

GUIDELINES / STANDARDS

TEXAS FACILITIES COMMISSION - PROFESSIONAL SERVICE PROVIDER GUIDELINES AND STANDARDS



Edit Date: 1/15/2010

This document replaces the previously published Architectural/Engineering Guidelines (Revision Date: February 1, 2008).

Revised portions have been included in a new tabular format for greater clarity.

Unrevised portions remain in the previous outline format.

Additional revisions to the Guidelines/Standards will be issued from time to time to reflect the latest TFC practices.

As revisions are issued they will be published in the new tabular format.

The electronic version of this document contains hyperlinks to relevant internet web-sites as well as pertinent locations within the document itself.



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ABBREVIATIONS - GENERAL			
<u>ADA</u>	Americans With Disabilities Act	<u>IPD</u>	Internal Procurement Division (TFC)
<u>ADAS</u>	ADA Standards	<u>LDC</u>	Land Development Code (City of Austin)
<u>AHJ</u>	Authority Having Jurisdiction	<u>LJA</u>	Local Jurisdictional Authority(ies) – Building Plan Review, Site Plan Review, Utility Providers, Fire Department...
<u>ANSI</u>	American National Standards Institute	<u>NFPA</u>	National Fire Protection Association
<u>ASHRAE</u>	The American Society of Heating, Refrigerating and Air-Conditioning Engineers	<u>OAC</u>	Owner / Architect / Contractor
<u>BMS</u>	Building Management System	<u>PDF</u>	Adobe Acrobat file type
<u>BIM</u>	Building Information Modeling	<u>PSP</u>	Professional Service Provider
<u>CADD</u>	Computer Aided Design and Drafting	<u>RVT</u>	Autodesk Revit file type
<u>CCS</u>	TFC's Internet-based Central Collaboration Server	<u>SECO</u>	State Energy Conservation Office
<u>CHP</u>	Combined Heating and Power System	<u>SFMO</u>	State Fire Marshal's Office
<u>COA</u>	City of Austin	<u>SGC</u>	Supplemental General Conditions
<u>DIR</u>	Department of Information Resources	<u>SMSL</u>	Space Management & State Leasing Services (TFC)
<u>DPM</u>	Director of Project Management (TFC-FDC)	<u>SMP</u>	Space Management Program
<u>DPS</u>	Department of Public Safety	<u>TAC</u>	Texas Administrative Code
<u>DWF</u>	Autodesk Design Review file type	<u>TAS</u>	Texas Accessibility Standards
<u>DWG</u>	Autodesk Autocad file type	<u>TCEQ</u>	Texas Commission on Environmental Quality
<u>EAB</u>	Elimination of Architectural Barriers	<u>TDLR</u>	Texas Department of Licensing and Regulation
<u>EMPO</u>	Energy Management and Plant Operations (TFC)	<u>TDI</u>	Texas Department of Insurance
<u>FDC</u>	Facilities Design and Construction (TFC)	<u>TFC</u>	Texas Facilities Commission
<u>FMD</u>	Facilities Management Division (TFC)	<u>TGC</u>	Texas Statutes - Government Code
<u>HSC</u>	Health & Safety Code (Texas)	<u>THC</u>	Texas Historical Commission
<u>ICC</u>	International Code Council	<u>TRG</u>	Technical Resources Group (TFC-FDC)
<u>IMPACT</u>	TFC's Internet-based "Project Management Control System"	<u>UA</u>	Using Agency(ies)
		<u>UGC</u>	Uniform General Conditions

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ABBREVIATIONS – DESIGN DISCIPLINES			
ACOU	Acoustical	INT	Interiors
ARCH	Architecture	KIT	Kitchen
CIV	Civil Engineering	LAR	Landscape Architecture
COMM	Data/Communications	MECH	Mechanical Engineering
ELEC	Electrical Engineering	PLUM	Plumbing Engineering
FA	Fire Alarm	SEC	Security/Access Control
FURN	Furniture	STRU	Structural Engineering
GEN	General (Cover / Index...)		

ABBREVIATIONS – PROJECT PHASES			
BA	Contract Bidding & Award	MP	Mobilization / Pre-Design
CA	Construction Contract Administration	PA	Project Analysis
CD	Contract Documents	RD	Record Documents
DD	Design Development	SD	Schematic Design

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GUIDELINES / STANDARDS - PURPOSE		
TOPIC	INFORMATION	LINKS
Applicability	A. This document applies to all TFC projects contracted on or after the Edit Date indicated in the header above.	
Intent	A. Identify TFC preferred procedures, systems, and materials; and B. Aid the PSPs in delivering professional services resulting in facilities that meet or exceed TFC project and performance goals. C. The Guidelines/Standards are not intended to replace or circumvent the informed professional judgment of planning, design, and construction Professional Service Providers (PSPs). D. Professional judgment leading to recommendations that differ from these Guidelines/Standards must be communicated in writing through TFC's Project Manager (PM) for consideration and determination by TFC.	
Periodic Revisions	A. Revisions to the Guidelines/Standards will be issued from time to time to reflect the latest TFC practices, but only currently issued versions will be posted on the FDC Forms Index page of TFC's website. B. A project commencing under a specific Guidelines/Standards issue date may continue on the basis of that issue; however, it is the PSP's responsibility to keep a copy of the relevant Guidelines/Standards.	<ul style="list-style-type: none"> · FDC Forms Index
TFC Statutory Charge	A. Determining, creating, and protecting long term value in the public's investment for housing state government programs and functions. B. Texas Government Code (TGC) Chapter 2165 states that TFC: 1. "...has charge and control of all public buildings, grounds, and property..."; and 2. "...is the custodian of all state personal property...". C. Exceptions exist for certain named agencies and Higher Education.	<ul style="list-style-type: none"> · TGC 2165
Software Requirements	A. TFC has adopted Building Information Modeling (BIM) as a standard for producing the design and documentation for all projects developed under TFC authority. B. TFC-adopted BIM software versions are listed in the "BIM Standards - Overview" section of this document. C. CADD software may be used only in isolated circumstances as indicated in the "CADD Standards" section of this document	<ul style="list-style-type: none"> · BIM Standards · CADD Standards

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STATE AGENCIES		
Entity	DESCRIPTION	LINKS
Texas Facilities Commission (TFC)	<p>A. Agent for the State of Texas;</p> <p>B. "Owner" and/or "Lessor" for capital construction and leasing projects.</p> <p>C. TFC Divisions:</p> <ol style="list-style-type: none"> 1. Facilities Design and Construction (FDC): <ol style="list-style-type: none"> a. Represents TFC in its capital construction projects; b. Assigns a Project Manager (PM) to each project. 2. Space Management Program (SMP): <ol style="list-style-type: none"> a. Reviews and approves space allocations for Using Agencies; 3. Facilities Management Division (FMD): <ol style="list-style-type: none"> a. Manages and maintains facilities and grounds in properties owned or operated by TFC. 4. Internal Procurement Division (IPD): <ol style="list-style-type: none"> a. Procures goods and services for use by TFC including but not limited to: <ol style="list-style-type: none"> i. New construction of state office property; and ii. Professional services such as architectural and engineering services. 	<ul style="list-style-type: none"> • TFC • FDC • SMP • FMD • IPD
Using Agency (UA)	<p>A. The agency (or agencies) for which TFC manages the design and construction process of a project.</p>	
Other Key Agencies	<p>A. Department of Public Safety, Capitol District (DPS):</p> <ol style="list-style-type: none"> 1. Administers the Austin area parking programs for TFC facilities; 2. Provides physical security for state personnel and property; and 3. Installs and controls Austin area keyways and keys. <p>B. Elimination of Architectural Barriers (EAB) - Texas Department of Licensing & Regulation's division responsible for certification of all plans and specifications for accessibility to persons with disabilities in accordance with the Texas Architectural Accessibility Standard.</p> <p>C. State Energy Conservation Office (SECO) - responsible for developing and administering standards for energy efficient design for state buildings and facilities.</p> <p>D. Department of Information Resources Telecommunications (DIR) - operates the local Capitol Complex telephone systems, a statewide long distance network and provides consulting on telecommunication aspects of projects throughout the state.</p>	<ul style="list-style-type: none"> • DPS • TDLR • EAB • SECO • DIR

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STATUTORY REQUIREMENTS		
REQUIREMENT	SUMMARY DESCRIPTION	LINKS
General	A. TFC statutory requirements of general interest to the PSP or that require PSP compliance include but are not limited to the following:	<ul style="list-style-type: none"> • TGC 2151 • TGC 2152 • TGC 2155 • TGC 2156 • TGC 2157 • TGC 2158 • TGC 2161 • TGC 2162 • TGC 2163 • TGC 2165 • TGC 2166 • TGC 2167
TFC Enabling Statute	A. The Texas Facilities Commission Act, Articles 2151 through 2167, Texas Government Code (TGC) establishes the authority of the Texas Facilities Commission.	
FDC Activities and Limits	A. TGC Chapter 2166 generally describes the activities and limits of the Facilities Design and Construction division of TFC.	
Project Funding	<p>A. TGC Chapter 2166.251(c) "The appropriation of funds by the legislature for the construction of a project shall be construed by TFC and the using agency as an expression of legislative intent that the project be completed within the limits of the funds actually appropriated ..."</p> <p>B. The State's goal is to include all project requirements in the bid documents to assure that all aspects of the project have been competitively bid thereby resulting in the best value for the State.</p>	
Change Orders	A. TGC Chapter 2166.257 - No additive change order may be authorized without approval by the PSP, the UA, and FDC's DED.	
Document Review	<p>A. TGC Chapter 2166.156(c) "...ensure that [preliminary and working] plans and specifications" for all facilities constructed for the purpose of housing a State of Texas agency (or agencies):</p> <ul style="list-style-type: none"> a. "Are clear and complete; b. Permit execution of the project with appropriate economy and efficiency; and c. Conform with the requirements described by the Project Analysis". <p>B. TGC Chapter 2166.156(d) "...approve plans and specifications before the Using Agency(ies) may accept or use them."</p>	

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STATUTORY REQUIREMENTS		(CONTINUED)
REQUIREMENT	SUMMARY DESCRIPTION	LINKS
Storm Water Pollution Prevention Plan	A. As applicable, projects require a Storm Water Pollution Prevention Plan (SWPPP) per TCEQ.	<ul style="list-style-type: none"> • TCEQ Construction Activities Regulations
Capitol Views	<p>A. Compliance with the most restrictive of the following is required:</p> <p>B. TGC Chapter 3151; and</p> <p>C. COA Land Development Code, 25-2-161, 162, 641, 642 and Appendix A.</p>	<ul style="list-style-type: none"> • TGC 3151 • COA - LDC
Energy / Water Conservation	<p>A. For leased and state owned facilities, TAC Title 34, Chapter 19, Subchapter B requires state agencies to:</p> <ol style="list-style-type: none"> 1. "...ensure preparation of a Resource Efficiency Plan..."; 2. Certify to [SECO] that the plan has been completed; and 3. "...implement the cost effective utility conservation measures in accordance with ... the agency's Resource Efficiency Plan...". <p>B. TGC Section 447.004 requires compliance with SECO's "The Energy Conservation Design Standard for New State Buildings".</p> <p>C. All design must comply with ASHRAE 90.1-(currently adopted edition) and furnish evidence of compliance with <u>energy efficiency (and water conservation effective September 1, 2009) standards</u> published by SECO.</p> <p>D. TGC Sections 2166.404 and 2166.405 require all projects to be designed for water conservation including irrigation and xeriscape planting.</p>	<ul style="list-style-type: none"> • TAC • SECO • TGC 447 • ASHRAE 90.1 • SECO Suggested Water Efficiency Standards • TGC 2166

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REQUIREMENT	SUMMARY DESCRIPTION	LINKS
<p>Alternative Energy Evaluations</p>	<p>A. TGC 2166.403 - All projects require a written economic feasibility evaluation of incorporating energy alternatives and energy-efficient architectural and engineering design into the building's design and proposed energy system.</p> <ol style="list-style-type: none"> 1. Alternative Energy is defined as a renewable energy resource including solar energy, biomass energy, geothermal energy, and wind energy. 2. SECO must approve any methodology or electronic software used in the analysis. 3. The evaluation must identify the best energy alternative for each function of the project over the economic life of the building considering costs and benefits of implementing alternative design practices and energy systems for all or part of each function relative to the use of conventional design practices and energy systems. 4. The evaluation must be made available to the public and presented at an open meeting. 5. If alternative designs or energy systems are determined to be economically feasible, the alternative design or system must be incorporated into the project. 	<ul style="list-style-type: none"> • TGC 2166 • SECO Approved Methodologies

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REQUIREMENT	SUMMARY DESCRIPTION	LINKS
<p>Combined Heating and Power (CHP) System</p>	<p>A. TGC 2311.002 – All new construction and extensive HVAC equipment renovations to <u>critical governmental facilities</u> require evaluation of the economic feasibility (over a 20 year period) of equipping the facility with a Combined Heating and Power (CHP) system.</p> <p>1. A critical government facility is defined as a building owned by the state or a political subdivision of the state that is expected to:</p> <ul style="list-style-type: none"> a. Be continuously occupied; b. Maintain operations for at least 6,000 hours each year; c. Have a peak electricity demand exceeding 500 kilowatts; and d. Serve a critical public health or public safety function during a natural disaster or other emergency situation that may result in a widespread power outage, including a: <ul style="list-style-type: none"> i. Command and control center; ii. Shelter; iii. Prison or jail; iv. Police or fire station; v. Communications or data center; vi. Water or wastewater facility; vii. Hazardous waste storage facility; viii. Biological research facility ix. Hospital; or x. Food preparation or food storage facility. 	<ul style="list-style-type: none"> · TGC 2311 (No link available at this time)

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REQUIREMENT	SUMMARY DESCRIPTION	LINKS
Exterior Lighting/Lighting Pollution	A. Health and Safety Code, Title 5, Subtitle F, Chapter 425 requires outdoor lighting fixtures to be cutoff type luminaires under specific circumstances.	<ul style="list-style-type: none"> • HSC 425
Codes and Standards	<p>A. The most restrictive requirements of the following codes and standards will govern:</p> <ol style="list-style-type: none"> 1. NFPA 101 Life Safety Code - Latest adopted edition per SFMO (TGC 417.008(e) establishes the SFMO as the AHJ for fire safety in all state owned buildings). 2. International Code Council (ICC) family of codes (latest published editions). 3. NFPA 70: National Electrical Code (latest published edition). 4. NFPA 70E: Standard for Electrical Safety in the Workplace; 5. ASHRAE 90.1: Energy Conservation Design Standard for State-Funded Buildings (latest adopted edition per SECO); 6. Americans With Disabilities Act of 1990 (as currently amended); <ol style="list-style-type: none"> a. ADA Standards for Accessible Design; 7. TGC Chapter 469, Elimination of Architectural Barriers; <ol style="list-style-type: none"> a. Texas Accessibility Standards (and Technical Memoranda). <p>B. State of Texas properties are not subject to municipal or local codes, however TFC projects should be generally consistent with local land use practices. Cooperation with local services such as fire, watershed and utilities is advantageous to TFC projects.</p>	<ul style="list-style-type: none"> • TGC 417 • NFPA 101 • NFPA 101 - SFMO Adoption • ICC • NFPA 70 (NEC) • NFPA 70E • ASHRAE 90.1 • ASHRAE 90.1 – SECO Adoption • ADA Standards • TGC 469 • TAS Standards • Architectural Barriers Technical Memoranda

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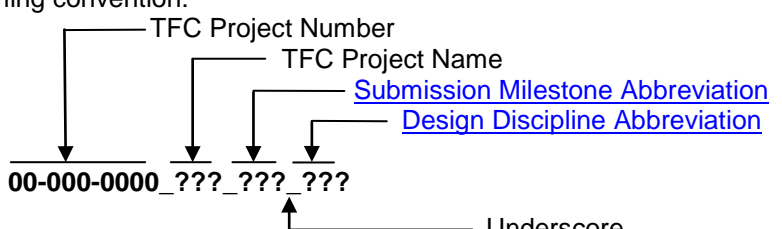


STATUTORY REQUIREMENTS		(CONTINUED)
REQUIREMENT	SUMMARY DESCRIPTION	LINKS
Hazardous Materials	<p>A. Prior to demolition or construction efforts on existing facilities;</p> <p>a. TAC, Title 25, Part 1, Chapter 295, Subchapter C, Rule 295.34 requires building owners to:</p> <ul style="list-style-type: none"> i. Survey the facility for asbestos-containing material (ACM); ii. Abate all asbestos-containing building material (ACBM) that could foreseeably be disturbed in the area to be renovated; and iii. Perform abatement in accordance with the Federal National Emission Standard for Asbestos (40 CFR, Chapter 61, Subpart M) <p>b. Obtain certification by a licensed engineer or architect that:</p> <ul style="list-style-type: none"> i. In the engineer's or architect's professional opinion, all parts of the building affected by the planned renovation or demolition do not contain asbestos." ii. Certification may be based on: <ul style="list-style-type: none"> (a) Current or previous surveys and reports; (b) Material safety data sheets for the materials used in <ul style="list-style-type: none"> (i) The original construction; and (ii) The subsequent renovations or alterations of all parts of the building affected by the planned renovation or demolition. 	<ul style="list-style-type: none"> • TAC, 25.1, 295, C, 295.34
Uniform and Supplemental General Conditions	<p>A. TGC Chapter 2166.302 requires TFC to adopt "...uniform general conditions to be incorporated into all building construction contracts made by the state".</p> <ul style="list-style-type: none"> 1. TFC's Supplemental General Conditions modify the UGC and are required by TFC to also be incorporated into all TFC construction contracts. 2. TFC's currently adopted UGC and SGC are available on the TFC website. <p>B. TFC has also developed Special Conditions that may be incorporated in construction contracts at the discretion of TFC.</p> <ul style="list-style-type: none"> 1. TFC Special Conditions, when required, may be obtained through TFC's PM. 	<ul style="list-style-type: none"> • TGC 2166 • UGC / SGC
Site Inspections	<p>A. TGC Chapter 2166.351 - TFC is responsible for protecting the interests of the state during construction through appropriate levels of inspections, including requirements upon the PSP.</p>	<ul style="list-style-type: none"> • TGC 2166

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SUBMISSION PROCEDURES		
PROCEDURE	PSP ACTIONS REQUIRED	LINKS
General	<p>A. TFC has adopted an electronic “Round Trip” review process intended to:</p> <ol style="list-style-type: none"> 1. Maximize clarity of communications between TFC and PSPs; 2. Minimize document review turn-around time; and 3. Reduce the environmental impact created by the traditional method of printing and transporting hard-copy documents. <p>B. Submit all documentation required at each project milestone as required in this section and in the Submission Milestones and Submission Content sections below.</p> <p>C. Clearly indicate the appropriate Edit Date of the Guidelines / Standards applicable to the project being submitted for review.</p>	<ul style="list-style-type: none"> · Round Trip Review Process · Submission Milestones
Electronic Documents (Soft Copy)	<p>A. BIM Models: At each submission milestone:</p> <ol style="list-style-type: none"> 1. Civil3D Files: <ol style="list-style-type: none"> a. Update the “.adsk” file(s) exported from the Building Model(s); and b. W-Block out information in “.dwg” file format. 2. Revit Files: <ol style="list-style-type: none"> a. “Synchronize” all Revit “Local Files” with the “Central Model File”; and b. Export the “Central Model File” to “.adsk” (only for projects that require coordination with Civil3D files). <p>B. Drawings: At each submission milestone:</p> <ol style="list-style-type: none"> 1. Publish, or Export (<u>do not scan</u>) drawing sheet views to “DWF” format; 2. Group sheets into separate files by design discipline using the following file naming convention: <div style="text-align: center;">  <p>00-000-0000_??_??_??</p> </div>	<ul style="list-style-type: none"> · BIM Standards

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* See next page for additional Submission Procedure requirements.

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SUBMISSION PROCEDURES		(CONTINUED)
PROCEDURE	PSP ACTIONS REQUIRED	LINKS
Electronic Documents (Soft Copy) (Continued)	<p>A. Specifications: At each submission milestone:</p> <ol style="list-style-type: none"> 1. Print (<u>do not scan</u>) all specification sections to DWF format (use Autodesk's free "DWF Writer" program); 2. Group specifications into separate files by Division Number; 3. Name division files using the following file naming convention: <div style="text-align: center;"> <p>00-000-0000_??_??_SPEC_##</p> <p>Labels: TFC Project Number, TFC Project Name, Submission Abbreviation, Division Number, Underscore</p> </div> <p>B. Update all files on TFC's Central Collaboration Server; and</p> <p>C. Verify that all appropriate parties receive notification that the files have been uploaded and are ready for review.</p>	<ul style="list-style-type: none"> • Submission Milestones • Autodesk "DWF Writer"
Printed Documents (Hard Copy)	<p>A. At each submission milestone:</p> <ol style="list-style-type: none"> 1. Print complete set of Drawings and Specifications; 2. Deliver complete, bound document sets to TFC's PM; and 3. Notify TFC's Project Manager that the printed documents have been sent. 	
Respond to Owner Comments	<p>A. Insert the DWF Mark-Up file into the appropriate BIM Model (or CADD file if applicable);</p> <p>B. Modify the BIM Model (or or CADD file if applicable) as appropriate to address Owner comments;</p> <p>C. While still in the BIM Model (or CADD file if applicable):</p> <ol style="list-style-type: none"> 1. Select each mark-up as it is addressed and modify the "Status" and "Notes" properties to indicate that the comment was addressed and how it was addressed. 2. Save the Markup (or republish the DWF if in CADD); <p>D. Follow steps D and E in the Electronic Documents submission procedure above.</p>	<ul style="list-style-type: none"> •

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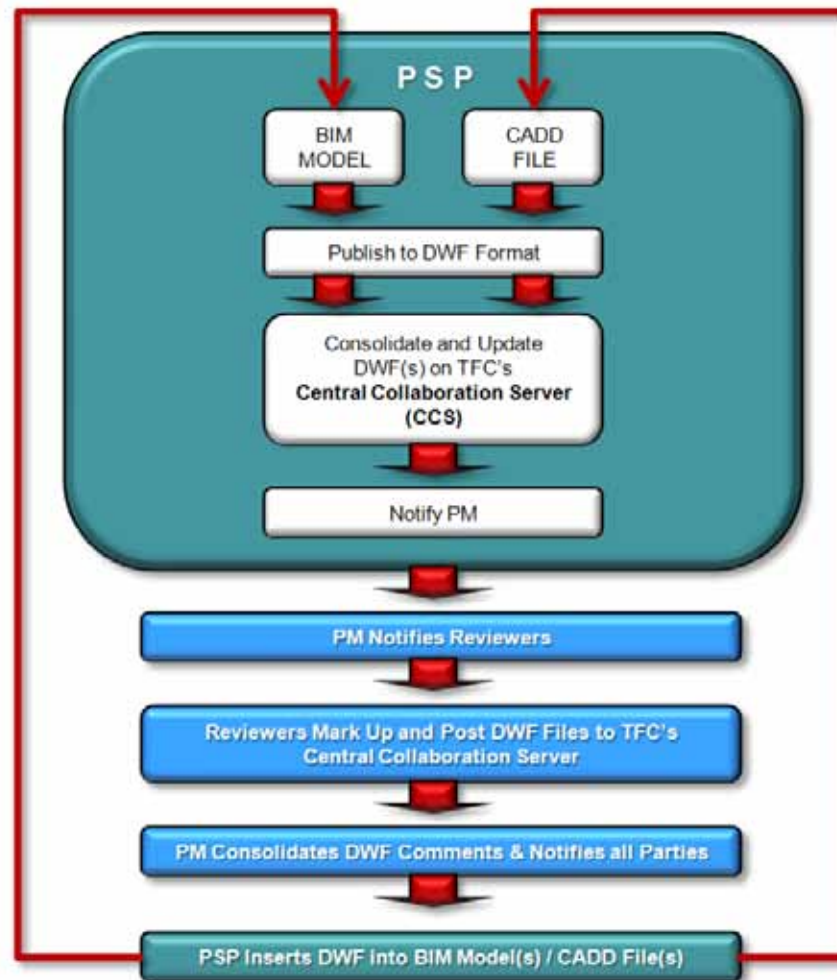
SUBMISSION PROCEDURES		(CONTINUED)
PROCEDURE	PSP ACTIONS REQUIRED	LINKS
SECO Compliance Form(s)	A. Submit the completed compliance certification form and supporting documentation to the PM: 1. For downloadable compliance forms, follow the link to the right (SECO's Building Codes and Standards web page).	<ul style="list-style-type: none"> · SECO – Texas Design Standard Compliance Forms Nonresidential Residential
Accessibility Review and Inspection	A. Register project with TDLR and pay registration fee; B. Submit proof of registration and sealed Contract Documents to TDLR or an RAS within the allotted time; C. Pay the review fee; D. Respond in writing to TDLR or the RAS regarding measures to be taken to address any conditions found to be non-compliant and issue a formal Addendum correcting the deficiencies; E. Schedule the accessibility inspection on or after the date of substantial completion; F. Pay the inspection fee; G. Respond in writing to TDLR or the RAS regarding measures to be taken to address any conditions found to be non-compliant and issue a formal Change Proposal or directive. H. Provide TFC's PM with copies of all communications with TDLR and/or the RAS.	<ul style="list-style-type: none"> · TDLR Online Registration · TDLR Fee Schedule · TDLR Document Submission Requirements
Historical Status Determination and Compliance	A. If the Project Analysis indicates a requirement for THC review and approval, submit required documentation directly to THC in a timely manner.	<ul style="list-style-type: none"> · THC
TCEQ Documentation	A. Submit SWPPP documentation to TCEQ and pay all application and review fees.	<ul style="list-style-type: none"> · TCEQ

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SUBMISSION PROCEDURES – ROUND TRIP REVIEW PROCESS DIAGRAM



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SUBMISSION MILESTONES		
PHASE	MILESTONE DESCRIPTION	SUBMISSION FORMAT
General	A. Submit documentation for Owner review at each submission milestone listed below. B. Individual project requirements (as determined by FDC) may dictate the need for fewer or additional submissions. C. Submission content requirements are provided in the "Submission Content" portion of this document.	.
Mobilization / Pre-design (MP)	A. MP1 - End of Phase - : 1. Substantially complete documentation of the work required in this design phase. 2. Final draft summarizing the decisions made to date. B. MP2 - Final Program : 1. Final programming documentation satisfactorily addressing TFC comments on previous submission.	<ul style="list-style-type: none"> · 3 printed and bound sets; and · Save electronic files to TFC's Central Collaboration Server.
Schematic Design (SD)	A. SD1 - End of Phase : 1. Substantially complete documentation of the work required in this design phase; and 2. Final draft summarizing the decisions made to date. B. SD2 - Final Presentation : 1. Final schematic documentation satisfactorily addressing TFC comments on previous submissions. 2. Presentation materials for the purpose of obtaining approval by TFC's commissioning board.	<ul style="list-style-type: none"> · 3 printed and bound sets; · Save electronic files to TFC's Central Collaboration Server; and · 3 mounted copies of renderings: <ul style="list-style-type: none"> ○ Image width 24" (min.) ○ Board width 30" (min.)
Design Development (DD)	A. DD1 - End of Phase : 1. Complete, coordinated documentation of the work required in this design phase except MEP documentation. B. DD2 - MEP End of Phase : 1. Complete, coordinated documentation of the MEP work required in this design phase.	<ul style="list-style-type: none"> · 3 printed and bound sets; and · Save electronic files to TFC's Central Collaboration Server.

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SUBMISSION MILESTONES		(CONTINUED)
Contract Documents (CD)	<p>A. CD1 - Mid-Phase:</p> <ol style="list-style-type: none"> 1. In progress documentation of all work required in this design phase. 2. Submission occurs at approximately the mid-point of this design phase. 3. Satisfactorily address TFC comments on previous submissions. <p>B. CD2 - End of Phase:</p> <ol style="list-style-type: none"> 1. Substantially complete, coordinated documentation of all work required in this design phase. 2. Satisfactorily address TFC comments on previous submissions. 	<ul style="list-style-type: none"> · 4 printed and bound sets; and · Save electronic files to TFC's Central Collaboration Server.
Contract Bidding and Award (BA)	<p>A. BA - Bid Documents:</p> <ol style="list-style-type: none"> 1. Satisfactorily address TFC comments on previous submission materials. 2. Complete, fully coordinated Bid Documents with: <ol style="list-style-type: none"> a. Professional seals affixed; and b. Signatures of all responsible design professionals. 3. Submit all necessary documentation to authorities having jurisdiction. 	<ul style="list-style-type: none"> · Printed and bound sets (number defined in Contract); and · Save electronic files to TFC's Central Collaboration Server.
General Administration of Construction Contracts (CA)	<p>A. CA – Construction Phase Documents:</p> <ol style="list-style-type: none"> 1. Consolidated set of sealed / signed documents incorporating all Addenda and Clarifications issued during the bidding phase. 	<ul style="list-style-type: none"> · 3 printed and bound sets; · Save electronic files to TFC's Central Collaboration Server.
Warranty (RD)	<p>A. RD – Record Documents:</p> <ol style="list-style-type: none"> 1. Documentation of as-constructed conditions. 	<ul style="list-style-type: none"> · 3 printed and bound sets; and · Save electronic files to TFC's Central Collaboration Server.

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SUBMISSION CONTENT – MOBILIZATION / PRE-DESIGN (MP1 & MP2)		
DOCUMENT	PSP ACTIONS REQUIRED	ELECTRONIC SUBMISSION FILE FORMAT
General	A. Confirm or modify to reflect current project requirements and/or conditions: <ol style="list-style-type: none"> 1. Prior programming decisions provided by TFC; 2. Existing conditions documents and other information provided by TFC. 	.
Executive Summary Report	A. Document relevant data collected, analyses performed, and design concepts and criteria recommended. B. Include: <ol style="list-style-type: none"> 1. An illustration of key conceptual issues; 2. Stacking and Blocking diagrams showing efficient use of space; 3. Summary of site evaluation and regional data. 	. Autodesk Design Review 2010 (.dwf) (.dwfx is not acceptable)
Project Objective Statement	A. State whether the project follows or deviates from the Project Analysis and why.	
Project Implementation Plan	A. Outline the method by which the project will be organized and delivered.	
Schedule for Delivery of Services	A. Identify all project milestones including: <ol style="list-style-type: none"> 1. Design Document Submission Dates and Review Periods for Owner and Jurisdictional Authorities: <ol style="list-style-type: none"> a. Submission; b. Review; c. Revision; and d. Authorization to Proceed. 2. Critical Meetings / Presentations; 3. Bid Package Issuance Date(s); 4. Bid Opening Date(s); 5. Construction start, punch inspection, and substantial completion; 6. Owner Move-in; and 7. Warranty Period. 	

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SUBMISSION CONTENT – MOBILIZATION / PRE-DESIGN (MP1 & MP2)		(CONTINUED)
DOCUMENT	PSP ACTIONS REQUIRED	ELECTRONIC SUBMISSION FILE FORMAT
Preliminary Estimate of Probable Project Construction Cost	<p>A. Adjust the TFC provided project budget to reflect updated program requirements with the following basis for Unit Costs:</p> <ol style="list-style-type: none"> 1. Anticipated square footage (from Space Allocation Program below) 2. Recent comparable projects of similar function, size, construction type, level of finish, and type of mechanical and electrical system(s); 3. Adjust unit costs for local bidding climate at time of projected bid date. <p>B. Organize the estimate according to CSI Uniformat categories;</p> <ol style="list-style-type: none"> 1. Include all applicable assemblies and systems. <p>C. Include list of items that are:</p> <ol style="list-style-type: none"> 1. Not in the contract; 2. Supplied by others. <p>D. Include contingencies for the following:</p> <ol style="list-style-type: none"> 1. Scope escalation; 2. Development of design elements; 3. Economic influences on cost escalation / fluctuation; and 4. Construction phase changes. <p>E. Identify cost variances between the Estimate and the established Construction Cost Limitation;</p> <p>F. Propose strategies for reconciling the variances.</p>	<ul style="list-style-type: none"> • Autodesk Design Review 2010 (.dwf) (.dwfx is not acceptable)
Technical Requirements List	<p>A. Submit a list of all applicable:</p> <ol style="list-style-type: none"> 1. TFC Guidelines / Standards (Reference the applicable Edit Date); 2. Codes and Standards; 3. Jurisdictional Authorities; 4. Utility Providers; 5. Environmental factors affecting the project design (including EPA and TCEQ fuel storage requirements); 6. Applicable TFC Technical and Design Standards; 7. Applicable Using Agency(ies) Technical and Design Standards; <p>B. Provide Plumbing Fixture Count Calculations (based on Space Allocation Program below).</p>	

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DOCUMENT	PSP ACTIONS REQUIRED	ELECTRONIC SUBMISSION FILE FORMAT
Existing Facilities Condition Analysis	A. Describe the condition of the existing building and / or site features: <ol style="list-style-type: none"> 1. Provide a list of all items to be relocated or reused; 2. Indicate all features that do not meet Programmatic or Technical Requirements; 3. Describe specific deficiencies for each non-compliant feature; and 4. Propose strategies for reconciling the deficiencies. 	<ul style="list-style-type: none"> •
Room Data Sheets	A. Provide the following information for each programmed space: <ol style="list-style-type: none"> 1. Structural / Physical Isolation; 2. Hazardous Materials List (Types & Quantities); 3. Fire Separation; 4. Acoustical Performance; 5. Access Control / Monitoring; 6. Door Information: <ol style="list-style-type: none"> a. Type(s); b. Size(s); c. Material(s); and d. Hardware Functions. 7. Finish Materials; 8. HVAC; <ol style="list-style-type: none"> a. Temperature Range(s); b. Humidity Control; c. Filtering; 9. HVAC and Lighting controls requirements; 10. Lighting Level (Foot Candles); 11. Electrical Power; 12. Data / Telecommunications; 13. Plumbing; 14. Re-used Items; and 15. Special Considerations. 	<ul style="list-style-type: none"> • Autodesk Design Review 2010 (.dwf) (.dwfx is not acceptable)

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DOCUMENT	PSP ACTIONS REQUIRED	ELECTRONIC SUBMISSION FILE FORMAT
Layout Diagrams	<p>A. Provide the following graphic information for each programmed space:</p> <ol style="list-style-type: none"> 1. Diagrammatic configuration of individual and/or groups of spaces; 2. Dimensional Requirements (absolute, minimum, and/or maximum); 3. Partition Type(s): <ol style="list-style-type: none"> a. Height; b. Fire Rating; and c. Sound Rating. 4. Door Location(s); 5. Window Location(s); 6. Furniture / Casework / Equipment / Relocated Items; <ol style="list-style-type: none"> a. Type(s) / Size(s); b. Location(s); c. Mounting Heights; and d. Clearance Requirements. 7. Ceiling: <ol style="list-style-type: none"> a. Height(s); and b. Material(s). 8. Lighting: <ol style="list-style-type: none"> a. Fixture Type(s) / Location(s); and b. Switch / Controls Type(s) / Location(s). 9. Power / Data / Communications: <ol style="list-style-type: none"> a. Outlet Type(s) / Location(s); and b. Mounting Heights. 	<ul style="list-style-type: none"> • Autodesk Design Review 2010 (.dwf) (.dwfx is not acceptable) <p style="text-align: center;">AND</p> <ul style="list-style-type: none"> • Autocad 2010 (only when CADD delivery is approved by DPM)
Adjacency & Stacking Diagrams	<p>A. Provide 2D and 3D diagrams illustrating horizontal and vertical relationships between spaces and between departments.</p>	<ul style="list-style-type: none"> • Autodesk Design Review 2010 (.dwf) (.dwfx is not acceptable)

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SUBMISSION CONTENT – MOBILIZATION / PRE-DESIGN (MP1 & MP2)		(CONTINUED)
DOCUMENT	PSP ACTIONS REQUIRED	ELECTRONIC SUBMISSION FILE FORMAT
Space Allocation Program	<p>A. Use TFC standard "Space Allocation Program" to report the following for each programmed space:</p> <ol style="list-style-type: none"> 1. Building-wide information: <ol style="list-style-type: none"> a. Building Grossing Factor; b. Total Gross Building Area. 2. Departmental Information: <ol style="list-style-type: none"> a. Using Agency Department Name and ID Number; b. Common Areas; <ol style="list-style-type: none"> i. Circulation Spaces (vertical and Horizontal); ii. Maintenance and Support Spaces: <ol style="list-style-type: none"> (a) Restrooms and Showers; (b) Housekeeping; (c) Shipping and Receiving. iii. Building Service Spaces: <ol style="list-style-type: none"> (a) Mechanical; (b) Electrical; (c) Data / Communications; (d) Plumbing; 3. Space Information: <ol style="list-style-type: none"> a. Space Name and ID Number; b. Space Type; c. Number of occupants; d. Net area and dimensions (length, width, and ceiling height) e. Number Required. f. Total occupancy (number x occupants); g. Total Net Area (number x net area); h. Departmental Grossing Factor; i. Departmental Gross Area (factor x total net); and 	<ul style="list-style-type: none"> • Autodesk Design Review 2010 (.dwf) (.dwfx is not acceptable)

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DOCUMENT	PSP ACTIONS REQUIRED	ELECTRONIC SUBMISSION FILE FORMAT
Narratives / Analyses / Evaluations	<p>A. Provide written analyses, assumptions, and recommendations to be included as the Basis of Design for materials, systems, equipment and energy sources for the following:</p> <ol style="list-style-type: none"> 1. HVAC Systems: <ol style="list-style-type: none"> a. Coordination events schedule; b. Load Estimates (order of magnitude); c. Strategy for resolving conflicts between: <ol style="list-style-type: none"> i. Project criteria; ii. Design / Technical Standards; and iii. Code Requirements. 2. Plumbing Systems: <ol style="list-style-type: none"> a. Domestic and Fire water pressure and line size requirements; b. Wastewater: <ol style="list-style-type: none"> i. Discharge capacity; ii. Lift station requirements (if applicable). 3. Energy Sources: <ol style="list-style-type: none"> a. Primary Utility; b. Emergency / Standby Power; 4. Energy Conservation; <ol style="list-style-type: none"> a. Alternative Energy Sources b. Metering of: <ol style="list-style-type: none"> i. Electrical power and lighting; ii. Natural Gas; iii. Domestic, irrigation, and process water. c. Artificial lighting and daylighting systems and controls strategies; 5. Smoke and emission control systems; 6. Fire and Life Safety systems; 7. Building Management System. <p>B. Estimate above ceiling space requirements for all systems.</p> <p>C. List all materials / systems yet to be determined.</p>	<ul style="list-style-type: none"> • Autodesk Design Review 2010 (.dwf) (.dwfx is not acceptable)

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SUBMISSION CONTENT – SCHEMATIC DESIGN (SD1 & SD2)		
DOCUMENT	PSP ACTIONS REQUIRED	ELECTRONIC SUBMISSION FILE FORMAT
General	A. Describe the proposed conceptual design, scale, and relationships among the major components of the Project.	.
Executive Summary Report	A. Revise the previous report to reflect current project conditions.	<ul style="list-style-type: none"> · Autodesk Design Review 2010 (.dwf) (.dwfx is not acceptable)
Schedule for Delivery of Services	A. Revise the previous Schedule to reflect any changes to anticipated task durations and milestone dates.	
Estimate of Probable Project Construction Cost	<p>A. Revise the previous Estimate based on</p> <ol style="list-style-type: none"> 1. New information regarding proposed building systems and materials; and 2. Square footage calculations as measured from the SD Drawings: <ol style="list-style-type: none"> a. Basis for Measurement: AIA Document D101 - Methods of Calculating the Area and Volume of Buildings; <p>B. Retain the CSI Uniformat organization;</p> <p>C. Include the same types of contingencies as in the previous phase.</p>	
Space Allocation Program	<p>A. Revise the previous Space Allocation Program to reflect new or deleted spaces; and</p> <p>B. Provide square footages:</p> <ol style="list-style-type: none"> 1. Measured from drawings below; 2. Use AIA Document D101-1995, Methods of Calculating the Area and Volume of Buildings. 	
BIM Model	<p>A. Provide all BIM model and annotation files (and all linked files) containing all features of the project as indicated in the Drawing requirements below.</p> <p>B. See BIM Standards for more information.</p>	<ul style="list-style-type: none"> · Autodesk Navisworks (.nwd and all linked .nwf files) · Autodesk Civil3D 2010 · Autodesk Revit 2010

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DOCUMENT	PSP ACTIONS REQUIRED	ELECTRONIC SUBMISSION FILE FORMAT
Drawings – SD1	<p>A. Provide drawings describing the proposed design containing the following:</p> <ol style="list-style-type: none"> 1. Project information; <ol style="list-style-type: none"> a. TFC Project Name and TFC Project Number; b. Project address / Location map; c. Team members; d. Drawing index; e. Submission Milestone. 2. Site: <ol style="list-style-type: none"> a. Existing conditions site survey; b. Property lines, setbacks, easements, and view corridor restrictions (existing and proposed including metes and bounds); c. Building locations; d. Adjacent roadways; e. Site Demolition; f. Public transportation stops; g. Vehicular and pedestrian circulation paths and parking; h. Service vehicle access; i. Landscape planting strategies; j. Basic grading and soil retention strategies; k. Pools, ponds, and other water features; l. Storm water management strategies (as applicable) for: <ol style="list-style-type: none"> i. Rainwater collection; ii. Drainage, Filtration, and Detention. m. Utility service locations and routing (existing and proposed); n. Major exterior equipment locations and sizes such as: <ol style="list-style-type: none"> i. Diesel generators; ii. Electrical enclosures; iii. Communications towers; and iv. Fuel storage facilities. 	<ul style="list-style-type: none"> • Autodesk Design Review 2010 (.dwf) (.dwt is not acceptable) <p style="text-align: center;">AND</p> <ul style="list-style-type: none"> • Autocad 2010 (only when CADD delivery is approved by DPM)

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DOCUMENT	PSP ACTIONS REQUIRED	ELECTRONIC SUBMISSION FILE FORMAT
Drawings – SD1 (Continued)	<ol style="list-style-type: none"> 1. Floor Plan(s): <ol style="list-style-type: none"> a. Overall building configuration; b. Arrangement of programmed spaces; c. Space names and numbers coordinated with Space Allocation Program; d. Horizontal and vertical circulation elements; e. Furniture layouts; 2. Roof Plan: <ol style="list-style-type: none"> a. Basic configuration; b. Major slopes defined; 3. Major exterior Building Elevations: <ol style="list-style-type: none"> a. Design vocabulary; b. Basic materials; c. Door and window openings; d. Floor-to-floor heights; e. Line of finished grade. 4. Building Section(s) as needed to illustrate unique volumetric characteristics of the proposed design. 5. MEP: <ol style="list-style-type: none"> a. One Line diagrams; b. Major equipment locations and sizes identified such as: <ol style="list-style-type: none"> i. Chillers; ii. Fire Pump; iii. Emergency Generator; iv. Automatic Transfer Switch (ATS); v. Uninterruptable Power Supply (UPS); and vi. Switchboards and Panels vii. Building Management System (BMS). 6. Other drawings if needed to illustrate important design features. 7. Legends and symbols: All disciplines. 	<ul style="list-style-type: none"> • Autodesk Design Review 2010 (.dwf) (.dwfx is not acceptable) <p style="text-align: center;">AND</p> <ul style="list-style-type: none"> • Autocad 2010 (only when CADD delivery is approved by DPM)

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SUBMISSION CONTENT – SCHEMATIC DESIGN (SD1 & SD2)		(CONTINUED)
DOCUMENT	PSP ACTIONS REQUIRED	ELECTRONIC SUBMISSION FILE FORMAT
Drawings – SD2	A. Provide final presentation documents reflecting satisfactory responses to TFC comments regarding the SD1 documents; and B. Renderings: Photo-realistic color perspectives of the exterior of the proposed building(s) in context with their surroundings: <ol style="list-style-type: none"> a. One bird’s-eye” view (or other view as determined by TFC); and b. One eye-level view that includes the main façade. 	<ul style="list-style-type: none"> • Renderings: 600 DPI (.png)
Specifications	A. List primary materials and building systems: <ol style="list-style-type: none"> 1. Format: Outline using TFC template. B. See appendices for technical standards	<ul style="list-style-type: none"> • Autodesk Design Review 2010 (.dwf) (.dwt is not acceptable)
Energy Efficient Architectural and Engineering Design Alternatives Evaluation	A. Develop in greater detail and verify results of the Energy Efficient Architectural and Engineering Design Alternatives Evaluation provided by TFC at the beginning of the Mobilization and Pre-design Phase. <ol style="list-style-type: none"> 1. Address all requirements of TGC Sections 2166.153, 2166.401, 2166.403, and 2166.408 such as: <ol style="list-style-type: none"> a. Identify and compare the benefits and disadvantages of potential alternatives including: <ol style="list-style-type: none"> i. Environmental impact (both initially and over the project’s life cycle); ii. Economic Impact (both initially and over the project’s life cycle). b. Recommend the best alternatives considering both economic and environmental life-cycle costs and benefits. 2. Determine the viability of accommodating future alternative energy system installations by providing anticipated floor space and service pathways in the current design. B. Utilize data embedded in the BIM model in conjunction with other appropriate energy modeling software and web-based weather/energy databases to perform this analysis. <ol style="list-style-type: none"> 1. Modeling shall comply with ASHRAE 90.1 (currently adopted edition) Appendix G Performance Rating Method. 	<ul style="list-style-type: none"> • Autodesk Design Review 2010 (.dwf) (.dwt is not acceptable)

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SUBMISSION CONTENT – SCHEMATIC DESIGN (SD1 & SD2)		(CONTINUED)
DOCUMENT	PSP ACTIONS REQUIRED	ELECTRONIC SUBMISSION FILE FORMAT
Narratives / Analyses	<p>A. Recommend the most appropriate assemblies/equipment/systems that address project specific needs including:</p> <ol style="list-style-type: none"> 1. Operating Concepts: Critical ideas behind the recommended design solution and the rationale which supports that solution: <ol style="list-style-type: none"> a. Statutory and regulatory requirements; b. Interrelationships between spaces (both interior and exterior); c. Life safety features; d. Material and building systems selections; e. Artificial Lighting and Daylighting strategies for each type of space; f. Environmental quality (both interior and exterior); g. Emergency operations B. Water conservation/efficiency (SECO Water Conservation Standard) ; C. Foundation and Structural Frame Systems: <ol style="list-style-type: none"> 1. Brief analysis of soils report as related to system selection; 2. Comparison of benefits and disadvantages of potential systems; and D. Building Envelope: <ol style="list-style-type: none"> 1. Brief description of existing and new building envelope assemblies (as applicable); 2. Comparison of the proposed envelope assemblies to the ASHRAE 90.1- (currently adopted edition) Appendix G baseline. E. MEP, Fire Alarm, Fire Protection, and Security Systems Narratives: <ol style="list-style-type: none"> 1. Brief description of existing and new systems/conditions (as applicable); 2. List of assumptions and unknowns; 3. Design criteria; 4. Benefits and disadvantages of potential equipment/systems: 5. Comparison of the proposed systems to the ASHRAE 90.1 (currently adopted edition) Appendix G baseline. <ol style="list-style-type: none"> a. Target Efficiency: 15% more efficient than baseline building. b. Maximum Payback Period: 5 years. 6. Address preparation of electrical breaker coordination study and NFPA 70E labeling requirements. 	<ul style="list-style-type: none"> • Autodesk Design Review 2010 (.dwf) (.dwfx is not acceptable)

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DOCUMENT	PSP ACTIONS REQUIRED	ELECTRONIC SUBMISSION FILE FORMAT
General	<ul style="list-style-type: none"> A. Illustrate and coordinate all important aspects of the Project. B. Resolve all major issues that could cause significant restudy during the CD phase. 	.
Executive Summary Report	<ul style="list-style-type: none"> A. Revise the previous report to reflect current project conditions. 	<ul style="list-style-type: none"> • Autodesk Design Review 2010 (.dwf) (.dwt is not acceptable)
Schedule for Delivery of Services	<ul style="list-style-type: none"> A. Revise the previous Schedule to reflect any changes to anticipated task durations and milestone dates. 	
Estimate of Probable Project Construction Cost	<ul style="list-style-type: none"> A. Revise the previous estimate based on: <ul style="list-style-type: none"> 1. New information regarding proposed building systems and materials; and <ul style="list-style-type: none"> a. Quantities take-off as measured from the DD Drawings. B. Retain the CSI Uniformat organization; C. Include the same types of contingencies as in the previous phase. 	
Space Allocation Program	<ul style="list-style-type: none"> A. Same as SD submission content above plus the following: <ul style="list-style-type: none"> 1. Add room numbers (from drawings below). 	
BIM Model	<ul style="list-style-type: none"> A. Same as SD submission content above plus the following: <ul style="list-style-type: none"> 1. All physical features of the project as indicated in the Drawing requirements below. 2. Prior to document submission, use conflict checking software to: <ul style="list-style-type: none"> a. Identify and resolve clashes between all disciplines and specialties included on the project: <ul style="list-style-type: none"> i. Hard clashes between the various elements; and ii. Soft clashes between any element(s) and required clearances. b. Submit the report generated by the checking software indicating that conflicts have been resolved. B. See BIM Standards for more information. 	<ul style="list-style-type: none"> • Autodesk Navisworks (.nwd and all linked .nwf files) • Autodesk Civil3D 2010 • Autodesk Revit 2010

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DOCUMENT	PSP ACTIONS REQUIRED	ELECTRONIC SUBMISSION FILE FORMAT
Drawings - DD1	<p>A. Same as SD submission content above plus the following:</p> <ol style="list-style-type: none"> 1. Site: <ol style="list-style-type: none"> a. Accessible Route; b. Landscape planting and irrigation plans; c. Site furnishings and appurtenances; d. Planter, wall, and fence elevations; e. Grading Plan (with critical spot elevations); f. Utility Plan; g. Typical details; <ol style="list-style-type: none"> i. Planting; ii. Paving and hardscape; iii. Retaining walls and planters; iv. Bollards; v. Utilities. h. Parking counts; 2. Floor Plan(s): <ol style="list-style-type: none"> a. Room and door numbers; b. Reference keys: <ol style="list-style-type: none"> i. Enlarged plans; ii. Partition types; iii. Exterior and Interior elevations; iv. Building and Wall sections; and v. Plan details. c. Dimensions: <ol style="list-style-type: none"> i. Massing; ii. Structural Grid; and iii. Partitions. d. Furniture layouts. 	<ul style="list-style-type: none"> • Autodesk Design Review 2010 (.dwf) (.dwfx is not acceptable) <p style="text-align: center;">AND</p> <ul style="list-style-type: none"> • Autocad 2010 (only when CADD delivery is approved by DPM)

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DOCUMENT	PSP ACTIONS REQUIRED	ELECTRONIC SUBMISSION FILE FORMAT
Drawings - DD1 (Continued)	<ol style="list-style-type: none"> 1. Roof: <ol style="list-style-type: none"> a. All slopes indicated; b. Major equipment locations identified; c. Major MEP penetrations coordinated; d. Reference keys: <ol style="list-style-type: none"> i. Building and Wall sections. 2. Exterior Building Elevations: <ol style="list-style-type: none"> a. All building faces; b. Material patterns; c. Vertical dimensions; d. Structural grid; e. Building section and wall section keys; f. Major MEP penetrations coordinated. 3. Detailed code compliance information (all disciplines); <ol style="list-style-type: none"> a. Reference codes; b. Jurisdictional authorities; c. Building information: <ol style="list-style-type: none"> i. Construction type; ii. Occupancy(ies); iii. Fire suppression systems; d. Code compliance calculations indicating both allowable/required and proposed conditions: <ol style="list-style-type: none"> i. Height and area; ii. Exiting; iii. Plumbing fixture count; e. Life safety plans: <ol style="list-style-type: none"> i. Occupant loading; ii. Exiting; iii. Fire rated walls and partitions clearly identified. 	<ul style="list-style-type: none"> • Autodesk Design Review 2010 (.dwf) (.dwfx is not acceptable) <p style="text-align: center;">AND</p> <ul style="list-style-type: none"> • Autocad 2010 (only when CADD delivery is approved by DPM)

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DOCUMENT	PSP ACTIONS REQUIRED	ELECTRONIC SUBMISSION FILE FORMAT
Drawings - DD1 (Continued)	<ol style="list-style-type: none"> 1. Enlarged floor plans; <ol style="list-style-type: none"> a. Typical room layouts (as applicable to project type); b. Restrooms / Showers; c. Stairs, ramps, and elevators; and d. Other specialty spaces as appropriate to the proposed design. 2. Interior / Millwork Elevations; 3. Door and frame information: <ol style="list-style-type: none"> a. Schedule (including hardware set assignments); b. Types; and c. Typical head, jamb, and sill details. 4. Hardware Schedule: <ol style="list-style-type: none"> a. Generic functions only; b. Basis of Design: Include in specifications. 5. Room Finish Schedule (by individual space); 6. Reflected Ceiling Plans; 7. Architectural Details (typical); 8. Structural: <ol style="list-style-type: none"> a. Foundation and Framing Plans; b. Loading assumptions and member sizes; c. Important details. 	<ul style="list-style-type: none"> • Autodesk Design Review 2010 (.dwf) (.dwfx is not acceptable) <p style="text-align: center;">AND</p> <ul style="list-style-type: none"> • Autocad 2010 (only when CADD delivery is approved by DPM)

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SUBMISSION CONTENT – DESIGN DEVELOPMENT (DD1 & DD2)		(CONTINUED)
DOCUMENT	PSP ACTIONS REQUIRED	ELECTRONIC SUBMISSION FILE FORMAT
Drawings – DD2	<p>A. Provide drawings describing the proposed design containing the following:</p> <ol style="list-style-type: none"> 1. Detailed code compliance information; 2. Metering: <ol style="list-style-type: none"> a. Meter locations; b. Types of data being metered. 3. Mechanical: <ol style="list-style-type: none"> a. Site information (if applicable); b. Equipment and thermostat locations; c. Primary distribution routing and sizes; d. Secondary distribution routing; e. Supply devices with CFM; f. Riser diagrams; g. Major duct penetrations (Locations and sizes); and h. Equipment selections / Schedules. 	<ul style="list-style-type: none"> • Autodesk Design Review 2010 (.dwf) (.dwfx is not acceptable) <p style="text-align: center;">AND</p> <ul style="list-style-type: none"> • Autocad 2010 (only when CADD delivery is approved by DPM)

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SUBMISSION CONTENT – DESIGN DEVELOPMENT (DD1 & DD2)		(CONTINUED)
DOCUMENT	PSP ACTIONS REQUIRED	ELECTRONIC SUBMISSION FILE FORMAT
Drawings – DD2 (Continued)	4. Electrical: <ul style="list-style-type: none"> a. Site information (if applicable); b. Equipment locations; c. Floor Plans: <ul style="list-style-type: none"> i. Lighting layout; ii. Lighting Footcandle Levels (interior and exterior) including tables showing: <ul style="list-style-type: none"> (a) Maximum, average, and minimum lighting levels; (b) Maximum-to-Average ratio; (c) Average-to-Minimum ratio. iii. Power (panel and receptacle locations); iv. Lightning Protection and Grounding; v. Data / Communications (indicating drop locations); vi. Fire Alarm (FACP and device locations); vii. Security Systems (access control, CCTV, equipment schedules). d. Riser diagrams: <ul style="list-style-type: none"> i. Expected panels and transformers; ii. Cable and conduit information. e. Equipment and Fixture Schedules; f. Lighting Density Schedule for main areas: Demonstrate compliance with ASHRAE 90.1-(Currently adopted edition). 5. Plumbing and Fire Protection: <ul style="list-style-type: none"> a. Site information (if applicable); b. Equipment and fixture locations; <ul style="list-style-type: none"> i. Supply, waste, vent, and storm routing with flow rate quantities. c. Riser diagrams; d. Major piping penetrations and risers (Locations and sizes); and B. Equipment and Fixture Schedules.	.

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SUBMISSION CONTENT – DESIGN DEVELOPMENT (DD1 & DD2)		(CONTINUED)
DOCUMENT	PSP ACTIONS REQUIRED	ELECTRONIC SUBMISSION FILE FORMAT
Specifications	A. Describe primary materials and building systems. <ol style="list-style-type: none"> 1. Format: Short form using TFC template. 2. Copies of manufacturers' data and/or illustrations of materials and equipment proposed to be specified for the Project. B. See appendices for technical standards. C. Manufacturers' Data Sheets: <ol style="list-style-type: none"> 1. Lighting Fixtures; 2. Lighting Controls; 3. Lamps (identify proposed lamp temperatures) 	<ul style="list-style-type: none"> • Autodesk Design Review 2010 (.dwf) (.dwfx is not acceptable)
Narratives / Analyses / Evaluations	A. Revise narratives and analyses submitted in the previous phase: <ol style="list-style-type: none"> 1. Summarize decisions made (and supporting reasons) for each. B. Identify possible impacts of Construction phasing on Design strategies.	
Data / Calculations	A. Provide data and calculations for the following: <ol style="list-style-type: none"> 1. Building Envelope Comcheck confirming compliance with ASHRAE 90.1 (currently adopted edition). 2. MEP Equipment List: <ol style="list-style-type: none"> a. Location(s), Size(s), and Weight(s); b. Clearance requirements. 3. Mechanical: <ol style="list-style-type: none"> a. Load analysis summary; b. Building pressure air quantity summary: <ol style="list-style-type: none"> i. Exhaust; ii. Outside Air; iii. Required occupant ventilation. c. Sequence of operations for major equipment and BMS criteria; d. Electrical Load analysis summary (include schedules documenting the sizing of the system / equipment). e. Lighting Comcheck confirming compliance with ASHRAE 90.1. 4. Plumbing and Fire Protection: Flow test (capacity and pressure). 	

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SUBMISSION CONTENT – CONTRACT DOCUMENTS (CD1 & CD2)		
DOCUMENT	PSP ACTIONS REQUIRED	ELECTRONIC SUBMISSION FILE FORMAT
General	A. Develop detailed and coordinated documents setting forth the requirements for the construction of the project.	.
Executive Summary Report	A. Revise the previous report to reflect current project conditions.	<ul style="list-style-type: none"> • Autodesk Design Review 2010 (.dwf) (.dwfx is not acceptable)
Schedule for Delivery of Services	A. Revise the previous Schedule to reflect any changes to anticipated task durations and milestone dates.	
Estimate of Probable Project Construction Cost	A. Revise the previous estimate based on: <ol style="list-style-type: none"> 1. New information regarding proposed building systems and materials; and 2. Detailed quantities take-off (measured from Drawings below). B. Retain the CSI Unifomat organization; C. Include the same types of contingencies as in the previous phase.	
Space Allocation Program	A. Same as DD submission content above.	
BIM Model	A. Same as DD submission content above ; and B. All physical features of the project as indicated in the Drawing requirements below. C. See BIM Standards for more information.	<ul style="list-style-type: none"> • Autodesk Navisworks (.nwd and all linked .nwf files) • Autodesk Civil3D 2010 • Autodesk Revit 2010

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SUBMISSION CONTENT – CONTRACT DOCUMENTS		(CONTINUED)
DOCUMENT	PSP ACTIONS REQUIRED	ELECTRONIC SUBMISSION FILE FORMAT
Drawings	<p>A. Same as DD submission content above plus the following:</p> <ol style="list-style-type: none"> 1. Site: <ol style="list-style-type: none"> a. Erosion and Sedimentation Control (plan and details); b. Fire Protection Plan; c. Accessible Signage; d. Dimensions; e. Additional detailing as appropriate for the project needs; f. Grading Plan (with all spot elevations); g. Landscape planting and irrigation details; h. Impervious cover calculations; and i. Utility profiles. 2. Floor Plan(s): <ol style="list-style-type: none"> a. Dimensions (all); and b. Furniture layouts moved to Furniture Plans (for reference only). 3. Roof: <ol style="list-style-type: none"> a. All equipment and walk pad locations; b. Safety tie-backs (if applicable); and c. Detail reference keys. 4. Architectural Details (all); 5. Structural: All remaining notes, plans, schedules, and details; 6. Mechanical: <ol style="list-style-type: none"> a. Equipment and fan room layouts; b. All ductwork routing and sizes; c. Fire and smoke dampers; d. Equipment Schedules; e. Flow and control diagrams; f. All remaining drawings, notes, schedules, and details. 	<ul style="list-style-type: none"> • Autodesk Design Review 2010 (.dwf) (.dwfx is not acceptable) <p style="text-align: center;">AND</p> <ul style="list-style-type: none"> • Autocad 2010 (only when CADD delivery is approved by DPM)

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GUIDELINES / STANDARDS

SUBMISSION CONTENT – CONTRACT DOCUMENTS		(CONTINUED)
DOCUMENT	PSP ACTIONS REQUIRED	ELECTRONIC SUBMISSION FILE FORMAT
Drawings (Continued)	<ol style="list-style-type: none"> 1. Electrical / Fire Alarm: <ol style="list-style-type: none"> a. Electrical details showing such things as: <ol style="list-style-type: none"> i. Grounding; ii. ATS; iii. Wiring; iv. Lightning protection; v. Fencing; and vi. Housekeeping pads. b. All remaining notes, plans, schedules, and details. 2. Plumbing / Fire Protection: <ol style="list-style-type: none"> a. Equipment and pump room layouts; b. All piping routing and sizes; c. Fixture and Equipment Schedules; d. Flow and riser diagrams; e. Fire sprinkler hazard zones; f. Fire hydrant static and residual pressures: <ol style="list-style-type: none"> i. Indicate fire and / or domestic water pump requirements. <p>B. All remaining notes, plans, schedules, and details.</p>	<ul style="list-style-type: none"> • Autodesk Design Review 2010 (.dwf) (.dwfx is not acceptable) <p style="text-align: center;">AND</p> <ul style="list-style-type: none"> • Autocad 2010 (only when CADD delivery is approved by DPM)
Specifications	<ol style="list-style-type: none"> A. Provide complete Project Manual: <ol style="list-style-type: none"> 1. Format: 3 part CSI MasterFormat (2004 Edition)). 2. Include all TFC Front-End documents as provided by TFC's PM. 3. Include the following TFC-provided matrices at the end of the Project Close Out section of the Project Manual and complete them to reflect project specific requirements: <ol style="list-style-type: none"> a. Submittals; b. Warranties; c. Testing; d. Training; and e. Manuals. B. See the Appendices for relevant technical standards. 	<ul style="list-style-type: none"> • Autodesk Design Review 2010 (.dwf) (.dwfx is not acceptable)

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SUBMISSION CONTENT – CONTRACT DOCUMENTS		(CONTINUED)
DOCUMENT	PSP ACTIONS REQUIRED	ELECTRONIC SUBMISSION FILE FORMAT
Narratives / Analyses / Evaluations	A. Revise narratives and analyses submitted in the previous phase: <ol style="list-style-type: none"> 1. Summarize decisions made (and supporting reasons) for each. B. Update the DD MEP systems narratives to indicate intended operational and maintenance procedures (for building occupants).	<ul style="list-style-type: none"> • Autodesk Design Review 2010 (.dwf) (.dwfx is not acceptable)
Data / Calculations	A. Same as DD submission content above indicate the following: <ol style="list-style-type: none"> 1. Room by room electronic load analysis per ASHRAE 90.1 (currently adopted edition); 2. Changes from previous submission; 3. Duct and piping calculations; 4. Air balance calculations; 5. Energy and ventilation calculations. 	

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SUBMISSION CONTENT – CONTRACT BIDDING AND AWARD (BA)		
DOCUMENT	PSP ACTIONS REQUIRED	ELECTRONIC SUBMISSION FILE FORMAT
General	A. Execute and issue bid documents that form the basis of competitive price proposals.	.
Executive Summary Report	A. Revise the previous report to reflect current project conditions.	<ul style="list-style-type: none"> • Autodesk Design Review 2010 (.dwf) (.dwfx is not acceptable)
Schedule for Delivery of Services	A. Revise the previous Schedule to reflect any changes to anticipated task durations and milestone dates.	
Space Allocation Program	A. Same as DD submission content above.	
BIM Models	A. Provide all BIM model and annotation files (and all linked files) reflecting the information contained within the Bid Documents as described below. B. See BIM Standards for more information.	<ul style="list-style-type: none"> • Autodesk Navisworks (.nwd and .nwf files) • Autodesk Civil3D 2010 • Autodesk Revit 2010
Bid Documents	A. Provide final, executed (sealed and signed): <ol style="list-style-type: none"> 1. Drawings and Specifications reflecting satisfactory responses to TFC comments; and 2. Addenda and Clarifications as required to sufficiently respond to: <ol style="list-style-type: none"> a. Requirements of regulatory authorities; b. Bidder Requests for Information; and c. Requests for Substitution. 	<ul style="list-style-type: none"> • Autodesk Design Review 2010 (.dwf) (.dwfx is not acceptable) <p style="text-align: center;">AND</p> <ul style="list-style-type: none"> • Autocad 2010 (only when CADD delivery is approved by DPM)
Narratives / Analyses / Evaluations	A. Revise narratives and analyses submitted in the previous phase: <ol style="list-style-type: none"> 1. Summarize decisions made (and supporting reasons) for each. 	.

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* See next page for additional Contract Bidding and Award Submission Content.

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GUIDELINES / STANDARDS



SUBMISSION CONTENT – CONTRACT BIDDING AND AWARD (BA)		(CONTINUED)
DOCUMENT	PSP ACTIONS REQUIRED	ELECTRONIC SUBMISSION FILE FORMAT
Data / Calculations	A. Same as CD submission content above.	.
SECO Documentation	A. Submit sealed and executed SECO compliance forms and supporting documentation in accordance with SECO requirements and the Submission Procedures section of this document.	
Accessibility Review	A. Register project and submit documentation to TDLR or a RAS in accordance with the TDLR requirements and the Submission Procedures section of this document.	
Hazardous Materials Certification	A. Submit letter (complying with the hazardous materials statutory requirements listed above) certifying that the project and all parts of any building(s) affected by the project do not contain asbestos.	· Adobe PDF
TCEQ / EPA Documentation	A. Submit: <ol style="list-style-type: none"> 1. SWPPP complying with TAC Title 30, Part 1, Chapter 213, Subchapter B, RULE §213.24. 2. SPCC Plan (EPA) for fuel storage tanks; 3. Fuel storage tank registration (TCEQ). 	· TAC 30.1, 213, B, §213.24

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SUBMISSION CONTENT – CONSTRUCTION (CA)		
DOCUMENT	PSP ACTIONS REQUIRED	ELECTRONIC SUBMISSION FILE FORMAT
Schedule for Delivery of Services	A. Revise the previous Schedule to reflect any changes to anticipated task durations and milestone dates.	<ul style="list-style-type: none"> Autodesk Design Review 2010 (.dwf) (.dwfx is not acceptable)
Consolidated Contract Documents	A. Provide final, executed (sealed and signed) Drawings and Specifications updated to reflect all revisions including Addenda and Clarifications issued during the Contract Bidding and Award phase.	<ul style="list-style-type: none"> Autodesk Design Review 2010 (.dwf) (.dwfx is not acceptable) <p style="text-align: center;">AND</p> <ul style="list-style-type: none"> Autocad 2010 (only when CADD delivery is approved by DPM)
BIM Model and Annotation Files	<p>A. Provide all BIM model and annotation files (and all linked files) reflecting the information contained within the Consolidated Contract Documents as described above;</p> <p>B. See BIM Standards for more information.</p>	<ul style="list-style-type: none"> Autodesk Navisworks (.nwd and .nwf files) Autodesk Civil3D 2010 Autodesk Revit 2010
Change Documentation	<p>A. Provide final, executed (sealed and signed) Change Documentation including Drawings and Specifications reflecting agreed upon changes to the Contract for Construction such as:</p> <ol style="list-style-type: none"> 1. Minor Changes / Supplemental Instructions (UGC 11.4) such as those resulting from: <ol style="list-style-type: none"> a. Modifications to shop drawings and other submittals; b. RFI responses. 2. Changes resulting from unforeseen concealed conditions (UGC 11.5); and 3. Change Orders. 	<ul style="list-style-type: none"> Autodesk Design Review 2010 (.dwf) (.dwfx is not acceptable)

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SUBMISSION CONTENT – WARRANTY		
DOCUMENT	PSP ACTIONS REQUIRED	ELECTRONIC SUBMISSION FILE FORMAT
Record Documents	<p>A. Update Drawings and specifications to reflect the “as-constructed” condition of the complete scope of the project as recorded in Contractor’s as-constructed field marked Record Documents and all:</p> <ol style="list-style-type: none"> 1. Addenda; 2. Clarifications; 3. Minor Changes / Supplemental Instructions (UGC 11.4) such as those resulting from: <ol style="list-style-type: none"> a. Modifications to shop drawings and other submittals; b. RFI responses. 4. Changes resulting from unforeseen concealed conditions (UGC 11.5); 5. Change Orders; and 6. Product, material, and equipment substitutions. <p>B. Finalize the MEP Systems Operations Manual.</p> <ol style="list-style-type: none"> 1. Comply with ASHRAE Guideline 0, Informative Annex O. 	<ul style="list-style-type: none"> · Autodesk Design Review 2010 (.dwf) (.dwfx is not acceptable) <p style="text-align: center;">AND</p> <ul style="list-style-type: none"> · Autocad 2010 (only when CADD delivery is approved by DPM) · Microsoft Word 2007
Record BIM Models	<p>A. Update all BIM model and annotation files (and all linked files) to reflect the information contained within the Record Documents as described above.</p> <p>B. Tag all components in the BIM models with embedded hyperlinks to the relevant:</p> <ol style="list-style-type: none"> 1. Specification section in the Project Manual; 2. Product / Equipment Information in the O&M Manual; 3. Final, accepted Submittal Data; 4. Training Materials; 5. Commissioning Documentation; 6. Systems Manuals; and 7. Warranty Documents. <p>C. See BIM Standards for more information.</p>	<ul style="list-style-type: none"> · Autodesk Navisworks (.nwd and .nwf files) · Autodesk Civil3D 2010 · Autodesk Revit 2010

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GUIDELINES / STANDARDS

DRAWING STANDARDS – DOCUMENT ORGANIZATION																			
Purpose	A. Facilitate familiarity of the document structure and contents by all parties.	Drawing Numbering	A. Begin numbering in the bottom right corner. B. Continue numbering upward and then to the left.	<table border="1"> <tr> <td></td> <td>9</td> <td>6</td> <td>3</td> <td></td> </tr> <tr> <td></td> <td>8</td> <td>5</td> <td>2</td> <td></td> </tr> <tr> <td></td> <td>7</td> <td>4</td> <td>1</td> <td></td> </tr> </table>		9	6	3			8	5	2			7	4	1	
	9	6	3																
	8	5	2																
	7	4	1																
DISCIPLINE	SHEET #	SHEET NAME																	
General	A000 A001 (A002...) A100 (A101...)	Cover Project Information Accessibility Requirements Code Review Site and Floor Plans																	
Civil	C100 C200 (C201...) C300 C400 (C401...) C500 C600 C700 C800 (C801...) C900 (C901...)	Existing Conditions Erosion and Sedimentation Control Plan and Details Demolition Plan Site Plan and Site Details Dimension Control Plan Fire Protection Plan Grading Plan Utility Plan and Details Storm Drain Plans and Profile Lines																	
Landscape	LA100 (LA101...) LA200 (LA201...) LA300 (LA301...)	Planting Plans, Details, and Schedules Irrigation Plans, Details, and Schedules Hardscape Plans, Details, and Schedules																	
Structural	S000 (S001...) S100 (S101...) S200 (S201...) S300 (S301...) S400 (S401...) S500 (S501...)	Structural Notes Foundation and Framing Plans Live Loads Maps Foundation Details and Schedules Column, Beam, and Joist Schedules Framing Details																	

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* See next page for additional Document Organization Standards.

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GUIDELINES / STANDARDS



DRAWING STANDARDS – DOCUMENT ORGANIZATION			(CONTINUED)
DISCIPLINE	SHEET #	SHEET NAME	
Architectural	A200 (A201...)	Demolition Floor Plans, Elevations, Details (as required)	
	A300 (A301...)	Floor and Roof Plans	
	A400 (A401...)	Enlarged Plans	
	A500 (A501...)	Finish Plans	
	A600 (A601...)	Reflected Ceiling Plans	
	A700 (A701...)	Partition Types and Details	
	A800 (A801...)	Schedules (Door # = Room # plus a, b...) (Window Type = A, A1..., B, B1 ...)	
	A900 (A901...)	Exterior Elevations	
	A1000 (A10001...)	Interior Elevations	
	A1100 (A1101...)	Building Sections	
	A1200 (A1201...)	Wall Sections	
	A1300 (A1301...)	Casework Details (Plan and Section)	
	A1400 (A1401...)	Plan Details	
	A1500 (A1501...)	Section Details	
	A1600 (A1601...)	Signage	
A1700 (A1701...)	Equipment Layouts		
A1800 (A1801...)	Furniture Layouts		
Mechanical	M000	Mechanical Symbols, General Notes, and Abbreviations	
	M100	Mechanical Site Plan	
	M200 (M201...)	Mechanical Floor and Roof Plans	
	M300 (M301...)	Mechanical Enlarged Plans	
	M400 (M401...)	Mechanical Piping Plans	
	M500 (M501...)	Mechanical Schedules	
	M600 (M601...)	Mechanical Details	

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GUIDELINES / STANDARDS



DRAWING STANDARDS – DOCUMENT ORGANIZATION			(CONTINUED)
DISCIPLINE	SHEET #	SHEET NAME	
Electrical	E000	Electrical Symbols, General Notes, and Abbreviations	
	E100	Electrical Site Plan	
	E200	Electrical One Line Diagrams	
	EL200 (EL201...)	Electrical Lighting Plans	
	EP200 (EP201...)	Electrical Power Plans	
	EM200 (EM201...)	Electrical Mechanical Plans	
	EF200 (EF201...)	Electrical Fire Alarm Plans	
	E300 (E301...)	Electrical Enlarged Plans	
	E400 (E401...)	Electrical Riser Diagrams	
	E500 (E501...)	Electrical Schedules	
E600 (E601...)	Electrical Details		
Plumbing	P000	Plumbing Symbols, General Notes, and Abbreviations	
	P100	Plumbing Site Plan	
	P200 (P201...)	Plumbing Floor and Roof Plans	
	P300 (P301...)	Plumbing Enlarged Plans	
	P400 (P401...)	Plumbing Riser Diagrams	
	P500 (P501...)	Plumbing Schedules	
	P600 (P601...)	Plumbing Details	
Telecommunications / Data	Substitute “T” for Prefix “X” below	Substitute “Tele/Data” for “Prefix “YYY” below.	
Security	Substitute “SC” for Prefix “X” below	Substitute “Security” for “Prefix “YYY” below.	
Special Systems	X000	YYY Symbols, General Notes, and Abbreviations	
	X100	YYY Site Plan	
	X200 (T201...)	YYY Floor and Roof Plans	
	X300 (T301...)	YYY Enlarged Plans	
	X400 (T401...)	YYY Riser Diagrams	
	X500 (T501...)	YYY Schedules	
	X600 (T601...)	YYY Details	

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BIM STANDARDS – OVERVIEW		
		LINKS
General	<p>A. TFC has adopted Building Information Modeling (BIM) as a standard for producing the design and documentation for all projects developed under TFC authority.</p> <p>B. Deviations from these standards must be clearly defined and must be approved in writing by the project’s DPM.</p> <p>C. CADD software may be used only in isolated circumstances as indicated in the “CADD Standards” section of this document.</p>	<ul style="list-style-type: none"> · CADD Standards
Purpose	<p>A. Facilitate implementation of TFC standards;</p> <p>B. Minimize document review turn-around time through standardization of:</p> <ol style="list-style-type: none"> 1. Elements common to all TFC projects: 2. Format and organization of documents. <p>C. Streamline TFC facilities management and maintenance processes from the date of occupancy through the life of the property.</p>	<ul style="list-style-type: none"> ·
Software Requirements	<p>A. All BIM Models are required to be created using BIM authoring software in native file formats readable by the current software versions in use by TFC as indicated below:</p> <ol style="list-style-type: none"> 1. Autodesk Civil 3D 2010 2. Autodesk Navisworks 2010 3. Autodesk Revit Architecture 2010 4. Autodesk Revit MEP 2010 5. Autodesk Revit Structure 2010 <p>B. PSPs are responsible for providing proper software training for their staff members assigned to TFC projects.</p>	<ul style="list-style-type: none"> · Civil 3D · Navisworks · Revit Architecture · Revit MEP · Revit Structure

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GUIDELINES / STANDARDS



BIM STANDARDS – FILE TYPES		
FILE TYPE	DEFINITION	LINKS
General	<p>A. There are two types of files for a TFC project:</p> <ol style="list-style-type: none"> 1. Model Files contain all physical features of the project; <ol style="list-style-type: none"> a. Site Models; and b. Building Models. c. All model files shall include: <ol style="list-style-type: none"> i. Existing conditions to remain; ii. Existing conditions to be removed; iii. Proposed new construction; and iv. All elements tagged with CSI Unifomat Level 4 categories; d. The extent of existing conditions modeling required beyond the affected areas and the level of information to be included will be determined based on project-specific needs. 2. Annotation Files: Contain all non-physical information (such as notes, dimensions, details, etc.) describing the physical features contained in the model files. 3. All drawings and schedules required for assessment, review, bidding and construction shall be extractions from the model file(s). <p>B. Separating the project into model and annotation files is intended to:</p> <ol style="list-style-type: none"> 1. Limit the size of the “<i>Central File</i>”; 2. Maximize workflow efficiency; and 3. Limit documentation access to only those responsible for any given scope of work. 	
Geo-Referencing	<p>A. All BIM Models shall be geo-referenced to the Texas NAD-83 State Plane Zone appropriate to the individual project location.</p>	.
Existing Conditions Model(s)	<p>A. In cases of facility renovation projects, a copy of any existing BIM file(s) and associated Record Documentation will be made available through TFC’s Central Collaboration Server.</p> <p>B. The model file(s) and documentation shall be utilized in the preparation of all related design and contract documents.</p>	

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* See next page for additional BIM File Types.

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GUIDELINES / STANDARDS



BIM STANDARDS – FILE TYPES		(CONTINUED)
FILE TYPE	DEFINITION	LINKS
Templates	<p>A. The following standard files will be provided by TFC via TFC’s Central Collaboration Server:</p> <ol style="list-style-type: none"> 1. Revit Model File with standardized information such as: <ol style="list-style-type: none"> a. Project Phasing (and associated graphic overrides); b. Graphic conventions; c. Wall (Partition) types; d. Door types; e. Door hardware functions; f. Room finish types. 2. Revit Annotation File with standardized information such as: <ol style="list-style-type: none"> a. Drawing sheet organization; b. Graphic conventions; c. Partition keys and details; d. Legends; e. Schedules. 3. Revit Titleblocks: 30x42 (Arch E1): <ol style="list-style-type: none"> a. Cover Sheet; b. Information Sheet; and c. All other sheets. <p>B. These template files are provided for the convenience of design professionals providing services to TFC for projects developed under TFC authority.</p> <p>C. The template files are intended to facilitate compliance with TFC design standards and must not replace the informed professional judgment of the PSP.</p> <p>D. It is solely the PSP’s responsibility to determine the proper application of the standardized information contained within these files.</p>	.

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BIM STANDARDS – FILE TYPES		(CONTINUED)
FILE TYPE	DEFINITION	LINKS
Site Model	<p>A. Site Models are Autodesk “Civil3D” Project Drawings (or central data files).</p> <p>B. They contain all site related physical features of the project that are not integral with the building envelope:</p> <ol style="list-style-type: none"> 1. Utilities; 2. Topography; 3. Water Quality Ponds; 4. Stormwater Detention and Filtration Structures; 5. Planting Materials 6. Paving (Streets, parking, curb and gutter, driveways, walks, etc.); 7. Site stairs, ramps, and railings; 8. Retaining Walls; 9. Site furnishings. <p>C. Preferred File Locations:</p> <ol style="list-style-type: none"> 1. “Project Drawings”: TFC’s Central Collaboration Server; 2. “Working Files”: TFC’s Central Collaboration Server. <p>D. Alternate File Locations (by DPM written authorization only):</p> <ol style="list-style-type: none"> 1. “Project Drawings”: PSPs’ Servers; 2. “Working Files”: PSPs’ Servers. <p>E. Coordination with other disciplines:</p> <ol style="list-style-type: none"> 1. Periodically W-Block out information in “.dwg” file format and update the file(s) on TFC’s Central Collaboration Server. 2. Import and periodically update “.adsk” file(s) exported from the Building Model(s). 	

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BIM STANDARDS – FILE TYPES		(CONTINUED)
FILE TYPE	DEFINITION	LINKS
Building Model	<p>A. Building Models are Revit “<i>Central Files</i>” (Worksets are enabled).</p> <p>B. Each Building Model File contains all physical features for a single building:</p> <ol style="list-style-type: none"> 1. Architectural; 2. Structural; 3. Mechanical; 4. Electrical; 5. Plumbing; and 6. Special Systems. <p>C. Shade Structures and pavilions are to be treated as independent buildings.</p> <p>D. Preferred File Locations:</p> <ol style="list-style-type: none"> 1. “<i>Central Files</i>”: TFC’s Central Collaboration Server; 2. “<i>Local Files</i>”: TFC’s Central Collaboration Server. <p>E. Alternate File Locations (by DPM written authorization only):</p> <ol style="list-style-type: none"> 1. “<i>Central Files</i>”: PSPs’ Servers; 2. “<i>Local Files</i>”: PSPs’ Servers. <p>F. Coordination with Civil3D:</p> <ol style="list-style-type: none"> 1. Export to ADSK file format and upload a copy of the file to the TFC Server at regular intervals. 2. Insert the Civil3D file as a link into the “<i>Central File(s)</i>”. <p>G. Model File coordination with other disciplines: “<i>Synchronize</i>” with the “<i>Central Model File</i>” at regular intervals during the work day.</p>	

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* See next page for additional BIM File Types.

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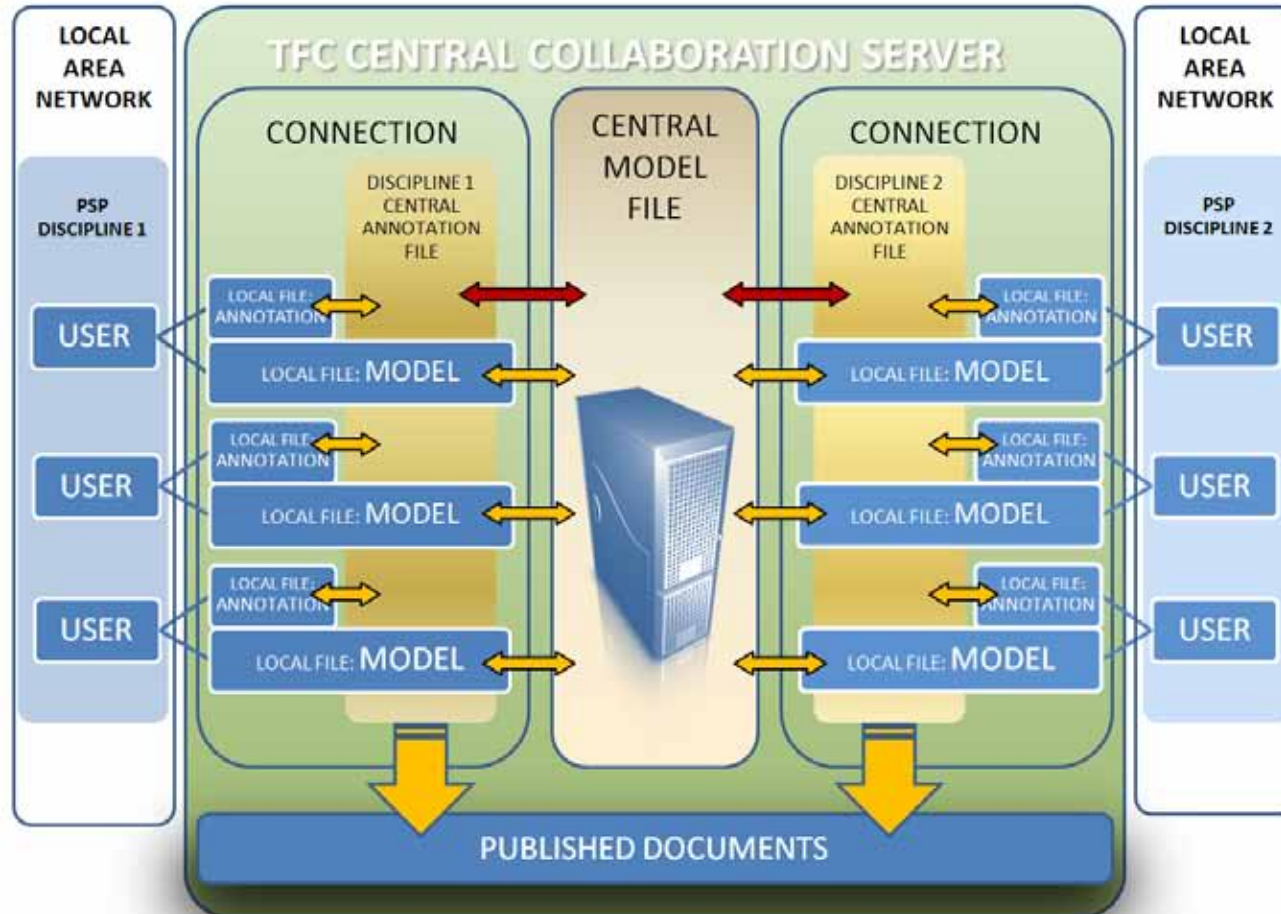
BIM STANDARDS – FILE TYPES		(CONTINUED)
FILE TYPE	DEFINITION	LINKS
Annotation	<p>A. Each design discipline will have a dedicated annotation file that references the appropriate Model File(s):</p> <ol style="list-style-type: none"> 1. Civil3D Files: 2. Revit Files: <ol style="list-style-type: none"> a. Insert the “Central Model File” as a link into the “Central Annotation File” using the following setting: <ol style="list-style-type: none"> i. Positioning: <i>Auto - Origin to Origin</i>. b. “<i>Bind</i>” the linked “Central Model File” into the “Central Annotation File” using the following settings: <ol style="list-style-type: none"> i. Include Attached Details – Toggle Off; ii. Include Levels – Toggle On; and iii. Include Grids – Toggle On. c. Binding the file allows tags to work (tags do not currently work when using linked files). d. Pin the bound file in place. e. Periodically update the bound file using the “<i>Load as Group</i>” command and “<i>Replace the existing group</i>” when prompted. <p>B. Preferred File Locations:</p> <ol style="list-style-type: none"> 1. “<i>Central Files</i>”: TFC’s Central Collaboration Server; 2. “<i>Local Files</i>”: TFC’s Central Collaboration Server. <p>C. Alternate File Locations (by DPM written authorization only):</p> <ol style="list-style-type: none"> 1. “<i>Central Files</i>”: PSPs’ Servers; 2. “<i>Local Files</i>”: PSPs’ Server. 	<ul style="list-style-type: none"> • Drawing Sheet Organization

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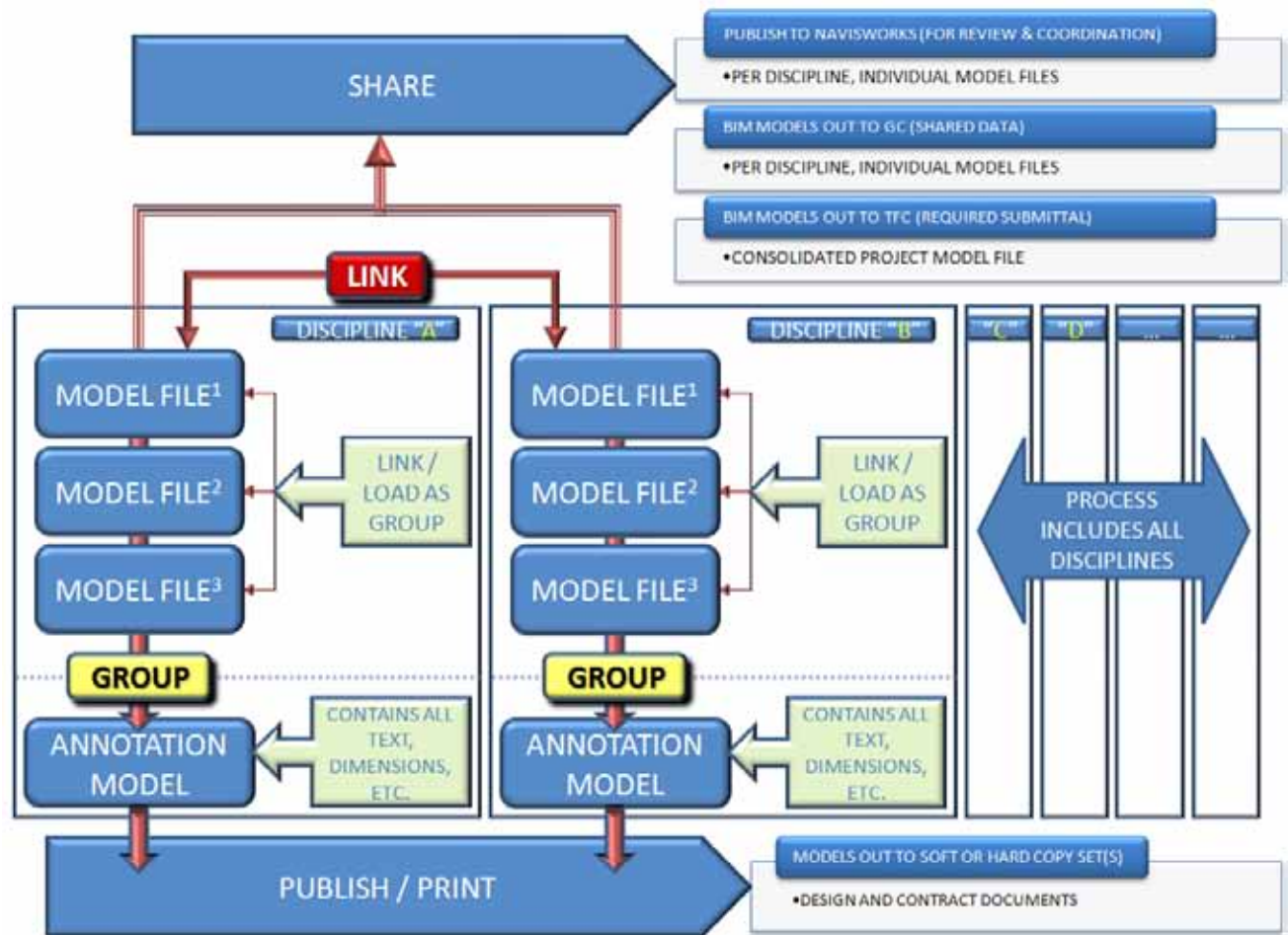
GUIDELINES / STANDARDS

BIM STANDARDS – FILE COORDINATION DIAGRAM (PREFERRED METHOD)



GUIDELINES / STANDARDS

BIM STANDARDS – FILE COORDINATION DIAGRAM (ALTERNATE METHOD) (By DPM written authorization only)



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BIM STANDARDS – REVIT WORK SHARING	
WORKSET	DESCRIPTION
General	<p>A. The TFC “<i>Central Model File</i>” template contains standard groups of “<i>Worksets</i>” intended to facilitate sharing of the model within and between the various disciplines.</p> <p>B. Some worksets are organized by floor level.</p> <ol style="list-style-type: none"> 1. Below Grade Floors: Use the designation “0B” plus two digits after the prefix (SF0B01 = Structural Frame Basement Level One...) 2. Above Grade Floors: Use a two digit number after the prefix (SF01 = Structural Frame Level One...) 3. Roof Levels: Use “R” plus a single digit (SFR1 = Structural Frame Roof Level 1...) <p>C. Model components to be included in each “<i>Workset</i>” are indicated below (workset contents are illustrative only and are inclusive of but not necessarily limited to those listed).</p>
XS (Exterior Site)	<p>A. Contains all site related features that are not included in the Civil3D Site Model such as:</p> <ol style="list-style-type: none"> 1. Site furnishings, irrigation systems, trees, shrubs, grass, groundcover, paving, stairs, ramps, railings, retaining walls, fences, utilities, etcetera. <p>B. Site related worksets are organized by design discipline:</p> <p>XSC: Civil XSL : Landscape XSS : Structural XSA : Architectural XSM : Mechanical XSE : Electrical XSP : Plumbing XS? : Site features associated with ? discipline</p>
XE (Exterior Envelope)	<p>A. Contains all elements of the exterior envelope of the building.</p> <p>B. Exterior building related worksets include:</p> <p>XE-Floor (Balcony or roof deck paving systems) XE-Roof (Roofing systems, canopies, and roof openings) XE-Shade (Shading devices) XE-Wall (Exterior walls and openings) XE-Vertical (Stairs, ramps, and railings)</p>

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* See next page for additional Revit Work Sharing Standards.

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BIM STANDARDS – REVIT WORK SHARING		(CONTINUED)
WORKSET	DESCRIPTION	
SF (Structural Frame)	<p>A. Contains all elements of the building’s structural frame including:</p> <ol style="list-style-type: none"> 1. Column grid, floor datum levels, slabs-on-grade, elevated slabs, roof slabs, load bearing walls, beams, joists, columns, piers, footings, grade beams, etcetera. <p>B. Worksets are organized by floor level:</p> <p>SF01: Structural elements associated with the first floor. SF02: Structural elements associated with the second floor. SF?? : Structural elements associated with the?? floor.</p>	
C (Core)	<p>A. Contains all building improvements <u>shared by multiple building tenants</u>.</p> <p>B. Core spaces include: Lobbies, egress corridors, lease space demising partitions, vertical circulation, restrooms, showers, maintenance spaces, mechanical spaces, shafts, and etcetera.</p> <p>C. Architectural core elements include: Floor finishes, partitions, doors, windows, openings, toilet partitions, ceilings, stairs, ramps, railings, elevators, moveable furniture and fixtures, moveable equipment that is not MEP related, etcetera.</p> <p>D. Mechanical core elements provide service to common spaces and/or multiple building tenants and include: Thermostats, sensors, air supply registers, return air grilles, ducts, mechanical equipment, mechanical piping, and etcetera.</p> <p>E. Electrical core elements provide service to common spaces and/or multiple building tenants and include: Electrical, alarm, data and communications devices and equipment; lighting fixtures, etcetera.</p> <p>F. Plumbing core elements provide service to common spaces and/or multiple building tenants and include: Plumbing fixtures; domestic water, process water, fire protection, and waste water piping, pumps, and equipment, etcetera.</p> <p>G. Worksets are organized by floor level and design discipline:</p> <p>C01A: Architectural core elements associated with the first floor. C01M: Mechanical core elements associated with the first floor. C01E: Electrical core elements associated with the first floor. C01P: Plumbing core elements associated with the first floor. C01? : ? core elements associated with the first floor. C02? : Core elements associated with the second floor.</p>	

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* See next page for additional Revit Work Sharing Standards.

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BIM STANDARDS – REVIT WORK SHARING		(CONTINUED)
WORKSET	DESCRIPTION	
T (Tenant)	<p>A. Contains all interior improvements associated with <u>individual Tenant Spaces</u> and not shared by other tenants.</p> <p>B. Architectural tenant finish-out elements include: Floor finishes, partitions, doors, windows, openings, toilet partitions, ceilings, stairs, ramps, railings, elevators, moveable furniture and fixtures, moveable equipment that is not MEP related, etcetera.</p> <p>C. Mechanical tenant finish-out elements include: Thermostats, sensors, air supply registers, return air grilles, ducts, mechanical equipment, mechanical piping, and etcetera.</p> <p>D. Electrical tenant finish-out elements include: Electrical, alarm, data, and communications devices and equipment; lighting fixtures, etcetera.</p> <p>E. Plumbing tenant finish-out elements include: Plumbing fixtures; domestic water, process water, fire protection, and waste water piping, pumps, and equipment, etcetera.</p> <p>F. Worksets are organized by individual tenant suite, and design discipline:</p> <p>T118A: Architectural tenant finish-out elements associated with Suite 118. T118M: Mechanical tenant finish-out elements associated with Suite 118. T118E: Electrical tenant finish-out elements associated with Suite 118. T118P: Plumbing tenant finish-out elements associated with Suite 118. T118? : ? tenant finish-out elements associated with Suite 118. T201? : Tenant finish-out elements associated with Suite 201.</p>	

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BIM STANDARDS – REVIT VIEW SETTINGS							
VIEW	SCALE	DETAIL LEVEL	MODEL GRAPHICS STYLE	SHADOWS	CROP REGION	PHASE	PHASE FILTER

EXISTING

Site Plans	1" = 20'-0"	Coarse	Hidden Line	Off	Off	Existing	Show All
Floor Plans	1/8" = 1'-0"	Medium	Shading With Edges	Off	Off	Existing	Show All
Reflected Ceilings	1/8" = 1'-0"	Coarse	Shading With Edges	Off	Off	Existing	Show All
Exterior Elevations	1/8" = 1'-0"	Coarse	Shading With Edges	Off	Off	Existing	Show All
Interior Elevations	3/8" = 1'-0"	Medium	Shading With Edges	Off	Off	Existing	Show All
Building Sections	1/8" = 1'-0"	Medium	Shading With Edges	Off	Off	Existing	Show All
Wall Sections	3/4" = 1'-0"	Fine	Shading With Edges	Off	Off	Existing	Show All

DEMOLITION

Site Plans	1" = 20'-0"	Coarse	Hidden Line	Off	Off	Demolition	Show Previous + Demo
Floor Plans	1/8" = 1'-0"	Medium	Shading With Edges	Off	Off	Demolition	Show Previous + Demo
Reflected Ceilings	1/8" = 1'-0"	Coarse	Shading With Edges	Off	Off	Demolition	Show Previous + Demo
Exterior Elevations	1/8" = 1'-0"	Coarse	Shading With Edges	Off	Off	Demolition	Show Previous + Demo
Interior Elevations	3/8" = 1'-0"	Medium	Shading With Edges	Off	Off	Demolition	Show Previous + Demo
Building Sections	1/8" = 1'-0"	Medium	Shading With Edges	Off	Off	Demolition	Show Previous + Demo
Wall Sections	3/4" = 1'-0"	Fine	Shading With Edges	Off	Off	Demolition	Show Previous + Demo

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* See next page for additional Revit Architecture View Settings Standards.

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GUIDELINES / STANDARDS



BIM STANDARDS – REVIT VIEW SETTINGS							(CONTINUED)
VIEW	SCALE	DETAIL LEVEL	MODEL GRAPHICS STYLE	SHADOWS	CROP REGION	PHASE	PHASE FILTER

NEW CONSTRUCTION

Site Plans	1" = 20'-0"	Coarse	Hidden Line	Off	Off	New Construction	Show Previous + New
Floor Plans	1/8" = 1'-0"	Medium	Shading With Edges	Off	Off	New Construction	Show Previous + New
Reflected Ceilings	1/8" = 1'-0"	Coarse	Shading With Edges	Off	Off	New Construction	Show Previous + New
Exterior Elevations	1/8" = 1'-0"	Coarse	Shading With Edges	Off	Off	New Construction	Show Previous + New
Interior Elevations	3/8" = 1'-0"	Medium	Shading With Edges	Off	Off	New Construction	Show Previous + New
Building Sections	1/8" = 1'-0"	Medium	Shading With Edges	Off	Off	New Construction	Show Previous + New
Wall Sections	3/4" = 1'-0"	Fine	Shading With Edges	Off	Off	New Construction	Show Previous + New

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GUIDELINES / STANDARDS



BIM STANDARDS – REVIT PARTITIONS		
ELEMENT	DEFINITION	LINKS
Wall (Partition) Type Tags	<p>A. When a “Wall Type” tag is placed, the correct partition type information is automatically populated.</p> <p>B. Partition Assembly Type Codes:</p> <ul style="list-style-type: none"> A = Metal stud framing with one layer of gypsum board on each side. B = Metal stud framing with two layers of gypsum board on each side. C = Metal stud furring partition with one layer of gypsum board on the finished side. D = Metal stud Shaftwall with one inch shaft-liner and varying layers of gypsum board on the finished face. E = Metal stud framing with resilient furring channels on one side and one layer of gypsum board on each finished face. F = Metal stud framing with resilient furring channels on one side and two layers of gypsum board on each finished face. G = Metal stud framed plumbing chase with 1 layer of gypsum board on each finished face. H = Partial height metal stud framing with one layer of gypsum board on each side. J = Fire rated metal stud partition with window(s) and deluge sprinklers. K = Concrete masonry units of varying widths. 	

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* See next page for additional Revit Architecture Partition Standards.

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GUIDELINES / STANDARDS



BIM STANDARDS – REVIT PARTITIONS		(CONTINUED)
ELEMENT	DEFINITION	LINKS
Wall (Partition) Type Tags (Continued)	<p>A. Core Width Codes:</p> <ul style="list-style-type: none"> 1 = 1 5/8" Metal Studs 3 = 3 5/8" Metal Studs 4 = 4" Metal Studs – or - 4" Nominal Masonry 6 = 6" Metal Studs – or - 6" Nominal Masonry 7 = 7" Clear inside width at metal stud framed plumbing chase 8 = 8" Metal Studs – or - 8" Nominal Masonry 9 = 9" Clear inside width at metal stud framed plumbing chase 12 = 12" Nominal Masonry <p>B. Partition Height Codes:</p> <ul style="list-style-type: none"> A = Above Ceiling (to 6" above ceiling) (Set the "Top Offset" constraint of the "Wall" to six inches more than the height of the ceiling in question) C = Ceiling (to bottom of ceiling) (Attach the "Wall" to the "Ceiling") D = Deck High (to bottom of structural deck above) (Attach the "Wall" to the "Structural Floor" above) ## = Fixed Height (in inches to top of finish) (Set the "Unconnected Height" constraint of the "Wall" to the desired height of the partition at the top of the finished wall cap) <p>C. Sound Rating Codes:</p> <ul style="list-style-type: none"> S## (## = 2 digit STC rating number) <p>D. Fire Rating Codes:</p> <ul style="list-style-type: none"> F01 = 1 hour F02 = 2 hour F03 = 3 hour F04 = 4 hour F20 = 20 minutes F30 = 30 minutes F45 = 45 minutes F90 = 90 minutes 	

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* See next page for additional Revit Architecture Partition Standards.

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GUIDELINES / STANDARDS



BIM STANDARDS – REVIT PARTITIONS		(CONTINUED)
ELEMENT	DEFINITION	LINKS
Wall (Partition) Type Tags (Continued)	A. When the “ <i>Wall Type</i> ” is changed, the tag automatically updates with the appropriate information for the new partition type. B. Custom “ <i>Wall Types</i> ” can be generated if necessary, but must include the following parametric “ <i>Identity Data</i> ” information: <ol style="list-style-type: none"> 1. <i>Assembly Code</i> - Edit Unifomat selection to match the wall construction ; 2. <i>Type Mark</i> – Assign a new partition type (use TFC naming conventions); 3. <i>Fire Rating</i> – Indicate if applicable. 4. <i>Fire Test #</i> - Provide UL assembly number if partition is fire rated; 5. <i>Sound Test #</i> - Provide STC rating if applicable; and 6. <i>UL URL</i> – Provide web address for specific UL assembly. 	
Wall (Partition) Types	A. The Project Template file has a large library of TFC standard “ <i>Wall Types</i> ” (interior partitions) pre-loaded. B. All TFC standard “ <i>Wall Types</i> ” contain parameter text that matches the appropriate TFC standard partition type. C. “ <i>Wall Type</i> ” names are based on the Type Tag conventions above: <ol style="list-style-type: none"> 1. Example: “A3DS-51” <ol style="list-style-type: none"> a. Partition Type: A b. Core Width: 3 5/8” metal stud framing c. Partition Height: Deck high d. Sound Rating: STC 51 e. Fire Rating: None 	

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GUIDELINES / STANDARDS

BIM STANDARDS – REVIT DOOR TYPES									
The Project Template file has a library of TFC standard “Door Types” based on the function of the space the door is serving. Schedule information parameters are pre-defined as follows:									
DOOR TYPE	WIDTH (inches)	HEIGHT (inches)	DOOR TYPE	DOOR MATERIAL	DOOR FINISH	FRAME TYPE	FRAME MATERIAL	FRAME FINISH	HARDWARE FUNCTIONS
Conference	36	84	Single ¼ Lite	Solid Core Wood	Stain	Single	Aluminum	Anodized	LO, CL, STW
Conference (Enhanced)	36	84	Single ¼ Lite	Solid Core Wood	Stain	Single Sidelite	Aluminum	Anodized	LO, CL, STW
Copy/Print	36	84	Single ¼ Lite	Solid Core Wood	Stain	Single	Aluminum	Anodized	LA, STW
Entrance (Primary)	72	84	Double Full Lite	Aluminum / Glass	Anodized	Double	Aluminum	Anodized	EA, ED, FBA, CL, TH, WS
Entrance (Secondary)	36	84	Single	Hollow Metal	Paint	Single	Hollow Metal	Paint	EA, ED, CL, TH, WS
File	36	84	Single ¼ Lite	Solid Core Wood	Stain	Single	Aluminum	Anodized	LS, CL, STW
Maintenance	36	84	Single	Solid Core Wood	Stain	Single	Hollow Metal	Paint	LS, CL, STW
MEP (Single)	36	84	Single	Solid Core Wood	Stain	Single	Hollow Metal	Paint	LS, CL, STW
MEP (Double)	72	84	Double	Solid Core Wood	Stain	Single	Hollow Metal	Paint	LS, CL
Office	36	84	Single	Solid Core Wood	Stain	Single	Aluminum	Anodized	LO, CH, STW
Office Suite	36	84	Single	Solid Core Wood	Stain	Single Sidelite	Aluminum	Anodized	LO, STW
Hardware Abbreviations	CH – Coat Hanger CL – Closer EA – Electronic Access ED – Exit Device			FBA – Flush Bolt (Automatic) LA – Latchset LO – Lockset (Office) LS – Lockset (Storage)			STW – Stop (Wall) TH - Threshold WS - Weatherstripping		

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* See next page for additional Revit Architecture Door Types.

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GUIDELINES / STANDARDS



BIM STANDARDS – REVIT DOOR TYPES									(CONTINUED)
DOOR TYPE	WIDTH (inches)	HEIGHT (inches)	DOOR TYPE	DOOR MATERIAL	DOOR FINISH	FRAME TYPE	FRAME MATERIAL	FRAME FINISH	HARDWARE FUNCTIONS
Restroom (Single)	36	84	Single	Solid Core Wood	Stain	Single	Aluminum	Anodized	Privacy Lockset, Closer, Wall Stop
Restroom (Common)	36	84	Single	Solid Core Wood	Stain	Single	Aluminum	Anodized	Push, Pull, Kick Plate, Closer, Wall Stop
Server	36	84	Single	Solid Core Wood	Stain	Single	Aluminum	Anodized	Electronic Access, Storage Lockset, Wall Stop
Stair	36	84	Single	Hollow Metal	Paint	Single	Hollow Metal	Paint	Exit Device, Closer, Smoke Seal
Storage (Single)	36	84	Single	Solid Core Wood	Stain	Single	Aluminum	Anodized	Storage Lockset, Wall Stop
Storage (Double)	72	84	Double	Solid Core Wood	Stain	Single	Aluminum	Anodized	Storage Lockset, Removable Mullion

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GUIDELINES / STANDARDS



BIM STANDARDS – REVIT ROOM STYLES			
The Project Template file has a library of TFC standard “Room Styles” with Finish Schedule information parameters pre-defined.			
ROOM TYPE	FLOOR	BASE	CEILING
Break	VCT	4” Rubber Cove	2’x2’ ACT
Conference	Carpet Tile	4” Rubber Cove	2’x2’ ACT
Conference (Enhanced)	Carpet Tile	Wood (Stained)	2’x2’ ACT, Painted Gypsum Board
Copy / Print	VCT	4” Rubber Cove	2’x2’ ACT
Corridor	Carpet Tile	4” Rubber Cove	2’x2’ ACT
File	Carpet Tile	4” Rubber Cove	2’x2’ ACT
Maintenance	Sealed Concrete	4” Rubber Cove	2’x2’ ACT
MEP	Sealed Concrete	None	2’x2’ ACT
Office	Carpet Tile	4” Rubber Cove	2’x2’ ACT
Restroom	Tile	Tile	Painted Gypsum Board
Server	Static Dissipative Tile	4” Rubber Cove	2’x2’ ACT
Shower	Tile	Tile	Water Resistant Gypsum Board (Epoxy Paint)
Stair	Sealed Concrete	None	2’x2’ ACT, Painted Structure
Storage (General)	Sealed Concrete	None	Painted Structure
Storage (Office)	Carpet Tile	4” Rubber Cove	2’x2’ ACT

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GUIDELINES / STANDARDS



BIM STANDARDS – REVIT MATERIALS		
The Project Template file has a library of TFC standard “Materials” with Design Selections Schedule information parameters pre-defined.		
MARK	DESCRIPTION	MATERIAL CLASS
AT-AC01	Acoustical Coating	Acoustical Treatment
AT-SAP01	Sound Absorptive Panel	Acoustical Treatment
AT-SRP01	Sound Reflective Panel	Acoustical Treatment
AW-WD01	Wood Trim	Architectural Woodwork
AW-WP01	Wood Panel	Architectural Woodwork
AW-WV01	Wood Veneer	Architectural Woodwork
CF-BR01	Broom Finished Concrete	Concrete Finish
CF-CS01	Concrete Finish (Clear Sealer)	Concrete Finish
CF-EA01	Exposed Aggregate Concrete	Concrete Finish
CF-IC01	Integral Color Concrete	Concrete Finish
CF-POL01	Polished Concrete	Concrete Finish
CF-RF01	Rough Formwork Concrete	Concrete Finish
CF-SB01	Sandblasted Concrete	Concrete Finish
CF-ST01	Stained Concrete	Concrete Finish
CF-TRW01	Trowel Finished Concrete	Concrete Finish

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* See next page for additional Revit Materials.

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GUIDELINES / STANDARDS



BIM STANDARDS – REVIT MATERIALS		(CONTINUED)
MARK	DESCRIPTION	MATERIAL CLASS
CL-AT01	Acoustical Ceiling Tile	Ceilings
CL-GD01	Acoustical Ceiling Grid	Ceilings
CL-LS01	Linear Ceiling System (Wood or Metal)	Ceilings
CW-HG01	Cabinet Hardware (Grommet)	Casework
CW-HP01	Cabinet Hardware (Pull)	Casework
DS-CB01	Chalk Board	Visual Display Surfaces
DS-MB01	Marker Board	Visual Display Surfaces
DS-TB01	Tack Board	Visual Display Surfaces
FL-AF01	Access Flooring	Flooring
FL-CP01	Carpet (Broadloom, Tile)	Flooring
FL-FA01	Fluid Applied Flooring	Flooring
FL-LS01	Linoleum Sheet Flooring	Flooring
FL-LT01	Linoleum Tile Flooring	Flooring
FL-SDT01	Static Dissipative Tile	Flooring
FL-TZ01	Terrazzo	Flooring
FL-VS01	Vinyl Sheet Flooring	Flooring

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* See next page for additional Revit Materials.

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GUIDELINES / STANDARDS



BIM STANDARDS – REVIT MATERIALS		(CONTINUED)
MARK	DESCRIPTION	MATERIAL CLASS
FL-VT01	Vinyl Tile (VCT, Solid Vinyl..)	Flooring
FL-WD01	Wood Floor	Flooring
GF-CK01	Cork Flooring	General Finishes
GF-CT01	Ceramic Tile	General Finishes
GF-CTG01	Ceramic Tile (Grout)	General Finishes
GF-FB01	Fabric	General Finishes
GF-M01	Metal	General Finishes
GF-PL01	Plastic Laminate	General Finishes
GF-QS01	Quartz Surface	General Finishes
GF-SS01	Solid Surface	General Finishes
GF-ST01	Stone Tile	General Finishes
GL-G01	Glass (Tempered, Decorative, Mirrored, LCD)	Glazing
GL-P01	Plastic Glazing	Glazing
GL-SF01	Surface Applied Glazing Film	Glazing

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* See next page for additional Revit Materials.

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GUIDELINES / STANDARDS



BIM STANDARDS – REVIT MATERIALS		(CONTINUED)
MARK	DESCRIPTION	MATERIAL CLASS
PC-CS01	Clear Sealer	Paints and Coatings
PC-HP01	High Performance / Special Coatings (Fire Resistive, Galvanizing...)	Paints and Coatings
PC-IP01	Interior Paint	Paints and Coatings
PC-IS01	Interior Stain	Paints and Coatings
PC-IT01	Interior Textured Coating	Paints and Coatings
PC-WR01	Water Repellant Coating	Paints and Coatings
PC-XP01	Exterior Paint	Paints and Coatings
PC-XS01	Exterior Stain	Paints and Coatings
PC-XT01	Exterior Textured Coating	Paints and Coatings
WB-R401	4" Rubber Wall Base	Wall Base
WB-R601	6" Rubber Wall Base	Wall Base
WB-V401	4" Vinyl Wall Base	Wall Base
WB-V601	6" Vinyl Wall Base	Wall Base
WB-WD401	4" Wood Wall Base	Architectural Woodwork
WB-WD601	6" Wood Base	Architectural Woodwork
WF-FP01	Fabric Wall Panel	Interior Wall Finishes
WF-WC01	Wall Covering	Interior Wall Finishes

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* See next page for additional Revit Materials.

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GUIDELINES / STANDARDS



BIM STANDARDS – REVIT MATERIALS		(CONTINUED)
MARK	DESCRIPTION	MATERIAL CLASS
WP-CG01	Corner Guard	Wall and Door Protection
WP-WG01	Wall Guard	Wall and Door Protection
WT-BL01	Blinds	Window Treatments
WT-DR01	Drapery / Curtain	Window Treatments
WT-SH01	Window Shades	Window Treatments
XF-BK01	Brick Veneer	Exterior Finishes
XF-CFS01	Exterior Cement Fiberboard Siding	Exterior Finishes
XF-CM01	Concrete Masonry Unit Veneer	Exterior Finishes
XF-CP01	Cement Plaster	Exterior Finishes
XF-GU01	Glass Unit Masonry	Exterior Finishes
XF-LS01	Linear Soffit System (Wood or Metal)	Exterior Finishes
XF-MP01	Exterior Metal Panel	Exterior Finishes
XF-PC01	Exterior Precast Concrete Wall Panel	Exterior Finishes
XF-SP01	Exterior Simulated Plaster (EIFS)	Exterior Finishes
XF-SS01	Simulated Stone Veneer	Exterior Finishes
XF-ST01	Stone Veneer	Exterior Finishes
XF-WS01	Exterior Wood Siding	Exterior Finishes

GUIDELINES / STANDARDS



BIM STANDARDS –RECOMMENDED PRACTICES		
TOPIC	RECOMMENDATION	LINKS
Model Planning & Coordination	A. Utilize a BIM Planning and Coordination Document such as in Appendix M (or a similar document) to identify authorship responsibility for each portion of the Building Model Central File. B. Do not modify or manipulate elements that other PSPs are responsible for.	<ul style="list-style-type: none"> · Appendix M - BIM Planning Document
Revit Worksharing	A. Check out worksets rather than borrowing them. This minimizes response time when manipulating model elements. B. Communicate regularly with other PSPs regarding changes to the Building Model Central File.	
Revit File Maintenance	A. Audit the Central Files periodically to identify and correct file irregularities. B. Compact the Central files at the end of each work day to reduce file size.	
Digital Data Agreement	A. It is TFC’s intent to share the Project BIM Model with the Contractor for their use in project scheduling and coordination. B. TFC recommends that the PSP include a Division 1 Specification requirement for the Contractor, Subcontractors, and Suppliers to enter into a Digital Data Licensing Agreement such as AIA Document C106-2007.	<ul style="list-style-type: none"> · AIA Documents
Digital Coordination & Review	A. TFC utilizes Autodesk’s free “Design Review” software to review all documentation submitted by PSPs. We encourage all PSPs to coordinate with each other using the same process.	<ul style="list-style-type: none"> · Autodesk Design Review Software

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* See next page for additional Recommended Practices.

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BIM STANDARDS –RECOMMENDED PRACTICES		(CONTINUED)
TOPIC	RECOMMENDATION	LINKS
Revit Productivity	<p>A. Download and utilize software extensions and bonus tools available from the Autodesk Subscription Center:</p> <ol style="list-style-type: none"> 1. Subscription Advantage Packs for Autodesk Revit Architecture 2010, Revit MEP 2010, : <ol style="list-style-type: none"> a. Subscription Release Packs: <ol style="list-style-type: none"> i. User Interface Enhancements: <ol style="list-style-type: none"> (a) Structure Tab (b) Conditional Formatting in Schedules (c) Element Section Area and Linear Weight in Schedules (d) Span Direction Tool (e) Beam Coping (f) Text Formatting Shortcuts (g) Beam System Tags (h) Split Walls with Defined Space Between Them (i) Keyboard Shortcuts (j) Find and Replace Text in Text Notes (k) Convert Line Types ii. Structural Components and Modeling <ol style="list-style-type: none"> (a) Slanted Columns (b) Beam Placement with 3D CAD Drawing Geometry References (c) Curved Beams (d) Structural Trusses (e) Metal and Structural Deck Assembly iii. Performance <ol style="list-style-type: none"> (a) Calculation Adjustments for Beam Length iv. Documentation 	

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BIM STANDARDS –RECOMMENDED PRACTICES		(CONTINUED)
TOPIC	RECOMMENDATION	LINKS
Revit Productivity (Continued)	<ul style="list-style-type: none"> b. Revit Extensions for Autodesk Revit Architecture 2010 <ul style="list-style-type: none"> i. Wood Framing ii. Content Generator iii. Freeze Drawing Update iv. Grid Generator Update c. Autodesk Revit Model Review <ul style="list-style-type: none"> i. Automates the process of reviewing and auditing BIM projects. d. Autodesk Revit DB Link <ul style="list-style-type: none"> i. Import, export, and maintain relationships between external database information and the BIM model. e. Autodesk ImageModeler 2009: <ul style="list-style-type: none"> i. Use 2D digital photographs to more quickly create, edit, and texture 3D models for building renovation projects and energy-efficiency analysis. <p>2. HVAC Load Calculation Extension:</p> <ul style="list-style-type: none"> a. Commercial and industrial HVAC load calculation; b. Based upon the latest ASHRAE calculation methods; c. Calculates total cooling and heating loads for a building. <p>3. Residential HVAC Load Calculation Extension:</p> <ul style="list-style-type: none"> a. Residential and light commercial HVAC load calculation; b. Determines peak cooling and heating loads for buildings. c. Imports from and exports to gbXML. <p>4. US Content Extension (Revit® MEP 2009):</p> <ul style="list-style-type: none"> a. Imperial and metric duct and pipe fittings designed specifically to meet US standards. b. Duct fittings adhere to SMACNA standards and c. Pipe fittings adhere to ASME standards for Class 150 and 300 Malleable Threaded Iron and Flanged Cast Iron. <p>5. Space Naming Utility (Revit® MEP 2009 & 2010):</p> <ul style="list-style-type: none"> a. Automatically assigns the names and numbers from architectural rooms to Revit MEP spaces. 	

GUIDELINES / STANDARDS



BIM STANDARDS –RECOMMENDED PRACTICES (CONTINUED)		
TOPIC	RECOMMENDATION	LINKS
Revit Productivity (Continued)	<ol style="list-style-type: none"> 6. Worksharing Monitor (Revit® Architecture 2010, Revit® Structure 2010, Revit® MEP 2010): <ol style="list-style-type: none"> a. Facilitates worksharing by answering questions such as: <ol style="list-style-type: none"> i. Who is currently working on this project? ii. Is my local copy of the project up-to-date? iii. When will my Save to Central operation finish? iv. Has my request to borrow elements been granted? v. Are any issues interfering with my work on a Revit software project? 7. Globe Link (Revit 2010 platform products): <ol style="list-style-type: none"> a. Publish 3D building information models directly into Google Earth™ mapping service. b. Acquire site information from Google Earth mapping service and import it into Revit 2010 software applications for building and site layout purposes. 	

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CADD STANDARDS		
STANDARD	DESCRIPTION	LINKS
Limitations of Use	A. TFC has adopted Building Information Modeling (BIM) as a standard for producing the design and documentation for all projects under TFC authority. B. CADD software may only be used to produce documents on minor renovation or maintenance projects when approved in writing by one of the FDC Directors.	<ul style="list-style-type: none"> BIM Standards
Deviations from Standards	A. Should it become necessary to deviate from these standards: <ol style="list-style-type: none"> Submit written documentation fully describing each deviation; and Obtain written approval from TFC's CADD Manager (through the PM). 	
Software Requirements	A. Autocad 2010. B. All CADD drawings are required to be created using AutoCAD in the .dwg file format and must be readable by the current version of AutoCAD in use by TFC.	<ul style="list-style-type: none"> Autocad 2010
Purpose	A. Provide a uniform format for CADD based projects developed under TFC authority.	
Template File	A. TFC will provide a template file containing standard dimension styles, layers, text styles, and other useful tools that will help the PSP meet TFC's CADD Standards.	
Existing Conditions Files	A. In cases of facility renovation projects, a copy of the existing CADD drawing files and associated Record Documentation will be made available for download through the project's IMPACT folder structure. B. These files and documents shall be utilized in the preparation of all related design and contract documents.	
Accuracy	A. All CAD drawings shall be drafted using precision input employing the most accurate source material available. B. For all drawing entities, zero tolerance is required: <ol style="list-style-type: none"> All lines meet at intersections; Straight lines are straight; Blocks are inserted properly without overlap; Closure of all polygons, etc. 	

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* See next page for additional CADD Standards.

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GUIDELINES / STANDARDS



CADD STANDARDS		(CONTINUED)
STANDARD	DESCRIPTION	LINKS
Color	<ul style="list-style-type: none"> A. Color will be used to control pen assignments and line weights. B. Select layer colors in accordance with the "Pen / Color Values Table". C. Create all objects with color bylayer. 	
Linetypes	<ul style="list-style-type: none"> A. Use only standard linetypes. B. Contour lines, dashed lines and other fonted lines shall be made of one continuous line segment, not a series of separate line segments. C. A sample drawing must be submitted and approved by the CAD Manager if multilines are used. 	
Units	<ul style="list-style-type: none"> A. Set DDUNITS to architectural and angles to deg/min/sec with the precision set at 1/16" 	
Blocks	<ul style="list-style-type: none"> A. Any graphic entity that occurs repeatedly in drawings should be made into a block. B. Insertion points for blocks shall be consistent with its placement in the drawing <ul style="list-style-type: none"> 1. Keep names simple and descriptive. 2. Use a logical insertion point (center of circle, bottom left corner of object). 3. Blocks must be drawn on layer 0 and inserted on the proper layer; or drawn on the proper layer/ layers and inserted on layer 0. C. Nested blocks are permitted but should be avoided whenever possible. D. If custom nested blocks are used, TFC's CADD Manager must approve them. 	
External Reference Files (XRefs)	<ul style="list-style-type: none"> A. Bind (do not insert) all reference files into the active file. 	
Scale	<ul style="list-style-type: none"> A. All model space files must be drawn at real size (1-to-1). B. Objects must be created at full size: <ul style="list-style-type: none"> 1. A 50-foot wall must be drawn to 50 feet 0"; and 2. A 48-inch column must be drawn to 48 inches. C. CAD files will be drawn in 2D only (not 3D). 	

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* See next page for additional CADD Standards.

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CADD STANDARDS		(CONTINUED)
STANDARD	DESCRIPTION	LINKS
Text and Fonts	<ul style="list-style-type: none"> A. Use only standard text fonts supplied with AutoCAD's font library. B. Fonts for lettering shall be readable and plottable by AutoCAD with no additional software required. C. Text size must be legible and appropriate to the graphic information presented and the intended plotted scale of the drawing. 	
Drawing Origin	<ul style="list-style-type: none"> A. The lower left corner of the building shall be placed at 0,0,0. B. For non-rectilinear buildings a logical origin point shall be established. C. The origin point must remain consistent between all model files for the purpose of xref coordination. D. Once the origin is established, it may not be changed. 	
Dimensions	<ul style="list-style-type: none"> A. All dimensioning shall be associative. <ul style="list-style-type: none"> 1. Break lines and parts of cut-through views are an exception. B. Preferred dimension styles are provided in the template file. 	
Hatching	<ul style="list-style-type: none"> A. Use pattern hatching sparingly since the practice significantly increases the AutoCAD entity count of a drawing. B. Associative hatching may be used only with the approval of TFC's CAD Manager. C. Use the solid command or polyline command to represent solid-filled regions when possible. 	
Layers	<ul style="list-style-type: none"> A. CADD drawings shall be organized in accordance with the TFC Layering Guidelines. <ul style="list-style-type: none"> 1. If the TFC format does not include an appropriate layer name, layer names shall be in accordance with CAD Layer Guidelines as published by the American Institute of Architects (A.I.A.). B. The layer names shall be the long format and shall include the modifier. C. As these layer guidelines allow flexibility in the assignment of layers, a Layer Matrix shall be provided to TFC with the Record Documents. D. All third party add on application packages which modify or create CAD layers or other entities must comply with the <u>AIA CAD Layer Guidelines</u>. 	

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* See next page for additional CADD Standards.

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CADD STANDARDS		(CONTINUED)
STANDARD	DESCRIPTION	LINKS
Area Calculations	<p>A. Include the following area calculations using area polylines included in the “as-built” submittal.</p> <ol style="list-style-type: none"> 1. Construction Area – Area calculation boundary line will be drawn around the exterior Floor Plan for each level of building on layer a-area-cons 2. Gross Area - Area calculation boundary line will be drawn around interior Floor Plan for each level of building on layer a-area-gros 3. Room Area - Area calculation boundary line will be drawn around each room from the centerline of the wall on layer a-area-room <p>B. Wall edges, partition centerlines and structural centerlines used for area polygons, should be saved in the layers listed above, as appropriate.</p>	
Quality Check	<p>A. Check the CADD files to verify the following:</p> <ol style="list-style-type: none"> 1. All entities are: <ol style="list-style-type: none"> a. Dimensionally accurate; b. Inserted on the proper layer; 2. Column and grid line dimensions are correct; 3. Entity intersections meet each other properly; 4. Entities outside the drawing limits are deleted. 5. Colors and linetypes are assigned BYLAYER; 6. Layering system conforms to TFC and AIA CAD Layer Standard. <p>B. Correct any non-compliant conditions.</p> <p>C. Confirm that all files are free of viruses.</p>	
Purge / Audit	<p>A. If the drawing file becomes too large, response to commands will be slow and regeneration times will be longer.</p> <p>B. Prior to submitting files:</p> <ol style="list-style-type: none"> 1. Purge all unused blocks, linetypes and layers. 2. Audit all files and “Fix All Errors”. 	

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APPENDICES		
NUMBER	TITLE	DESCRIPTION
A	Reserved for Future Use	A. (Previously "Standard Procedure for Measurement")
B	Reserved for Future Use	A. (Previously "Sustainable Building Practices")
C	Indoor Air Quality Guidelines	A. Design and construction requirements for meeting indoor air quality criteria.
D	Reserved for Future Use	A. (Previously "Energy Simulation Software").
E	Reserved for Future Use	A. (Previously "Resources")
F	Landscaping Criteria	A. Standards for the selection and specification of water conserving landscape materials.
G	Facilities Programming Guide	A. Recommended practices for the programming of facilities to be developed under the authority of TFC.
H	DPS Standards (12/12/2005)	A. Design standards for DPS projects.
I	Reserved for Future Use	A. (Previously "Common TAS Errors")
J	DPS Design Issues	A. A sampling of common design issues and preferred solutions on DPS projects.
K	Project Manual Format and Specification Requirements	A. Standard formatting for: 1. Project Manual Cover and signature pages ; and 2. Specification sections . B. Standards for the content of select specification sections.
L	Space Allocation Program	A. Standard spreadsheet for recording square footages for proposed buildings, departments, and individual spaces.
M	BIM Planning and Coordination Document	A. Matrix for assigning BIM scopes of work by discipline.

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WEB LINKS INCLUDED IN THIS DOCUMENT

STATE OF TEXAS

DIR	Department of Information Resources	http://www.dir.state.tx.us/
DPS	Department of Public Safety	http://www.txdps.state.tx.us/index.htm
HSC	Health & Safety Code (Texas)	http://www.statutes.legis.state.tx.us/?link=GV
SECO	State Energy Conservation Office	http://www.seco.cpa.state.tx.us/index.php
	Texas Design Standard Compliance Forms	http://www.seco.cpa.state.tx.us/sa_codes.html#anchor01
	AHRAE 90.1 and RETScreen Software Adoption	http://www.seco.cpa.state.tx.us/sa_codes.html#sb982
	SECO Suggested Water Efficiency Standards	http://www.seco.cpa.state.tx.us/waterconservation.pdf
	SECO Approved Methodologies	http://www.seco.cpa.state.tx.us/sa_codes.html
SFMO	State Fire Marshal's Office	http://www.tdi.state.tx.us/fire/index.html
TCEQ	Texas Commission on Environmental Quality	http://www.tceq.state.tx.us/
	TCEQ Construction Activities Regulations	http://www.tceq.state.tx.us/permitting/water_quality/stormwater/TXR15_AIR.html
TDI	Texas Department of Insurance	http://www.tdi.state.tx.us/
TDLR	Texas Department of Licensing and Regulation – Home Page	http://www.license.state.tx.us/index.htm
	Document Submission Requirements	http://www.license.state.tx.us/ab/abrules.htm#6850
	EAB (Elimination of Architectural Barriers)	http://www.license.state.tx.us/ab/ab.htm
	Fee Schedule	http://www.license.state.tx.us/ab/abfees.htm
	Online Registration	https://www.license.state.tx.us/ABProjectRegistrationOnline/
	TAS (Texas Accessibility Standards)	http://www.license.state.tx.us/ab/tas/abtass.htm
	Architectural Barriers Technical Memoranda	http://www.license.state.tx.us/ab/techmemos.htm
TAC	Texas Administrative Code	http://info.sos.state.tx.us/pls/pub/tacctx\$.startup

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STATE OF TEXAS (Continued)

TFC	Texas Facilities Commission – Home Page	http://www.tfc.state.tx.us/
	FDC (Facilities Design and Construction)	http://www.tfc.state.tx.us/communities/facilities/prog/construct/
	FMD (Facilities Management Division)	http://www.tfc.state.tx.us/communities/facilities/prog/FMD
	Guidelines / Standards	http://www.tfc.state.tx.us/communities/facilities/prog/construct/formsindex
	IMPACT (Web based Project Management Software)	http://www.3di.com/impact/tfc/
	Internal Procurement Division	http://www.tfc.state.tx.us/communities/commissionadmin/prog/internal-procurement-1/
	Space Management & State Leasing Services	http://www.tfc.state.tx.us/communities/facilities/prog/planning
UGC / SGC (Uniform and Supplemental General Conditions)	http://www.tfc.state.tx.us/communities/facilities/prog/construct/formsindex	
TGC	Texas Statutes - Government Code	http://www.statutes.legis.state.tx.us/?link=GV
THC	Texas Historical Commission	http://www.thc.state.tx.us/index.shtml

FEDERAL and LOCAL

ADA	Americans With Disabilities Act	http://www.ada.gov/
ADAS	ADA Standards	http://www.ada.gov/stdspdf.htm
COA	City of Austin	http://www.ci.austin.tx.us/

CAPITOL VIEW CORRIDOR

TGC 3151	Preservation of View of State Capitol	http://www.statutes.legis.state.tx.us/?link=GV
LDC	Land Development Code (City of Austin)	http://www.amlegal.com/austin_tx/

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CODES AND REFERENCE STANDARDS		
AIA D101-1995	Methods of Calculating the Area and Volume of Buildings;	http://www.aiabookstore.com/
ANSI	American National Standards Institute	http://www.ansi.org/
ASHRAE	The American Society of Heating, Refrigerating and Air-Conditioning Engineers	http://www.ashrae.org/
ASHRAE 90.1	Energy Conservation Design Standard for State-Funded Buildings	http://openpub.realread.com/rrserver/browser?title=/ASHRAE_1/ashrae_90_1_2007_IP_1280
Comcheck	Energy Code Compliance Checking Software	http://energycode.pnl.gov/COMcheckWeb/
CSI MasterFormat	2004 Edition Numbers and Titles	http://www.csinet.org/s_csi/docs/9400/9361.pdf
ICC	International Code Council	http://www.ecodes.biz/product.cfm?category_id=119
NFPA	National Fire Protection Association – Home Page	http://www.nfpa.org/aboutthecodes/list_of_codes_and_standards.asp?cookie_test=1
	NFPA 101 - Life Safety Code	http://www.nfpa.org/aboutthecodes/AboutTheCodes.asp?DocNum=101
	NFPA 70 - National Electrical Code	http://www.nfpa.org/aboutthecodes/AboutTheCodes.asp?DocNum=70
	NFPA 70E - Standard for Electrical Safety in the Workplace	http://www.nfpa.org/aboutthecodes/AboutTheCodes.asp?DocNum=70E

SOFTWARE	
Autodesk "Autocad 2010"	http://usa.autodesk.com/adsk/servlet/pc/index?id=13779270&siteID=123112
Autodesk "Autocad Civil 3D"	http://usa.autodesk.com/adsk/servlet/index?siteID=123112&id=3566722
Autodesk "DWF Writer"	Autodesk - Autodesk DWF Writer
Autodesk "Navisworks"	http://usa.autodesk.com/adsk/servlet/index?id=10571060&siteID=123112
Autodesk "Revit Architecture"	http://usa.autodesk.com/adsk/servlet/index?id=3781831&siteID=123112
Autodesk "Revit MEP"	http://usa.autodesk.com/adsk/servlet/index?siteID=123112&id=6861034
Autodesk "Revit Structure"	http://usa.autodesk.com/adsk/servlet/index?id=5523749&siteID=123112

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