



DESIGN PROCESS

DFCM DESIGN MANUAL UNIVERSITY OF UTAH SUPPLEMENT

January 15, 2016

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PREFACE

University of Utah Supplement

GENERAL INTRODUCTION TO THE UNIVERSITY OF UTAH SUPPLEMENT:

The DFCM Design Manual “Design Process” (State of Utah, Department of Administrative Services, Division of Facilities Construction and Management, referred to herein as “DFCM Manual” or “Manual”) dated March 15, 2006, is the basis for A/E design services provided for all University of Utah projects.

This document accepts the DFCM Manual as the University of Utah standard, and supplements the Manual with requirements which are needed to satisfy University organization and mission objectives.

The reader is directed first to the DFCM Manual, then to this supplement where added requirements are preceded by “**ADDED**” and paragraph alterations required to accommodate University processes are preceded by “**REVISED**.”

To remain consistent with the DFCM Manual, this supplement is organized in a format matching that of the parent Manual. Only portions of the parent Manual are reproduced in this supplement, either as navigation guides or as altered paragraphs. DFCM text is presented in a gray font. University additions and insertions are presented in normal font.

ADDED:

The purpose of this supplement is to acquaint the A/E with functions and standards of the University of Utah. A basic knowledge in these areas is essential before an A/E can successfully carry out its contract responsibilities.

This supplement describes University policies, procedures, and requirements which pertain to the construction of new and remodeled facilities.

This supplement is an essential tool and guide to be used by the A/E through all phases of project development. It is not meant to dictate *design solutions*, but rather guide *design decisions* to be in harmony with University standards.

ADDED:

REVISIONS SUMMARY for the University of Utah Supplement:

REVISION DATE	LOCATION	SUMMARY OF CHANGE
1 May 2015	8.0	<u>CAD</u> Added new requirements
27 February 2012	7.1 / F. / 6.	<u>Specifying Construction Products</u> . Removed section
06 January 2012	---	<u>University Design Standards</u> . The former University Design Standards Chapter 1 “General Guidelines” has been reformatted and re-issued as the University of Utah Supplement to the DFCM Design Manual. Most of Chapter 1 has been placed in the “Design Process” supplement while other portions have become supplemental text to the other two volumes, “Programming Standards” and “Design Requirements.” Chapter 1 text which duplicates DFCM or A/E

		Agreement language has been removed.
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Revisions Summary (*continued*)

REVISION DATE	LOCATION	SUMMARY OF CHANGE
06 January 2012	---	<u>Campus Design & Construction.</u> CD&C has changed to <i>Construction Project Delivery</i>
06 January 2012	---	<u>Facilities Planning.</u> Facilities Planning has changed to <i>Campus Planning</i>
06 January 2012	---	<u>Business Services.</u> Business Services has changed to <i>Facilities Business Services</i>
06 January 2012	---	<u>Plant Operations.</u> Plant Operations has changed to <i>Facility Operations</i>
06 January 2012	---	<u>O&M Manuals.</u> Removed Chapter 1 O&M manual requirements which are now located in the Supplemental General Conditions for University of Utah Projects
06 January 2012	---	<u>Printed Bid Sets to University.</u> Removed the requirement for 5 bid sets delivered to the Project Manager. No hard copy sets of bidding documents are needed unless requested by the Project Manager. Building Official reviews are now accomplished in electronic format.
25 January 2011	8.3 / A. / 1.	<u>XREFs.</u> Submitted CAD drawings using xrefs to have xrefs bound
25 January 2011	8.1 / B. / 2.	<u>Revit.</u> Revit drawings to be converted to CAD for submittals
25 January 2011	4.4 / F. / 5. / b.	<u>GIS.</u> DD Phase Submittals are to comply with GIS requirements
25 January 2011	4.4 / J. / 11.	<u>O&M and Warranties.</u> Adjusted section to match O&M/Warranties in the former Chapter 6
25 January 2011	4.4 / J. / 12. / a. / (3)	<u>XREFs.</u> As-Built Drawings using xrefs to have xrefs bound
25 January 2011	4.4 / J. / 12. / c. / (1)	<u>“As-Built” Tracings.</u> Two As-Built original tracings required (previously one)
25 January 2011	4.4 / J. / 12. / c. / (2)	<u>Revit.</u> One electronic copy of Revit model is required if designed in Revit

DESIGN PROCESS

University of Utah Supplement

1.0 GENERAL

1.1 General

REVISED:

A. Design Process

The Design Process applies to the capital development and capital improvement activities of DFCM, and the design of construction projects at the University of Utah. It contains specific information for the preparation of contract documents administered by the Division of Facilities Construction and Management or University of Utah Facilities Management. It delineates and supplements (either directly in the document or indirectly by reference) codes, industry recognized standards, and guide specifications. Many of the criteria are based upon the experience of DFCM and the University and the input of professional and industry representatives.

REVISED:

B. Performance Evaluation

Each entity which has a contract with DFCM or the University of Utah will be evaluated on its performance in accordance with the Design Process which includes both self-performed work and the performance of its subconsultants. As a result, it is critical that the A/E, which is in contract with DFCM or the University of Utah, communicate to its subconsultants the requirements of the Design Process and that the subconsultants communicate to the A/E and DFCM / University any deviations from the Design Process.

ADDED:

C. A/E Selection

DFCM (assisted by the University) selects and manages A/Es for University projects administered by the State. University of Utah Facilities Management selects and manages A/Es for University administered projects.

D. Projects Over \$10 Million

Projects larger than \$10 million are generally administered by DFCM. For DFCM managed projects, DFCM will issue contracts, authorize payments, manage change orders, etc., until completion, whereupon the University will occupy, operate, and maintain the new or remodeled facility. Though managed by DFCM, the University will participate in the development and management of the project. This includes design reviews and approval of each design phase before further progress is authorized.

E. Delegation / Designing University Projects

The State has delegated to the University the authority to manage construction projects costing less than \$10 million and may also delegate larger projects on a project specific basis. Facilities Management will manage all aspects of these projects (contracts,

authorize payments, manage change orders, etc.) and is directly responsible to University Administration, the Board of Trustees, the DFCM, and the State Building Board.

1. Designing University of Utah Construction Projects

a. Point of Contact

Facilities Management is generally the A/E's only authorized contact with the University on project related items.

b. Direction from Facilities Management Only

The A/E and Contractor are cautioned to take no action on directions issued by other University staff or departments until approval is obtained from Facilities Management, because any cost to the designer or Contractor, either by the action itself or subsequent repair or realignment to the project scope, will not be compensated by project funds, Facilities Management, nor by DFCM.

2. The role of Facility Operations

The Facility Operations department is responsible for the operation and maintenance of most campus buildings, systems, and grounds; and, participates in the development of the University's "Design Standards". Project information needed from Facility Operations is to be requested through the University Project Manager.

3. The role of Campus Planning

The Campus Planning department identifies the site for each new building and manages the program phase of design. This department is responsible for continuity in campus development.

4. The role of the University Purchasing Department

The Purchasing department oversees bidding on projects administered by the University. The procurement processes for A/E services and construction are managed and conducted by Facilities Management (Facilities Business Services). Procurement processes for material purchases are generally managed and conducted by Purchasing.

5. The role of the A/E

a. DFCM (assisted by the University) selects and manages A/Es for campus projects administered by the State. Facilities Management selects and manages A/Es for University administered projects.

b. Design A/Es and their subconsultants must be licensed or permitted as required by pertinent Utah State laws. Subconsultants must be identified in the fee proposal before contractual agreements are processed.

- c. Creativity and innovation, which encourage a fresh review of University direction, are openly welcomed.
6. University Hospital / Clinic Facilities Design and Construction
- a. Construction projects in the University Hospital and some surrounding buildings are handled differently than other buildings on campus. Understanding the reasons for these differences will help clarify the intent of the University's policies. Specific differences include:
 - (1) Accreditation

Construction and maintenance work in the hospital and associated buildings is required to meet the stringent requirements of the JCAHO. These requirements will affect project design.
 - (2) Construction Activity

Construction activity will be affected by patient care concerns. Noise, dust, contamination, electrical outages, and similar problems could severely compromise patients' welfare. Therefore, construction activity will often require special schedules and techniques.
 - (3) Timely Performance

Timely performance of design and construction is a constant concern. University Hospital functions as a teaching institution as well as a patient care facility and is a self-funding institution. Revenue generated by the hospital is critical to maintaining quality of care. Excessive lead time for construction materials or down time for site renovation negatively affects patient care, teaching schedules, and lost revenue for the facility.
 - (4) Utility Systems

Hospital utility systems serve several buildings. Work on the utility systems may adversely affect other buildings and must be carefully monitored and controlled.
 - b. The Hospital Department of Facilities and Engineering (or "Hospital F&E") consists of project supervisors, designers, draftsmen, estimators, maintenance, and construction personnel.
 - (1) Hospital F&E may contract directly with A/Es up to a delegated threshold limit. When the construction cost estimate exceeds a certain threshold, Facilities Management will bid the construction via the University's Internet based bid system.

- (2) Projects in the hospital area of the campus will often require joint coordination with Hospital F&E and Facilities Management. For such projects, the A/E will primarily work with both a Hospital F&E designer and a Hospital F&E project supervisor, and secondarily with a University Project Manager assigned by Facilities Management who will organize the bidding process.

1.2 Related Documents

REVISED:

- A. Documents incorporated by reference.
The Design Process (refer to <http://dfcm.utah.gov/> for DFCM managed projects and <http://www.facilities.utah.edu/designstandards> for University managed projects) includes the following documents which are incorporated herein by reference:

REVISED:

1. Programming Standards documents requirements for Facility Program documents. Refer to <http://dfcm.utah.gov/> for DFCM managed projects and Programming Standards, University of Utah Supplement found at <http://www.facilities.utah.edu/designstandards>. Both documents are required for University projects.

REVISED:

2. Design Requirements documents DFCM requirements which have resulted from DFCM's expertise and experience from previous projects. Design Requirements, University of Utah Supplement, details specific University requirements accumulated from University experience. Refer to <http://dfcm.utah.gov/> for DFCM managed projects and <http://www.facilities.utah.edu/designstandards> for University managed projects. . Both documents are required for University projects.

- B. DFCM incorporates by reference Codes, Standards, Rules...

ADDED:

1. Refer to the University of Utah Facilities Management Web Site (www.facilities.utah.edu), Departments, Building Official for current code information required for University of Utah project design.

- C. Date of Applicable Documents

ADDED:

2. The A/E shall insure that all applicable requirements of both the DFCM Design Manual and the University of Utah Supplement are included in the A/E's design.
 - a. To ensure compliance with the latest version of the DFCM Design Manual and the University of Utah Supplement, the A/E shall incorporate any revisions of these documents up to the date of the University's approval of the A/E's submitted design development documents.

- b. To ensure compliance with the latest requirements for specific products and vendors in the DFCM Design Manual and the University of Utah Supplement, the A/E shall include any revisions of these documents regarding such items up to the submittal of Contract Documents for Contractor bidding.

1.3 Communication

REVISED:

- A. Project Manager
DFCM's Designated Representative or the University Project Manager shall arrange for implementing an effective process for communicating with ~~Agency~~ the University for the purposes of determining facility requirements, ~~Agency's~~ University inquiries, and concerns related to the project.

1.4 Conflicts, Exclusions, Omissions, and Revisions

- A. Conflicts

REVISED:

- 2. In cases where references in the Design Process have changed or are otherwise incorrect, document issues to DFCM's Designated Representative for DFCM managed projects.

ADDED:

- a. For Design Manual or supplement conflicts on University of Utah projects, any anticipated change to, or variance from any portion of the DFCM Design Manual and its associated supplements will require a review by the University Design Standards Committee. Each request for change or variance must be submitted to the Committee on the appropriate form found herein and on the Facilities web site. Document the issue on the appropriate form and route the completed form through the University Project Manager to Facilities Business Services.

- B. Exclusions

REVISED:

- 1. Where any requirement cannot be applied due to project specific requirements that conflict with the Design Process, they will be considered for exclusion. A requirement may be excluded only when the exclusion may not affect DFCM's or the University's ability to deliver high quality facilities and does not absolve DFCM or the University, or entities which contract with DFCM or the University, from the responsibility to provide facility realization services that comply with the Design Process.

REVISED:

- 2. DFCM's Designated Representative is responsible for submitting exclusions from the Design Process for a specific project to the Director of DFCM for DFCM managed projects. For University of Utah projects, managed either by DFCM or the University, proposed exclusions to the DFCM Design Manual and its University of Utah Supplement for University Projects shall be documented on a University of Utah Design Standards "Project Variance Request Form" and

routed through the University Project Manager to the University's Design Standards Committee for review. The Director (DFCM) has the responsibility and authority for examining whether the proposed exclusions are appropriate and for approving them on DFCM managed projects. University's Design Standards Committee has the responsibility and authority to evaluate University specific issues.

ADDED:

- C. Change and Variance Forms.
The University of Utah Design Standards "Change Request Form" and "Project Variance Request Form" are provided on the following two pages.

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CHANGE REQUEST FORM

UNIVERSITY OF UTAH DESIGN STANDARDS CHANGE REQUEST FORM	
Section of the Design Standards Being Considered	Date Submitted
	Requested By
	Requestor's Office / Shop Organization
Brief Description of the Current Requirement	
Suggested Wording for the Proposed Addition / Deletion / Change (attach additional document(s) for lengthy changes)	
Justification	
Committee Review Date	Committee Decision / Action Assignment

VARIANCE REQUEST FORM

UNIVERSITY OF UTAH DESIGN STANDARDS PROJECT VARIANCE REQUEST FORM	
Project Name	Date Submitted
	University Project Number
	Name of Project Manager
Requested By	Requestor's Office / Shop Organization
Current Design Requirement (Reference the Applicable Design Standard)	
Brief Description of the Problem (Include the Proposed Addition / Deletion / Change to the Design Requirement)	
Justification	
Committee Review Date	Committee Decision / Action Assignment

2.0 PROJECT SPECIFIC REQUIREMENTS

2.1 Image to Public and Occupants

A. General

REVISED:

2. Provide facilities that are aesthetically compatible with the function and importance of the facility. Obtain permission from DFCM's Designated Representative / **University Project Manager** to expose facility components which detract from the aesthetic quality of the facility.

REVISED:

3. Review aesthetic features, which are defined as architectural elements other than finishes that are not required for the facility to function efficiently for the ~~Agency~~ **University**, with the DFCM's Designated Representative / **University Project Manager**. Examples of aesthetic features are: atriums, fountains, skylights, spaces with excessive volume, and exterior free standing architectural elements.

B. Appearance and Image of the Facility

REVISED:

1. Determine, with the **University Project Manager** (and DFCM's Designated Representative where applicable), the required appearance and image of the facility.

2.2 Budget

REVISED:

A. Services within Budget

Provide Design Services that do not exceed the project budget in the Agreement with either DFCM or the University of Utah.

B. The project budget, which must not be exceeded...

REVISED:

1. In projects where the services of an A/E are procured, the A/E with the **University** (or DFCM for DFCM managed projects) shall develop a cost model within the budget for the construction of the project. The different portions of the cost model will be assigned to the A/E and the Design Subconsultants for identifiable elements of the project. Refer to the Cost Model Requirements for additional requirements.

C. Alternates

REVISED:

1. Obtain approval from the **University Project Manager** (or DFCM's Designated Representative as applicable) for any alternates prior to advertisement. Do not exceed six alternates, unless approved by the **University Project Manager** (or DFCM's Designated Representative for DFCM managed projects).

ADDED:

6. For University managed projects, alternates shall be listed in ranked priority. The determination of the low bidder must be based on the base bid plus any alternates awarded in the order in which they were ranked.

2.3 Schedule

REVISED:

- A. Complete Services on Schedule
Provide Design Services that are completed on schedule as documented in the Agreement with the University or DFCM for the specific project.

REVISED:

1. Written approval of any changes in the schedule is required from the University Project Manager or DFCM's Designated Representative for DFCM managed projects.

2.4 Agency Related Requirements

REVISED:

- A. Constraints to Design Services
Provide Design Services, within the constraints of the Design Process and other DFCM and University specified constraints, which meet requirements specified by the Agency University, requirements not stated by the Agency University but which are necessary for the intended use, statutory and regulatory requirements, and additional requirements specified by the participants in the Facility Program (if one is prepared).

REVISED:

1. Minimize the disruption of the Agency's University's mission.

3.0 REGULATORY, STANDARDS, AND DFCM REQUIREMENTS

3.1 General

REVISED:

- A. Document Design Assumptions
Document in the Basis of Design the assumptions utilized in the design, including codes and other regulatory requirements (including dates and amendments), consensus based standards, and DFCM / University requirements.

ADDED:

1. The A/E will comply with the program/scope document as a contractual obligation. Design progress is to be reviewed with the University Project Manager in an ongoing dialogue intended to aid the A/E in achieving a design solution appropriate to meet the needs of the University.
2. There are master plans which govern the development of all projects within the University's jurisdiction. The A/E is to follow these guidelines.

C. Utilize design practices...

1. Exceptions

REVISED:

- a. If a proposed system is not designed in accordance with a consensus based standard, notify the University Project Manager (or DFCM's Designated Representative for DFCM managed projects). This requirement provides the University or DFCM the opportunity to determine whether the risk of an option that does not comply with a consensus based standard is acceptable.

4.0 PROJECT PROCESS

4.1 General

REVISED:

A. CSI Project Development Stages

This section defines, in general, the stages in the facility life cycle based upon the Construction Specification Institute's Project Resource Manual. The University Project Manager (or DFCM's Designated Representative for DFCM managed projects) has the flexibility to adapt or combine stages to the needs of the project subject to DFCM / University processes and procedures.

C. Documentation Requirements

REVISED:

1. Document Submittals

For non-University projects, DFCM encourages document submittals to be submitted in digital pdf format; however, provide paper copies in accordance with agreements and as required to fulfill requirements. Copies in digital format may be transmitted by email, except for copies which shall become a permanent record which shall be submitted in DVD format.

ADDED:

- a. For University of Utah projects, managed either by DFCM or the University, and in addition to the requirement for CAD formatted drawings, submit electronic review drawings and specifications in Bluebeam PDF searchable format with drawing sheet identifiers in accordance with the National Cad Standard using the specific University approved parent-child format for discipline designators. Request these Bluebeam PDF formatting requirements from the University Project Manager well in advance of design phase review submittals.

REVISED:

2. Permanent Record Documents

Design for most projects is developed in five stages. Each design stage is submitted for review. Revision comments and approval to proceed are directed to the A/E. Some projects will not require all five stages, and for such projects the A/E should clearly understand which submittals are required. Permanent Record Documents...

REVISED:

3. Digital Documents

For non-University projects, Digital Documents in pdf, DWG, DGN, DOC, XLS, and similar formats. Specific digital document requirements for University of Utah projects are described below.

REVISED:

- a. For all projects, provide documentation of Virus Free Format: Virus Scanning Software, Version, Date; Scan Date.

ADDED:

4. Code Summary

For all University of Utah projects, managed either by DFCM or the University, include a code summary placed on the second drawing sheet following the title sheet. The code summary form is located on the University of Utah Facilities Management Web Site (www.facilities.utah.edu), Building Official (under “Departments”).

5. Performance Parameters

For all University of Utah projects, managed either by DFCM or the University, include a summary of building performance parameters (design temperatures for spaces, humidity control set-points, special ventilation requirements, lighting levels for spaces, etc.) with the code summary.

D. Verification

REVISED:

1. Both DFCM and the University of Utah expects that each project task can be completed right the first time. In order to meet this expectation, the goal is to eliminate nonconformity by concentrating the efforts of all participants necessary to contribute to proper planning. Without proper planning, rework absorbs resources that often results in compressing the schedule which can increase costs, cause additional schedule compression, and reduce quality. To avoid rework, both DFCM and the University require that each member of the A/E team is expected to verify that their work is complete prior to submitting it for observation by DFCM, the University or its their agents. The DFCM's / University verification process shall not be a substitute for the verification process required by the parties in contract with DFCM or the University and shall not relieve these parties of their responsibilities.

REVISED:

- b. Notwithstanding this expectation, it is understood that the planning, programming, and design services develop through an iterative process; however, it is expected that the deliverables required at each phase of the process shall be substantially complete prior to obtaining approval of the University Project Manager (or DFCM's Designated Representative for DFCM managed projects) to proceed to the next phase of the process. The reason for this requirement is to avoid compressing the schedule which contributes to poor quality. Major changes in approved documents shall be avoided and require approval of the University Project Manager (or DFCM's Designated Representative for DFCM managed projects).

- E. Validation.
The A/E shall fully cooperate in providing information required to validate the design.

REVISED:

- 1. Either DFCM or the University may validate, or arrange to have validated, that the work process and the facility complies with the Design Process, the Facility Program (if prepared), and other Agency University Design Criteria. Refer to the related documents for Design Requirements.

REVISED:

- 2. Either DFCM or the University may arrange for the validation of the Structural Design by a Structural Engineering Peer Review. The Structural Engineering Peer Review shall be performed by a Utah registered SE experienced in similar project types.

REVISED:

- 3. Either DFCM or the University may arrange for the validation of the Energy Design for conformance with DFCM's energy conservation requirements by a Utah Professional Engineer specializing in mechanical engineering.

REVISED:

- 4. Either DFCM or the University may arrange for the validation of the Irrigation Design for conformance with DFCM's water conservation requirements by a certified Landscape Irrigation Auditor.

4.2 Project Conception Stage

REVISED:

- A. Need Statement
All DFCM / University projects start off as a need statement...

ADDED:

- 1. A need statement (scope statement) describes the basic requirements, goals, design objectives, etc. of the project. The University Project Manager may prepare a scope statement or assign this task to the A/E. The scope of a project defines the design and construction limits for the intended work.
- 2. The A/E will comply with the program / need / scope document as a contractual obligation. Design progress is to be reviewed with the University Project

Manager in an ongoing dialogue intended to aid the A/E in achieving a design solution appropriate to meet the needs of the University.

3. There are master plans which govern the development of all projects within the University's jurisdiction.
4. The A/E is to follow these guidelines.

REVISED:

- B. Steering Committee

DFCM or the University shall assemble a steering committee which includes the appropriate representation from DFCM / the University and ~~the Agency~~ appropriate University entities to provide guidance to the design team throughout the process.

REVISED:

- C. Funding

DFCM / The University shall allocate the funding in accordance with its procedures and prepare a schedule documenting the major milestones for the funded portions of the project. DFCM / The University shall define project quality by requiring compliance with the Design Process and other specific requirements necessary for project success.

4.3 Project Delivery Stage

REVISED:

- A. Delivery Method

The University (or DFCM for DFCM managed projects) shall determine the project delivery method and selection procedures. The project delivery method...

- B. Construction Delivery Methods:

REVISED:

1. Construction Management/General Contractor (CM/GC)

This method of construction is the preferred construction delivery method for ~~the~~ State development projects. University of Utah projects over \$2.5 million will be evaluated to determine the better procurement method between CM/GC and 2-step low bid. The CM/GC assists the A/E by...

REVISED:

3. Design-Build

DFCM or the University contracts with a single-entity for the complete design and construction of a project. The selection of this delivery method requires approval of the Director (for DFCM managed projects) or the Associate Vice President, Facilities Management (for University managed projects). Either the Single Bid or Multiple Bid Procurement methods are acceptable in this construction delivery method.

4.4 Design Stages

REVISED:

Note: If the project is small and uncomplicated the different design stages may be combined with approval of the University Project Manager (or DFCM Designated Representative for DFCM managed projects).

B Expectations of Design Team.

REVISED:

1. Both DFCM and the University expects that the A/E, together with its subconsultants, have responsible charge of the Design. The A/E shall designate the person who is in responsible charge of a specific design service for a specific project and through a qualification's process assure DFCM / the University that the person is qualified legally and by experience to perform the specific design service. This designated person shall be...

REVISED:

2. The goal is a quality coordinated design that minimizes the need for RFI's or change orders, and achieves a high value for cost. It is necessary that drawings, notes, and specifications be coordinated so as to minimize conflicting provisions. A design that relies upon a preponderance of vendor expertise and design effort, generally, will not accomplish this goal. Include the necessary expertise in your A/E team. Obtain permission from DFCM / the University for the use of any performance specifications which do not show the extent of the work on the drawings and which are significantly a product of vendor input. Coordinate all work between disciplines.

REVISED:

3. Either DFCM or the University may utilize the services of an independent commissioning agent. The A/E shall coordinate with the selected commissioning agent to incorporate the commissioning requirements in to the specification. The commissioning agent shall provide the information that must be included in the specification. The goal of the commissioning agent is to focus on key systems identified with DFCM / the University that, from past experience, have been problematic. The commissioning agent validates that the key systems will comply with the Design Process, DFCM's / the University's Project Constraints, and the Basis of Design at each phase of the project after their services have been procured.

REVISED:

C. Cover Sheets

DFCM has established cover sheets for the drawings for each design phase of DFCM managed projects. These are available through the DFCM web site. Utilize these cover sheets for each submittal phase to DFCM.

ADDED:

1. The University has likewise established cover sheets for project drawings. Use University of Utah cover sheets for each phase submittal to the University.

D. Stage 1 – System Selection
System Selection Design Phase

REVISED:

1. In the System Selection Design phase (at approximately 50% to 75% completion of Schematic Design), the A/E shall confirm the facility program requirements defined in the facility program document or as otherwise defined by the University (or DFCM as applicable).

REVISED:

2. The A/E shall document its Basis of Design including any design assumptions, and confirm the assumptions with the authorities having jurisdiction, the University ~~Agency~~ and DFCM where applicable.

REVISED:

3. The A/E shall provide the University, DFCM, steering committee (as applicable) with system options and evaluate the impact of each. Adjust the allocation of resources within the cost model, without exceeding the budget, based upon the direction from the steering committee or University as applicable. Obtain mutual agreement in order to proceed.

ADDED:

- a. For University projects, describe design alternatives with an economic analysis, if requested. Such design alternatives might include one level versus multi-level construction, glass fiber reinforced concrete versus brick veneer, steel versus concrete, or chilled water versus DX systems.

- (1) If requested, submit the following considerations with recommendation for:

- (a) Alternative Structural Systems (including seismic)

- (b) Alternative Mechanical Systems

- (i) Heating

- (ii) Air conditioning

- (iii) Ventilation

- (iv) Controls

- (v) Plumbing (if specialized)

- (vi) Fire protection

- (c) Alternative Electrical Systems

- (i) Power

- (ii) Lighting

- (iii) Fire notification

- (d) Alternative Acoustical Systems

- (e) Energy Saving Considerations

- b. For University projects, when an economic analysis is requested, include life cycle costs in which initial investment, operation, and maintenance

costs are considered during the economic life of the structure. The economic analysis shall be prepared in accordance with generally accepted practice.

4. System Selection Submittal Requirements:

b. Drawings Requirements

REVISED:

(1) Use the University / DFCM provided cover sheets and input the required information.

(4) Architecture

REVISED:

(a) Architectural Drawings: should include floor plans and room names, exit pathways and exterior rough elevations to show the essence of the building material types. Note that room numbers on University projects are assigned by the University and provided to the A/E at the design development stage of design.

E. Stage 2 – Schematic Design
Schematic Design Phase

2. In the Schematic Design phase, the A/E documents...

ADDED:

a. Schematic Design Drawing

(1) For University projects, the schematic design is generally presented in a "single-line" type drawing showing the type of construction and materials to be used and a visual organization of the total facility and site.

(2) This stage of the design should include the site plan, floor plans, building cross sections, elevations as required, mechanical systems, electrical systems, and a CSI outline specification.

b. Site Drawing

For University projects, the site drawing is to include proposed adjacent development as well as existing buildings, landscape, trees, walks, plazas, roads, parking, utilities, etc., all properly oriented with the coordinate requirements for University projects described in CAD Requirements 8.2.C herein. This is intended to provide a clear understanding of all influences affecting the building design.

c. Existing Utilities

For University projects, special attention must be given to existing utilities. The A/E is responsible for the identification and impact

assessment of the numerous underground utilities in and around the project site. Consideration of future utility development is also required. The University Project Manager can assist in utility identification and future development plans. Field verification should be considered with the University Project Manager.

d. Value Management Session

For University projects, the schematic design may be evaluated in a value management Session where additional alternatives may be considered. The A/E will be expected to implement approved design change proposals identified by the value management team.

REVISED:

3. The A/E shall be responsible to communicate with the State Fire Marshall's Office to receive any direction required to move to the next phase of design. On University managed projects, the A/E shall be responsible to communicate with the University Building Official and University Fire Marshall as appropriate.
4. Schematic Submittal Requirements:
 - a. Written Requirements.

REVISED:

- (2) Updated Cost Model
Note: The A/E is not to proceed unless the cost estimate is within the budget.

ADDED:

5. Schematic Design Review and Approval on University Managed Projects
 - a. The schematic design (including the cost estimate) is to be submitted for review. The University Project Manager will coordinate the review of the mechanical and electrical portion with Facility Operations. The A/E is responsible for coordinating code reviews with the Fire Marshal for compliance with Life Safety, ADA, Board of Health, and OSHA requirements. The A/E should plan to present the schematic design at a project review meeting set by the University Project Manager and attended by Facilities Management staff and user departments.
 - (1) The schematic design submission must be within budget. The University reserves the right to verify the estimate. A submission not within the project budget will be returned to the A/E without review, will be considered incomplete, and will not meet contractual scheduled submission deadlines.

F. Stage 3 – Design Development
Design Development Phase

1. Continue to Develop and Refine the Schematic Design Requirements

REVISED:

2. After written approval of Schematic Design has been obtained from the University Project Manager (or DFCM's Designated Representative for DFCM managed projects), the A/E shall proceed with the design development phase of the project upon receipt of written confirmation to initiate the next phase of design. The design development phase fixes and describes the size and character of the entire project. Submittal drawings should have enough detail with a scale large enough to show furnishings, equipment, and all elements necessary for the proper function of the facility and the spaces within. In order for the project design to be considered successful, only minor modifications to the location of the facility on the site, the floor plans, and facility sections should be required during the Construction Documents Stage.

REVISED:

3. The A/E shall be responsible to communicate with the State Fire Marshall's Office to receive any direction required to move to the next phase of design. On University managed projects, the A/E shall be responsible to communicate with the University Building Official and University Fire Marshall as appropriate.

REVISED:

4. Design Development Plan Review. The DD Design (including the cost estimate) is to be submitted for review. The A/E is responsible for coordinating code reviews with the Building Official and the State Fire Marshal for compliance with Life Safety, ADA, Board of Health, and OSHA requirements. For University managed projects, the A/E should plan to present the design development submittal at a project review meeting set by the University Project Manager and attended by Facilities Management staff and user departments.

- e. Typical floor plans

ADDED:

- (1) Electronic Submittal for Room Numbering (all University projects):
 - (a) When the design of a project includes the addition or deletion or relocation of walls, the design development submittal shall include an electronic version of the design development drawings in accordance with Section 8.0 "CAD Requirements" herein AND include PDF formats. The revised floor plan will be used for room numbering by the University.

ADDED:

- f. The design development submission must be within budget. The University reserves the right to verify the estimate. A submission not within the project budget will be returned to the A/E without review, will be considered incomplete, and will not meet contractual scheduled submission deadlines.

5. Design Development Submittal Requirements:

- a. Written Requirements:

REVISED:

(2) Updated Cost Model

The cost estimate must include the current CSI divisions with detailed quantities and unit costs.

(3) Project Manual (refer to CSI Project Resource Manual)

ADDED:

(a) For University managed projects, the University's general requirements "boiler plate" section is not to be included with the specifications for this submittal.

(b) For University managed projects, the specification should include a summary of recommendations concerning the general type, quality, and character of building systems and materials included in the project.

b. Drawing Requirements:

ADDED:

For the DD submission on all University projects, the following specific requirements for campus GIS must be followed. These requirements apply to every type of delivery method (design-bid-build, design-build, or CM/GC) and are applicable to every bid package submitted for DD review.

(1) Include electronic copies of the ACAD drawings and PDFs of the DD drawings.

(a) ACAD DD Drawings

(i) Provide all civil, landscape, architectural and structural drawings.

(ii) Civil drawings are to show the utility information leading up to the building.

(b) PDF DD Files

Provide a PDF set of files containing all DD drawings.

REVISED:

Continue to update and refine what was previously shown and add the following information. Submittal drawings should have enough detail with a scale large enough to show furnishings, equipment, and all elements necessary for the proper function of the facility and the spaces within.

G. Stage 4 – Construction Documents
Construction Documents Phase

REVISED:

1. After written approval of the Design/Development Documents has been obtained from the University Project Manager (or DFCM's Designated Representative for DFCM managed projects), the A/E shall proceed with the construction documents phase of the project. The construction documents are...

ADDED:

- a. Project Review Meeting

For University managed projects, the A/E should plan to present the completed construction documents submittal at a project review meeting set by the University Project Manager and attended by Facilities Management staff and user departments.

REVISED:

2. Coordinate requirements for the following items with the University Project Manager (or DFCM's Designated Representative for DFCM managed projects) and assist the University / DFCM as needed.

REVISED:

- d. Obtain list of contractors from the University Project Manager (or DFCM's Designated Representative for DFCM managed projects), if applicable.

ADDED:

- i. Material and Equipment Selections

For University managed projects, material and equipment selections used in the completed design are to be reviewed with the University Project Manager and approved before the final review submittal.

REVISED:

3. The University (or DFCM for DFCM managed projects) will initiate and prepare, with assistance as required from A/E, the following standard documents.

- a. Notice to Contractors
- b. Bid Form
- c. Bid Bond (DFCM)
- d. Bidder's Proposed Subcontractors (DFCM)
- e. Contractor Agreement Form (DFCM / University of Utah)
- f. Payment Bond (DFCM)
- g. Performance Bond (DFCM)
- h. Certificate of Substantial Completion (DFCM / University of Utah)
- i. General Conditions (DFCM / University of Utah)
- j. Supplementary Conditions (DFCM) / Supplemental General Conditions for University of Utah Projects (University of Utah). The University of Utah General Conditions and Supplemental General Conditions for University of Utah Projects are available at <http://www.facilities.utah.edu/contractdocuments> .

4. Construction Documents Submittal Requirements

REVISED:

a. Written Requirements

Submit a detailed cost estimate. This estimate shall include a careful take-off and breakdown of trades, quantities, labor, material, profit, overhead, contingencies, architect's fees, furnishings, equipment, etc., and shall include all design changes made up to the estimate date. The University may choose to verify the estimate. If so, the A/E will be required to meet with the University's estimator to reconcile differences between the two estimates.

REVISED:

b. Drawing Requirements

For University managed projects, the A/E is to submit six hard-copy sets and one electronic CAD drawing and PDF of drawings and specifications for construction (or furnishings/equipment installation) that depict and define complete requirements for the facility. The University Project Manager will distribute copies internally, including one set to the University's Environmental Health and Safety Department. Complete, coordinated drawings ready for final review and comment by DFCM (as applicable), the Agency University and Authorities having jurisdiction include the following:

REVISED:

- (1) Project Title Page: Template provided by the University (or DFCM for DFCM managed projects).

ADDED:

d. Specific University of Utah review requirements:

- (1) Budget

A submission not within the project budget will be returned to the A/E without review.

- (2) Site Plan

When a site plan is applicable to a project, or when the footprint of an existing building changes, an electronic drawing (in accordance with Section 8.0 "Cad Requirements" herein) and PDF of the project site plan showing the building footprint, including extensions, awnings, connecting bridges, etc., in relation to the surrounding environment shall accompany the construction document Submittal for review.

- (3) Special Events Affecting the Construction

The University of Utah operates 365 days per year, 24 hours per day. On occasion, there are a number of special events which may have an adverse effect on the construction schedule for any project. The most prominent of these are the annual commencement ceremonies, but there may be other such events. It is the responsibility of the A/E to specifically identify those events, and to clearly delineate them in the contract documents, if such events may cause construction efforts to be halted, delayed, or modified. Such wording must enable the bidding Contractor to anticipate shutdown costs and schedule delays in its bid.

(4) Inspection Checklist

The A/E shall prepare a comprehensive inspection checklist comprised of specifications requirements to be published as part of the specifications package. The checklist will be used later during project inspections and systems commissioning. This checklist should be organized to follow the specifications numbering system and shall include all sections.

H. Stage 5 – Contract Documents
Contract Documents Phase

REVISED:

1. Written Approval to Proceed

After the construction documents have been modified to comply with requirements of the authorities having jurisdiction and requirements of the steering committee written approval by DFCM’s Designated Representative (for DFCM managed projects) or the University Project Manager (for University managed projects) is required to issue the Contract Documents.

REVISED:

a. Building Official Plan Sets

Provide two complete and corrected sets of drawings. Drawings shall be wet-stamped, signed and dated by a State of Utah licensed Architect or Engineer and submitted for approval by the University or State Building Official. One set to be retained by the University (or DFCM for DFCM managed projects), the other set to be given to the General Contractor and kept at the construction site.

ADDED:

b. Bid Due Dates

For University managed projects, dates for advertising, walk-through, prior approvals, and the due date for bids will be established by the University.

c. “Boiler Plate”

For University managed projects, the University's general requirements "boiler plate" section will be added to the front of the project specifications by the University.

d. Advertisement (University Managed Projects)

- (1) Projects to be bid will be advertised if the construction cost estimate reaches or exceeds a threshold established by University / DFCM procurement rules. If advertising is required, the University will post the boilerplate, specifications and drawings into the University's Internet based bid system where the project will be visible to all contractors.
- (2) Projects with estimates below the advertising threshold may similarly be entered into the Internet based bid system; however, visibility and access may be limited to specific contractors invited to bid. No other contractors will see the project on the web site.

e. Issuing Bid Documents

For University managed projects, contract documents and associated addenda for bidding will be distributed by the University on its Internet based bid system. The A/E will generally download the final documents from the University's Internet based bid system to print sets for the University.

f. Furnishings, Fixtures and Equipment

For University managed projects, furnishings and equipment bidding documents will require coordination between the A/E, the University Project Manager and the University's Purchasing Department before preparing documents. Begin this process with abundant lead time prior to the intended bid. The A/E may be required to prepare the specifications using the form and layout provided by Purchasing. The University will add a title sheet and legal bidding information to the front of the A/E's specifications. University Purchasing will issue bidding documents to vendors / suppliers via the University's Internet based bid system.

g. Contractor / Vendor Questions

Contractor/vendor questions will be directed to the A/E, who will prepare an addendum for review and issuance by the University through the University's Internet based bid system. See "j" below.

h. Pre-Bid Meeting

For University managed projects, any pre-bid meeting will generally be conducted by the A/E and assisted by the University Project Manager. Contractor questions which result in clarifying or project altering

responses will require an addendum. A mandatory pre-bid meeting will require an addendum listing the attending contractors.

i. Addenda to Bid Documents

For University managed projects, addenda to the bidding documents will be prepared by the A/E, then submitted via simultaneous email to the University Project Manager and pre-identified members of the Facilities Business Services Contracts (“Contracts”) staff. The email is to be sent to the Project Manager and identified Contracts staff at the same time to allow the University Project Manager to verify content while the Contracts staff verifies compliance with procurement rules. The last addendum must allow all contractors/subcontractors/vendors adequate time to adjust their bids. If addendum release is too close to bid day, the Contracts staff may require an extension of the bid due date.

j. Submission of Bids

For University managed projects, the A/E is not permitted to receive bids. Bids are submitted through the University’s Internet based bid system for receipt by the University.

k. Bids Over Budget

The A/E must revise specifications and drawings upon request at no cost to the University/DFCM, if the lowest responsive bid exceeds the total construction budget. If a professional estimator is used by the A/E, the A/E retains responsibility for the estimate and design revisions.

l. Award and Notice to Proceed

Following the bid opening, the A/E may be asked to assist the University/DFCM in evaluating the bids and preparing for award. The University/DFCM will control the advertising, bid opening, publishing of bid results, awarding of the contract, securing the contract, etc.

I. Stage 6 – Pre-Construction
Pre-Construction Stage

2. Pre-Construction Meeting

REVISED:

- a. The University Project Manager (or DFCM’s Designated Representative for DFCM managed projects) shall arrange for a preconstruction meeting. The A/E will assist during the preconstruction meeting to clarify the line of communication, establish inspection criteria, coordinate staging space; and, present the rules for document interpretation, change orders, etc. Shop drawing scheduling shall be coordinated so that the information is available for each discipline and trade to review and coordinate prior to the Pre-installation conference.

ADDED:

- J. Stage 7 – Construction
Specific Construction Stage Requirements for University Managed Projects
1. Shop Drawings / Submittals

A concurrent review by Facility Operations is required. Provide a copy of each submittal to the University Project Manager for distribution. The University Project Manager is responsible to establish review deadlines for each applicable Facility Operations shop, and respond to the A/E with timely review comments within the time limits provided in the Contract Documents.
 2. Substitution Requests

The University Project Manager will obtain Facility Operations' approval / rejection of materials and equipment included in any substitution request after the A/E has reviewed the request.
 3. Substantial Completion
 - a. Per the landscape design requirements in *Design Requirements*, projects with landscape irrigation require the Contractor to obtain a CLIA Audit prior to the Substantial Completion Inspection (the CLIA Audit report must be acceptable to the University before authorizing a Substantial Completion Inspection).
 - b. A set of as-built control drawings are to be accessible during the walk-through.
 4. University As-Built Documents Requirements
 - a. Furnish to the University within 60 days of the completion of the project, a complete set of "Record As-Built" drawings and project documents.
 - (1) Security System As-Built Submittal

"Record As-Built" drawings and project documents prepared by the installing contractor of the security system will be submitted directly to the University's UCard main office. This information must be kept confidential and must be submitted as one bound hard copy and one electronic copy. No other entity will receive a copy of security system "as-built" drawings and project documents.
 - b. The "Record As-Built" submittal is to include:
 - (1) Two "as-built" original tracings on bond (re-plotted CAD drawings).

- (2) One electronic copy of the Revit model if designed in Revit.
- (3) One electronic copy of CAD “as-built” drawings, specifications, addenda, change orders, cost estimates, design calculations, balancing information, field notes, meeting minutes, submittals, warranties, operation & maintenance manuals, and images. The electronic copy is to include drawings in AutoCAD and PDF formats. Any other documents provided on the disk are also to be in PDF.
- (a) The electronic copy shall be on compact disk with the following label information:
- (i) DISK LABEL:
- PROJECT NAME
 - UNIVERSITY PROJECT NUMBER
 - A/E BUSINESS NAME
 - A/E’S PROJECT NUMBER
 - SUBMITTAL DATE
- (ii) CASE EDGE LABEL:
- UNIVERSITY OF UTAH
 - UNIVERSITY PROJECT NUMBER
- (iii) CASE COVER LABEL:
- PROJECT NAME
 - UNIVERSITY PROJECT NUMBER
 - A/E BUSINESS NAME
 - A/E’S PROJECT NUMBER
 - SUBMITTAL DATE
- (iv) CASE INSIDE COVER:
- PROJECT NAME
 - UNIVERSITY PROJECT NUMBER
 - DISK CONTENTS, FILE TREE, FILE NAMES
 - ❖ Drawings (AutoCAD)
 - ❖ Drawings (Adobe PDF)
 - ❖ Specifications
 - ❖ Addenda
 - ❖ Change Orders
 - ❖ Cost Estimates
 - ❖ Design Calculations
 - ❖ Balancing Reports
 - ❖ Field Notes
 - ❖ Meeting Minutes
 - ❖ Submittals
 - ❖ Warranties
 - ❖ O&M Manuals
 - ❖ Images

5.0 DFCM QUALITY ASSURANCE REQUIREMENTS

5.1 General

REVISED:

- A. Interdisciplinary Coordination
DFCM has determined that many of the Quality Control problems can be reduced by a structured approach to interdisciplinary coordination and integration. The A/E shall integrate the drawings and specifications of all disciplines. The A/E shall inform the University (or DFCM for DFCM managed projects) of the process they will implement with the design team for dimensional control and comprehensive coordination of all elements of each of the following:

6.0 COST MODEL REQUIREMENTS

6.1 General

REVISED:

- A. Goal of Cost Model Requirements
The goal of the Cost Model Requirements is to provide clear criteria which the cost models and bids for a facility must meet to achieve DFCM's and the University's requirements for the project to be considered successful.

REVISED:

- B. Defined in A/E Agreement
The University Project Manager (or DFCM's Designated Representative for DFCM managed projects) shall define in the "Agreement between the University / DFCM and A/E" the Cost Model submittals required by the A/E. Unless otherwise indicated in the "Agreement Between University / DFCM and A/E," Cost Models are submitted at the following phases:

REVISED:

- C. Cost Model at Each Design Phase
The A/E shall prepare a Cost Model at each phase of the Design which identifies a sub-cost model for each discipline. Based upon this Cost Model, the A/E with each of the Design Subconsultants shall summarize in the Cost Model narrative what can be constructed in accordance with the Cost Model. Document any variances that do not comply with the Design Process, Facility Program, or Agency University Requirements. Prepare design document submittals that comply with the Cost Model.

On projects where a CM/GC has been selected the CM firm will...

6.2 Standards

- A. Cost Model Preparation
The Cost Model shall be prepared according to the...

REVISED:

2. Exception: a proprietary Cost Estimating data base may be utilized when validated by objective evidence and approved by the University Project Manager (or DFCM's Designated Representative for DFCM managed projects).

6.3 Cost Model Report Table of Contents

- A. Executive Summary

REVISED:

4. DFCM or University Furnished Cost Model (Lump Sum, Cost/gross sf);

7.0 PROJECT MANUAL REQUIREMENTS

7.1 General

REVISED:

- C. A/E Addresses Instructions to Contractor
The only parties to the construction contract are the DFCM (or University of Utah for University managed projects) and Contractor. The A/E shall therefore address all instructions to the Contractor. Do not address individual subcontractors or trades.

ADDED:

- F. Specifications Requirements
Specifications Requirements for University of Utah Projects:

1. Boiler Plate

- a. The A/E will coordinate with the University Project Manager to provide project specific information for the following "boiler plate" documents which are placed at the beginning of project specifications:

- (1) Title Page
- (2) Table of Contents
- (3) Notice to Contractors
- (4) Instructions to Bidders
- (5) Bid Response Form
- (6) Bid Bond Form
- (7) Subcontractors List Form
- (8) Sample Contractor's Agreement
- (9) Performance / Payment Bond Forms

- (10) Application and Certificate for Payment Form
- (11) Certificate of Occupancy / Substantial Completion Form
- (12) General Conditions and Supplemental General Conditions for University of Utah Projects(by reference)

2. Coordination

Drawings and specifications shall coordinate with each other. All items described in the specifications shall be referenced in the drawings. Avoid duplication and conflict between the various drawings and specifications sections. In project specifications, do not repeat requirements described in the General Conditions. The A/E will be liable for all costs attributable to change orders resulting from coordination conflicts within the Contract Documents. This will include coordination of all portions of the documents prepared by subconsultants as well.

3. Accurate, Detailed Documents

A fundamental requirement is that drawings and specifications be complete, detailed, and accurate enough such that all bidders may prepare estimates on exactly the same work, and that construction may proceed with no misunderstanding of the work to be done.

4. Unusual Materials

Avoid the use of unusual materials or items not readily available locally. Where materials may not be well known, include the name and address of either the manufacturer or local supplier.

5. University Approved Manufacturers

Certain items identified in the “Design Requirements” University of Utah Supplement are identified as “approved manufacturers”. Where this occurs, no other manufacturer is acceptable without written approval from the University Project Manager prior to the bid due date. Approval by the A/E of any other manufacturer as a substitute without such written notice is not acceptable and the A/E will be liable for all costs incurred in obtaining acceptable equipment for the project.

7.2 Preferred Source Documents

REVISED:

- A. Manufacturer’s Written Specifications
The University / DFCEM requires written disclosure and project manager approval if specifications are prepared by a manufacturer. Manufacturer written specifications generally should not be used in order to avoid unfair influence by a manufacturer in the procurement process.

REVISED:

- B. Comply with CSI / Documented Quality Process
The University / DFCM requires that specifications be prepared in compliance with CSI requirements and that the specification masters be prepared using a documented quality process.

7.3 Construction guarantees and warranties shall:

REVISED:

- A. Protect
Protect DFCM and the University against faults, defects, or failure, in spite of technical compliance with the terms of the contract.

REVISED:

- B. Extend Warranty on Selected Items
Extend the manufacturer's responsibility beyond the end of the one year guarantee period on selected items as approved by DFCM (or the University as applicable).

7.4 Product and Service Life Cycle Requirement:

- A. Assure High Value
Assure there is a high value for the cost by:

REVISED:

1. Maximize competition consistent with the purpose. In addition, minimize sole source procurements (Refer to <http://www.rules.utah.gov/publicat/code/r023/r023-001.htm>). Provide a minimum of three manufacturers for each material or installation, except where authorization from the University Associate Vice President – Facilities Management (or Director of DFCM for DFCM projects) has been obtained for sole source procurements. The use of an “or equal” clause in the specifications...
2. In order to avoid excessive addition and replacement costs, use open source and open protocol systems when possible.

REVISED:

- a. Where proprietary software and service organizations are required to service a component, obtain price information for DFCM (as applicable) and the Agency University identifying the long term cost (10 years) in order to include this in the evaluation.

7.5 Materials REVISED:

- A. Specify New Materials / Standards Certification
Specify materials which are new, unless approved by the University Project Manager (or DFCM's Designated Representative for DFCM managed projects). Provide certification or label with the name of the manufacturer or supplier and the approved testing laboratory where consensus based standards have been developed.

8.0 CAD REQUIREMENTS

8.1 General

REVISED:

- B. Produce all University Drawings in CAD
For DFCM managed projects, coordinate with DFCM's Designated Representative to determine the drawing format. For University projects, the consultant shall produce all drawings in a CAD format with a specific coordinate system as described in 8.2. C.1.

ADDED:

1. The consultant shall provide drawings for University projects in either .dwg or .rvt format.
2. Consultants shall select the project drawing format using the following guidelines:
 - a. Anticipated project construction cost less than \$2.5 million: .rvt or .dwg format.
 - b. Anticipated project construction cost \$2.5 million or more: .rvt format.
3. The consultant shall prepare civil site drawings in .dwg format regardless of the anticipated project construction cost.
4. The consultant shall provide all survey data collected in the field in either .csv or .txt format, including associated coordinates and coding, within 30 days of collection.

REVISED:

- C. Approval to Vary from CAD Standards
The performance requirements are given as appropriate as minimum criteria to allow flexibility within the constraints of the CAD Standards. If a variance from the standard is desired, the approval of the University Project Manager (or DFCM's Designated Representative for DFCM managed projects) is required.

8.2 Standards

- B. CAD Software

REVISED:

2. Microstation, current version (not allowed on University projects)

ADDED:

- C. Required University Coordinate System
Coordinate System Requirements for all University of Utah Projects
1. The consultant shall prepare all drawings with the following coordinate system:
 - a. Horizontal: NAD 1983 UTM Zone 12N feet

- b. Vertical: NAVD 1988 feet
 - 2. The consultant shall utilize this coordinate system in all submitted drawings (site plans, floor plans, ceiling plans, mechanical, electrical, elevations, etc.).
- D. GIS for University of Utah Projects
- 1. The consultant shall provide the University with all survey data collected in the field during design and construction within 30 days of collection. The survey data shall be in either .csv or .txt format and shall include all associated coordinates and coding.
 - 2. The consultant shall provide the University with all underground utility information collected during design and construction within 30 days of collection. The utility information shall include location of existing utilities as well as expected location of utilities planned for installation.

8.3 Guidance

A. Assumptions

REVISED:

- 1. The consultant shall bind xrefs in all .dwg drawings.

ADDED:

E. Specific University of Utah drawing requirements:

- 1. Use the University's standard title sheet, standard "sheet two" and the Design Code & Criteria for code summary and design parameters. Each template will be provided by the University Project Manager.
- 2. Use simple keyed notation for items pertaining to each individual sheet. Do not use keyed notes referencing specification section numbers.
- 3. Redundancy of dimensions, brand names, specification oriented notes, etc. is prohibited.
- 4. Nomenclature of systems, assemblies, items, etc. must agree with the specifications. For example, usage of trade/brand names such as "Drivit" in lieu of "Exterior Insulation and Finish System" is not acceptable. Another example is "Sheet Rock" in lieu of "Gypsum Board".
- 5. Once University-assigned room numbers have been provided, only the University room numbers should appear in submitted drawings. This transition must occur by the Construction Documents phase and Contract Documents must reflect University-assigned room numbers.
- 6. Include exact locations for existing features and conditions which surround or traverse the project site. Include buildings (with critical grades, elevations, heights, floor levels, views), landscape (with exact locations of trees), utilities, drainage, lighting, walks, roads, parking, etc. Coordinate the site plan(s) scale with the University Project Manager. Note that the University does not

warrant the accuracy or completeness of its Utility Base Maps. To the extent that survey information, or the University's utility location maps, may be incomplete or inaccurate as to the actual size and location of site utilities, topography, existing landscape, or structures, the A/E is required to determine the information needed for accurate development of the Project.

- a. No structure will be allowed to be built over existing underground utilities without prior approval from the University at design conception. The University is required to prior-approve appropriate budget / funding for complete utility relocation / restoration.

8.4 CAD Layer Guidelines – Supplemental Requirements

- B. Identify user-defined layers using standard alphanumeric format.

ADDED:

1. For all University projects, in order to facilitate the preparation of floor plans and the conversion of floor plans into GIS format, the layers containing walls (both exterior and interior), windows, doors, and University-assigned room numbers must contain only these elements. Submittals must clearly identify which layers contain this floor plan information.
2. Drawing elements should be grouped in appropriate layers. Drawing elements within a categorized grouping should be represented in one layer only. Minimize unnecessary duplication of elements for purely graphic purposes.
3. Separating old and new elements of the same type. Drawings may contain separate layers differentiating between existing objects and the new objects that are to be installed or constructed, as long as the layer names are clear and each layer actually contains only that type of object, and this same type of object does not appear arbitrarily throughout other layers. For example, curb lines may be separated into two layers representing existing curbs and new curbs.
4. Unacceptable Conditions. Digital site plan drawings containing conditions such as the following will not be accepted: 1) Layers identified by numbers alone, for example '20300012'; or layers identified by very general terms, such as 'LINEWORKP1'; or layers identified by terms that are not easily understood; 2) Common elements, for example, the surrounding sidewalks, represented in multiple layers.
5. Use simple, straight forward layer names and ensure that the contents of layers are consistent. Use the layering guidelines in the National AIA CAD Standard as adopted by DFCM. Layering of the drawing shall be arranged such that each layer contains one, and only one, type of real world object. Layer names are expected to be relatively intuitive and/or explicit in describing the content of each layer. If the layer name is "cryptic", e.g. simply a series of numbers, then include a simple list of layer names (electronic, on the same disk as the referenced files) and a description of what each layer contains. It is

preferable to have the real world elements separated more or less according to the following categories:

ROADS	all roads elements (including curbs)
SIDEWALKS	all sidewalk elements
BUILDING	all building footprints and elements
OTHER	other, non-building elements like walls, concrete, and rock
LIGHT POLES	light poles, power poles, bollards, and other point elements
UTILITY	all buried utility line elements
LANDSCAPE	all landscaping elements like trees, shrubs, etc.
CONTOUR	all contour line work and elevation info
SURVEY	all survey and/or grid referencing elements like bench marks
PAINT	all paint line elements like red curbs, striping, etc.
GRAPHIC	all other purely graphic elements

8.5 Uniform Drawing Standards – Supplemental Requirements

A. Drawing Set Organization

REVISE

D:

3. File Naming Convention: DFCM’s preference is to use two character discipline designators. One character discipline designators may be used for sheets that apply to all the drawings in a discipline or if the project is small. For small projects, the use of one character discipline designators must be approved by the University Project Manager (or DFCM’s Designated Representative for DFCM managed projects) for the project.

B. Sheet Organization

REVISE

D:

2. Obtain written approval, prior to submitting sheets that vary from this standard, from the University Project Manager (or DFCM’s Designated Representative for DFCM managed projects). Request shall be in writing and include a justification for the variance.

REVISED:

D. Drafting Conventions

Comply with Drafting Conventions Module 04 for both DFCM and University projects. Use University supplied sheets for University projects. Where approvals are required per instructions below, University projects will require approval from the University Project Manager.

REVISED:

- H. Code Conventions
Provide the code information as required in the design process and in paragraph 4.1.C.4 in this University of Utah Supplement (or DFCM cover sheet templates for DFCM managed projects).

ADDED:

- I. Building Performance Parameters
For University of Utah projects, include a summary of building performance parameters (design temperatures for spaces, humidity control set-points, special ventilation requirements, lighting levels for spaces, etc.) with the code summary.

8.6. Construction Phase

- 1. General
The consultant shall update the project drawings every 30 days to show changes made through change orders or recorded on red-line drawings kept by the contractor.
- 2. Shop drawings
The contractor shall submit fabrication models, coordination models, and shop drawings in the same format (.dwg or .RVT) as the project drawings. These drawings shall reflect the exact geometric properties of the materials and systems being submitted.

8.8 Project Close-out

The Design team shall coordinate preparation and submittal of the following close-out documents:

- 1. The consultant shall deliver submittals and record drawings (.rvt or .dwg and .pdf format) within 45 days of substantial completion.
- 2. The contractor shall deliver scanned as-built drawings (.tif format) within 45 days of substantial completion.
- 3. The contractor shall deliver O&M manuals and warranty information to the consultant for review following substantial completion. The contractor shall incorporate the consultant's comments in the O&M manuals and warranty information and submit the final version (2 hard copies in three-ring binders and one .pdf version) to the University within 45 days of substantial completion.

End of University of Utah Supplement – Design Process