping shall be routed in an orderly manner, plumb and parallel to the building structure.
4. Piping shall be graded for proper flow and located to conserve building space while not interfering with other work.
5. All piping shall have sleeves when it passes through flooring, walls, footings, or other building components.
6. Locations of fire sprinkler system drains to the exterior of buildings shall be located so they do not drain onto sidewalks, paving, or pedestrian pathways. All care should be taken to ensure no slip hazards are created.
7. Final termination shall be approved by OSBC.

IV. Section 21 31 13 Fire Pumps

A. A/E shall design the discharge system of the fire pump's circulation relief line to be free from splash creation at the discharge point.
B. The splash free design must be based on the maximum flow of the relief valve during the fire pump test.

V. Section 21 31 15 Clean Agent Fire Extinguishing System

A. The clean agent fire suppression system shall be designed in accordance with NFPA 2001: The Standard for Clean Agent Fire Extinguishing Systems by an individual appropriately licensed in accordance with the requirements of the Texas State Fire Marshal.
   1. All equipment and materials shall be installed in accordance with NFPA 2001 and UTSW fire suppression design specifications.
B. All clean agent fire suppression system plan designs and project questions shall be submitted to UTSW Office of Safety and Business Continuity – Fire Safety program for review and permitting.
   1. The A/E shall document locations of the clean agent fire suppression system room for coordination with other contractors and submit these for approval by a licensed company in accordance with the Texas State Fire Marshal.
      a. Three (3) copies of the signed drawings, manufacture specifications, and calculations (where applicable) shall be submitted for review.
      b. Design review can take up to two (2) weeks to complete and no work shall begin until a permit has been issued.
      c. Inspections require a minimum of three (3) days' notice and must include a copy of the approved designs onsite.

VI. Section 21 31 16 Installation of Kitchen Extinguishing System (Dry/ Wet Chemical)

A. The dry/wet fire suppression system shall be designed in accordance with NFPA 17 – The Standard for Dry Chemical Systems, NFPA 17a – The Standard for Wet Chemical Systems, and NFPA 96- The Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations by an individual appropriately licensed in accordance with the requirements of the Texas State Fire Marshal.
   1. All equipment and materials shall be installed in accordance with the fire codes listed above and the UTSW fire suppression design specifications.

B. The A/E shall document locations of the Wet/ Dry Chemical fire suppression system room for coordination with other contractors submit documents to UTSW Office of Safety and Business Continuity – Fire Safety program for review and permitting.
   1. Three (3) copies of the signed drawings, manufacturer specifications, and calculations (where applicable) shall be submitted for review.
   2. Design review can take up to two (2) weeks to complete and no work shall begin until a permit has been issued.
   3. Inspections require a minimum of three (3) days' notice and must include a copy of the approved designs onsite.
   4. Appropriate design documents shall be developed and submitted for approval by a licensed company in accordance with the Texas State Fire Marshal.

End of Division 21

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DESIGN CRITERIA

DIVISION 22 PLUMBING

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DIVISION 22 00 00 – PLUMBING

I. General Information

A. Where provisions for future equipment, fixtures, or building expansion are required, the design of systems equipment capacity, pipe sizing, and arrangement shall accommodate proposed demand.

B. Easy access shall be provided to all working parts of all plumbing devices.
   1. Items requiring periodic maintenance or repair shall not be permanently sealed in masonry partitions.

C. Hose Bibs:
   1. Provide frost proof hose bibs on the exterior of all buildings.
   2. Major buildings shall have a minimum of one hose bib on each face of building.

D. For all plumbing work, rebar locations shall be determined prior to coring any holes.

E. Confirm access requirements for WIFI access for all MEP spaces.

F. Natural gas piping shall not be added within new construction projects. During renovation projects of spaces with existing natural gas piping, the A/E shall confirm with UTSW PM, users, and OSBC if existing piping shall be removed during construction. Refer to UTSW Design Guideline Section A, Environmental Safety Design.
   1. Removal of natural gas piping shall go back to the source.

G. Pressure Reducing Valves (PRVs) shall be located in the system to allow for repair and maintenance. Design strategies shall include providing bypass piping, isolation valves, and PRV (if needed) to maintain the required system pressure.

II. Design Review Submittal Requirements

A. Refer to Section C in the UTSW Design Guidelines.

B. Additional Plumbing Requirements:
   1. Flow diagrams shall be drawn for each piping system including but not limited to steam, heating water, chilled water, hot and cold water, distilled water, fire standpipe, oxygen, compressed air, condensing water, gas, vacuum, and refrigerant systems.
      a. Mains and major branches shall show quantities of flow with size.
      b. All valve sizes shall be indicated.
      c. Architectural room names and numbers shall be used to indicate locations.
   2. When developing floor plans, the A/E shall coordinate location of plumbing fixtures with the lower floor levels to avoid the need to route drainage, waste, or sanitary vent piping within the ceilings of or exposed above sensitive equipment or areas where water leakage could cause contamination or major property loss.
   3. Plumbing and air conditioning systems shall be drawn as separate drawings. These systems may be combined on common drawings only by written permission of UTSW.
   4. Where piping systems are to be installed underfloor, these shall be shown on an underfloor plan and not on the plan prepared for the space above. Plumbing riser diagrams must be drawn with one for each riser on the project. The riser diagram

shall include plumbing from all levels, including underfloor, roof and any unique levels. Clean-outs shall be shown on plans and on riser diagrams.

5. All construction details shall be shown on the drawings.
6. All equipment and material specifications shall be bound in the specifications and shall not be shown on the drawings.
7. Performance data schedules for all equipment shall be shown in schedules on the drawings.

III. Section 22 05 19 Meters and Gauges

A. All meters and gauges shall be located with indicators facing the main traffic pathway.

B. Domestic Cold Water:
   1. The meter shall be exactly like the type manufactured by Rosemount under the product umbrella “Rosemount 8705 magnetic flow meter.”
   2. All meters should be equipped with a Rosemount remote transmitter model 8712.
   3. Meter should be installed per the manufactures specifications and should be field verified by physical plant – utilities personnel.

C. Domestic Hot Water:
   1. The meter shall be exactly like the type manufactured by Rosemount under the product umbrella “Rosemount 8705 Magnetic Flow Meter.”
   2. All meters should be equipped with a Rosemount remote transmitter model 8712.
   3. The meter should be installed per the manufactures specifications and should be field verified by Physical Plant – Utilities personnel.

D. Irrigation Water:
   1. The meter shall be exactly like the type manufactured by Rosemount under the product umbrella “Rosemount 8705 Magnetic Flow Meter.”
   2. All meters should be equipped with a Rosemount remote transmitter model 8712. The meter should be installed per the manufacture’s specifications and should be field verified by Physical Plant – Utilities personnel.

E. Locate irrigation deduct water meters near streets for ease of reading by City of Dallas or jurisdictions in which a project is located.

IV. Section 22 05 53 Plumbing Identification

A. Plumbing identification is a critical part of all piping work. The A/E shall utilize UTSW master specifications including 22 05 53 “Plumbing Identification” when discussing labeling strategies.

B. Equipment Labeling:
   1. Each major component of equipment shall have the manufacturer’s name, address, and catalog number on a plate securely attached to the item of equipment.
   2. Secondary labeling shall identify the equipment per system name, for example Boiler 1, Boiler 2, etc.
      a. This labeling may utilize mounted plate or stenciling.

C. Pipe Markers:

   1. Visibility:

a. Markers shall be located so that they are readily visible to personnel from the point of normal approach.
b. Pipe markers shall instantly tell you all you need to know about pipe contents, direction of flow, pipe size, and whether hazardous or safe.

2. Pipes shall be marked:
   a. Markers shall be located on the two lower quarters of the pipe where the view is unobstructed.
   b. Install labels close to and on both sides of valves and flanges.
   c. Install labels before and after all wall, floor, and ceiling penetrations.
   d. Install labels adjacent to changes in direction and branches.
   e. Withing Building Concealed Spaces, locate pipe markers at 10-foot maximum intervals.
   f. Within mechanical rooms and plants, locate pipe markers at 20-to-25-foot maximum intervals.

D. Natural Gas Pipe Identification:

1. Natural gas pipe identification shall be as per A13.1-2015 standard. According to the standard, pipe markers should be positioned so that they are readily visible from the point of normal approach.
2. The A13.1 standard makes recommendations for the size of letter height and length of color field for various pipe diameters. These recommendations are shown in the table below.

Pipe Contents Label	Abbreviation	Label Colors
Natural Gas	NG	Yellow/Black
FITS PIPE OUTER DIAMETER	LENGTH OF COLOR FIELD	LETTER HEIGHT
3/4 - 1-1/4-inch	8-inch	1/2-inch
1-1/2 – 2-inch	8-inch	3/4-inch
2-1/2 – 6-inch	12-inch	1-1/4-inch
8 – 10-inch	24-inch	2-1/2-inch
over 10-inches	32-inch	3-1/2-inch

3. Exception to Label Colors:
   a. Where natural gas pipes are visible to the public, pipe paint color shall match wall or ceiling color adjacent to piping and shall be approved by UTSW.

V. Section 22 07 19 Plumbing Insulation

A. For under lavatory guards, refer to Design Guideline and Section 10 28 00 “Toilet and Bath Accessories.”

VI. Section 22 11 16 Plumbing Piping

A. Piping Types
   1. General:
      a. Press Fittings:
         i. Press fittings for copper piping are allowed in locations and methods that comply with manufacturer’s requirements for installation.
         ii. Press fittings for carbon steel piping are allowed in locations and methods that comply with manufacturer's requirements for installation.
         iii. During the design process, the A/E shall confirm with UTSW Plumbing and Utilities, the use of press fittings.
         iv. Any proposed locations of press fittings that are out of standard applications shall be approved by UTSW FM in writing.

B. Domestic Water:
   a. All interior water piping shall be type L copper with soft solder joints and/or press fittings.
   b. Exterior water piping, where copper tube is specified, it shall be Type K.
      i. Use Type K copper in tunnels and underground.

C. Heating Water – Press fittings may be allowed when following manufacturer’s instructions. Copper press fittings up to 4 inches diameter can be used.

D. Condensate drain piping – Press fittings may be allowed when following manufacturer’s instructions. Refer to Division 23 for steam condensate return.

E. Lab Water
   1. Non-drinkable.
   2. Follow the press fitting requirements for domestic water piping noted above.

F. Deionized Water
   1. Per UTSW Specification.

G. Groove Coupling Piping:
   a. Groove coupling piping systems may be used on domestic water systems for piping 2-inches and larger only.
   b. Groove type couplings may be used for galvanized steel and copper piping in mechanical rooms only.

H. Gas Piping Types:
   1. Gas lines shall be of all welded black steel piping or Viega mega press fittings inside of the building to emergency shut-off valves. Gas lines from valve to lab table or appliances may be screwed black steel with M.I. fittings for 3/4-inch and smaller.
   2. Service of gas into labs has traditionally utilized manifolds, which create issues as they age. Local tank switchers may be preferred for service to minimize cost and leaks.

I. Natural Gas
   1. All building gas piping shall be designed and installed in accordance with National Fuel Gas Code, NFPA 54, and latest edition. Refer to Division 22, General Information for campus information.

J. Valves:
   1. For domestic water supplied to a building, a reduced principle zone (RPZ) backflow preventer assembly is required.
   2. Reduced pressure zone backflow preventers shall be used on any domestic water connection to the fire protection water system and shall have reduced pressure double check valves.
   3. All control valves shall be listed in a schedule on the drawing showing identification number, body size, port size, if applicable, whether normally open or closed, spring range, and CV.
   4. All control valves in the domestic water system shall be of non-ferrous, epoxy coated or stainless-steel construction.

K. Construction and Installation:
   1. Provide insulation on all roof drain lines and overflow lines and pipes that accept condensate.
   2. Provide threaded wall stops at all lavatories and sink water supply piping.
   3. Deionized water piping shall be completely drainable. All low points and traps in the system shall have the capability to drain the system completely prior to starting the system.
   4. Piping removed during construction shall be removed back to main line still in use and capped.
   5. No piping should be run in concrete floors.
   6. Pipes penetrating exterior walls below grade must be installed so as to prevent breakage due to building settlement and to maintain a watertight seal.

L. For sanitary sewage, refer to Section 33 31 00. For additional requirements Section 22 11 16 should be referred to.
   1. Underground sanitary sewer to be cast iron, hub, and spigot or DWV PVC.
      a. No-hub cast iron may be used in the interior of the building.
   2. In general, sanitary distribution systems outside the building are civil engineering projects. If distribution is complex, such a consultant shall be retained to do this work.
   3. Sanitary sewers shall show invert elevations at manholes and other critical points.
   4. Buildings shall be designed to permit gravity drainage of sanitary sewage.
      a. The pumping of sanitary sewage is prohibited unless there is absolutely no other alternative.
      b. Where sewage ejector or sump pumps are to be provided, these shall be so located that there is sufficient head room to pull the pump shafts straight up through the floor plate. Lifting eyes shall be included in or near the ceiling to facilitate this operation. Rail mounted pumps should be considered.
   5. Vent pipes shall be carried up adjoining soil and waste pipe, and they shall be connected into the main stack at top and bottom.

a. Vents may be one size smaller than the traps they serve, except that no vent shall be less than 2-inches.
b. The size of vent lines accommodating more than one fixture shall be sized in accordance with the International Plumbing Code.

6. General Requirements:
   a. All floor drains and floor sinks shall be furnished with trap guards .
   b. All janitors' closets shall be arranged with the sink near the door and a floor drain in the room.
   c. All mechanical room floor sinks shall be a minimum 4-inch diameter, with acid resisting interior, and shall be connected with trap guards . Floor drains in areas above grade and over crawl spaces shall have mechanical joints for easy access. Coordinate with architect to provide minimum 1-inch in a 10-foot slope to room and area drains. Do not locate floor drains under machinery.
7. Drains serving as indirect receptors for other drain piping shall be floor sink style.

M. Toilet Room Requirements:
1. Sanitary waste cleanouts shall be located at 24-inches AFF in every toilet room. Install upstream from all fixtures to enable cleaning of entire waste line to sanitary vertical stack.
2. Each restroom should have at least one 4-inch floor drain when serving 80 or more square feet and 3-inches minimum for less area. Locate under toilet stall partition or where one is not likely to walk.

N. For ARC special requirements, refer to UTSW Design Guideline Section A2.

O. Domestic water lines shall not be run to coffee makers, unless a drain is provided, and the coffee maker is immediately adjacent to a sink.

P. For storm drainage utilities, refer to Section 33 41 00 for additional requirements.
1. Storm shall show invert elevations at manholes and other critical points.
2. In general, storm distribution systems outside the building are civil engineering projects. If distribution is complex, such a consultant shall be retained to do this work.
3. Roof drain piping shall be sized in accordance with the current International Plumbing Code.
4. Roof drains shall be run separately from all other storm water sources to a manhole outside the building.
   a. Downstream from this manhole, the piping shall be sized sufficiently large to prevent roof drain water from impeding the proper flow from area drains.
   b. All piping 50 feet or more below the roof shall be welded construction.
5. Buildings shall be designed to permit gravity drainage of storm water.
   a. The pumping of rainwater is discouraged and, where it becomes necessary, an assignable area could be flooded on pump failure.
   b. An emergency generator shall be provided with adequate room for ventilation, a fuel supply, exhaust to roof, and radiator cooling duct.
   c. Submersible type heavy duty pumps with extraction rails shall be used in lieu of vertical type sump pumps.

VII. Section 22 11 19 Plumbing Specialties

A. For ARC specific requirements including backflow preventor locations, refer to UTSW Design Guideline Section A2
   1. Water supply services within containment facilities shall have back flow prevention devices including housekeeping hose bibs.
   2. Drainpipes:
      a. Drainpipes shall be sized appropriately for expected usage but no smaller than 4-inches.
      b. Some large animal areas may require drainpipes greater than 6-inches in diameter.
   3. Floor and sink drains:
      a. Each shall have traps filled with water or disinfectant to prevent movement of vermin or gases.
      b. All floor drains shall have traps and cleanouts with the means of flushing readily available due to food or bedding becoming clogged in pipes.
      c. Floor drain traps shall be a minimum of 5-inches deep with cleanout plugs located within the containment area.

VIII. Section 22 40 00 Plumbing Fixtures

A. Toilet Rooms:
   1. Lavatories located in public and staff washrooms shall be provided with electronic sensor activated faucets.
   2. All electronic flush valve sensors shall be provided with a manual override button.

B. Specimen Collecting Toilet Rooms:
   1. Lavatory faucets shall be provided with AC powered electronic sensors that are controlled by a wall switch located outside of the toilet room.
   2. Flush valves shall not have manual override buttons and shall have AC powered electronic sensors that are controlled by a wall switch located outside of the toilet room.
   3. Coordinate with Owner's staff for exact location of wall switches.

C. Patient Areas:
   1. All lavatories and sinks within patient care areas shall be provided with a spout having an outlet a minimum of five inches above the flood level rim of the fixture.
   2. Gooseneck spout outlets shall terminate 5-inches minimum and 6-1/2-inches maximum above top of rim of lavatory sink. Horizontal dimension from spout inlet to spout outlet shall be a minimum 5-1/2-inches.
   3. EXCEPTION: All lavatory faucets within public toilets shall have low-profile (non-gooseneck) spouts.

D. Healthcare Areas:
   1. Refer to UTSW Design Guidelines Section A3 Clinical Design Requirements for these spaces.
   2. For clinical sink locations such, refer to Section A3 – Clinical Design Requirements for splash guard requirements.
   3. Hospital toilets shall include plumbing protection systems as noted in the UTSW Master Specifications.
   4. Project A/E shall confirm requirements for patients of size to ensure toilet models are correct for the need.

E. For ARC requirements, refer to UTSW Design Guideline Section A2.

F. Lab Requirements:
   1. Lab sinks used for general research shall be provided with manually operated faucets served with hot and cold water.
   2. Sinks located in BL-2 or higher tissue culture rooms shall be provided with foot pedal or electronic sensor activated faucets.

G. Electric Water Coolers (Drinking fountains):
   1. Wall-mounted, stand-alone units are preferred for ease of maintenance and repair.
   2. Water bottle filling units shall be provided on one of the two water coolers units at one location per floor with approval from FM.
   3. Adherence to ADA and TAS is critical, and layouts shall prevent the creation of protruding objects on the “high” unit.
   4. Models shall include a filter status indicator.

H. Shower and Bath:
   1. Showers shall be provided with code compliant drain pans attached to floor drain in accordance with the latest edition of the Uniform Plumbing Code.
   2. Shower finished floor and bathtub bottom shall be slip resistant.
   3. Bathtubs shall be enameled cast iron or high strength composite material with porcelain finish.

I. Emergency Fixtures:
   1. Emergency showers and eyewash are required where bulk hazardous chemicals are handled or as indicated by UTSW OSBC Chemical Safety. All labs shall be within code-required distance of an emergency shower.
      a. Floor drains at safety showers are not required. Where drains are proposed, the design discussion must include initial and long-term costs, the need for trap primers or similar technology, and must ensure wastewater requiring treatment doesn’t enter the sanitary sewer system. Design discussions shall include facility users, UTSW Building Maintenance Teams, OSBC, and other UTSW groups as required.
      b. Floor sinks with grate are preferred to drains, where possible, beneath safety showers.
   2. Emergency fixtures are required to comply with project codes, regulations, and ANSI. Refer to UTSW Master Specifications.

3. Emergency fixtures may include emergency showers, eyewash, and combination units.

J. Refer to Section 12 36 00 Countertops for integral, epoxy, and solid surface sink bowls.

IX. Section 22 61 10 Laboratory Compressed Air Systems

A. Compressed Air Piping
   1. The piping for vacuum and gases shall be Type L, hard drawn, seamless copper tubing with wrought copper solder fittings.
   2. Piping to pitch back so that it drains to the drain points shown on drawings.
   3. Piping shall be cleaned in accordance with CGA recommendations for oxygen piping service.

B. Valves
   1. Compressed air valves shall be stainless steel ball valves, with screwed joints and Teflon seats.

C. Pressure System
   1. Air compressor shall be scroll and oil less type. Unit to be protected by temperature switches.

D. Desiccant Air Dryer
   1. To deliver -60 degree Fahrenheit pressure dew point each rated to handle capacity of two compressors.
   2. Dual air line filtration system for removal of particulate matter and liquids.

X. Section 22 62 19 Medical Gas and Vacuum Systems

A. Piping
   1. The piping for vacuum and gases shall be Type L, hard drawn, seamless copper tubing with wrought copper solder fittings.
   2. All vacuum piping shall be purged with dry nitrogen while being soldered.
   3. Piping to pitch back so that it drains to the drain points shown on drawings.
   4. Branch takeoffs shall be made from the top of main pipe.
   5. Before erection all piping shall be thoroughly cleaned in hot solution of sodium carbonate mixed in equal proportions of one pound to three gallons of water.

B. Service Outlets
   1. Wall type service outlets – shall be quick release type installed approx. 50 inches above finished floor housed in back box with stainless steel cover.
   2. Ceiling type recessed service outlets – shall be complete with pin indexing between fascia and matching, keyed slot in channel slot box saddle. Hose coupler shall be threaded type and hose shall be plastic, conductive and color coded. Connect all ceiling outlets to a common ground.

C. Medical Gas Valves
   1. Valves shall be bronze bodied, double seal, full flow ball valve with Teflon seat seals and O-ring packing designed for 300 psi with a chrome plated brass ball which seals in

both directions. The valves require only a quarter turn of the handle to completely open or close.

D. Medical Gas Hard Piped Manifold
   1. The medical gas system supplied from multiple gas storage tanks shall be provided with a pipe manifold to connect to the gas tanks. It should be equipped with a monitoring and switching device like Thermo Scientific Gas Guard model 3050/3052 or approved equal. When the active supply tank is depleted, an audible alarm sounds, and it automatically switches to the second tank.

E. Vacuum Pump and Accessories
   1. The vacuum pumping unit shall be arranged for triplex operation as scheduled on the Drawings.
   2. Provide vacuum relief valve, silencer and water seal solenoid valve.
   3. Pipe air and water discharge to the nearest floor drain.
   4. Install vacuum exhaust line to exhaust vapors and odors to outside.

XI. Section 22 66 00 Lab Waste System

A. Acid waste piping will be Borosilicate glass system and Polypropylene Acid Waste Pipe manufactured from resin meeting ASTM D4101 and Socket Fusion Fittings.
   1. No-Hub fittings allowed.
   2. No acid waste or vent pipe shall be sized smaller than 2-inches diameter.

B. Acid waste exposed to the potential for damage shall be constructed of high silicone cast iron protected with uni-strut guards.

XII. Section 22 64 00 Medical Gases Startup and Certification Procedure

A. The certification shall be performed by a party other than the installation contractor.

B. The certification of medical gas pipeline system must be performed by a Certifier, licensed to ASSE Series # 6030.

C. The Contractor is responsible to fill the system with the appropriate gases before the certification process. The gases are to be filled as per manufacturer's instructions.

D. The Contractor shall complete all system tests listed in specs section 22 64 00 and prepare test reports to be submitted to UTSW PM, Owner (UTSW Facilities & Hospital Facilities) and Certifier.

E. After certification the system should be leak free and continuously fed. The manifold should not fluctuate in pressure, indicating a possible leak.

XIII. Section 22 67 06 Deionized Water System

A. All deionized water fixtures shall be designed for recirculation, regardless of existing de-ionized water design or availability.
   1. If a return line is not available, the fitting will be capped for future.

B. All fixtures serving laboratory Millipore filtration systems shall be equipped with a positive connection, such as a compression fitting.
   1. "Tube-and-turret-barb" configurations are not allowed.

C. The standard procedure is to provide a Hayward 1/2-inch PVC Needle valve with double female connections, stock # NV10050T.

D. Piping:
   1. Piping utilized includes Poly Propylene, PVDF, Schedule 80 PVC, Schedule 80 CPVC, and PTEF for tubing.
      a. Poly Propylene may be used with use and locations to be confirmed in writing by UTSW FM.
   2. All connections between dissimilar materials in the piping system shall be made with couplings.

E. At every point where piping penetrates a floor slab, except slabs on grade, a cast-in sleeve or other waterproof curbing at least 4-inches high shall be provided.

End of Division 22

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DESIGN CRITERIA

DIVISION 23 HEATING, VENTILATING, AND AIR CONDITIONING

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DIVISION 23 00 00 - HEATING, VENTILATING, AND AIR CONDITIONING

I. General Information

A. This design guideline is intended to provide useful information to the A/E to establish a basis of design. The responsibility of the engineer is to apply the principles of this section and the ones that follow so that UTSW may achieve a level of quality and consistency in the design of their facilities.
   1. Deviations from these guidelines must be submitted to the UTSW PM for approval.

B. Design - System:
   1. Mechanical systems in all buildings should be designed to exceed the minimum performance requirements of ASHRAE 90.1 and incorporate cost effective energy conservation measures that do not compromise building performance or occupant comfort.
   2. The design of the mechanical system and other building components in all buildings shall be integrated together to produce a building that meets the project programmed functional, sustainable and energy requirements.
   3. Provide N+1 redundancy for critical building utility service equipment, typically including chilled water pumps, hot water pumps, and heat exchangers.
   4. Mechanical systems must be coordinated with all other building systems and features.
   5. Mechanical systems must be maintainable and all components reliable. The mechanical design and installation of all components and equipment shall allow for eventual removal and replacement.
   6. All mechanical system components shall be manufacturers' standard commercial product. A standard commercial product is a product that has been sold for a period of at least five years on the commercial market, is listed in the manufacturers' catalogs and brochures and represents the latest production models.
   7. HVAC systems shall be designed to allow systems to be scheduled off or set-back during unoccupied hours, weekends, and holidays. Allow a small AHU with OUTSIDE AIR to be scheduled on to maintain positive building pressure.
   8. Variable Frequency Drives (VFD's): Shall be provided on all air moving fans and pumps of two horsepower and above. This does not apply to constant volume fans and pumps. The designer shall use care in the provision of VFD's and shall not arbitrarily provide for VFD's where not appropriate.
   9. No more than 3 rooms of similar size, orientation, and function should be on the same zone.
      a. Director offices, corner rooms, conference rooms, and other special purpose rooms should be on an individual zone.
      b. Small corridor areas or storerooms may be added to almost any small zone.

c. Zones requiring large amounts of air (such as auditoriums or laboratories) may require more than one terminal unit and may be controlled by a single thermostat.
d. Terminal units are limited to 2,000 cfm maximum.

10. Locate thermostats near light switches in every room in a standard configuration and coordinate locations before IFC with furniture, artwork, equipment, and other elements.
11. Consultant to include a summary schedule to list all humidification systems. The list shall include as minimum:
    a. AHU/humidification system identification, number, or tag.
    b. Sheet number.
    c. Room number where the system is installed.
    d. Fire alarm device location.
12. The A/E shall communicate concerns for any proposed system design, if they believe it cannot comply, to the UTSW PM in writing. This shall occur during the design phase to ensure there is sufficient time to meet Contract schedule obligations.

C. Design – Layout:
1. A/E shall design all systems with required service and maintenance clearance space following campus codes and manufacturer's recommendations. Refer to Design Guideline Section A, "Building Core Elements: Mechanical Rooms" for design requirements.
2. The design shall include a plan for the removal of all demolished equipment.
    a. Indicate the sizes of major pieces of equipment and clearly marked paths of removal and egress for the equipment.
    b. UT Southwest's preference is to remove all equipment through elevators to ground level but egress paths of equipment through removable louvers or roof cupolas are acceptable only if the elements are crane accessible.
    c. Coordinate with the structural designers to add lifting beams as required to remove or replace heavy equipment.
3. Coordinate with the architect to ensure elevator access to all levels, including basement, attic mechanical spaces, roof, or mechanical penthouses.
    a. An exit path to a stair shall be required at the roof level.
    b. The elevators shall be sized and designed for equipment removal and replacement.
4. Provide unions or flanges to permit easy removal of equipment.
5. The design of rooftop equipment shall include the incorporation of mechanical penthouse design. Rooftop sheds or doghouses shall not be utilized on new projects.

D. Design – Controls:
1. Plans and specifications must include a detailed system process and instrumentation diagram which includes all control points and control sequences of operation.

E. Design – Identification:
   1. Safety signage and symbols shall be reviewed and approved by OSBC. Refer to Section 10 14 00 “Signs and Graphic Elements” in the UTSW Design Guidelines and Master Specifications.
   2. Label major mechanical equipment with a permanently affixed label containing equipment identification number or bar code as assigned by the facility management software.

F. Design – OSBC
   1. A/E shall provide OSBC with drawings indicating where life safety elements interface with HVAC components for review and approval at each design phase.
      a. A/E must obtain written approval from OSBC on location and type of life safety devices installed with humidification systems.
      b. A/E shall follow NFPA 90A for the design and locations of fire dampers. Refer to section 23 33 00 “Ductwork Accessories” for additional requirements.
   2. Smoke detectors in an HVAC system that includes the use of humidification shall be located in a manner such that they will not activate during the process of water vapor generation. The smoke detectors used shall be listed for use in an HVAC system and installed in accordance with the Texas State Fire Marshal currently adopted edition of NFPA 72: The Fire Alarm and Signaling Code, NFPA 90A: Standard for the Installation of Air Conditioning and Ventilating Systems, and 90B: Standard for the installation of Warm Air Heating and Air Conditioning Systems.
   3. Smoke detectors in HVAC system shall not be used to modulate vanes to control airflow.
   4. Fire dampers only shall be used to provide protection in 2 hour or above fire rated barriers. Fire/ Smoke dampers or smoke dampers shall be installed only where specifically required by NFPA 90A.
   5. Fire dampers shall be positioned so that the links are immediately accessible to maintain and service them.
   6. The contractor shall provide a Code compliant method of testing the function of the fire dampers. An initial testing report documenting the operation of the dampers shall be provided upon approval and acceptance of the dampers.

G. Provide complete flashing and trim details for all thermal and moisture protection systems to include assemblies, system transitions, and termination points.

H. Coordinate with UTSW Utilities for the contractor to be used on each building.

I. Confirm access requirements for WIFI access for all HVAC spaces.

II. Design Review Submittal Requirements

A. Refer to Section C in the UTSW Design Guidelines.

B. Additional HVAC Requirements:
   1. Floor plans for mechanical systems shall be drawn to show pipes, ducts, etc. on the floor in which they are installed.

2. Floor plans for mechanical systems shall be drawn to show pipes, ducts, etc., on the floor in which they are installed.
3. A complete roof plan shall be included both for air conditioning plans and plumbing plans; one plan may serve for both.
4. All construction details shall be shown on the drawings.
5. All equipment and material specifications shall be bound in the specifications and shall not be shown on the drawings.
6. Performance data schedules for all equipment shall be shown in schedules on the drawings.

III. HVAC – Renovation General Design Guidelines

A. Predesign Requirements:

1. The A/E is responsible for understanding and documenting existing building conditions in their project scope.
2. Refer to Section B2 for additional information on Renovation deliverables.
3. Early in the design phase, the A/E shall make advance arrangements with the UTSW PM for access above ceilings.
    a. A/E shall determine the above noted field conditions and to locate existing HVAC components and utility services.
4. Contact the UTSW PM to coordinate with OSBC to identify existing fire, smoke, and fire/smoke dampers within the Project Boundary and to determine acceptable actions to be taken.
    a. Clearly communicate this scope of Work within the Construction Documents.
5. The following table represents typical conditions and actions regarding existing dampers.
    a. Verify actual scope of Work required with OSBC prior to finalizing Construction Documents:

Criteria	Action
Compliant and Needed	Maintain
Compliant and Not Needed	Remove Completely
Deficient and Needed	Replace with New or Repair
Deficient and Not Needed	Remove Completely
Access Issue and Needed	Repair
Access Issue and Not Needed	Remove and Document

B. Planning:

1. When zoning and selecting air handling systems, consideration must be given to the following:
    a. Space availability for equipment, piping, equipment floor drains, and ductwork.

b. Construction phasing requirements.
c. Present capacity and condition of the existing HVAC systems, and components if any, serving areas to be renovated.
d. Determine current HVAC load requirements prior to calculating the revised HVAC loads for the renovated Project area.
e. Impact of renovation activities on adjoining areas not included in the Project.

C. Documentation:
1. For all stainless-steel ductwork to be altered in a renovation, the A/E shall note in a general note and coordinate with the Mechanical PE the following:
a. General Contractor shall have all ignitable debris removed from all ductwork and ductwork risers from the section of removal all the way through the roof. This may include horizontal ductwork sections serving other areas. The removal of debris must be done prior to plasma cutting, grinding, cutting, and welding any ductwork as part of the renovation. The supply or exhaust will also need to be shut down prior to Hot work being started and inspected by OSBC before work starts.
b. General Contractor will need to make provision to investigate condition of the ductwork prior to cutting any ductwork that may or may not contain ignitable debris.
c. General Contractor shall verify conditions are safe for welding new stainless-steel sections to other sections or HVAC equipment.

IV. HVAC – General Planning Criteria

A. Each component of an air handling system shall be spaced in the unit so that there is room as per code/manufacturers recommendations on all sides for inspection, maintenance, and location of man-sized hinged access doors.
B. Equipment rooms shall be large enough to provide access to all equipment for maintenance and a means to remove and replace equipment. Adequate “pull spaces” shall be provided for coils, shafts, filters, etc.
C. Mechanical Rooms:
1. Do not use mechanical rooms or air handling unit equipment rooms as return air plenums. No pumps, panel boxes, etc. can be installed in a plenum.
2. Ventilate mechanical rooms.
3. All mechanical rooms shall have locks and a common key system not accessible to building personnel. Coordinate with the key shop for locks hardware requirements.
4. Access shall be provided to mechanical room spaces without going through any assigned area such as a janitor closet.
5. Combinations of mechanical rooms and janitor closets, or mechanical room with storage spaces, are not acceptable.
D. Provide lifting eyes or trolley rails for heavy equipment.
E. Roof Areas:

1. Walkways shall be provided for roof-mounted machinery so that equipment may be serviced without traffic directly on roof.
2. Roof-mounted equipment shall be accessible by a stair.
3. Hatches without stairs or use of external ladders are not acceptable.

V. Cooling And Heating Load Calculations

A. Heating and cooling system design loads must be determined in accordance with the calculation procedures described in the ASHRAE 183 unless otherwise specified herein.

B. Heating and cooling system design loads for the purpose of sizing systems, appliances and equipment must be determined in accordance with the following requirements.

1. The HVAC design analysis for new facilities or renovation of existing facilities must include a psychometric analysis documenting that the system meets design criteria.
    a. The analysis must provide calculations of system cooling load, energy/mass transfer through conditioning equipment and fans, and a system schematic indicating state point dry bulb and wet bulb temperatures (or humidity ratios) of outside air, mixed air, supply air, and return air flow streams.
    b. The system must provide the capability to condition ventilation air and maintain space relative humidity over the full range of cooling load.

VI. Outdoor Design Conditions

A. Use the ASHRAE Fundamentals Handbook.

B. Comfort cooling: 0.4 percent dry bulb and the corresponding mean coincident wet bulb (MCWB) temperature and 0.4 percent humidity ratio and corresponding mean coincident dry bulb (MCDB) temperature.

C. Comfort Heating 99.6 percent dry bulb temperature.

D. Indoor Design Conditions for Various Occupancies: Listed below are the general design conditions that shall be used for occupancies at UTSW:

Room Type	Temperature	Humidity (Percent)	Air Changes	Room Pressure
Office	72 +/- 3°F	10 - 60	6-10 per hour	Neutral
Wet Lab	72 +/- 3°F	10 - 60	10-15 per hour	Negative
Dry Lab	72 +/- 3°F	10 - 60	6- 10 per hour	Neutral
Equipment Galley	72 +/- 3°F	10 -60	6- 10 per hour	Neutral
Animal Room	72 +/- 3°F	10 -60	10-15 per hour	Negative
Fly room	63 +/- 3°F	30 - 70	1 - 5 per hour	Negative
Tissue culture	72 +/- 3°F	10 - 60	6- 10 per hour	See below

1. Most buildings on the UTSW campus are designed for 100 percent outside air.
2. Air from wet labs, animal rooms, fly rooms, tissue culture labs, and other similar spaces shall be 100 percent exhausted.

3. Tissue culture rooms shall be negative pressure with respect to the corridor in order to prevent contamination of adjacent labs. Tissue culture labs require that the room be positive with respect to the hood in order to prevent migration of contamination into the experiment.
4. Standard practice has been to locate the exhaust grill between the hood(s) and the room exit to provide a relative negative pressure zone with respect to the hood and the adjacent laboratories.
5. Where cleanliness requirements are needed, an air shower should be used.
6. Special consideration must be used in the location of supply air diffusers in a tissue culture room. As a rule, diffusers are not located within six feet of a hood, and the airflow is directed away from the hood face.
7. In lieu of location, directional diffusers must be used. The velocity of the supply air discharge shall not exceed 50 FPM for any diffuser within six feet of a tissue culture hood.
8. Dehumidification process:

   > 40 percent RH – Refrigeration or chilled water
   < 40 percent RH – Refrigeration or chilled water supplemented by desiccant wheel type dehumidification

VII. Research Lab Spaces HVAC System

A. Research labs shall be 100 percent outside air, single duct, variable air volume, central air-handling units with hot water reheat coils.

B. For ARC special requirements, refer to UTSW Design Guideline Section A2.
C. Building ventilation shall be provided by dedicated outside air pre-treatment unit(s).
D. Lab Exhaust Header system connecting all chemical fume hoods, ducted bio-safety cabinets, and general lab exhaust to common lab exhaust fan system shall be located on a roof.
E. Lab exhaust shall terminate with stack to exhaust contaminants to provide acceptable dilution and prevent recirculation of containments into building ventilation.
F. Exhaust energy recovery laboratory facilities with total exhaust greater than 15,000 CFM shall include heat energy recovery systems to precondition outside air.
   1. Energy recovery systems will be designed for zero cross-contamination.

VIII. Office Spaces HVAC System

A. The office space HVAC system shall be single duct, variable air volume, central air-handling units with VAV boxes and hot water reheat coils.
B. Building ventilation shall be provided by dedicated outside air pre-treatment unit(s).

IX. Clinic Spaces HVAC System

A. The clinic space HVAC system shall be single duct, variable air volume, central air-handling units with VAV boxes and hot water reheat coils.
B. Building ventilation shall be provided by dedicated outside air pre-treatment unit(s).

X. Support Spaces

A. All storage spaces shall be ventilated and should preferably be served with building exhaust air
B. Toilet rooms shall have a supply and a mechanical exhaust system. Janitor's closets shall have a mechanical exhaust system.
C. Exhausts from adjacent toilet rooms shall be arranged to prevent sound transmission between men and women's areas.
D. Transformer vaults shall have separate ventilating fan or fans connected to emergency power supply. Vault shall be vented to outside in accordance with the National Electric Code.

XI. Automatic Temperature Controls

A. Provide a temperature control/energy management system and control function for the entire building.
B. The system shall include a standalone Siemens Direct Digital Control (DDC) System. That communicates with the Central EMS at the Facilities Services Department through an Ethernet card and the campus instrumentation control distribution wiring system.
C. The EMS/Automatic Temperature Control (ATC) system must be compatible with the existing Siemens campus system while monitoring and/or controlling the central campus systems including, but are not limited to, the following:
    1. Temperature control.
    2. Fire alarm.
    3. The start and stop of major equipment.
D. Monitoring of specific mechanical equipment and systems will be dependent on the recommendations of Facilities Management.
E. Provide metering of utilities with indication and totalization capabilities.

XII. Energy Management System

A. Provide a stand-alone direct digital control (DDC) system for space conditioning in campus buildings connected to the central campus EMS system.
B. During the Design Development and Construction Documents phase, consult with the respective controls firm to determine the number of DDC Panels required and the location for each panel.
C. A/E shall document the panel locations in the drawings.

XIII. Section 23 05 19 Meters and Gauges

A. All meters and gauges shall be located with indicators facing the main traffic pathway.
B. All buildings shall be designed for metering campus thermal utilities.
C. All auxiliary areas in a building shall be piped in a manner to allow sub-metering including flow and temperature sensors on supply and return chilled water piping.
D. Calculations shall be based on flow and temperature differential.
E. Provide a lockable bypass valve around the building meter(s) if uninterruptable service is critical.
F. The Make-up water meters:
    1. The make-up water connections for hot water, chilled water and condenser water services shall be provided with water meters.
    2. The meter shall have the capability of sending output of totalizer in gallons and flow rate in gpm to Siemens BAS.

XIV. Section 23 05 23 Valves for HVAC Piping

A. All steam and condensate valves shall be 300# forged carbon steel. Brass valves are not acceptable.
B. Butterfly valve hand wheels shall be positioned to allow access and ease of operation.
C. If a valve is more than 6 feet above the floor, a chain fall shall be provided.
D. The orientation of butterfly valves shall be installed per manufacturer recommendations to increase valve longevity and avoid flow turbulence.

XV. Section 23 05 48 Vibration and Seismic Controls for HVAC:

A. Design of HVAC systems to maintain noise levels below those recommended for the proposed occupancy in accordance with the ASHRAE Handbook and SMACNA guidelines.
B. Use ASHRAE Applications Handbook Chapter “Selection Guide for Vibration Isolation” or manufacturers recommendations for vibration isolation design requirements.
C. Locate sound sensitive rooms away from air handlers and mechanical equipment.
D. Acoustical duct liner is not allowed.
E. Use double wall acoustic duct where sound attenuation cannot be accomplished by other methods and the duct is not serving occupancies that are sensitive to particulates.
F. Increase the outside duct dimensions as required to maintain adequate internal cross sections. A/E to notify UTSW PM of this approach for cost validation.

XVI. Section 23 07 13 Ductwork Insulation

A. Duct wrap, rigid, and semi rigid insulation are listed in the Specifications.
B. Rigid/semi rigid duct insulation is highly preferable to blanket insulation/duct wrap as the installations tend to last longer.
    1. Duct wrap insulation is frequently proposed as a value engineering option in lieu of rigid/semi rigid duct insulation.

XVII. Section 23 09 00 Instrumentation and Control for HVAC

A. This section is for the control equipment for HVAC systems, components, and other systems shown to be controlled by the Building Automation Systems (BAS) including, but not limited to all computer software and hardware, controllers, sensors, transmission equipment, and related components.
B. Refer to UTSW Master Specification for additional requirements for DDC points list and additional software programming points. Alternatively, this information could be added to the drawings.
C. Standard monitoring on UTSW campus includes:
    1. Carbon Monoxide.
    2. Carbon Dioxide.
    3. Oxygen.
D. Safety: Additional monitoring may be required per project and shall be confirmed with UTSW Utilities and OSBC.
    1. CDAS Equipment Monitoring:
        a. Central Data Acquisition System (CDAS) is a campus-wide, central monitoring station. This is physically located in the Facilities Management Office Building.
        b. Equipment monitored by CDAS includes low-flow alarms at hoods, refrigerators, freezers, blanket warmers (could require 1 or 2), and other equipment as indicated per project.
        c. Provide the following for each CDAS monitoring location:
            i. In-wall box and faceplate shall be connected to conduit that is stubbed out above the ceiling.
            ii. The cabling type shall be confirmed per project. Typical cables include multi-conductor twisted pair 22 o4 18AWG plenum rated or vendor proprietary types.
            iii. The controls contractor will provide items identified for CDAS.
    2. Dry Ice Storage:
        a. Storage space shall be ventilated to always maintain ambient carbon dioxide (CO_2) concentrations below 5,000 parts per million (ppm) and ambient oxygen (O_2) levels above 19.5 percent.
        b. The Project Engineer shall determine the quantity of air changes per hour to maintain concentrations below 5,000 ppm.

c. Provide both visual and audible alarms for gas monitoring to indicate when either concentration is outside of range.
    i. Visual alarm shall be strobe on both the interior and exterior of the space.
    ii. Audible alarm shall be located on both the interior and exterior of the space.
    iii. Issue a remote alarm to BAS.

XVIII. Section 23 20 00 HVAC Piping and Pumps

A. Chilled Water System: For North and South Campus, the chilled water system for the facilities is comprised of a pair of CHS/CHR pipes from the central plant. Typically, the water is provided with a 14°F temperature difference, but A/E shall coordinate with facility management and use the highest possible temperature difference (Delta T) between CHS/CHR. Loads will have two-way modulating control valves to control chilled water flow to the equipment. Differential pressure transmitters between the chilled water supply and return mains at various locations will be utilized to inform the campus facilities engineering group information about the health of the system. The cooling coil farthest from the system connection will be equipped with an automatic 3-way control valve to maintain a minimum flow rate in the piping system. A secondary process chilled water piping loop with plate frame heat exchanger may be added to meet the process chilled water requirements of microscopes and other lab equipment.

B. Steam System: For North and South Campus, a two pipes steam system for the facilities will be provided from the central plant. A/E shall get the steam system conveying pressure from UTSW PM. The primary users of steam will be Hot water Heat exchangers, autoclaves, cage washer, and humidifiers.

C. Heating Hot Water System:
    1. The heating hot water system for the facilities will consist of a pair of steam to hot water heat exchangers with associated heating hot water pumps with make-up water connections, and all support equipment including expansion tank and water treatment for a 20°F delta distribution loop.
    2. The A/E shall coordinate with UTSW PM and use the highest possible temperature difference (Delta T) between CHS/CHR. The primary users of heating hot water in the facility will be air handling and fan coil units and reheat coils serving the laboratory spaces.
    3. Loads will have two-way modulating control valves to control heating hot water flow to the equipment. Differential pressure transmitters between the heating hot water supply and return mains at various locations will be utilized to inform the campus facilities engineering group about the health of the system. The heating coil farthest from the system connection will be equipped with an automatic 3-way control valve to maintain a minimum flow rate in the piping system.

XIX. Section 23 21 13 Hydronic Piping

A. Design:
   1. Groove coupling piping is not acceptable for use in utilities or chilled water applications unless written approval received from UTSW PM and UTSW Utilities.
   2. Design for and specify standard pipe sizes only.
   3. Water piping systems shall be sized using standard engineering formulas and coefficients based on pipe condition and roughness. Refer to the maximum flow rates allowed by ASHRAE 90.1 and recommended by ASHRAE Fundamental.
   4. Route groups of pipes parallel to each other.
   5. Piping shall not be buried beneath the lowest floor level except for soil pipe.
      a. Piping will not be run in concrete floors.
      b. If pressure piping placement under slabs is unavoidable then the piping must be run in a steel pipe sleeve so leakage can be channeled off.
   6. Space pipes to allow the pipes to be completely insulated and to allow valves to be serviced.
      a. Provide a minimum 2-inch clearance between insulated piping and other piping, walls, structural members, or other obstructions.

B. Control water flow through equipment with 2-way valves.
   1. Use one 3-way control valve per loop only if the loop recirculating pump is a constant speed pump.

C. For closed-loop hydronic systems in a building provide effective chemical water treatment to minimize effects of corrosion, scale, and other typical contaminants.
   1. Ion exchange softeners are not required for average makeup water tap hardness below 100 parts per million (ppm), or 5.8 grains per gallon.

D. Pumps:
   1. Pumps shall be located in easily accessible areas for service.
   2. Do not locate pumps above the ceiling.
   3. Consolidate secondary loads into a minimum number of separate water circulating loops. Aggregation of equipment on such loops shall be approved in advance by the UTSW PM.

E. Drains:
   1. All condensate drain lines shall be insulated to the vertical main. In exposed areas insulation shall be pre-molded. In unexposed areas the insulation can be foil wrapped.
   2. Provide drain valves at the low points and automatic air vents at the high points in each piping system. Use eccentric reducers in horizontal piping to maintain the top of the pipe level.
   3. The buried chilled water and condenser water piping shall have drain connection between a set isolation valves at its lowest point.
   4. Condensate drain piping – Press fittings may be allowed. Installation shall follow manufacturer instructions.

F. Make-up water piping – Press fittings are not allowed.

G. Accessories:
   1. Insulation:
      a. Specify pre-molded fitting insulation.
      b. Provide metal jacket on all crawl space piping, exterior insulate piping and mechanical room piping (up to 8-foot AFF) insulation.
      c. Provide cellular glass insulation for steam and steam condensate piping.
      d. Loose fill insulation is not allowed.
   2. Specify flange kits to join dissimilar metal piping.
   3. All manual air vents shall be plugged.
   4. Specify EPDM or hard Garlock gaskets.
      a. Use EPDM gaskets in "push on" joints.
      b. Do not specify red rubber gaskets on hot water lines and heat exchangers.

XX. Section 23 21 23 HVAC Pumps

A. Select pumps on the ascending side of the efficiency curve. All pump motors shall be non- overloading to the end of the pump curve.
B. Evaluate the pump system conditions to select the optimum pump type and configuration based on efficiency and pump characteristics. Where feasible, provide pumps as follows:
   1. Up to 50 GPM - in-line circulating pumps or close-coupled end suction pumps.
   2. Between 50 and 500 GPM - base-mounted end suction pumps.
   3. More than 500 GPM - horizontal split case, double-suction pumps.
   4. Larger in-line pumps may be considered for specific situations where floor space is limited. Larger vertical in-line pumps shall require approval.
C. Pump Design:
   1. Select pumps that are designed to operate to 1,750 RPM unless directed otherwise.
   2. Select pumps that are sized for a critical speed of at least 115 percent operating speed at 60 Hz.
   3. Modulate water pumps 5 HP or greater with variable frequency drives.
   4. Select pumps that are free of flashing and cavitation at all flow rates between 25 and 125 percent of design flow under the suction conditions of the pump installation.
   5. Size pumps at middle of pump curve to allow for future load.
   6. Suction diffusers are only allowed if space constraints require their use. Provide a line size isolation valve and strainer on the pump suction piping.
   7. Provide a line sized, spring-loaded silent check valve and isolation valve on the pump discharge piping.
   8. To prevent leaks, minimize the use of flexible connectors. If needed, provide pump suction and discharge pipe flex connectors. Flex connectors shall be constructed with 304 stainless steel protective wire braided covers with flanged tie rods.
   9. If the pump is not redundant and the service is critical, provide a means to bypass the pump VFD.

D. Pump Layout:
    1. Design pump rooms with the manufacturer's recommended clearances around the pumps. Provide clearance to enable the pump to be easily removed. Indicate the required access space around pumps for service on the drawings.

E. Documentation:
    1. Detail the pipe changes off pumps using long radius reducing elbows or eccentric reducers to reduce and minimize turbulence.
    2. For base mounted pumps, detail the piping supports such that piping weight is not transferred to pump flanges or casing.
    3. Provide inline pump support details according to the pump manufacturer's instructions, with minimum supports on both sides of the pump.
    4. Provide straight pipe diameters at pump inlet and discharge connections according to the manufacturer's instructions.

XXI. Section 23 22 13 Steam and Steam Condensate Return Piping

A. High and Medium pressure steam piping shall be Schedule 80 black steel piping.
B. Low pressure steam piping shall be Schedule 80 black steel piping.
C. Steam Condensate return piping shall be Schedule 80 black steel piping.
D. Press fittings are not allowed on Steam and Steam Condensate return piping.
E. All high pressure steam valves 4 inches and larger shall be piped with 1-inch equalizing line/bypass valve assembly. The equalizing bypass line shall have a line size bypass valve.
F. The buried steam and steam condensate return lines shall have a drain connection between a set of isolation valves at its lowest point.

XXII. Section 23 23 00 Refrigerant Piping

A. Copper Tube: ASTM B280, H58 hard drawn or O60 soft annealed.
    1. Fittings: ASME B16 22 wrought copper.
    2. Joints: Braze, AWS A5.8M/A5.8 BCuP silver/phosphorus/copper alloy.
B. Press fittings are not allowed on refrigerant piping.

XXIII. Section 23 31 00 HVAC Ducts and Casings

A. Design:
    1. Verify ALL return air paths.
    2. All exposed ductwork to have internal insulation and metal liner and be fabricated from paint grip metal. The use of fiberglass internal duct liner is prohibited.
    3. Provide hangers for all slot diffusers and insulated plenum boxes. Provide detail on drawings.
    4. Provide required upstream straight duct for all air flow measuring station.
    5. Provide air foil turning vanes in square 90° elbows.

6. All large round duct to be hung with half-round saddles and rods. Cable hangers are NOT acceptable.
7. Transition duct sizes gradually, not exceeding 20 degrees divergence and 30 degrees convergence.
8. Connections to air devices shall be made with hard elbows. Connections between the elbow and the low-pressure branch duct shall be made with a maximum five-foot length of flexible duct with no elbows.
    a. Exception - where structural conditions and interference's prevent connections with hard elbows, Flex-Flow elbow supports attached to flexible duct may be used with prior approval from UTSW FM.
9. Provide flexible duct connection on all rotating equipment.
10. Duct sizes shown on drawings represent the inside air stream clear area. Pressure class, as defined by SMACNA, shall be clearly indicated on drawings with appropriate symbols.
11. For noise-prone and/or noise-sensitive applications, provide double-wall ductwork with a perforated inner liner for a minimum of ten feet after the first elbow from both supply and return plenums of the air handling unit(s). Liner shall be 2-inch thick, tested against erosion to at least 110 percent of scheduled duct velocity, and treated with an anti-microbial surface coating. Return air transfer ducts shall be internally lined sheet metal constructed ductwork.
12. All volume dampers shall be shown in the plans.
13. Use short radius elbows in lieu of square 90° fittings with turning vanes. It is preferred that long radius sweeps be employed where space permits.
14. There must be a minimum of three diameters of straight rigid ductwork entering terminal units. A detail will be required to emphasize this requirement to the Contractor.

B. Exhaust:
1. Exhaust branch ducts shall be sized for a velocity not to exceed 1500 Feet/Minute
2. Exhaust Grilles shall be sized for a Noise Criteria (NC) level less than 25.
3. Exhaust ducts from equipment operating with steam shall be sloped back to the equipment and drain provided for condensate return. Such ducts shall be constructed of stainless steel to avoid corrosion.
4. The general exhaust system duct shall be negative while inside the building.
5. Lab general and fume hood exhaust requirements: The UTSW OSBC and lab manager should be contacted/consulted to establish various chemicals used in the lab with emphasis on chemicals causing corrosive fumes. The use of stainless-steel ductwork for fume hood exhaust should be discussed/agreed with OSBC.
6. Laboratory fume hood exhaust duct shall be minimum 18-gauge 304 stainless steel made airtight with continuous external weld for all seams and joints. All exposed ductwork and fittings below ceiling shall be 316 stainless-steel.
7. Dishwasher and Autoclave wet exhaust duct shall be minimum 18-gauge 304 stainless steel made liquid tight with continuous external weld for all seams and joints. Provide low point drain pocket with 1 inch drain connection and provide access door for

inspection and cleaning. All exposed ductwork and fittings below ceiling shall be 316 stainless-steel.

8. Grease exhaust duct shall be carbon steel not less than 0.054 inch (18 gauge) thick fabricated as required by NFPA 96. All joints shall have liquid tight continuous external welds. Install cleanout doors at each change of direction and in straight sections every 20 feet. Paint exterior ductwork with paint and primer in accordance with NFPA 96 paragraph 4-6.2.
9. In-line exhaust fans are prohibited in the general exhaust system inside the building. However, under certain circumstances exhaust fans mounted directly under the roof are permitted provided that the total discharge duct length does not exceed 5 feet inside the building, and the duct connections are welded.

C. Accessories:
1. All spin-ins shall be of the conical type with damper shaft mounted horizontally.
2. All grilles shall be regulated by a volume damper, when possible, in lieu of an OBD.
3. All metal components on galvanized sheet metal ducts shall be galvanized materials such as angle stiffeners. Trapeze hangers, rods, straps, etc.
4. Provide hinged access doors for duct access.
5. Provide cover plates with appropriate finish for all recessed damper operators.
6. Use fiberglass and Benjamin Foster sealant with fiberglass mat embedded in sealant.
   a. Foil backed tape on ducts is not permitted.
7. All exterior duct insulation shall have a vapor seal and metal jacket applied with fiberglass mesh installed and resealed with vapor barrier sealer.

XXIV. Section 23 33 00 Ductwork Accessories

A. A/E shall specify accessories appropriate to the design pressures for long-term performance.
B. Medium- to high-pressure duct access doors with 2-part systems shall be specified for medium- to high-pressure installations. A/E to confirm correct products are submitted and installed.
1. Refer to specifications for acceptable units.
2. A/E to ensure submittals for all accessory types are reviewed for compliance.
3. A/E to review installed accessories to ensure compliance during construction.

C. Access panels for fire dampers shall be located next to the fire damper collar, not to exceed 10-inches for required access and maintenance.
D. A/E shall follow NFPA 90A for the design and locations of fire dampers.

XXV. Section 23 35 00 Special Exhaust Systems

A. Lab Exhaust Design
1. Chemical fume hood exhaust ducts shall be sized for a velocity not to exceed 1500 Feet/Minute
2. Low flow alarms required for each hood shall be remotely monitored at CDAS.

3. All efforts shall be made to select direct drive fans as opposed to belt driven.
    a. Provide scaffolding and means to lift sections of the fans off to allow servicing.
4. For establishing room balance, the hood exhaust shall be calculated based on a face velocity of 110 feet/minute at a sash position of 16 inches. However, the exhaust ducting shall be sized based on 110 feet/minute with the sash wide open.
5. General area exhaust shall be provided in those cases where the room exhaust requirements exceed fume hood exhaust.
6. The area exhaust grilles shall be placed to provide a uniform exhaust flow rather than bias the flow to one area of the room.
7. Makeup air for exhaust hoods shall be located so as not direct air into face of the hood.

B. Biological Safety Cabinets:
1. Biological Safety Cabinets (BSC) shall not exhaust into the general exhaust system.
2. If exhaust is required, a dedicated exhaust system shall be constructed. Ducts shall be sized for a velocity not to exceed 1500 Feet/Minute
3. The BSC exhaust duct shall be negative while inside the building.

C. Quench Vent Exhaust Systems:
1. MRI Quench vent exhaust shall be coordinated with MRI equipment manufacturer's requirements.

XXVI. Section 23 36 00 Air Terminal Devices

A. Clearly document on the drawings for all dual and single duct boxes used in laboratories or medical service to meet UTSW Specification requirements.

B. Mixing Box Vendors: UTSW has developed a specification for medical grade mixing boxes, and has qualified the following suppliers through testing:
1. Titus
2. Metalaire
3. Greenheck

C. Refer to specification Section 23 36 00 "Air Terminal Devices" for mixing box construction.

D. VAV Mixing Box Controls:
1. All terminal boxes shall have a control transformer and be powered by individual electrical supply.
    a. Central control transformers with 24V runs to terminal boxes is unacceptable.
2. UTSW dual duct mixing boxes are normally set to constant volume with the mixed air temperature varied to maintain space temperature.
3. When a constant volume double duct box is required, it will be specifically called out on the schedules.
4. All dual or single duct boxes that are to be re-used shall be retrofitted with DDC Controls.
5. Dual duct boxes require factory installed flow crosses on the hot and cold inlets and no flow cross on the discharge.
    a. UTSW personnel normally install mixing box controls in the field. Therefore, factory controls are not normally specified.

b. Controls shall be confirmed for each project and have appropriate specifications to ensure the project meets design criteria.

E. The VAV Terminals with hot water reheat coils serving Animal Resource Center (ARC) should maintain the Entering Water Temperature (EWT) of 120°F min/150°F max to avoid nuisance high temperature alarm from the AMWS Controls when hot terminal air hits the AMWS room sensors located at higher wall elevation.

F. The VAV terminals for reheat service would be equipped with either hot water or electric heating coils.
   1. The electric heating coil shall be open-coil design, 80/20 nickel-chrome heating element, magnetic contactor step controller, SCR controller and airflow switch

G. Locations
   1. VAV dual duct boxes shall be centered over the lab peninsulas with the control box readily accessible without having to move lab equipment off the countertop.
   2. Mixing boxes shall be situated in offices so that they are readily accessible without having to move heavy furniture. Corridors and doorways are preferred locations.
   3. A minimum of 24-inches of clear space is needed in order to access the controls.
   4. For dual duct boxes, 24-inches clearance is needed on both sides.
   5. The design engineer shall coordinate the HVAC, plumbing, electrical, and fire protection drawings to ensure that the control access to the VAV box is not hampered.

H. VAV Box Sizing:
   1. UTSW does a considerable amount of renovation and subsequent relocation of VAV boxes and diffusers. This requires us to implement a standardized VAV sizing system, which has the benefits of capacity, flexibility, controllability, and simplified installation.
   2. UTSW uses 8-inch, 10-inch, and 12-inch single and dual duct boxes for all new construction and renovation work. Any larger capacity requirements shall use two boxes slaved together or independent zone control. A 6-inch box is used in some circumstances but is generally not desired.
   3. VAV mixing boxes in sizes 14-inch or 16-inch are acceptable only under special circumstances and must be submitted to UTSW PM for review with UTSW FM for approval PRIOR TO incorporation in the design.
   4. The following minimum CFM guidelines shall be used for selection of mixing box size:

6-inch	400 CFM
8-inch	700 CFM
10-inch	1100 CFM
12-inch	1600 CFM

   5. Each lab (wet, dry, or tissue culture shall have dedicated VAV mixing box(s) .

XXVII. Section 23 37 13 Diffusers and Dampers

A. Diffusers shall be selected based on a Noise Criteria (NC) level less than 25.
B. Standard diffuser throat sizes are 8-inch, 10-inch, 12-inch, and 14-inch diameter.
    1. Diffuser throat sizes smaller than 8-inches are unacceptable.
    2. Any proposed conditions must be documented then proposed to UTSW PM for review with UTSW FM for approval.
C. Dampers:
    1. Balancing dampers shall be located in each branch duct and located no closer than 3 feet from the diffuser throat.
    2. All dampers shall be shown in the plans.
    3. Power-actuated dampers (including smoke dampers) are normally equipped with a 24-volt electric actuator.
    4. Damper actuators for make-up air and/or exhaust (general and hood) serving variable volume labs, shall be pneumatic for acceptable room pressure control recovery time with volume change.

XXVIII. Section 23 41 00 Air Filters

A. All air conditioner intakes shall have 2-inch-thick Merv 11 pre-filter and a bag type Merv 15 final filters for the building air handlers.
    1. HEPA filters are also used downstream of the air conditioner fan for all animal research facilities.
B. Pre-Filters:
    1. Indicate a 1-inch-thick pre-filter in all animal room exhaust grilles to contain animal hair.
    2. Indicate a 1-inch-thick pre-filter in fly room exhaust grilles to prevent inadvertent release of species.
    3. Indicate a Merv 11 pre-filter on all heat recovery coils.
C. HEPA filters are used on exhaust for all experiments using radioactive isotope. HEPA filters to be tested every six months as required by OSBC.

XXIX. Section 23 50 00 Central Heating Equipment

A. Refer to Section B – Codes and Standards
B. Refer to **EXHIBIT 23.1 Boiler Emission Requirements.**
C. UTSW utilizes multiply types of boilers on campus.
    1. Condensing boilers shall have stainless steel heat exchangers.

XXX. Section 23 60 00 Central Cooling Equipment

A. Requirements for new cooling towers shall be directed and approved by the UTSW Utilities Team.

1. Replacement or renovation projects shall match the characteristics of the existing unit.
2. New unit requirements shall consider initial cost, lead times, and replacement cost.
3. All metal components to be a minimum of 304 stainless steel for outdoor units.

B. Follow City requirements for deduct meter processes**.**

XXXI. Section 23 73 00 Indoor Air-Handling Units

A. General Design:
1. Mechanical rooms must be large enough to allow for air handling unit coil pull space and full space service clearance around the unit for filter replacement and to accommodate both major and minor repairs.
   a. A minimum clearance of 3 feet must be planned around the unit with additional space at the heating and cooling coil pull locations.
   b. Indicate the designated coil pull and maintenance clearance space on the Drawings.
2. Schedule the minimum and maximum water, air flow rates, fan horsepower, entering and leaving coil water, and air temperatures, MBTUs, water and air pressure drops, and physical parameters of the coils for each air handling unit.
3. When one or more AHU are connected, controlled isolation dampers shall be provided to allow repairs while other fans remain in operation.

B. Fans:
1. Implement supply fan static pressure set point reset per ASHRAE 90.1 (latest state adopted version).
2. Each air handling unit fan equipped with a fan motor size 2-horsepower and above shall be provided with a variable frequency drive (VFD). The high efficiency fan motor shall be compatible with VFD applications, which is controlled by the supply duct static design pressure set point.
3. Air handling units shall not contain individual motors larger than 10 HP.
4. Air handling unit fans shall have an efficiency rating where the ratio of the fan system power to the supply fan airflow rate (main fan) of each HVAC system at design conditions shall not exceed the allowable fan system power indicated in the latest state adopted version of ASHRAE Standard 90.1.
5. Fan arrays are acceptable to use on air handling units and energy recovery units (ERU's) unless noted otherwise by Owner.
   a. UTSW preference is to provide a fan array with at least one redundant fan. The ideal case would be 100 percent redundant fan cubes served by two independent VFDs.
   b. Each fan cube shall have a gravity backdraft damper.
6. Provide factory installed motor removal rail system.

C. Access doors (or panels) on air handling unit sections:
1. Access doors shall always open against the positive side of the door and shall not be blocked by internal filter casings or internal equipment components.

2. A/E shall specify access doors that will provide long-term performance according to the pressures designed. Refer to section 23 33 00 "Ductwork Accessories."
3. Micro switches or safety switch interlocks need to be provided at access doors or panels to protect maintenance personnel from possible injuries from rotating or electrical equipment components inside the air handlers.

D. The use of permanent affixed ladders, stairs, guard rails, and walkways shall be evaluated on all air handling units to provide safe access to components, filters, instruments, damper actuators, and switches.
   1. All access shall include OSHA compliant, non-skid treads from the exit of the accessible compartment to the general walkway.
      a. Design of access shall take into account utility piping directly in the path of maintenance and operations personnel as well as elevation changes between the base floor height of the AHU and the surface directly outside the entry doors of the AHU.

E. A/E shall coordinate the locations of wall-mounted room temperature sensors with furniture and equipment so that sensor locations do not conflict with tall items of furniture or equipment.

F. Coils:
   1. If chilled water is used as the cooling medium, the A/E needs to acquire the supply water temperature at the site where the coil will be used. Similarly, if hot water is used as the heating medium, the A/E needs to acquire system temperature at the site where the coil will be used. Confirm with UTSW PM.
   2. Maximum differential pressure across the air side of the cooling coil shall not exceed 0.7-inch w.g.
   3. Maximum cooling coil discharge face velocity shall not exceed 425 fpm in variable air volume (VAV) applications and 375 fpm in constant air volume (CAV) applications. Heating coil discharge face velocity shall not exceed 700 fpm.
   4. Pipe spool connections at the coils must be bolted flange connections to allow the coils to be pulled and installed without having to remove the control valves.

XXXII. Section 23 82 19 Fan Coil Units

A. The limitations of fan-coil units with regards to latent loads associated with simply providing adequate ventilation for occupancies make them unsuitable as the only means of cooling and dehumidification in most locations and for most occupancies, unless a dedicated, 100 percent outdoor air handling unit is provided when fan coil units are used. The dedicated outdoor air handling unit shall supply conditioned air to occupied spaces by fully ducted air distribution system.

B. Where fan coil units are the only option, the system design shall be based on 4-pipe configuration, capable of providing on-demand heating or cooling. Fan coil units can be used in vertical, floor-mounted or in horizontal, ceiling-suspended (recessed or concealed) configuration with supply and return air ductwork as required. Vertical units are generally located under windows to control cold drafts and solar radiation.

C. Generally, the use of 4-pipe fan coil systems shall be limited to serve perimeter spaces only. Use of fan coil units for interior spaces shall be carefully evaluated on a case-by-case basis.

D. Design the cooling coil condensate piping to remove condensate without clogging the drain pan and drain lines. Provide insulated drain pans and condensate drain piping. Minimize the extent of horizontal runs and provide cleanouts at each turn in the direction of flow. Pitch the drain line in the direction of flow to facilitate flow by gravity.

E. Unit filters must be accessible to allow for required filter changes. Filters may be located in return grilles, if applicable.
   1. Unit filtration shall meet the minimum filtration requirements listed in the room data sheets for spaces being served.

F. Select fan coil units to deliver the required capacity at mid-speed. Provide sound attenuation as required to achieve desired space noise level. Special attention should be paid to ceiling- suspended fan coils. Refer to Section B XII Acoustical Design, XIII Noise Criteria, XIV Sound Transmission Class.

G. 4-pipe fan coil units shall be equipped with separate cooling and heating coils. Provide a modulating control valve for each coil to operate the cooling and heating modes in sequence. The use of two- or three-way control valves shall be coordinated with the facility to match their existing system DDC controls shall be used, where proven cost-effective. For new construction and major renovation, 2-way control valves with a modulating pump speed shall be utilized. All hangers shall be hot dipped galvanized in the crawl space and wet areas and cad plated otherwise.

H. All ball valves shall be two-piece threaded 600 with stainless steel ball and stem.

I. All gate valves to be rising stem.

EXHIBIT 23.1 Boiler Emission Requirements

Natural Gas-Fired Hot Water and Steam Boiler Design Phase – Air Quality Compliance Reference Table

Maximum Design/Rated Heat Input Capacity	≤ 2.0[b] MMBtu/hour	≥2.1[c] to <10[d] MMBtu/hour	≥10 [e],[f] to 40 [g,h] MMBtu/hour	40 [i,j] to 100[e,i] MMBtu/hour
Federal Regulatory Applicability	Not Applicable[d]		Notifications Required (dates for construction commenced / complete, startup)[k]	
State Emissions Limits	Not Applicable[b]	NOx Limit = 0.036 lb/MMBtu (30 ppmvd at 3 percent O_2)[g] CO Limit = 400 ppmvd at 3 percent O_2[g]		NOx Limit = 0.01 lb/MMBtu (9 ppmvd at 3 percent O_2)[i] CO Limit = 500 ppmvd at 3 percent O_2[i]
Meters	Not Required[b]	Fuel Use, totalizing flow meter (monthly records)[g]		Fuel Use, totalizing flow meter (hourly records)[i] Hours of Operation[i]
Emissions Monitoring	Not Required[b]	NOx and CO (quarterly, portable analyzer)[g]		Stack Oxygen (hourly records)[i] Nox and CO (parametric, hourly records)[i]
Stack Testing	Not Required[b]	Within 60 Days of First Fire (notification due 15 days before testing; report due within 60 days of testing)[c]		
New Source Review (NSR) Authorization	Permit by Rule – No Registration[h]			Registered under Standard Permit or Individual NSR permit [j]
Nonattainment NSR (NNSR) Authorization	Case-by-case Assessment, Project NOx emissions must be < 5 TPY (may require APD-CERT)[l]			
Title V Authorization	Case-by-case Assessment (may warrant off-permit notification, especially if not included within currently permitted boiler groups)[l]			

Notes:

[a] Presumes no diesel fuel/fuel oil used as backup-fuel

[b] Less than or equal to 2.0 MMBtu/hr

[c] Greater than or equal to 2.1 MMBtu/hr

[d] Less than 10 MMBtu/hr

[e] 100 MMBtu/hr or less, but greater than or equal to 10 MMBtu/hr

[f] Greater than or equal to 10 MMBtu/hr

[g] Greater than or equal to 2.1 to less than 40 MMBtu/hr

[h] Less than or equal to 40 MMBtu/h[i] Equal to or greater than 40 MMBtu/hr, but less than 100 MMBtu/hr

[j] Greater than 40 MMBtu/hr

[k] Greater than or equal to 10 MMBtu/hr

[l] Potentially applicable to all heat input capacities

EXHIBIT 23.1 (continued)

≤ 2.0 MMBtu/hour Maximum Design/Rated Heat Input Capacity

Federal Air Quality Regulations – Not Applicable [a]

State Emission Limits – Not Applicable [b]

Meters – Not Required [b]

Emissions Monitoring – Not Required [b]

Stack Testing – Not Required [b]

NSR Authorization – Permit by Rule; No registration required [c]

NNSR Authorization – Case-by-case assessment; Project NOx emissions must be < 5 TPY; May require APD-CERT [d]

Title V Authorization – Case-by-case assessment. May warrant off-permit notification, especially if not included within currently permitted boiler groups [d]

2.1 to < 10 MMBtu/hour Maximum Design/Rated Heat Input Capacity

Federal Regulatory Applicability – Not Applicable [a]

State Emissions Limits – NOx Limit = 0.036 lb/MMBtu (30 ppmvd at 3 percent O_2); CO Limit = 400 ppmvd at 3 percent O_2 [b]

Meters – Fuel Use, totalizing flow meter (monthly records) [b]

Emissions Monitoring – Nox and CO, quarterly, portable analyzer [b]

Stack Testing – Required within 60 days of first fire, Notification due 15 days before testing, Report due within 60 days of testing [c]

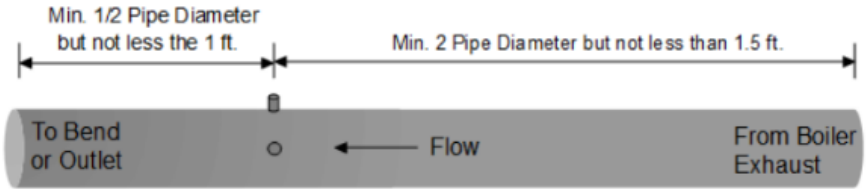
NSR Authorization – Permit by Rule; No registration required [d]

NNSR Authorization – Project NOx emissions must be < 5 TPY; May require APD-CERT [e]

Title V Authorization – Case-by-case, may warrant off-permit notification [e]

EXHIBIT 23.1 (continued)

Stack Testing Port Location Requirements



Gas sample ports may be constructed by welding a 1/2- to 1-inch collar or threadolet on the exhaust pipe and closing if off with a bull plug. Alternately use a 1- by 6-inch pipe nipple, closed with a pipe cap.

Threaded connections should be made hand tight only and threads should be coated with high temperature anti-seize compound. There should be no obstructions within 2 pipe diameters of the direction pointed by the port.

2 ports are needed at 90 degrees from each other

Notes:

[a] Less than 10 MMBtu/hr

[b] Greater than or equal to 2.1 to less than 40 MMBtu/hr

[c] Greater than or equal to 2.1 MMBtu/hr

[d] Less than or equal to 40 MMBtu/hr

[e] Potentially applicable to all heat input capacities

≥ 10 to 40 MMBtu /hour Maximum Design/Rated Heat Input Capacity

Federal Regulatory Applicability – Requires Notifications [a,]

- Date **construction is commenced** (initial + 45-day interruptions), postmarked ≤ 15 days after,
- Date **construction complete** postmarked within 15 days after,
- Date of **initial startup** submitted prior to, with time that allows regional rep to be present

State Emissions Limits - NOx Limit = 0.036 lb/MMBtu (30 ppmvd at 3 percent O_2); CO Limit = 400 ppm at 3 percent O_2 [b]

Meters – Meter required to measure fuel use totalizing flow meter; monthly records required [b]

Emissions Monitoring – Nox and CO (quarterly, portable analyzer) [b]

EXHIBIT 23.1 (continued)

Stack Testing – Required within 60 days of first fire [c]

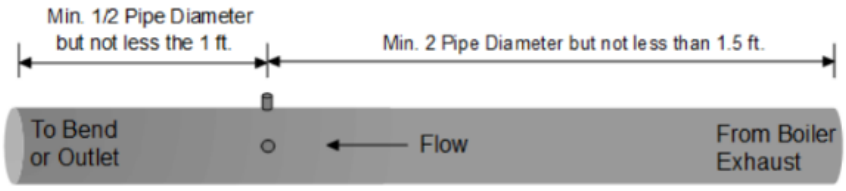
- Notification due 15 days before testing
- Report due within 60 days of testing

NSR Authorization – Permit by Rule; No registration required [d]

NNSR Authorization – Project NOx emissions must be < 5 TPY; May require APD-CERT [e]

Title V Authorization – Case-by-case; may warrant off-permit notification.

Stack Testing Port Location Requirements



Gas sample ports may be constructed by welding a 1/2- to 1-inch collar or threadolet on the exhaust pipe and closing if off with a bull plug. Alternately use a 1- by 6-inch pipe nipple, closed with a pipe cap.

Threaded connections should be made hand tight only and threads should be coated with high temperature anti-seize compound. There should be no obstructions within 2 pipe diameters of the direction pointed by the port.

2 ports are needed at 90 degrees from each other

Notes:

[a] Less than 10 MMBtu/hr

[b] Greater than or equal to 2.1 to less than 40 MMBtu/hr

[c] Greater than or equal to 2.1 MMBtu/hr

[d] Less than or equal to 40 MMBtu/hr

[e] Potentially applicable to all heat input capacities

EXHIBIT 23.1 (continued)

40 to 100 MMBtu /hour Maximum Design/Rated Heat Input Capacity

Federal Regulatory Applicability – Requires Notifications [a]

- Date **construction commenced** (initial + 45-day interruptions) postmarked within ≤ 15 days after;
- Date of **construction complete** postmarked 15 days after;
- Date of **initial startup** submitted prior to, with time that allows regional rep to be present

State Emissions Limits – NOx Limit = 0.01 lb/MMBtu (9 ppmvd at 3 percent O_2); CO Limit = 50 ppmvd at 3 percent O_2 [b]

Meters – Meter required to measure the following: [b]

- Fuel use, totalizing flow meter, hourly records required
- Hours of operation

Emissions Monitoring – Monitors required to measure the following: [b]

- Stack oxygen, hourly records required;
- NOx and CO (parametric measurements based on stack oxygen and fuel flow); hourly records required.

Stack Testing – Required within 60 days of first fire [c]

- Notification due 15 days before testing,
- Report due within 60 days of testing.

NSR Authorization – Registered under one of the following: [d]

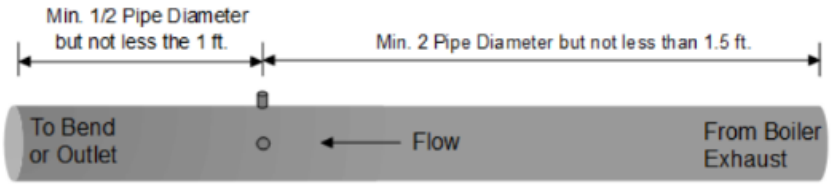
- Standard Permit for boilers,
- Individual NSR permit.

NNSR Authorization – Project NOx emissions must be < 5 TPY (may require APD-CERT for sources not included in above permits) [e]

Title V Authorization – Case by case, may warrant off-permit notification

EXHIBIT 23.1 (continued)

Stack Testing Port Location Requirements



Gas sample ports may be constructed by welding a 1/2- to 1-inch collar or threadolet on the exhaust pipe and closing if off with a bull plug. Alternately use a 1- by 6-inch pipe nipple, closed with a pipe cap.

Threaded connections should be made hand tight only and threads should be coated with high temperature anti-seize compound. There should be no obstructions within 2 pipe diameters of the direction pointed by the port.

2 ports are needed at 90 degrees from each other

Notes:

[a] Greater than or equal to 10 MMBtu/hr

[b] Greater than or equal to 40 MMBtu/hr but less than 100 MMBtu/hr

[c] Greater than or equal to 2.1 MMBtu/hr

[d] Greater than 40 MMBtu/hr

[e] Potentially applicable to all heat input capacities

End of Division 23

DOCUMENT HISTORY

Issue Date	Description	Editor
06/19/2020	June 19, 2020 Print	MS
10/09/2020	Revision to General Information section	MS
03/30/2021	1Q 2021 - Revision to General Information section	MS
06/30/2021	Q2 2021 Updates	EV
10/03/2022	Q3 2022 Update	EV
06/26/2023	Q2 2023 Update	EV
12/15/2023	Q4 2023 Update	EV
06/13/2024	Q2 2024 Update	EV
12/20/2024	Q4 2024 Update	EV
06/27/2025	Q2 2025 Update	EV
12/18/2025	Q4 2025 Update	SK

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DESIGN CRITERIA

DIVISION 25 INTEGRATED AUTOMATION

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DIVISION 25 00 00 – INTEGRATED AUTOMATION

I. General Information

A. The Facilities Utilities group manages the various building automation systems on campus for power and HVAC systems.

II. Design Review Submittal Requirements

A. Refer to Section C in the UTSW Design Guidelines.

III. Automatic Temperature Controls

A. Provide a temperature control/energy management system and control function for the entire building.
   1. The system shall include a standalone Direct Digital Control (DDC) System.
   2. This system shall communicate with the Central Building Automation System (BAS) at the Facilities Services Department through an Ethernet card and the campus instrumentation control distribution wiring system.

B. The BAS/Automatic Temperature Control (ATC) system must be compatible with the existing campus system.
   1. Systems or building components to be monitored and/or controlled by the campus systems include, but are not limited to, the following: temperature control, temperature, and humidity control of and the start and stop of major equipment.
   2. Monitoring of specific mechanical equipment and systems will be dependent on the recommendations of UTSW Facilities Department.

C. Provide metering of utilities with indication and totalization capabilities.

IV. Building Automation System

A. Provide a stand-alone direct digital control (DDC) system for space conditioning in campus buildings connected to the central campus BAS system.

B. During the design development and construction documents phase, consult with the respective controls firm in order to determine the number of DDC Panels required and the location for each panel.

C. The panel locations shall be shown on the detailed design drawings.

V. DDC System Manufacturer

A. UTSW currently uses Siemens Building Technologies, Inc.

VI. FM Capital Projects

A. FM capital projects in existing buildings shall extend and/or upgrade existing DDC control systems to control renovated areas.

B. On off-campus locations, type of controls shall be as required in the Program of Requirements or as directed by UTSW PM. At a minimum, these locations shall have a means for night, weekend, and holiday setback.

End of Division 25

DOCUMENT HISTORY

Issue Date	Description	Editor
06/19/2020	June 19, 2020 Print	MS
10/03/2022	Q3 2022 Update	EV

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DESIGN CRITERIA

DIVISION 26 ELECTRICAL

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DIVISION 26 00 00 – ELECTRICAL

I. General Information

A. Electrical design for UTSW projects shall include requirements documented both in the UTSW Design Guidelines and the UTSW Master Specifications. Specification sections such as Section 26 00 00 – Basic Electrical Requirements, 26 00 10 - Electrical Design Requirements, and 26 05 00 - Basic Electrical Materials and Methods Requirements include critical design requirements that must be included for each project.

B. All current carrying conductors shall be 95 percent conductivity copper. This includes primary cable, building wire, signal, communication and control wire, panel buses, switchgear and switchboard buses, and bus duct.

C. A/E to confirm with UTSW PM any service outages and if that needs to be coordinated in the Contract Documents.

D. Where power is critical or back-up power is required, electrical design shall provide diversity of power services/sources for building mechanical, electrical, and plumbing equipment. Ensure a panel failure does not result in all equipment going down.

E. Main electrical switch gear shall be in a separate room and avoid liquid conveying pipes above the gear.
    1. Where such an arrangement is not possible, consult UTSW.

F. Emergency Power:
    1. Confirm requirements per project with UTSW PM, User, Building Maintenance, Utilities, Access Control, and other team members.
        a. Equipment requiring emergency power could include but is not limited to chillers, heaters, elevators, pumps, air handling units, and project specific equipment.
    2. Indicate the required number of auxiliary contacts to control all equipment.

G. Confirm access requirements for WIFI access for all electrical spaces.

H. For ARC special requirements, refer to UTSW Design Guideline Section A2.

I. UTSW preference is to provide disconnecting means for individual hard-wired equipment at readily accessible or accessible locations per code.

II. Design Review Submittal Requirements

A. Refer to Section C in the UTSW Design Guidelines.

III. Utilization Voltages

A. Voltages, generally, shall be as follows, unless determined differently by design team with UTSW PM and FM for approval:
    1. 4160 volts, 3 phase for motors 300 HP and larger.
    2. 480 volts, 3 phase for motors 1/2 HP and larger.
    3. 120 volts for motors 1/2 HP and smaller.
    4. 120 volts, 1 phase, for individual task lighting.

5. 120 volts, 1 phase, for convenience outlets and specific equipment loads.
6. 277 volts, 1 phase, for LED lighting.
7. 277 or 480 volts, 1 phase smaller space heating applications, and as required for special purpose outlets.

IV. Section 26 00 10 UTSW Electrical Design Requirements

A. Project Engineer shall utilize UTSW specification section for campus design requirements per project.

V. Section 26 05 01 Electrical Demolition

A. Project Engineer shall utilize the associated specification section for all remodel projects.
B. Coordinate requirements in this section with existing conditions identified in the project scope.
    1. Panelboards and luminaries to remain, shall be documented to be repaired and cleaned as indicated in article “Cleaning and Repair.”

VI. Section 26 05 13 Single Conductor Medium-Voltage Cables

A. Primary cable 5 KV and 15 KV shall be ethylene propylene insulated to 133 percent voltage level. Systems are to be grounded neutral with the extra thickness as a safety factor.
    1. Primary cable shall have copper conductors and copper shielding.
    2. Coordinate with the MV distribution system is fed from the 13.8 kV substation located on Inwood at the railroad tracks.
    3. MV distribution equipment and breakers shall be metal-clad-roll-out type.
    4. Warranties shall be indicated separately from the manufacturer and the contractor.
    5. Cable and equipment testing shall conform to manufacturer’s specifications and relevant standards.
    6. Coordinate with FM Utilities for underground cabling.
B. The characteristics of the primary power service shall be determined specifically for the campus involved and for the particular location on the campus.
C. In general, each major building shall have two underground primary feeders terminating in a double ended sub-station. This does not apply to all campuses and shall be confirmed in programming during design criteria gathering.

VII. Section 26 05 19 Building Wire Cable and Connectors (600V and Below)

A. Electrical conductors rated less than 1,000 volts shall be stranded and insulation rated for THHN/THWN or RHH/RHW as appropriate for installations in areas with normal operating temperatures. Conductor terminations for ratings of 100 amps or less and in sizes No. 1 AWG and less shall use the 60-degree F column of Table 310.15(B)(16) to comply with 110.14(C).

B. Splices shall by one of these methods:
   1. Terminals rated for the amperage of the conductor or more.
   2. Devices designed to screw onto the conductor with an internal spring.
   3. Polaris type terminals that have factory applied insulation.
   4. Split-bolt devices shall not be used.
   5. Plug-in type splices shall not be used.

VIII. Section 26 05 33 Conduits and Boxes

A. Floor Mounted Wireway for Communications and Power Systems:
   1. All floor low voltage wiring and communication cable protectors shall be aluminum finish and factory devices per plans unless noted otherwise by the UTSW PM.
   2. A removable wireway cap along the entire length of the floor protector shall be provided to allow for easy access to the wireway channel. Provide trim accessories to hide openings in wall, were applicable.
   3. Floor mounted wireways shall be Connectrac or UTSW approved equivalent.
      a. For installations with hard flooring, such as LVT, wireways shall be mounted on top of the flooring with sloped sides to ensure TDLR compliance.
      b. For installations with carpet flooring, surface wireways shall be mounted to concrete floors, underneath the carpet.
      c. Wireways mounted in areas with carpet may be installed under carpet tiles or may have the removable cover exposed, sides and edges shall be tapered to ensure TDLR compliance.

IX. Section 26 09 23 Networked Lighting Control System

A. UTSW has various existing types and levels of lighting controls throughout campus. For each project, the A/E shall confirm the lighting control requirements for the building, the user groups, and the space utilization.

B. Lighting control systems shall comply with applicable code requirements including IECC, SECO, and energy efficiency goals. Off-campus locations shall follow the local AHJ.

C. UTSW has implemented a campus standard for Networked Lighting Controls to ensure code compliance, energy efficiency, and to streamline management.
   1. In renovation projects over $50,000 and in Capital Improvement Projects (CIP), a networked lighting controls system shall be provided in accordance with Section 26 09 23 “Networked Lighting Control System” of the UTSW Specification and the UTSW Design Guidelines.

2. For existing buildings without the new lighting control system, the A/E shall work with the UTSW PM and UTSW FM to locate space for the new controller and ensure a connection to the UTSW Network is provided.

D. Wireless systems and embedded fixtures may be considered with written approval from UTSW FM, IR / Wireless Group, and UTSW Electrical Shop.
   1. Wireless components shall not interfere with UTSW Wireless Network.

E. Occupancy time delays before dimming or shutting off shall be factory set at 20 minutes unless otherwise required to meet energy code requirements.

F. Networked graphic wall stations shall be used at select space types such as auditoriums, training spaces, or large classrooms. Project A/E shall coordinate with user group requirements and include the scope in the contract documents.

G. Power packs shall be group mounted wherever possible within 1-foot of doors, above the ceilings.
   1. All power packs placed above the ceiling for lighting controls shall be indicated by a ceiling label per UTSW specification Section 26 05 53 Electrical Identification.

H. Relays shall be located in serviceable locations within electrical closets, mounted between 18 inches and 60 inches AFF. For existing electrical closets without adequate space, TR closets may be utilized.

I. Refer to **EXHIBIT 26.2 Lighting Control Matrix** which indicates the preferred Sequence of Operation by space type.
   1. The Project A/E shall use this as the starting point for lighting controls discussion per project.
   2. Any deviations from this shall be approved in writing by the UTSW PM and Design Team.

J. Starting at the earliest design phase, the A/E shall provide a lighting controls Sequence of Operation (SOO) or Narrative that describes the needs of each space type, amount of operability, system type, and the level of integration.
   1. This shall be revised at each design phase and a final version provided within the IFC package.
   2. Refer to Section C to confirm deliverable requirements per project type.

K. Preinstallation meetings are required with the selected Lighting Controls Product vendor to ensure coordination of room level sequence of operations and overall system requirements.

X. Section 26 10 00 Medium-Voltage Electrical Distribution

A. General:
   1. UTSW has a Medium Voltage service entrance substation West of the campus. This substation receives power from four (4) ONCOR over-head transmission lines that share support towers. This substation contains two (2) 135 KV to 13.8 KV transformers and two (2) 13.8 KV Medium voltage distribution switchgear. The two (2) 13.8 KV Medium Voltage distribution switchgear are arranged in a Main-Tie-Main (MTM) arrangement. Distribution from each Medium voltage switchgear to campus building and loads is through two (2) separate underground ductbanks arranged in a Loop feeder configuration. Most existing buildings and new buildings

are supplied by at least one (1) Medium Voltage feeder from each underground ductbank system. This arrangement is reliable enough that some new buildings constructed in the last 20 years are served by one (1) feeder from each ductbank system in a Loop arrangement without a backup generator.

2. Refer to UTSW Design Guideline Section 33 71 19 Underground Ductbanks and Manholes for distribution requirements.

B. Secondary Unit Substations with Switchgear Secondary:
   1. Each transformer in a double-ended sub-station shall be sized to serve 75 percent of the maximum demand on the sub-station. In critical loads such as hospitals and research facilities, or where determined to be necessary by the University and design team, this may be increased to 100 percent.
   2. Where feeders are arranged in a looped system, full capacity feed-through capability will be required.

C. Coordination:
   1. Coordination with UTSW FM shall begin during the Schematic Design stage for all projects.
   2. Coordination with Oncor shall begin during the Schematic Design stage for projects connecting directly into ONCOR's electrical system.
   3. The UTSW Medium Voltage group shall be informed of, and allowed to be part of, any coordination meetings with ONCOR.
   4. Any fees to be paid by UTSW to ONCOR for electrical service has to be coordinated with UTSW PM as soon as possible, but before the 100 percent Design Development stage.

D. Mechanical equipment connections for mechanical equipment on campus shall be connected with liquid-tite flexible metallic conduit.

XI. Section 26 20 00 Low-Voltage (LV) Electrical Distribution

A. General:
   1. Equipment designs, including CT, MRIs, PET CTs, Cage Washers, and similar equipment may have engineered documents.
   2. These documents may show power, data, required empty conduit, and other vendor specific requirements. These elements shall be incorporated into the overall design to ensure all requirements are captured and coordinated.
   3. The presence of these engineered documents shall not preclude the A/E from incorporating this required information into the contract documents.

B. Low-Voltage Transformers:
   1. Generally, the first transformer shall be 480Y/277 volts, 3 phase, 4 wire. 4160 volts, 3 phase, 3 wire may be required for large motors.
   2. Three phase dry type transformers shall be installed at strategic locations to provide 208Y/120 volt, 3 phase, 4 wire service to LED lighting, convenience outlets, specific equipment loads and small motors. One of the determining factors of the transformer locations shall be the cost of the increased length of branch circuits versus the addition of transformers/panels.

C. Switchboards and Panelboards:
    1. To protect personnel on campus, UTSW prefers that distribution panelboards 600 volts and less as well as 400 amperes and large shall be Square D I-Line panelboards.
        a. Equivalent products may be submitted using substitution requests.
        b. Only manufacturers offering equivalent safety features for at least five (5) years in the United States market will be considered.
    2. Branch Circuit Panelboards 240 volts and less and 400 amperes and less shall be Square D Type NQOD with factory means to individually install each breaker to the Panelboard bus by bolt-on means and plug-in means.
        a. Products from other manufacturers that have manufactured an equivalent product for the United States market for at least five (5) years will be considered for substitution when submitted with proper substitution request form per Division 01 project specifications.
    3. Branch Circuit Panelboards rated 480 volts and less and 400 amperes and less shall be Square D Type NF with factory means to individually install each breaker to the Panelboard bus by bolt-on means.
        a. Products from other manufacturers that have manufactured an equivalent product for the United States market for at least five (5) years will be considered for substitution when submitted with proper substitution request form per Division 01 project specifications.
    4. Covers shall be door-in-cover with continuous hinged front where factory available for the submitted Distribution and Branch Circuit Panelboards. Door-in-door covers shall be listed for the location installed.
    5. Distribution Panelboards shall not have exposed bus when interior the cover is removed.
    6. Two and three pole branch circuit breakers installed in Distribution and Branch Panelboards shall have factory installed lock-off devices that remain on the breaker when not locked off.
    7. Feeder conductors for Distribution and Branch Panelboards shall be fully rated for the overcurrent protection device.
    8. Distribution and branch Circuit Panelboards shall be labeled with this information as a minimum:
        a. Name.
        b. Voltage, phase, and wire count.
        c. Where fed from and breaker size.
        d. Feeder conductor sizes and conduit sizes.
        e. BB.FF.RRRR. Where BB is Building designation, FF is the floor, and RRRR is the room where panel is located.
    9. Branch circuits supplying minus 80 Degree-F freezers shall be 3#10, 1#10, 3/4-inch. These freezers can be 120-volt, 20 amp; 208-volt, single phase, 20 amp; and 208-volt, single phase, 30 amp. The extra conductors shall be capped off in the device box and in the panelboard.
    10. Refer to Design Guideline Section 33 71 19 Underground Ductbanks and Manholes for distribution requirements.

11. Fire Pumps shall be fed from two (2) reliable power sources to comply with NFPA 70 (NEC) and NFPA 20 Stationary Fire Pumps.
    a. The existing medium voltage underground distribution system is considered reliable.
    b. The required two (2) reliable sources could be from different Medium Voltage underground distribution systems without generator backup or a combination of normal feeders and a feeder from a backup generator.
    c. This determination will be determined by the project conditions and the availability of a backup generator.
12. Arrangement one (1) is from both ends of a double-ended unit substation containing a Main-Tie-Main (MTM) arrangement when a generator is not available. The two (2) normal feeders shall be tapped ahead of the two (2) Main Circuit Breakers (MCB) in separate vertical sections from the MCBs.
13. Arrangement two (2) is from one end of a double-ended unit substation containing a Main-Tie-Main (MTM) arrangement and from a standby generator. The normal feeder shall be tapped ahead of one (1) of the Main Circuit Breakers in a separate vertical section. Fire pump service feeder from an available generator shall originate from a generator mounted breaker or from a generator distribution board.
14. Arrangement three (3) is from one (1) end of a double ended unit substation and from a standby generator. The normal feeder shall be tapped ahead of the Main Circuit Breaker in a separate vertical section. Fire pump service feeder from an available generator shall originate from a generator mounted breaker or from a generator distribution board.
15. Arrangement four (4) is from each end of two (2) single unit substations without a MTM arrangement when no generator is available.

D. There shall be only one (1) breaker in the Normal power feeder before connecting to the Fire Pump controller. More than one (1) breaker is allowed in Fire Pump feeders supplied from a standby generator. The Automatic Transfer Switch (ATS) shall be located in the fire Pump Room to comply with NFPA 20 and NFPA 70. The ATS should be part of the Fire Pump controller to save space.

E. Devices:
    1. New buildings shall be constructed to comply with current Texas Accessibility Standards. FM capital projects buildings and spaces shall be brought into compliance as required when renovated. This shall include, but not necessarily be limited to:
        a. Height of wall mounted devices, receptacles, light switches, card readers, etc., above finished floor.
        b. Type and location of audible and visible fire alarms and other distress signals.

F. Low-Voltage Controllers:
    1. Variable Frequency Drives (VFD) shall be provided with input and output reactors and/or filters to limit harmonics transmitted back into the electrical system and to the motor.

   a. VFD manufacturers shall provide calculations for each VFD provided to verify the amount of Harmonics generated and transmitted to system and motor.
   b. Locate VDFs in a climate controlled mechanical space and to limit conductor length from VFD to motor to 75-feet.
2. Engineer specifying VFDs shall be conscious of harmful harmonics and vibration generated by VFDs and add design features for mitigations.
   a. Harmonic mitigation units shall be located in the distribution panelboard.
   b. Harmonics shall be calculated at 4 percent maximum at distribution panelboards and at the electrical service.
   c. The electrical service shall be considered the point of common coupling.
   d. Calculations shall be based on IEEE 519 and other applicable standards.
   e. Motors rated 0.5 Hp and larger shall be rated for VFD duty with motor shaft grounding rings. The use of 12 or 18 pulse VFDs may be used to reduce objectionable harmonics.
3. Each VFD shall be in a separate enclosure.

XII. Section 26 27 13 Metering

A. Provide a multi-function metering device, one for each main circuit breaker. Each metering device/s shall have a digital display and be rated for 120 Volts AC or DC. The metering device/s shall be Underwriters Laboratory listed per UL508.
B. The electronic metering device/s shall be capable of the following electrical parameters:
   1. Volts, phase to phase and phase to neutral.
   2. Current, per phase RMS and 3 phase average.
   3. Average demand current, per phase.
   4. Power factor, per phase and 3-phase total.
   5. Real power, 3 phase total.
   6. Reactive power, 3 phase total.
   7. Apparent power, 3 phase total.
   8. Energy (MWH).
   9. Reactive energy (MVARH).
   10. Frequency.
   11. Average demand real power.
   12. Adjustable demand interval (5-60 minutes).
C. The metering device/s shall have:
   1. Built-in communications capability which will allow multipoint communication via Ethernet to a SCADA system.
   2. Nonvolatile memory for storing all historical data.
   3. Waveform capture capability for steady-state power harmonic analysis for up to the 30th harmonic of the fundamental power frequency.

D. Metering device/s shall be capable of being set up from the display of the device. It shall not be necessary to open its enclosure to reach rear mounted Dipswitches. Setup parameters shall include CT ratio, PT ratio, System type 3 or 4 wire, and demand interval.

XIII. Section 26 32 13 Standby Power Generator Systems

A. When required, a complete standby power supply system shall provide on-site generated electric power over a standby power distribution system. The system shall, upon loss of utility source power, automatically provide electrical service at 480/277 volts, three phase, four- wire, 60 Hertz. The system shall include an engine directly connected to a four-pole alternator, with equipment to automatically start, connect to load, supply the load, and automatically stop on restoration of normal utility power.
B. The power generation system shall be built, tested and shipped by a single equipment supplier so that there is one source of supply and responsibility. The engine, alternator and major items of equipment shall be product of U.S. manufacturers regularly engaged in the production of such equipment, and shall be assembled, tested and shipped to the job site by the engine manufacturer/authorized dealer.
C. Provide a packaged sub-base, double-wall fuel tank system for the engine. The tank shall be a minimum of 8-hour full load capacity complete with all fuel tank accessories.
D. The engine exhaust piping shall be schedule 40 black steel rigid exhaust pipe of size recommended by the generator manufacturer. Exhaust to be provided with double walled silencer and fully closed barometric rain cap.
E. Provide maintenance free batteries and solid-state battery charger.
F. Provide a remote alarm annunciator panel complying the requirement of NFPA-110, Level-1 indications.

XIV. Section 26 33 53 Uninterruptible Power Systems

A. The Uninterruptable Power System (UPS) is three-phase continuous duty, on-line, solid-state uninterruptable power system. UPS operates with existing electrical systems to provide power conditioning, back-up and distribution for electronic equipment loads. The UPS system consists of UPS module, one or more maintenance free battery packs, options and accessories, and 3-breaker maintenance bypass panel.
B. Protect equipment from extreme temperature and humidity by storing it in a conditioned space. Deliver batteries no sooner than 7 days before charging.
C. Provide five (5) years warranty including batteries coverage.
D. Design requirements: Estimate equipment reliability is 2 years minimum MTBF. Equipment maintainability MTTR not to exceed ½-hour.
E. Environmental requirements: Acoustic noise 65 dBA at 1 meter, EMI suppression to meet FCC part 15 subpart J for class A devices, Electrostatic discharge (ESD) immunity to meet IEC 801-2 and withstand maximum 25 kilovolts without damage or adverse effect to critical load. System efficiency at full unity power factor load and nominal input voltage.

F. Accessories: Remote emergency power off (REPO) station and Remote monitoring panel (RMP).

XV. Section 26 36 00 Transfer Switches

A. Provide Automatic Transfer Switches to provide a normal and an alternate service to certain electrical loads. Transfer switches shall be listed with UL and constructed in accordance with NEMA standards.
B. The transfer switch shall be electrically operated from the source to which the load is to be transferred and mechanically held after transfer. Power failure relays shall be provided to sense when the voltage of any phase drops below normal and causes transfer of load to the alternate source. Moreover, it will sense when all normal source phase voltages are rated voltages and re-transfer to the normal source.

XVI. Section 26 41 13 Lightning Protection System

A. In general, all UTSW buildings shall have an Underwriters Laboratories, Inc. approved, Master Label lightning protection system.
    1. Where such a system is not provided, complete justification for its elimination shall be made a part of the record.
    2. UTSW PM shall coordinate with VP of FM and with OSBC for approval to not provide a lightning protection system.
B. Lightning protection shall be provided for all roof top equipment.
C. A lightning protection contractor shall review the need for protection and interconnections to existing lightning protection system.
D. Lightning protection systems shall be maintained for protection of buildings and life safety of occupants.

XVII. Section 26 43 13 Surge Protection Devices

A. Provide transient protection on 480V/277V service entrance and on the 208V/120V distribution electrical system. The panel boards shall be UL listed under UL 1449 Third Edition as a transient voltage surge protection and shall meet the UL listing for each mode of protection.
B. The surge protective device (SPD) shall be solid state electronic unit providing transient voltage surge suppression and high frequency noise attenuation on the electrical lines being protected. The unit shall be rated to withstand a single surge impulse of 250,000 amps and 100,000 amps line to line, line to neutral, and neutral to ground for service entrance and distribution panels without failure or degrading. Unit shall have frequency filter to provide an insertion loss ratio of 50:1 at 100,000 hertz and 500:1 at 10 mega hertz. The unit shall operate continuously at 125 percent of the normal voltages of system being protected and shall survive a minimum of 5,000 surges without failure or degrading more than 5 percent.

C. At the time of beneficial occupancy by the owner, test each unit to establish proper operation.
D. Each unit shall be provided with a 20-year extended warranty by the manufacturer.

XVIII. Section 26 50 00 Lighting

A. General:
    1. Engineer should be aware that lay-in lighting fixtures and lighting fixtures attached to ceiling are required to be mechanically attached to the ceiling framing members by NEC code.
    2. UTSW additionally requires lay-in lighting fixtures to be supported by the building structure at two (2) locations.
    3. The Design Professional Engineer (PE) is responsible to research and make recommendation for Foot-Candle (FC) levels that meet both Owner and IESNA requirements for the specific projects.
        a. A/E shall ensure light levels for MEP spaces provide lighting levels consistent across spaces appropriate to the work areas.
    4. Perform all lighting calculations based on IES Lighting Handbook and the lighting power density criteria of the applicable edition of ANSI/ASHRAE/IESNA 90.1. Include the following information in all submitted calculations:
        a. Room Name.
        b. Room Number.
        c. Fixture type chosen for the room.
        d. Number and type of lamps to be used in the room.
        e. Required illumination level calculated illumination level.
    5. LED Lights:
        a. When determining light fixtures, consideration shall be given to efficiency, LED life, and ease of maintenance of light source.
        b. Any LED luminaires proposed shall comply with UL and Design Lighting Consortium (DLC).
    6. Consider maximum flexibility for switching and circuiting for lighting control as natural illumination levels, and/or task change.
    7. Automatic occupancy sensing may be used in areas where this may be applicable to save energy, even where not required by ASHRAE 90.1 or IECC. These shall be proposed and described to UTSW PM for consultation with user group and FM for approval.
    8. Provide daylighting controls to meet code requirements.
    9. Where required by UTSW FM, provide multiple circuits for outside lighting, such that lighting can be reduced, yet uniform coverage retained, in times of critical energy shortage or as applicable for scheduling.
    10. Outside lighting shall be controlled by a contactor controlled with photo-electric cells in conjunction with a time-of-year adjustable time switch capable of one “off” and one “on” operation during the hours of darkness. Provide lighting contactor in an enclosure with a front mounted H-O-A switch.

11. Designate exterior security fixtures that are to remain on all night as controlled with photocell only.
12. Use task lighting techniques with lower room ambient lighting levels where applicable and where task areas can be defined to achieve energy conservation.
13. Clearly indicate in specifications that contractor will provide training for lighting controls.

B. Lighting - Energy Conservation:
   1. Electrical systems design shall comply with the Texas State Energy Conservation Office (SECO) Design Standard for State Buildings except Low-Rise Residential Buildings, based on ASHRAE Standard 90.1 or IECC for Nonresidential Buildings. Refer to Section B for current editions.
   2. The energy performance of the lights shall be at least 5 percent above the minimum requirements of SECO.

XIX. Section 26 51 00 Interior Lighting Fixtures

A. The lighting design of a building shall take code requirements, aesthetics, light level needs, longevity, energy efficiency as well as maintenance into consideration.
   1. Light fixtures chosen for use on campus shall be easy to maintain.
   2. Design and installation shall provide physical access for repair and service.
   3. Light installation locations shall consider safety for those carrying out normal maintenance.

B. Manufacturers of fixtures shall be companies with proven track record of quality fixtures, bulbs, and systems.
   1. Lighting fixture manufacturers shall have been in the lighting fixture business and producing LED fixtures for a minimum of 5 years.
   2. Catalog cut sheets on each lighting fixture shall be submitted to UTSW for review.
   3. LED fixtures shall be DLC certified LED with a 10-year warranty.

C. LED Interior Lighting:
   1. The lighting level required and the type of luminary to be used in each area, shall be submitted to UTSW for approval.
   2. The calculated lighting level based upon the lighting system designed shall be submitted by the DD stage or early CD to prevent redesign.
   3. Floor or site plans with lighting software generated photometrics are required by the University for normal lighting and separately for emergency lighting.
   4. Recessed lighting fixtures shall be fed by a separate flexible “whip”. The junction box serving the “whip” shall be accessible above the fixture. Lighting fixtures shall not be used for “through-wiring.”
   5. Engineers shall verify lighting levels using photometric software and provide prints of these values during design. Photometric calculations shall be performed and submitted with all normal lighting ON and with only emergency lighting ON. Provide direction for contractors to provide photometric calculations for submitted light fixtures under two conditions: with all lighting at full brightness; and with only the

egress lighting on. Egress lighting calculations shall provide the required lighting levels required by NFPA 101.

D. Interior Lighting Controls (Hospital spaces):
    1. Standalone automatic light control shall be installed in offices, exam rooms, meeting rooms, restrooms, and similar areas.
    2. Automatic light control shall be in commonly used areas as lobbies, corridors, and similar areas. The light control shall be connected to a central lighting control system.
E. Lighting – For ARC special requirements, refer to UTSW Design Guideline Section A2.
F. Lighting design of toilet rooms shall minimize wall-washing on tile walls while providing a comfortable, well-lit space.
G. Refer to **EXHIBIT 26.1 Recommended Commonly Used Light Schedule**.

XX. Section 26 52 00 Safety Lighting

A. Emergency Egress lighting shall be provided with backup power from a generator or by battery backup to comply with NFPA 101, Life Safety Code.
    1. This requirement shall include exit access, stairs, exit discharge, and stairs.
    2. The exit discharge also includes the exterior path from a building exit to a public way.
    3. Interior egress lighting may include a ceiling mounted light fixture or an architecturally pleasing wall mounted unit.
B. Exit fixtures shall be provided and located to comply with NFPA 101, Life Safety Code.
    1. Exit fixtures shall be LED with a life of 60,000 hours minimum.
    2. Exit fixtures may be a combination unit with “bug eyes” to also provide the required emergency egress lighting.
C. Lighting levels in the exit access, stairs, exit discharge, stairs shall comply with NFPA 101 Life Safety Code.
D. In some spaces, an emergency fixture red-light indicator may prevent proper optical measurement, which would impact required processes and equipment. In these conditions, provide an unlit wall-mounted test switch in lieu of the red-light. Provide labeling on both the switch and fixture “Push to test emergency lighting.”

XXI. Section 26 56 00 Exterior Lighting

A. Exterior lighting type shall be proposed by A/E to address project scope and provide energy savings.
    1. Fixtures shall comply with applicable Texas laws for night sky requirements.
    2. Fixtures shall be mounted on poles of appropriate height for the location.
    3. Poles shall match the newest existing campus poles or be selected by project Architect with FM approval.
    4. Exterior and building mounted lighting fixtures shall be located to facilitate maintenance without the use of cranes.

B. Garage Lighting:
    1. Within garages, lighting shall provide adequate lighting without causing distress to drivers.
    2. Entrances shall have additional lighting to comply with garage entrances and exits of the Illuminating Engineering Society of North America (IESNA).
    3. Exit light fixtures shall be located to direct people to the nearest exit.
    4. Back-up Power:
        a. Exit fixtures shall have backup power from a generator or by battery backup integral to the fixture.
        b. Selected garage lighting shall have backup power from a generator or by battery backup integral to the fixture.
        c. Garages provided with generator power shall have the egress lighting fixtures providing egress lighting and exit fixtures connected to the generator.
        d. Emergency egress lighting and exit light fixtures with integral battery backup units shall be controlled by a separate breaker for each level or floor area of a large garage.
            i. These breakers shall be noticeably labeled for monthly testing of the battery units.

C. Exterior Lighting Controls:
    1. Exterior building lighting shall be controlled with an astronomical time clock with manual bypass switch. Outside area and street lighting may be controlled with photoelectric cells or an astronomical time clock. Lighting contactors shall have provisions for connection to building automation system.

D. Exterior Night Lighting Level Standard:
    1. Exterior lighting levels on the UTSW Main campus shall conform to the lighting levels in **Figure 26 56 00 – Exterior Lighting Level Standard**.
    2. Exterior lighting levels for off-campus leased facilities shall meet lighting levels of **Figure 26 56 00 – Exterior Lighting Level Standard** or shall meet established lighting levels of the respective municipality.

Figure 26 56 00 Exterior Lighting Level Standard

Building Exterior	
Description	Foot-Candles (FC)
Active (pedestrian and/or conveyance)	5
Building Surroundings	1

Pedestrian Tunnels (D Plaza Area)			
Description	Avg. Horizontal FC	Avg. Vertical FC	Uniformity Ratio
Pedestrian Tunnel	4.3	5.4 @ 6-foot	3:1

Covered Parking Facilities*			
Description	Avg. Day FC	Avg. Night FC	Uniformity Ratio
Basic	5	5	4:1
Ramps & Corners	10	5	4:1
Entrance areas	50	5	4:1
Stairways			

Open Parking Facilities*		
Description	Avg. Horizontal FC	Uniformity Ratio
General parking & pedestrian areas	0.6	4:1
Vehicle use area (only)	1.0	3:1

Sidewalks			
Description	Avg. Horizontal FC	Avg. Vertical FC	Uniformity Ratio
Roadside Sidewalks	0.6	1.1 @ 6-foot	3:1
Walkways distant from roadways**	0.5	0.5 @ 6-foot	3:1

Roadways		
Description	Avg. Horizontal FC	Uniformity Ratio
Local roads, intermediate traffic, R4 road	0.6	6:1

* Parking areas are considered medium activity.

** Light should extend 6-foot on either side at least 1/3 light level.

Note: The table is a guide only. The responsibly of the design professional (PE) is to comply with IESNA & UTSW Police requirements regarding exterior light level.

End of Division 26

EXHIBIT 26.1 Recommended Commonly Used Light Schedule

Type/ Figure	Manufacturer / Brand Proposed Fixture	CCT	Line Comment	Space Type	Dimming	Space Sensor Required
A	Lithonia CPX 2X2 ALO7 SWW7 M4	3500K	2x2 LED	Back of House, Housekeeping, Building & Dept. Storage, Retail, Dining, Restrooms, Autoclave, Equipment Galley	N	Y
B	Lithonia CPX 2X4 ALO8 SWW7 M2	3500K	2x4 LED		N	Y
A	Lithonia CPX 2X2 ALO7 SWW7 M4	3500K	2x2 LED	MEP Spaces, TR, Fire Command, Equipment Rooms, Kitchen, Servery, Corridor, Lobbies	N	N
B	Lithonia CPX 2X4 ALO8 SWW7 M2	3500K	2x4 LED		N	N
A	Lithonia CPX 2X2 ALO7 SWW7 M4	3500K	2x2 LED	Lab Spaces, Dark Rooms	Y	N
B	Lithonia CPX 2X4 ALO8 SWW7 M2	3500K	2x4 LED		Y	N
C1	Lithonia STAKS 2X2 ALO3 SWW7	3500K	2x2 LED	Office, Wellness, Multi-person Office, Open Office, Classroom, Student Gathering, Lab	Y	Y
C2	Lithonia STAKS 2X4 ALO6 SWW7	3500K	2x4 LED		Y	Y
D1	Lithonia CSVT L48 ALO3 MVOLT SWW3 80CRI	3500K	4FT DLC listed and IP65 and IP66 rated. Part of CS)	Wet Locations:, Parking Garage Stairwells, back of house overhangs, tunnels, shops, warehouses, etc.	Match space type settings	
D2	Lithonia CNY LED ALO SWW2 UVOLT PE PIR DDB M2	3500K	14 x 14" Canopy Luminaire	Parking Garages/ Canopies	Per Code (Field Selectable)	
E1	Lithonia BLWP4 40L ADP GZ10 E10WLCP LP835 Unit with Passive Dual Technology that Dims to 50% with no occupancy, emergency backup	3500K	2', 4', and 8' lengths	Stairwell lighting, where acceptable Per Code	Per Code (Field Selectable)	

Type/ Figure	Manufacturer / BrandProposed Fixture	CCT	Line Comment	Space Type	Dimming	Space Sensor Required
E2	Lithonia BLWP4 40L ADPT EZ1 LP835 MSDPDT7ADCX DIM50 Unit with Passive Dual Technology that Dims to 50% with no occupancy	3500K	2', 4', and 8' lengths	Stairwell lighting, where acceptable Per Code	Integrated Sensors with with automatic dimming control photocell	
F1	Lithonia 2SRTL G L24 5000LM IAW AFL MVOLT GZ1 35K 80CRI DWAM	3500K	2 x 2	Vapor Sealed, Clean Room, Negative Pressure Spaces, Bio-Sensitive	Match space type settings	
F2	Lithonia 2SRTL G L48 5000LM IAW AFL MVOLT GZ1 35K 80CRI DWAM	3500K	2 x 4	Vapor Sealed, Clean Room, Negative Pressure Spaces, Bio-Sensitive	Match space type settings	
U1	ABL-Juno UCES 24IN SWW6 90CRI WH	3500K	2" x 24"	Under Cabinet Lights	Match space type settings	
U2	ABL-Juno UCES 36IN SWW6 90CRI WH M6	3500K	2" x 36"	Under Cabinet Lights	Match space type settings	
D3	Kenall Model CSEFL14 Lamp 23R/45L Step controller between light and Avidity controls. LUXdrive low voltage dimmer model A019	23W-Red 45W-White LED	1' x 4'	ARC Holding areas	Dimming - Y Space sensor - N	

EXHIBIT 26.2 Lighting Control Matrix

This matrix indicates the preferred Sequence of Operation by space type for the Project A/E to use as a starting point.

Space Type	Manual On/Off	0-10v Dimming	Vacancy Mode Occupancy Sensor	Programable Scene Control	Scheduled Time Control
Administration					
Conference Room	Y	Y	Y	Y	N
Private Office	Y	Y	Y	N	N
Wellness Room, Meditation Room	Y	Y	Y	N	N
Multi-Person Office	Y	Y	Y	N	N
Open Office (Note 3)	Y	Y	Y	N	N
Copy Room, Huddle, Small Meeting Room	Y	N	Y	N	N
Breakroom, Lounge	Y	N	Y	N	N
Building Housekeeping, Building and Department Storage	Y	N	Y	N	N
Retail	Y	N	Y	N	N
Dining Area (Note 4)	Y	N	Y	N	N
Small Public Restroom, Staff Restroom	Y	N	Y	N	N
Large Public Restroom, Large Staff Restroom (Note 6)	N	Y	Y	N	N
Fire Stair (Note 6)	N	Y	Y	N	N
MEP Spaces, TR, Fire Command Center, Equipment Rooms	Y	N	N	N	N
Kitchen/Servery	Y	N	N	N	N
Corridor, Lobbies (Note 5)	Y	N	N	N	Y
Research and Education					
Classroom	Y	Y	Y	N	N
Student Gathering College Room	Y	Y	Y	N	N
Lab - Biochemistry, Pharmacology (Note 3)	Y	Y	N	N	N
Lab - Optics, Microscopy (Note 2)	Y	Y	N	N	N
Lab - Electro-Physiology	Y	Y	N	N	N

Space Type	Manual On/Off	0-10v Dimming	Vacancy Mode Occupancy Sensor	Programable Scene Control	Scheduled Time Control
Dark Rooms (Note 2) (Note 7)	Y	Y	N	N	N
Laser Use spaces (Note 1) (Note 2)	Y	Y	N	N	N
Lab - Tissue Culture	Y	N	Y	N	N
Housekeeping - Clean/Soiled/Chemical	Y	N	Y	N	N
Autoclave	Y	N	Y	N	N
Equipment Galley, Freezer Galley	Y	N	Y	N	N

Note 1 - Red light indicators in emergency fixtures not allowed. Provide unlit wall-mounted test switch with labelling on both switch and light fixture indicating "Push to test emergency lighting".
Note 2 - Space will have lights off as standard.
Note 3 - Lighting zone sizes and locations shall occur with user input to identify group assignments.
Note 4 - There may be cases of specialty dinning that may require dimming. A/E to confirm with UTSW user group.
Note 5 - Emergency Egress lighting to be uncontrolled.
Note 6 - Dim lighting to 50% when unoccupied. Provide battery packs or generator circuit as required for egress lighting.
Note 7 - Dark rooms will require red light. A/E to confirm requirements per project.

GENERAL NOTES

- ARC (Animal Resource Center) spaces and Sound Booths are excluded from this matrix. Refer to UTSW Design Guidelines for requirements.
- All under cabinet lighting in labs shall be controlled On/Off by the same means as the space lighting (No dimming). Other space types shall confirm with user groups.
- Where large equipment, tall lab benching, or other fixtures that may affect operability, design occupancy sensor locations to account for obstructions.
- Within offices and smaller spaces, type and location of occupancy sensor shall account for standard monitor and furniture placement to detect occupant movement.
- Lighting zone sizes and locations shall occur with user input. Labs may require special understanding of group assignments.
- For spaces with daylighting and 150 watts of lighting or greater shall be capable of dimming and be controlled via photocell per applicable IECC requirements.
- UL924 listed controls bypass devices can be used to bypass lighting controls in the event of an outage for spaces with UTSW approval.
- Occupancy mode sensors that auto on lighting to 50%, manual on to 100% may be used instead of Vacancy mode sensors where approved by UTSW Design Team and UTSW PM.
- For any space types that do not fall into one of the categories above, please reach out to the UTSW Design Team for directions.

DOCUMENT HISTORY

Issue Date	Description	Editor
06/19/2020	June 19, 2020 Print	MS
12/30/2020	Q4 2020 Revision, Addition of Exhibit 26.1	MS
06/30/3031	Q2 2021 Update	EV
10/03/2022	Q3 2022 Update	EV
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12/20/2024	Q4 2024 Update	EV
06/27/2025	Q2 2025 Update	EV
12/18/2025	Q4 2025 Update	SK

DESIGN CRITERIA

DIVISION 27 COMMUNICATIONS

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DIVISION 27 00 00 – COMMUNICATIONS

I. General Information

A. Every building shall have a Main Distribution Frame (MDF) that interconnects all building Intermediate Distribution Frame (IDF) and provides connectivity to all campus resources.
   1. The UTSW IR department shall be consulted for MDF design per project.
   2. Resources include but are not limited to network, phones, applications, and WIFI.
   3. Additional services within a MDF may include Cellular and Public Safety DAS, paging systems, nurse call, and other building management systems.
   4. Thoughtful design and layout shall ensure new MDF spaces will be functional, efficient, and provide required flexibility.

B. Provide design and/or performance specifications for the General Contractor to procure and install a system of wire, cable management, and associated hardware for a complete system of communications. This design shall support voice transmissions, data transmission, and wireless information from the Technology Room (TR) / Intermediate Distribution Frame (IDF) to each voice/data outlet in the building.
   1. The General Contractor shall be responsible for all pathways.
   2. UTSW IR will confirm specific scope of cabling for the General Contractor per project as this will vary per project size, on versus off campus location, and contract requirements. Refer to IR Specification Guide in UTSW DG Section A1.

C. The design shall include Outside Plant (OSP) communications pathway, entrance facilities, building riser, horizontal building pathways, Main Distribution Frame (MDF), and TR / IDF designed for UTSW IR services.

D. Every aspect of the Electronics Industries Alliances (EIA) / Telecommunications Industry Association (TIA) and Building Industry Consulting Services International (BICSI) standards must be followed for the design of this project.

E. Do not route mechanical or plumbing utilities through or above any MDF, TR, or IDF spaces. The only exception allowed is the branch sprinkler line serving only the sprinkler head in the TR / IDF.

F. Conduits in areas with hard ceilings must route to hallway access panel.

G. A/E to confirm required locations for WIFI access, which include service within MEP spaces, and coordinate the data requirements for expected equipment. Coordinate with UTSW IR and Users to document services and locations needed.

H. A/E to confirm per renovation project with UTSW IR if existing IDF / TR meets project needs or if a new IDF / TR will be identified as part of the project scope.

II. Design Review Submittal Requirements

A. Refer to Section C in the UTSW Design Guidelines.

III. Technology Room (TR) / Intermediate Distribution Frame (IDF) Guidelines

A. The exact physical layout of the room will be determined according to requirements for each project and the space provided. Layouts shown in this document are for guidance in the bidding and design process. Designs shall be created for each project.
B. For TR / IDF layout and design refer to **EXHIBIT 27.2 TR / IDF Typical Room Layout**.
C. Room Location:
    1. All TR / IDF shall be located so they can be accessed through a door from a main corridor with card reader access.
    2. There shall be a minimum of one space located on each floor.
    3. Additional spaces shall be provided to keep voice/data outlet cable lengths to (270-feet) maximum in length.
    4. Location of TR / IDF spaces shall be coordinated with and approved by IR.
    5. If the distance from the work area outlet to TR / IDF, including slack, is greater than 270-foot, design shall include multiple spaces identified per floor.
D. TR / IDF Design:
    1. The space must be a minimum of 10- by 10-foot or calculated using BICSI formula, whichever is larger, be centrally located, and stacked.
    2. Floor areas of 5,000 square feet or less shall have a room no smaller than 10- by 8-foot to support that area.
    3. Floor areas between 5,000 and 10,000 square feet shall have a room no less than 10- by 10-foot to support that area.
    4. TR / IDF shall be free from angles and columns and the door must open outward.
    5. TR / IDF on differing floors shall be stacked one on top of the other.
    6. Fire retardant plywood shall cover all four (4) walls, floor to ceiling, using complete sheets of plywood where possible. Begin plywood at 4 inches above finished floor.
        a. All plywood shall be painted with two (2) coats of fire-retardant white paint using caution not to cover the fire rated stamp on the plywood.
E. Electrical:
    1. Each TR / IDF shall have multiple standard NEMA 5-20 convenience electrical outlets on walls located per **EXHIBIT 27.2 TR / IDF Typical Room Layout**.
    2. If the facility has a backup generator, the TR / IDF design will include generator receptacles as outlined in Section 27 11 26 “Communications Rack Mounted Power and Power Strips.”
    3. All power for racks or cabinets will be fed from receptacles mounted on ladder rack above each equipment rack.
    4. Note: Electrical requirements for a Main Distribution Frame (MDF) Room will be specified and outlined in the construction overview for each project.
F. HVAC:
    1. Each new TR / IDF shall be provided with HVAC and a means to control the temperature in within the space. The temperature range is 65-degrees F to 75-degrees F.

G. Lighting:
    1. Each TR / IDF shall be provided with adequate lighting to enable easy installation and maintenance of all components within the space. Provide a minimum of 50 fc.
    2. Installation will vary depending on ceiling height in room.

H. Pathways:
    1. Final pathways shall be outlined per construction project, but A/E shall assume, for design and bidding purposes, a basket type cable tray, sized to fit, shall be installed from each TR / IDF and following every major corridor.
    2. Any Low Voltage (LV) cabling that carries voltage will not be allowed inside the cable tray. Such cabling will be routed in J hooks or sidecars attached to the sides of cable tray**.**
    3. All OSP 4-inch conduits that will house any fiber optic cables shall be fully populated with two (2) 3-cell ducts. This shall be installed by a certified Max Cell installer.
    4. Strain relief shall be added to keep cabling from being routed in a direct 90-degree angle.

I. Station Cables:
    1. No cable shall be allowed to rest on ceiling grid wires or come in contact with ceiling tiles.
    2. All station cables in the TR /IDF shall be routed through the back side of the horizontal wire managers.
    3. Only Velcro shall be used to bundle and secure cable.
    4. Conduit size for station cable shall be a minimum of 1-inch in diameter. The actual size may vary by project.
    5. Flex conduit is not allowed on UTSW communications projects.
    6. For each location in a hard ceiling, provide one (1) 1-inch conduit above ceiling to an accessible corridor location.
    7. Document cable requirements for appropriate disciplines in Construction Documents.

IV. Section 27 41 00 Audiovisual Systems and Equipment

A. Standard audiovisual components include wall-mounted monitors with additional components determined per project requirements.
    1. A complete sound system shall be provided if the project scope requires either an assisted listening device or sound reinforcement.

B. Audio-visual equipment is typically Owner purchased and Owner installed under a separate contract from the GC.
    1. The design team shall identify equipment, coordinate required infrastructure, indicate locations, and coordinate the documentation.

C. Monitors:
    1. Standard monitor sizes are 43 inches, 55 inches, and 86 inches.

2. Project A/E shall coordinate power and data to be located behind the monitor and above the mounting bracket.
3. Recessed backboxes with multiple services are preferred where possible. Confirm preferences per project with A/V.
4. Refer to **EXHIBIT 27.5 Media Technology Audiovisual**, AV Room Standard Chart (Recommended Setup) in the UTSW Design Guidelines

V. Section 27 52 23 Nurse Call System

A. Nurse call systems vary according to project and application type. Refer to UTSW Master Specifications for notes on existing hospital systems and clinical preferences.
B. Nurse call system design and elements are determined by applicable regulations for each project and application. If no regulation entity exists, the A/E shall confirm UTSW preferences and requirements.
   1. Stakeholders shall include Hospital or Clinical leadership, User Representative, Nurse Call Committee (if applicable), and UTSW PM. For Hospital or Hospital-Based project, include UTSW IR.
   2. Nurse call system scope shall be identified in schematic design for pricing. Begin documentation of locations and elements in design development with finalization during Construction Documents.
   3. A/E shall confirm the needs of the patients and staff per space. Identify the best device to support the needs at each location.
      a. Document components required, locations, programming, nomenclature desired, and system color requirements.
      b. Components may include nurse consoles (a base station with annunciation), staff terminals, staff duty station, staff station, staff assist, enhanced patient stations, emergency pull stations, and corridor lights at each location.
   4. Confirm requirements for regular or emergency power.
      a. At ambulatory locations, within the IDF room, connect the control panel to back-up power, if provided.
C. Applications:
   1. Hospital – Any projects within a hospital shall match existing systems and requirements, providing complete integration.
   2. Hospital-Based Clinics: To be confirmed per project.
   3. Ambulatory / Clinical:
      a. Clinical installations will not have audio communication elements, code blue, or rapid response components.
      b. Standard locations within a clinic may include patient restrooms, infusion rooms, procedure rooms, such as stress test rooms, EKG rooms, and Echo rooms. Confirm additional locations per project.
      c. Additional nurse console locations, console types, and other elements shall be confirmed per project. The location of the Nurse Master Station is typically at a nurse station but is to be confirmed per project.

d. At patient pillow speakers, connection to window shades, A/V, and lighting controls may be needed. Confirm per project.

VI. Section 27 52 24 USB Vitals Monitoring System

A. Typical installation information is in **EXHIBIT 27.4 VITALS USB**. This sketch is provided for reference only and each A/E is responsible for creating and documenting the requirements for their projects.

VII. Section 27 53 13 Clock Systems Standard

A. Wireless, wall-mounted clocks for research, academic, and clinical buildings shall follow the Primex synchronized systems or approved equivalent.
   1. Primex face type: Traditional Series.

B. Stand-alone (battery) clocks shall follow AllSet Series Clocks with molded case or approved equivalent.
   1. AllSet face type: Time CH93.

VIII. Section 27 53 18 WLAN

A. UTSW preferences for wireless access point (WAP) and antenna mounting are in **EXHIBIT 27.3 IR MOUNTING PREFERENCES**. These sketches are provided for reference only and each A/E is responsible for creating and documenting the mounting requirements for their projects.

End of Division 27

EXHIBIT 27.1 **TR / IDF Rack Typical Layout**

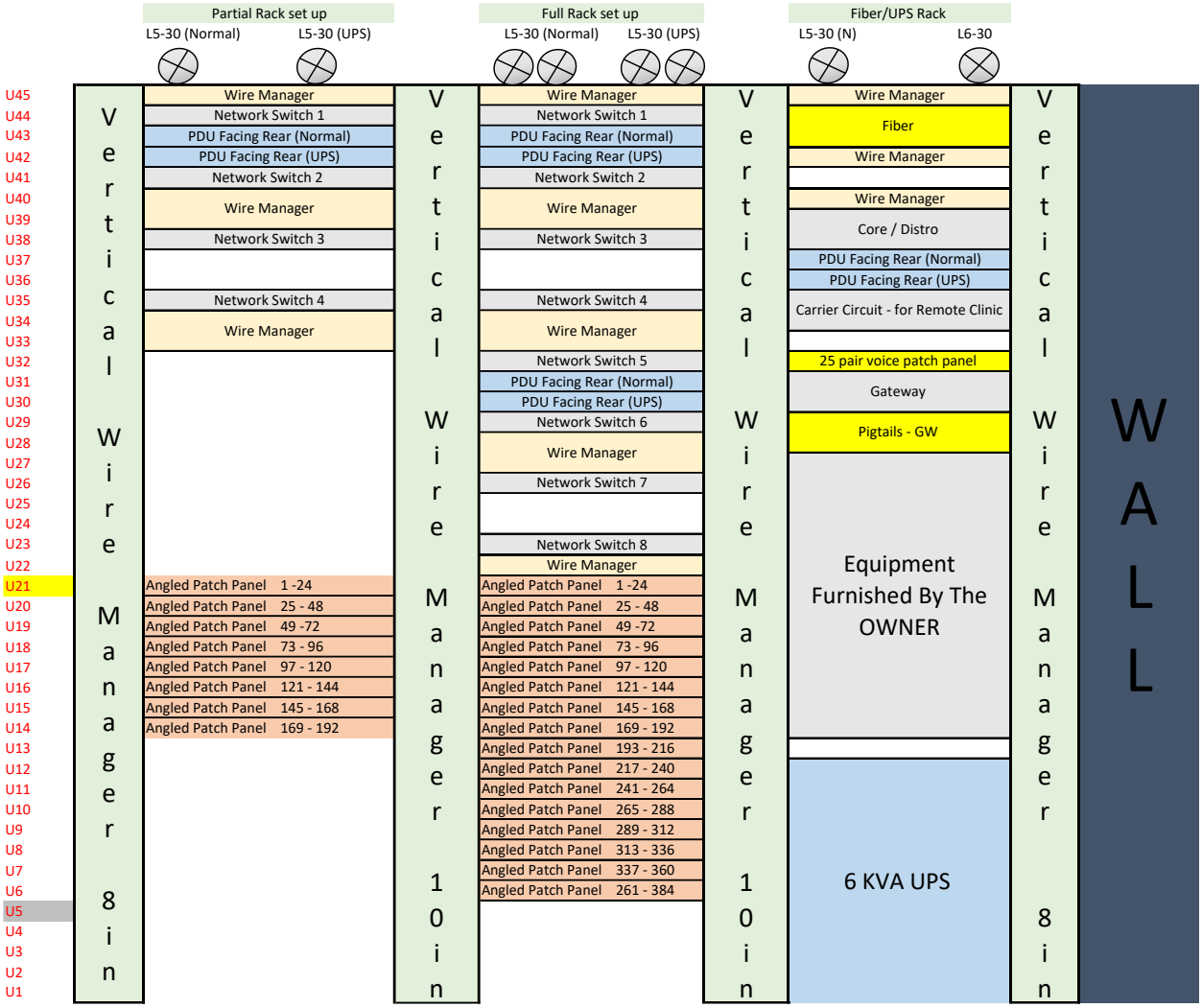
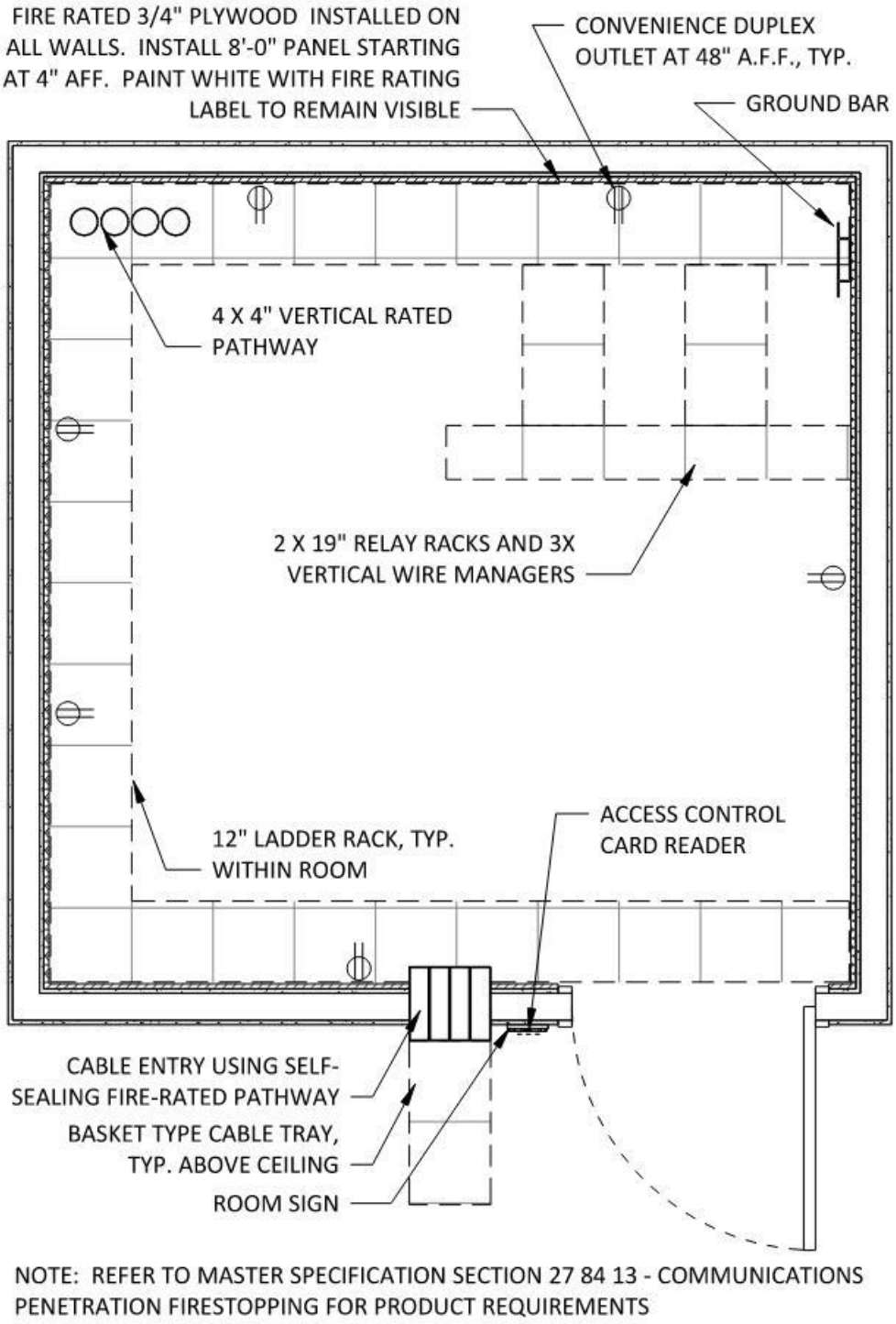
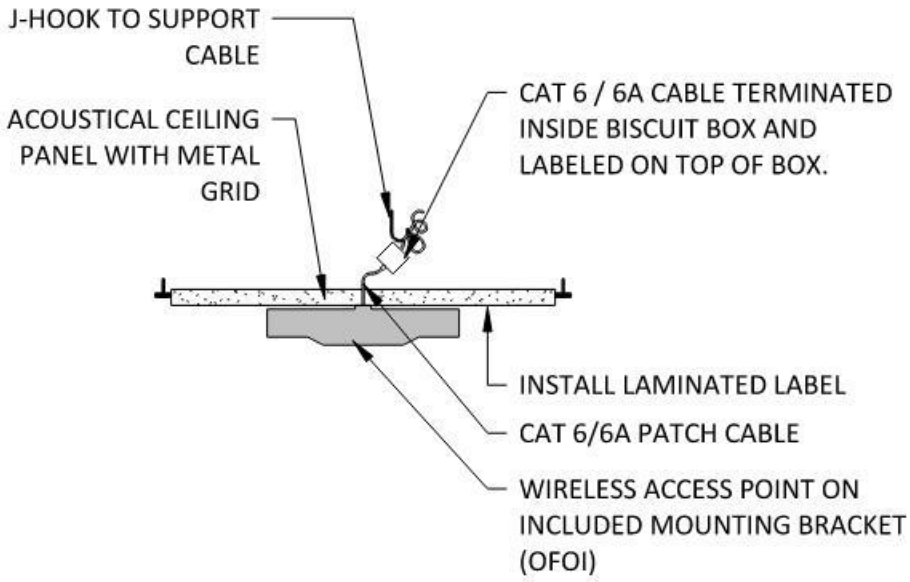


EXHIBIT 27.2 TR / IDF Room Typical Layout

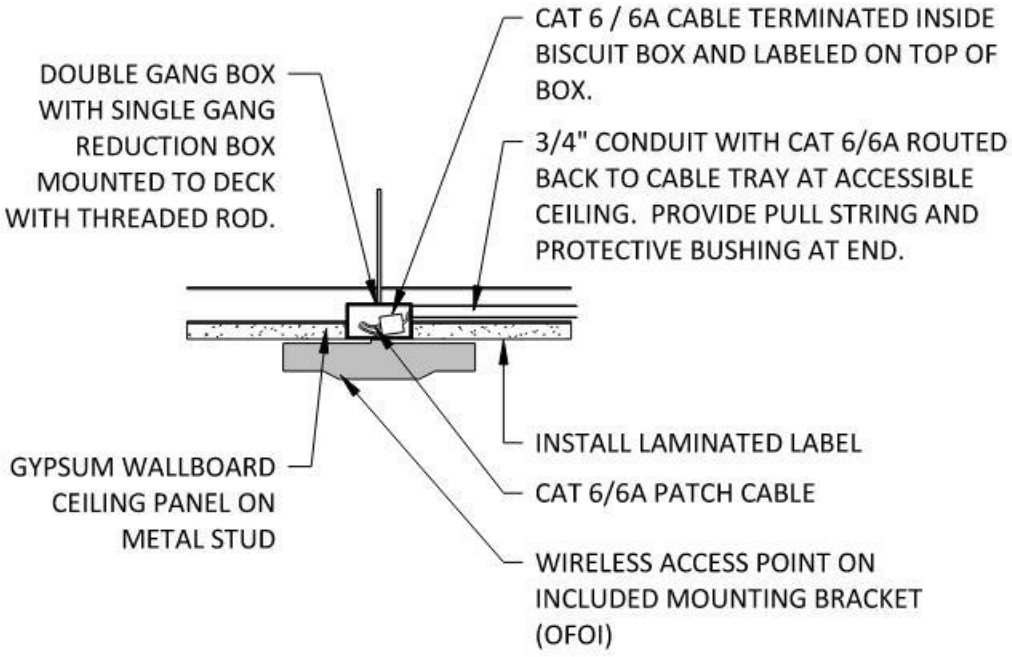


NOTE: REFER TO MASTER SPECIFICATION SECTION 27 84 13 - COMMUNICATIONS PENETRATION FIRESTOPPING FOR PRODUCT REQUIREMENTS

EXHIBIT 27.3 IR Mounting Preferences

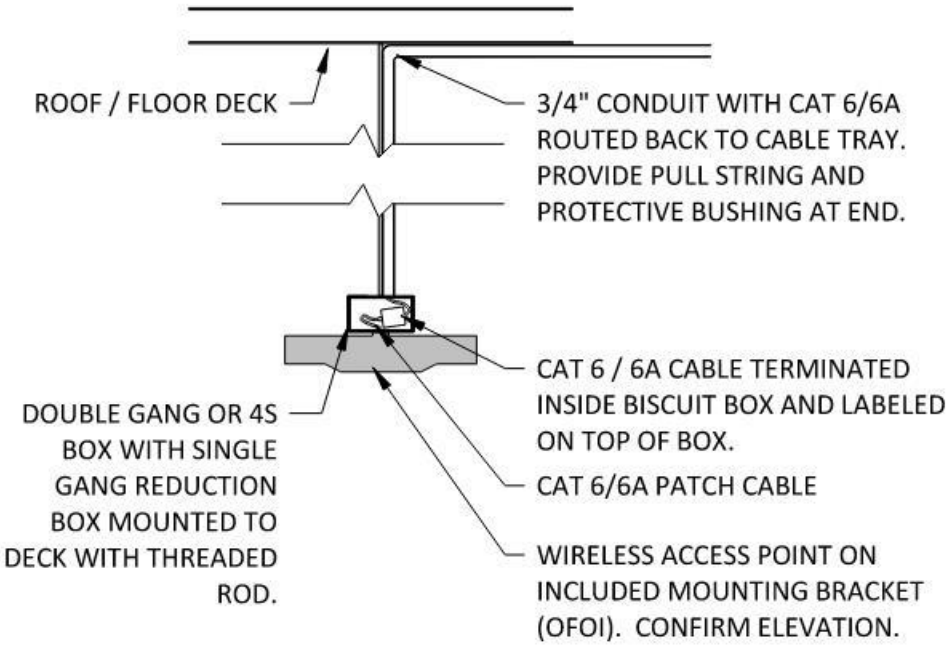


WAP MOUNTING - ACOUSTICAL CEILING SYSTEM

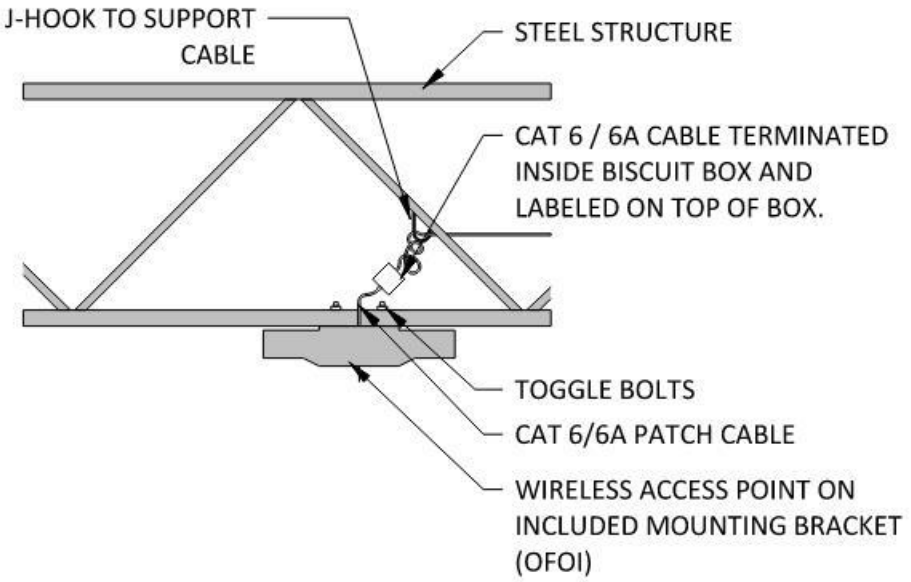


WAP MOUNTING - GYPSUM CEILING

EXHIBIT 27.3 (Continued)

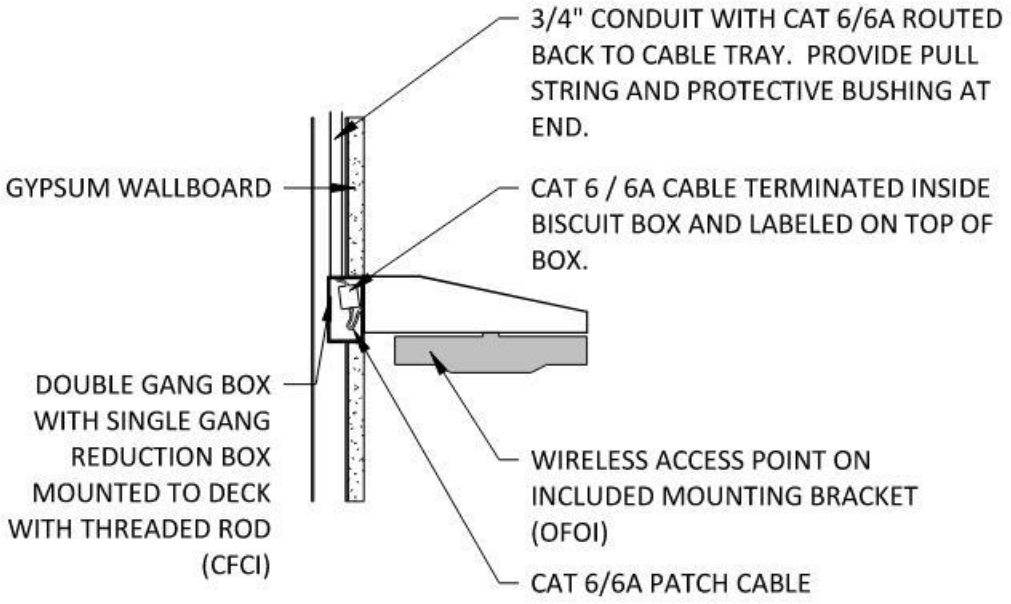


WAP MOUNTING - EXPOSED CEILING

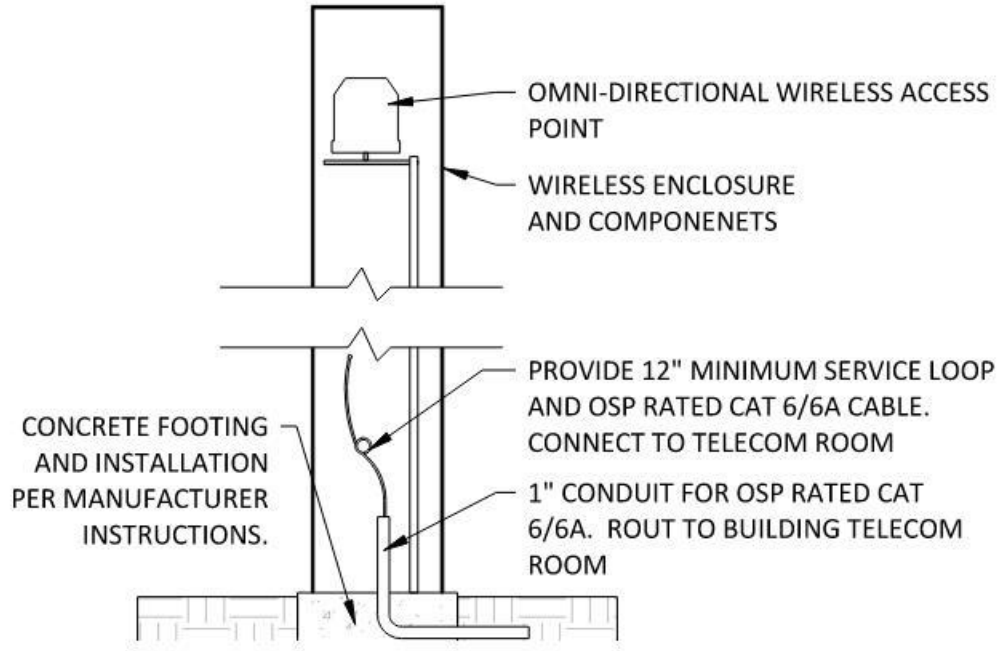


WAP MOUNTING - EXPOSED JOIST SYSTEM

EXHIBIT 27.3 (Continued)

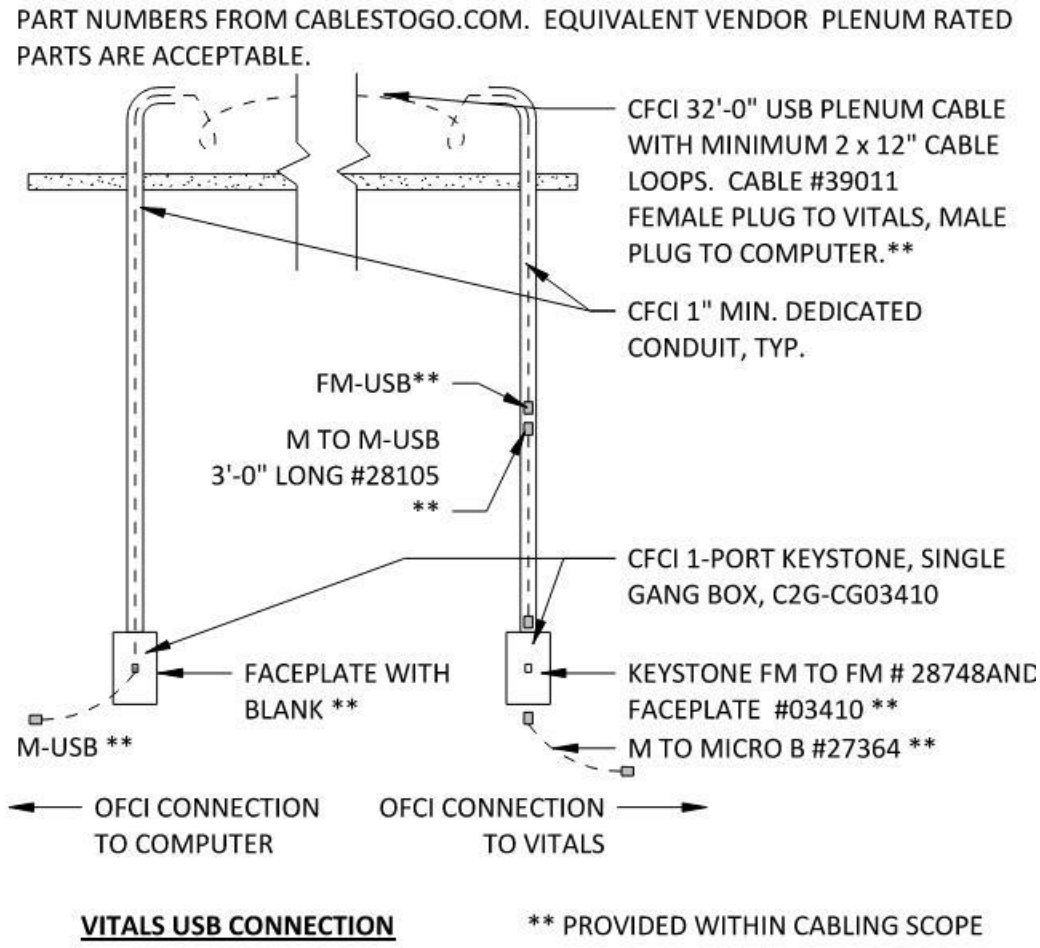


WAP MOUNTING - GYPSUM WALL



WAP MOUNTING - WIRELESS BOLLARD

EXHIBIT 27.4 Vitals USB



VITALS USB CONNECTION

** PROVIDED WITHIN CABLING SCOPE

EXHIBIT 27.5 Media Technology Audiovisual

Audio Visual Room Standard Chart (Recommended Setup)

Media Technology by Public Space Function

Public Space	Elevators	Waiting Rooms, Lobbies, Status Board	Valet Desk	Patient Rooms	Dining / Grab n' Go	Parking Services	Chapel	Hallways
Network	1	1	1	2	1	1	1	1
Wireless Network	1	1	1	1	1		1	1
Coaxial / Cable TV	1	1	1	1			1	1
HDMI							1	
USB				1				
3.5 Audio							TBD	
XLR Audio							TBD	
Monitor	1	1	1	1	1+	TBD	1+	TBD
Projector								
Projector Screen								
Control Panel								
Computer				TBD			TBD	
Signage Player	1	1	1		1	1	TBD	1
Conferencing Camera Location							1	
Aux Output Wall Plate								
AC Power (receptacle #)	4	4	4	4	4	4	4	4
AV Table Boxes								
AV Floor Boxes							1	

DISCLAIMER: A/E to obtain most current version of this exhibit from UTSW PM

EXHIBIT 27.5 (continued)

Audio Visual Room Standard Chart (Recommended Setup)

Media Technology by Room Function

Room Function	Breakroom	Huddle Room	Small Conference room	Large Conference room	Small Classroom	Large Classroom	Auditorium	Simulation Room	Multipurpose / Specialty Room	Offices / Director/ AVP/VP	AV Control Room/Closet
Network	2	2	2	2	2	2	2	2	2	2	2
Wireless Network	1	1	1	1	1	1	1	1	1	1	1
Coaxial / Cable TV	1			TBD			1				1
HDMI	1	1	1	1	1	1	1	1	1	1	1
USB		1	1	1	1	1	1	1	1	1	
3.5 Audio			TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	1
XLR Audio			TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	1
Monitor[3]	1	1	1	2	1	2+	2+	1	1+	1	1+
Projector					TBD	TBD	TBD		TBD		
Projector Screen					TBD	TBD	TBD		TBD		
Control Panel	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Computer	TBD	1	1	1	1	1	2	TBD	1	1	1
Signage Player	TBD										1
Conferencing Camera Locations			1	1	2	2	4		1	1	
Aux Output Wall Plate						1	2				2
AC Power (receptacle #)	2	4	4	4	4	4	4	4	4	4	8
AV Table Boxes		1	1	1	1	1	1	1	1	1	
AV Floor Boxes			1	1	1	1	1	1	1		

DISCLAIMER: A/E to obtain most current version of this exhibit from UTSW PM:

EXHIBIT 27.5 (continued)

UTSW Media Technology, Audio Visual Support
IR – Academic & Administration Information Systems Contact Information:

James Turner, Assistant Director Media Technology
Phone: 214-648-7143
James.turner@utsouthwestern.edu

Adolfo Ortuzar, Director IR-AAIR Operations
Phone: 214-645-7446
adolfo.ortuzar@utsouthwestern.edu

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06/26/2023	Q2 2023 Update	EV
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06/13/2024	Q2 2024 Update	EV
12/20/2024	Q4 2024 Update	EV
06/27/2025	Q2 2025 Update	EV
12/18/2025	Q4 2025 Update	EV

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DESIGN CRITERIA

DIVISION 28 ELECTRONIC SAFETY AND SECURITY

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DIVISION 28 00 00 – ELECTRONIC SAFETY AND SECURITY

I. General Information

A. The UTSW Police Department operates on property owned, leased, or otherwise under the control of the UT System or UTSW.

B. The Access Control Division is responsible for operating and managing the integrated total security management system for UTSW, including the campus access-control system which manages all UT Southwestern ID badges and access control points.

1. The centrally managed badge-access system is intended to provide security only for specific exterior campus perimeter entrances, high-security areas, or sensitive areas.

C. The Access Control Division establishes processes necessary to operate and manage the badge-access system, grant system access, and monitor compliance.

D. The Access Control Division oversees the University's security camera system and supports the information technology systems of the University Police.

E. Observation camera systems are the responsibility of UTSW IR Project Management Office (PMO).

F. Following project programming, to align with submittal requirements, the A/E shall prepare a concise summary of all security services (cameras, panic / duress devices, card readers, etc.) requested during review meetings.

1. Before proceeding with security into farther phases, A/E must obtain approval from the project advocate and/or project Steering Committee before finalizing security systems requirements.

II. Design Review Submittal Requirements

A. Refer to Section C in the UTSW Design Guidelines.

III. Section 28 05 37 Security Voice Communications – Distributed Antenna System (DAAS)

A. Security Voice Communication shall be provided throughout the building via radio repeater systems for all buildings.

B. Radio DAS coverage shall be provided throughout the building; a minimum of -95 dbm is required in all areas of the building regardless of occupancy. Compliance with NFPA and other regulations per Authority Having Jurisdiction shall be provided.

C. Pathways for the system shall be maintained in Technology Rooms from the lowest required level to roof-top equipment.

IV. Section 28 10 00 Access Control

A. Access control of buildings or spaces can be accomplished with standard keyed locks, keypad locks, reader-capable keypad locks, or badge readers (card reader). Access to the spaces by First Responders is required for any controlled area.
   1. Keys will be keyed for the master key of the area and can be accessed using a master key. Keypad locks and reader-capable keypad locks shall have provisions for key over-ride keyed to the master key of the building.
   2. Comply with master key requirements noted in Section 08 71 00 Door Hardware.

B. A/E shall coordinate type of access required with user representative and UTSW PM for project requirements as well as all rooms containing medications.
   1. For ARC special requirements, refer to UTSW Design Guideline Section A2.

C. UTSW PM with support from A/E shall inform Access Control early in the design process of the department's request for badge readers and for rooms with special access control requirements.
   1. Doors controlled by card readers are allowed only with approval of the Chief of Police.
   2. Access Control will coordinate with user representative and UTSW PM to create a security plan, estimates for FM scope of work, and documentation to submit to the Chief of Police for approval.

D. Access control along the means of egress paths as determined by the Life Safety/ Architectural drawings shall be coordinated with the A/E. These paths shall meet the minimum requirements of the currently adopted version of the Life Safety Code by the Texas State Fire Marshal.

E. Pharmacies will not be required to have a direct means of access for first responders. A Key Management System (KMS) shall be provided to contain access keys for first responders. This panel shall have keypad for access and a data cable connected to the network which is then tied into the access control system. A security camera shall be located to monitor the KMS.
   1. Refer to "Key Control" article in Section 08 71 "Door Hardware."

F. For MRI Spaces:
   1. Badge readers shall be installed and operable at all doors. Installation and testing of the badge readers shall follow all codes and specifications.
      a. For Human Use at Zone III; and
      b. For Non-Human Use at Zone III. If there is no Zone III door, install a badge reader at Zone IV.

G. Campus standards – Access Control equipment placement locations:
   1. Card reader:
      a. Building exterior perimeter entrances.
      b. Interior stairwell entrances leading onto floors (hospitals and clinics).
      c. Elevators.
         i. Inside the elevator cab.
         ii. On the floor as a call reader.

d. Elevator lobby doors (dependent on whether elevators are badge access controlled).
e. Interior entrances from a public lobby/waiting area leading into staff/clinical spaces.
f. Sky bridges between buildings.
g. Communications/MDF/IDF rooms.
h. Low voltage rooms.
i. Equipment storage (high value, sensitive materials).
j. Cash rooms.
k. Pharmacy.
l. Irradiator/Select Agent locations.
m. Psychiatry areas.
n. Lab entrances (depends on the type of lab and materials being used).
    i. Page turn meetings with occupants/customer determines what type of materials are being used within each lab and whether a card reader is needed or not.
o. Surgical areas.
p. Clean/dirty & hazardous waste locations.
q. Central sterile department.
r. Certain hospital corridors (separation of departments).
s. Medication rooms.
t. Hospital staff/physician lounges.
u. Hospital/Animal Resource Center locker rooms.
v. On-call rooms (hospital).
w. Clean supply areas.
x. Kitchen/pantries (hospitals and clinics).
y. Animal Resource Center
z. MRI/Imaging areas.
aa. Shipping/Receiving pedestrian entrances.
bb. Parking garage/lot, vehicle entrances/exits.

2. Head end enclosure (controller board, reader boards, input/output boards).
    a. Low voltage rooms.
    b. TR / IDF rooms.
    c. Elevator control rooms (for elevator in-cab card readers).
3. Door contacts only:
    a. Building perimeter doors leading into fire control/command/pump/mechanical rooms.
    b. Dock overhead doors.
    c. Parking garage overhead doors.
    d. Exit only doors (no exterior door hardware).
    e. Roof hatches.
    f. Rooftop stairwell doors.
    g. Elevator machine rooms.
    h. Floor hatches.

4. Panic / Duress buttons:
    a. Check-in desks (Hospital & clinic areas).
    b. Check-out desks (hospital & clinic areas).
    c. Cash rooms.
    d. Cash registers.
    e. Pharmacy.
    f. Psychiatry units.
    g. Hospital emergency department nurse/control stations.
5. Intrusion panels (see Section 28 31 11 Building Intrusion Detection):
    a. Pharmacy.
    b. Campus stores.
    c. Irradiator rooms.
    d. Gamma Knife/Pods.
    e. Cash rooms.
    f. Other specialty locations as determined.
6. Door release buttons - Shall include a video intercom to verify who is at the door. Coordinate with IR for video intercom requirements that IR will provide.
    a. Reception desks.
    b. Admin desks.

V. Section 28 15 13 Emergency Intercom System

A. This system consists of blue lights and blue phones located across the campus and parking garages which connect you to the UTSW Police Department in the event of an emergency.
    1. Emergency call boxes may be located on stanchions or wall surfaces.
B. Locations and quantities for new projects to be determined by the UTSW Police Department. Integration required with UTSW Access Control.

VI. Section 28 20 00 Video Surveillance

A. Network Video Recording and Management System for security can be accomplished when requested by UTSW Access Control.
    1. There are two types of video surveillance on campus, one for security and one for clinical observation.
        a. Refer to UTSW Design Guideline Section 28 23 33 for Clinical Video Observation System requirements.
B. Security cameras are managed with UTSW Access Control and IR groups.
    1. UTSW PM, with support from A/E, shall inform Access Control and IR early in the design process of the department's request for camera installations.
        a. Security cameras are allowed only with approval of the Chief of Police.
        b. Access Control will coordinate with user representative and UTSW PM to create a security plan, estimates for FM scope of work, and documentation to submit to the Chief of Police for approval.

c. The requesting department will coordinate with Information Resources department to coordinate installation of data cables.

2. IP cameras:
   a. Perimeter entrances with card readers.
   b. Main lobbies/waiting areas.
   c. Stairwells with card readers.
   d. Elevator lobbies (buildings and parking garages).
   e. Elevator cabs (interior).
   f. Medication rooms.
   g. Medication dispensing machines and medication disposal units.
   h. Major cross-corridor intersections (primarily hospital and clinic locations, e.g. UH and WC).
   i. Building connectors/sky bridges.
   j. Rooftop corners (parking lot coverage).
   k. Loading docks.
   l. Pharmacy.
   m. Central sterile department.
   n. ATM's.
   o. Cash rooms.
   p. Drug safe rooms.
   q. Cafeterias/Café's/Kitchens/Grab-N-Go's/Pantry storage.
   r. Parking garage/lot vehicle entrances/exits.
   s. Valet/traffic circles.
   t. Emergency call box locations in a parking garage.
3. Video recorders:
   a. Seneca servers – primary (45+ cameras) shall be installed in NL1.130, WC1.206A, or Police Department server room depending on function/purpose.
4. Dell servers – for satellite sites only (44 cameras or less) shall be installed on-site at satellite locations within the communications room(s).
   a. Potential sites include clinical sites or other sites with high security or sensitive areas.
   b. A primary recorder and a failover recorder are required for each satellite site.

VII. Section 28 15 23 Intercom Entry Systems

A. General Information:
   1. Intercom entry systems are used at internal and external locations.
   2. All installations shall be ADA / TAS compliant.
   3. Connection to back-up power or battery is required.
   4. Coordination with security systems and door hardware are required.
   5. UTSW IR will manage systems after completion of projects.

B. External Intercom Entry Systems:
   1. These solutions help manage access into buildings, normally at exterior locations.

2. A video intercom will be connected to the UTSW phone network and route to a predetermined video phone location.
3. Once the system and infrastructure are installed by a Contractor, UTSW IR will program devices, provide static IP address at exterior devices, and non-DID phone number. Interior video attendant may have a DID phone number.
    a. Alternate destinations to receive calls may be discussed per project needs.
    b. Recess or surface mount installations may be specified.

C. Internal Intercom Entry Systems:
1. These solutions help manage access into portions of buildings at interior locations such as a patient floor.
2. A video intercom will be connected through the proprietary system to a video phone located at a nearby nurse station.
3. Utilizes Cat6 cables.

VIII. Section 28 23 33 Clinical Video Observation System

A. Clinical Video Observation Systems may be required in some projects for training and patient safety. This system is used by clinical staff to monitor high-risk patients using power over ethernet (POE).
1. Standard locations are where patient safety is a concern. This may be anywhere a patient can obtain access and may include rooms, corridors, and other identified spaces by the Clinical User Group.

B. Clinical observation cameras are managed and installed through UTSW IR PMO.

C. Locations to be indicated by Clinical Leadership.
1. Stakeholders shall include Clinical leadership, User representative, IR PMO, and UTSW PM.

IX. Section 28 31 00 Addressable Fire Alarm System

A. The fire alarm system shall be designed in accordance with NFPA 72: The National Fire Alarm Code by an individual appropriately licensed in accordance with the requirements of the Texas State Fire Marshal.

B. All equipment and materials shall be installed in accordance with NFPA 72 and UTSW fire alarm design specifications.

C. In MRI Spaces:
1. Fire alarm system shall comply with the UTSW Master Specifications and be Class B wiring in the MRI room.
2. If recommended by the MRI manufacturer, installation of wave guides and RF filters shall be installed in the fire alarm system wiring within the MRI room.
3. Smoke detector(s) shall not be installed directly above the MRI.
4. In the MRI room, installation of smoke detector(s) with NO intelligence shall be the only type permitted.

D. Near Coolers and Freezers:
    1. Fire alarm notification devices shall not be placed in coolers or freezers. The device shall be located immediately outside of the unit so that the flash can be seen through the window (when a window is provided) or the occupant can be notified of the alarm immediately upon exiting the unit.

E. Refer to Section B of the UTSW Design Guidelines for OSBC drawing submittal requirements.

X. Section 28 31 11 Building Intrusion Detection

A. Building Intrusion Detection (Intrusion Panels) are required for the following project types within the project scope with review and approval by Access Control and UPD:
    1. Pharmacy.
    2. Campus stores.
    3. Irradiator rooms.
    4. Gamma Knife/Pods.
    5. Cash rooms.
    6. Other specialty locations as determined.

B. These systems shall provide a battery back-up unless the system requires back-up power connection.

C. Coordination is required with security systems, access control systems, and door hardware.

End of Division 28

DOCUMENT HISTORY

Issue Date	Description	Editor
06/19/2020	June 19, 2020 Print	EV
10/09/2020	28 31 00 added OSBC preference for coolers and freezers	EV
06/30/2021	Q2 2021 Update, Security requirement update	EV
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06/27/2025	Q2 2025 Update	EV

DESIGN CRITERIA

DIVISION 31 EARTHWORK

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DIVISION 31 00 00 – EARTHWORK

I. General Information

A. Earthwork processes on UTSW campus shall follow best practices to ensure solutions that will enhance long-term master planning goals.

II. Design Review Submittal Requirements

A. Refer to Section C in the UTSW Design Guidelines.

III. Section 31 10 00 Site Clearing

A. The OSBC Biological / Chemical Safety Director and/or the OSBC Environmental Compliance Manager must be consulted for elements of site clearing including:
   1. Any site clearing under a VCP Conditional Certificate of Closure, Restrictive Environmental Covenant, or similar environmental control.
   2. Prior to clearing any site which will require installation of a vapor instruction barrier before to building construction.

B. Clearing and Grubbing:
   1. Clear/grub/strip site of trees, roots, and vegetation on that portion of the site to receive landscaping and improvements and remove roots to a minimum depth of 24-inches.
   2. Trees/vegetation to remain shall be adequately fenced and otherwise protected from damage by construction operations.
   3. No onsite burning is allowed unless approved by Owner.
   4. Refer to Division 32 – Exterior Improvement in the UTSW Design Guideline for more information on planting.

C. Earth Stripping:
   1. If good quality, friable topsoil exists on site, strip this material to a depth of 4-inches and stockpile for reuse in areas to receive grass and other landscaping.

D. Topsoil:
   1. Topsoil shall be a natural, fertile, and friable soil that is free of significant vegetation, rocks, or other deleterious materials. It shall be obtained from approved naturally well-drained areas.
   2. Specifications shall include requirements for the Contractor to furnish the location where the topsoil is to be obtained and provide a one-gallon sample of such soil for approval by UTSW FM.
   3. Only the top 12-inches of earth shall be removed and used. Topsoil shall not be acidic or excessively alkaline or contain toxic substances, which may be harmful to the plant growth.

4. Topsoil shall be without admixture of subsoil and shall contain a minimum of lumps, stones, stumps, roots, or similar substances 1-inc) or more in diameter, quality to be determined by Facilities Management Department or its representative.
    a. Topsoil shall not be collected from sites that are infected with a growth of, or the reproductive parts of, noxious weeds such as Nut Sedge or Johnson grass.
    b. Topsoil shall not be stripped, collected, or deposited while wet.

IV. Section 31 22 00 Grading

A. Slopes of planted areas should allow easy maintenance.
    1. Turf areas shall have a slope of no more than 3:1 and no less than 1-percent. A 2-percent minimum slope is desirable.
    2. Areas with slopes greater than 3:1 must be planted with ground cover and constructed to control erosion.

B. Slopes for walkways shall comply with Texas Accessibility Standards.

C. Existing trees and other plant material to be preserved shall be indicated on the grading plan. Where trees are to be preserved no grading or paving of the existing grade within the drip line is allowed.

D. Compact per the requirements of the Geotechnical Engineer or as a minimum compact the top 6-inches of all subgrades to receive embankment or paving/structural improvements to a minimum of 95-percent maximum density as per ASTM D-698. Open area embankment shall be placed in maximum 12-inch lifts and compacted to a minimum of 90-percent maximum density as per ASTM D-698.

E. Structural embankment shall be compacted per the requirements of the Geotechnical Engineer or as a minimum compact in maximum 8-inch lifts to a minimum of 95-percent ASTM D-698. Backfill around structures shall be placed uniformly and only after the elements of the structure have attained the required strength to resist the soil pressure.

F. Select fill where required shall be a material available in the general area of the project (if possible) having a plasticity index (PI) ranging from 7 to 15, a liquid limit of 35 or less and being free from organic matter, large rocks, or other deleterious materials.

G. Mineral filler shall consist of some dust, crushed sand or other inert material approved by the Owner; and may be added in amounts not to exceed 10-percent of the weight of the sand or mixture of sands, to improve the workability or plasticity of the concrete mix. Such mineral filler must be of the quality specified for fine or coarse aggregate, and when tested by laboratory methods shall meet the following requirements for percentage by weight:

Retained on No. 30 (600 um) sieve	0 percent
Retained on No. 200 (75 um) sieve	0 to 35 percent

H. Where a mineral filler is used, it shall be measured by volume or weighed and batched separately.

V. Section 31 23 00 Excavation and Fill

A. Appropriate geotechnical and soil sampling is important to ensure there is no soil contamination prior to removal.

B. Any excavation and digging below 1-foot around the campus bird sanctuary must be approved by the OSBC. The area of the bird sanctuary is defined as the tree line surrounding it.

C. Backfilling is to be scheduled so there is a minimum amount of open excavation left during hours of no work.
   1. All open excavation shall be properly lighted and barricaded during hours that contractor is not on site.
   2. The open ends of all utility lines shall be temporarily sealed at the end of the working day.

D. Adequate measures shall be taken to prevent runoff water from entering the trench without damage to surrounding facilities/properties.

E. De-watering systems shall be provided as required for excavation/backfill activities and to allow installation of utility lines and embedment envelope on dry stable trench bottom.
   1. Prior to beginning de-watering, the OSBC Biological / Chemical Safety Director and/or the OSBC Environmental Compliance manager must be consulted.
   2. Discharge from the de-watering system shall be directed to drainage facilities of adequate capacity in a manner that will not damage or interfere with the use of adjoining facilities/properties.
   3. De-watering systems shall be provided at no additional cost to the Owner.

F. The embedment zone for a utility line extends from 6-inches below the bottom of a utility line to 12-inches above its top.
   1. Embedment material for water and sanitary sewer PVC lines shall be clean sand.
   2. Embedment material for storm sewer RCP lines is fine gradation gravel with maximum diameter of 3/4-inch.
   3. Embedment material for pre-insulated thermal utility piping is sharp sand.
   4. Electrical ductbank is typically encased in red concrete and installed on the undisturbed trench bottom. Refer to Design Guideline Section 33 71 19 Underground Ductbanks and Manholes.
   5. High water table elevations may necessitate the use of an alternate embedment material and different embedment zone dimensions.

G. Backfill above the embedment zone for trenches in open areas shall be native material compacted in maximum 12-inch lifts to 90-percent maximum density as per ASTM D-698.
   1. Backfill above the embedment zone for trenches in areas under existing or proposed pavement or ground supported structures shall be cement stabilized sand (1 ½ sacks of cement per cubic yard of sand) compacted in maximum 8-inch lifts.
   2. Consolidation of trench backfill by flooding/jetting is not allowed.

H. An excavation/trench safety program shall be implemented which complies with OSHA Trench Safety Standards, Subpart P.
   1. The trench safety plan shall be prepared and sealed by a Texas Professional Engineer and submitted to the Owner prior to the start of construction.

VI. Section 31 31 16 Termite Control

A. When soil treatment is required, all products used for the treatment of termites shall display labels bearing Environmental Protection Agency (EPA) approvals and shall be mixed and applied in accordance with directions on the label.

VII. Section 31 32 13 Lime Soil Stabilization

A. If lime soil stabilization is required, refer to Division 32 “Site Paving” in the UTSW Design Guideline.

B. Void Space Below Grade Beams - Provide soil retainers at the face of grade beams below grade to form a void of sufficient depth to prevent expansion of earth to cause pressure on bottom of beams.

End of Division 31

DOCUMENT HISTORY

Issue Date	Description	Editor
06/19/2020	June 19, 2020 Print	EV
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DESIGN CRITERIA

DIVISION 32 EXTERIOR IMPROVEMENTS

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DIVISION 32 00 00 – EXTERIOR IMPROVEMENTS

I. General Information

A. UTSW Landscaping Services is responsible for maintaining over 100 acres of green space on the campus. This is accomplished through the coordination of landscape maintenance, irrigation, pest control, and maintenance of campus streets, sidewalks, and hardscapes with the goal of providing an inviting environment for visitors, students, faculty, and staff.

II. Design Review Submittal Requirements

A. Refer to Section C in the UTSW Design Guidelines.

III. Section 32 10 00 Bases, Ballasts, and Paving

A. Site Paving shall be provided to facilitate pedestrian and vehicular access along with ensuring emergency and service vehicles have clear access to the site and facility being designed.

B. Materials, parameters, and methods shall be in basic conformance with the Texas Department of Transportation (TxDOT) "Standard Specifications for Construction of Highways, Streets and Bridges," latest edition and applicable ASTM standards.

C. Paving:

1. Subgrade material to receive pavement sections other than pedestrian sidewalks which has a plasticity index (PI) greater than 17 shall be stabilized in place with lime prior to placing the pavement.
    a. Lime shall be placed in slurry form or with Owner approval, lime may also be dry placed as Type C pelletized quicklime (grade DS).
    b. Lime shall be thoroughly mixed into the subgrade with a rotary pulverizing mixer using a two-step preliminary mix/final mix procedure with appropriate curing times between mixes and compaction before opening to traffic or placing additional courses.
2. Subgrade material to receive pavement sections other than pedestrian sidewalks which has a plasticity index (PI) less than 5 shall be stabilized in place with Type I Portland cement.
    a. The cement shall be dry mixed into the subgrade using a rotary pulverizing mixer, appropriate water added and then thoroughly mixed with the cement and soil until a full depth uniform mix has been obtained.
3. Appropriate compaction and moist curing shall occur prior to placing additional courses. Stabilized subgrade shall be compacted to the requirements of the Geotechnical Engineer or to a minimum of 95 percent of the maximum density as per ASTM D-698.
    a. Stabilized subgrade shall extend a minimum of 12-inches beyond the supported pavement section.

b. The amount of lime or cement to be added to the subgrade and the depth of stabilization shall be determined by the geotechnical consultant based on design mix tests and anticipated traffic loadings.

4. Pavement sections subject to vehicular traffic shall be either a rigid section of Portland cement reinforced concrete (PCRC) or a flexible section consisting of hot mix asphaltic concrete (HMAC) surface over an approved flexible base material. UTSW PM shall confirm the appropriate pavement type per project.
   a. PCRC pavement sections shall be a minimum of 6-inches thick.
      i. Finish shall be broom or burlap drag. HMAC shall be Type "D" and the flexible base material shall be Type A, grade 1 or 2 as defined in the TxDOT standard specifications.
   b. A rolling pattern for HMAC shall be established using a Troxler Nuclear Density Gauge.
      i. The flexible base shall be compacted in maximum 8-inches lifts to a minimum density of 95-percent of the maximum density as per ASTM D-1557 and shall be primed with approved asphaltic material at a rate established by the team and shown on the plans prior to HMAC placement.
      ii. The HMAC surface course shall be compacted to contain 3 to 8 percent air voids when tested in accordance with Tex-207-F and Tex-227-F.
5. Concrete for all site paving/curbs/gutters shall have a minimum compressive strength of 3,000 psi at 28 days. Reinforcement shall be new deformed steel bars conforming to ASTM A615, Grade 60 minimum No. 4 bar in size. No welded wire fabric shall be used as reinforcement except in unique situations as approved by Owner.
6. All concrete shall be adequately cured by protecting it against moisture loss for a period of not less than 72 hours beginning immediately upon completion of finishing operations and initial set of concrete.
7. The thickness of the pavement section elements shall be recommended by the geotechnical engineer based on soil conditions and anticipated traffic loadings.
   a. Pavement at dumpsters, loading docks, etc. subject to heavy vehicular maneuvering and turning shall be PCRC.

D. Walking Surfaces:
1. All stoops, porches, docks, and steps, exterior and interior, should have built-in abrasive surfaces.
2. Slope exterior porches and treads to drain water 1/4-inch per foot.
3. OSBC to be contacted to confirm requirements for coefficient of friction for sidewalk and pavements including broom finish levels. All flooring surfaces must provide slip resistance at wet and dry conditions of .5 or better with tribometer testing.
4. Pedestrian sidewalks shall be PCRC with a minimum thickness of 4-inches and a minimum width of 4-feet. Pedestrian sidewalks that may also be service and/or emergency vehicle pathways shall be a minimum of 6-inches thick and appropriate width.
   a. The finish shall typically be a light broom finish but shall be coordinated with any campus standard finish schemes.

b. Sidewalks shall be cross-sloped a maximum of 2 percent in the direction of site drainage patterns.
c. Sidewalks adjoining concrete curb and gutter shall be doweled into the curb and gutter section.
d. Sidewalks adjoining foundations at doors and other points of pedestrian circulation shall be doweled to the foundation in a manner to prevent differential movement.

E. Joints:
1. A/E shall create a jointing plan to show the type and location of joints in all PCRC pavements, including sidewalks and curbs/valley gutters.
2. Sidewalk expansion joints in shall be placed at walk intersections and at maximum 20-foot centers in straight runs.
3. Expansion joints, contraction joints, construction joints and isolation joints shall be placed in accordance with good engineering practice as required to control cracking and other distress in the concrete pavement and to facilitate construction.
4. Concrete sawn joints shall be cut “green” using the “soft saw cut technique” as soon as the concrete hardens to support the weight of an early entry type concrete saw and operator to avoid raveling.
5. Expansion joints in concrete shall be primed before a urethane installation.
a. Self-leveling sealant is not preferred and shall be reviewed with Facilities Management for consideration.
b. All installations shall ensure the proper depth of urethane needed per specifications.

IV. Section 32 12 16 Asphalt Paving

A. Asphalt paving is not typically installed on campus for permanent features. Any use shall be approved by FM and meet TXDOT requirements.

V. Section 32 13 13 Concrete Paving

A. Concrete sidewalks width shall be sized to handle pedestrian flow.
1. Sidewalks over 6-foot wide shall be designed to handle vehicular traffic.
B. Concrete sidewalks are generally medium broom finish.
C. Avoid surface drainage of storm water across sidewalks.

VI. Section 32 13 16 Decorative Concrete Paving

A. Patterned concrete may be used on campus as it can be repaired easily.
B. Imprinted and stamped concrete are not preferred as repairs are difficult to match original area.

VII. Section 32 14 00 Unit Paving

A. Brick unit paving is utilized on campus and any new installations shall be judiciously studied before proposing.
   1. Issues to consider include foot and wheeled traffic, creation of slip hazards, trip hazards, maintenance, and aesthetics.

B. Sand set paving is not preferred on campus as it causes trip hazards and increases maintenance in the long term.

VIII. Section 32 16 00 Curbs, Gutters, Sidewalks, and Driveways

A. Concrete pavement shall typically be edged with a 6-inches concrete curb.
   1. A monolithic curb poured with the pavement is preferred.
   2. In non-monolithic pours, the curb section shall be recessed 1-inch into the pavement and attached with dowels of sufficient spacing and length to hold the curb firmly to the pavement.

B. HMAC flexible pavement sections shall typically be edged by reinforced concrete curb and gutter.

C. Curb and gutter section shall be placed on 4-inches of flexible base material compacted to the same requirements as the pavement section.

D. Joints:
   1. Place doweled expansion joints in curb and gutter as a minimum at end of radius returns, at curb inlets and at maximum 40-foot centers in straight runs.
   2. Expansion joints in curbs with adjoining sidewalks shall match the joint location and spacing in the sidewalk.
   3. Contraction joints a minimum depth of 3/4-inches or 1/4 slab depth whichever is greater shall be placed at 10-feet intervals.

E. Reinforced concrete valley gutters shall be placed in areas of concentrated storm water runoff across HMAC pavement such as at street/driveway intersections.
   1. The valley gutter section shall be placed on 4-inches of flexible base material compacted to the same density requirements as the pavement section.
   2. Doweled expansion joints shall be placed in valley gutters at maximum 40-feet centers.

F. All pavement/surfaces and gutters shall be crowned and/or sloped sufficiently to positively direct storm runoff to points of discharge or collection as to eliminate ‘birdbaths.”
   1. Minimum cross slopes for open pavement areas shall be 1-percent.
   2. Minimum crown for streets shall be 6-inches above the gutter line.
   3. Minimum slopes for curb and gutter shall be 0.5-percent.

IX. Section 32 17 00 Paving Specialties

A. Parking Bumpers and parking blocks are not preferred since they are trip hazards.
   1. If required, they shall be painted safety yellow for contrast.

B. The basic configuration of parking lots shall be as follows:

1.	Parking Angle:	90 degrees
2.	Stall Width:	9-foot (Compact spaces not preferred)
3.	Module Width:	62-foot (stripe to stripe) 60-foot (face of curb to stripe) 58-foot (face of curb to face of curb)
4.	Drive Aisle:	24-foot (surface lots and garages)
5.	Stripe Width:	4-inch
6.	Stripe Length:	18-foot
7.	Stripe Colors:	
	Pavement Markings	Refer to color schedule in Specification Section 32 17 23
8.	Lighting:	Refer UTSW Design Guidelines 26 56 00
9.	Landscaped Medians:	Irrigated low-profile vegetation.
10.	Concrete Mow Strips:	2-foot-wide back of curb for head-in parking when no wheel stops are provided.

X. Section 32 17 23 Pavement Markings

A. Pavement markings shall comply with Elimination of Architectural Barriers Texas Government Code Chapter 469, Texas Administrative Code 16 TAC part 4 chapter 68, Texas Accessibility Standards (TAS), and local jurisdiction for projects .

B. Parking areas and roads may be managed by UTSW Parking Services or Facilities Management.
   1. Parking lots and parking garages are typically managed by Parking Services.
   2. Roads and restricted parking areas are typically managed by Facilities Management.

C. Symbols, markings, and preferred materials shall be confirmed with UTSW FM and UTSW Parking Services per project.

XI. Section 32 31 00 Fences and Gates

A. Fencing used on campus includes:
   1. Wrought Iron.
   2. Chain Link Fences and Gates.
   3. High-Security Chain Link Fences and Gates.
   4. Welded Wire Fenced and Gates.
   5. Expanded Metal Fences and Gates.
   6. Wire Fences and Gates.
   7. Wildlife Deterrent Fence.

B. A/E shall confirm with UTSW PM the appropriate fencing type and design to match current standard designs per area of campus.
   1. Coordinate grounding requirements with existing or proposed infrastructure.

C. Access at gates shall be coordinated with Access Control and UTSW Key Control.

XII. Section 32 32 00 Retaining Walls

A. UTSW utilizes many types of retaining walls including precast, unit masonry, and gabion retaining walls.

XIII. Section 32 33 00 Site Furnishings

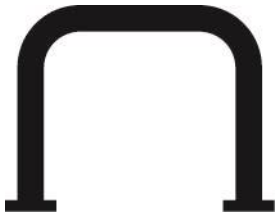
A. Site Waste and Litter Containers.
   1. Refer to Master Specifications Section 32 33 00 – Site Furnishings for exterior basis of design products.
   2. Exterior layouts shall provide spaces for side-by-side waste and recycling containers in locations corresponding to building entrances, areas of seating, and expected traffic patterns with adequate lighting for usage after dark.
      a. Locate waste containers at grade level in a manner so that they can be loaded from top as well as side while being screened from public view.
      b. Where side-by-side locations are not possible, place recycling containers so they are visible from waste containers.
   3. In new construction, waste and recycling shall be matching units with labeling to identify recycling with text and/or the white triangular arrow symbol for recycling.
   4. At dumpster locations, provide a concrete pad of sufficient size and strength to accommodate the dumpster and truck. Ensure clear travel path for expected truck size, path, and turning space.

XIV. Section 32 33 13 Site Bicycle Racks

A. Refer to Master Specification 32 33 13 – Site Bicycle Racks
B. Bicycle racks shall be located near and be visible from building entrances but not placed to block any pedestrian movement. This location shall be in a well-lit, high-traffic areas, and be documented in Construction Documents.
   1. Preferred locations within covered parking garages or beneath building overhangs shall be discussed with Project Users and UTSW FM.
   2. Minimum lighting levels shall comply with UTSW Exterior Lighting Level Standard, refer to **Figure 26 56 00 – Exterior Lighting Level Standard**.
   3. A/E to include safety discussions with UTSW PD for each installation and confirm requirements for additional safety or security.
   4. Locations shall be clear of accessible routes including those on sidewalks and pathways.
C. Quantity of racks required will be determined during the schematic design stage with the UTSW PM.

D. Rack Types:
   1. Bicycle racks shall be heavy and fastened to the ground surface. Utilize multiple mounting points either direct to concrete or to embedded anchors to prevent movement.
   2. Finish materials may include hot dipped galvanized steel, powder coated steel, or stainless steel. Confirm per campus standards per project.
   3. Rack configurations may include inverted-U (inverted horseshoe), post & ring (meter), and wheel-well secure types. High density configurations may be considered per project needs. **Refer to Figure 32 33 13.1 – Allowable Rack Configurations.**

Figure 32 33 13.1 – Allowable Rack Configurations:



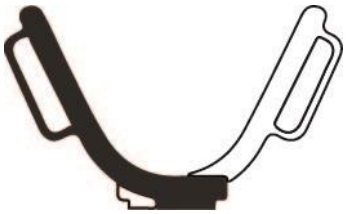
Inverted U



Inverted U / Loop



Post and Ring



Wheel-Well Secure

XV. Section 32 84 00 Planting Irrigation

A. Design and installation must meet Texas Commission on Environmental Quality (TCEQ) irrigation laws and requirements.
B. Irrigation systems shall be installed under the supervision of a Texas Licensed Irrigator.
C. Refer to **EXHIBIT 32.1 Irrigation Materials List**.
D. Design of the irrigation system shall be positively separated from the domestic water system by a double check or reduced pressure type backflow preventer meeting the requirements of AWWA C506 and be suitable to the installation location and conditions.
   1. Backflow preventers may be placed in the mechanical space of the building when appropriate.
   2. Backflow preventers placed underground in landscape areas shall be in valve boxes or vaults with adequate room for testing.

3. Backflow preventers placed above ground shall be located to minimize visibility and to maintain aesthetics.

E. Enclose pipe and wiring beneath roadways, walks, curbs, etc., in sleeves.
   1. Extend sleeve ends 24-inches beyond the edge of paved surface.
   2. Mark sleeve location with 3/8- by 3-inches brass or stainless-steel stove bolt embedded in the concrete at each end. Refer to Design Guideline Division 33 for "Utility Marking."
   3. Sleeving pipe beneath pedestrian pavements shall be PVC Class 200 with solvent welded joints.
   4. Sleeving pipe beneath drives and streets shall be Schedule 40 with solvent welded joints.
   5. Sleeves installed under pavement for future irrigation installation shall be loose capped on each end and marked with stove bolts as above.
   6. Size and depth of sleeve should be coordinated with the landscape architect, with a minimum size being 4-inches.

F. Controller:
   1. The satellite irrigation controllers should be located outside the building or as directed by FM.
   2. Controller units shall be compatible with the existing campus controller system.
   3. Locate a quick disconnect from the power source next to controller.
   4. Electric wire from the satellite controller to each remote-control valve and common wire shall be AWG No. 14 solid copper, type UF cable, UL approved for direct underground burial.
      a. Wire color should be continuous over its entire length.
         i. Use white for common ground wire.
         ii. Use easily distinguishable colors for other control wires.
      b. Control wire splices shall be made with 3M-DBY or equal direct burial splice kit. If multiple splices are made in one location, splices are to be placed in a valve box.
      c. Install a control wire from controller to each remote-control valve.
      d. Multiple valves on a single control wire are not permitted.
      e. Control wires shall be in same trench as constant pressure lines.
   5. Provide an isolation valve for each zone; however, it is acceptable to install 2 zones to an isolation valve if necessary.

G. Remote control valves and irrigation heads should be compatible with existing campus irrigation system.
   1. Remote control valves shall be placed in valve boxes.

H. Head-to-head spacing is required.
   1. Spacing must not exceed manufacturer's recommended spacing.
   2. All heads shall be adjusted to factory specifications.

I. Excavated material is generally satisfactory for backfill.
   1. Backfill shall be free from rubbish, vegetation, frozen materials, and stones larger than 2-inches in dimension.
   2. Backfill placed next to pipe shall be free of sharp objects which may damage the pipe.

3. Contractor shall be responsible for adding soil to trenches after settling has occurred.

J. Upon completion of work, remove all tools, excess materials, and rubbish from site.

XVI. Section 32 90 00 Planting

A. Landscaped medians under 4-foot width must have drip irrigation.
   1. TCEQ check required.
   2. This includes any landscape strips between thorough fare and landscaped area.

B. All landscaping plantings shall be planned and designed to be compatible with the overall campus landscaping scheme. Emphasis shall be placed on durability and low maintenance characteristics.

C. Planting Mixture: Premixed blend of topsoil, organic matter, and sand in a ratio suited for the area and plant material specified.

D. Planters: 12-inches minimum of planting mix placed in planter. Crown surface for drainage.

E. Turf Areas: 3 to 4-inches of topsoil placed and fine graded before placement of turf.

F. Concrete Mow Strip shall be used under any chain link fence location.
   1. Shall be one-foot wide minimum and be located at grade.
   2. If adjacent to a building, the mow strip shall not be doweled to the building foundation.
   3. Reinforcing shall be No. 3 rebar.
   4. Concrete shall be 5 sack mix, 3000 PSI at 28 days, minimum.
   5. Medium broom finish.

G. All disturbed areas shall be seeded or sodded with a permanent grass and graded to properly drain.

H. Landscape Architect shall ensure UTSW Landscape reviews and approves trees prior to any planting.

XVII. Section 32 92 00 Turf and Grass

A. Sod / Sprig:
   1. TifGrand® (PP2117) (Cynodon dactylon (L.) Pers. x Cynodon transvaalensis)
   2. PalisadesTM Zoysia (Zoysia Japonica Steud x Zoysia matrella (L.) Merr.)

B. Seed:
   1. La Prima Bermuda (Cynodon dactylon (L.) Pers.)
   2. Princess 77 Bermuda (Cynodon dactylon (L.) Pers.)
   3. Riviera Bermuda (Cynodon dactylon (L.) Pers.)

C. Sod variety shall be approved by the campus representative:
   1. Sod shall be purchased from a sod farm, composed of certified, approved, and true to name/variety:
      a. Sod shall be cut, delivered and installed within 24 hours of cutting.
      b. Sod shall be cut by mechanical means such as sod cutters.

   c. Sod shall not be cut when the moisture content (either excessively wet or dry) will affect the lifespan of the sod.
2. Sod shall be substantially free of noxious weeds, disease, insects, thatch, and undesirable grasses.
3. Sod shall have a sufficient density so that no surface soil is visible with a maximum mowing height of 1.5-inches.
4. Sod shall be neatly mowed and mature enough that when grasped at one end it can be lifted and handled without damage to the sod.
5. Sod shall be cut to provide a sufficient root zone and stand of live grass.
   a. Sod shall be cut with a uniform soil portion of a 1/2-inch to 1-inch thickness, plus or minus 1/4-inches.
6. Area to be designated for sod, shall be fine graded, smoothed, and have topsoil placed before final grading. If soil is dry, lightly moisten before placement of sod.
7. First row of sod shall be placed in straight line with additional placement of rows shall be parallel and tightly placed against each row. Check boarding joints butted tightly shall be used. Sod shall not be stretched or overlapped.
8. Sod on slopes greater than 3:1 shall be placed perpendicular to slope. Sod on slopes shall be temporally fastened to ground by stakes, staples, pegs or other approved methods. After sod has become established, contractor shall remove fasteners.
9. Sod shall be rolled after section is placed and immediately watered prevent excessive drying. Thoroughly water sod so that underside of sod and soil are completely wet.
10. Upon laying of sod, UTSW Building Maintenance Landscape shop must be notified so irrigation can be adjusted for optimal growth.

XVIII. Section 32 93 00 Plants

A. Allowable plant species on campus are below.
B. Any Plant not specifically listed below will need approval from UTSW Landscape Department.

XIX. Section 32 93 13 Ground Covers

A. Liriope.
B. Mondograss.
C. Purple Wintercreeper (Euonymus fortunei ‘Coloratus’).
D. Sedge/Carex.
E. Tam Juniper.
F. Vinca Minor.
G. Ornamental Grass:
   1. Muhlenbergia capillaris.
   2. Miscanthus adagio.
   3. Miscanthus gracillimus.
   4. Misccanthus morning light.
   5. Pittosporum.

XX. Section 32 93 23 Plants and Perennials

A. Black Eyed Susan (Rubeckia Goldsturm).
B. Butterfly Bush.
C. Coneflower (Echinacea).
D. Coral Bells (Heuchera).
E. Coreopsis.
F. Dianthus (perennial varieties).
G. Daylily.
H. Fern (Holly, Autumn & Wood).
I. Guara.
J. Hosta.
K. Inland Sea Oats.
L. Lantana.
M. Phlox.
N. Rock Rose.
O. Russian Sage.
P. Saliva:
    1. Salvia greggii.
    2. Salvia farinacea, 'Henry Duelberg.'
    3. Salvia leucantha.
    4. Salvia sylvestris, 'May Night.'
Q. Senna (Senna Corymbosa).
R. Skullcap.
S. Turks Cap.
T. Texas Gold Columbine.
U. Verbena.
V. Yarrow.

XXI. Section 32 93 33 Shrubs

A. Abelia.
B. Aspidistra.
C. Aucuba.
D. Azalea.
E. Dwarf Burford Holly.
F. Dwarf Yaupon Holly.
G. Indian Hawthorne.
H. Japanese Plum Yew.
I. Juniper.
J. Loropetalum.
K. Nandina (dwarf/compact varieties).
L. Pittosporum.
M. Rose:

1. Nacogdoches “Grandma’s Yellow Rose.”
2. Antique & drift varieties.

N. Spirea.
O. Sunshine Ligustrum.
P. Texas Sage (compact varieties).
Q. Yucca (Hesperaloe parviflora) Red or Yellow.

XXII. Section 32 93 43 Trees

A. Large Size (40+ Feet Tall) Requires Minimum 30 Foot Spacing. 3-inch Caliper minimum preferred.
   1. Black Walnut (Juglans nigra).
   2. Caddo Maple (Acer saccharum).
   3. Canby Oak (Quercus canby).
   4. Deodora cedar (Cedrus deodara).
   5. Ginkgo (MALE ONLY) (Ginkgo biloba).
   6. Louquat – Leaf Oak (Quercus glaucoldes).
   7. Mexican sycamore (Plantas Mexicana).
   8. Mexican White Oak (Quercus polymorphia).
   9. Pecan (Carya illinoinenis).
   10. Southern Magnolia (Cultivars Only) Magnolia grandiflora.
   11. Summer Red Maple (Acer rubrum ‘HQSR’).

B. Trees – Medium Size (20 – 40 feet tall) – Requires 20 foot spacing.
   1. Arizona Cypress (Cupressus arizonica).
   2. Big Tooth Maple (Acer grandidentatum).
   3. Eastern Red Cedar (Juniperus virginiana).
   4. Lacebark Elm (Ulmus parvifolia).
   5. Lacey Oak (Quercus laceyi).
   6. Little Walnut (Juglans Microcarpa).
   7. Shantug Maple (Acer Truncatum).
   8. Trident Maple (Acer Buergarianum).

C. Trees – Small Size (1 – 20 feet tall) – Requires 15 foot spacing.
   1. Eve’s Necklace (Sophora affinis).
   2. Goldenball Leadtree (Leucaena retusa).
   3. Japanese maple (Acer palmatum).
   4. Loquat (Eriobotya japonica).
   5. Mexican Buckeye (Ungnaidia speciose).
   6. Red Buckeye (Aesculus pavia).
   7. Roughleaf Dogwood (Cornus drummondii).
   8. Texas Mountain Laurel (Sophora secundiflora).
   9. Texas Persimmon (Diospyros texana).

D. Refer to Specification Section 32 90 00 Planting for additional information.

EXHIBIT 32.1 Irrigation Materials List

Last update: 06/2023

Control System

1. Controller – WeatherTRAK cellular smart controller by Hydropoint with 10-year warranty and data. Controller model to be determined by irrigation system size.

Valves

1. Control Valves - Hunter IBV Brass Valves
2. Drip Control Valves – Rain Bird XCZ-100-PRB-LC
3. Isolation Valves
    a. Manual Valves – Manual valves 2 ½-inch and smaller shall be all brass with wheeled handles, globe type with composition disc rated at 150 pounds W.O.G.
    b. Ball Valves – Ball Valves shall be used up to 4-inch in size. The size shall correspond to the main line they are attached to
4. Quick Coupling Valves – Hunter HQ-33DRC
5. Master Valve – Netafim Hydrometer (normally open)
6. Flow Sensor – WeatherTRAK compatible flow sensor.
7. Backflow Preventer - FEBCO 850 Double Check Assembly (DCA)

Valve Boxes

1. Control Valve Box – NDS Model No. 117BC Jumbo Box. Green Overlapping Lid
2. Isolation Valve for Control Valve Box – NDS Model No. 117BC. Jumbo Box. Green Overlapping Lid
3. Quick Coupler Valve Box – NDS Model No. 117BC SAND Black Jumbo Box. Purple Overlapping Lid
4. Main Line Isolation Valve Box – NDS Model No. 117BC SAND Jumbo Box. Sand Overlapping Lid

Swing Joints (NO Flex pipe or Funny pipe allowed)

1. 1/2 inch – Hunter
2. 3/4 inch to 1 inch - Lasco

Heads

1. Rotors
    a. Hunter I-20-(04,06)-SS-ADJ
    b. Hunter I-25-(04,06)-SS-ADJ
    c. Hunter I-40-(04,06)-SS-ADJ
    d. Rain Bird R-VAN
2. Sprays
    a. Hunter Pro-Spray Series (PRS30)
        i. Toro Precision Nozzles
3. Bubblers
    a. Hunter Pro-Spray Series (PRS30)
        i. Irritrol 533 Adjustable flood bubble

EXHIBIT 32.1 (Continued)

Drip

1. Netafim Techline CV

Pipe

1. Mainline Pipe - ASTM D 2231, PVC, 1120 or 1220, Schedule 40 or Class 200
2. Lateral Line Pipe
    a. Pipes 3/4-inch diameter and larger: ASTM D 2231, PVC, 1120 or 1220, SDR 21.0, 200 PSI
    b. Pipes 1/2-inch diameter: ASTM D 2231, PVC, 1120 or 1220, SDR 13.5, 315 PSI

Primer/Glue

1. Weld-On 711 for PVC pipe up to 4-inch and /or Weld-On 710 for PVC pipe up to 2-inch. In the event PVC pipe is greater than 4-inch then a Weld-On 711 series “heavy” body shall be used.
2. Weld-On P-68 or P-70 primer

End of Division 32

DOCUMENT HISTORY

Issue Date	Description	Editor
06/19/2020	June 19, 2020 Print	EV
10/09/2020	Exhibit 32.1 added, Update to 32 84 00 including formatting	EV
03/30/2021	1Q 2021 Updates	EV
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06/26/2023	Q2 2023 Update	EV
12/15/2023	Q4 2023 Update	EV
06/13/2024	Q2 2024 Update	EV
12/20/2024	Q4 2024 Update	EV

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DESIGN CRITERIA
DIVISION 33 UTILITIES

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DIVISION 33 00 00 – UTILITIES

I. General Information

A. All connections to campus utility distribution systems or public utilities shall be accurately located by dimensions or coordinates.
B. All site utilities shall be included as part of the drawing deliverables. They shall be shown accurately in terms of size, depth, and location. Depth includes inverts shown at manholes and other critical points.
C. Site telephones:
   1. Provide at least two ADA accessible exterior emergency telephones.
   2. Contractor to provide one telephone conduit, one power conduit, one power line, and foundation with anchor bolts.
      a. Conduit shall be one-inch minimum size.
      b. Verify exact location with UTSW PM.
      c. Comply with campuses standard for emergency telephones.

II. Design Review Submittal Requirements

A. Refer to Section C in the UTSW Design Guidelines.

III. Utility Marking

A. Locations of utility lines, sleeves, and pipes underneath sidewalks, driveways, parking, or other paving shall be permanently marked with utility identification.
   1. Utility markers shall be brass, stainless steel, or other rugged metal drilled and adhered into the pathway near the perimeter.
   2. Markers shall have wording on the top with a general description of items buried as well as arrows indicating the direction of utilities.

IV. Section 33 05 00 Concrete Utility Boxes

A. Concrete boxes required by the mechanical, plumbing, civil site work, and/or electrical divisions must be properly dimensioned, reinforced and/or detailed.
B. Chilled water and heating water valves in underground systems shall have a concrete valve box with sufficient space to maintain and operate valves.
C. Direct buried valves may be considered if acceptable to UTSW FM.

V. Section 33 05 61 Manhole Covers

A. UTSW has standardized utility manhole covers shall be conventional cast iron or steel covers with H-20 & AASHTO HS-25 load rating.

1. Provide TxDOT-rated thickness to be used for vehicular traffic on roadways and drives.
2. The top surface is slip resistant.
3. “UTILITIES” to be cast into center of all manholes together with utility commodity name (ELECTRICAL, THERMALS, SANITARY, STORM) where applicable.
4. No commodity name to be shown on access covers for utility tunnels.
5. All covers are to be ordered with a locking device.
6. Provide and install manhole inflow protectors at all ductbank manholes and other locations as required by UTSW FM.
7. Provide and install aluminum label markers at each manhole. The identification wording shall be approved by UTSW FM prior to installation.

VI. Section 33 10 00 Water Utilities

A. The domestic water system shall be designed and installed in accordance with TCEQ requirements.

B. Domestic water piping from 4- to 12-inch in size shall be AWWA C-900 or AWWA C-909, Class 200 PVC with elastomeric gasketed push-on joints.
   1. Piping smaller than 4-inch shall be SDR 21 Class 200 ASTM D2241, PVC with elastomeric gasketed push on joints. Fittings shall be PVC of equal strength.
   2. Domestic water piping larger than 12-inch shall be AWWA C-905, Class 200 PVC with elastomeric gasketed push-on joints.
   3. Fittings shall be cement mortar lined and appropriately coated and protected mechanical joint ductile iron.

C. All angles, bends, tees etc. shall be stabilized with concrete thrust blocks sized by the Project A/E.

D. Appropriately spliced and terminated tracer wire or aluminum tape shall be laid with all non-metallic water line.

E. Line Valves:
   1. Line valves shall be placed at all points of connection to existing water lines, at branch intersections, and any other location necessary for adequate control of the water system.
   2. Typically, the number of valves at an intersection will equal the number of branches less one.
   3. “In line” valves shall be placed in long runs of pipe at approximate 2000-foot spacing.
   4. Adequately supported air/vacuum relief valves shall be installed as required along the main in enclosures to facilitate draining and maintenance/inspection.
   5. Line valves 3-inch and larger shall be direct bury resilient wedge gate valves meeting the requirements of AWWA C509 with mechanical joint connectors and non-rising stem nut operator.
   6. Valves shall be poly wrapped in accordance with AWWA C105.
   7. All valve operators shall open when turned counterclockwise and close when turned clockwise.

8. Line valves smaller than 3-inch shall be bronze body ball valves with threaded connectors, stainless steel ball and stem, lever operated with a rated working pressure of 200 psi.

F. Cast iron adjustable valve boxes with surface reinforced concrete collar shall be provided over all buried valves to provide access from ground surface to valve operating nut.

G. Fire Hydrants:
   1. Adequate fire hydrants shall be placed around the facility such that no portion of the building is over 300-foot from a hydrant.
   2. Fire hydrants shall be 5 1/4-inch main valve opening with 2 ~ 2-1/2-inch hose nozzles and a 4 1/2-inch pumper nozzle.
   3. Coordinate nozzle size and thread requirements with entity providing fire protection.
   4. Fire hydrants shall be dry-top compression type hydrants, traffic model, complying with AWWA C502.
   5. Auxiliary gate valves shall be placed in all fire hydrant leads.

H. Where necessary, connections to existing water mains shall be a “hot” tap using a tapping sleeve and valve appropriate to the type of pipe being tapped.
   1. No full-size taps shall be made without approval by the Owner.

I. The domestic water supply to a facility shall be metered unless directed otherwise by the Owner.

J. The complete site domestic water system installed for the project shall be pressure tested for leakage in accordance with TCEQ requirements along with applicable fire protection codes and shall be disinfected in accordance with the requirements of AWWA C601.

K. All waterlines shall have an aluminum detector tape placed 12-inch below final grade.

VII. Section 33 30 00 Sanitary Sewerage Utilities

A. The sanitary sewer system shall be designed, installed, and tested in accordance with Texas Commission on Environmental Quality (TCEQ) requirements.
   1. Leakage test on PVC pipe shall be a low-pressure air test performed as set forth by the Uni-Bell PVC Pipe Association.
   2. Deflection tests shall be by a mandrel pulled 30 days following trench backfill.
   3. All tests shall be witnessed by the Owner.

B. Sanitary sewers sizes shall be determined by a Texas Professional Engineer (PE) and is to be based on existing/future capacities.

C. Sanitary sewer and storm sewer shall be shown on separate sheets along with the profiles for all pipe sizes. Include depth of cover, other utility crossings with verified elevations, slope, inverts, pipe material, and class of pipe at a minimum.

D. Piping:
   1. Gravity sanitary sewer mainlines shall be no less than 6-inch and services lines shall be no less than 4-inch.
   2. All gravity sanitary sewer piping shall be SDR 26 PVC (ASTM D 3034) or heavier.
   3. Exposed piping shall be ductile iron with appropriate coating protection.

4. PVC and ductile iron piping shall have watertight push-on joints using elastomeric gaskets meeting the requirements of ASTM F 477 and AWWA C111 respectively.
5. Fittings shall be of equal strength as the piping. Appropriately spliced and terminated tracer wire or aluminum tape shall be laid with all non-metallic sewer piping.
6. All pipes penetrating exterior walls or foundations of buildings below grade must be installed properly with sleeves to prevent breakage due to building settlement or expansive soil.

E. Manholes:
1. Manhole construction and testing shall be in accordance with TCEQ requirements.
2. Sanitary sewer manholes shall be either cast-in-place or pre-cast (ASTM C478)) with a reinforced concrete base. Minimum 28-day concrete strength shall be 3,000 psi.
3. Provide 30-inch diameter minimum size access openings for all sanitary manholes.
4. Manholes are required for all horizontal and vertical bends as well as changes in pipe size.
5. Manholes on sanitary sewer mainlines shall be spaced no further than 350-feet apart. Additional locations include at all piping intersections and angle points with an exception at 4-inch service lines. Appropriate wye fittings shall be used at such service connections.
6. Manholes shall be placed on 9-inch of 1-1/2 sack cement stabilized sand.
7. The invert of the manhole shall be sloped and smooth finished sufficiently to prevent deposition of solids.
8. If the elevation difference between an entering pipe and the existing pipe is more than 2-feet, a drop type connection to the manhole shall be used.

F. Cleanouts shall be provided for all service laterals and be located at the building and at each bend. Cleanouts shall be installed on all 4-inch sanitary sewer service lines as required to facilitate line cleaning.

G. Sanitary sewer lift stations shall consist of precast (ASTM C478) or cast-in place reinforced concrete wet well containing a heavy-duty duplex pumping system readily accessible/removable for replacement/maintenance.
1. A lockable hatch system of adequate size for maintenance/access shall be provided.
2. A reliable level control system shall be provided to start/stop the pumps including a high-level alarm.
3. The basic control system shall consist of a remote disconnect, combination starter for each motor, H-O-A switches, visual and audible high-level alarm, run lights and seal failure sensors. All Conduit connections to the wet well will be adequately sealed to sewer gases/moisture.
4. Pump discharge piping for each pump shall be flanged ductile iron containing a check valve and plug valve located in a valve pit exterior to the wet well. Metal surfaces inside the wet well and the inside surfaces of the wet well shall be protected by appropriate coatings.
5. Valve pit shall have a lockable hatch of adequate size for operation and maintenance of valves.

H. Sanitary sewer force mains shall be SDR 21 PVC complying with ASTM D2241.

1. All fittings shall be of equal Class and pressure rating as pipe. All angles, bends, tees, etc. shall be stabilized with concrete thrust blocks, sized by the Project A/E.
2. All non-metallic force mains shall have aluminum detector tape 12-inch placed below final grade.

VIII. Section 33 40 00 Storm Drainage Utilities

A. Storm sewer sizes shall be determined by a Texas Professional Engineer (PE) and is to be based on existing/future sewer capacities and a drainage study for storm sewers. If the existing infrastructure cannot accommodate the increased loads, then an estimate shall be presented to the Owner to determine if additional funds need to be appropriated for any up sizing.

B. Storm sewer shall either be RCP Class III (ASTM C76) for 12-inch and above or SDR 26 PVC (ASTM D3034) or heavier for less than 12-inch. RCP joints shall meet ASTM C443. PVC pipe shall have watertight push-on joints meeting the requirements of ASTM F477.

C. Storm roof drains shall be run separately from all other storm water sources to the outside of the building.

D. Manholes:
   1. Manholes and/or junction boxes with access openings shall be installed on the storm sewer system at all piping intersections, changes in slope, and changes in angle points. The exception is at small drain leads, which may use appropriate wye fittings.
   2. Manholes shall be either pre-cast (ASTM C 478) or cast-in-place with a reinforced concrete foundation.
   3. Iron castings for manhole rings and covers shall conform to ASTM A 48, Class 30 and be traffic rated.
   4. Junction boxes shall be of reinforced pre-cast or cast-in-place construction. Minimum 28-day concrete strength shall be 3,000 psi.
   5. The foundation for manholes and/or junction boxes shall be on 1-1/2 sack cement stabilized sand.
   6. Provide 30-inch diameter minimum size access openings for all manholes.

E. Inlets:
   1. Area inlets for the storm sewer system shall be either pre-cast or cast-in-place reinforced concrete with frame and grate iron castings conforming to ASTM A48 Class 30 and shall be traffic rated.
   2. Curb inlets shall also be either pre-cast or cast-in-place with a manhole frame and cover installed in the top to allow access.
   3. At pedestrian drop-off points or other high visibility areas design inlet tops to be cast-in-place. Minimum concrete 28-day compressive strength for inlets shall be 3,000 psi.

F. Typically storm sewer discharge points shall be stabilized with either a pre-cast or cast-in-place headwall structure with adequate surrounding rip-rap to control erosion. Minimum concrete 28-day compressive strength for headwalls shall be 3,000 psi.

IX. Section 33 60 00 Hydronic and Steam Energy Utilities

A. Piping:
   1. Chilled water and heating water distribution piping shall be pre-insulated ductile iron. All straight section shall be factory insulated. Fittings and joints shall be provided with field insulation kits compatible with the factory insulation. The insulation shall be protected by an HDPE outer shell. Pipe shall be listed suitable for use with 43-degree chiller water and 180-degree heating water. Ductile iron pipe shall be Class 50 thickness, restrained joint conforming to ANSI A 21.512 or AWWA C 151-75.

B. Pipe and fittings shall be cement lined and have an external bituminous/tar coating and no internal coating. Pipe and fittings shall be U.S. Pipe TR FLEX or Clow Super Lok.

C. Spacing between chilled and heating pipes should be at least 10 – 12 inches.

D. Direct burial of steam piping is not acceptable but may be required on some areas of campus. This is only allowed after review and approval from Utilities group.

E. Use Cor-ten© bolts or corrosion resistant alloy bolts on underground piping especially heating water piping.

F. Direct bury of valves is not recommended. Valves shall be located for access within a vault or manhole.

X. Section 33 71 19 Underground Ductbanks and Manholes (Electrical)

A. Underground ductbanks provide pathways for services throughout the UTSW campus. Design considerations shall include the campus master plan for future construction, existing utilities, efficiencies, future growth, and providing redundancy for required service and maintenance.
   1. Provide redundant manholes.

B. Ductbanks shall be indicated and sections shown in Design Development stage at the latest.
   1. Normal electrical service ductbank from exterior transformer to the building shall not include conductors of other systems.
   2. Ductbanks from exterior generator to building shall not include conductors of other systems not serving the generator.
   3. Generator conductors for controls, status indicator, and feeders to generator mounted branch panels shall be allowed.
   4. Normal and generator conductors shall not share manholes.

C. Outside the perimeter of buildings, install underground medium-voltage conductors in red-colored, concrete-encased, steel-reinforced ductbanks with not less than 3-inches concrete coverage and 1.5-inches between adjacent ducts.

D. Specify red-dyed concrete for medium-voltage ductbank embedment.
   1. Dye shall consist of red ferrous-oxide concrete coloring pigment mixed at the rate of two pounds per sack of cement.

E. Minimum duct trade size (nominal voltage class):
   1. Low-Voltage (0 - 1000 V): 2-inches
   2. Medium-Voltage (15kV): 6-inches

F. Specify duct material to be Schedule 40 polyvinyl chloride (PVC).
G. Design ductbanks and manhole systems to slope a minimum of 3-inches per 100-feet to a suitable sump in a manhole.
H. Provide and install manhole inflow protectors at all ductbank manholes.
    1. Provide and install aluminum label markers at each manhole. The identification wording shall be approved by UTSW FM prior to installation.
I. Design the ductbanks to provide a minimum cover of 30 inches from the ground surface to the top of the concrete.
J. For new power ductbank installations, provide 33-percent spare ducts, rounding all fractions up to the next whole number, but not less than one spare duct.
K. For projects involving the addition of cable(s) to an existing ductbank, provide a new duct run along the same route if the installation will fill the only remaining open duct(s).
L. Provide a minimum of two new spare ducts. A fault in a ductbank frequently results in the faulted cable adhering to the walls of the duct, very difficult or impossible to remove.
M. Install underground warning tape below grade and above all ductbanks marked “BURIED ELECTRIC LINE.” Warning tape shall be metallic (detectable) or contain a detection strip integral to the tape material.

XI. Section 33 71 19.13 Power Manholes

A. Provide precast concrete manholes dedicated to the campus medium-voltage utility and distribution system. Include all standard hardware and accessories.
B. Provide precast manholes for all site medium voltage power distribution. The maximum allowed spacing is 400 feet and at all 90 degree horizontal changes in direction.
C. Medium-voltage manholes used for the distribution of power shall have nominal dimensions of 8-feet high X 10-feet long X 8-feet wide to accommodate the space required for pulling, bending, wrapping, and supporting the largest shielded MV105 cables required for a 600A main feeder circuit consisting of 3-500 kcmil conductors plus a 600V-rated 2 AWG grounding conductor, in addition to the largest submersible medium-voltage switch that may be installed (a unit with 5 switched-ways each rated at 600A).
D. Standard hardware and accessories for power manholes include:
    1. Thin-wall knockouts on every wall.
    2. Ladder with skid-resistant rungs anchored to floor and wall.
    3. H-20 rated manhole ring and cover.
    4. Sump pit & pump.
    5. “Ladder Up” safety post.
    6. All metal parts bonded to ground rod.
    7. Cable racks.
    8. Pull irons.
E. Existing manholes must always remain accessible during construction.

XII. Section 33 80 00 Data/Communications Distribution

A. The contractor shall furnish and install a communications ductbank consisting of 4 four-inch conduits surrounded by reinforced concrete similar to the 12KV ductbanks except the concrete shall not be dyed orange.
B. This ductbank shall include a No. 2/10 bare ground wire cast inside the concrete envelope. The ductbank shall run from the building's main distribution frame room (MDF) to the Owner designated communications manhole.
C. Sand shall not be used as a backfill.
D. A minimum of 18-inches of backfill is required but 24-inches is preferred.
E. There must be a minimum of 24-inches of cover above the concrete encasement.
F. All hand holes shall be traffic rated and large enough to store cable slack without damaging cable.
G. Two of the three ducts must have 3-2 cell flexible fabric inner duct installed.

XIII. Site Lighting

A. Refer to Division 26 of the UTSW Design Guidelines.

End of Division 33

DOCUMENT HISTORY

Issue Date	Description	Editor
06/19/2020	June 19, 2020 Print	MDR
10/03/2022	Q3 2022 Update	EV
06/13/2024	Q2 2024 Update	EV
12/20/2024	Q4 2024 Update	EV
12/18/2025	Q4 2025 Update	EV

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DESIGN CRITERIA

SECTION B CODES AND STANDARDS

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SECTION B – CODES AND STANDARDS

From The University of Texas System, Owner's Design Guideline, Appendix C, updated 08/21/2023
Italicized text are UTSW specific requirements.

I. General Requirements

A. Unless specifically directed by the Owner in writing, the Project Architect/Engineer shall design all UT System Capital Improvement Program (CIP) projects (Projects) to comply with the current UT System adopted editions of the federal, state and UT System Board of Regents (BOR) mandated codes and standards indicated within this *section*. In order to confirm a minimal standard of compliance, certain baseline requirements are established for all Projects.

1. *Refer to Section B-1 in the UTSW Design Guidelines for understanding of the Capital Project sizes per budgets.*
2. *Refer to **EXHIBIT B.1** for "Excerpts from TDI Commissioner's Order No. 4015" for additional compliance information.*

B. The State Fire Marshal (SFMO) is the code Authority Having Jurisdiction (AHJ) for all issues pertaining to NFPA 101 Life Safety Codes and NFPA 1 Fire Code. Each institution's Fire Marshal, or the person they so designate to represent them, shall be included in relevant NFPA code discussions and resolutions of conflict.

C. The Owner's Designated Representative (ODR) is the AHJ and/or the responsible party for coordination with other governing agencies having jurisdiction, as well as for all adopted building-related codes. The UT System adoption of NFPA 101 Life Safety Code and NFPA 1 Fire Code will continue to be coordinated with the SFMO. When conflicts or other relevant needs arise, the ODR will facilitate resolution and confirm interpretations after a thorough and joint review with the institution's designated Fire Marshal.

Refer to the UT System Risk Mitigation & Monitoring Plan for Major Capital Projects (RMMP), UT RMMP for confirmation of additional authorities having jurisdiction and for additional clarification on state and federal regulatory requirements.

1. *UT Southwestern Medical Center Office of Safety and Business Continuity (OSBC) and the State Fire Marshal are the final code Authority Having Jurisdiction (AHJ) for all issues pertaining to NFPA 101 Life Safety Codes and NFPA 1 Fire Code for all property owned, leased, or operated by UT Southwestern Medical Center*
2. *UTSW Medical Center leases spaces in various cities in the DFW area to provide medical care close to patient's homes. These off-campus lease spaces are subject to the review and approval of the AHJ of the respective city as well as OSBC in accordance with the Texas Government Code Section 417.0081. If deemed necessary by the cities' AHJ to review any aspect of the project, such review shall be arranged to allow the OSBC and UTSW PM and any other representatives the UTSW PM invites to attend with the Project A/E. In the instance of a conflict between a local city's codes and state fire codes, the more restrictive shall be followed.*

D. The Office of Facilities Management (FM) has the final determination in all questions related to the construction of buildings in accordance with the International Building Code

(IBC) in projects located on UTSW property. The exceptions are lease spaces under the jurisdiction of a City Building Code Official and Chapters 9 and 10 of the IBC.

1. *The Office of Facilities Management (FM) reserves the right to make a final determination on the A/E's interpretation and recommended best practices of International Building Code (IBC) questions related to the design and construction of buildings.*

E. The Project Architect/Engineer shall prepare a written codes and standards analysis, "Building Code Analysis," for each project for review by ODR. This analysis shall provide a side-by-side comparison of the requirements of the codes and standards listed in *Section B* for each code issue and an indication of which code requirement is being applied to the project (see sample analysis **EXHIBIT *B.2 Building Code Analysis***). In the absence of a careful and thorough discussion by the design team and the ODR of a specific conflict between the codes, the default is to *design to* the more restrictive or more protective code. These code discussions are project-specific and on a point-by-point basis within the codes. The final approved Building Code Analysis shall be placed in the project construction document drawings for future reference by the Owner.

F. If deemed necessary for the local authority to review any aspect of the project, such review shall be arranged to allow an ODR or institutional representative to attend with the Project Architect/Engineer.

G. In the event of the need for interpretation among the codes and standards, the Project Architect/Engineer shall inform ODR of the need for an interpretation and ODR will establish the requirements for compliance.

1. *In the event of the need for interpretation among the Fire and Life Safety codes and standards, the A/E shall inform the UTSW PM of the need for an interpretation, who will coordinate with OSBC for a project specific interpretation.*
2. *When conflicts arise between NFPA and IBC, the UTSW PM will work directly with VP of FM and with OSBC to provide final resolution*

H. ODR requires the Project Architect/Engineer to comply with certain provisions of the local fire department that provides fire protection services for the institution. These provisions may include locations and dimensions for firefighting access, including fire lanes; locations and specifications for standpipes, fire hose cabinets, fire control room, and fire hose connections; elevator requirements; and other similar matters.

I. The Project Architect/Engineer shall be required to provide an affirmation statement that the project is designed in compliance with applicable codes and standards. The following statement shall be located on the drawing index page or adjacent the project building code summary *at DD, during CD phase, and at IFC*:

> "Life Safety Code Compliance: The Project Architect/Engineer acknowledges that construction projects for the University of Texas System must, at a minimum, be designed in accordance with the requirements of National Fire Protection Association (NFPA) 101 Life Safety Code and NFPA 1 Fire Code as currently adopted by the State Fire Marshal, Texas Administrative Code 34.303. Therefore, the Project Architect/Engineer affirms that, to the best of his/her professional judgment, knowledge, and belief, the design of this project satisfies the requirements of NFPA 101 Life Safety Code and NFPA 1 Fire Code as well as any other codes or standards made applicable to the project by the professional services agreement."

II. Design Basis

A. National Fire Protection Association National Fire Code NFPA 101 - Life Safety Codes (LSC), including the indicated edition date of all referenced standards.
   1. 2021 Edition effective September 1, 2023.

B. National Fire Protection Association National Fire Code NFPA 1 Fire Code including the indicated edition date of all referenced standards.
   1. 2021 Edition effective September 1, 2023.

NOTE: The NFPA 1 Fire Code includes provisions that allow state fire marshal inspectors to use their experience and judgment to accept reasonable accommodations through equivalencies, alternatives, and modifications. Any proposed variances must be coordinated with and approved by the State Fire Marshal's office. **See EXHIBIT *B.1* for details and exceptions adopted by the SMFO for the NFPA 1 – 2021 edition.**

C. International Building Code 2021 Edition, effective September 1, 2023.

D. UT Southwestern Medical Center Facilities Management Guideline Specifications

III. Architectural Design

A. NFPA 45 Edition Standard on Fire Protection for Laboratories Using Chemicals as applicable.

B. Texas Department of Licensing and Regulation (TDLR).
   1. Elimination of Architectural Barriers Texas Government Code Chapter 469, Texas Administrative Code 16 TAC part 4 chapter 68 and Texas Accessibility Standards (TAS).
      NOTE: If commencement of construction begins on or after March 15, 2012, then new construction or alterations shall comply with the 2012 TAS.
   2. Elevators and Escalators, Health & Safety Code chapter 754 and 16TAC § 74 (see 16TAC § 74.100 for effective dates of ASME standards)
      (see 754.014(k) for date of installation definition).
      a. Elevators shall be selected and designed to comply with American Society of Mechanical Engineers/American National Standards Institute (ASME/ANSI) safety code for elevators and dumbwaiters, ASME A17.1, latest revision as well as all requirements from with Texas Department of Licensing and Regulation (TDLR), local municipality regulations.
      b. Comply with the Texas Accessibility Standards (TAS) ANSI 117.1 and ADA.
      c. National Electrical Code (NEC) references to ANSI C1, NFPA 70.
   3. Boilers, Health & Safety Code chapter 755 and 16TAC § 65.

C. Americans with Disabilities Act, 28 CFR Part 35 Nondiscrimination on the Basis of Disability in State and Local Government Services, Final Rule, as published in the Federal Register Friday, July 26, 1991.
   1. If physical construction or alterations commence on or after March 15, 2012, then new construction and alterations shall comply with the 2010 ADA Standards.

IV. Civil/Structural Design

A. ACI – 318 current edition, Building Code Requirements for Structural Concrete.
B. AISC current edition, for Steel Construction Manual.
C. Texas Department of Insurance Windstorm Inspection Program.
D. FEMA 100-year flood plain.
E. NFPA 1: City of Dallas Amendments related to fire lane access.

V. Mechanical & Plumbing Design – OCP Managed Projects

A. International Mechanical Code 2021 Edition, effective September 1, 2023
B. International Plumbing Code 2021 Edition, effective September 1, 2023.
C. International Fuel Gas Code 2021 Edition, effective September 1, 2023.
D. Guideline Specifications for Divisions 21, 22 and 23.

VI. Electrical Design

A. Based upon the February 2017 Memorandum of Understanding (MOU) between the State Fire Marshal's Office (SFMO), Texas Department of Licensing and Regulation (TDLR), and U.T. System (UTS), the effective date of compliance with the latest adopted edition of NFPA 70 National Electrical Code (NEC) was established such that every three (3) years in September when the latest NEC is published and released by NFPA, TDLR announces on its website that the new version of the NEC will become effective in one year. The SFMO will allow the use of, and UTS will require compliance with, the latest edition of the NEC as adopted by the TDLR based upon the start of electrical work. Currently, the following effective dates are in effect:

1. National Electrical Code 2023 Edition for electrical construction beginning on or after September 1, 2023.
2. Ongoing adoption will occur on a three-year cycle.

NOTE: TDLR defines the start of electrical work as the day an electrician begins installing electrical materials or equipment within the building structure. Start of work includes the installation of temporary power for construction.

3. Guideline Specifications for Divisions 26, 28 and 33.

VII. Energy & Water Conservation Design

A. Energy Conservation Design Standard for New State Buildings (including major renovation projects), current edition, State Comptroller's Office, Government Code sec. 447.004 and 34 TAC § 19.32.
B. ASHRAE / IESNA 90.1 2019 Edition (effective September 1, 2023) or International Energy Conservation Code (IECC) 2021 Edition (effective September 1, 2023)
C. SECO's Water Conservation Design Standards for State Buildings and Institutions of Higher Education Facilities dated April 2020 (effective January 1, 2021).

VIII. Code Compliance Confirmation Reviews

A. A project design "Code Compliance Confirmation Review" will be performed, documented, and submitted to the Owner at DD and 75 percent CD submission to ensure compliance with the following codes as they apply to a specific project. *CIP projects shall include an independent code review while renovation projects may provide an in-house.* The Owner's Project Manager will direct the A/E to obtain this code confirmation review or will direct the Owner's Code Consultant to perform this code confirmation review. (non-inclusive code review list, editions as listed in sections above):

1. International Building Code (IBC)
2. International Fuel Gas Code (IFGC)
3. International Mechanical Code (IMC)
4. International Plumbing Code (IPC)
5. National Electrical Code (NEC) NFPA 70
6. NFPA 101 Life Safety Code
7. NFPA 1 Fire Code
8. NFPA Codes as applicable, with emphasis on the following:
    a. NFPA 101 Referenced Required Codes
    b. NFPA 1 Referenced Required Codes
    c. NFPA 12A
    d. NFPA 20
    e. NFPA 22
    f. NFPA 54 As adopted by TX Railroad Commission
    g. NFPA 58 As adopted by TX Railroad Commission
    h. NFPA 70 (NEC)
    i. NFPA 92
    j. NFPA 204
    k. NFPA 2001
    l. FEMA 100-year flood plain verification
    m. Texas Department of Insurance (TDI) First Tier Coastal Counties wind load criteria

B. This Code Compliance Confirmation Review does not relieve the A/E firm from complying with the approved codes and standards for the project. See **EXHIBIT *B.3*** for sample code review template.

IX. OSBC References

A. Specific projects shall be reviewed by OSBC and shall comply with the following standards and references:

1. *DEA (requirements for controlled substances storage location)*
2. *CDC-NIH Biosafety in Microbiological and Biomedical Laboratories, 5th Edition*
3. *American National Standard for Laboratory Ventilation (ANSI/AIHA Z9.5-2012)*
4. *National Institutes of Health Design Requirements Manual, December 12, 2016, most recent edition.*
5. *OSBC utilize and reference the following standards, guidelines, regulatory authorities, and recognized associations regarding the design of research and clinical laboratories: BMBL 5th edition, NIH Recombinant DNA Guidelines, NIH Laboratory Design Manual, ANSI, ASHRAE, OSHA (29 CFR), EPA, NCR, NFPA, CDC, FDA, USDA, APHIS, OLAW, Guide*

for the Care and Use of Laboratory Animals, 8th edition, CGA, an the Texas Administrate and Health and Safety Code

6. *For clinic spaces, OSBC sites the following standards, codes, and guidelines: TJC, CAP, CLIA, APIC, Oncology Nursing Society, NIOSH, USP standards and other relevant codes and standards.*

X. Communications Design

A. TIA/EIA Standards.
B. BICSI.
C. NFPA 75.

XI. Acoustical Design

A. There are several standards organizations offering recommendations on best practice in acoustical design dependent on the space types. The Architect shall confirm with UTSW PM the applicable guidelines to comply with per project including UTSW standards in Section A, "Building Core Elements: Partition Standards,". Limited guidelines to consider are below.

1. *Hospital and Clinic Spaces:*
   a. *Hospital Licensing Rules – Sound Transmission Limitations in Hospitals.*
   b. *FGI Guidelines.*
2. *Education Spaces:*
   a. *ANSI S12.60 "Acoustical Performance Criteria, Design Requirements and Guidelines for Schools."*
3. *Animal Resource Centers (ARC) Spaces:*
   a. *Assessment and Accreditation of Laboratory Animal Care (AAALAC).*
   b. *National Institutes of Health (NIH) Guidelines.*
   c. *National Academy of Sciences Guide for the Care and Use of Laboratory Animals.*
   d. *United States Department of Agriculture "Animal Welfare Act and Regulations."*
   e. *U.S. Department of Health and Human Services Biosafety in Microbiological and Biomedical Laboratories.*

XII. Noise Criteria (NC)

A. Design in accordance with good practice to achieve conventional ambient noise levels qualified in Noise Criteria (NC) defined in current ASHRAE Applications Volume, Chapter 42 and ANSI S1.8 Reference Quantities for Acoustical Levels – ASA 84 and associated requirements per building type.
B. The ambient sound level of an occupied space is not to exceed the following NC listed for its respective typical occupancy unless specifically directed otherwise by the UTSW PM. Spatial forms, materials, assemblies, systems and equipment selections are to be designed as required to achieve a standard quality of specified level of maximum background noise.
C. These conventional standards of the level of ambient noise in a space are independent of and prior to the installation of any Owner-furnished equipment, furniture and furnishings unless specified otherwise.
D. Other resource material describing conventional ambient noise criteria is available in the current edition of Ramsey/Sleeper Architectural Graphic Standards.

*E. Refer to **Figure B.1 – Maximum Noise Criteria Requirements Per Occupancy** for examples of noise criteria per occupancy.*

Figure B.1 – Maximum Noise Criteria Requirements Per Occupancy

Maximum Noise Criteria (NC) Requirements Per Occupancy				
Typical Occupancy		*Maximum Noise Criteria (NC) (ASHRAE Applications Volume, Chap. 42 and ANSI S1.8 Reference Quantities for Acoustical Levels ASA 84.*	*FGI Noise Criteria (NC) 2014*	*NIH Design Requirements for Research Areas (refer to document for additional info.)*
Apartment/Dorms				
	Individual rooms/suites	*35*		
	Service/support areas	*45*		
Offices				
	Executive	*30*	*40*	*30 - 35*
	Conference Rooms	*30*	*35*	
	Private	*35*	*40*	
	Open plan areas	*40*		*35 - 45*
	Business machine areas	*45*		
	Public circulation	*45*		
	Teleconference Room		*25*	
Research, Hospital and Clinics				
	Private rooms	*30*	*40*	
	Wards	*35*	*45*	
	Operating rooms	*25*	*50*	*40 - 45*
	Medication Safety Zone		*40*	
	Treatment Room			
	NICU Sleep Area		*30*	
	NICU staff and family areas		*35*	
	Waiting Area		*35*	
	Dining Rooms & Lobbies			*40*
	Central Sterile, Food Service / Serving			*45*
	Kitchen, Lockers, Warehouse and Shops			*50*
Laboratories				
	Research & General	*35*	*55 - 50*	*40 - 45*
	Research Animal Housing Areas			*45*
	Teaching	*30*	*45*	
Education				
	Classrooms	*30*	*30*	*30 - 35*
	Conference Rooms & Lecture Rooms	*30*	*30*	*25 - 35*
	Auditoriums	*30*		*20 - 25*
Corridors		*35*	*45*	*45*
Public Areas		*40*	*45*	

XIII. Sound Transmission Class (STC)

A. Construction standards such as Sound Transmission Class (STC) and Ceiling Attenuation Class (CAC) shall be used along with NC maximums in the design of spaces for UTSW projects. Guidelines to follow include those listed previously with references in the charts below in ***Figure B.2 – Animal Resource Center (ARC) – Room Adjacency and STC Minimums and Figure B.3 – Room Adjacency and Sound Transmission Class STC Minimums****. Construction detailing shall follow standard best practice for partition, floor, and ceiling acoustic guidelines at a minimum.*

B. The acoustic quality of an occupied space shall meet minimum standards of the typical occupancy type unless specifically directed otherwise by the UTSW PM.

Figure B.2 – Animal Research Center (ARC) – Room Adjacency and STC Minimums

Animal Research Center (ARC) - Room Adjacency and STC Minimum				
Room Type	*Room Type*	*Min. STC Required*	*Additional Requirement*	*Reference*
Small Animal Room and Normally Occupied rooms	*Large Animal Room, Cage Wash or Noise Producing Support Spaces.*	*60*		*NIH Design Requirements Manual, ASTM E90*
Behavioral Suites	*Other Room Types*	*58*		*NIH Design Requirements Manual, ASTM E90*
Occupied Areas	*Public Corridors*	*50*		*NIH Design Requirements Manual, ASTM E90*
Includes demising partitions separating functionally separate areas. Walls shall be full height from structural floor slab to structural floor slab or roof.				
Enclosed Room	*Non-Public Corridors within a functional area*	*-*	*NIC 45 Minimum per ASTM E336.*	
Elevator lobbies	*Noise sensitive areas*	*-*	*Acoustically isolated.*	*NIH Design Requirements*
Elevator machine Rooms	*Critical care, occupied rooms and animal holding rooms*	*-*	*Acoustically and electronically isolated.*	*NIH Design Requirements*

Figure B.3 – Room Adjacency and Sound Transmission Class (STC) Minimum

Room Adjacency and Sound Transmission Class (STC) Minimum					
		FGI 2022	ANSI / ASA S12.60 (2010)	Hospital Licensing Rules	Hospital Licensing Rules
Room		STC Minimum for normal speech privacy	Design Guidelines for Schools - STC Minimum	25 TAC 133.169(a) Table 1 - New Construction	25 TAC 133.169(a) Table 1 - Existing Construction
Patient Care Units					
Patient Room	Patient room (wall-same floor) **	45	50	45	35
Patient Room	Patient room (floor-to-floor)	50		45	40
Patient Room	Corridor (w/ entrance)	35		45	45
Patient Room	Public Space	50		55	40
Patient Room	Service Area	60	0	65	40
Patient room	MRI room	60			
Diegnostic and Treatment Location					
Exam Room	Corridor (w/ entrance)	35			
Exam Room	Exam room (with electronic masking) ***	40			
Exam Room	Exam Room (no electronic masking)	50			
Exam Room	Public Space	50			
Exam Room	MRI Room	60			
Treatment Room	Corridor (w/ entrance)	35			
Treatment Room	Treatment Room	50			
Procedure Room	Corridor (w/ entrance)	35			
Procedure Room	Procedure Room	50			
Operating Room	Operating Room	50			

Room Adjacency and Sound Transmission Class (STC) Minimum					
		FGI 2022	ANSI / ASA S12.60 (2010)	Hospital Licensing Rules	Hospital Licensing Rules
Room		STC Minimum for normal speech privacy	Design Guidelines for Schools - STC Minimum	25 TAC 133.169(a) Table 1 - New Construction	25 TAC 133.169(a) Table 1 - Existing Construction
Operating Room	MRI room	60			
Consultation Room	Public Space	50			
Consultation Room	Patient Room	50			
Consultation Room	Corridor (w/ entrance)	35			
Telemedicine Room	Public space, office, consultation, treatment, exam, and patient room	55			
Public Areas					
Toilet Room	Public Space	45			
Public Space	MRI Scanner Room	50			
Administrative and Academic Spaces					
Core Learning	Core Learning		50		
Core Learning	Corridor		45		
Core Learning	Office		45*		
Core Learning	Corridor, Stair		45		
Core Learning	Public Toilet		53		
Core Learning	Mechanical Equip. Room		60		
Office or Conference	Corridor, Stair or Public Toilet		45*		
Office or Conference	Office or Conference		45*		
Office or Conference	Mechanical Equip. Rm.		60		

Room Adjacency and Sound Transmission Class (STC) Minimum					
		FGI 2022	ANSI / ASA S12.60 (2010)	Hospital Licensing Rules	Hospital Licensing Rules
Room		STC Minimum for normal speech privacy	Design Guidelines for Schools - STC Minimum	25 TAC 133.169(a) Table 1 - New Construction	25 TAC 133.169(a) Table 1 - Existing Construction
Note: * For acoustical privacy requirement, minimum composite STC should be 50 including effects of doors. **Where greater speech privacy is required between patient rooms when both patient room doors to the connecting corridor are closed, the wall performance requirement shall be STC 50. UTSW Special Consideration shall include acoutic treatments on doors. *** Electronic masking shall provide a maximum background level of 48 dBa.					

XIV. Campus Protocols

A. UT Southwestern Medical Center is one of the leading academic medical centers, patient-care providers and research institutions in the United States. Because of this, there are special measures which Architects and Engineers working on campus must be aware of at all times. Design professionals and their consultants shall follow campus policies including "FSS-312 Campus Facilities and Key Controls," which states that all employees and those who are contracted to perform a service on campus must wear a UT Southwestern badge at all times, regardless of the type of work being performed or where it is being performed.

B. Per policy, any contractor or technician without an identification will be asked to leave. Badges should be worn above the waist in hospital and clinical areas. Patient safety and privacy is of the utmost concern. Before entering rooms in clinical and hospital areas, all Architects and Engineers must contact the charge nurse for that area. Also, all Architects and Engineers must yield to patients and care givers at all times.

C. While working in research areas, Architects and Engineers should be aware of their environment. They should take notice to all placards and signs posted on lab doors and notify occupants of their presence before entering lab areas. Should a problem or concern arise, the Office of Safety and Business Continuity can be contacted at 8-2250 from any campus phone or from off campus at 214-648-2250.

D. Architects and Engineers shall work closely with the UTSW PM to coordinate with users of various spaces for appropriate times to meet with users and gather information.

XIV. Campus Protocols: OSBC

A. The Office of Safety and Business Continuity is committed to the management and sustainability of safety, risk and insurance services, emergency management, and business continuity affairs for UTSW. Through the life of projects occurring on campus, the A/E will become involved with various OSBC groups for review, approval, and/or information. Early involvement with these groups is critical to address problems as well as code issues that drive design. These groups may include:

B. Fire and Occupational Safety

1. *The Mission of the Fire Safety program is to ensure occupant safety, property conservation, and fire and life safety code compliance at all UT Southwestern owned or operated facilities. This is accomplished through a judicious surveillance and risk assessment program, comprehensive plan review process, and thorough inspections during construction, renovations and repairs, and identification and resolution of fire or life safety code deficiencies. The Fire Safety program fulfills the responsibility of the Authority Having Jurisdiction (AHJ) on all UT Southwestern properties.*
2. *The goal of the Occupational Safety Program is to create and maintain a workplace which is free of accidents or injuries. This is accomplished through a proactive approach on the identification and mitigation of unsafe work practices or areas, the generation of permits for hazardous activities, educational programs for employees and contractors on the potential hazards in their work areas, and how to respond appropriately in the event of an emergency.*

C. *Biological and Chemical Safety*
   1. *The Biological Safety Program's renovation, demolition, construction, and design review services focuses on ensuring the proper biocontainment and control of biological hazards and regulated medical waste. The group considers what is anticipated or recognized to be generated, handled, stored, and/or disposed of in all campus research, teaching, healthcare, and ancillary facilities. Additionally, the group considers all forms of biological contaminants (e.g. fungus, legionella) that may exist in the indoor environment, plumbing, or mechanical systems.*
   2. *The Chemical Safety Program's renovation, demolition, construction, and design review services focuses on ensuring proper containment of chemicals, physical hazards, and hazardous waste that will be generated, used, stored, and/or disposed. The group's purview includes all campus research, teaching, healthcare, and ancillary facilities. Additionally, all airborne hazards/pollutants that may be generated or entrained or that may infiltrate or penetrate through barriers, doorways, temporary structures, or building envelopes are reviewed.*

D. *Radiation and Laser Safety*
   1. *The Radiation and Laser Safety group is dedicated to promoting a safe radiation work environment. The scope includes radiation-producing machines (x-ray, CT, linear accelerators), MR safety, radioactive materials (medical use in diagnostic and therapeutic cases, academic research, isotope production), and laser safety. The Radiation and Laser Safety group manages the radiation safety program for UTSW along with those for Parkland and Children's Medical Center. The Radiation and Laser Safety group supports the UTSW Radiation Safety Advisory Committee and Clinical Laser Safety Committee.*

E. *Environmental Compliance Group*
   1. *This group is designed as an advisory group that ensures UTSW functions within the parameters of environmental regulations, statutes, and codes. The goals of the group are to ensure compliance with permits, regulations, and best practices for protection of the air, soil, groundwater, and surface waters of the State.*
   2. *This group operates and updates specific compliance programs by obtaining and maintaining permits, reviewing regulations including new and revised regulations, conducting initial testing and routine monitoring, responding to*

emergency releases, collecting and maintaining records, and preparing registrations and reports for submittal to regulatory agencies such as the EPA and TCEQ.

XV. Radiation Safety Control

A. *The University of Texas Southwestern Medical Center (UTSW) is authorized to procure, use and dispose of radioactive materials (RAM) under a Broad Scope License issued by the Texas Department of State Health Services (DSHS) – Radiation Control Program. Under the Broad Scope License, the Radiation Safety Officer (RSO) and Radiation Safety Advisory Committee (RSAC) have the authority and responsibility to establish radiation safety standards and maintain a sublicensing program that ensures compliance with the Texas Department of State Health Services – Radiation Control Program. These standards include an internal surveillance program to monitor the sublicensed users of radioactive materials.*
B. *UT Southwestern's Broad Scope Radioactive Material License empowers the RSO and RSAC to establish policies for the safe use of RAM, to review, approve, and issue specific sublicenses to qualified users, to monitor the use of RAM by the sublicensees, and to suspend operations deemed unsafe. The use of RAM will be limited to the sites and locations authorized under the Broad Scope License.*
C. *The Radiation Safety Group, within OSBC, monitors safety concerns and verifies equipment follows standards on UTSW campus.*
D. *UTSW PM will provide the UTSW Radiation Safety Manual as needed to A/E.*

XVI. MRI Safety Control

A. *Follows the American College of Radiology (ACR), Manual of MR safety (current version) and the Joint Commission.*
B. *The Radiation Safety Group, within OSBC, monitors safety concerns and verifies equipment follows standards on UTSW campus.*
C. *UTSW MR Operations and Safety Committee*
    1. ** Definitions of zones are taken from UHISMR 602.00: Magnetic Resonance Imaging (MRI) Safety Policy, October 2019.

XVII. Pest Control

A. *UTSW follows the guidelines and regulations of the following for all pest control policies and procedures:*
    1. *UTSW Office of Safety and Business Continuity (OSBC)*
    2. *Texas Department of Agriculture (TDA)*
    3. *Texas Commission on Environmental Quality (TCEQ)*

End of Section B

EXHIBIT B.1 NFPA Amendments - Texas Secretary of State

Texas Register for March 31, 2023, Adopted Rules Regarding

Title 28. Insurance Adopted Section

Part 1. Texas Department of Insurance
Chapter 34. State Fire Marshal

Title 28 Adopted Sections - March 2023

EXHIBIT B.2 Building Code Analysis

[TEMPLATE] For CIP Projects, refer to DG Section B I.
Final approved analysis shall be included within the Issue for Construction Drawings.

UTSW Project Name:

UTSW Project No.:

Code/Standards:
Analysis Date:
Project Phase:

Applicable Codes (actual edition dependent upon date of design contract)

1. NFPA 101 Life Safety – 2021, effective September 1, 2023
2. NFPA 1 Fire Code – 2021, effective September 1, 2023
3. International Building Code – 2021 Edition
4. Texas Accessibility Standard – 2012 Edition
5. Etc.

Note: The code requirements selected as the basis for design are bolded.

Code Issue	NFPA 101	IBC
Occupancy Classification		
1. Offices and college classrooms	**Business**	Group B
With less than 50 occupants	**6.1.2.2**	304.
Construction Classification		
1. Main Building	Not addressed	**Type IIA** **403.3.1**
Stair Pressurization	Not Required	**1005.3.2.5**
Distance between exits	**250 ft.** **if sprinkled**	250 ft. if sprinkled

Etc.

EXHIBIT B.3 Code Compliance Confirmation Review

[TEMPLATE] Submit at DD and 75 percent CD at a Minimum

[Date]

[UTSW Project Manager]

UT Southwestern Medical Center
Facilities Management – (A/E specify Department)
5323 Harry Hines
Dallas, Texas 75390

Reference: Review Comments on [100 percent DD or 75 percent CD]
[UTSW Project name]
UTSW Project No. XXX-XXX Dear

[Project Manager]:

[For CIP: Code Consulting Firm (CCF)] [For Renovation: A/E Firm] has completed its Code Compliance Confirmation review and has prepared review comments on the documents for the [DD or 75 percent Construction Documents] package for the referenced project.

In performing this current service, [CCF] [A/E] reviewed the following documents, furnished by A/E.

- DD or 75 percent Construction Documents Drawings dated [month dd, yyyy].
- DD or 75 percent Construction Documents Project Manual, Architectural Volume I Divisions 1-14, dated [month dd, yyyy].
- DD or 75 percent Construction Documents Project Manual, M.E.P. Volume II Divisions 21 - 33, dated [month dd, yyyy].

The principal codes (actual edition dependent upon date of design contract) used in this review are as follows:

- International Building Code, 2021 Edition (IBC)
- NFPA 101, *Life Safety Code*, 2021 Edition (LSC) (effective September 1, 2023)
- NFPA 1, *Fire Code,* 2021 Edition (effective September 1, 2023)

Other applicable codes, standards, and regulations are listed in the Project Data shown on the Building Code Analysis Drawing 1.1 and in the Project Information Manual. Additionally, FEMA 100-year flood plain verification and TDI First Tier Coastal County wind load criteria were reviewed where applicable.

<u>Description of Project</u>

The [Project] consists of …

Note: The follow major headings in this Code Compliance Confirmation Review Template are for reference only to demonstrate process.

EXHIBIT B.3 (continued)

Building Code Issues

Comments:

[Drawing 5.1, Drawing 10.21, Drawing 11.41 indicates there are accessible dwelling units. There is no table that indicates the discrete Apartment ID and Building ID for each accessible dwelling unit so that a user of the plans can see in one place the summary of accessible units.]

Requirements for Hazardous Materials and Laboratories

Insert comments as necessary.

Means of Exit Access

Insert comments as necessary.

Emergency and Standby Power

Insert comments as necessary.

Fire Water Supply

Insert comments as necessary.

FEMA 100-year Flood Plain

Insert comments as necessary.

TDI Windstorm Inspection Program

Insert comments as necessary.

Other Major Code Headings as Necessary

Insert comments as necessary.

Summary

Compliance with the comments stated in this letter does not relieve the A/E from complying with the Owners Design Guidelines, Owner's insurance/underwriting requirements, applicable NFPA Standards and State requirements.

Sincerely,

A/E Project Manager
Texas License No. xxxxx

cc: *Vice President, Facilities Management*
Director, CIP
Director, Fire and Occupational Safety

DOCUMENT HISTORY

Issue Date	Description	Editor
06/19/2020	June 19, 2020 Print	MS
10/09/2020	Revisions to confirm UTSW preferences with UTS updates	EV
06/30/2021	Q2 2021 Update	EV
10/03/2022	Q3 2022 Update	EV
06/26/2023	Q2 2023 Update	EV
12/15/2023	Q4 2023 Update	EV
06/13/2024	Q2 2024 Update	EV
06/27/2025	Q2 2025 Update	EV
12/18/2025	Q4 2025 Update	EV

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DESIGN CRITERIA

SECTION B1 DEFINITIONS

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SECTION B1 – DEFINITIONS

I. General Information

A. Common definitions in alphabetical order

Architect - Individual who has fulfilled education and experience requirements and passed rigorous exams that, under State licensure laws, permits them to offer and perform **architectural design** services directly to the public.

Architect & Engineer (A/E) - A consultant specializing in Architecture and Engineering also known as the Design Team.

Board of Regents (BOR) - Governing body for the UT System composed of nine members appointed by the Governor and confirmed by the State Senate.

Calendar Days - Are every consecutive day on the calendar, including holidays and weekends.

Construction Documents (CDs) - Phase of design where more detail is shown as it relates to the scope of work. Completion of this will result in a bid document.

Change in Function - The change in the function of the current room to be renovated. Example: Current space is laboratory and needs to be converted to future open office space; Current office to future clinical exam room; Current restroom converted to future office.

Change in Room Assignment - The change in the current assigned room from one Department to another Department per the FSS-310 UTSW Policy.

Customer - Person representing the interest of the department requesting the renovation. Customer represents the End-users' and Department Head's best interests. The main point of contact through the duration of the project. AKA Project Champion.

Construction Manager (CM) - Supervising Manager of the Construction Coordination (CC) Shop managers.

Design Development (DD) - Phase of design where the AE takes the scope developed by the PM and shows the intent of the scope in drawings that include plans, elevations, reflected ceiling plans, specifications.

Design Team – A UTSW Service Provider from Facilities Planning, Design, and Construction that manages UTSW Design Guidelines, standards, master specifications, and provides technical support for renovation projects.

Facilities Management (FM) - Department responsible for planning, construction, facilities maintenance and operations.

Facilities Planning, Design, and Construction (FPD&C) - A department under Facilities Management that focuses on Planning, Design, and Construction of capital projects that support the tripartite mission of UTSW.

Furniture - The portion of a capital project that only has to do with replacing and/or purchasing of fixed/unfixed furniture.

Financial Planning (FP) - Capital and Resource Planning that analyzes and routes capital project costs for funding approval.

General Contractor (GC) - Construction Contractor that sub-contract with other trades and manages all construction activities.

Information Resources (IR) - A UTSW Service Provider from Information Resources.

Office of Safety & Business Continuity (OSBC) - A UTSW Service Provider from the Office of Safety and Business Continuity (i.e., Fire Safety, Environmental Health & Safety).

Owner - A UTSW Owner Designated Representative, usually a Project Manager from Facilities Management or other UTSW department.

Owner Designated Representative (ODR) - The individual assigned by Owner to act on its behalf and to undertake certain activities as specifically outline in the Contract. ODR is the only party authorized to direct changes to the scope, cost, or time of the Contract for Design and Construction.

Owner, Architect, Contractor (OAC) - The Owner's Designated Representative (FM PM), Architect, Contractor.

Point of Contact (POC) - Person who is the primary point of contact for the Customer department and/or Capital Project.

Professional Engineer (PE) - Individual who has fulfilled education and experience requirements and passed rigorous exams that, under State licensure laws, permits them to offer and perform **engineering** services directly to the public.

Project Manager (PM) - The one POC for all estimating, design and construction activities involved in a capital project. The UTSW PM represents the Customers' best interests.

Project Team - All UTSW stakeholders such as UTSW Service Providers, Vendors, End-Users, Customer Administrative Operations, Building Managers, FM.

Purchase Order (PO) - An account approved by Procurement to fund a design and/or construction contract for services.

Procurement - Supply Chain Management department that approves requisitions for services and goods.

Scope of Work (SOW) - SOW is a document generated by a PM during Scope Development to understand Customer's project needs and how it will support the department's goals.

Schematic Design (SD) - Preliminary phase of design that includes demolition and proposed floor plans that reflect the scope of work involved.

Senior Construction Manager - The Renovations Manager that oversees Project Managers that manage Capital Projects under $10m.

Service Provider - Is any member of a group of UTSW departments that provide services to the University. For example, Information Resources, Office of Safety & Business Continuity (OSBC) , Media Technology, Interior Architecture, etc.

Service Request (SR) - A Customer request entered in PeopleSoft for a renovation budget, feasibility study, and/or design services for new furniture.

Total Project Cost (TPC) Estimate - Preliminary project budget established after the PM has developed a scope of work for the renovations to support the department's mission.

Work Order (WO) - Billable Service Request with labor tasks assigned for management of renovation project.

Capital Project need < $50,000 - Projects that involve make ready or furniture and/or small equipment purchases.

Capital Project need with estimated construction cost between $51,000 and $250,000 - Projects that involve minor renovation (with furniture or equipment) and that require capital budget and procurement approval.

Capital Project need with estimated construction between $251,000 and $10m - Projects with major renovation and large equipment and/or furniture purchases.

Capital Project need with estimated construction > $10m - Projects with major renovation and large equipment and/or furniture purchases managed by the Capital Improvement Program (CIP).

End of Section B1

DOCUMENT HISTORY

Issue Date	Description	Editor
06/19/2020	June 19, 2020 Print	EV
10/03/2022	Q3 2022 Update	EV
12/18/2025	Q4 2025 Update	EV

PROJECT DELIVERY REQUIREMENTS

SECTION C DELIVERABLE REQUIREMENTS FOR DESIGN DOCUMENTS

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SECTION C – DELIVERABLE REQUIREMENTS FOR DESIGN DOCUMENTS

I. Introduction:

Projects at UT Southwestern Medical Center are typically divided up into two main types: Capital Improvement Projects (CIP) and Renovations. This section and its exhibits are applicable to both project types. Architects/Engineers (A/E) shall utilize this section and exhibits dependent on the project type and scope of the project.

The UTSW PM and Procurement shall indicate conformance requirements and as noted in the "General Information" in the Introduction of the UTSW Facilities Management Design Guidelines, all projects shall conform to the most recent Design Guidelines posted online.

II. Standard Provided Documents:

UTSW Medical Center provides A/E with standard documents for use and references. Additional documents to be used on UTSW projects:

- Front End Documents provided by Procurement.
- Master Specification sections provided by the UTSW PM, refer to Section A1 – Master Specifications.
- UTSW PM to provide any hazardous material report(s).
- UTSW Document: "Furniture: Standards and Layouts" provided by the UTSW PM.
- UTSW Signage manuals and nomenclature standards provided by the UTSW PM.
- UTSW Template sheets - MEP1 and T1 provided by the UTSW PM. These sheets are to be included and project symbols shall match this sheet.

These documents do not relieve the A/E of their professional duties to provide content that is correct, accurate and appropriate for each project.

III. Deliverables Per Project Type

A/E shall confirm deliverables with UTSW PM.
All projects shall provide deliverables identified in Section C with required exhibits as well as the following:

A. CIP Projects:
   1. **Section C 1**
   2. **EXHIBIT C.7 Basic System Data**
      a. Shall be revised throughout the design process.
   3. **EXHIBIT C.8 Cost Quantity Survey**
      a. Use CSI Master Format, current edition and/or the Uniformat Assemblies format.

b. Provide a Construction Cost Estimate by an independent estimating company throughout the entire design process at the end of each design phase (or as necessary to meet the UTSW PM's identified CCL) until final completion of the Construction Documents.
c. Site, civil, and landscape work based on generalized quantities and/or square feet.
d. Based upon (at a minimum) square footage costs for building systems (i.e. foundation, structure, exterior closure, roof, interior construction, specialties, conveying, MEP systems, etc.) typical for the building type and location.
e. Estimate shall be based upon detailed quantities and unit costs for all materials, labor, equipment, building systems, General Conditions, fees and contingencies.
f. Further refine the cost estimate for site/landscape/civil work based on further refinement of drawings, more specific quantities, volumes, lengths, square feet, etc.

4. Life Cycle Cost:
   j. Employ a life cycle cost study to determine Return on Investment (ROI) timeline and present the results to UTSW. Perform the analysis with up- front costs, energy costs, maintenance costs, and end-of-life costs, for at least 4 of these concepts, or for other energy efficient measures under consideration:
   k. Demonstrate energy usage design compliance via a whole-building energy model for the Envelope, Mechanical Systems, and Lighting as is in project scope.
      i. Provide output of energy model for base building design and ECM strategies, annual usage profile for electric and gas from the model.
      ii. Provide template of the format of final deliverables to UTSW PM and Utilities for approval prior to study.

B. Renovation Projects:
   1. **Section C 1**

IV. Deliverables Required for All Projects

At all levels of submission, the A/E will be held to a standard of care for the documents provided to UTSW. All documents submitted shall provide information that is clear, concise, complete, and correct.

A. Drawing Sets shall be provided at each deliverable phase, compiled per discipline, and containing index information bookmarked with Optical Character Recognition (OCR) .
B. Project Manual and Specifications shall be provided at each deliverable, compiled, and containing index information bookmarked with Optical Character Recognition (OCR) .
   1. Specifications:
      a. Each document shall follow the most current Construction Specifications Institute (CSI) format, utilizing the current UTSW Master Specifications as provided by the UTSW PM as well as required.
      b. Schematic Design:
         i. Descriptive Specifications: Provide brief narrative descriptions of the proposed component systems, materials, and equipment.

ii. Descriptive Literature: Include catalogue cut sheets for all equipment, fixtures, and products proposed.

c. Design Development,:
   i. Provide an outline or preliminary specifications for all disciplines that indicate project specific components, products, and equipment including the levels of quality.
   ii. Provide descriptive literature in the form of catalogue cut sheets of proposed components, products, materials, and equipment.

d. Construction Documents,:
   i. Specifications revised to the appropriate stage of completion shall be included with each stage of construction documents submitted.
   ii. UTSW PM shall provide Division 1 sections for inclusion in the Project Manual.
   iii. Prepare Project Manuals as indicated in the Contract and with UTSW PM confirmation.
   iv. Prevailing Wage Rates: UTSW PM will provide the UT System prevailing wage rates to be used for the project.

2. Include packages for furniture and/or equipment purchased for use in the project (as required).
3. Include physicist / shielding report (if required).
4. Geotechnical Investigations (if required) – Shall be performed per requirements in **EXHIBIT C.6**.

C. UTSW Comment Form
1. At each phase of document submission, the UTSW PM will collect review comments from UTSW teams within a standard UTSW review spreadsheet.
2. The A/E shall review and provide responses to the comments within the same spreadsheet. These responses shall be returned to UTSW PM. The specific deadline for returning responses shall be confirmed with the UTSW PM but shall be prior to the next document submission.
3. The A/E shall determine if corrections, revisions, or additions are required to the documents to fully address UTSW comments. These changes shall be made to the documents for the following document submission.
   a. For any questions or concerns about comments received, the A/E shall request clarification through UTSW PM.
   b. Any conflict about UTSW comments shall be reviewed with the UTSW Design Team.
   c. The Director of Planning, Design, and Construction shall provide final determination on remaining conflicts.

D. Pending Issues Report
1. The A/E shall prepare, maintain, and submit a Pending Issues Report throughout the Schematic Design, Design Development, and Construction Document Phases to record and track outstanding issues, concerns, and decisions for the Design Team.
2. Use **EXHIBIT C.1, Pending Issues / Project Tracking**, as an example for expected data that shall be maintained and documented.

E. Code Compliance Confirmation Reviews
   1. The A/E team shall provide a Code Compliance Confirmation Review and submit to the UTSW PM at 75 percent CD, and IFC submission at a minimum.
      a. Use Section B, Code Compliance Confirmation Reviews and **EXHIBIT B.3** for a sample code review template.
      b. CIP projects shall use an independent code consultant to provide the review.
      c. This Code Compliance Confirmation Review does not relieve the A/E from complying with the approved codes and standards for the project.
      d. During UTSW team's review, OSBC will perform all fire code reviews.

F. Survey (If required)
   1. A topographic survey will be performed for each project involving new construction and for FM capital projects where necessary by a surveyor licensed in the State of Texas per the requirements in **EXHIBIT C.5 Survey Requirements.**

G. TAS Accessibility Plan Review
   1. The A/E shall submit sealed documents to a RAS for an accessibility review.
      a. A/E shall send UTSW PM a copy of the receipt of submittal from the RAS.
      b. Refer to Section A – Regulation Requirements for additional requirements.
   2. The A/E shall provide UTSW PM with a corrective action plan to address non-compliant issues noted in the report while documenting issues in the "Pending Issues Report / Project Tracking" seen in **EXHIBIT C.1.**
      a. The A/E shall identify associated accessibility issues outside of project scope and report to UTSW PM.
      b. The A/E shall advise UTSW PM for additional services proposal (ASP) to provide corrective action plan for issues outside of scope.
   3. The A/E shall review the proposed corrections and potential cost implications with the UTSW PM for approval prior to final documentation. UTSW PM and A/E will determine the course of action to issue updates.
   4. The A/E shall document corrections through issuance of documentation such as an ASI or Addendum to confirm the corrective action plan has been completed.

V. Storm Water Pollution Prevention Plan (SWPPP)

A. A/E shall refer to **EXHIBIT C.4** for preparation of SWPPP documents for all sites of one (1) acre or more.

VI. CAD Backgrounds

A. The Project A/E shall provide CAD backgrounds at IFC.
B. AutoCAD version will be confirmed by UTSW PM.
C. All CAD files submitted shall follow UTSW CAD Drafting Standards and Archibus Requirements. Use **EXHIBIT C.2 – UTSW CAD Standards** and **EXHIBIT C.12 – UTSW Archibus Export Requirements** in the UTSW Design Guidelines.
   1. Background shall include rooms, spaces, and areas exported as polylines.
D. All files shall be in root directories with drawing files before support files. Bind all files to prevent external x-refs.

VII. BIM Requirements

A. A/E shall provide BIM files to match UTSW Standards per contract requirements.
B. Refer to **EXHIBIT C.3 UTSW BIM Standards,** if required.

VIII. Documentation Format for All Projects:

A. All text shall be Arial on floor plans and specifications.
B. Drawing Minimum Requirements:
    1. Drawing sheets: ARCH E1 – 30 x 42 inches or ARCH D 24 x 36 inches
        a. Confirm project sheet size with UTSW PM prior to sheet creation.
    2. Overall plans shall be provided for each level and discipline.
        a. Overall plans shall be sized a minimum at 1/8-inch scale or appropriate scale to fit entire plan on one page.
        b. Enlarged plans sized a minimum at 1/4-inch scale.
        c. All disciplines shall include room names and UTSW room numbers on their respective plans.
    3. Design Drawings for project area shall fit onto one page. If size is prohibitive, areas may be broken into consecutive pages with match lines at 1/8-inch scale minimum.
    4. Associated details shall be at larger scales appropriate to view critical components.
    5. Enlarged plans shall, at a minimum, be created at each: elevation changes (such as stairs), toilet room, typical room types, electrical rooms, mechanical rooms, IR rooms, and specialty or unique spaces.
C. Backgrounds for <u>all disciplines</u> shall include project grid lines, grid designations, callouts, and any dimensioning that is required to coordinate the project.
    1. Structural grids and callouts shall match facilities provided CAD plans.
D. Plan North and Project North arrows and graphic scales shall be shown on each sheet.
E. All sheets shall have completed title blocks as noted within “Standard Drawing Set Requirements for All Projects.”
F. All sheet number sequences shall be matched by other disciplines. I.e., A1.01 Demolition Plan shall be matched to E1.01, M1.01, etc.
G. All disciplines shall provide symbols and abbreviations for their work. Sheets shall have general notes referencing the symbols and abbreviations on that sheet.
H. All disciplines shall provide disclaimers on their work, for each design phase submitted, indicating interim review.
    1. This disclaimer shall include the responsible A/E name, license/registration number, and professional designation.
    2. Professional seals with signature are required for construction, bidding, or permit purposes on all documents produced.
I. Compile Design Drawings into one pdf in an order that matches the sheet index numbers and names. PDF shall include index information bookmarked with Optical Character Recognition (OCR).
    1. If file size is prohibitive to use easily, file may be broken into packages or into disciplines following the order of the index.

IX. Standard Drawing Set Requirements for All Projects:

The following items shall be included in each design phase submittal.

A. **Cover Sheet:** Cover sheet shall include at a minimum:
1. UTSW project name, UTSW Work Order number, and UTSW PM Name with their email contact information.
2. UTSW project address and/or location.
3. Project A/E name and street address with contact name and information. Shall include email address, phone number and fax number.
4. All companies shall be licensed/registered to practice in Texas with the A/E of record to be licensed/registered to practice in Texas.
5. Project A/E consultants' names and professional discipline(s) with contact name and information. Shall include email address, phone number and fax number.
6. Project location plan to scale appropriate to building size.
7. List of applicable UTSW building codes.

B. **Title Block:** A/E shall create a Title block draft to be reviewed with UTSW PM prior to first deliverable. The following items at a minimum shall be included on each drawing title block:
1. UTSW project name, UTSW Work Order number, and PM name with email contact information.
2. UTSW project address and/or location.
3. Project A/E name and street address.
4. Project A/E consultants' names and professional discipline(s) on their sheets.
5. Location for the date of issue of the plans with space for several revision dates.
6. Location for professional seals and registration numbers.
7. Location for the sheet title.
8. Location for Sheet Name and Number which matches other disciplines.
    a. I.e., A1.01 Demolition Plan shall be matched to E1.01, M1.01, etc.
9. Deliverable Phase Title.
10. Project Key Map for larger projects shall indicate which project area is identified on the sheet.

C. **Project Data Sheet:** The project data sheet shall include, at a minimum, the following information specific to the project design and the phase of deliverable:
1. List of Drawings, Tables, and Schedules.
2. Square footage per project level and the project total (gross and assignable square footage).
3. Project information including approximate square feet of space to be renovated/constructed.
4. List of applicable UTSW building codes including codes and standards analysis summary (Can be submitted as an independent code page).
5. Abbreviations used.
6. Drawing symbols.
7. Alternate bid descriptions.
8. Future provisions for expansion (all design disciplines).
9. Materials legend.

10. Vicinity map.

D. **Standard Accessibility Sheet:**
   1. Each project shall have the A/E's standard sheet(s) demonstrating the ADA and TAS 2012 standard heights, clearances, and requirements as references.
   2. Sheet shall include knee and toe clearances, clear floor or ground space, protruding objects, stairways, doors, and applicable site requirements at a minimum.

E. **Fire / Life Safety Drawings:**
   1. The Fire Life Safety drawings would include as a minimum:
      a. Construction type, fire exposure analysis, building occupancy type, and occupancy loads including tabulations and totals.
      b. Required egress capacity, means of egress, and egress widths with egress distances noted to nearest exits.
      c. Transportation systems (elevators, dumbwaiters, etc.)
      d. Required fire and smoke barriers including wall ratings, shafts, and ratings per occupancy type including existing building core partitions.
      e. Adjacent space ratings (if required) for renovation projects.
      f. Fire suppression, emergency notification, smoke control, stair pressurization, vertical openings, emergency lighting, etc.
      g. Fire extinguisher locations and coverage identified.
      h. Locations for AED, Stop the Bleed Kits, and Stair Chairs, as required.
      i. Provide technical documentation support with any proposed equivalencies and list anticipated building code variance requests or known deficiencies.
      j. Confirm code requirements with OSBC.

F. **Symbols and Abbreviations:**
   1. Each discipline to have separate page indicating symbols and abbreviations standard to the discipline's pages.

G. **Alternates (if required):**
   1. Show flexibility for expansion and alterations. Clearly identify in notes and plans the scope of the alternates. Coordinate information in the specifications.

H. **Equipment Schedules and Coordination:**
   1. Provide equipment scheduling for all equipment requiring a space allocation and/or architectural/mechanical/plumbing/electrical service and/or any rough-in, including any provisions for future equipment if required in the construction documents.
   2. Equipment schedules shall be included in deliverables as early as possible but not later than Design Development deliverables.
   3. Categories shall include the following at a minimum:
      1. Equipment designator.
      2. Equipment Manufacturer, Item number.
      3. Quantity.
      4. L x W x H.
      5. Required clearances for service, maintenance and/or code.
      6. Utility Requirements (Electrical, water service, gas, grounding, etc.).

7. Specification section number.
8. Special notes.
9. Furnish/Install assignment.

F. Furnish/Install assignment of which entity furnishes the item as well as which entity shall install the item shall follow the following categories:
   1. Contractor Furnished - Contractor Installed (CFCI).
   2. Owner Furnished – Contractor Installed (OFCI).
   3. Owner Furnished - Owner Installed (OFOI).
   4. Owner Furnished – Vendor Installed (OFVI).

G. In all cases, the infrastructure designed by the A/E shall be coordinated to provide for all known pieces of equipment. In some instances, equipment that is more specialized may require utilizing more than just two entities for a complete installation. In these cases, the equipment schedule shall indicate multiple categories, as seen in the next example.
   1. Example: A cage wash machine will be purchased by the owner, with the vendor installing the machine. The contractor will be required to perform hard connections to the utilities. While the infrastructure of the building shall inherently be designed to provide for the cage wash, this does not clearly identify the need for electricians or plumbers at installation. This machine shall show the following in the furnish/install column: OFVI / CFCI.

X. Civil and Landscaping

A. Programming:
   1. The Facility Program shall include the project requirements, design approach, proposed siting, layouts, and massing.
   2. Matrix identifying desired types of spaces, sizes, features, intended operations, adjacencies, and other features of the project.
   3. Narratives describing the major components and assumptions.
   4. Applicable Code Requirements include confirmations that the program is compliant with these codes and guidelines.

B. Survey according to **EXHIBIT C.5 Survey Requirements.**

C. SWPPP deadline and deliverables per contract and **EXHIBIT C.4 Storm Water Pollution Prevention Plan**.
   1. Note: At 50 percent - 75 percent CDs or as otherwise indicated by UTSW PM, submit Stormwater Pollution Prevention Plan (SWPPP) to UTSW PM for review/comment and approval. Confirm with OSBC.

D. Schematic Design:
   1. Reports per discipline shall be provided that indicate the scope of work involved including descriptions of all necessary systems in the project. Narrative shall clearly state any extreme deviations from Design Guidelines in design approach and justification for deviation. Any deviations will need to be reviewed and approved by CIP and FPD&C (Planning and Design).
   2. Civil design report: describe proposed hardscape including discussion of storm water collection, detention, and disposal.
   3. Landscape design report: describe both hardscape and soft scape, include proposed special features such as fountains, sculpture, etc. Indicate potential challenges and decisions that will need to be addressed during the next phase of development.

Include potential power needs, lighting needs for accent or focal points, and/or any heating requirements due to local climate conditions.

E. Design Development:
   1. Expansion of SD report with further development as well as a summary of the site investigation with field notes and/or plans, if required.
   2. Area tabulations compared to program requirements, if required
   3. Special requirements.
   4. Final updated design criteria for any systems.
   5. Life Cycle Cost Analysis as applicable.

F. Drawings beginning in Design Development through IFC:
   1. Landscape Drawings:
      a. Plan(s) of proposed areas to be planted and irrigated at a scale consistent with Architectural Site Plan.
      b. Show location of water source for irrigation.
      c. Show major space defining elements such as trees, walls, fences, etc. to convey overall Site design concept.
      d. Show major vehicular and pedestrian circulation patterns.
      e. Show minor features such as benches, light fixtures, and unique elements.
      f. Shall reflect Campus Master Plan and/or Facility Program requirements.
      g. These may be included on the Architectural Site Plan itself unless the degree of complexity requires a separate Plan sheet.
      h. Further refine site plan to evolve into a separate plan sheet at DD with complete hierarchy of proposed plant materials shown and identified, show proposed landscape accessories such as seating, litter receptacles, tables, tree grates, drinking fountains, etc.
      i. Show landscape lighting if applicable.
      j. Show proposed grading in background from Civil, as applicable.
      k. Identify hardscape materials.
      l. Show irrigation diagrammatically in terms of number of zones and type of components (sprays on risers, pop-up sprays, rotary heads, drip, etc.).
      m. Requires licensed landscape architect and licensed irrigator for IFC.
      n. Final approved site plans and plans to scale, fully developed, and coordinated with all disciplines, code requirements and existing conditions.
      o. Plans shall show landscape accessories, hard-scapes, soft-scapes, proposed grading, lighting, irrigation, and other required components of the design.
      p. Plans, details, sections, schedules, and other items to fully document the design.
   2. Civil Drawings:
      a. Site Plan(s) at a scale consistent with Architectural Site Plan.
      b. Show and identify required site utilities with spot elevations.
      c. Show connections to existing site or City utilities.
      d. Show major civil engineering elements to convey overall site design concept.
      e. Show major vehicular and pedestrian circulation layout at least diagrammatically.
      f. Show relationships of all proposed work to existing site survey.
      g. Refine all plans incorporating SD review comments from UTSW PM and Users.
      h. Incorporate erosion control drawing and details.
      i. Site plan should illustrate complete scope of hardscape/engineered features.

j. Show outdoor lighting if within Consultant's scope of work.
k. Show proposed grading contours with applicable spot elevations, drain inlets, manholes and other related structures.
l. Show temporary storm water runoff and containment to meet applicable standards.
m. Identify all hardscape materials within scope of civil work.
n. Requires licensed Civil Engineer for IFC.
o. Final approved plans with complete scope of the hardscape and engineered features.
p. Fully coordinated plans with other disciplines including outdoor lighting if within the scope.
q. Drawings shall include details, sections, and other drawing aids to show the complete design.
r. Show grading contours with applicable spot elevations, drain inlets, manholes and other related structures.
s. Show temporary storm water runoff and containment to meet applicable standards.
t. All site plans showing existing and proposed utilities, connections to existing or City utilities underground and overhead, with sizes shown, valves, boxes, cleanouts, access ways, manholes, fire protection Siamese and hydrant locations.

XI. Structure

A. Programming:
1. Project Requirements.
2. Design Approach.
3. Proposed siting, layouts, and massing.
4. Matrix identifying desired types of spaces, sizes, features, intended operations, adjacencies, and other features of the project.
5. Narratives describing major components and assumptions.
6. Applicable Code Requirements include confirmations that the program is compliant with these codes and guidelines.

B. Schematic Design:
1. Reports per discipline shall be provided that indicate the scope of work involved including descriptions of all necessary systems in the project. Narrative shall clearly state any extreme deviations from Design Guidelines in design approach and justification for deviation. Any deviations will need to be reviewed and approved by CIP and FP&C Planning and Design.
2. Outline of Structural Criteria: Include a brief description of structure including building functions, number of floors, basement, exterior walls, interior partitions, overall building dimensions, frequency of expansion joints including those at exposed exterior building components.
   a. Unusual design features.
   b. Describe the floor and roof structural systems. Discuss reasons for selection of System chosen. This should include comments on the economics of the system

as opposed to others, unusual spans, and loads, fireproofing and any other factors governing selection of structural system. The Engineer shall be prepared to provide typical framing plans (i.e., one to two (1-2) bays) for pricing and determination of the most cost-effective system.

c. The structural design report shall provide a description of the proposed structural system, special features and project understanding. This shall include an outline of Structural Design Criteria as noted in the Structural section, below.

3. Schematic Design drawings to include major analysis and design assumptions shall be briefly described in the "Structural Notes" on the design drawings.
4. Calculations, if requested, will show at a minimum:
   a. Members shall be cross-referenced to plans and (rough) details with any number system that permits easy identification of the member and its location in the structure.
   b. Unit dead loads with partitions load assumptions.
   c. Unit live loads with sustained load assumptions and reduction factors.
   d. Deflections. Show justification for long, slender members.
   e. Ponding.
   f. Vibration considerations where applicable.

C. Drawings beginning in Design Development through IFC:
1. Provide preliminary structural demolition drawings if demolition is required for the project, revise and refine at each following deliverable.
2. Provide load schedule to conform with IBC requirements as well as provide for specific project scope requirements.
3. Give a brief statement of the method of distributing loads and moments throughout frame. Except for complex structures, any recognized method will be satisfactory.
4. If required, discuss methods of distributing wind loads. Wind loads must be taken to the integral parts of the structure.
5. State method of stress analysis i.e., working stress, ultimate strength. List Codes, Standards, and pertinent references to be used as criteria for sizing members. Give class and strength of structural materials to be used.
6. List unit loads, wind loads, seismic load factors.
7. As soon as soils investigations have been completed, give detailed description of foundation type and soils capacities actually used in sizing foundation members. State anticipated settlements if known.
8. Crawl Space, Basement and Ground floor foundations shall be designed in accordance with the Geotechnical Recommendations given in the Geotechnical Report.
9. Discuss below grade waterproofing and method of removing water at exterior walls, under slab or in crawl space.
10. Discuss lateral load assumptions at below grade locations.
11. Discuss unusual foundation and shoring problems due to nature of soils, proximity of adjacent structures, etc.
12. Provide a detailed discussion of why the particular framing and foundation system was chosen.

13. Provide schematic layout drawings and framing plans.
14. Provide sample calculations
15. proposed for use on project - computer input, program utilized, etc. if requested by UTSW PM.
16. Provide live load maps.
17. Foundation, floor, and roof plans to scale with all major structural members, preliminary sizes with approximate reinforcing quantities.
18. Show all major structural members along with approximate reinforcing quantities to assist in the preliminary pricing of the structure.
19. Indicate recessed areas in slabs, major openings, elevator, and sump pits.
20. Indicate subsurface drainage system (if required). Coordinate with Architectural, Civil and Plumbing.
21. Provide typical details including pier layout, lateral bracing, and framing details to assist in the preliminary pricing of the structure.
22. Show locations and heights of soil retentions systems.
23. Preliminary structural demolition drawings (if required).
24. Show Roof drawings, pipe penetrations, AHU curb locations/details.
25. Provide preliminary Live Load maps. Floor Live Load maps shall have an Architectural Background.
26. Backgrounds shall include appropriate grid lines and callouts and any dimensioning that is required.
27. Provide Roof Uplift Load map showing gross uplift loads for all roof areas, including canopies and other architectural features that may be subject to wind uplift forces.
28. Foundation, floor, and roof plans shall show all major structural members along with approximate reinforcing quantities.
29. Indicate recessed areas in slabs, major openings, elevator, and sump pits.
30. Indicate subsurface drainage system if required.
31. Provide typical details including pier layout, lateral bracing, and framing details.
32. Show locations and heights of soil retentions systems.
33. Roof drawings, pipe penetrations, AHU curb locations/details including roof mounting equipment and loads.
34. Design drawings shall include plan Live Load maps for all floors including the foundation. The maps shall indicate live loads and dead loads requiring special consideration. The floor load maps shall have an Architectural Background in lieu of a Structural Background as these maps will be used for future renovation projects. Backgrounds shall include appropriate grid lines and callouts.
35. Design drawings shall include Roof Uplift Load maps showing gross uplift loads. Coordinate roof uplift map with Architectural Drawings and Specifications. Backgrounds shall include appropriate grid lines and callouts and any dimensioning that is required.
36. Design documents (drawings and/or specifications) shall include general post-construction penetration guidelines including:
    a. Where penetrations are allowed (with noted restrictions).

b. Where penetrations may be allowed with the review and approval of a Structural Engineer.
c. Where penetrations will never be allowed.

XII. Architecture

A. Programming:

1. The Facility Program shall include the project requirements, design approach, proposed siting, layouts, and massing.
2. Matrix identifying desired types of spaces, sizes, features, intended operations, adjacencies, and other features of the project.
3. Narratives describing the major components and assumptions.
4. Applicable Code Requirements include confirmations that the program is compliant with these codes and guidelines.
5. Expected schedule projections for design and construction phases.
6. Preliminary Total Project Budget based on assemblies and anticipated quantities.

B. Schematic Design:

1. Reports per discipline shall be provided that indicate the scope of work involved including descriptions of all necessary systems in the project.
   a. Provide updated scope narrative.
   b. Provide program variance document to describe significant changes from original project scope.
   c. Narrative shall clearly state any extreme deviations from Design Guidelines in design approach and justification for deviation. Any deviations will need to be reviewed and approved by CIP and FPD&C (Planning and Design).
2. A Life Safety Code design report shall be included that describes means of compliance as well as any major code issues. Shall describe systems required for compliance.
3. The architecture design report shall briefly describe the proposed building, how it meets the Facility Program requirements, state the design statement of intent, and discuss how design goals will be met in the spaces provided.
4. The interior design report shall describe the proposed solutions for finishes and furniture layouts.
5. A copy of the approved Facility Program.

C. Design Development

1. Revision and progression of elements presented in SD report.
   a. Scope narrative.
   b. Program variance document.
   c. Design guideline deviation.
2. Summary of site investigation with field notes and/or plans, if required.
3. Area tabulations compared to program requirements, if required.
4. Description of construction phasing, if required.

D. Leadership Presentations:

1. Confirm requirements with UTSW PM.
   a. Initial submissions may include:

i. Perspective drawing(s) showing visual appearance and orientation of the Project with adjacent structures and amenities.
ii. Elevation drawing(s) showing proposed façade(s) and massing.
iii. Typical floor plans.

b. Final submissions
i. Site plan(s) showing building orientation and proximity to adjacent buildings, roads and drives, pathways, and other features.
ii. Elevation and Perspective Drawings to show scale and visual exterior elements of the proposed design.
iii. Main level floor plan with spaces identified and circulation paths illustrated.
iv. Upper-level typical floor plan(s) depending on the nature of the project and the number of floor levels included.
v. Fact sheet outlining square footage, including both gross and net assignable, costs and other pertinent data.
vi. Project Planning Form (PPF).

E. Drawings:
1. Site plan indicating areas of demolition, building location and footprint, adjacent structures, parking and/or parking structures, pedestrian and vehicular circulation, emergency vehicle access, loading dock/truck access, all major landforms, site features and constraints, topographical contour lines, sub-surface conditions, survey, landscaping scheme, coordinate with Civil Engineering and Landscape disciplines.
2. Circulation Path Plan:
a. All patient focused project types shall include a circulation path plan overlay. Scale of drawing must be easily readable for clarity and sign-off by Owner.
b. Circulation path plan shall be submitted at any partial Design Development issuances, at final Design Development submittal with plan(s) on full-size sheets.
c. At a minimum, it shall have differing line types to indicate the following circulation types:
i. Public / General Circulation.
ii. Patient Unescorted Circulation.
iii. Patient Escorted Circulation.
iv. Staff Open Circulation.
v. Restricted Staff Circulation.
vi. Specialty Circulation based on Project Specifics.
d. Related discussions to be included shall include access control, door hardware types, automatic door openers, and other project specific requirements that affect the workflow and functions.
3. Demolition Plans:
a. Renovation projects shall include plans of the existing building, building structural system, and areas requiring demolition.
b. Any hazardous material locations identified in the UTSW provided environmental testing report shall be indicated in drawings and noted as “Not in scope – to be removed by abatement contractor.”

4. Floor Plans:
    a. Floor Plans of final scheme showing room layout, room number and room name, gross areas, doors with swings, columns, shear walls, rated partitions, shafts, and stairs.
    b. Notes shall be included indicating any special requirements for spaces such as HVAC, electrical or plumbing unique conditions.
    c. Equipment rooms shall show clearances for maintenance and access.
    d. All proposed floor plans showing overall dimensions, room numbers and sizes, door swings, furniture layout (both fixed and mobile), equipment layout (both fixed and mobile), fire rated walls, gross area, and net assignable area calculations, as well as smoke control zones.
    e. Plan shall document any occupied spaces.
    f. Room numbers shall follow UTSW assigned numbering.
    g. All associated spaces including mechanical, electrical, service closets, etc. shall be noted on plans as required in renovation projects.
    h. Include levels above and below plan areas affected by the work.
    i. Include approximate square footage / linear footage affected by associated scope of work planned.
    j. Includes all stairs, elevator shafts, or shafts associated with the work.
5. Kitchen and foodservice shall indicate serving areas, seating areas, and circulation.
6. Interior finish schemes shown on floor plans coordinated with finish and material schedules.
7. Reflected ceiling plans including mechanical items, electrical items, material types, elevations, and other details to describe intent.
8. Roof plans shall be coordinated to show all equipment, pathways, roofing changes, walk pads, etc.
9. Enlarged Plans of spaces shall indicate required clearances for accessibility, maintenance clearances and indicate any potential items of non-compliance. Spaces include at a minimum: Toilet rooms, stairs, TR closets, mechanical spaces, electrical rooms, and spaces with special design criteria, etc.
10. Exterior Elevations: At least two exterior elevations (final agreed scheme), a building profile section showing floor to floor dimensions, ground floor elevation to mean sea level (MSL), a primary elevation and other significant façades (street-facing, loading dock area, adjacent to recognized neighbor, etc.), with materials and extents described on drawings.
    a. A continuation and refinement of elevations to expand to all exterior elevations including exterior materials referenced to wall sections and details. Indicate material transition locations, expansion joints, control joints, etc. Fully noted and dimensioned back to structural grid.
11. Building Sections shall indicate critical building components, hierarchies, elevations, special conditions, etc. including heights and dimensions.
12. Wall sections shall show all exterior finishes, materials, and fenestration types, parapet condition, assemblies, and indicate floor-to-floor types as well as dimensions back to structural grid.

a. Indicate each wall type at a minimum graphically with specific information including sound attenuation, fire ratings, UL, or other testing design numbers.

13. Construction details: Indicate details at large scale to clearly show components and assemblies including waterproofing, assemblies, windows, storefronts, equipment, shielding, etc., cabinet/casework elevations, and typical sections, details of unique finishes, dimensioned with notes indicating materials and components.
14. Door schedule indicating doors, frames, fire ratings, and special conditions planned.
15. Interior elevations for all special design criteria, such as finish, acoustics, environmental, transportation, security, details of unique features to be included at enlarged scales, dimensions to indicate finish heights and extents, important elevations to be enlarged as required.
16. Furniture and Equipment Plans: Preliminary furniture layouts for the entire building to substantiate and verify that program space requirements are being met, and to confirm electrical, communication, and audio/visual locations.
    a. Preliminary furniture layouts shall be both well resolved and workable, while conforming to ADA standards.
    b. Indicate electrical requirements and connections.
    c. Final layouts shall include walls, windows, doors, room numbers, built-in cabinetry, and equipment.
    d. Furniture layouts shall be half-toned.
17. Perspective Renderings: If required per contract, provide according to requirements.
18. Schedules: Refer to DG Section C2 Deliverables Checklist.
    a. Room schedules and/or space schedule that validate program requirements.
    b. Door schedules, opening schedules, glazing schedules, etc.
    c. Toilet accessory schedule
    d. Signage schedule including standards.
    e. Interior finishes and materials schedule to coordinate with interior finish plans.
    f. Equipment responsibility matrix showing OFCI, OFOI, CFCI, etc. with indications of equipment on emergency power - Refer to Design Guidelines Section B – Equipment Schedules and Coordination.
19. Phasing: Information and drawings if required.

F. Finish Binders: Provide three (3) finish binders and digital copies shall be provided to the Owner, UTSW PM and UTSW Design Team indicating all finish items in the project. This binder shall include a finish schedule and each material sample shall be noted with identification number for reference.

XIII. Plumbing

A. Programming:

1. The Facility Program shall include the project requirements, design approach, proposed siting, layouts, and massing.
2. Matrix identifying desired types of spaces, sizes, features, intended operations, adjacencies, and other features of the project.
3. Narratives describing the major components and assumptions.

4. Applicable Code Requirements include confirmations that the program is compliant with these codes and guidelines.

B. Schematic Design:
   1. Reports per discipline shall be provided that indicate the scope of work involved including descriptions of all necessary systems in the project. Narrative shall clearly state any extreme deviations from Design Guidelines in design approach and justification for deviation. Any deviations will need to be reviewed and approved by CIP and FDP&C (Planning and Design).

C. Design Development Report:
   1. Design loads for Plumbing and Plumbing Fixture requirements per code.
   2. Special environmental requirements (such as equipment, space pressurization, processes, animals, odors, sterility, etc.)
   3. Provide final calculations for all systems.
   4. Final updated design criteria for each plumbing system, including set points, water quality, piping levels, etc.
   5. Life Cycle Cost Analysis as applicable.

D. SECO
   1. Provide "Water Conservation Design Standard Compliance Certification for State-Funded Buildings" with initial draft of form submitted at SD.

E. Drawings:
   1. All site plans showing existing and proposed utilities, underground and overhead, with sizes shown, valves, boxes, cleanouts, access ways, manholes, fire protection Siamese and hydrant locations.
   2. Utility Plans: Provide location, types, and sizes of existing and proposed utilities. Plumbing Engineer, Civil Engineer, and Landscape Architect shall collaborate and coordinate plans. Indicate any areas of specialty systems including lawn irrigation.
   3. Demolition Plans: For renovation projects, provide plumbing domestic water, sanitary waste piping, and other specialty piping demolition plans.
      a. Any hazardous material locations identified in the UTSW provided environmental testing report shall be indicated in drawings and noted as "Not in scope – to be removed by abatement contractor."
   4. Diagrams:
      a. Indicate routing of vent stacks up through roof for all project vents.
      b. Isometric riser diagrams for all plumbing risers in the building (each main stack identified by a number on both the plans and the riser diagram), including domestic water, sanitary, storm, laboratory water, medical gas, RODI, etc.
      c. One-line (riser) diagrams for every plumbing system including domestic cold/hot water, sanitary, storm, laboratory water, medical gas, RODI, vent etc.
      d. Control diagrams for all plumbing systems.
      e. Flow diagrams for all pressure systems including heating and cooling, water, steam, gas, oxygen, air, vacuum, fire protection, etc.
   5. Floor Plans: To show:
      a. All plumbing fixtures, lab fixtures, floor and roof drains, special devices

b. Locations and details of fire hose connections, lavatory connection, pump connection, hot water generator, water softener, acid dilution basin, sewer manholes, backflow prevention, water header, etc., including details.
c. All sanitary waste and vent piping.
d. Roof/Overflow Storm Drain piping.
e. Main water supply taps and piping, sized.
f. Indicate required service areas.
g. Any special plumbing system requirements such as vacuum, compressed air, de-ionized water, medical or laboratory gases or laboratory waste.
h. Back Flow prevention locations.
i. All spaces shall be identified by name and room numbers with column grids and numbers on all plans.
j. Plans shall note where space is limited.
k. Schedule all major equipment on drawings.
l. Plumbing plans shall have all fire and smoke walls and partitions (and their ratings) clearly indicated.
m. For renovations: identify any relocation of main plumbing risers or other elements.

6. Roof plans shall be coordinated to show all equipment, pathways, roofing changes, walk pads, etc.
7. Enlarged Floor Plans: Any congested spaces shall be shown at 1/4-inch minimum scale.
8. Construction Details: Provide plumbing details.
9. Schedules: Equipment responsibility matrix showing OFCI, OFOI, CFCI, etc. with indications of equipment on emergency power – Refer to Design Guidelines Section B, Equipment Schedules, and Coordination.
10. Design criteria for each plumbing system, including set points, water quality, piping levels, etc.

XIV. Mechanical

A. Programming:

1. The Facility Program shall include the project requirements, design approach, proposed siting, layouts, and massing.
2. Matrix identifying desired types of spaces, sizes, features, intended operations, adjacencies, and other features of the project.
3. Narratives describing the major components and assumptions.
4. Applicable Code Requirements include confirmations that the program is compliant with these codes and guidelines.

B. Schematic Design:

1. Reports per discipline shall be provided that indicate the scope of work involved including descriptions of all necessary systems in the project. Narrative shall clearly state any extreme deviations from Design Guidelines in design approach and

justification for deviation. Any deviations will need to be reviewed and approved by CIP and FP&C Planning and Design.

2. Design loads for HVAC, requirements per code.
3. Special environmental requirements (such as equipment, space pressurization, processes, animals, odors, sterility, etc.)
4. Provide final calculations for all MEP systems.
5. Life Cycle Cost Analysis as applicable.

C. SECO (As required)
   1. Provide SECO/ASHRAE 90.1 Compliance form initial draft to be issued at SD.

D. Design Criteria: To be submitted at each deliverable.
   1. Code Review, UT Guidelines Review, and Occupancy classification, Construction Envelope, International Mechanical Code, International Plumbing Code, International Fuel Gas Code, Texas Department of Licensing and Regulation.
   2. Design loads for HVAC, Plumbing; and Plumbing Fixture requirements per code
   3. Special environmental requirements (such as equipment, space pressurization, processes, animals, odors, sterility, etc.).
   4. Update and resubmit at final DD design calculations the "Basic Systems Data" form, refer to **EXHIBIT C.7**.

E. Drawings:
   1. Site plans showing existing and proposed utilities, underground and overhead, with sizes shown, valves, boxes, cleanouts, access ways, manholes, fire protection Siamese and hydrant locations.
   2. Demolition plans: For renovation projects, provide schematic HVAC system ductwork and air devices demolition plans.
      a. Any hazardous material locations identified in the UTSW provided environmental testing report shall be indicated in drawings and noted as "Not in scope – to be removed by abatement contractor."
   3. Diagrams showing control diagrams, riser diagrams, flow & riser, and other as determined per project.
   4. Floor Plans:
      a. Overall project area air flow diagram indicating air handlers, exhaust fans, duct risers, main ducts, and shafts.
      b. HVAC Floor Plans showing equipment layout in mechanical rooms.
      c. Building floor plans indicating ductwork in single line format for Supply Air (SA), Return Air (RA) and Exhaust Systems; indicate estimated SA, RA, and Exhaust airflow rates; piping mains.
      d. Show locations, orientation and size of major equipment, risers, lines, and connections. Include clearances with dimensions for any enlarged equipment plans.
      e. Plumbing fixtures and equipment may be shown on Architectural Floor Plans.
      f. All HVAC floor plans shall include:
         i. Plans shall indicate the egress route for large equipment including height requirements.
         ii. Remodel projects shall also indicate egress routes for major components.

iii. Medium pressure ductwork shown in double line format, placement of single/dual duct terminal units, thermostats. Show major taps and splits, duct sizes.
iv. Low-pressure ductwork shown in single line format, not sized, diffusers, grilles and returns shown but not sized. Indicate SA, RA, and Exhaust Device cfm from current Load Calculations.
v. Duct layout for typical spaces including required dampers, fire dampers, smoke dampers and combination F/S dampers.
vi. Routing of HVAC piping and pipe sizes shown.
vii. Show in special detail, cross-section or other appropriate manner above ceiling spaces dedicated to specific services, such as special laboratory services, conduit, piping, ductwork, fire protection piping, etc.
viii. Indicate shafts, chases access clearance requirements including wall ratings that match floor plans.
ix. Identify all systems including air, hydronic, steam, condensate and other HVAC related systems, and other materials as required to describe the fundamental design concept for all mechanical systems.
x. Indicate the amount of redundancy for all major pieces of mechanical equipment. This is to be provided in the preliminary building assessment report prior to designing.
xi. On major equipment, indicate air intake, discharge locations and special occupancy zones (if required)
xii. Identify space classification (hospital, clinic, laboratory, BSL level, etc.)
xiii. Indicate Gross HVAC zoning and typical individual space zoning including quantity of VAV boxes per space type.

5. Construction Documents:
   a. All air conditioning systems are drawn to scale including all ductwork in two lines with all fittings to scale.
   b. Sections through mechanical rooms to adequately describe the construction requirements.
   c. Schedule of all major items of equipment to indicate performance characteristics.
      i. Include humidification schedule, where required. Schedule shall include equipment number or tag, sheet number, room number of installation, and fire alarm device location.
   d. All piping systems complete with necessary sections to clarify routing.
   e. Applicable details.
   f. All columns numbered.
   g. All rooms numbered.
   h. Flow diagrams for each piping system except drains - show quantities in each major branch take-off and the base of each main.
   i. Identify all systems including air, hydronic, steam, condensate and other HVAC related systems, and other materials as required to describe the fundamental design concept for all mechanical systems.

j. Provide one-line diagrams for each air, hydronic, steam, condensate, and all other HVAC related systems.
k. On major equipment, indicate air intake, discharge locations and special occupancy zones (if required).
l. Identify space classification (hospital, clinic, laboratory, biosafety level, etc.).
m. Indicate Gross HVAC zoning and typical individual space zoning including quantity of VAV boxes per space type.
n. Roof plans shall be coordinated to show all equipment, pathways, roofing changes, walk pads, etc. Indicate clearances and access for roof-top equipment on plans.
o. Enlarged Floor Plans: Mechanical room plan (1/4-inch minimum scale) laid out with HVAC and associated equipment (air handlers, pumps, compressors, etc.) shown to scale.
    i. Mechanical room plans to indicate service clearances for all equipment, including coil pull space for Air Handling Units (AHU) and door clearances.
p. Construction Details: Show in special detail, cross-section or other appropriate manner above ceiling spaces dedicated to specific services, such as special laboratory services, conduit, piping, ductwork, fire protection piping, etc.
q. Controls: Describe the proposed controls sequence of operation for each system. This may reside within the narrative or on a drawing sheet in early design.
    i. For systems with multiple fans or pumps, indicate size of each relative to full load capacity, and how many operate at a time.
    ii. For AHU controls, indicate if economizer cycle and CO2 demand ventilation sequences will be included.
    iii. Describe any required network integration of packaged controls systems for equipment such as chillers, boilers, computer room AHUs, etc.
    iv. Include connections to building management system.
    v. Provide preliminary points list/outline for all systems that is complete enough to allow accurate scope of work for pricing of controls work.
    vi. Provide detailed sequence of operation for all systems.
    vii. Control diagram in concept form for all mechanical systems.
    viii. Indicate type of controls to be removed and/or replaced such as pneumatic or Direct Digital Control (DDC).
    ix. Include connections to building management system.
    x. Provide points list/outline for all systems that is complete enough to allow accurate scope of work for pricing of controls work.
    xi. Provide detailed sequence of operation for all systems.
    xii. Control diagram in final form for all mechanical systems.
    xiii. Schedules: Equipment schedule showing OFCI, OFOI, CFCI, etc. with indications of equipment on emergency power - Refer to Design Guidelines Section B – Equipment Schedules and Coordination.

XV. Electrical

A. Programming:

1. The Facility Program shall include the project requirements, design approach, proposed siting, layouts, and massing.
2. Matrix identifying desired types of spaces, sizes, features, intended operations, adjacencies, and other features of the project.
3. Narratives describing the major components and assumptions.
4. Applicable Code Requirements include confirmations that the program is compliant with these codes and guidelines.

B. Schematic Design:

1. Reports per discipline shall be provided that indicate the scope of work involved including descriptions of all necessary systems in the project. Narrative shall clearly state any extreme deviations from Design Guidelines in design approach and justification for deviation. Any deviations will need to be reviewed and approved by FP&C Planning and Design.
2. Electrical design report shall briefly, describe the proposed normal and emergency electrical power distribution systems, preliminary design loads, interior and exterior lighting, fire detection/alarm, communication, audio visual, central clock, CCTV, and security systems. Include any other items relevant to the project, such as lightning protection, special grounding requirements, UPS, power quality, hazardous locations, etc.
3. Lighting controls Sequence of Operation (SOO) or Narrative shall describe needs of each space type within project, amount of operability, system type, and the level of integration.

C. Design Development:

1. Special environmental requirements (such as equipment, space pressurization, processes, animals, odors, sterility, etc.).
2. Provide final calculations for all MEP systems.
3. Final Fault current and coordination studies shall be used to specify equipment ratings.
4. 100 percent Electrical load calculations.

D. Drawings:

1. Site plans showing location of existing or new utility source, characteristics, and proposed routing of new electrical service to building.
    a. Indicate the provider of the power, utility company, campus generated, etc.
    b. Show normal and emergency electrical service system equipment locations, include electric utility switches, power poles, sub-stations, vaults, duct-banks, manholes, exterior lighting, etc., as applicable.
2. Utility Plans shall identify, locate, and determine any applicable capacity of normal power, emergency power, and pathways for low voltage systems.
3. Demolition Plans shall indicate existing demolition in site and in plan, including equipment to be removed, repurposed, relocated, or to remain.
    a. Any hazardous material locations identified in the UTSW provided environmental testing report shall be indicated in drawings and noted as “Not in scope – to be removed by abatement contractor.”

4. Diagrams:
    a. One-line or riser diagram indicating electrical service supply (primary and secondary as applicable), switchgear, switchboards, MCC's, large individual mechanical equipment, distribution panel boards, branch circuit panel boards, generators, fire pumps, etc. including equipment ratings.
    b. Nominal power riser diagram with circuit breaker, fuse, conduit, and wire sizes
    c. Emergency power riser diagram with circuit breaker, fuse, conduit, and wire sizes.
    d. Grounding riser diagram.
5. Floor Plans:
    a. Typical lighting and power layouts and main distribution gear locations.
    b. Show locations, orientation and size of major equipment, risers, lines, and connections. Include clearances with dimensions for any enlarged equipment plans.
    c. Coordinate minimum size of electrical rooms with Architectural plans.
    d. Data and Technology: indicate required spaces on floorplans with basic equipment layout and clearances dimensioned.
    e. Updated estimate of total normal and emergency electrical loads with line-item breakout of power, lighting, mechanical, receptacles, misc., etc.
    f. All floor plans showing typical light fixture layout and types, both interior and exterior, typical power layouts including outlets, all distribution equipment locations, electrical rooms/vaults, communications rooms, etc. Unless permitted otherwise, provide separate sets of sheets as needed for power, lighting, fire alarm, communications, audio-visual and security.
    g. Schedule of typical spaces, including exterior, with design footcandle levels and calculated lighting levels for the corresponding spaces.
    h. Switchgear, switchboards, MCC's, large individual mechanical equipment, distribution panel boards, branch circuit panel boards, generators, fire pumps, etc. including equipment ratings.
    i. Security: Indicate required spaces on floorplans with basic equipment layout and clearances dimensioned.
    j. Lighting plans shall note elevation heights, other high installed items like milli-q's, clocks, etc. Identify undercounter light locations and extents.
    k. Roof plans shall be coordinated to show all equipment, pathways, roofing changes, walk pads, etc.
    l. Enlarged Floor Plans - Any congested spaces, equipment rooms, electrical rooms, substation, and generator room plans including standard details (if required) and ATS descriptions.
    m. Construction Details - Provide the required details for the contractor to build the work.
    n. Controls - Lighting control system and control device descriptions including dimming, daylighting, and low voltage control zones.
    o. Panel schedules with load calculations.
    p. Light fixture schedule including fixture type.
    q. Equipment schedule showing OFCI, OFOI, CFCI, etc. with indications of equipment on emergency power - Refer to UTSW Design Guidelines Section B – Equipment Schedules and Coordination.

r. Electrical Calculations:
   i. Lighting photometrics with calculated values on plans of each floor with only emergency egress lighting calculated values.
   ii. Provide lighting photometric values for each building and discharge to a public way.
   iii. Fault current and coordination studies are used to specify equipment ratings.
   iv. Final Calculations shall have the list of equipment on emergency power with electrical load calculations for service equipment and each distribution panel.

XVI. Data / Technology / Security

A. Programming:

1. The Facility Program shall include the project requirements, design approach, proposed siting, layouts, and massing.
2. Matrix identifying desired types of spaces, sizes, features, intended operations, adjacencies, and other features of the project.
3. Narratives describing the major components and assumptions.
4. Applicable Code Requirements include confirmations that the program is compliant with these codes and guidelines.

B. Schematic Design:
1. Reports per discipline shall be provided that indicate the scope of work involved including descriptions of all necessary systems in the project. Narrative shall clearly state any extreme deviations from Design Guidelines in design approach and justification for deviation. Any deviations will need to be reviewed and approved by FP&C Planning and Design.
2. Provide summary of all security services requested including cameras, duress alarms / panic devices, card readers, and other security devices. Include floor plans to show quantity, types, and locations.

C. Design Development:
1. Design criteria for each discipline, code requirements, special environmental requirements, final calculations for all systems.

D. Drawings:
1. Site plans showing the location of existing or new elements.
2. Utility Plans to provide location, types, and sizes of existing and proposed utilities.
3. Demolition Plans to indicate existing demolition in site and in plan, including equipment to be removed, repurposed, relocated, or to remain.
   a. Any hazardous material locations identified in the UTSW provided environmental testing report shall be indicated in drawings and noted as “Not in scope – to be removed by abatement contractor.”
4. Diagrams including raceway and grounding riser diagrams.
5. Data/Technology:
   a. Full floor plans showing outlets, equipment, associated rooms/spaces, conduit and cable trays, backboard locations, identify receptacles in existing walls, and

Technology Room (TR) / Intermediate Distribution Frame (IDF) locations, sizes, and door swings.
   b. Typical voice, data and video outlet location plans including installation heights.
   c. Refer to any data connection not identified on plans as 'to be located in coordination with IR infrastructure coordinator'.
   d. Wall phone locations.
   e. Wi-Fi locations shall be provided by UTSW.
6. A/V and Special Systems:
   a. System descriptions (if present).
   b. Finalized device location plans.
   c. Including clock, A/V equipment, camera, microphone, white noise location plans as provided by vendor.
7. Security: Full floor plans shall show
   a. Equipment location plans including device location, card access-control equipment, etc.
   b. Equipment descriptions and specific information.
   c. Panel or tie-in locations.
8. Reflected Ceiling Plans - In separate reflected ceiling plan, locate cable trays and heights as it relates to structure and utilities.
9. Roof plans to show any equipment, routing, or connections within the project scope.
10. Enlarged plans of TR / IDF rooms shall be at 1/4-inch scale minimum.
    a. Security office layout, access control equipment, closet layout, and elevations.
11. Construction Details shall indicate special conditions and requirements including dimensions.
12. Control systems and control device descriptions.
13. Equipment schedule showing OFCI, OFOI, CFCI, etc. with indications of equipment on emergency power - Refer to Design Guidelines Section B – Equipment Schedules and Coordination.
    a. Equipment list for shared communication rooms.

XVII. Fire Protection

A. Programming:

1. The Facility Program shall include the project requirements, design approach, proposed siting, layouts, and massing.
2. Matrix identifying desired types of spaces, sizes, features, intended operations, adjacencies, and other features of the project.
3. Narratives describing the major components and assumptions.
4. Applicable Code Requirements include confirmations that the program is compliant with these codes and guidelines.

B. Schematic Design:

1. Reports per discipline shall be provided that indicate the scope of work involved including descriptions of all necessary systems in the project. Narrative shall clearly state any extreme deviations from Design Guidelines in design approach and justification for deviation. Any deviations will need to be reviewed and approved by FP&C Planning and Design.

C. Design Development
   1. Summary of site investigation with field notes and/or plans, if required
   2. Special environmental requirements that affect discipline.
   3. Final updated design criteria.
   4. Life Cycle Cost Analysis as applicable.

D. Drawings
   1. Site plans showing locations of existing or new elements, utility connections, etc.
   2. Utility plans indicating utility relationships.
   3. Demolition plans to indicate existing demolition in site and in plan, including equipment to be removed, repurposed, relocated, or to remain.
      a. Any hazardous material locations identified in the UTSW provided environmental testing report shall be indicated in drawings and noted as "Not in scope – to be removed by abatement contractor."
   4. Floor Plans: Fire protection plans shall include:
      a. Location of incoming supply, valves, fire pump, etc.
      b. All piping routes, sprinkler head locations in architecturally sensitive areas only, fire department connections.
      c. Show sizes of risers and trunks.
      d. Fire Alarm Plans shall include FA panel device and appliance location plans.
         i. Indicate existing approximate sprinkler head locations in demolition RCP plans.
         ii. Sequence matrix.
         iii. In architecturally sensitive areas, include main piping sizes and head locations.
   5. Enlarged Plans of spaces shall indicate required clearances for maintenance clearances. Spaces include at a minimum:
      a. Spaces with special design criteria, fire pump rooms, etc.
   6. Construction Details shall indicate special conditions and requirements.
   7. Equipment schedule showing OFCI, OFOI, CFCI, etc. with indications of equipment on emergency power - Refer to Design Guidelines Section B – Equipment Schedules and Coordination.

XVIII. Construction Administration and Closeout Requirements for All Projects:

A. Note: Due to security protocols, no zipped or compressed files shall be accepted.
B. Some projects may utilize project management software during construction documentation and construction administration. Version shall be confirmed by UTSW PM.
C. Documentation provided in ".pdf" format with index information bookmarked and shall be provided with Optical Character Recognition (OCR) .
D. Dependent on contract requirements, A/E shall revise the drawings and specifications upon Final Completion of the construction, to incorporate all Addenda, all Change Orders for the Work, and any modifications recorded by the Contractor on the As-Built Drawings and Specifications maintained at the job site.
   1. The A/E shall label the revised drawings and specifications as "Record Drawings" and "Record Specifications" and shall deliver copies to the UTSW PM for record purposes, as follows:

2. Record Specifications: Provide one (1) bound hard copy set and one (1) electronic set of the fully conformed records specifications incorporating all changes and as-built conditions in PDF format containing index information bookmarked with optical character recognition (OCR) .
3. Record Drawings: Provide one (1) complete bound print set of record drawings, and one (1) complete electronic set of the full record drawings incorporating all changes and as-built conditions in PDF format with optical character recognition.

E. Confirm contract requirements:
1. CAD files of drawings shall comply with UTSW CAD Standards, refer to **EXHIBIT C.2**.
2. BIM files of project shall comply with UTSW BIM Standards, refer to **EXHIBIT C.3**.

XIX. Office of Safety and Business Continuity (OSBC) Coordination Requirements:

Project shop drawing documentation required for review by OSBC shall conform to the following as well as specific requirements from UTSW Master Specification sections.

Civil: (NFPA 1: 1.7.11.1/ 12.8)

I. New Construction
II. Renovation/ Modification

Architectural / Engineering: (NFPA 1: 1.7.11.5/ 1.7.11.6/ 12.8)

I. New Construction
II. Renovation/ Modification/ Tenant Fit Out

Automatic Fire Sprinkler System: (NFPA 1: 1.7.11.1/ 1.7.11.6/ 12.8; NFPA 13: 23.1)

I. New Installations
II. Renovation/ Modifications/ Tenant Fit Outs which require the addition or movement of more than 2 sprinkler heads.

Hydraulic Calculations

I. Required for the addition or modification of more than 5 fire sprinkler heads.

Fire Alarm System: (NFPA 1: 1.7.11.1/ 1.7.11.6/ 12.8; NFPA 72:7.1.1/ 7.1.2)

I. New Installations
II. Renovation/ Modifications/ Tenant Fit Outs which require the addition or movement of more than 2 fire alarm devices.

Battery Calculations

I. Required for the addition or modification of more than 2 devices.

Clean Agent System: (NFPA 1: 1.7.11.1/ 1.7.11.6/ 12.8; NFPA 2001: 5.1.2.1)

I. New Installations

II. Renovation/ Modifications/ Tenant Fit Outs which require the addition or modification of nozzles or fire alarm devices.

System Calculations

I. Required for the addition of any nozzles or fire alarm devices.

Ansul System: (NFPA 1: 1.7.11.1/ 1.7.11.6/12.8; NFPA 17A: 6.3)

I. New Installations
II. Renovation/ Modifications/ Tenant Fit Outs which require the addition or modification of nozzles or fire alarm devices.

Agent Calculations

I. Required for the addition of any nozzles.

Other Plans/ Permits required by the Fire Code:

I. Permits for Tank Installation/ Removal or for Change of: Occupancy; Means of Egress; Fire Suppression; Fire Alarm; Private Fire Hydrants; Open Fires/ Burning; Tents; Hot Works; Construction; Etc.
   A. NFPA 1: 1.12.2.1 – Applications for permits shall be accompanied by such data as required by the AHJ and fees as required by the jurisdiction.
   B. NFPA 1:12.8 – Permits shall be required in accordance with Table 1.12.8 (a) – (d)

New Construction:

I. NFPA 1:1.7.11.1 – The AHJ shall have the authority to require plans and specifications to ensure compliance with the applicable codes and standards. (Note: OSBC is the AHJ on UTSW campus).

Existing Construction:

I. NFPA 1: 1.7.11.6 – Plans shall be submitted to the AHJ proper to the alteration of the means of egress of fire protections systems of any existing structure.

End of Section C

EXHIBIT C.1 Pending Issues / Project Tracking

(EXAMPLE FORMAT) A/E Shall prepare, maintain, and submit throughout Design Phases to IFC to record and track outstanding issues, concerns, and decisions.

Date Issued:

Project Name:

UTSW Project Number:

Original Project Scope Summary/Narrative:

Scope Changes and Dates:

Action Number	Date Action Initiated	Requested By	Requested Action	Responsible Party	Due Date For Resolution	Action Item / Comment	Status (Open / Closed)

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EXHIBIT C.2 UTSW CAD Standards

I. Requirements

A. The following items must be accurate for acceptance of the files submitted into UTSW FPD&C for record documents:
   1. All lines indicating objects (walls, doors, windows, etc.) must be continuous lines and not made up of partial lines or duplicated lines.
   2. Walls must match architectural conditions as found in the field. Specifically, walls must meet the exterior walls at mullions, not simply end into a window.
   3. If any special conditions found in the field must be noted along with the drawing file at the time of submittal for review by UTSW FPD&C.
   4. Layers as shown below are to be maintained and limited to only those layers listed. Any variance from this list requires prior written approval from UTSW FPD&C.
   5. Plans shall contain room names and room numbers within each room.

B. Symbols used in CAD programs by the A/E shall match the symbols on UTSW provided MEP1 sheet.

ITEMS ON FACILITY PLAN	LAYER NAME
BUILT-IN EQUIPMENT	A-EQUP
BUILT-IN EQUIPMENT	A-EQUP-HIDN
CABINETS	A-CABT
DOORS	A-DOOR
DRAWING TITLE / NORTH ARROW	TITLE
FUME HOODS	A-HOOD
FURNITURE	A-FURN
LAB BENCHES	A-LAB-BENCH
ROOM NAMES	A-ROOM-NAME
ROOM NUMBERS	A-ROOM-NUMBER
SCALE	TITLE
SHELVES	A-CABT-UPPR
SINKS / PLUMBING FIXTURES	A-FIXT
STAIRS	A-WAL-PERM
STRUCTURAL ELEMENTS	S-COL

EXHIBIT C.2 (continued)

STRUCTURAL GRID	S-COL-GRID
STRUCTURAL IDENTIFICATION	S-COL-IDEN
WALLS – INTERIOR PARTITION	A-WALL
WALLS – PERMANENT / BUILDING AND WINDOW WALLS	A-WALL-PERM
WINDOWS - INTERIOR	A-WIND

EXHIBIT C.3 UTSW BIM Standards

I. General

A. Refer to the project's Owners Design Guidelines for other requirements related to the development, maintenance and exchange of design information, the formatting of design documents, and the completion and submittal of Record Documents.

B. Refer to Owner's Master Construction Specifications for other requirements related to the development, maintenance, and exchange of construction project information, and the completion and submittal of Record Documents.

C. Symbols used in BIM programs by the A/E shall match the symbols on UTSW provided MEP1 sheet.

II. Summary

A. This document establishes general and administrative requirements pertaining to Building Information Modeling (BIM) to meet UTSW's expectations for projects of various sizes and delivered under various contracting methodologies.

B. BIM practices require cooperation and involvement of all parties throughout the project delivery process, regardless of the delivery method being used for a given project.

C. BIM practices encompass and coordinate traditionally separate functions of design and construction in order to assemble all related building information into one Project Information Matrix that will provide the information needed to efficiently operate and maintain the facility once Substantial Completion has been achieved and the Project has been turned over to the Owner.

D. It is of primary concern that all building modeling and facility information developed during the design and construction of the Project be timely and efficiently developed, maintained, and exchanged from initiation of the Project through Final Completion in accord with all Contract Documents and with Owner's operational and maintenance needs.

E. Throughout the Project lifecycle, the A/E and the Contractor are expected to systematically demonstrate to the Owner that all building and system information is current to the extent that it can be at a given time during the design and construction process.

F. It shall be the responsibility of the A/E and each of its consultants, as well as the Contractor and each of its Subcontractors, to have or obtain, at their cost, the trained personnel, hardware, and software necessary to successfully fulfill their respective obligations as set forth in the mutually developed BIM Execution Plan.

III. Definitions

A. BIM Execution Plan (BEP) – A document developed by the BIM Team that prescribes how Building Information Modeling will be implemented for the Project and how requisite information will be transferred into the Project Information Matrix prior to Substantial Completion of the Project.

EXHIBIT C.3 (continued)

B. BIM Level – The extent to which model and information development will be required on a specific project. The BIM Level initially will be determined by the Owner but may be adjusted, with Owner's express approval, by the BIM Team over the course of the Project. The BIM Level will depend upon several factors, including the scope of project, project schedule; project cost; availability of existing BIM models; and availability of existing BIM data, etc.

C. Building Automation System (BAS) – The distributed control system that is used to monitor and control infrastructure systems within its facilities.

D. Building Information Modeling (BIM) – The process of generating and managing building data using three-dimensional (3-D), real-time, dynamic building modeling software resulting in a Building Model.

E. Building Information Modeling Team (BIM Team): Working group made up of representative(s) from the A/E, A/E's consultants, Contractor, Subcontractors and Owner.

F. A/E will provide ad hoc representation of the A/E's consultants on the BIM Team as required for the implementation of the BIM Execution Plan. Contractor will provide ad hoc representation of Subcontractors on the BIM Team as required for implementation of the BIM Execution Plan.

G. Building Model – A 3-D digital representation of physical and functional characteristics of a facility, or the components or systems thereof that encompass building geometry, spatial relationships and quantities and properties of building components and systems.

H. Computerized Maintenance Management System (CMMS) – The computer software package that is used to manage a digital database of information related to its facilities equipment and systems for the purpose of optimizing its maintenance operations.

I. CMMS Integration Process (CIP) – The prescribed process by which the information generated during Building Information Modeling will be fully integrated into Owner's CMMS. The CIP is to be developed by the BIM Team and is to be included in the BIM Execution Plan.

J. Construction Documents – In addition to the items set forth in the UT UGCs, the Construction Documents shall include the Building Model and the Project Information Matrix.

K. Construction Model – A 3-D digital representation of physical and functional characteristics of a facility, or the components or systems thereof, that encompasses building geometry, spatial relationships and quantities and properties of building components and systems and that is developed by the Contractor or one of its Subcontractors before or during the Construction Phase of the Project.

L. Design Model – A 3-D digital representation of physical and functional characteristics of a facility, or the components or systems thereof, that encompasses building geometry, spatial relationships and quantities and properties of building components, and systems and that is developed during the preconstruction (Design) phase of the Project.

M. Facilities Information Management (FIM) – The process of gathering, maintaining, and distributing data associated with Owner's facilities for the purposes of operating and maintaining those facilities.

EXHIBIT C.3 (continued)

N. Level of Development (LOD) – The degree to which information included within the Building Model can be relied upon.

O. Project Information Matrix (PIM) – The electronic file for a spreadsheet or database that identifies the information required from the Building Model, Drawings, and any other data source(s) developed for the Project and the parameters and properties of the content. During the design phase, the A/E will populate the PIM as information becomes available. Throughout the construction phase, the Contractor will update the PIM and will issue scheduled renditions during construction in addition to the final PIM to UTSW at Substantial Completion of the Project.

P. Record Documents – The electronic files, hard copy drawings, hard copy submittals, RFI's, ASI's and all other forms of documentation that are required to represent the final AS BUILT condition of the project. Reference the Owner's Design Guidelines for details and requirements for this record documentation including CAD Standards.

Q. System – A group or collection of items or equipment that work together or in tandem to function as a whole. Examples of systems include but are not limited to: HVAC systems, Bulk Gas Systems (any gases or vacuum not supplied by a point-of-service device), Plumbing, Fire Rated Assemblies such as doors/frames, Glazing, etc. or any items that are commonly known as systems by the Design and Construction Industries. If uncertainty exists, Consultants and the contractor are to coordinate with the owner for clarification.

R. Test, Adjust, and Balance (TAB) Firm: The Owner may engage a Test, Adjust, and Balance Firm for the Project under a Separate Contract. When engaged for the Project, the TAB Firm shall be a part of the BIM Team and shall provide services as set forth in the Specifications and its Separate Contract.

IV. Coordination

A. BIM Team
   1. Representatives assigned by Owner's Designated Representative,
   2. A/E, including A/E and sub-consultant BIM manager(s), except for projects implemented with design-build methodology,
   3. TAB Firm, when engaged for the Project.

B. Contractor's Members
   1. Individuals, each having authority to act on behalf of the entity they represent, explicitly organized to implement all BIM and FIM activities through coordinated actions.
   2. Representatives of Contractor, including but not limited to
      a. Contractor's project manager
      b. Contractors BIM Coordinator
      c. A/E, including A/E sub-consultant BIM manager(s), (for projects implemented with design-build methodology)

EXHIBIT C.3 (continued)

d. Subcontractors, as needed for Contractor to fulfill its BIM obligations, and
e. Equipment suppliers, as needed for Contractor to fulfill its BIM obligations.

C. Scheduling
1. Design (Preconstruction) Phase
a. For projects implemented using the competitive sealed proposal, construction manager-at-risk, or job order contracting methodology, the A/E shall integrate all BIM activities into its Project Work Plan and the design schedule.
b. For projects implemented using the construction manager-at-risk or design-build methodology, the Contractor shall integrate all BIM activities into the Baseline Schedule, the Work Progress Schedule, and shall ensure that BIM requirements are clearly set forth in all solicitation documents used to select subcontractors or suppliers for the Project. All parties will address scheduling problems and make necessary notifications in a timely manner to expedite all BIM activities.
2. Construction Phase
a. Contractor shall integrate all BIM activities into the Baseline Schedule and the work Progress Schedule. All parties will address scheduling problems and make necessary notifications in a timely manner to expedite all BIM activities.
b. Contractor shall provide the initial schedule of primary BIM activities at the project kick-off meeting. Prior to the start of Schematic Design, Contractor shall have incorporated and integrated all BIM activities into
c. the Baseline Schedule and Work Progress Schedule with appropriately linked predecessors and successors.
3. Roles and Responsibilities
a. Roles and responsibilities of BIM Team members are set forth below to help to clarify Owner's expectations with respect to the BIM and FIM processes.
b. Owner's Role and Responsibilities:
i. Provide specifications related to the format and content for the Project Information Matrix.
ii. Provide initial direction as to the extent the BIM is to be used on the Project. BIM Level to be used on the Project.
iii. Approve the BIM Execution Plan and A/E's and Contractor's schedules for completing all BIM activities.
iv. Participate in BIM Team meetings.
v. Review and validate adequacy of Building Model development and project data collection.
4. A/E's Role and Responsibilities:
a. Attend BIM Team meetings.
b. Incorporate all BIM activities into the design Work Plan and the design phase schedule.

EXHIBIT C.3 (continued)

c. Produce for Owner's approval, the initial BIM Execution Plan, the initial Project Information Matrix of all devices, systems and equipment supplied.
d. Review and approve Contractor's edits to the BIM Execution Plan, and the Project Information Matrix.

5. Contractor's Role and Responsibilities:
   a. Receive from A/E and assume lead responsibility for the BIM Execution Plan, the Building Model and the Project Information Matrix.
   b. Administer updates to the BIM Execution Plan, the Building Model and the Project Information Matrix with the intent that all BIM-FIM Team members will have up-to-date information as the Project progresses.
   c. Provide an individual, subject to Owner's approval, experienced in Building Information Modeling to document changes to Building Model and complete the implementation of the BIM Execution Plan. The Contractor shall assign this individual to act as the BIM Coordinator, who may have additional duties such as MEP Coordinator, but shall not be Contractor's project manager or superintendent. The contractor shall submit qualifications demonstrating the BIM Coordinator's technical expertise and experience to the Owner for approval. In the event that Contractor chooses to subcontract its BIM obligations, Contractor must submit the
   d. name and qualifications of the proposed subcontractor for Owner's approval.
   e. Ensure that Building Modeling activities are incorporated into the Baseline Schedule and the Work Progress Schedule.
   f. Schedule and conduct periodic meetings with Subcontractors and equipment suppliers related to BIM to ensure the Building Model and the Project Information Matrix are being routinely and accurately updated.

V. EXECUTION

A. BIM Execution Plan
   1. Throughout its development, efforts shall be made to align the responsibilities set forth in the BIM Execution Plan with the skills customarily contributed by each party associated with the Project.
   2. The BIM Execution Plan shall be considered a "living document" that is updated and refined throughout the life of the Project. It shall be available for review and verification by Owner at any time.
   3. To the extent practical, the BIM Execution Plan shall minimize redundant efforts in favor of a single, organized approach to all activities required to successfully complete the BIM- FIM process.

EXHIBIT C.3 (continued)

4. The BIM Execution Plan shall include all pertinent Project Information, as a baseline for required information. It shall also identify and specify.
    a. The extent to which Building Model(s) are to be used on the Project.
    b. The expected timeline for when information will become available.
    c. The information workflow process, include the requirements for transferring information, the Depth of Detail, and the party responsible for authoring and supplying the information at the appropriate time.
    d. The software version to be used.
    e. The file structure for the Building Model.
    f. The model types, names, content, and relationships.
    g. The Level of Development for each element to be included within the Building Model at each stage of the Building Model development.
    h. The Depth of Detail for each element to be included within the Building Model.
    i. The drawings to be generated from the Building Model(s) and the process(es) to be used for generating two-dimensional drawings from
    j. the Building Model(s) which meet Owner's CAD standards.
    k. The CMMS Integration Process to be used on the Project, including the requisite process for receiving Owner's CMMS Asset Numbers and for incorporating those numbers into the design documents and the PIM.
    l. The data transfer protocol.
    m. Conventions to be used for naming files.
    n. Measures to be taken to ensure that there is no significant loss of drawing entities or data during drawing generation and data extraction.
    o. Identifying areas in for laser scanning, if applicable.
5. Development of the BIM Execution Plan shall be included as an agenda item for all Project Team meetings throughout the Preconstruction (Design) Phase of the Project. The discussion items shall include, as a minimum:
    a. The status of the development of the BIM Execution Plan.
    b. The identification of any issues related to the timing for exchanging information between the various Building Models and the timing and the means, and methods for entering information into the Project Information Matrix.
    c. The Level of Development of each of the Building Models,
    d. The Depth of Detail for information within the Building Models and to be entered into the Project Information Matrix.

B. Extracted Database
1. Unless Owner specifically agrees otherwise, all data input into the model(s) or CAD drawings shall be extracted from its various sources and delivered in a single Microsoft Access database. This Extracted Database shall include:

EXHIBIT C.3 (continued)

a. Equipment data gathered during the course of design and construction that is related to equipment listed in the PIM, but for which a data field does not exist within the PIM. This data may or may not physically reside with a table or schedule located within the drawings or specifications.
b. Fixed equipment data gathered during the course of design and construction that is not associated with equipment listed in the PIM (e.g., manufacturer's maintenance information related to sinks, faucets, emergency showers, light fixtures, life safety items, etc.). This data may or may not physically reside with a table or schedule located within the drawings or specifications.
c. Data related to all fixed architectural and finish features (e.g., manufacturers maintenance information related to doors, hardware, finishes, glazing, etc.). This data may or may not physically reside with a table or schedule located within the drawings or specifications.
d. All information that is contained within a schedule or table located within the drawings.
e. All information contained within a schedule or table within the specifications.

C. Document Index
1. An index shall be included with each document delivery. The document index shall be in the form of a Microsoft Excel spreadsheet and shall identify every file included in the delivery. Identification information shall include:
a. Owner's project number.
b. Owner's project name.
c. File name.
d. File description.
e. Identity of the file authoring entity (i.e., who generated the file A/E, consultant, Contractor, Subcontractor).
f. Cross references to any required support files.

D. Laser Scans
1. Unless Owner specifically directs or agrees otherwise, Contractor shall provide laser scans for the following types of spaces:
a. Operating rooms.
b. Intensive care units.
c. Imaging suites.
d. Mechanical equipment rooms.
e. Plenum spaces through which significant mechanical, electrical, plumbing and information technology distribution systems are routed.
2. When conducted, laser scans shall be completed for walls and plenums before final cover-up begins.

EXHIBIT C.3 (continued)

3. Laser scan deliverables shall be in the form of three-dimensional models or two-dimensional drawings as set forth below in the BIM-FIM Deliverables section of this document and the final point cloud file generated by the laser scan used to create the models or drawings.

E. Record Documents
   1. Unless Owner specifically directs or agrees otherwise, A/E and Contractor shall provide all Project Record Documentation as defined in the Definitions section of this document. When any questions arise as to whether documentation, electronic or hard copy, should be considered.

F. BIM-FIM Deliverables
   1. The BIM-FIM deliverables shall be set forth in the BIM Execution Plan and are based upon this Project requirements.
   2. All files delivered in portable document file (pdf) format shall be searchable (i.e., “smart” or “vector” pdf’s).
   3. Unless Owner expressly agrees otherwise the deliverables for each Project type shall be as follows:
      a. Project Deliverables
         i. BIM Execution Plan
         ii. Project Information Matrix
         iii. Design Model(s) – in the most current release of Autodesk REVIT or other software as indicated by the UTSW PM.
   4. In order to achieve maximum usage of the deliverables for Post Construction Facilities Management purposes the following modelling guidelines shall be adhered to unless Owner’s BIM representative agrees otherwise:
      a. Architects, Engineers, and sub consultants (A/E) shall utilize REVIT to generate all design models.
      b. A/E shall maximize the use of REVIT “Spaces” and “Zones” within the models. Each item that is placed within the model will be linked to a Space and/or Zone.
      c. ALL Mechanical, Electrical, Plumbing, Security, Communications and all other items or equipment that is part of a System will be linked to both the “Space” it is located within and the “Zone” (groups of Spaces and/or Zones) that are served by said items or equipment.
      d. Systems and their related Zones and Spaces shall be scheduled within their respective models.
      e. All physical items that are documented in a table, schedule, list, external spreadsheet/database, submittal, RFI, ASI, etc. that pertain to final completion of the project will be required to be represented within the model as a 3-D object with inherent parameters or as part of a property set, etc.
   5. Construction Model(s) – in the most current release of Autodesk REVIT.

EXHIBIT C.3 (continued)

6. In order to achieve maximum usage of the deliverables for Post Construction Facilities Management purposes the following modelling guidelines shall be adhered to unless owners BIM representative agrees otherwise.
    a. Contractor and subcontractors shall utilize REVIT to generate all final as-build construction models.
    b. Contractor shall maximize the use of REVIT “Spaces” and “Zones” within the models. Each item that is placed within the model will be linked to a “Space” and/or “Zone.”
    c. ALL Mechanical, Electrical, Plumbing, Security, Communication and all other items or equipment that are part of a System will be linked to both the “Space” it is located within AND the “Zone” (groups of Spaces and/or Zones) that are served by said items or equipment. Systems and their related Zones and Spaces shall be scheduled within their respective models.
    d. All physical items that are documented in a table, schedule, list, external spreadsheet/database, submittal, RFI, ASI, etc. that pertain to final completion of the project will be required to be represented within the model as a 3-D object with inherent parameters or as part of a property set, etc.

All hard copy documents, i.e. submittals, RFI’s, ASI’s, etc. shall be scanned into a searchable PDF format and hyperlinked from the model to their proper folder location within Project Workspace.

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EXHIBIT C.4 Storm Water Pollution Prevention Plan (SWPPP) Deliverables

I. General Requirements

A. The A/E Civil Engineer (CE) is required to visit the site, in person, to evaluate the existing conditions before preparation of the SWPPP. The CE shall notify the UTSW PM at least ten (10) business days in advance of the site visit. The Owner may choose to participate in the site review. After visiting the site, the CE shall prepare the SWPPP book to include the sections listed below.

B. The SWPPP is more than just a SWPPP drawing. A SWPPP book containing all the relevant SWPPP information for that project is to be maintained at the project site.

C. This A/E guideline must be used in conjunction with UTSW Specification Section 01 57 23, Temporary Storm Water Pollution Control.

II. SWPPP Book Format

A. As a minimum, one digital submission and two hard copies of the SWPPP book (one for UTSW headquarters, and one for jobsite) shall be prepared in the following format: 8-1/2 by 11-inch size paper bound in a 3-ring binder, 1-1/2-inch minimum, with table of contents, tabbed sections as described below, and with plan drawings (size and scale may vary depending on nature of project) folded and inserted.

B. The binder is to include a cover page and spine insert on the outside of the binder indicating the title Storm Water Pollution Prevention Plan, the institution name, the UTSW project name and number, the consultant's name, and date prepared (month and year).

III. Title Page, Engineer's Seal, Signature and Date

A. First page of SWPPP book shall identify the title Storm Water Pollution Prevention Plan, the institution name, the UTSW project name and number, the consultant's name, and date (month and year) of preparation of SWPPP. Following identification of the project shall be the project engineer's seal, signature, and date.

IV. Table Of Contents

A. Include a table of contents in the SWPPP listing all ten (10) of the following Sections.

V. Section 1 - Notices of Intent (NOIs) And Permits or Construction Site Notices (CSNs) For Owner and Contractor and Notice of Termination (NOTs)

A. Draft versions of the SWPPP book shall include the incomplete unsigned NOI, CSN or NOT forms following the Table of Contents. After filing NOIs for Owner and Contractor, Owner shall distribute both completed and signed NOIs or CSNs for each copy of the SWPPP book, along with both copies of TCEQ TPEDES Construction Discharge Permits.

VI. Section 2 –Posting Notice/Contacts and Delegation Letters

A. For large construction sites of five (5) acres or larger include two (2) incomplete copies of the UTSW Posting Notice/Primary Points of Contacts form. Both forms will be completed later and posted at the entrance of the facility.

EXHIBIT C.4 (continued)

B. A copy of the Owner's and Contractor's delegation of authority letters are to be kept in this section.
   1. Shared SWPPP Acceptance Certification

VII. Section 3 – Site Description

A. This section of the SWPPP shall include a written description of the following items or map when appropriate:
   1. A description of the project site, followed by an 8-1/2 by 11-inch vicinity map. The vicinity map shall be of sufficient scale to show the project site location and the major streets and highways in and around the project location.
   2. A description of the nature of the project including impacts to other elements and any environmental impacts.
   3. Latitude and longitude of the site.
   4. A description of the intended sequence of major activities that disturb soils for major portions of the site (e.g., on-site mobilization, demolition, clearing, grubbing, excavation, grading, utilities, and infrastructure installation.). Include timing of activities when it becomes available.
   5. Estimates of the total number of acres of the campus and the total area of the site that is expected to be disturbed by excavation, grading, or other activities including off-site borrow and fill areas.
   6. An estimate of the runoff coefficient of the site for both the pre-construction and post-construction conditions and data describing the soil or the quality of any discharge from the site.
   7. The name of receiving waters and extent of wetlands.
   8. Identify any industrial activities such as concrete or asphalt batch plants associated with the construction of the project. If none, state so.
   9. A general location map or vicinity map (e.g. a portion of a city or county map), which locates the site within the overall drainage pattern of the city and/or county and shows the receiving waters and surface waters. The preference for the general location map is a color US Geological Survey Quadrangle map or equal. An 8 -1/2 by 11-inch general location map should be kept in this section or a larger quad map in the back of the 3-ring binder with other SWPPP drawings in the section titled exhibits.

VIII. Section 4 – General Permit Requirements

A. Copy of the permit requirements. Include copy of TCEQ TPDES General Permit TXR150000, March 5, 2013, containing the general permit requirements.

EXHIBIT C.4 (continued)

IX. Section 5 – Erosion and Sedimentation Controls

A. Each SWPPP shall include a written description of appropriate control measures (i.e., Best Management Practices – BMPs) that will be implemented as part of the construction activity to control pollutants in storm water discharges. The written description must clearly describe for each major activity, appropriate control measures and the general timing (or sequence) during the construction process that the measures will be implemented.

B. Include an Erosion and Sediment Control Drawing and any control detail drawings illustrating the BMPs as exhibits in Section 10. Ensure the proposed locations of stabilized construction entrances and exits are shown on the Erosion and Sediment Control Drawing (see Section 10 of the A/E Guideline for additional contents of the drawing).

C. Include a statement identifying which permittee is responsible for implementation.

D. Include statements for Erosion and Sediment Controls – Short- and Long-Term Goals and Criteria that include the following:

1. The construction-phase erosion and sediment controls should be designed to retain sediment on site to the extent practicable.
2. All control measures must be properly selected, installed and maintained in accordance with the manufacturer's specifications and good engineering practices. If periodic inspections or other information indicates a control has been used inappropriately, or incorrectly, the permittee must replace or modify the control for site situations.
3. If sediment escapes the construction site, off-site accumulations of sediment must be removed at a frequency sufficient to minimize offsite impacts. (i.e. sediment accumulation in streets and curbs).
4. Sediment must be removed from sediment traps or sedimentation ponds when the design capacity has been reduced by 50 percent.
5. Litter, construction debris, and construction chemicals exposed to storm water shall be prevented from becoming a pollutant source for storm water discharges (i.e. screening outfalls, picked up daily) Stabilization Practices – include a description of interim and permanent stabilization practices for the project site, including a schedule of when the practices will be implemented. Site plans should ensure that existing vegetation is preserved where attainable and that disturbed portions of the site are stabilized. Use of impervious surfaces for stabilization should be avoided. Stabilization practices may include, but are not limited to:
    a. Establishment of temporary vegetation
    b. Establishment of permanent vegetation
    c. Mulching
    d. Geotextiles
    e. Sod stabilization
    f. Vegetative buffer strips

EXHIBIT C.4 (continued)

g. Protection of trees
h. Preservation of mature vegetation

1. Structural Practices – include a description of structural practices to divert flows from exposed soils, store flows, or otherwise limit runoff and the discharge of pollutants from exposed areas of the site to the degree attainable. Structural practices may include, but are not limited to:
   a. Silt fences
   b. Earth dikes
   c. Drainage swales
   d. Sediment traps
   e. Check dams.
   f. Subsurface drains
   g. Pipe slope drains
   h. Level spreaders
   i. Storm drain inlet protection
   j. Rock outlet protection
   k. Reinforced soil retaining systems.
   l. Gabions
   m. Temporary and permanent sediment basins (detention ponds)
   n. Stabilized construction exit
   o. Rock berms

II. Section 6 – Maintenance

A. As a minimum, include a statement indicating that if site inspections identify BMPs that are not operating effectively, maintenance shall be performed before the next anticipated storm event or as necessary to maintain the continued effectiveness of storm water controls.

III. Section 7 – Spill Prevention

A. List and describe the material management practices that will be used to reduce the risk of spills or other accidental exposure of materials and substances to storm water runoff. The general construction site superintendent is responsible for cleaning up and disposition of spills.
B. Include a statement that spills and releases of hazardous material shall be reported to the UT Southwestern OSBC, as soon as there is knowledge of the spill. The OSBC Environmental Compliance Manager will determine if the spill is a reportable quantity and determine who must be notified. Include a statement that the contractor shall contain the spill until such time the OSBC can give direction or clean up.
C. Include a statement that the SWPPP must be modified within 14 days of the spill to show any BMP modifications for spill prevention.

EXHIBIT C.4 (continued)

D. Section 8 – Inspections
   a. Note to CE: Construction site "owned" by GC and responsibility of UTSW PM to make sure GC is being monitored to appropriately manage SWPPP process and any permits. This includes dumpsters.

E. Include in the SWPPP a written description of all steps to be taken, by a qualified person, to perform inspections of site controls. Steps include but are not necessarily limited to items b. through h. below.

F. Include statements that the owner and contractor's construction inspector shall be responsible for a routine inspection of on-site controls, once every seven (7) days, on Tuesday. One standard UTSW form shall be used for routine inspections. An after-rain event inspection will not be required if the 7-day inspection is followed.

G. Include instructions to perform site inspections, at specified intervals and using UTSW inspection forms. Verify that all implemented site controls are functioning properly to prevent erosion and sedimentation. Note any and all deficiencies in site controls on inspection form. Inspection report forms are to be signed in accordance with the General Permit by a person qualified to make such inspections and by the individual designated as having certification authority.

H. Include instructions to provide a copy of inspection report to party responsible for maintenance and repair of site controls. Keep copies of all inspection reports filed with SWPPP on site for review by EPA, TCEQ, MS4 operator officials, or Owner's representatives.

I. Include instructions requiring when controls are found to be ineffective, or require modification to adequately prevent erosion and sedimentation, revise on-site copy of SWPPP to reflect changes made. Describe and illustrate the change and note date of change.

J. Direct Contractor to perform regular inspections at beginning of workweek (Tuesday) to allow sufficient time for maintenance and repair of site controls during same workweek.

K. Include instructions that all inspection reports, along with noted revisions to the SWPPP, shall be retained for a period of at least three years from the date the site is finally stabilized. Include copy of UTSW SWPPP Inspection Report Form. These forms are to be duplicated and used for inspection purposes.

IV. Section 9 – Non-Storm Water Discharges

A. Include an inventory of the non-storm water substances expected to be present onsite during construction. Examples are:
   1. Discharges from firefighting.
   2. Fire hydrant flushing.
   3. Vehicle, building, and pavement wash water.
   4. Water used for dust control.

B. If no non-storm water substances are expected, then include a statement indicating there are none.

EXHIBIT C.4 (continued)

V. Section 10 – Exhibits

A. Erosion and Sediment Control Drawing (SWPPP drawing) – plan drawing(s) and detailed drawing of controls, with plan sheet showing proposed improvements (building, paving, etc.) and indicating the following:

1. Existing drainage patterns indicated with post construction arrows to show direction of flow on site with destinations of flow described (both on-site and off-site destinations).
2. Approximate slopes anticipated after major grading activities (steeper slopes shall require additional control measures until final stabilization).
3. Areas of soil disturbance (limit disturbance as much as possible and protect as much of existing vegetation in place as possible).
4. Areas which will not be disturbed (indicate intent to protect or preserve existing vegetation).
5. Show limits of construction.
6. Locations of major structural and non-structural controls identified in SWPPP (silt fences, berms, swales, dikes, inlet protection, etc).
7. Locations where stabilization practices are expected to occur (exposed embankments during excavations, etc.).
8. Locations of off-site material, waste, borrow or equipment storage areas (concrete wash pits, lay-down areas, soil stockpile areas, etc.).
9. Surface waters (including wetlands or low areas, drainage channels, creeks, lakes, etc.).
10. Locations where storm water discharges to surface water.
11. Location and description of any discharge associated with industrial activity other than construction, including storm water discharges from dedicated asphalt plants and dedicated concrete plants, which is covered by this permit.
12. Offsite material storage areas (also including overburden and stockpiles of dirt, borrow areas, etc.) used solely by the permitted project are considered a part of the project and shall be addressed in the SWPPP.

B. General Location Map (Quadrangle Map or equal).

EXHIBIT C.5 Survey Requirements

I. Survey Requirements:

A. The survey shall include information for, but not limited to, topography, existing construction (buildings, roads, sidewalks, etc.), existing utilities on site including closest point of connection if not on site, significant vegetation, easements, etc.

B. The survey shall be drawn using AutoCAD.

1. The survey shall be modeled at 1:1 scale. All dimensions and elevations shall be in Imperial units. The plotted scale shall be 1.0 inch = 20.00 feet and the title block shall include the project name and project number.
2. Include a legend of symbols and abbreviations used on the drawing, a north arrow, and a graphic scale.
3. Provide contours at 1-foot intervals unless directed otherwise by the System Civil Engineer with an error not to exceed 1/2 contour interval.
4. Provide at least two horizontal and one vertical control points with description and elevation to nearest .01 foot. Datum shall be NAD 83 for horizontal and NGVD 88 for vertical.
5. Provide spot elevations at street intersections and curb, crown of roads, sidewalks, edge of paving including far side of paving, drainage flow line, manhole rims/covers, top and bottom of retaining walls, etc. Spot elevation on paving or other hard surface shall be to the nearest .05 foot and spot elevations on other surfaces to the nearest .1 foot.
6. Include the location of above and below ground structures, man-made and natural features, all floor elevations, and finish floor elevations at each entrance of buildings on the property, if applicable.
7. Include the location, size and depth of water bodies and reservoirs, gas and thermal utilities. For depths of utilities on UTSW campus, coordinate with the Facilities Management Department. For depths of utilities in City of Dallas right of ways, coordinate with City of Dallas.
8. Include the location of fire hydrants available to the property and the size of the main serving each.
9. Include the location and characteristics of power and communications systems above and below grade.
10. Include the locations, size, depth, and direction of flow of sanitary sewers, combination sewers, storm drains and culverts serving or on the property; location of catch basins, manholes, and inverts of pipe at each.
11. Provide the name of operating authority of each utility. Utility information can be provided by the Facilities Management Department. Additional information may also be provided by Facilities Planning Division, Real Estate Services and Academic Planning.
12. Provide the mean elevation of water in any excavation, well, or nearby body of water.

EXHIBIT C.5 (continued)

13. Provide the location of 1 percent annualized potential and 0.2 percent annualized potential (100yr & 500-yr) floodplains.
    a. Provide the extent of watershed onto the property.
14. Provide the location of trees along with the species name in English, the caliper in inches and the canopy width. Provide the perimeter outline only of any thickly wooded areas unless otherwise directed.
15. Show boundary lines, giving length and bearing (including reference or basis) on each straight line; interior angles; radius, point of tangency and length of curved lines.

C. Locate existing benchmarks. Where no monument exists, set permanent iron pin (monument) or other suitable permanent monument at property corners; drive pin into ground to prevent movement, mark with wooden stake; state on the drawing(s) whether corners were found or set and describe each.

D. Survey shall be reviewed by UTSW PM and Facilities Management Department before being finalized.

E. The final drawing shall be sealed by a Texas RPLS.

F. Upon completion of the survey, provide two copies of the plotted survey and one electronic set containing the native CAD file, an IFC copy of the file, as well as an ASCII file of the point elevations.

EXHIBIT C.6 Geotechnical Investigations

I. Geotechnical Investigations

A. Where geotechnical investigations are required, reports shall be as follows:

1. All parts of the report are to be made on white or off-white paper measuring 8-1/2 by 11-inches, suitable for photocopying and bound in booklet form. If larger drawings are necessary, they shall be folded to 8-1/2 by 11-inches to fit into the report booklet.
2. Written reports and analysis shall be on geotechnical firm's letterhead.
3. Include with the report a chart illustrating the soils classification criteria and the terminology and symbols used on the boring logs.
4. Identify the ASTM or other recognized standard sampling and test methods utilized.
5. Provide a plot plan with horizontal location and ground elevation of test borings using same datum as survey.
6. Provide vertical sections for each boring plotted and graphically presented showing the number of borings, sampling method used and date of start and finish.
7. Soil classified in the field logs in accordance with current applicable ASTM and other standards.
8. Surface elevation at all bores.
9. Description of soil and thickness of each layer Hydraulic pressure required or number of blows per foot (N value) and where applicable.
10. Depth to loss or gain of drilling fluid.
11. Depth to wet cave-in.
12. Depth to artesian head.
13. Ground water elevation and time when water reading was made (repeat observation after 24 hours).
14. Presence of gases.
15. Location of strata containing organic materials, wet materials or other inconsistencies that might affect engineering conclusions.
16. Description of the existing surface conditions and summarize the subsurface conditions.
17. As a minimum, the following tests are to be performed: Moisture Contents, Atterberg Limits, percent Passing #200 Sieve, Hydrometer, Pocket Penetrometer, Unconfined Compression, and Unit Dry Weight.

B. Two final reports sealed by a Texas Registered Professional Land Surveyor with the project name and project number on the cover page and one electronic submission with the report in PDF format. The PDF shall contain a Table of Contents bookmarked and linked to the corresponding pages with optical character recognition (OCR) .

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EXHIBIT C.7 Basic Systems Data

(EXAMPLE) For CIP projects. To be revised throughout the design process. Submit at final DD.

Project: _____ Date: _____

Location: _____ UTSW Project No.: _____

Areas:

Gross: _____

Assignable: _____

U-Values & SC Values:

WALLS

	Type 1	Type 2	Type 3	Type 4	Type 5
U-Value					
Location					

GLASS

	Type 1	Type 2	Type 3	Type 4	Type 5
U-Value					
SC Value					
Location					

ROOF

	Type 1	Type 2	Type 3	Type 4	Type 5
U-Value					
Location					

FLOOR

	Type 1	Type 2	Type 3	Type 4	Type 5
U-Value					
Location					

SLAB EDGE

	Type 1	Type 2	Type 3	Type 4	Type 5
U-Value					
Location					

EXHIBIT C.7
Basic Systems Data
(Continued)

COOLING SYSTEM

Tons: _____ GPM: _____

Type: _____

Prime Energy Source: _____

If served by central plant, has plant capacity for this project been verified? Yes: ___ No: ___

Confirmed by: _____

HEATING SYSTEM

1000 BTU: _____ Lb/Hr Steam: _____ or GPM HW: _____ Type:

_____

Prime Energy Source: _____

If served by central plant, has plant capacity for this project been verified? Yes: ___ No: ___

Confirmed by: _____

AIR SYSTEM

Type: _____

No. of prime units: _____ Total CFM: _____

VENTILATION RATES

CFM/person: _____ or CFM/sq. ft. _____
or Air Chg./Hr.: _____
Min. O. A. _____ Max. O. A. _____
Vent Cycle? _____

PLUMBING

San. load:	_____FU	_____GPM
Cold Water:	_____FU	_____GPM
Hot Water:	_____FU	_____GPM
Storm Water:	_____FU	_____GPM

ELECTRICAL LOADS

Lighting:	_____ watts/sq. ft.	_____kw total
General Power:	_____ watts/sq. ft.	_____kw total
Special Power:	_____ watts/sq. ft.	_____kw total

EXHIBIT C.8 Cost Quantity Survey

(Example Format) For CIP Projects. Provide at the end of each design phase including IFC.

UT Southwestern Medical Center
Project Name:
UTSW Project Number / Work Order Number:
Title: (Design Development or Construction Document Estimate)
Summary: Base Bid (Repeat for Each Alternate Bid)
Date of Estimate:

		$	$/GSF (XX,XXX GSF)
DIVISION 01	GENERAL REQUIREMENTS	XXX,XXX	X.XX
DIVISION 02	EXISTING CONDITIONS	XXX,XXX	X.XX
DIVISION 03	CONCRETE	XXX,XXX	X.XX
DIVISION 04	MASONRY	XXX,XXX	X.XX
DIVISION 05	METALS	XXX,XXX	X.XX
DIVISION 06	WOOD, PLASTIC, AND COMPOSITES	XXX,XXX	X.XX
DIVISION 07	THERMAL AND MOISTURE PROTECTION	XXX,XXX	X.XX
DIVISION 08	OPENINGS	XXX,XXX	X.XX
DIVISION 09	FINISHES	XXX,XXX	X.XX
DIVISION 10	SPECIALTIES	XXX,XXX	X.XX
DIVISION 11	EQUIPMENT	XXX,XXX	X.XX
DIVISION 12	FURNISHINGS	XXX,XXX	X.XX
DIVISION 13	SPECIAL CONSTRUCTION	XXX,XXX	X.XX
DIVISION 14	CONVEYING SYSTEMS	XXX,XXX	X.XX
DIVISION 21	FIRE SUPPRESSION	XXX,XXX	X.XX
DIVISION 22	PLUMBING	XXX,XXX	X.XX
DIVISION 23	HVAC	XXX,XXX	X.XX
DIVISION 25	INTEGRATED AUTOMATION	XXX,XXX	X.XX
DIVISION 26	ELECTRICAL	XXX,XXX	X.XX
DIVISION 27	COMMUNICATIONS	XXX,XXX	X.XX
DIVISION 28	ELECTRONIC SAFETY AND SECURITY	XXX,XXX	X.XX
DIVISION 31	EARTHWORK	XXX,XXX	X.XX
DIVISION 32	EXTERIOR IMPROVEMENTS	XXX,XXX	X.XX
DIVISION 33	UTILITIES	XXX,XXX	X.XX
	SUBTOTAL:		
	ADD FOR GENERAL CONDITIONS -_____% :	XXX,XXX	
	ADD FOR GENERAL CONTRACTOR'S FEE -_____% :	XXX,XXX	
	SUBTOTAL:	XXX,XXX	
	ADD FOR GENERAL CONTINGENCIES -_____% :	XXX,XXX	
	SUBTOTAL:	XXX,XXX	X.XX
	(Describe, if any) SPECIAL CASH ALLOWANCE(S):	XXX,XXX	
	CONSTRUCTION CONTINGENCY ALLOWANCE:	XXX,XXX	
	TOTAL OF ESTIMATE:	XXX,XXX	

EXHIBIT C.8 (Continued) Cost Quantity Survey
(Example Format)) For CIP Projects. Provide at the end of each design phase including IFC.

UT Southwestern Medical Center
Project Name:
UTSW Project Number / Work Order Number:
Title: (Design Development or Construction Document Estimate)
Summary: Base Bid (Repeat for Each Alternate Bid)
Date of Estimate:

REF.	DESCRIPTION	QUANTITY	UNIT	RATE	TOTAL
DIVISION 03 - CONCRETE					
03 30 00 - CAST-IN-PLACE CONCRETE					
200	Retaining wall 18-inches deep	X,XXX	SF	XX.XX	XX,XXX
300	Concrete topping slab	X,XXX	SF	XX.XX	XX,XXX
500	10- by 10-inch Housekeeping Pad	X,XXX	EA	XX.XX	XX,XXX
510	6-inch Housekeeping Pad	X,XXX	EA	XX.XX	XX,XXX
	REFERENCE 03 30 00 - SUBTOTAL: XX,XXX				
03 53 00 - CONCRETE TOPPING					
010	Broom Finish concrete topping on XX,XXX waterproof membrane	X,XXX	SF	XX.XX	
150	Concrete topping on waterproof XX,XXX membrane to east and west terraces	X,XXX	SF	XX.XX	
	REFERENCE 03 53 00 - SUBTOTAL: XX,XXX				
03 35 00 - CONCRETE FINISHING					
100	Broom finish to concrete topping and sidewalk	X,XXX	SF	XX.XX	XX,XXX
	REFERENCE 03 35 00 - SUBTOTAL: XX,XXX				
03 35 13 – HIGH-TOLERANCE CONCRETE FINISHES					
010	Trowel top of elevated slabs	X,XXX	SF	XX.XX	XX,XXX
011	Deburr and patch bottom of slabs	X,XXX	SF	XX.XX	XX,XXX
015	Trowel top of pier caps	X,XXX	SF	XX.XX	XX,XXX
020	Rub finish round columns	X,XXX	SF	XX.XX	XX,XXX
	REFERENCE 03 35 13 - SUBTOTAL: XX,XXX				

EXHIBIT C.9 Sign: Schedule Template

	ROOM SIGN SCHEDULE						
Sign Nmbr	**Room Number**	**Sign Content**	**SIGN TYPE**	**2nd Sign**	**BRAILLE**	**QTY.**	**COMMENTS**
1	NE2.704	AUTHORIZED PERSONNEL ONLY. ZONE III	343	363A	Y	1	
2	NE2.704A	MRI CONTROL	342		Y	1	
3	NE2.704B	SPIN LAB. ZONE IV	343	363A	Y	1	TWO ENTRANCES TO NE2.704B
4	NE2.704C	MRI. ZONE IV	343	363A	Y	1	1,2,3,4,5,6,7
5	NE2.704G	ELECTRICAL	341		Y	1	
6	NE2.705	MRI EQUIPMENT	342	362	Y	1	362 IS GAS CYLINDER
7	NE2.706A	*tbd*	343	363A	Y	1	DOORS FROM NE2.704
8							
9							
10							
11							
12							

	COMMENTS
A	General contractor to remove all existing signs.
B	General Contractor to patch and prep all signage locations for new signage.
C	All signs are provided and installed by UTSW Sign Shop
D	All signs to be manufactured in accordance with the UTSW Comprehensive Interior Signage Manual and Texas Accessibility Standards (TAS), 2012, Section 703. Proofs are to be supplied for all signs for approval by UTSW prior to manufacture
E	All signs to be installed in accordance with the UTSW Comprehensive Interior Signage Manual and TAS, 2012, Section 703.4. If not possible alert construction PM before installation for guidance

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EXHIBIT C.10 Responsibility Matrix

The following responsibility matrix indicates UTSW preferences for purchasing, acquiring, and installing the items included. Project A/E shall confirm with the UTSW PM and Users what variations are present per project.

All equipment required for a project shall have the required utilities and infrastructure included within the project design to be constructed by the GC.

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Items to be Identified and Quantified	Education, Research, Administrative (University)	Lease (University)	Ambulatory Clinic	Lease (Clinical)
Division 01				
Construction Dumpster	CFCI	CFCI	CFCI	CFCI
10 11 00 Visual Display Units				
Glass Markerboard (Wall Mounted)	OFOI	OFOI	OFOI	OFOI
Mobile Glass Markerboard	OFOI	OFOI	OFOI	OFOI
10 14 00 Signs and Graphic Elements				
Room Signs, Building Signs, etc. as approved by UTSW Sign Shop and OSBC.	CFCI	CFCI	CFCI	CFCI
OSBC & Lab Safety Signs as approved by UTSW Sign Shop and OSBC	CFCI	CFCI	CFCI	CFCI
10 21 23 Cubicle Curtains and Tracks				
Cubicle Tracks	CFCI	CFCI	CFCI	CFCI
Cubicle Curtains	CFCI	CFCI	CFCI	CFCI
10 28 00 Toilet Accessories				
Paper Towel Dispenser (Manual)	CFCI	* Per Contract	OFCI	* Per Contract
Paper Towel Dispenser (Auto)	CFCI		OFCI	
Soap Dispenser	CFCI		OFCI	
Toilet Paper Dispenser	CFCI		OFCI	
Toilet Seat Cover Dispenser (** As approved by BMO)	CFCI		OFCI	
Hand Sanitizer	CFCI		OFCI	
Built-in Trash Cans	CFCI		CFCI	
Built-in Trash Cans w/ Paper Towel	CFCI		CFCI	
Loose Trash Cans	CFCI		OFCI	
Sanitary Napkin Vending Unit	CFCI		CFCI	
Sanitary Napkin Disposal	CFCI		CFCI	
Specimen Pass Through	CFCI		CFCI	
Folding Shower Seat, Shower Curtain Rod, Shower Curtain	CFCI		CFCI	
Under Lavatory Guards	CFCI		CFCI	
Custodial Accessories: Utility Shelf, Mop/Broom Holder, etc.	CFCI		CFCI	
Baby Changing Stations	CFCI		CFCI	
Additional Built-in Items: including grab bars, coat hooks, framed mirror units, etc.	CFCI		CFCI	

Items to be Identified and Quantified	Education, Research, Administrative (University)	Lease (University)	Ambulatory Clinic	Lease (Clinical)
10 43 00 Emergency Aid Specialties				
Automated External Defibrillators (AED)	CFCI	CFCI	OFOI	OFOI
AED Recessed/Semi-Recessed Cabinet	CFCI	CFCI	CFCI	CFCI
Stop the Bleed Kits (STB)	CFCI	CFCI	OFOI	OFOI
STB Recessed/Semi-Recessed Cabinet	CFCI	CFCI	CFCI	CFCI
Stair Chairs	CFCI	CFCI	OFCI	OFCI
Patient Safes	NA	NA	OFCI	OFCI
10 44 13 Fire Extinguisher Cabinets				
Recessed Cabinet	CFCI	CFCI	CFCI	CFCI
Semi-Recessed Cabinet	CFCI	CFCI	CFCI	CFCI
10 44 16 Fire Extinguishers				
Type Per Project Requirements	CFCI	CFCI	CFCI	CFCI
10 50 00 Storage Specialties				
Lockers	Confirm per project, CFCI or OFOI			
Benches	Confirm per project, CFCI or OFOI			
10 56 00 Storage Shelving				
Storage Shelving (Wall Mounted)	CFCI	CFCI	CFCI	CFCI
10 81 01 Knox Boxes / Emergency Key Boxes				
Knox Boxes and Emergency Key Boxes	CFCI	CFCI	CFCI	CFCI
11 12 00 Parking Control Equipment				
Parking Control Equipment	CFCI	CFCI	CFCI	CFCI
11 13 00 Loading Dock Equipment				
Loading Dock Bumpers	CFCI	CFCI	CFCI	CFCI
Loading Dock Seals and Shelters	CFCI	CFCI	CFCI	CFCI
Stationary Loading Dock Equipment	CFCI	CFCI	CFCI	CFCI
11 30 00 Residential Appliances				
Breakroom appliances and equipment	OFOI	OFOI	OFOI	OFOI
11 52 13 Projection Screens				
Projection Screens	OFOI	OFOI	OFOI	OFOI
11 52 24 Flat Screen TV Mounts				
Flat Screen TV Mounts	OFOI	OFOI	OFOI	OFOI
11 53 13 Laboratory Fume Hoods				
Laboratory Fume Hoods and Associated Components	Confirm per project, CFCI or OFOI			

Items to be Identified and Quantified	Education, Research, Administrative (University)	Lease (University)	Ambulatory Clinic	Lease (Clinical)
11 53 19 Laboratory Specialty Equipment				
Sterilizer, Glass Washer, Dryer, Flammable Storage Cabinets	OFOI	OFOI	OFOI	OFOI
Tank Restraints	CFCI	CFCI	CFCI	CFCI
DI Water Unit, Water Purifier	OFOI	OFOI	OFOI	OFOI
Avidity Environmental System - Auto-water, environmental monitoring, lighting, room access controls.	CFCI	CFCI	-	-
Avidity Environmental System - In wall pathways and enclosures for low voltage controls	CFCI	CFCI	-	-
Allentown IVC Racks	OFOI	OFOI	-	-
Allentown VFV and Escutcheon	CFCI	CFCI	-	-
Animal Transfer Stations	OFOI	OFOI	-	-
Cage Processing Equipment (Rack wash, tunnel wash, bedding, and waste systems) *Confirm OFOI or OFCI	OFOI*	OFOI*	-	-
11 70 00 Healthcare Equipment				
Healthcare Equipment	-	-	OFOI	OFOI
12 00 00 Furnishings				
Furniture, Chairs, etc.	OFOI	OFOI	OFOI	OFOI
12 10 00 Art				
Artwork	OFOI	OFOI	OFOI	OFOI
12 35 53 Laboratory Casework				
Metal or P-lam Laboratory Casework	CFCI	CFCI	CFCI	CFCI
12 36 00 Countertops				
Metal, Solid Surface, Epoxy, or P-lam	CFCI	CFCI	CFCI	CFCI
Stainless Steel Countertop	CFCI	CFCI	CFCI	CFCI
12 46 00 Furnishing Accessories				
Interior Waste and Recycling Containers	OFOI	OFOI	OFOI	OFOI
12 59 00 Systems Furniture ***Power for direct connection by GC**				
Office Furniture, Cubicles, Tables, Chairs, etc.	OFOI	OFOI	OFOI	OFOI
13 21 01 Special Purpose Rooms				
Pre-Manufactured Controlled Environmental Rooms, Clean Rooms, etc.	CFCI	CFCI	CFCI	CFCI
13 49 00 Radiation Protection				
Requirements per UTSW Medical Physics team and OSBC.	CFCI	CFCI	CFCI	CFCI

Items to be Identified and Quantified	Education, Research, Administrative (University)	Lease (University)	Ambulatory Clinic	Lease (Clinical)
13 49 46 MRI Radio Frequency Enclosure				
Requirements per UTSW Medical Physics team and OSBC.	CFCI	CFCI	CFCI	CFCI
14 92 00 Pneumatic Tube System				
Pneumatic System and Components	-	CFCI	CFCI	CFCI
21 08 00 Commissioning of Fire Protection Systems				
Commissioning of Fire Protection Systems	OFOI	*Per Contract	OFOI	*Per Contract
22 08 00 Commissioning of Plumbing Systems				
Commissioning of Plumbing Systems	OFOI	*Per Contract	OFOI	*Per Contract
22 40 00 Plumbing Fixtures				
Eye Wash - Counter / Deck Mounted	CFCI	CFCI	CFCI	CFCI
Eye Wash, Drench Hose - Counter / Deck Mounted	CFCI	CFCI	CFCI	CFCI
Toilet, Sink, Faucet, EWC, Shower, etc.	CFCI	CFCI	CFCI	CFCI
23 05 93 Testing, Adjusting, and Balancing **23 05 94 System Testing, Adjusting, and Balancing**				
Test and Balance	OFOI	* Per Contract	OFOI	* Per Contract
23 08 00 Commissioning of HVAC Systems				
Commissioning of HVAC Systems	OFOI	*Per Contract	OFOI	*Per Contract
26 08 00 Commissioning of Electrical Systems				
Commissioning of Electrical Systems	OFOI	*Per Contract	OFOI	*Per Contract
Division 27 Communications				
Wall Mounted Displays	*Confirm with IR per project.			
Data Communications Network Cabling, Demolition, and Installation				
Data Demolition (project specific)	OFOI	*Per Contract	OFOI	*Per Contract
In-wall pathways and backbones for data communications cabling.	CFCI	CFCI	CFCI	CFCI
27 52 23 Nurse Call System (Clinical)	-	-	CFCI	CFCI
In-wall pathways and backbones for audio visual	CFCI	CFCI	CFCI	CFCI

Items to be Identified and Quantified	Education, Research, Administrative (University)	Lease (University)	Ambulatory Clinic	Lease (Clinical)
28 08 00 Commissioning of Fire Alarm Systems				
Commissioning of fire alarm systems.	OFOI	*Per Contract	OFOI	*Per Contract
Division 28 Electronic Safety and Security				
Card Reader Door Access Control Pathways, Cabling, Equipment, and Devices	CFCI	CFCI	CFCI	CFCI
28 15 23 - Internal Intercom Entry Systems (AIPhone)	CFCI	CFCI	CFCI	CFCI
28 15 23 - External Intercom Entry Systems (TalkaPhone) UTSW will program, install devices, and test.	CFCI	CFCI	CFCI	CFCI
28 23 00 - Video Surveillance System (Security)	CFCI	CFCI	CFCI	CFCI
Network Video Recording and Management System (NVRMS) - Security	OFOI	OFOI	OFOI	OFOI
Network Video Recording and Management System (NVRMS) - Clinical	OFOI	OFOI	OFOI	OFOI
28 23 33 – Clinical Video Observation System	CFCI	CFCI	CFCI	CFCI
32 30 00 Site Furnishings				
Exterior Waste and Recycling Containers	CFCI	CFCI	CFCI	CFCI
Exterior Benches and Tables	OFOI	OFOI	OFOI	OFOI
32 33 13 Site Bicycle Racks				
Exterior Bicycle Racks	CFCI	CFCI	CFCI	CFCI

OFOI - Owner Furnished, Owner Installed
OFCI Owner Furnished, Contractor Installed
CFCI -Contractor Furnished, Contractor Installed

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EXHIBIT C.11 Shop Drawing Reviews

The following is a reference only that indicates additional UTSW internal and external teams to be included for shop drawing reviews as noted in UTSW Master Specifications.

Shop Drawing Review and Approval	UTSW PM	UTSW OSBC	UTSW Building Maintenance	UTSW Utilities	UTSW Key Control	UTSW Access Control / Police	UTSW Elevator Shop	Specialty Consultant / Vendor
08 34 00 Special Function Doors	X		X		X	X		X
08 41 26 All-Glass Entrances and Storefronts	X		X		X	X		X
08 41 29 Automatic Entrances	X		X		X	X		X
08 71 00 Door Hardware	X		X		X	X		X
08 71 13 Power Door Operators	X		X		X	X		X
10 22 33 Accordion Folding Partitions	X		X		X	X		X
11 13 19 Stationary Loading Dock Equipment								
14 10 00 Dumbwaiters	X	X	X	X		X	X	X
14 20 50 Elevators, 14 20 70 Elevator Cars 14 21 00 Electric Traction Elevators 14 22 00 Electric Traction Elevator Modernization 14 24 00 Hydraulic Elevators	X	X	X	X		X	X	X
22 00 10 Basic Plumbing Requirements	X		X	X				X
22 05 33 Heat Tracing for Plumbing Piping	X		X	X				X
23 00 00 Mechanical Design Requirements	X		X	X				X
23 05 33 Heat Tracing for HVAC Piping	X		X	X				X
26 00 00 Basic Electrical Requirements	X		X	X				X
26 24 19 Motor Control Centers	X		X	X				X
32 31 36 Security Gates and Barriers	X		X			X		X

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EXHIBIT C.12 UTSW Archibus Export Requirements

I. Deliverables
   A. Project deliverables must include an AutoCAD background with rooms, spaces, and areas exported as polylines for use by Archibus. Archibus requires polylines to attach e-handles which contain data and are used in conjunction with the AutoCAD file to create the floor plan graphic visible in the application.
   B. Drafting programs used by an A/E without conversion procedures inherent to the application should manually populate electronic backgrounds with polylines prior to sending deliverables to UTSW PM
   C. The DWG export setup for REVIT is included but similar procedures exist in AutoCAD Architecture (3-D CAD) as well as other applications

II. Revit Example
   A. Revit Detail Level: Change to “coarse” to limit the visibility of components, prior to DWG export.
   B. Detail Level: Structural framing changes depending on the detail level. At coarse levels, it appears as lines. At medium and fine levels, it displays with more geometry.
   C. Manage Visibility Graphics: Do not show detail lines of geometry and/or components.
   D. Polylines are not shown for clarity in following images

DWG Export: *Acceptable*

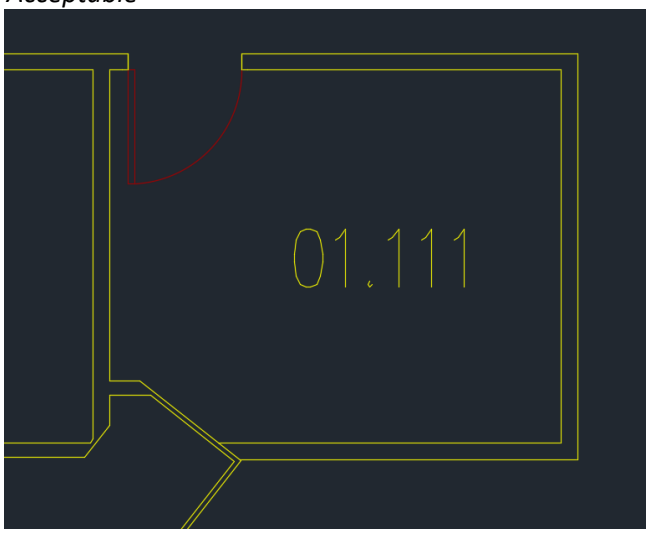
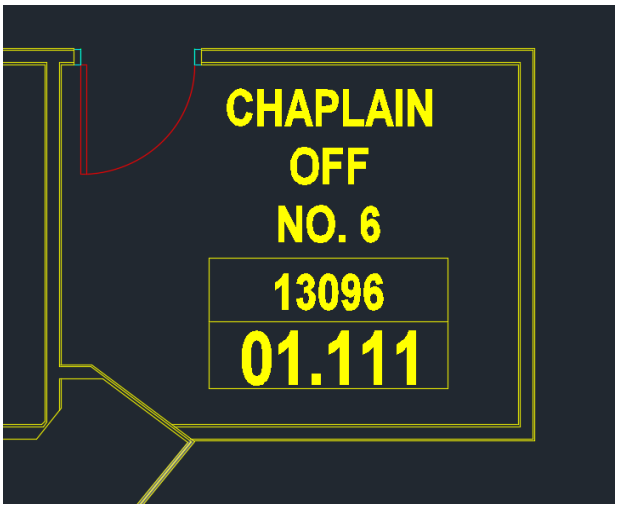


EXHIBIT C.12 (continued)

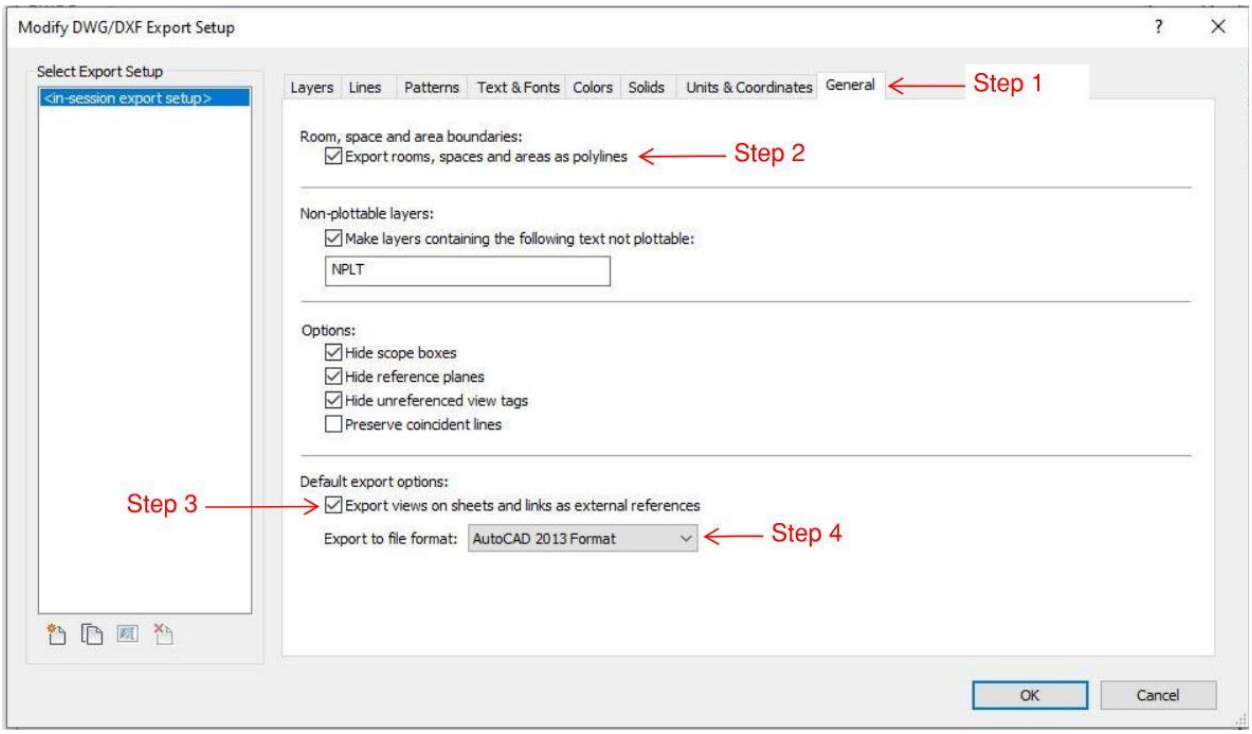
DWG Export: *Unacceptable*



E. Revit Detail Level: Change to “coarse” to limit the visibility of components, prior to DWG export.
F. Within the Revit DWG Export option box, choose the CAD Format from the “Select Export Setup.”
    1. Select the "General" tab.
    2. Under “Room, space and area boundaries,” check the box for "Export rooms, spaces and areas as polylines."
    3. Under the “Default Export Options” check the box for "Export views on sheets and links as external references."
    4. Unless told otherwise, choose “AutoCAD 2013 Format” under the “export to file format.”

EXHIBIT C.12 (continued)

Revit Dialogue Box



DOCUMENT HISTORY

Issue Date	Description	Editor
06/19/2020	June 19, 2020 Print	MR
10/9/2020	Code Compliance to remove duplication in section V	EV
03/30/2021	Q1 2021 Update	EV
03/25/2022	Introduction, VI-VII., Added coordination with UTSW Signage Manager on nomenclature standards, Updated Section V. Code Compliance Confirmation Reviews	MR
10/03/2022	Q3 2022 Update	EV
06/26/2023	Q2 2023 Update	EV
12/15/2023	Q4 2023 Update	EV
06/13/2024	Q2 2024 Update	EV
12/20/2024	Q4 2024 Update	EV
06/27/2025	Q2 2025 Update	EV
12/18/2025	Q4 2025 Update	EV

PROJECT DELIVERY REQUIREMENTS

SECTION C1 – DELIVERABLES CHECKLIST

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SECTION C1 – DELIVERABLES CHECKLIST

I. General Information

A. UTSW Design Guidelines Section C - Submittal Requirements is intended to work in tandem with the Deliverables Checklist.

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Type	Topic	For specific drawing requirements, refer to DG Section B.	Prog.	SD	DD	CD	IFC	Submitted	Pending	N/A	Comments
Status Legend In Submittal Phase: P - Preliminary; U - Update; F - Final											
Basic Requirements											
Report	Basic Data Form (CIP)	Refer to DG Section C, Exhibit C.8 to this document.	P	U	U	U	F				
Report	Construction Cost Estimate (CIP)	Refer to DG Section C, Exhibit C.9	P	U	U	U	F				
Report	Pending Issues Report	Refer to DG Section C, Exhibit C.1	P	U	U	U	F				
Letter	Code Compliance Confirmation Reviews	Independent consultant for CIP, Refer to DG Section B and Exhibit B.3 for template. DD, 75% CD, and IFC.			P	U	F				
Process	TAS Accessibility Plan Review	Confirm scheduling with UTSW PM									
Digital Submissions											
	CAD Background	Refer to DG Section C, Exhibit C.2 for UTSW CAD Standards.					F				
	BIM Requirements	Refer to DG Section C, Exhibit C.5 if required.									
Specifications / Project Manual											
	Schematic Design	Descriptive specifications and literature		P							
	Design Document	Outline or preliminary for all disciplines and descriptive literature			U						
	Construction Documents	Completion level per progresses per stage of CD				U	F				
	Furniture and Equipment Packages			P	U	U	F				
	Physicist / Shielding Report	Refer to DG Section B.			P	U	F				
General Drawings											
Drawing	Building Code Analysis	Refer to DG Section B, Exhibit B.2	P	U	U	U	F				
	Cover and Titleblocks			P	U	U	F				
	General Sheets	Includes: Project Data Sheet, Code Sheet, Life Safety Code Compliance Statement.		P	U	U	F				
Programming											
Report		Facility Program, Narratives, and Applicable Code Requirements to be provided for all disciplines.	P	U	F						
Report		Expected schedule projections for design and construction phases	P	U	U	U	F				
Report	(CIP)	Preliminary Total Project Budget based on assemblies and anticipated quantities.	P	U	U	U	F				
Civil and Landscape											
	Survey										
		Refer to DG Section C, Exhibit C.6 for complete survey requirements.									
	SWPPP										
		Deadline and deliverables per contract and refer to DG Section C, Exhibit C.4									
Report		Note: At 50% - 75% CD, or as indicated by UTSW PM, submit SWPPP to UTSW PM for review/comment and approval. Confirm with OSBC.	P	U	U	F					

Type	Topic	For specific drawing requirements, refer to DG Section B.	Prog.	SD	DD	CD	IFC	Submitted	Pending	N/A	Comments
Status Legend In Submittal Phase: P - Preliminary; U - Update; F - Final											
	Drawings										
Drawing	Landscape Drawings	Plans and site plans.		P	U	U	F				
Drawing	Civil Drawings	Plans and site plans.		P	U	U	F				
Structure											
	Geotech										
Report	Geotechnical Investigations	Refer to DG Section C, Exhibit C.7.	F								
Report		Structural design report with a description of the proposed structural system, special features and project understanding.		P	U	U	F				
	Calculations										
Report		If requested.									
	Drawings										
Drawing	Demo Plan(s)	Provide preliminary structural demolition drawings if demolition is required for the project, revise and refine at each following deliverable.		P	U	U	F				
Drawing	Plan(s)	Foundation, floor, and roof plans. Live load maps are required.		P	U	U	F				
Drawing	Construction Details				P	U	F				
Architecture											
Report		Architecture and interior design reports and others per discipline shall be provided that indicate scope of work involved including descriptions of all necessary systems in the project.		P							
Report		Scope narrative.		P	F						* Update at CD if changes occur.
Report		Program variance document.		P	F						* Update at CD if changes occur.
Report		A Life Safety Code Design Report.		P	U	F					
Report		Revision and progression of elements presented in SD report, summary of site investigation, area tabulations Description of construction phasing, if required.			U						
	Leadership Presentations										
Presentation	(CIP)	Confirm requirements with UTSW PM for initial and final submissions.	P	U	U						
	Drawings										
Drawing	Standard Accessibility Sheet			P	U	U	F				
Drawing	Fire / Life Safety Drawings			P	U	U	F				
Drawing	Site Plan(s)			P	U	U	F				
Drawing	Circulation Path Plan		P	U	F						

Type	Topic	For specific drawing requirements, refer to DG Section B.	Prog.	SD	DD	CD	IFC	Submitted	Pending	N/A	Comments
Status Legend In Submittal Phase: P - Preliminary; U - Update; F - Final											
Drawing	Demo Plan(s)			P	U	U	F				
Drawing	Floor Plan(s)			P	U	U	F				
Drawing	Interior Finish Plan(s)				P	U	F				
Drawing	Reflected Ceiling Plan(s)				P	U	F				
Drawing	Roof Plan(s)				P	U	F				
Drawing	Enlarged Floor Plan(s)				P	U	F				
Drawing	Exterior Elevations			P	U	U	F				
Drawing	Building Sections			P	U	U	F				
Drawing	Wall Sections				P	U	F				
Drawing	Wall Types	With STC or UL assembly indicated.			P	U	F				
Drawing	Construction Details				P	U	F				
Drawing	Door Schedule and Details				P	U	F				
Drawing	Interior Elevations				P	U	F				
Drawing	Furniture and Equipment Plans				P	U	F				
Drawing	Perspective Renderings	If required per contract.		P	U	U	F				
Drawing	Schedules				P	U	F				
Drawing	Phasing	Information and drawings if required.		P	U	U	F				
Report	Finish Binder (CIP)	Provide final selections at close-out.									
MEP General											
Drawing	UTSW MEP1 Sheet	Include most current sheet. Match UTSW symbols		P	U	U	F				
Plumbing											
Report		Plumbing design reports that indicate scope of work involved including descriptions of all necessary systems in the project.	P	U	F						
Report		Design loads for Plumbing and Plumbing Fixture requirements per code, special environmental requirements, final calculations for all systems		P	U	U	F				
	SECO										
Report		Provide "Water Conservation Design Standard Compliance Certification for State-Funded Buildings" with initial draft of form submitted at SD.		P	U	U	F				
	Drawings										
Drawing	Site Plan(s)			P	U	U	F				
Drawing	Utility Plan(s)			P	U	U	F				
Drawing	Demo Plan(s)			P	U	U	F				
Drawing	Diagrams	Vent stack routing up through roof for all project vents, riser diagrams, one-line diagrams for all systems, control diagrams, and flow diagrams.		P	U	U	F				
Drawing	Floor Plan(s)			P	U	U	F				
Drawing	Roof Plan(s)			P	U	U	F				

Type	Topic	For specific drawing requirements, refer to DG Section B.	Prog.	SD	DD	CD	IFC	Submitted	Pending	N/A	Comments
Status Legend In Submittal Phase: P - Preliminary; U - Update; F - Final											
Drawing	Enlarged Floor Plan(s)				P	U	F				
Drawing	Construction Details				P	U	F				
Drawing	Schedules	Refer to DGs Section C – Equipment Schedules and Coordination.			P	U	F				
Drawing	Design Criteria			P	U	U	F				
Mechanical											
Report		Mechanical design reports for HVAC system, gross design loads, supply and return air system, principal piping materials, and fire protection system. Shall include design conditions.		P	U	U	F				
	SECO										
Report		Provide SECO/ASHRAE 90.1 Compliance form initial draft to be issued at SD.		P	U	U	F				
	Design Criteria										
Report		Update and resubmit at final DD design calculations the “Basic Data” form, refer to Exhibit C.8	P	U	U	U	F				
	Drawings										
Drawing	Site Plan(s)			P	U	U	F				
Drawing	DemoPlan(s)			P	U	U	F				
Drawing	Diagrams			P	U	U	F				
Drawing	Floor Plan(s)			P	U	U	F				
Drawing	Roof Plan(s)			P	U	U	F				
Drawing	Enlarged Floor Plan(s)				P	U	F				
Drawing	Construction Details				P	U	F				
Drawing	Controls	Include Sequence of Operations.			P	U	F				
Drawing	Schedules	Refer to DGs Section C – Equipment Schedules and Coordination.			P	U	F				
Electrical											
Report	Schematic Design Report	Electrical report shall provide indicated scope of work involved including descriptions of all necessary systems in the project.		P	U	U	F				
Report	Lighting Controls	Lighting controls Sequence of Operation (SOO) or Narrative.		P	U	U	F				
	Drawings										
Drawing	Site Plan(s)			P	U	U	F				
Drawing	Utility Plan(s)			P	U	U	F				
Drawing	DemoPlan(s)			P	U	U	F				
Drawing	Diagrams	One-line or riser diagram, nominal power riser diagram, emergency power riser diagram, grounding riser diagram.		P	U	U	F				
Drawing	Floor Plan(s)	Power plans.		P	U	U	F				
Drawing	Lighting Plan			P	U	U	F				

Type	Topic	For specific drawing requirements, refer to DG Section B.	Prog.	SD	DD	CD	IFC	Submitted	Pending	N/A	Comments
Status Legend In Submittal Phase: P - Preliminary; U - Update; F - Final											
Drawing	Roof Plan(s)			P	U	U	F				
Drawing	Enlarged Floor Plan(s)				P	U	F				
Drawing	Construction Details				P	U	F				
Drawing	Controls				P	U	F				
Drawing	Panel Schedules				P	U	F				
Drawing	Light Schedules				P	U	F				
Drawing	Equipment Schedules	Refer to DGs Section C – Equipment Schedules and Coordination.			P	U	F				
Drawing	Electrical Calculations	Lighting photometrics, fault current/coordination, emergency power, and electrical load.		P	U	U	F				
Data / Technology / Security											
		Design criteria for each discipline, code requirements, special environmental requirements, final calculations for all systems.		P	U	U	F				
	Drawings										
Drawing	Communications Site Plan(s)			P	U	U	F				
Drawing	Communications Utility Plan(s)			P	U	U	F				
Drawing	Communications Demo Plan(s)			P	U	U	F				
Drawing	Communications Plan(s) / RCP(s)			P	U	U	F				
Drawing	Communications Room Plan(s)			P	U	U	F				
Drawing	Communications Details				P	U	F				
Drawing	Security Plan(s) / RCP(s)			P	U	U	F				
Drawing	Security Details				P	U	F				
Drawing	Audiovisual (AV) Plan(s) / RCP(s)			P	U	U	F				
Drawing	Audiovisual (AV) Details				P	U	F				
Drawing	Audiovisual (AV) Schedules	Refer to DGs Section C – Equipment Schedules and Coordination.			P	U	F				

Type	Topic	For specific drawing requirements, refer to DG Section B.	Prog.	SD	DD	CD	IFC	Submitted	Pending	N/A	Comments
Fire Protection		**Status Legend In Submittal Phase: P - Preliminary; U - Update; F - Final**									
		Final updated design criteria, code requirements, and special requirements.			U						
	Drawings										
Drawing	Site Plan(s)			P	U	U	F				
Drawing	Utility Plan(s)			P	U	U	F				
Drawing	DemoPlan(s)			P	U	U	F				
Drawing	Floor Plan(s)			P	U	U	F				
Drawing	Enlarged Floor Plan(s)				P	U	F				
Drawing	Construction Details				P	U	F				
Drawing	Schedules	Refer to DGs Section C – Equipment Schedules and Coordination.			P	U	F				

Issue Date	Description	Editor
12/15/2023	Q4 2023 Update - Reformatted Checklist	EV
6/13/2024	Q2 2024 Update	EV

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UT Southwestern Medical Center

Facilities Planning, Design, and Construction

Design Guideline Update Log
Q4 2025 – Issued December 18, 2025

Bold text indicating new/revised information.

Terminology and Format Updates

Revised references from "Interiors Design Team" to "Design Team."

Removed abbreviations or symbols for: foot/feet, inch/inches, percentage.

Names of Exhibits and Figures revised to be in bold with the title included throughout document.

Section	Revision/Addition
Table of Contents	Updates for new sections, section name changes, and page number adjustments.
Section A Design Philosophy	
Section A, XVI. Building Core Elements: Partition Standards	Addition: New Section

XVI. Building Core Elements: Partition Standards

A. Partitions:

1. **Full height partitions to the underside of structure shall be used in Animal Resource Center (ARC) spaces, clinical spaces, laboratory spaces, and where required by code.**
2. **Partitions with gypsum board stopping 6-inches above the ceiling shall be standard in other space types unless greater noise control or privacy are required.**
   a. **Where additional acoustic control is required but budget constraints or existing conditions prevent partitions from extending to the underside of deck, the A/E shall provide additional strategies for review and cost implications.**
3. **Design and construction of partitions shall allow access for maintenance and minimize repair costs. Locate access panels at regular intervals and at all equipment access points.**

Section A, XXVII. Food Service

Revision: D 1

D. Finishes and spaces shall meet requirements as determined by the Texas Department of State Health Services and Hospital Licensing Rules per project.
   1. All finishes shall be reviewed with and approved by UTSW ~~Interiors~~ **Users, PM, and Design** Team.

Section A, XXXII. MRI Design and Requirements

Revision: K 2

2. ~~Finishes will be determined by UTSW Interiors for standard waiting and reception areas.~~ **Finishes UTSW PM will provide finish standards to the A/E.**

Section A, Exhibit A.1 UTSW Room Numbering Standards

Revisions: Figure names and descriptions updated

Figure A.1-1 – Existing and Small Renovation: Example showing main elevator lobby and corridor numbering.

Figure A.1-1a – New Building and Major Renovation: Example showing main elevator lobby and corridor numbering.

Figure A.1-2 – Subspace Letter Designation - Example showing subspaces with sub-letter designation.

Figure A.1-3 – Stair Number Example - Floorplans showing the stairs formula

Figure A.1-4 – Restroom Formula – Floorplan showing the restroom formula for numbering multiple restrooms off the same corridor.

Figure A.1-5 – Cubicle Numbering Formula – For reference:

Figure A.1-6 – Dividing Open Spaces – Floorplan showing the division of open spaces between labs

Figure A.1-7 – Dividing Open Spaces 2 - Example showing dividing spaces in open offices with polylines located along column lines to further divide a larger space.

Figure A.1-8 – Lease Corridor Numbering Example. This plan shows that there are two options for numbering the corridor. It can be 550CR or 5.1 depending on the number of toilet rooms.

Figure A.1-9 – Corridor Numbering Example F2 - This plan shows Building F2 as an example for overall numbering strategy of corridors and stairs.

Figure A.1-10 – Corridor Number Example ND-5 - Example of ND-5 showing corridor numbering.

Section A, Exhibit A.1 UTSW Room Numbering Standards, Figure A.1-3 – Stair Number Example.

Revision: Drawing description revised:

Two building levels showing the same stairwell. **The first-floor stair number was based on the corridor number. The stair numbers above will match that numbering. ~~– 1st number based on corridor.~~**

Section A 1 Master Specifications

Exhibit A1.1 IR Specification Guide for On-Campus Renovation Projects

Exhibit A1.2 IR Specification Guide for CIP Projects

Revision: Usage of grey text changed to Italic. No changes to scope or understanding.

Section A2 Animal Resource Center (ARC) Design Requirements

Section A2, XIV, Section 09 29 00 Gypsum Board

Revision and Addition: A

A. Reference **NFPA 101 and** Specification Section 09 29 00 "Gypsum Board" for required "Partition Identification" labels and locations as well as requirements for construction, fire-resistance ratings, and fire protection **of existing and new fire-rated walls, partitions, compartments, assemblies, and smoke partition assemblies.**
   1. **Renovation and remodel projects shall include revisions to existing partition identification when the wall conditions are modified.**
   2. **Renovation and remodel projects shall include partition identification be added where missing and as indicated by OSBC.**

Section A2, XXXIV Section 23 00 00 Heating, Ventilating and Air Conditioning (HVAC),

Addition: New paragraph C, 9

9. **The VAV terminals with hot water reheat coils serving Animal Resource Center (ARC) should maintain the Entering Water Temperature (EWT) of 120 deg. F min/150 deg. F max to avoid nuisance high temperature alarms from the Animal Monitoring and Watering System (AMWS) controls when hot terminal air hits the AMWS room temperature sensors located at a higher wall elevations.**

Section A3 Clinical Design Requirements

Section A3, IV Spaces

Revision: E 2

2. Read Rooms – Dedicated work areas for viewing imaging results with strict lighting requirements. UTSW **PM will provide** ~~Interiors has~~ special finish requirements ~~documented~~.

Section A3, XV Section 09 29 00 Gypsum Board

Revision and Addition: A

A. Reference **NFPA 101 and Specification** Section 09 29 00 "Gypsum Board" for required "Partition Identification" labels and locations **as well as requirements for construction, fire-resistance ratings, and fire protection of existing and new fire-rated walls, partitions, compartments, assemblies, and smoke partition assemblies.**
   1. **Joint Commission projects do not allow scab patches.**
   2. **Renovation and remodel projects shall include revisions to existing partition identification when the wall conditions are modified.**
   3. **Renovation and remodel projects shall include partition identification be added where missing and as indicated by OSBC.**

Section A3, XXXIII, Section 12 50 00 Furniture

Revision and Addition: Entire section.

A. Furniture shall be easily cleaned and disinfected **and meet UTSW standards**.
B. Furniture **layouts** shall be **proposed** ~~designed and determined~~ by the UTSW ~~Interiors Team~~ **furniture vendor** for use in the A/E drawings.

1. **The furniture vendor will schedule Customer meetings for initial understanding and for presenting options.**
2. **The furniture vendor will provide A/E with an initial layout in CAD with furniture specifications for products planned.**
3. **For construction documentation, the furniture vendor will provide final layout drawings with power requirements in CAD.**

Section A4 – Laboratory Design Requirements.

Addition: New Section

I. General Information

A. **Design of laboratories shall include representatives from the project user group, Office of Safety and Business Continuity (OSBC) teams, Facility Management, Utilities, and Design Team. Throughout design, additional UTSW teams will be included to address project scope and special requirements.**
   1. **Design of laboratory spaces shall follow the NIH Design Requirements Manual (most recent edition) from planning through construction practices.**

B. **Project A/E shall provide solutions that meet standard best practices as well as specific project requirements. Confirm expected weights for wall mounted items, acoustic privacy desired, vibration considerations, and air pressures expected to provide partitions that meet design and regulatory requirements.**

C. **UTSW Laboratories are typically negatively pressurized compared to corridors with tissue culture labs negatively pressurized to any adjoining lab. Confirm project and building requirements.**

D. **On Renovation projects, the A/E shall document an understanding of the existing conditions including partitions, rated construction, utilities, and existing system constraints. Design solutions shall include all affected systems in the project scope, documenting existing capacities, known performance/quality/loads, and indicate alterations required to meet design requirements.**

II. Laboratory Design: Codes and OSBC

A. **The design and renovation of laboratory spaces shall comply with all UTSW Regulatory Requirements as indicated in the master specification Section 01 41 00 "Regulatory Requirements" and as indicated by UTSW OSBC.**

B. **Code considerations for laboratory design:**
   1. **Following NFPA 45 – The Standard of Fire Protection for Laboratories Using Chemicals requires a minimum of 1 hour fire rated walls for all renovations and new construction.**
      a. **A/E shall document user's planned chemical types and amounts in project drawings.**

b. **A/E will identify Laboratory Unit Fire Hazard Classification for each project and document required ratings.**

2. **Laboratories with more than 1,000 square feet shall have a minimum of two exits.**
3. **Compressed gas cylinders, cryogenic containers, or explosion hazards must be at least 10-feet away from primary entrances and egress paths. Project A/E shall consult with the UTSW AHJ for review and approval.**

C. **UTSW PM and Project A/E shall ensure compliance with appropriate OSBC teams for each project. Refer to UTSW Design Guideline Section B, "Campus Protocols: OSBC" for descriptions of each team and the area of focus.**

III. Laboratory Design: Biosafety Level

A. **Each laboratory space will be assigned a Biosafety Level (BSL) by UTSW OSBC. Project A/Es shall use this to guide their design solutions. The descriptions below are from the "UT Southwestern Biosafety Manual" version Date: December 2023.**

1. **"Biosafety Level 1. BSL1 is suitable for work involving well-characterized agents (including animal work) not known to consistently cause disease in immunocompetent adult humans. BSL1 agents present minimal potential hazards to laboratory personnel and the environment. BSL1 laboratories are not necessarily separated from the general traffic patterns in the building. Work is typically conducted on open bench tops using standard accepted microbiological practices. Special containment equipment or facility design is not required but may be used as determined by appropriate risk assessment. "**
2. **"Biosafety Level 2. BSL2 builds upon BSL1. BSL2 is suitable for work involving agents that pose moderate hazards to personnel and the environment. It differs from BSL1 in that: 1) laboratory personnel have specific training on containment, manipulation, cultivation, and disposal of pathogenic agents and are supervised by scientists competent in handling these agents; 2) access to the laboratory is restricted when work is being conducted and the door must remain closed at all times; and 3) all procedures in which aerosols or splashes may be created are conducted in BSCs or other physical containment equipment."**
3. **"Biosafety Level 3. BSL3 builds upon BSL1 and BSL2. BSL3 is applicable to clinical, diagnostic, teaching, research, animal research, or production facilities where work is performed with indigenous or exotic agents that may cause serious or potentially lethal disease following exposure. Laboratory personnel have specific training on containment, manipulation, cultivation, and disposal of high-risk pathogenic agents and must be supervised by scientists competent in handling these agents. All procedures involving manipulation of infectious materials must be conducted within BSCs, other physical containment devices, or by personnel wearing appropriate PPE. A BSL3 laboratory has special engineering and design features."**
4. **"Biosafety Level 4. BSL4 builds upon BSL1, BSL2, and BSL3. Currently, UT Southwestern does not have facilities that support BSL4 containment. "**

B. **Creation or renovation of BSL3 spaces will result in additional requirements which will be identified by OSBC. OSBC Biological and Chemical Safety teams will document design requirements and special testing requirements.**

IV. Laboratory Design: Space Planning

A. **UTSW prefers laboratories to be flexible and adaptable spaces wherever possible.**
   1. **Modular laboratories utilize UTSW standard casework and benching. Refer to EXHIBIT A4.1 Laboratory Space Planning for reference and information.**
      a. **Built-in casework, plumbing elements, and free-standing equipment can be in the perimeter zone and along partitions.**
      b. **Free standing and adjustable benching can be located through the interior of the space, with minimum 5-foot-wide aisles in a flexible zone.**
         i. **Within the flexible zone, utilities for aisles will come from ceiling service panels mounted in/at the ceiling.**

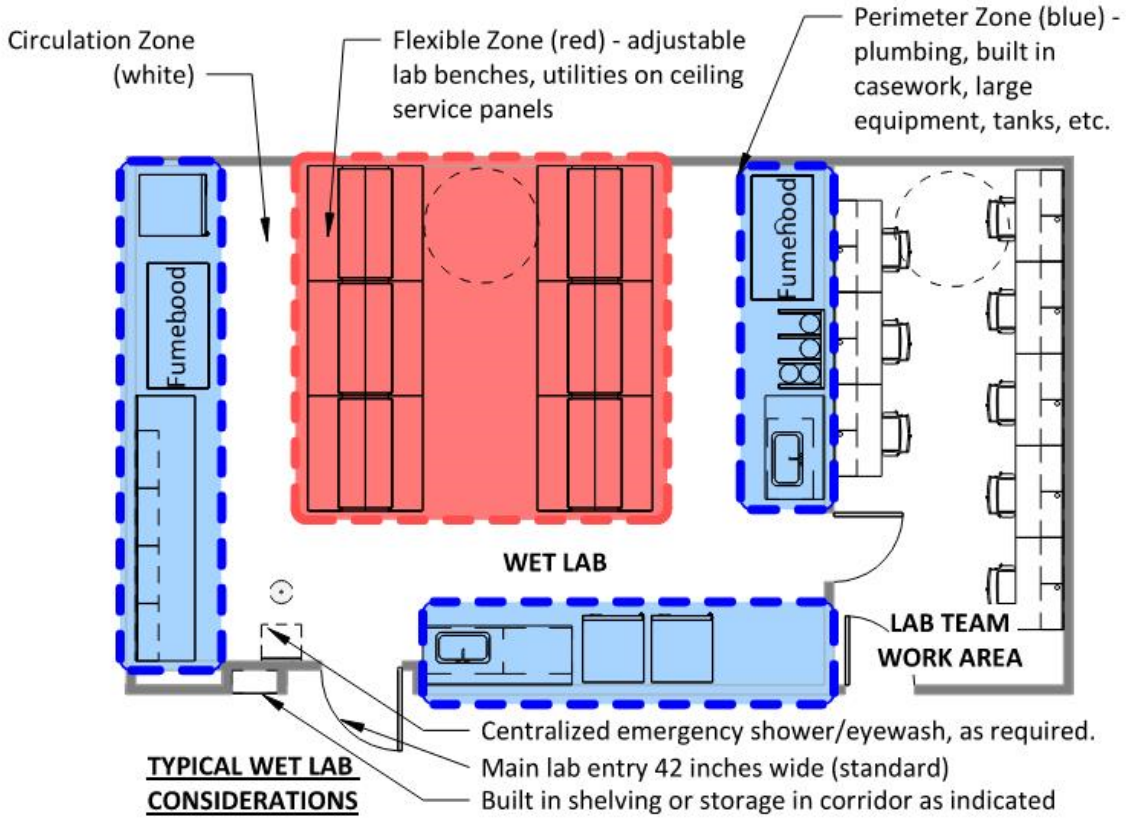
B. **Lab Benching and Casework:**
   1. **Existing built-in lab benching on campus is typically wood casework.**
      a. **Renovation projects with existing wood casework to remain shall work with UTSW PM, User, and OSBC to determine any condition issues, safety concerns, and remediation requirements.**
   2. **The standard for new laboratory benching is free standing and adjustable metal products. Documentation is in the UTSW Design Guidelines and Master Specifications. Refer to Division 12 00 00, for Sections including 12 35 53 "Laboratory Casework" and Section 12 36 00 "Countertops."**
   3. **All wall-mounted laboratory casework or equipment shall be securely attached. A/E shall confirm expected loading on/in these components.**
      a. **Confirm code requirements for these superimposed axial loads and design blocking and partitions to comply.**
      b. **Refer to UTSW Specifications for Sections 05 40 00 "Cold-Formed Metal Framing" and 09 22 16 "Non-Structural Metal Framing."**

C. **Typical lab requirements include:**
   1. **Provide a minimum of one door into a lab with at least 42-inches clear width for the movement of equipment.**
   2. **A minimum of one hand sink, emergency shower, and eyewash centrally located near the main traffic flow, as required by code and OSBC.**
   3. **Fume hoods and Biosafety Cabinets (BSCs) shall be located away from doors, traffic flow, HVAC supply, and other sources of air movement. Follow OSBC placement requirements in renovation and new projects.**
   4. **Flammable cabinets, flammable objects, cryogenic containers, and compressed gas cylinders shall be stored at least 10 feet from the lab primary entry and main egress path.**
   5. **Existing laboratories may operate with work areas located inside the lab space. When renovation of these spaces is designed, the AE shall propose built-in storage, adjacent to the entry door, within the corridor, these storage locations will be**

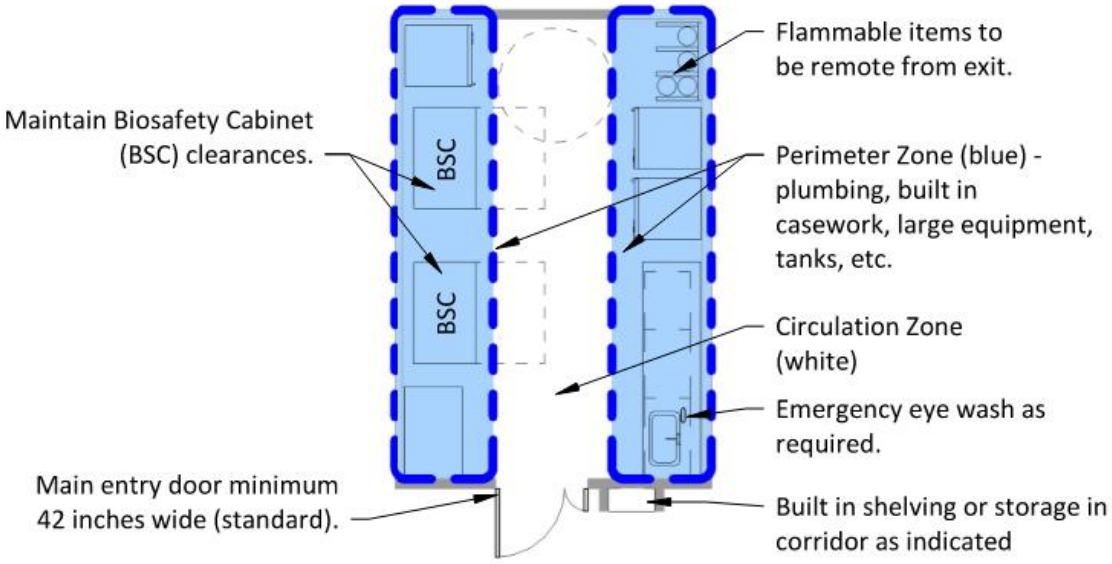
contingent on existing building constraints. Refer to EXHIBIT A4.2 Laboratory Entry Storage for reference.

a. **Where storage is installed in rated partitions, all materials shall comply with the currently adopted NFPA.**
b. **Storage shall be permanently affixed and not protrude into the required egress width.**
c. **Storage locations shall be coordinated with the required room and safety signage as well as, but not limited to, fire extinguishers, electrical panels, and ADA clear floor requirements.**

EXHIBIT A4.1 **Laboratory Space Planning**

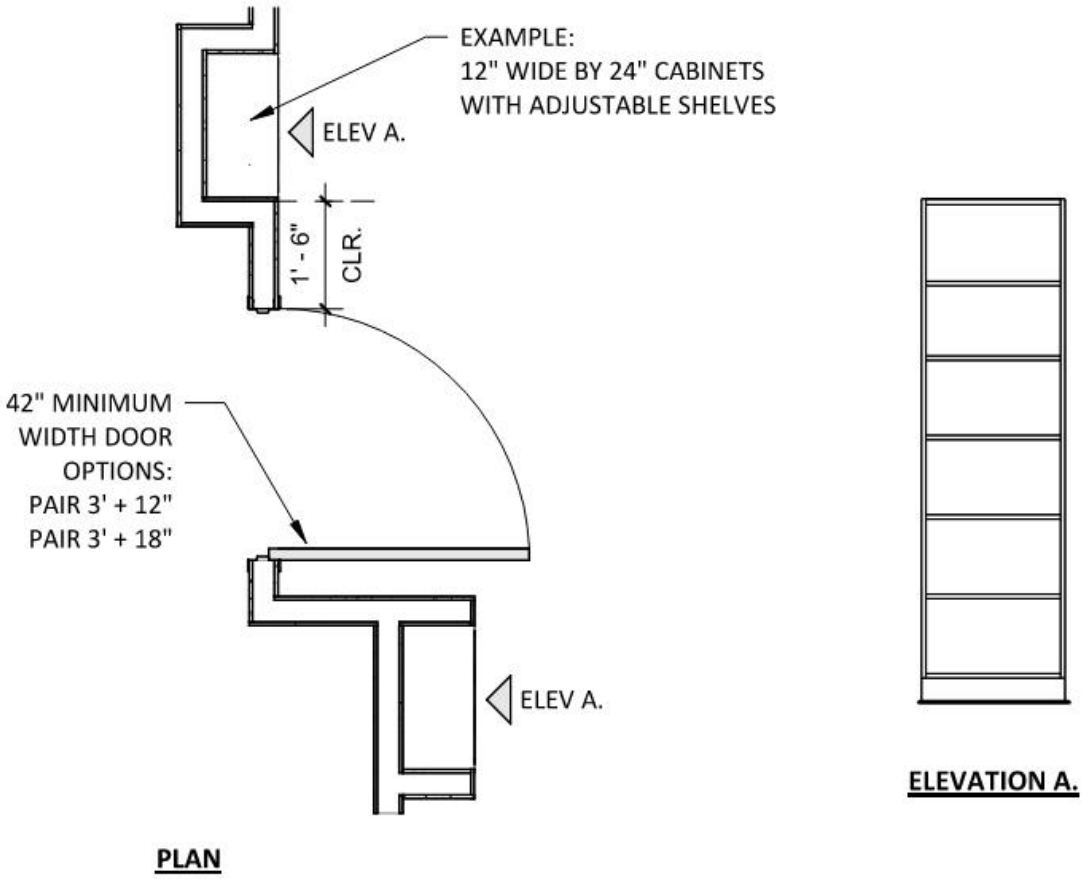


TYPICAL WET LAB CONSIDERATIONS



TYPICAL TISSUE CULTURE CONSIDERATIONS

EXHIBIT A4.2 **Laboratory Entry Storage**



V.Laboratory Design: Utilities

A. **Flexibility and adaptability shall be considered in utility overall designs so future growth and alterations can be accommodated.**
   1. **Confirm required future growth strategies for each project for each MEP discipline and provide oversized chases, units, panels, etc., as confirmed with department leadership.**
   2. **Lab spaces utilize tremendous HVAC and exhaust for proper operation. System capacities can easily become limiting factors in the life of the laboratory. Discuss expansion requirements for systems above the needs of the design for day one.**

B. **Confirm the utility types serving the project including the quality and quantity available for projects in existing buildings.**
   1. **The quantity/quality of building chilled water, process chilled water and compressed air shall be confirmed, compared to both manufacturer and lab requirements. The process chilled water piping loop should be equipped with plate frame heat exchanger to avoid circulation of campus chilled water through**

laboratory process equipment. Proposed design solutions shall be confirmed and validated with users.

2. Presence and quantity of emergency power is variable throughout the campus and shall be confirmed.

C. Communication is critical for utilities and services in laboratories.
   1. Clearly label pipes where all services come into the laboratory space.
   2. Label each power receptacle to indicate its circuit reference.
   3. Label data receptacles to match IR requirements.

D. Gas service for equipment and processes may be implemented utilizing manifolds or tank switchers. Confirm preferences per project for any new service. Refer to Section 22 62 19 "Medical Gas and Vacuum Systems" for additional information.

E. Ceiling service panels typical services may include vacuum, power, and data. Provide pre-punched spaces for future service.

VI. Laboratory Design: Finishes

A. Unless noted otherwise, standard finishes include painted gypsum wallboard, and scrubbable finish acoustic ceiling tiles. All finishes shall comply with the applicable codes and regulations.

B. Laboratory Flooring - Provide non-porous flooring with a minimum thickness of 3 mm.
   1. Typical wet-laboratory flooring shall be rubber sheet flooring and rubber base, refer to UTSW Master Specification Section 09 65 00 "Resilient Flooring." Historically, VCT has been the standard flooring in these spaces. A/E to work with UTSW PM to confirm when existing flooring shall be replaced with new flooring in renovations.
   2. Laboratories with greater chemical or abuse resistance requirements, extreme temperatures, and pressurized sprays shall utilize seamless resinous flooring. Refer to Section 09 67 23 "Resinous Flooring."
   3. For BSL-2 laboratories, floors shall be slip resistant, impervious to liquids, and resistant to chemicals.
   4. For BSL-3 and higher laboratories, flooring shall be seamless resinous flooring systems.

C. Laboratory window coverings shall be horizontal metal blinds and follow the building standard. Where blackout solutions are required, work with UTSW Design Team for approved solutions.

D. For standard finishes of casework, refer to Design Guidelines Divisions 12 00 00 and UTSW Master Specifications for Section 12 35 53 "Laboratory Casework" and Section 12 36 00 "Countertops."

E. UTSW standards shall be followed for non-laboratory specific components. Follow typical UTSW requirements for offices, meeting rooms, etc. as noted in other areas of this document.

VII. Laboratory Space Types

A. **The following spaces are not exhaustive and do not document every special condition. A/E to document unique project conditions and requirements to provide indicated design solutions.**

B. **Wet Bench Research:**
   1. **Standard equipment may include fume hoods, refrigerators, -20 freezers, microwaves, and BSLs.**
   2. **Standard utilities may include sinks, emergency eyewash and shower units, DI water, vacuum, power, and data.**

C. **Tissue Culture Room:**
   1. **On UTSW campus, most tissue culture rooms are defined as BSL-2 spaces.**
   2. **Standard equipment may include Biological Safety Cabinets (BSC), incubators, microscopes, and gas tanks, when required.**
   3. **Standard utilities shall include sinks, emergency eye wash, emergency showers (where required by OSBC), power, C02, and dimmable light fixtures.**

D. **Microscope Rooms / Laser Rooms:**
   1. **To understand the risks around lasers, follow the requirements from OSBC Laser Safety and UTSW Laser Committee including ANSI Z136.1. For each project, document laser class and what precautions are required.**
   2. **Spaces where lasers may be used include, but are not limited to optics labs, microscopy labs, linear equipment labs, and electrophysiology.**
   3. **Use of lasers may require additional safety measures including interlocking doors, door locking strategies, higher level MEP filters, and safety signage.**
   4. **Special attention is required:**
      a. **Mechanical supply and exhaust to laser spaces shall be carefully designed to ensure air movement does not restrict proper laser operation.**
      b. **Design lighting fixtures and levels to be completely controlled and turned off. Refer to EXHIBIT 26.2, Lighting Control Matrix.**
      c. **Finishes and materials utilized in laser spaces shall not create reflections and shall be approved by User, UTSW Design Team, and OSBC.**

E. **Cold Rooms:**
   1. **These purchased/prefabricated units are designed and installed within buildings. Where possible, a recessed slab is preferred to provide flat floor condition at doors. Where ramping is required, provide ADA compliant solutions.**
   2. **Finishes include stainless steel panels and easily cleanable floor finishes are preferred.**
   3. **Refrigeration units shall be reviewed with UTSW Refrigeration Shop to ensure systems, controls, and refrigerant type adhere to campus best practices.**

F. **Freezer Galley and Equipment Galley:**
   1. **This space will typically house larger equipment which produces greater noise and exhaust amounts.**
   2. **Provide acoustic control at partitions and doors to reduce noise transmission.**
   3. **Standard utilities will include power through wall mounted raceways. Confirm requirements for back-up power and alerts to CDAS.**

4. **Standard flooring will include resinous flooring and base. Refer to UTSW Specification Section 09 67 23 "Resinous Flooring" for preferred products.**

G. **Autoclaves:**
   1. **This space will include high temperature autoclaves for sterilization. Special attention is required to address the steam created with high exhaust capacity and stainless-steel ceiling panels.**
   2. **Finishes shall be high temperature rated such as resinous flooring.**
   3. **Standard utilities will include stainless steel sink, water, steam, power, and compressed air.**

H. **Accessory Spaces: May include chemical storage, dry ice storage, gas storage, etc. For these spaces, discuss MEP and finish requirements with the Users, UTSW FM, and UTSW OSBC Teams including Fire Safety, Biological Safety, and Chemical Safety.**

I. **Work Areas – Typical workspaces may include offices, shared open office, meeting rooms, break rooms and other standard requirements. Follow UTSW guidelines for sizes, layout preferences, finishes, and required furnishings.**

VIII. Section 08 00 00 Openings

A. **Refer to Design Guideline Section 08 10 00 "Doors and Frames" and Specification Sections 08 71 00 "Door Hardware" and 08 71 01 "UTSW Master Door Hardware Sets" for standard requirements.**

B. **Laboratory doors layouts shall ensure the safety of occupants as well as the expected movement of larger equipment.**
   1. **Discuss additional preferences with users including utilizing piano hinges to maximize clear openings.**

C. **Laboratory doors shall be self-closing while the laboratory space provides the as-designed air pressures and air changes per hour.**

D. **Where greater safety requirements exist due to Biosafety Level, comply with applicable regulations to provide interlocks,**

E. **Access control into laboratory spaces is predominately standard campus keyed locks or push button electronic locks. Badge access control is limited due to the high cost.**

F. **Glazing:**
   1. **Use of glazing into laboratory spaces shall not impede required processes or procedures.**
   2. **Risk assessment must be included to determine if special glass types are required to comply with Building Codes or NFPA.**

IX. Section 11 53 13 Laboratory Fume Hood

A. **Refer to Design Guideline Division 11 00 00 and UTSW Master Specification.**

X. Section 11 53 19 Laboratory Specialty Equipment

A. **For all equipment indicated to meet the design requirements of a project, the A/E is responsible for coordinating utilities, clearances, and manufacturer requirements for proper operation.**
B. **For primary containment equipment (fume hoods, BSCs, etc.), the A/E is responsible for verifying correct placement with respect to air devices, doors, and traffic patterns. This includes the requirements indicated in this guideline and OSBC documents.**
C. **Centrifuges – These require sturdy and stable surfaces due to their high weight. Provide clearance above to ensure the top fully opens. Requires dedicated power for each unit.**
D. **DI Water – Depending on building services, DI water may be provided from a building system or from local system. DI Water is required in all labs.**
E. **Reverse Osmosis (RO) Water – RO water may be provided from a building system or local system.**
F. **Incubators – These require CO2 connections and power. Many are double stacked.**
G. **Ice Machines - Floor drains with trap seals shall be located at large ice machine locations.**
H. **Millipore – This system provides higher purity water than DI water. It is only located where required. This will be connected to the DI water system for source water. The valve will be located next to a central lab sink and may be shared between labs.**
I. **Microwaves – Where located, they require a dedicated circuit.**
J. **Refrigerators and Freezers – At a minimum, these require extra dedicated circuits with no more than two on a single circuit.**
K. **Safety Showers and Eyewash – These are required where bulk hazardous chemicals are handled or as indicated by UTSW OSBC Chemical Safety. Refer to UTSW Specifications and Design Guideline Division 22, Section 22 40 00 "Plumbing Fixtures."**
L. **Tanks: All gas cylinders shall be secured with wall mounted tank restraints. Refer to UTSW Specification section 11 53 19 "Laboratory Specialty Equipment" for UTSW standard design.**

XI. Section 11 53 53 Biological Safety Cabinets

A. **Refer to Design Guideline Division 11 and UTSW Master Specification.**

XII. Section 12 35 53 Laboratory Casework

A. **Refer to Design Guideline Division 12 and UTSW Master Specification.**

XIII. Section 11 53 43 Laboratory Service Fittings

A. **Refer to Design Guidelines Division 11 and UTSW Master Specification.**

XIV. Section 13 21 01 Controlled Environmental Rooms

A. **Refer to Design Guideline Division 13 and UTSW Master Specifications.**

XV. Section 21 00 00 Fire Suppression

A. **Refer to Design Guideline Division 21 and UTSW Master Specification.**

XVI. Section 22 00 00 Plumbing

A. **Refer to Design Guideline Division 22 and UTSW Master Specification.**

XVII. Section 23 00 00 Heating, Ventilation, and Air-Conditioning

A. **Refer to Design Guideline Division 23 and UTSW Master Specification.**
B. **Laboratory spaces shall be maintained at negative air pressure with respect to the surrounding spaces.**
C. **In renovation projects, existing conditions shall be determined and documented as part of the design process to ensure final conditions satisfy design requirements.**

XVIII. Section 26 00 00 Electrical

A. **Refer to Design Guideline Division 26 and UTSW Master Specification.**
B. **In renovation projects, existing conditions shall be determined and documented as part of the design process to ensure final conditions satisfy design requirements.**

XIX. Section 27 00 00 Communications

A. **Refer to Design Guideline Division 27 and UTSW Master Specification.**
B. **In renovation projects, existing conditions shall be determined and documented as part of the design process to ensure final conditions satisfy design requirements.**

Division 01 00 00 General Information

Division 1, II Acronyms

Deletion: ~~IA Facilities Interior Architecture~~

Division 06 00 00 Wood, Plastics, and Composites

Division 1, VI. Section 06 40 23 Interior Architectural Woodwork

Deletion: B

~~B. Hard wood nosings or edge banding where plastic laminate is used on panels. Tape banding is not preferred.~~

Division 08 00 00 Openings

Division 8, XV. Section 08 80 00 Glazing

Addition: New name and figure number for door diagram.

Figure 8.1-1 – Standard Film Design: Example of a wood door with glass panel, showing typical location and elevations.

Division 09 00 00 Openings

Division 9, I. General Information

Deletion: C

~~A. Partitions and Ceilings:~~

~~1. Shall be designed to allow each access for maintenance and to minimize repair costs with access panels at regular intervals including at all equipment access points.~~

~~2. ARC, Clinical, and Research areas shall have full height partition to structure as standard.~~

Division 9, V Section 09 29 00 Gypsum Board

Revision and Addition: A

A. Reference **NFPA 101 and** Specification Section 09 29 00 "Gypsum Board" for required "Partition Identification" labels and locations as well as requirements for construction, fire-resistance ratings, and fire protection **of existing and new fire-rated walls, partitions, compartments, assemblies, and smoke partition assemblies.**

1. Joint commission projects do not allow scab patches.
2. **Renovation and remodel projects shall include revisions to existing partition identification when the wall conditions are modified.**

3. **Renovation and remodel projects shall include partition identification be added where missing and as indicated by OSBC.**

Division 9, VII Section 09 50 00 Ceiling

Deletion: B

~~B. If budget constraints prevent all partitions from extending to the underside of the deck, additional acoustical control shall be implemented for all areas with privacy concerns. Spaces include exam rooms, procedure rooms, offices, etc. A/E to review acoustical concerns with the users and confirm acoustical levels provided within each project.~~

Division 10 00 00 Specialties

XVII Section 10 43 00 – Emergency Aid Specialties

Revision: A 2 a Project Requirements

a. The Project A/E and UTSW PM shall confirm and coordinate requirements with Emergency Management for each project **using Figure 10 43 00.1 – UTSW Requirements for Emergency Aid Specialties for minimum campus requirements.**

Division 11 00 00 Equipment

Division 11, X Section 11 53 19 Laboratory Specialty Equipment

Deletion, Relocation to Section A4: C

~~C. Tanks: All gas cylinders shall be secured with wall mounted tank restraints. Refer to specification section 11 53 19 "Laboratory Specialty Equipment" for UTSW standard design.~~

Division 12 00 00 Furnishings

Division 12, I General Information

Revision: A

A. **Furniture layouts shall be proposed by the UTSW furniture vendor for use in the A/E drawings.**

1. **The furniture vendor will schedule Customer meetings for initial understanding and for presenting options.**
2. **The furniture vendor will provide A/E with an initial layout in CAD with cut sheets for products planned.**
3. **For construction documentation, the furniture vendor will provide final layout drawings with power requirements in CAD.**

~~B. Furnishing design reviews are required for all furniture selections and will be coordinated by UTSW PM at regular intervals. CIP projects will have required reviews for approval with the UTSW Interiors Team.~~

Division 12, III Fabrics

Revision: E 3

3. ~~Reference Design Guideline Section 12 05 13 - C "Abrasion Requirements."~~ **Requirements in this section.**

Division 12, V Section 12 20 00 Window Treatments

Revision: H

H. All fabric selections shall be coordinated **with UTSW Building Finish Standards. Where questions arise, they shall be** ~~and/or~~ reviewed with the UTSW Design Team.

Division 12, VII Section 12 35 53 Laboratory Casework

Revision: B

C. Finishes to be confirmed with UTSW PM and ~~UTSW Interiors~~ ~~**Team**~~ **UTSW Building Finish Standards.**

Division 12, IX Section 12 36 00 Countertops

Revision: A 1

1. ~~Finishes and products to be confirmed with UTSW PM and UTSW Interiors Team~~. **UTSW PM will provide building finish standards.**

Division 12, XI Section 12 46 19 Clocks

Revision: B

A. Refer to design guideline Section 27 53 13 "Clocks."
B. **Where clocks are required, the** final decisions shall be evaluated and confirmed with UTSW **User,** PM, and UTSW ~~Interiors~~ **Design** Team.

Division 12, XIII Section 12 50 00 Furniture

Revision: A

A. UTSW has furniture standards per building. A/E shall ~~verify~~ **receive Building Finish Standards** ~~with~~ **from** UTSW ~~Interiors~~ **PM** ~~Team~~ for each project.

Division 12, XIV Section 12 56 53 Laboratory Furniture

Revision: B

B. Finishes to be confirmed with **the** UTSW PM and UTSW **Building Finish Standards.** ~~Interiors Team.~~

Division 12, XVI Section 12 61 00 Fixed Audience Seating

Revision: A

A. Fixed audience seating must meet all applicable codes and specifications shall be reviewed by the UTSW ~~Interiors~~ **Design** Team **and finishes to be approved by the IDBC**.

Division 14, IX Elevator Enclosure

Revision: E 2

2. All finishes shall be approved by ~~UTSW PM and UTSW Interiors Team~~ **the IDBC**.
   ~~a. Review with the Institutional Design and Branding Committee shall be determined on a case-by-case basis.~~

Division 22 00 00 Plumbing.

Division 22, VI. Section 22 11 16 – Plumbing Piping.

Addition and Deletion: A.1.a

i. **Press** fittings for copper piping are allowed in locations and methods that comply with manufacturer's requirements for installation.

ii. Press fittings for carbon steel piping are allowed in locations and methods that comply with manufacturer's requirements for installation.

~~**iii. Press fittings are not allowed on steam or condensate piping.**~~

Addition: New paragraphs C & D, revisions to E, F G, H, I

C. Heating Water – Press fittings may be allowed when following manufacturer's instructions. Copper press fittings up to 4 inches diameter can be used.

D. Condensate drain piping – Press fittings may be allowed when following manufacturer's instructions. Refer to Division 23 for steam condensate return piping.

E. Lab Water

2. Non-drinkable.
3. **Follow the** press fitting **requirements for** ~~per~~ domestic water **piping** ~~notes~~ **noted** above.

~~B. Hydronic:~~

~~2. Heating Water - May be allowable when following manufacturer's instructions.~~

~~3. Chilled Water – To be confirmed with UTSW Utilities.~~

F. Deionized Water

1. Per UTSW Specification.

G. Groove Coupling Piping:

a. Groove coupling piping systems may be used on **domestic water** ~~fire protection~~ systems for piping 2~~ 1/2~~ inches and larger only.

b. Groove type couplings may be used for **galvanized steel and copper** piping in ~~equipment~~ **mechanical** rooms only.

H. ~~Refer to 23 21 13 "Hydronic Piping." Gas~~ Piping Types:

1. Gas lines shall be of all welded black steel **piping** ~~with~~ **or Viega mega press fittings** ~~construction~~ inside of the building to emergency shut-off valves. Gas lines from valve to lab table or appliances may be screwed black steel with M.I. fittings for 3/4-inch and smaller.

I. Valves:

1. For domestic water supplied to a building, a reduced **principle** ~~**pressure**~~ **zone (RPZ) backflow preventer** ~~double check valve~~ assembly is required.
~~For fire protection water supply, a simple double check valve assembly is required.~~

2. Reduced pressure zone ~~devices~~ / backflow preventers shall be used on any domestic water connection to the fire protection water system and shall have reduced pressure double check valves.
3. All control valves shall be listed in a schedule on the drawing showing identification number, body size, port size, if applicable, whether normally open or closed, spring range, and CV.
4. All control valves in the domestic water system shall be of non-ferrous**, epoxy coated or stainless-steel** construction.

Revision: K 5

5. No piping should be run in concrete floors. ~~No piping should be buried beneath the lowest floor level except for soil pipe.~~

Revision: L 6

6. General Requirements:
   a. **All floor** drains **and floor sinks** shall be furnished with trap **guards** ~~primers~~.
   b. All janitors' closets shall be arranged with the sink near the door and a floor drain in the room.
   c. All mechanical room floor sinks shall be a minimum of 4-inch diameter, with acid resisting interior, and shall be connected with trap **guards**. Floor drains in areas above grade and over crawl spaces shall have mechanical joints for easy access. Coordinate with architect to provide minimum 1-inch in a 10-foot slope to room and area drains. Do not locate floor drains under machinery.

Revision: P

P. For storm **drainage** ~~water~~ utilities, refer to Section 33 41 00 for additional requirements.
   1. Storm shall show invert elevations at manholes and other critical points.
   2. In general, storm distribution systems outside the building are civil engineering projects. If distribution is complex, such a consultant shall be retained to do this work.
   3. Roof drain piping shall be sized in accordance with the **current International** Plumbing Code.

Division 22 IX. Section 22 60 00 Gas and Vacuum for Laboratory and Healthcare

Deletion: Whole Section

~~A. All piping for vacuum and gases other than natural gas shall be ASTM B88, Type L hard drawn seamless copper pipe and tubing.~~
~~1. Use brass mechanical connections where required.~~
~~2. All vacuum and oxygen piping shall be dry nitrogen purged while being soldered.~~
~~B. Natural gas lines shall be of a welded black steel construction up to emergency shut-off valves within reach of occupants.~~
~~1. Natural gas lines from emergency shut-off valves to lab tables or appliances may be screwed if not larger than 3/4-inch and if they are exposed.~~
~~2. The emergency gas shut-off valve shall be located as close to the room exit as possible, outside the laboratory area.~~
~~C. An isolation valve shall be provided for each branch circuit.~~
~~1. Gas turrets shall not be relied upon as isolation valves.~~
~~6. Hard piped manifold systems are required for any tank installations with more than two tanks.~~

Division 22 IX. Section 22 61 00 Laboratory Compressed Air Systems

Addition: New Section

A. Compressed Air Piping
1. The piping for vacuum and gases shall be Type L, hard drawn, seamless copper tubing with wrought copper solder fittings.
2. Piping to pitch back so that it drains to the drain points shown on drawings.
3. Piping shall be cleaned in accordance with CGA recommendations for oxygen piping service.
B. Valves
1. Compressed air valves shall be stainless steel ball valves, with screwed joints and Teflon seats.
C. Pressure System
1. Air compressor shall be scroll and oil less type. Unit to be protected by temperature switches.
D. Desiccant Air Dryer
1. To deliver -60 degree Fahrenheit pressure dew point each rated to handle capacity of two compressors.
2. Dual air line filtration system for removal of particulate matter and liquids.

Addition: New Section

A. Piping

1. **The piping for vacuum and gases shall be Type L, hard drawn, seamless copper tubing with wrought copper solder fittings.**
2. **All vacuum piping shall be purged with dry nitrogen while being soldered.**
3. **Piping to pitch back so that it drains to the drain points shown on drawings.**
4. **Branch takeoffs shall be made from the top of main pipe.**
5. **Before erection all piping shall be thoroughly cleaned in hot solution of sodium carbonate mixed in equal proportions of one pound to three gallons of water.**

B. Service Outlets

1. **Wall type service outlets – shall be quick release type installed approx. 50 inches above finished floor housed in back box with stainless steel cover.**
2. **Ceiling type recessed service outlets – shall be complete with pin indexing between fascia and matching, keyed slot in channel slot box saddle. Hose coupler shall be threaded type and hose shall be plastic, conductive and color coded. Connect all ceiling outlets to a common ground.**

C. Medical Gas Valves

1. **Valves shall be bronze bodied, double seal, full flow ball valve with Teflon seat seals and O-ring packing designed for 300 psi with a chrome plated brass ball which seals in both directions. The valves require only a quarter turn of the handle to completely open or close.**

D. Medical Gas hard piped Manifold

1. **The medical gas system supplied from multiple gas storage tanks shall be provided with a pipe manifold to connect to the gas tanks. It should be equipped with a monitoring and switching device like Thermo Scientific Gas Guard model 3050/3052 or approved equal. When the active supply tank is depleted, an audible alarm sounds, and it automatically switches to the second tank.**

E. Vacuum Pump and Accessories

1. **The vacuum pumping unit shall be arranged for triplex operation as scheduled on the Drawings.**
2. **Provide vacuum relief valve, silencer and water seal solenoid valve.**
3. **Pipe air and water discharge to the nearest floor drain.**
4. **Install vacuum exhaust line to exhaust vapors and odors to outside.**

Division 22 XI Section 22 66 00 Lab Waste System

Revision: B

B. Acid waste exposed to the potential for damage shall be constructed of high silicone cast iron ~~(Duriron) or~~ protected with uni-strut guards.

Division 22 XII Section 22 64 00 Medical Gas Startup and Certification Procedure.

Addition: New Section

A. The certification shall be performed by a party other than the installation contractor.

B. The certification of medical gas pipeline system must be performed by a Certifier, licensed to ASSE Series # 6030.

C. The Contractor is responsible to fill the system with the appropriate gases before the certification process. The gases are to be filled as per manufacturer's instructions.

D. The Contractor shall complete all system tests listed in specs section 22 64 00 and prepare test reports to be submitted to UTSW PM, Owner (UTSW Facilities & Hospital Facilities) and Certifier.

E. After certification the system should be leak free and continuously fed. The manifold should not fluctuate in pressure, indicating a possible leak.

Division 23 00 00 Heating, Ventilating, and Air Conditioning

Division 23, XIII. Section 23 05 19 Meters and Gauges

Addition: F

F. **The Make-up water meters:**

1. **The make-up water connections for hot water, chilled water and condenser water services shall be provided with water meters.**
2. **The meter shall have the capability of sending output of totalizer in gallons and flow rate in gpm to Siemens BAS.**

Division 23, XVII. Section 23 09 00 Instrumentation and Control for HVAC

Revision: B

B. Refer to UTSW Master Specification for additional requirements **for DDC points list and additional software programming points. Alternatively, this information could be added to the drawings.**

Division 23, XVII. Section 23 20 00 HVAC Piping and Pumps

Revision: A

A. Chilled Water System: For North and South Campus, the chilled water system for the facilities is comprised of a pair of CHS/CHR pipes from the central plant. Typically, the water is provided with a 14°F temperature difference, but A/E shall coordinate with facility management and use the highest possible temperature difference (Delta T) between CHS/CHR. Loads will have two-way modulating control valves to control chilled water flow to the equipment. Differential pressure transmitters between the chilled water supply and return mains at various locations will be utilized to inform the campus facilities engineering group information about the health of the system. The cooling coil farthest from the system connection will be equipped with an automatic 3-way control valve to maintain a minimum flow rate in the piping system. A secondary **process chilled water piping** loop **with plate frame heat exchanger** may be added to meet the process chilled water requirements of microscopes and other lab equipment.

Division 23, XIX. Section 23 21 13 Hydronic Piping

Revision: E and F

E. Drains:
   1. All condensate drain lines shall be insulated to the vertical main. In exposed areas insulation shall be pre-molded. In unexposed areas the insulation can be foil wrapped.
   2. Provide drain valves at the low points and automatic air vents at the high points in each piping system. Use eccentric reducers in horizontal piping to maintain the top of the pipe level.
   3. **The buried chilled water and condenser water piping shall have drain connection between a set isolation valves at its lowest point.**
   4. **Condensate drain piping – Press fittings may be allowed. Installation shall follow manufacturer instructions.**

F. **Make-up water piping – Press fittings are not allowed.**

Division 23, XXI. Section 23 22 13 Steam and Steam Condensate Return Piping

Addition: New Section

A. **High and Medium pressure steam piping shall be Schedule 80 black steel piping.**
B. **Low pressure steam piping shall be Schedule 80 black steel piping.**
C. **Steam Condensate return piping shall be Schedule 80 black steel piping.**
D. **Press fittings are not allowed on Steam and Steam Condensate return piping.**

E. **All high pressure steam valves 4 inches and larger shall be piped with 1-inch equalizing line/bypass valve assembly. The equalizing bypass line shall have a line size bypass valve.**

F. **The buried steam and steam condensate return lines shall have a drain connection between a set of isolation valves at its lowest point.**

Division 23, XXII. Section 23 23 00 Refrigerant Piping

Addition: New Section

A. Copper Tube: ASTM B280, H58 hard drawn or O60 soft annealed.
   1. Fittings: ASME B16 22 wrought copper.
   2. Joints: Braze, AWS A5.8M/A5.8 BCuP silver/phosphorus/copper alloy.

B. Press fittings are not allowed on refrigerant piping.

Division 23, XXII. Section 23 31 00 HVAC Ducts and Casings

Revision and Addition: B

A. Exhaust:
   1. Exhaust branch ducts shall be sized for a velocity not to exceed 1500 Feet/Minute
   2. Exhaust Grilles shall be sized for a Noise Criteria (NC) level less than 25.
   3. Exhaust ducts from equipment operating with steam shall be sloped back to the equipment and drain provided for condensate return. Such ducts shall be constructed of stainless steel to avoid corrosion.
   4. The general exhaust system duct shall be negative while inside the building.
   5. **Lab general and fume hood exhaust requirements: The UTSW OSBC and lab manager should be contacted/consulted to establish various chemicals used in the lab with emphasis on chemicals causing corrosive fumes. The use of stainless-steel ductwork for fume hood exhaust should be discussed/agreed with OSBC.**
   6. **Laboratory fume hood exhaust duct shall be minimum 18-gauge 304 stainless steel made airtight with continuous external weld for all seams and joints. All exposed ductwork and fittings below ceiling shall be 316 stainless-steel.**
   7. **Dishwasher and Autoclave wet exhaust duct shall be minimum 18-gauge 304 stainless steel made liquid tight with continuous external weld for all seams and joints. Provide low point drain pocket with 1 inch drain connection and provide access door for inspection and cleaning. All exposed ductwork and fittings below ceiling shall be 316 stainless-steel.**
   8. **Grease exhaust duct shall be carbon steel not less than 0.054 inch (18 gauge) thick fabricated as required by NFPA 96. All joints shall have liquid tight continuous external welds. Install cleanout doors at each change of direction and in straight**

sections every 20 feet. Paint exterior ductwork with paint and primer in accordance with NFPA 96 paragraph 4-6.2.

9. In-line exhaust fans are prohibited in the general exhaust system inside the building. However, under certain circumstances exhaust fans mounted directly under the roof are permitted provided that the total discharge duct length does not exceed 5 feet inside the building, and the duct connections are welded.

Division 23, XXVI. Section 23 36 00 Air Terminal Devices

Revision: E and F

E. **The VAV Terminals with hot water reheat coils serving Animal Resource Center (ARC) should maintain the Entering Water Temperature (EWT) of 120°F min/150°F max to avoid nuisance high temperature alarm from the AMWS Controls when hot terminal air hits the AMWS room sensors located at higher wall elevation.**

F. **The VAV terminals for reheat service would be equipped with either hot water or electric heating coils.**

1. **The electric heating coil shall be open-coil design, 80/20 nickel-chrome heating element, magnetic contactor step controller, SCR controller and airflow switch**

Division 23, XXXI. Section 23 73 00 Indoor Air-Handling Units

Revision: B 5 a

a. **UTSW preference is to provide** a fan array with at least one redundant fan. The ideal case would be 100 percent redundant fan cubes served by two independent VFDs.

Division 26 00 00 Electrical

Division 26 I. General Information

Addition: F

F. Emergency Power:

1. Confirm requirements per project with UTSW PM, User, Building Maintenance, Utilities, Access Control, and other team members.
    a. Equipment requiring emergency power **could** include **but is not limited to chillers, heaters, elevators, pumps, air handling units, and project specific equipment.**
2. **Indicate the required number of auxiliary contacts to control all equipment.**

Division 26 VIII. Section 26 05 33 Conduits and Boxes

Revision: A 1

3. All floor low voltage wiring and communication cable protectors shall be aluminum finish and factory devices per plans unless noted otherwise by the UTSW ~~Interiors Team~~ **PM**.

Division 26 VIII. Section 26 32 13 Standby Power Generator Systems

Addition: New Section

A. **When required, a complete standby power supply system shall provide on-site generated electric power over a standby power distribution system. The system shall, upon loss of utility source power, automatically provide electrical service at 480/277 volts, three phase, four- wire, 60 Hertz. The system shall include an engine directly connected to a four-pole alternator, with equipment to automatically start, connect to load, supply the load, and automatically stop on restoration of normal utility power.**

B. **The power generation system shall be built, tested and shipped by a single equipment supplier so that there is one source of supply and responsibility. The engine, alternator and major items of equipment shall be product of U.S. manufacturers regularly engaged in the production of such equipment, and shall be assembled, tested and shipped to the job site by the engine manufacturer/authorized dealer.**

C. **Provide a packaged sub-base, double-wall fuel tank system for the engine. The tank shall be a minimum of 8-hour full load capacity complete with all fuel tank accessories.**

D. **The engine exhaust piping shall be schedule 40 black steel rigid exhaust pipe of size recommended by the generator manufacturer. Exhaust to be provided with double walled silencer and fully closed barometric rain cap.**

E. **Provide maintenance free batteries and solid-state battery charger.**

F. **Provide a remote alarm annunciator panel complying the requirement of NFPA-110, Level-1 indications.**

Division 26 XIV. Section 26 33 53 Un-uninterruptible Power Systems.

Addition: New Section

A. The Uninterruptable Power System (UPS) is three-phase continuous duty, on-line, solid-state uninterruptable power system. UPS operates with existing electrical systems to provide power conditioning, back-up and distribution for electronic equipment loads. The

UPS system consists of UPS module, one or more maintenance free battery packs, options and accessories, and 3-breaker maintenance bypass panel.

B. **Protect equipment from extreme temperature and humidity by storing it in a conditioned space. Deliver batteries no sooner than 7 days before charging.**

C. **Provide five (5) years warranty including batteries coverage.**

D. **Design requirements: Estimate equipment reliability is 2 years minimum MTBF. Equipment maintainability MTTR not to exceed ½-hour.**

E. **Environmental requirements: Acoustic noise 65 dBA at 1 meter, EMI suppression to meet FCC part 15 subpart J for class A devices, Electrostatic discharge (ESD) immunity to meet IEC 801-2 and withstand maximum 25 kilovolts without damage or adverse effect to critical load. System efficiency at full unity power factor load and nominal input voltage.**

F. **Accessories: Remote emergency power off (REPO) station and Remote monitoring panel (RMP).**

Division 26 XV. Section 26 36 00 – Transfer Switches.

Addition: New Section

A. **Provide Automatic Transfer Switches to provide a normal and an alternate service to certain electrical loads. Transfer switches shall be listed with UL and constructed in accordance with NEMA standards.**

B. **The transfer switch shall be electrically operated from the source to which the load is to be transferred and mechanically held after transfer. Power failure relays shall be provided to sense when the voltage of any phase drops below normal and causes transfer of load to the alternate source. Moreover, it will sense when all normal source phase voltages are rated voltages and re-transfer to the normal source.**

Division 26 XVII. Section 26 43 13 Surge Protection Devices.

Addition: New Section

A. **Provide transient protection on 480V/277V service entrance and on the 208V/120V distribution electrical system. The panel boards shall be UL listed under UL 1449 Third Edition as a transient voltage surge protection and shall meet the UL listing for each mode of protection.**

B. **The surge protective device (SPD) shall be solid state electronic unit providing transient voltage surge suppression and high frequency noise attenuation on the electrical lines being protected. The unit shall be rated to withstand a single surge impulse of 250,000**

amps and 100,000 amps line to line, line to neutral, and neutral to ground for service entrance and distribution panels without failure or degrading. Unit shall have a frequency filter to provide an insertion loss ratio of 50:1 at 100,000 hertz and 500:1 at 10 megahertz. The unit shall operate continuously at 125 percent of the normal voltages of system being protected and shall survive a minimum of 5,000 surges without failure or degrading more than 5 percent.

C. **At the time of beneficial occupancy by the owner, test each unit to establish proper operation.**

D. **Each unit shall be provided with a 20-year extended warranty by the manufacturer.**

Division 27 00 00 Communications

Division 27 VI Section 27 52 24 USB Vitals Monitoring System

Addition: New Section

A. **Typical installation information is in EXHIBIT 27.4 VITALS USB. This sketch is provided for reference only and each A/E is responsible for creating and documenting the requirements for their projects.**

Division 27 VIII Section 27 53 18 WLAN

Addition: New Section

B. **UTSW preferences for wireless access point (WAP) and antenna mounting are in EXHIBIT 27.3 IR MOUNTING PREFERENCES. These sketches are provided for reference only and each A/E is responsible for creating and documenting the mounting requirements for their projects.**

Division 33 00 00 Utilities

Division 33, VII Section 33 30 00

Revision: Section Name Change

Sanitary Sewerage **Utilities**

Division 33, VIII Section 33 40 00

Revision: Section Name Change

Storm ~~Water~~ **Drainage** Utilities

Section B Codes and Standards

Section B XI Acoustical Design

Revision: A

A. There are several standards organizations offering recommendations on best practice in acoustical design dependent on the space types. The Architect shall confirm with UTSW PM the applicable guidelines to comply with per project ***including UTSW standards in Section A, "Building Core Elements: Partition Standards"****. Limited guidelines to consider are below.*

Section B1 Definitions

Section B1 I. General Information

Addition:

Design Team – A UTSW Service Provider from Facilities Planning, Design, and Construction that manages UTSW Design Guidelines, standards, master specifications, and provides technical support for renovation projects.

Deletion:

~~**Interiors Team** – A UTSW Service Provider from Facilities Planning & Design that serves as Interior designer for project finishes and furniture. Manages campus and individual finish standards.~~

Section C Deliverable Requirements for Design Documents

Section C, I Introduction

Revision: Second Paragraph

The UTSW PM and Procurement shall indicate conformance requirements and as noted in the "General Information" in ~~Section A~~ **the Introduction** of the UTSW Facilities Management Design Guidelines, all projects shall conform to the most recent Design Guidelines posted online.

Section C, IV Deliverables Required for All Projects

Addition: C

C. **UTSW Comment Form**

1. **At each phase of document submission, the UTSW PM will collect review comments from UTSW teams within a standard UTSW review spreadsheet.**
2. **The A/E shall review and provide responses to the comments within the same spreadsheet. These responses shall be returned to UTSW PM. The specific deadline for returning responses shall be confirmed with the UTSW PM but shall be prior to the next document submission.**
3. **The A/E shall determine if corrections, revisions, or additions are required to the documents to fully address UTSW comments. These changes shall be made to the documents for the following document submission.**
   a. **For any questions or concerns about comments received, the A/E shall request clarification through UTSW PM.**
   b. **Any conflict about UTSW comments shall be reviewed with the UTSW Design Team.**
   c. **The Director of Planning, Design, and Construction shall provide final determination on remaining conflicts.**