

Division 1 – General Requirements

Design and Construction Quality

The Texas Tech University System's (TTUS) Facilities Planning & Construction (FP&C) Division has created the TTUS Design and Building Standards as a guideline for Design Professionals (DP) and General Contractors (GC) to assist in the design and construction phases for all Texas Tech University System projects. The guidelines in this document are the basic minimum requirements and are included for reference only and are not intended to replace applicable local, state, and federal codes.

FP&C is committed to the highest quality of design and construction for each project in our system, and we recognize that it takes teamwork from all segments of the design and construction process to meet or exceed the TTUS building standards.

Operating Policies and procedures (OPs) for using professional services to carry out the business of the TTUS are outlined in Texas Tech University (TTU) OP 72.

In the event of a conflict between this document and required design codes and regulations, the Design Professional will contact the FP&C Project Manager (PM) in writing for clarification.

Where there is no reference or specific requirement listed, the Design Professional and Contractor will use competent professional judgment.

All design and construction of TTUS projects must comply with the standards herein. However, there are instances when an exception to the university standards may be considered. This standard is not intended to prohibit the use of alternative methods, systems, or products not listed in this document. If a project team wants an exception to the standards to be considered, the request must be submitted in written form to the FP&C Project Team.

The Texas Tech University System property is insured by FM Global. All design and materials incorporated into TTUS Projects shall comply with FM Global recommendations. The use of any combustible construction material is prohibited unless approved by the FP&C Project Team.

Refer to FM Global Data Sheet 5-32 "Electronic Data Processing Systems" for the protection of mainframe electronic computer/information systems and major equipment or process control computer systems. The general concepts and many of the specific recommendations may also be applied to minicomputer systems, equipment and process control centers, and distributed control systems whose loss would create a business interruption or which have a relatively high value, as well as to high value electronic equipment not covered by other data sheets. However, considerable judgment should be used in applying recommendations to ensure that they are cost effective for the specific case under study.

Systems provided for under the contract shall be compatible and integrate with existing TTUS components and shall be provided for at the Contractor's expense.

Reference the Texas Tech University Operating Policies and Procedures website at <http://www.depts.ttu.edu/opmanual/> for further policies.

TTUS Project Manager will provide DP with the TTU Operations Division Standard Custodial Room design plan.

Where projects involve designing, entering and/or performing work in laboratories on any TTUS campus, project design teams and workers shall follow and adhere to the safety and health guidelines as outlined in The Texas Tech University Chemical Hygiene Plan. This plan can be referenced on the TTU Environmental Health & Safety web page <http://www.dept.ehs.ttu.edu/ehs/ehshome/labsafety>.

Campus Master Plans

The Texas Tech University System has been challenged with two goals: (1) Support the growth to 40,000 students by the year 2020; and (2) Support Tier 1 achievement. All building design shall follow the guidelines established in the Campus Master Plan's Architectural and Site Design Guidelines located on the FP&C website. In the event of a conflict between this document and the Architectural and Site Design Guidelines, please contact the Project Manager for clarification.

Texas Tech University System

The Texas Tech University System is comprised of four institutions in the following locations:

Texas Tech University	TTU Health Sciences Center (TTUHSC)	Angelo State University
Abilene	Abilene	Fredricksburg
Amarillo	Amarillo	Marble Falls
Fredericksburg	Dallas	San Angelo
Highland Lakes	Highland Lakes	
Junction	Lubbock	
Lubbock	Permian Basin	
Quedlinburg, Germany		
Seville, Spain	TTU Health Sciences Center El Paso (TTUHSC-EP)	
	El Paso	

Operating and Building Maintenance

The design of all buildings and the systems and materials incorporated into all buildings should be selected on the basis of aesthetics, long term operations, compliance with TTU standards where applicable, and deferred maintenance cost.

Project Administration

Per the Rules and Regulations of the Board of Regents (BOR) of the Texas Tech University System, all major construction projects that have received BOR approval shall be managed by the office of the TTUS FP&C. Major construction projects include: new construction projects with a total project budget of \$2,000,000 or more; and repair and rehabilitation projects with a total project budget of \$2,000,000 or more. Projects below the FP&C minimum project dollar limits will be managed by TTU Operations Division, ASU Facilities Management, Texas Tech University Health Science Center (TTUHSC), or the Texas Tech University Health Sciences Center El Paso (TTUHSC-EP).

Historically Underutilized Business (HUB) Program

In accordance with Texas Government Code (TGC) §2161.252 and Texas Administrative Code (TAC) Title 1, Part 5, Chapter 111, Subchapter B, Rule §111.14, each state agency (including institutions of higher education) as defined by TGC §2151.002 that considers entering into a contract with an expected value of \$100,000 or more shall, before the agency solicits bids, proposals, offers, or other applicable expressions of interest, determine whether subcontracting opportunities are probable under the contract.

If subcontracting opportunities are probable, each state agency's invitation for bids or other purchase solicitation documents for construction, professional services, other services, and commodities with an expected value of \$100,000 or more, shall state that probability and require a HUB Subcontracting Plan (HSP).

Texas Tech actively seeks the involvement of Historically Underutilized Businesses (minority-owned and woman-owned businesses) in its construction projects as providers of Professional Services, Construction Services, Supplies, Services, and Materials.

Building Codes and Standards

Each Project's Design, materials, and construction shall conform to the most current adopted code editions by the State of Texas and their local municipalities (unless noted otherwise) of the following published documents:

International Building Code (IBC);

International Energy Conservation Code (IECC);

International Fire Code (IFC) (edition adopted by State Fire Marshall);

International Plumbing Code (IPC);

International Electrical Code Administration Provisions (IECAP);

NFPA 101, Life Safety Code and all referenced codes (edition adopted by State Fire Marshall);

National Electric Code (NEC);

National Fire Protection Association Codes and Standards (edition adopted by State Fire Marshall);

ANSI/ASME A17.1 & 17.3 Safety Code for Elevators and Escalators (edition adopted by TDLR);

ANSI A136.1 Standards for Safe Use of Lasers;

United States Environmental Protection Agency regulations;

ASHRAE Standards 90A,B, & C-Energy Conservation in New Building and Design as adopted by SECO; and United States Department of Health, Public Health Service regulations and guidelines.

Sheet Metal and Air Conditioning Contractor's National Association (SMACNA);

State Energy Conservation Office (SECO) and their adopted codes; and

Biosafety in Microbiological and Biomedical Laboratories (BMBL), HHS Publication No. (CDC)21-112.

State statues adopted by the Texas Department of Licensing and Regulation, but not limited to the following:

Asbestos;

Boilers;

Control of Radiation;

Energy Consumption;

Fire Escapes;

Fire Alarms;

Plumbing Fixtures;

Texas Accessibility Standards of the Architectural Barriers Act;

State Fire Marshall's Office (SFMO);

Texas Department of Licensing and Regulation (TDLR);

Americans with Disabilities Act (ADA);

Accessibility Guidelines for Buildings and Facilities;

United States Department of Labor Occupational Safety and Health Administration (OSHA) regulations;

and Texas Commission on Environmental Quality (TCEQ).

Texas Tech University Systems requirements for:

TTUS FP&C Design and Building Standards; and

FM Global Standards for roof systems, fire alarm systems, and fire protection systems; and

TTUS Operating Policies and Procedures.

Public Art Program

One percent of the total project budget of each new major construction project will be allocated for the acquisition of works of public art, unless an exception is approved by the Board of Regents. These works of public art shall be located at or near the site of the construction project or, insofar as is permissible under the laws and applicable to the source of funds, the funds may be aggregated and expended pursuant to a comprehensive art and aesthetic improvement plan, as approved by the Board of Regents.

Landscape Enhancement Program

One percent of the total project budget of each new major construction project will be allocated to the enhancement of exterior landscape, hardscape, and waterscape features unless an exception is granted by the Board of Regents. These enhancements shall be located either at or near the site of the construction project or, insofar as is permissible under Texas Tech policies and applicable to the source

of funds, the funds may be aggregated and expended pursuant to a comprehensive art and aesthetic improvement plan, as approved by the Board of Regents.

Pre-Installation Meetings

The Contractor will conduct and document pre-installation meetings for all specification divisions. Texas Tech FP&C will participate in the pre-installation meetings and shall be given (1) week advance notice of intent to start installation of any building component. Texas Tech representatives must be permitted to perform a pre-installation inspection of materials and equipment, to be present throughout the installation process, observe installation techniques for compliance with plans and specifications, and to participate in the final inspection. The Contractor shall provide the Project team documentation from the pre-installation meeting, including but not limited to: thorough understanding of Project plans and specifications, review of addendums and RFI's, submittal approvals, mock -up requirements, testing requirements, owner training requirements, safety concerns and precautions, warranty requirements, TTU OPP's, and SWPPP requirements.

Interior Design (ID)

The intent of TTUS FP&C's Interior Design is for the project interiors to represent the client's specific needs and desires, have durable, appropriate and easily maintainable finishes. In addition, there are a couple of colors which Texas Tech would prefer not to use or to use very sparingly, including rust (burnt orange) and burgundy (maroon). On projects other than Athletic projects, they can be considered as a minor accent color. On Athletic Projects, they will not be considered.

The Interior Design package will be included in the Design Professional's services. The Design Professional's Interior Designer (DPID) will work cooperatively with TTU FP&C and other Project team members to successfully provide the Interior Design services required. The full scope of the Interior Design Services shall be completed within budget and on schedule, including furniture and general artwork (not to be confused with Public Art).

The Interior Design scope of work should include but not be limited to:

1. Selection of appropriate interior finish material types.
2. Specification/Presentation of specific interior finishes.
3. Production of detailed material schedule and room finish schedule(s).
4. Drawings such as renderings, elevations, details and enlarged floor plans clarifying special designs, patterns, details, accent walls, etc.
5. Interior Finish sample boards or finish notebooks, as required by FP&C and/or the client.
6. Space planning of furniture, fixtures and equipment (FFE).
7. Coordination of FFE placement with power and data plans, including placement of switches, T-stats, fire strobes and other MEP items.
8. Preparation of preliminary and final FFE budget.
9. Selection/Presentation of FFE items.
10. Preparation of documents required by TTU FP&C for procurement of FFE, including

- installation plans.
11. Selection of general artwork and accessories for public areas (not to be confused with Texas Tech's Public Art Program).
 12. Preparation of documents required by TTU FP&C for procurement of art and accessories.
 13. Management of FFE (provide TTU FP&C schedules, order status updates, coordinate delivery and installation, inspect FFE and full time onsite supervision of FFE furniture installation).
 14. Design of Donor Signage, if required, including preparation of drawings, specifications, price quotes and other documents required for procurement.
 15. Move management/relocation services.
 16. Interior punch lists and inspections. It is imperative that the DPID inspect and write a furniture punch list for all furniture provided by a furniture dealer as soon as that dealer has completed their work. This Punchlist is to be managed by the DPID until all items are corrected.
 17. All interior design FFE associated issues.

It is FP&C's intent that the DPID be an integral part of the team, being involved from the very beginning of the project. As the project progresses into Schematic Design Phase and Design Development, the DPID must attend selected project meetings with the Client, FP&C and the Project Design Team.

During the Schematic Design Phase, the DPID shall include development of interior elevations, floor plans and selection of types of interior finish materials.

The Interior Designer assigned to the Project shall be licensed to practice in the State of Texas by passage of the National Council for Interior Design Qualification (NCIDQ exam). Any exceptions must be reviewed and approved by FP&C.

Accessibility Guidelines

It is Texas Tech's intent to design and construct a fully accessible facility. All elements of this project are required to comply with the applicable Texas Accessible Standards (TAS). Specifically, all sidewalks, walkways, gradients, etc. in the project as well as those connecting to surrounding facilities are required to be an accessible route. Additionally, accessible routes shall be provided throughout the buildings to provide access to the entire facility. Accessible routes shall be designed so as to provide seamless access to all individuals and shall not separate handicapped individuals and their companions. See the Texas Accessibility Standards for complete requirements. The facility must contain the required number of rooms for physically challenged students. These rooms shall be located on the first floor and distributed throughout the facility. The facility shall also contain the required number of rooms for visually and hearing impaired students, also distributed throughout the facility. These rooms may be located on any floor. In the design of the project, steps shall be avoided to the maximum extent possible. Ramps with handrails and stairs, other than fire egress stairs, shall also be avoided. All accessible parking spaces and access aisles shall be the universal type and have a slope in any direction no greater than 2%. Use lay-down curbs at accessible parking areas with in-line curb ramps away from the parking spaces. The in-

line curb ramps shall have a slope of 5% or less in the direction of travel. Use parking bumpers, as needed, to hold the vehicles back for pedestrian access to the sidewalks. The accessible parking symbol is not required to be painted on each accessible space. Standard accessible parking signs are to be used with the universal type accessible parking spaces. Van accessible parking signs are not required when universal parking is utilized.

Construction Documents shall contain statements that require adherence to these directives notwithstanding any other information contained in the plans and specifications.

Alternates

The Design Professionals shall clearly define within the contract documents all work to be added, deleted or modified by alternates, and shall consider all effects that the alternate will have on the project, including to other systems and scheduling.

Addenda

Any addenda issued in writing by the Design Professional prior to the proposal closing time shall be covered by the proposal and acknowledged therein. In closing the Contract, such addenda will become a part thereof and modify the Specifications and/or the Drawings accordingly. Verbal changes in the work as shown or described, will not be binding.

Drawings and Specifications

The drawings and specifications are intended to describe and provide for a finished and complete piece of work, and all work must meet the requirements of all the applicable and governing laws, ordinances, rules and regulations of the locality. No extra compensation will be allowed for oversight of any such requirements, except by written order issued by Texas Tech.

Contingency Allowance

Contingency allowance shall be used only as directed for Texas Tech's purposes, and only by prior written approval which designates amount to be charged to contingency allowance. Contractor's related costs are not included in the contract sum (other than allowance itself) for work so ordered to be charged to contingency allowance. Texas Tech will NOT pay CM/GC a mark-up for Overhead/Profit for changes from the Contingency Allowance. At time of project close-out, unused amounts remaining in the contingency allowance shall be credited, in total, to the Owner by change order.

Delays and Extension of Time

The number of weather days for the following months shall be considered average lost weather days. No time extension for weather delays will be given unless the number indicated is exceeded.

Lubbock, Amarillo, & Odessa

January	2 days	July	4 days
February	2 days	August	4 days
March	2 days	September	4 days
April	3 days	October	3 days
May	4 days	November	2 days
June	5 days	December	2 days

El Paso

January	2 days	July	4 days
February	1 days	August	4 days
March	1 days	September	3 days
April	1 days	October	2 days
May	1 days	November	2 days
June	2 days	December	2 days

San Angelo and Abilene

January	2 days	July	2 days
February	3 days	August	3 days
March	3 days	September	3 days
April	2 days	October	4 days
May	5 days	November	2 days
June	4 days	December	2 days

Energy Conservation Design

Unless noted otherwise, the Design Professionals shall design to and certify that the project complies with the State Energy Conservation Office (SECO) adopted standards and codes, and submit a copy of that certification to the State Energy Conservation Office (SECO) at least thirty calendar days prior to start of construction. This certification form can be found on the SECO website at: <http://www.seco.cpa.state.tx.us/>. The design team shall provide TTUS three bound copies containing the completed certification form and all necessary information and calculations to support certification. Unless instructed otherwise by the FP&C PM, the project shall be designed and built to meet the minimum LEED certification standards.

Quality Control

Quality Control is the responsibility of the Design Professional and Contractor. A Quality Control Plan shall be submitted by the Contractor to TTU FP&C prior to beginning work.

The Design Professionals will specify the required testing and inspections for each TTUS project. TTUS will contract with independent testing agencies to perform specified testing of materials to ensure quality control.

The contractor will pay for re-testing of materials or systems when tests do not meet project requirements.

Each project will be assigned an FP&C Inspector(s) to ensure, through advanced inspections and quality control processes during all phases of construction, that the Texas Tech University System and its clients receive facilities that are built per project plans and specifications and meet or exceed the TTUS FP&C Design and Building Standards.

Inspectors must be given an advanced notice by the GC/CM of 48 hours prior to any project quality assurance event.

Nothing in the Design Guidelines shall limit the right of Texas Tech's designated representatives to access and observe all job site activities.

FP&C will determine if mockups will be required. If so, the Contractor shall build a mock-up/prototype and have Texas Tech approve the construction before proceeding with further construction. The prototype should be constructed at the permanent facility, if practicable.

The Contractor shall provide training for TTUS staff in proper maintenance and operation of all building systems and equipment.

Temporary Facilities

The Contractor shall furnish and maintain during construction of the project, adequate temporary office facilities at the site for the use of the Contractor, Owner's Representative and Texas Tech Project Manager/Inspector.

Contractors or subcontractors are not allowed to use toilet facilities in existing buildings, except when specifically approved by the owner's representative. The Contractor shall provide chemical toilet facilities and proper sanitation means for all workers and shall remove same at completion of the work. Toilets shall be completely enclosed and of neat appearance and shall be located as directed. Toilets are required to be staked down per the Storm Water Pollution Protection Plan for the project.

Provide on the premises, at locations approved by Texas Tech, suitable substantial watertight, securable storage sheds for storage of tools and all materials which might be damaged if exposed to the weather. Texas Tech will not be responsible for lost or stolen contractor/subcontractor's tools.

The Design Professionals shall specify control measures to contain construction-related dust, contaminants, and odors within the construction limits. Construction-related dust, contaminants, and odors shall not interfere with university operations.

Construction fence shall be a six foot (6') high chain link fence with steel posts and gates. The fence may be of new or of approved salvage materials with minimum bracing required for stability. The construction fence shall be kept neat and orderly, free from accumulations of trash and weeds.

Temporary Utilities

The Design Professional shall provide a preliminary assessment of the temporary utilities required for construction. The Design Professional shall coordinate the locations of, and capacity for, temporary

utility connections with the project manager. The Design Professional shall confirm with the Owner's Representative how the cost for the temporary utilities will be addressed in the project budget and contract documents.

The Contractor is responsible for all cost associated with the installation, and removal of the temporary utility systems. All outages associated with the temporary utility connections will be coordinated through TTUS. Allow 48 hour shutdown notifications for all utilities.

Provide temporary heating apparatus and operating fuel as necessary for the proper protection of work. The Contractor shall furnish temporary connections to the permanent heating or ventilation system as required to maintain operations of all existing HVAC systems. The Contractor shall maintain functionality of all existing HVAC systems required for all occupied spaces of the construction site. The Contractor shall restore the system to full functionality before turning over to Texas Tech. This shall in no way affect the guarantee period, which shall start at final acceptance of all work.

Site Security

Construction site security is the responsibility of the Contractor.

Construction Site Waste

The Contractor shall remove from the Campus and dispose of all unused materials and debris created by this construction. The Contractor is to keep the streets and construction area free of rubbish and debris. Grass and weeds within the construction fence are to be kept mowed. The site shall comply with the City Code and Environmental Safety regulations. The Contractor shall broom the streets during the excavation and fill process so that all spillage is removed as the work progresses.

Safety Requirements

Unless otherwise specified by the Owner in writing, the Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. It shall be the duty and responsibility of the Contractor and all of its Subcontractors to be familiar and comply with all requirements of Public Law 91-596, 29 U.S.C. §651 et. seq., the Occupational Safety and Health Act of 1970, (OSHA), and all amendments thereto, and to enforce and comply with all of the provisions of the Act. Contractor shall comply with all applicable laws and regulations of any public body having jurisdiction for safety of persons or property to protect them from damage, injury or loss and shall erect and maintain all necessary safeguards for such safety and protection. All Contractors are to supply and keep on file at TTUS FP&C a current Contractor's Safety and Health Plan.

Fire Safety

All fire and life safety policies and procedures can be found on the Environmental Health & Safety Web site at <http://www.depts.ttu.edu/ehs/Web/FireSafety.aspx> by clicking on the "University Fire Safety Program" link. Contractor is responsible for fire and life safety on the Project.

Parking

The Contractor shall maintain parking facilities for construction personnel within the area designated by the construction limits or any other area on campus designated by Texas Tech. Employees of the Contractor, its subcontractors or material suppliers shall park on campus only if space is available.

Requests for construction parking permits may be submitted to Texas Tech's ODR. The Contractor/subcontractor will be required to submit vehicle information for verification by Texas Tech's ODR. The Contractor/subcontractor will then be issued a Contractor's parking permit from Traffic and Parking.

The Contractor will be permitted a minimum of two (2) parking spaces, adjacent to the construction site. Nothing in this requirement is intended to abrogate the Contractor's regulation of employee parking, service vehicles and construction equipment within the contract limits.

If the Contractor is allowed space in the FP&C contractor overflow parking area located at 1725 Knoxville Ave., Lubbock, Texas, the following stipulations will apply:

1. All distant contractor parking will be directed by the FP&C Project Manager or the FP&C Director of Project Administration.
2. Containers and storage units will be assigned a designated location by the FP&C Director of Project Administration or the FP&C Project Manager.
3. Deliveries will be coordinated by the General contractor.
4. General Contractor's orientations and preconstruction meetings with subcontractors shall include this information, and include any issues regarding overflow parking safety reports, security, housekeeping, storage, and hazardous materials.
5. Texas Tech University is not responsible for damage or theft inside the FP&C overflow parking area.
6. Housekeeping and waste management will be the responsibility of the General Contractor.
7. Damages to Texas Tech University property such as fencing, gates, and posts, shall be reported as soon as possible to the FP&C Project Manager or the FP&C Director of Project Administration.

All individuals operating a vehicle on property owned and operated by TTU shall comply with the Traffic and Parking Regulations for Texas Tech.

Refer to TTU Operating Policies and Procedure 78.04 "Contractor Parking" for more specifics.

Project Signs

The Contractor shall install where directed, a project sign at two (2) locations at the site. The project sign shall be designed to comply with project specifications provided by FP&C. The contractor shall submit a drawing of the proposed sign, showing its size, content, and location to the Texas Tech ODR for approval prior to installation.

The Contractor may install one sign bearing the company name and logo indicating the point for delivery for material, supplies, and express deliveries at one gate. The company sign will be of the same size and orientation as the Project sign.

Other than the signs above, 911 address signs, interior site way finding signage and any signs required by safety and insurance requirements, no other signs will be installed at the project site. Signs attached to storage and office trailers may be approved by the ODR if they do not detract from the appearance of the campus.

Exterior construction project sign and 911 address signs shall be installed immediately after contract award. The Contractor shall remove exterior construction project signage prior to submission of Contractor's Final Application for Payment.

Exterior construction project signage shall be constructed of exterior grade ¾" CDX plywood. The size shall be 96" in length and 48" in height. The orientation shall be landscape (horizontal). The signage surface will be mounted to 4"x4" posts temporarily set in the ground. The bottom edge of the signage shall be at a minimum 48" above grade and installed level. All exposed surfaces (sign faces, edges, and posts) shall be weather sealed with white exterior latex paint.

Reference Attachment #1 for samples of project signs.

Project Closeout

When the FP&C Project Manager and the Design Professional determine that a project is complete (including all punch list items), a formal project closeout meeting shall be held and attended by the following:

1. FP&C Project Manager and Inspector
2. Design Professional representatives
3. Contractor's Project Manager and Superintendent at a minimum
4. Texas Tech University/TTU Health Science Center – Construction Coordinating Team representatives
5. User Representatives
6. Major subcontractors

At the closeout meeting, upon documentation of exceptions and assignment of completion responsibilities, the following material/data will be released by the FP&C Project Manager to the user and the TTU or TTUHSC Operations division personnel:

1. Certification of Punch List completion
2. Final reports and certificates of Commissioning and TAB
3. Complete marked-up construction drawings for DP and established distribution date for as-built drawings. Electronic as-builts will be distributed upon DPs completion.
4. 100% CDs in Autocad format
5. Three copies of complete operation and maintenance manuals (as specified) for but not limited to the following; elevator, fire alarm, sound system, specialty equipment, roofing systems, mechanical, electrical, fire protection, access control, security, and plumbing, including approved submittals of all items.
6. Keys assigned to the Contractor and checked out from the Lock Shop.
7. Building and elevator keys
8. All warranty documents for all items and work associated with the project, including any extended warranties for roofing and other items as may have been specified for the project. A tabular list shall accompany the warrantee documents showing the date the warrantee started and the date the warrantee expires. If an extended warrantee is provided for the project and the terms include proration, the list shall indicate the dates of the prorations.

9. Other documents as specified in the contract documents necessary for the User to properly maintain the facilities.
10. Signed receipts of showing previous delivery to the responsible Texas Tech department of spare parts, extra stock and/or test equipment required by the contract documents.
11. Complete record of project changes to establish as-built conditions of the project as represented in the as-built documents.
12. Names and 24-hour telephone numbers of contractor representatives for warranty work.
13. Building contact information (business hours and after hours)
14. Product information/technical data and manufacturer's maintenance recommendations for carpets, furnishings (if applicable), trash receptacles, floor seals and finishes.
15. Training material and documentation.

Reporting: Minutes of the Project Close-out meeting will be kept by the Contractor and any exceptions to the above will be recorded. Suspense dates for completion of exceptions will also be established to ensure expeditions completion. Copies of the minutes will be forwarded to all attendees.

Commissioning (CxA) / Testing and Balancing (TAB)

Commissioning is the Owner's comprehensive quality assurance program, beginning with the predesign phase of the project, continuing through the design and construction phases, and culminating in sustainable training and operation by the owner's staff. Commissioning is a programmed series of quality assurance, documentation, and testing activities that are performed specifically to ensure that the finished facility operates as intended.

The overall CxA approach will be to utilize as many "principles and best-practices" of the commissioning process as outlined in *The Building Commissioning Handbook* by John A Heinz, P.E., and Richard B. Casault, P.E. to verify supporting infrastructure systems functional performance. The approach will support construction phase design document reviews, CxA planning, site observations, system readiness checklists and functional performance testing script procedures, corrective actions and re-testing as needed to verify that the infrastructure systems are functioning as per project design intent and construction documents. The following is a basic

OVERVIEW outline (but-not-limited-to) of the commissioning services (CxA) roles and responsibilities:

1. Provide all labor, services, supplies, materials and equipment required to complete the work.
2. Review and understand the Owner's / Users / O&M project requirements, basis of design and Design intent.
3. Develop, monitor and maintain a construction phase CxA plan.
3. Coordinate and facilitate a construction phase kickoff meeting with an overview of the CxA plan along with roles and responsibilities of the CxA and supporting responsibilities from Owner, design team and contractor.
4. Attend selected construction phase progress meetings, facilitate CxA agenda items.
5. Review equipment submittals, RFI, ASI, O&M manuals, shop drawings, VE recommendations for impact and support of the CxA process.
6. Conduct selected site observations for issues that could impact the CxA process.
7. Attend selected equipment installations, start-up, preliminary checkout and functional operation.
8. Develop project specific system readiness checklists (SRC) for contractor implementation. Back check and verify a sampling of the process.
9. Develop for implementation, by contractor(s), project specific functional performance testing scripts. Facilitate, witness and document implementation of the FPT's.
10. Develop and sustain a corrective action log and report for systems that do not meet DID during

- initial testing.
11. Witness and document re-testing of systems that did not meet initial testing scripts.
 12. Monitor and witness a sampling of the contractor required training programs.
 13. Develop and facilitate a systems wide overview training program for Owner's O&M staff.
 14. Develop and submit a final CxA report of process and final benchmark settings of all system groups and controls.
 15. Facilitate opposite season and deferred testing.
 16. Coordinate and facilitate a 10th month into contractor warranty period up to a one day meeting to determine remaining operational and/or warranty issues.

The Commissioning Agent Professional Services will be directly contracted with TTUS FP&C.

TTUS FP&C will determine on a per project basis what level of commissioning is required.

TTUS FP&C prefers to have the TAB included in the commissioning agent's professional services.

The Design Professionals will provide to the commissioning agent all design intent documentations, contract documents, shop drawings, submittals, test and balance reports, completed equipment start-up reports, inspection reports, and test results.

The Contractor is responsible to provide all required support to commission the facilities. The Contractor shall provide all support required for start-up, testing, and commissioning and work with the CA to develop documentation of the commissioning effort, and submit all documentation of the controls commissioning that the CA requires. The Contractor shall schedule in the project schedule adequate time to accommodate commissioning activities which will include, but not limited to, inspections of installed systems prior to wall/ceiling closures, and the testing of components and systems when installed and operational. The contract documents shall include requirements for all subcontractors and suppliers to support commissioning activities.

The Commissioning Agent shall submit a commissioning plan to the Design Professionals prior to the commissioning process. That plan must be approved by the Design Professionals and FP&C. The CA shall submit a completed commissioning report after testing is complete.

Services of the Commissioning Agent shall be conducted under the direction of a licensed engineer charged with engineering managerial responsibility. Such person must be a registered engineer in the State of Texas and a full-time employee of the Commissioning Agent.

Asbestos Compliance and Abatement

The asbestos program at Texas Tech University consists of the following two separate entities:

1. Asbestos Compliance Management Section - The asbestos compliance management section is in the EH&S Department. It is responsible for training, surveying, sampling, analysis, quality control, recordkeeping, and communication to other departments.
2. Insulation/Abatement Shop - The insulation/abatement shop is in the Building Maintenance and Construction (BM&C) Section of Physical Plant. It is responsible for repair, encapsulation, abatement, transportation, and disposal.

Each department operates under departmental procedures that meet or exceed governmental regulations. Each department shall operate independently of the other to minimize any potential conflict of interest. Federal and state regulatory agencies with jurisdiction over asbestos at TTU are the Environmental Protection Agency, U.S. Department of Transportation, Texas Department of State Health Services, and the Texas Commission on Environmental Quality. Additional agencies with limited jurisdiction are the Railroad Commission of Texas and the Texas Department of Public Safety. Additionally, employees of private contractors working at TTU are subject to the regulations promulgated by the United States Department of Labor-Occupational Safety and Health Administration. Contact EH&S a minimum of twelve weeks prior to the initiation of any large scale project that may involve asbestos materials or be suspected of containing asbestos materials so that a survey, bulk sampling, and assessment can be scheduled and conducted. In the event the asbestos compliance manager determines the requested work cannot be accomplished by the available resources, the respective FP&C Project Manager shall be notified.

Reference the TTU Operating Policies and Procedure 60.08 *“Asbestos Compliance and Abatement Program”* for more specifics.

Hazardous Contaminates

Soil or other materials to be imported for use on any Texas Tech University System Project must meet the Requirements set forth by the US Environmental Protection Agencies Resource Conservation and Recovery Act (EPA RCRA) Regulation as stated under 40 CFR 261.24.

This covers the Toxicity Characteristic for the listed chemicals. The testing of the soil or other materials will show these constituents through the TCLP testing method (metals and pesticides), BTEX testing method (volatile organic compounds), and TPH testing method (Total Petroleum Hydrocarbon). Other variables may come into consideration and depending on the source of the soil material we may require other tests as necessary.

The link to the maximum concentration of contaminants for the toxicity characteristic is <http://www.gpo.gov/fdsys/granule/CFR-2011-title40-vol26/CFR-2011-title40-vol26-sec261-24>.

If upon discovery of these hazardous contaminants, the Contractor is responsible for notifying Texas Tech and providing their intent for removal of the contaminants.



12" x 12"

Insert project picture or graphic
60" x 20"



11.5" x 13.5"

3.5" Letters
PROJECT NAME

PROJECT BUDGET: \$XX,000,000
(or DONOR FUNDED PROJECT)

2.25" Letters CONTRACTOR
Company Name

2.25" Letters OWNER'S REP
Company Name

2.25" Letters DESIGNER
Designer Name

2" Letters — FP&C PROJECT MANAGER

2" Letters — PM's NAME

1.5" Letters — (806) 742-2116



12" x 12"

Insert project picture or graphic
50" x 20"



12" x 20"

3.5" Letters
PROJECT NAME

PROJECT BUDGET: \$XX,000,000
(or DONOR FUNDED PROJECT)

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Company Name

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Company Name

2.25" Letters DESIGNER
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Project Sign Examples