

DIVISION 4 DESIGN MANAGEMENT

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4. DESIGN MANAGEMENT

Introduction:

All construction projects are divided into two distinct parts: pre-construction and construction. Division 4, Design Management, includes the fundamental elements of pre-construction. Construction Management procedures can be found in Division 6.

Design management is the oversight of Design and its specific architectural phases. These phases include: programming/conceptual design (pre-design), schematic design, design development, construction documents (Construction Documents and specifications). For the San Diego Community College District (SDCCD), these design phases are supplemented and modified by the California Community College Chancellor's Office (CCCCO).

The review and approval stages for CCCCCO and their corresponding architectural design phases are as follows: Initial Project Proposal (IPP) & Final Project Proposal (FPP) = Programming/Conceptual Design; Preliminary Planning (PP) = Schematic Design & Design Development; and, Construction Documents (CDs) = are also known as Working Drawings

Below is a chart that shows the relationship graphically:

PRE-DESIGN	DESIGN	CONSTRUCTION DOCUMENTS	BID
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Agency Pre-Construction Phasing								
CCCCCO	IPP	FPP/Conceptual Design	PP (PP Review at 75%)		Updates to CCCCCO as necessary			
DSA	Schematic Review				First Review	Final Review	Updates to DSA as necessary	
Non-CCCCCO	Programming		Schematic design	Design Development	CD (Review at 50%)	CD (Review at 90%)	CD (Review at Final)	Bid Review and recommend

A/E Pre-Construction Services Phasing						
A/E	Pre-Design		Design		Construction Documents (w/ coordination of 50%/90% and Final Reviews)	Bid
	Programming (w/ coordination of IPP submittal)	Conceptual Design (w/coordination of FPP submittal)	Schematic design	Design Development (w/ coordination of 75% PP submittal)		

This Design Management section of the Program Manual provides approved policy regarding the physical design of buildings, landscape and hardscape elements on the San Diego Community Colleges Campuses.

4.1 DESIGN PROGRAM

Overview:

It is important to early establish Design Teams to help ensure an efficient review and recommendation process for each capital project during design stages. These teams will work together in reviewing each design products and will also work independently to resolve issues at the detail level during the development of a given design phase.

4.1A District Design Management Team

The District Design Management Team is maintained at the DISTRICT level. This Team will review and provide recommendations to the Chancellor and the Governing Board, as required, for all capital projects. The team includes the following members:

- SDCCD Vice Chancellor – Facilities Management
- SDCCD District Architect
- Campus Project Managers

4.1B Campus Administration Design Team

The Campus Administration Design Team is maintained at the Campus Cabinet level. The College President and Cabinet element of this Team will review and provide recommendations to the District for all College's capital projects. The Campus Administration Design Team will be primarily responsible for reviewing the exterior design elements of the building and to champion the design budget to support the principals of the Prop S and N Program. The Team includes the following members:

- College President and Cabinet
- Designated College Planning Teams
- Auxiliary Business Services Organization
- Campus Police
- Regional Facilities Officer
- Campus Project Manager

4.1C Project Task Force Design Team

The Project Task Force Design Team is comprised of key members of the Campus Administration Design Team and facility user group(s). This Team will review and provide recommendations to the Campus Administration Design Team. The Project Task Force is named by the Campus President to provide the input and data necessary for the preparation of the building program elements and functional spaces. The primary responsibility of the Project Task Force is to insure the functional spaces depicted in the Architect's design meet the approved programmatic requirements specified in the project FPP. The College Task Force consists of the Users (faculty, staff, maintenance and facilities staff) who are lead by one or two designated leaders (usually one Dean and one Faculty member) who are responsible for recommendation of the interior functional space layouts for approval. The Campus Project Manager is responsible for coordinating the meetings, preparing minutes and action reports, maintaining the schedule and deadlines, and obtaining the approval recommendations.

The Project Task Force should: 1) ensure program compliance; 2) verify cost estimates against project budgets; and 3) assess the efficiency of the design. The Team includes the following members:

- Key designee from Cabinet
- SDCCD District Architect
- Designated College Project Task Force

- Campus Project Manager
- Construction Manager if on-board

4.1D Project Communications Protocol:

Goals

A primary goal is to meet, and exceed where possible, the expectations of stakeholders. Successful project management requires superb communication between and among the design team consultants, facility users (including College faculty and staff), College officials and District officials.

It is the goal of the Program to facilitate and manage communication during the pre-construction phase, with the following objectives:

1. Maximize involvement of facility users during key stages of design
2. Assure control of decisions impacting design, cost and design by appropriate College and District leaders
3. Facilitate communication with each architectural team so that user information is acquired efficiently and that the “idea-review cycle” and the “design-review cycle” is completed while adhering to the project schedule
4. Assure, that direction given or decisions made do not conflict with previous direction or decisions

The more involvement by a greater number of people requires a higher level of coordination. This Communication Protocol will serve as one of the project controls needed to resolve these competing objectives.

The following list of program stages and of program participants reflects the numerous possibilities of communication during the development of a project. Lines between each stage and each participant, and then between participants quickly reveals the criticality of our Program Communication Protocol.

DESIGN STAGES

Pre-Design

Programming
Conceptual Design

Design

Preliminary Design
Design Development

Construction Documents

50% drawings
90% drawings
Final Review

Construction

Bidding
Change Orders

PROGRAM PARTICIPANTS

Students
Faculty
Deans
President

District Architect
Chancellor
Vice-Chancellor-Facilities Management
Campus Project Manager

Project Architect
Design Consultants

Campus Project Manager
Construction Manager
Contractors
Project Architect/Inspector

Protocol Procedures

The Communication protocol procedures are based upon the Campus Project Manager serving as

the “focal point” for all communications.

Program participants and communicators must copy the Campus Project Manager on all hard copy and electronic communication documentation. Verbal communication between participants must be memorialized if decisions or conclusions were made during the course of the conversation.

Most Communication will occur during a Task Force Meeting or a Construction Progress Meeting. All Meeting Minutes shall be entered into Expedition by CPM or CM (if on-board).

It will be the responsibility of members of Task Forces and Construction Meeting participants to obtain and review the meeting minutes if they are not able to attend. Corrections or clarification of items must be presented before or at the next regularly scheduled task force or design meeting.

The RFI process in Expedition will be used by the Campus Project Manager for the Pre-Design and Design phases of the project (pre-construction). During the Construction Phase, the RFI responsibility will shift to the Construction Manager. Until then, the Campus Project Manager shall be responsible for tracking action items in the Pre-construction RFI system, managed through Expedition.

The Project Architect shall be also responsible for submitting action items and answering the RFI items to the Campus Project Manager using the RFI system through Expedition.

All College and District staff shall copy the Campus Project Manager on all communication to the architect and other design team member.

The Architect, or their sub-consultants, may consult or confer with the Task Force chair, or the chair’s designee on aspects of the project that do not impact budget or schedule. Any and all decisions must be:

1. copied to the Campus Project Manager
2. copied to the Task Force Chair

Any selection or decision that has the potential to increase the project budget or add time to the project schedule must first be submitted to the Campus Project Manager.

Campus Project Manager shall be responsible for:

1. Forwarding copies of e-mails, meeting minutes, and any other communication documentation to District and College leaders accordingly.
2. Assure that when changes are made, they are communicated back to stakeholders involved in the original decision.

4.2 PRE-DESIGN

Overview:

The Pre-Design Phase consists generally of educational programming for the project to define scope, size, space relationships and site development. Additionally, the Pre-Design Phase provides project feasibility planning; including development of a building program, identifying facility functions, adjacency relationships, equipment needs and a conceptual cost estimate based upon area costs. Specifically the Pre-Design Phase is separated into two distinct sub-phases: Initial Project Proposal (IPP) and Final Project Proposal (FPP), as appropriate for State funded projects.

4.2A Initial Project Proposal (IPP)/Programming:

The purpose of the IPP is to introduce the concept and impacts on space intended by each project proposal so that efforts can be made to determine which projects should continue into more detailed planning and development. The District's mandated Five-Year Construction Plan lists projects under consideration by the District. In order to request funding from the State for a specific project, the District needs to describe the contemplated project, investigate available alternatives, arrive at a projected cost and develop a project that best meets the stated needs. The information provided to the State must follow a prescribed procedure and deadlines. The Preparer shall refer to the latest edition of the Facilities Planning Manual for the California Community Colleges published by the State's Chancellor's Office (CCCCO).

IPPs are required for all projects requesting State funding. The process of IPP can be skipped for non-State-funded projects. However, the District may also complete an IPP for 100% locally funded projects to use as a programming tool to assist in determining the scope and budget of the project.

Before completing the application for State funding, the following questions should be considered by the District:

1. Is the site eligible for the project?
2. What exactly are the needs to be satisfied?
3. Do all needs have priority with justification?
4. Is the project in conformance with the campus Master Plan priorities? Can the need be met with more efficient assignment and utilization of existing space or systems?
5. Is the capital outlay project required to provide new space, reconstructed space or systems?
6. What other facility and systems alternatives might be considered?
7. How would such a project relate to other projects and objectives on the campus?
8. What is the scope and estimated cost for such a project?
9. What is the anticipated schedule?
10. Is the project feasible, given the current funding sources, regulations, location and physical conditions, etc.?

If all of these questions are answered favorably, then the project can be analyzed in greater detail, a program developed, and the IPP drafted.

The purpose of submitting the IPP to the CCCCCO is to introduce the concept and impacts on space intended by each project proposal so that efforts can be made to determine which projects should continue into more detailed planning and development. Internally, the IPP is submitted to the Governing Board for review and approval.

4.2A-1 State Deadline for Submitting IPP's:

IPP's are typically due at the State Office no later than June 30th of each year. Verify

current deadlines with the CCCCCO prior to beginning work on any IPP.

In order not to miss the deadline, the District shall allow approximately 150 working days from the issuance of an RFP selecting an IPP Consultant up to the completion of the IPP and its approval by the Campus, District, and the Governing Board.

4.2A-2 IPP Development:

The firm that is selected to prepare the IPP (Consultant Architect) shall comply with the rules prescribed in the State's Facilities Planning Manual.

The Consultant Architect shall investigate, research, and collect all data available for the project, including all the Master Plan Documents. In addition, the Consultant Architect shall attend and participate in a series of meetings by the Campus Faculty Design Team and the District's staff and other Consultants who have a stake in the project. The Campus Project Manager shall assemble the participants and coordinate the meetings.

4.2A-3 IPP Review and Approval:

As the IPP is developed, it goes through a two level review and subsequent approval process before it is ready to be sent to the State. The District Architect is the key District Official who provides direction and has overall responsibility for the process. The Campus Project Manager sees to it that the District Architect is apprised of the IPP status.

Campus Process

Campus Project task Force is responsible for working with the Architect to develop the initial program requirements that will define the project scope and budget. Once the Draft IPP has been completed, the Team will recommend approval of the draft IPP to the Campus Administration Design Team. See 4.1C for the composition of the full Campus Faculty Design Team.

President's Cabinet - Immediately after the Draft IPP is signed off by the Campus Faculty Design Team, the document is forwarded by the Campus Project Manager to the President. The President may review the draft with his or her cabinet and other constituents or advisory groups before making a recommendation to the District. The CAMPUS PROJECT MANAGER will assist as needed in transmitting the President's recommendation to the District.

District Process

Following the completion of the Draft IPP by the Campus, the document is submitted to the District Architect. A copy is also provided for the Vice Chancellor. The Consultant Architect who prepared the Draft IPP also prepares the application's cover letter and completes the application package. This package is reviewed and approved by the Vice Chancellor. The Vice Chancellor will place the entire package with the detailed budget on the Governing Board's Agenda for official approval. The Governing Board action may be scheduled for the annual Capital Spending Plan Workshop. In some instances, the Chancellor may authorize the District Architect to submit to the State prior to the Governing Board action in order to meet the annual submittal deadline.

The IPP Package is delivered to the District Architect for submission to the State Chancellor's Office by the designated deadline.

4.2A-4 Architects IPP Responsibilities:

The responsibility of the selected Consultant Architect is to translate the Campus Faculty Design Team's data into a viable design and construction program, using State requirements and budget considerations. The IPP and the follow up process of FPP constitute the basis for the Preliminary Plans Phase of the project.

After receiving a "Notice to Proceed" (NTP) issued by the District Architect, the Consultant Architect shall:

1. Become familiar with the project background and goals, review related documents including the Master Plan and the 5-year Construction Plan, develop schedule and identify Deliverables.
2. Participate in the meetings of the Campus Design Teams.
3. Meet and communicate as necessary with Staff and Stakeholders.
4. Complete the IPP on time.

4.2B Final Project Proposal (FPP)/Programming & Conceptual Design

The FPP establishes the project justification, final scope & conceptual design and estimated costs for implementation of all acquisition and infrastructure of the facility. It reflects the level of quality, schedule, space systems, equipment plans, identification and secondary effects of the project, site conditions, environmental considerations, and more. The information provided to the State must follow a prescribed procedure and deadlines. The Consultant shall refer to the latest edition of the Facilities Planning Manual for the California Community Colleges published by the State's Chancellor's Office.

4.2B-1 State Deadlines for Submitting FPP's:

FPP's are typically due at the State Office by February 1st of each year. Verify current deadlines with the CCCC prior to beginning work on any FPP.

In order not to miss the deadline, the DISTRICT shall allow approximately 60 working days from the date of State approval of the IPP to the deadline for the FPP to allow time for the internal design process and its approval by the Campus, the District and the Governing Board. Approvals on the State level by CCCC, DOF, and PWD often take an indeterminate amount of time, usually a minimum of one year from submittal of FPP.

4.2B-2 FPP Development:

It is generally intended that the consulting firm that prepared the IPP will proceed with the preparation of the FPP. The Consultant firm or the Consultant A/E (let's call this firm the A/E from now on) shall comply with the rules prescribed in the State's Facilities Planning Manual formerly known as the Capital Outlay Handbook. Upon receipt of NTP from the District Architect, the A/E shall submit a schedule that will identify the benchmarks and deadlines for the preparation, approvals, and submittal of the FPP Package. The A/E shall obtain written approval of the schedule from the District Architect.

The Campus Project Manager with the A/E schedules the FPP Design Start Meeting. The Campus Project Manager will coordinate the Design Start Meeting with the Campus Faculty Design Team and will forward copies of the meeting notice to the District Architect, and members of both Campus Design Teams. Notice to the Campus Administration Design Team will be for information only.

The Campus Project Manager prepares a written Meeting Agenda. Items discussed at the Design Start Meeting can include: design phase durations, project budget and/or building program, schedule, efficient design and site utilization, required submittals, use of technology

standards, and unique characteristics of the selected site.

The A/E shall investigate, research, and collect all data available for the project. All feasibility, special designs and engineering studies, space systems and equipment plans must be reflected in the FPP. Initial studies (i.e. structural, soils, HVAC, Utilities,) should also be completed in order to provide reliable estimates of costs.

The A/E shall obtain copies of the following: District Design Guidelines and Standards, educational space program, available site and other relevant information.

The A/E shall attend and participate in a series of meetings with the Campus Project Task Force, the District's Facility staff, and other Consultants who have a stake in the project. The Campus Project Manager or his designated PM shall coordinate and conduct the meetings.

4.2B-3 FPP Review and Approval:

As the FPP is developed, it goes through a two level review and approval process before it is ready to be sent to the State. The District Architect, who has overall responsibility for the design process, is a key District Official who provides design guidelines. The Campus Project Manager shall apprise the District Architect of the FPP status.

- **Campus Process**

Campus Project Task Force is responsible for working with the A/E to develop the FPP conceptual design. Once the Draft FPP has been completed, the Team will recommend approval of the draft FPP to the Campus Administration Design Team. The Campus Project Manager is responsible for coordinating the meetings, preparing minutes and action reports, maintaining the schedule and deadlines, and obtaining the sign off signatures. See 4.1C for the composition of the full Campus Faculty Design Team.

When the Campus Project Task Force signs off the Draft FPP, the document is forwarded to the College President by the Campus Project Manager. The president may consult with his or her Cabinet and other advisory groups. The Campus Project Manager obtains the President's sign off and forwards to the District Architect.

- **District Process**

Following the completion of the Draft FPP by the Campus, the document is submitted to the District Architect. A copy is provided to the Vice Chancellor. The A/E who prepared the Draft FPP also prepares the application's cover letter and completes the application package. The package is submitted to the Chancellor for review and approval. Once approved, the entire package with the detailed budget is submitted to the Governing Board for official approval. See 4.1A for the composition of the District Design Management Teams.

- **State Process**

Once approved by the Governing Board, the FPP Package is combined with the Project summary form prepared by the Chancellor's Office and transmitted to the Department of Finance and other state agencies as a "capital outlay budget change proposal" (COBCP) for submission into the budget process.

4.2B-4 Architects FPP Responsibilities:

The responsibility of the FPP A/E is to transform the IPP's Users' program into a viable conceptual design, while adhering to the State requirements and the IPP's original budget

considerations. The IPP and the FPP constitute the basis for the Preliminary Plans Phase of the project.

4.2B-5 References:

State Facilities Planning Manual
California Community Colleges Chancellors Office
Web site: www.cccco.edu

4.3 PRELIMINARY PLANS (PP) PHASE

Overview:

The Preliminary Plans Phase is comprised of the typical Schematic Design and Design Development phases. The Preliminary Plans Phase commences once the project FPP has received official approval, either by the CCCCCO for state funded projects or the Governing Board for local funded projects.

4.3A Schematic Design Phase

While the FPP is under review by the CCCCCO, the Programming and Conceptual Design, advances to the Schematic Design Phase or awaits CCCCCO FPP approval at the District's discretion. The District can elect to advance to the next phase under the existing A/E contract or elect to select the services of another A/E firm.

The A/E will, in the Schematic Design Phase, develop and present to the Campus Project Task Force, several design solution options (at least three). These options are reviewed, and one solution is selected, further developed and presented at a Final Schematic Design Review Meeting as described below. Intermediate design review meetings may occur as necessary.

4.3A-1 Design Meetings:

The purpose of Design Meetings are to bring all key team representatives involved in the design effort together at specific milestones to clarify the design process and schedule, to confirm and outline the responsibilities of the A/E, to discuss relevant documents and site information, and to clarify any A/E questions or concerns.

The Campus Project Manager, with the A/E, schedules the Design Start Meeting once the A/E contract has been executed, unless executed previously at the pre-design phase. This level of design follows the Programming and Conceptual Design (Pre-Design) Phases (IPP/FPP).

The Campus Project Manager will coordinate the Design Start Meeting with the Campus Project Task Force and will forward copies of the meeting notice to the District Architect and all members of Campus Design Teams.

The Campus Project Manager prepares a written Meeting Agenda. Items discussed at the Design Start Meeting include: design phase durations, project budget and/or building program, schedule and budget adherence, efficient design and site utilization, required submittals, use of District Design Guidelines and Standards, and unique characteristics of the selected site.

The A/E shall obtain copies of the following: College Architectural Design Guidelines and Standards, educational space program, available site, technology standards and other relevant information. The A/E and the Campus Project Manager will review all required design delivery dates and establish the completion dates for Schematic, 75% PP and 100% Design Development phases.

Within one week of the meeting, the A/E submits a formal design schedule that identifies all submittal and review meeting dates from the Design Start Meeting through the completion and approval of Construction Documents. The schedule is reviewed by the Campus Project Manager and the District Architect, and revised by the A/E as required prior to the Schematic Design Review Meeting.

4.3A-2 Schematic Design:

Upon start of Schematic Design the A/E will review the documents developed during the Pre-Design (Programming) Phase or as provided by SDCCD, visit the site and gather additional information that may influence the design. Where applicable the A/E must meet with representatives of the following:

1. Division of the State Architect (DSA): Structural Safety, Fire Marshal and Access Compliance Sections.
2. California Community College Chancellors Office (CCCCO) *(If applicable)*
3. The City (or County) Engineering and Planning Departments for off-site improvement requirements and existing conditions of street profiles, curbs and walks, sewers, storm drains, reclaimed water and utility services. *(If applicable)*
4. City Engineer, Caltrans, or County Planning Department for driveway locations and traffic signal requirements. *(If applicable)*
5. Fire Department for site access, dispersal areas and on-site fire hydrants.
6. Utility Companies for location of existing and proposed water, electric, gas, telephone and cable services.
7. County Department of Health for food service and athletic facilities, including pools. *(If applicable)*
8. City (or County) Industrial Waste Management for acid waste requirements.
9. State Elevator Inspector for elevator requirements. *(If applicable)*

Minutes of these meetings shall be prepared by the A/E and submitted to members of the Campus Faculty Design Team.

4.3A-3 Final Schematic Design:

The A/E fully develops the scheme selected by the Campus Project Task Force. Documents prepared by the A/E for Final Schematic Design submittal must include drawings and a written report (Design Analysis) including a cost estimate. The drawings shall include, but not be limited to a proposed utilization study of the particular project site, schematic plans of all floor plan conditions, and further developed elevations indicating the fundamentals of the architectural concept and schematic design. The Design Analysis shall incorporate the Architect's estimate of Project Cost that shall be prepared at a level of detail necessary to assure the cost is within the budget established for the project.

The Design Analysis shall include discussion of design factors that are pertinent in the opinion of the A/E and outline descriptions of proposed engineered systems, construction methods, materials and work to be included in the construction contracts.

Finally, area calculations indicating compliance with the FPP/ Building Program shall be included with small scales of floor plans indicating ASF and programmed usage. The cost estimate, area calculations and diagrams shall comply with the Design Guidelines.

The A/E must have completed a comprehensive code review and coordinated and conducted a Preliminary review with DSA.

The A/E will also produce a CD ROM showing Final Schematic Design in both AutoCAD and PDF formats.

4.3A-4 Schematic Design Deliverables:

- *Architectural Site Plan*

- Indicate and identify existing/adjacent buildings on site and type of construction. Indicate existing or new parking areas required to support the program.
 - Indicate all new construction, site improvements and future expansion.
 - Indicate relevant topographical features or contours, only if topography presents potential problems and is required to demonstrate solutions.
 - Use color to delineate and emphasize new structures, site work and landscaping.
 - Indicate gross and assignable area of the new structure(s) and type of construction.
 - For certain projects, it may be necessary to indicate other specific items on Drawings. In such cases, the PM will bring these items to the attention of the A/E.
 - Mount site plan(s) on 30" x 40" boards.
- *Photographs:*
 - For new facilities, provide color photographs of proposed construction site, surrounding/adjacent facilities and other pertinent structures and any objects that may influence the design. Mount photographs on 30" x 40" boards.
 - *Floor Plans:*
 - Provide Floor Plans of all floor plan conditions.
 - *Building Elevations:*
 - Provide Building Elevations indicating the fundamentals of the architectural concept.
 - *Massing Study Model:*
 - A need for Study Models will be determined by the Design Review Team on a project-by-project basis.

4.3A-5 Final Schematic Design Review and Approval:

The Campus Project Manager sets the Final Schematic Design Review Meeting date and confirms whether it is consistent with the approved design schedule and notifies the Campus Project Task Force. The Campus Project Manager also forwards copies of the meeting notice to the Campus Administration Design Team.

The Campus Project Task Force should:

1. Ensure program compliance.
2. Verify cost estimates against project budgets.
3. Assess the efficiency of the design.

At the Final Schematic Design Review Meeting, the A/E presents the final scheme, summarizes the information contained in the submittal documents, identifies the changes made from the previous submittal, and responds to any questions or concerns raised by the Campus Design Team. Following the meeting, the Campus Project Manager collects any additional comments from members of the Campus Design Team that the A/E is to incorporate into the Design Development Documents. In some instances, all of these steps may be accomplished at the Final Schematic Design Review Meeting. The Campus Project Manager and the District Architect review the Final Schematic Design submittal for completeness.

Once the review is done, the Final Schematic Design is brought before the District Design Management Team for review and approval. When approved, the Campus Project Manager prepares a letter to the A/E noting approval of the Schematic Design and directing that a review meeting with DSA be scheduled. Once DSA has reviewed and provided comments, the Architect may be provided a NTP signed by the District for Design Development. The letter also identifies any modifications required to be included in the Design Development Documents. Copies of all Schematic Design submittals are to be in the project file.

4.3B Design Development Phase (DD)

After approval of the Final Schematic Design and upon receiving the NTP from the District, the A/E prepares Design Documents (DD) for submittal to the District. During DD, the Campus Project Manager schedules Design Review Meetings at least bi-weekly.

At each meeting, the A/E presents design progress on one or more major elements of design, i.e., building exterior, building structure, floor plans, mechanical, electrical, plumbing (MEP) systems and site development. Comments and direction given by the Campus Design Team at these meetings are documented by the Campus Project Manager in meeting minutes and incorporated into later submittals by the A/E.

Design Development Documents shall include drawings and written reports (Design Analysis) in significantly more detail than the Schematic Design documents, and shall take into account the District Design Management Team's comments on the previous submittal. The Design Analysis must include a detailed cost estimate for the project. Drawings shall include dimensioned site plan, floor plans, exterior elevations, typical building sections, and enlarged wall sections indicating proposed construction, as may be necessary. Drawings shall also include information on major finishes as well as diagrammatic drawings illustrating fundamentals of major engineering systems including structural, mechanical and electrical systems, etc. as may be necessary. All of this information will be in conformance with the District Design Guidelines and Standards.

Throughout the Design Development process, the Campus Project Manager and the Campus Design Team review the design progress presentations for conformance to Program, District Design Guidelines, Specifications and Standards and for design efficiency and effectiveness. The District intends to have specialty consultants available to assist the District in reviews as needed (A/E, Civil, Landscape, Interior design Consultants, and etc.). It is the responsibility of the Campus Project Manager to assess the complexity of the project and the particular knowledge and experience of the members of the Campus Design Team, and to arrange for the appropriate specialists to attend review meetings or to review documents as needed.

4.3B-1 Preliminary Plan (PP) 75% Review and Approval:

The PP phase encompasses all of the Schematic Design Phase and the Design Development Phase. At approximately 75% completion of this Preliminary Plan package, the A/E is required to submit documents for the review and approval. The 75% Preliminary Plans Design review is the last opportunity for the District and College to ensure the appropriateness of the selected design scheme prior to forwarding their recommended design to the Governing Board for approval.

4.3B-2 75% Preliminary Plan Deliverables:

- *Architectural Site Plan:*
 - This plan shall identify the building footprint, hardscape, elevations, ramps and

site improvements in detail.

- *Architectural Floor/Roof Plans:*
 - These plans will show details that have been developed, dimensions of built-in cabinetry, equipment, mechanical/electrical equipment rooms delineated to coordinate with building systems, locations of all windows and doors, and circulation systems including stairs and elevators.
- *Architectural Interior Elevations:*
 - Showing all major or significant architectural elements.
- *Architectural Building Sections:*
 - Showing full sections through the building and major site elements.
- *Architectural Exterior Elevations:*
 - All major elevations must be provided and shall identify materials and details for key elements.
- *3-D Computer Models:*
 - A 3-D model(s) of the building exterior and immediate site will be provided.

Note: There are often changes inherent in the ongoing Design Development, Construction Documents, code review and Construction phases of a project.

4.3B-3 Design Development (Preliminary Plan) Review and Approval:

The Campus Project Manager sets the Final Design Development Review Meeting date and confirms whether it is consistent with the approved design schedule and notifies the District Design Management Team as a first review step. Once approved, the A/E may then submit to the Campus Design Team. The PM also forwards copies of the meeting notice to the Campus Administration Design Team.

At the final Campus Design Development Review Meeting, the A/E presents an overview of all elements of design to the Campus Design Team and highlights any changes made pursuant to earlier progress reviews, as well as any elements of the submittal not previously presented. The cost estimate is also reviewed to ensure that it is reasonable and within the construction budget for the project. *Note: DD submittals will not be approved unless they are within budget.* Following approval by the Campus Design Team the Design Development plans are submitted to the District Design Management Team for final District approval. In some instances, all of these steps may be accomplished at the Final Design Development Review Meeting.

Locally Funded Projects: Once the Final DD review is completed, the Campus Project Manager prepares a letter to the A/E indicating approval of the Design Development Documents and providing a ***NTP for Construction Documents***. The NTP is signed by both the Campus Project Manager and the District Architect. The letter also identifies any modifications required to be included in the Construction Documents. Copies of all DD submittals are forwarded to the project file.

State Funded Projects: Once the Final DD review is completed, the District is responsible for the submittal of required documents to the CCCC for Preliminary Plan approval. The Campus Project Manager and the A/E shall review *CCCC Facilities Planning Manual, Part A - Chapter 7, Section 7.11 Request for Approval of Preliminary Plans for*

submittal requirement details.

4.3B-4 Design Development (Final Preliminary Plans) Deliverables:

Completed Design Development deliverables shall include all of the requirements outlined in the latest version of the Facilities Planning Manual.

- *Architectural Site Plan:*
 - This plan shall include all items previously required during schematic (IPP and FPP) and schematic/preliminary design. It should also indicate infrastructure work and easements that might impact the project, limits of work, and the gross area of new buildings, overhangs and other areas.
 - When information contained on site plan is too complex for presentation purposes, a separate simplified plan should be prepared to emphasize features of the project.

- *Code Analysis:*
 - Site plans including area of buildings, type of construction, complete code analysis, exiting requirements and path of travel.

- *Architectural Floor Plans, Technology Standards, Reflected Ceiling Plans, Roof Plans, Building Elevations and Sections:*
 - Indicate room sizes and equipment, furniture layout in classrooms and other major spaces.

- *Architectural Presentation Drawings or Renderings:*
 - Drawings shall be no larger than 30" x 40" and shall be delineated using a technique and perspective view which adequately and accurately indicates scope of the project. Drawings shall be in color, mounted and matted with Project and Architect's name.

- *Photographs:*
 - Submit photographs as described above under "Schematic Design Phase Submittal".

- *Others:*
 - Material Boards (2)
 - Finishes (2)

4.4 CONSTRUCTION DOCUMENTS (CD) PHASE

Overview:

After completion of the Design Development phase, the A/E prepares and submits Construction Documents. Construction Documents (CD's) include all of the drawings and specifications necessary to define the work for public bidding. CD submittals also include detailed cost estimates for the project. During the Construction Document Phase, review meetings continue to be held at least bi-weekly to review design progress. The District IT staff is to be included in these meetings to assure that technology standards are being addressed. Formal submittals and approvals occur at 50% and 90% CD's.

4.4A 50% Construction Documents

Develop all architectural and engineering drawings to a uniform level so that the entire project may be reviewed for conformance with the FPP scope and criteria. Combine the drawings as appropriate for simplicity and clarification. For example, show demolition plan and existing topography together unless complexities warrant more detail.

Note: For Stated funded project, equipment must be defined and priced for submittal to CCCCCO for approval at the 50% CD Stage.

4.4A-1 Title Sheet:

Title sheet should include a list of all anticipated drawings with sheet numbers for the complete 100% submittal. Indicate which sheets are included in the 50% submittal. The title sheet or sheets as necessary should also include the Code Analysis, Vicinity Map, Location Map as well as a list of the A/E's sub-consultants including addresses, phone numbers and points of contact.

4.4A-2 Civil Drawings:

4.4A-2.1 Existing Topography:

Existing contours should be plotted at one foot (0.3m) intervals and be clearly distinguishable from new contours. On substantially flat areas where one-foot contours are widely separated, augment the topography with spot elevations. All spot elevations on the ground should be given to the nearest tenth of a foot, and on pavements or structures to the nearest one hundredth of a foot.

Scale should be 1"=20' (1:300) with scales of 1"=40' (1:500) for large area projects and 1"=10' (1:100) for small area projects. The drawing shall be oriented so that the North arrow is up or to the right on the drawing. The following should be shown:

1. A topographic survey of the site with at least two points on the traverse set permanently to known monuments.
2. Both the horizontal and vertical control monuments including elevations and coordinates.
3. The bearing and distance between the control monuments.
4. All surface and subsurface utilities.
5. All surface structures on and off site that may affect the design.
6. All trees and shrubs on the project site.
7. Inverts of all utilities and sizes shall be shown.

4.4A-2.2 Demolition Plan:

Indicate the following:

1. Type and thickness of structures, foundations and pavements to be removed.
2. Sizes and materials of all existing utility lines to be removed.
3. Limits of demolition.
4. Size and thickness of trees to be removed.
5. Trees and shrubs to remain.
6. Recycling at least 50% of demolition debris is required. Demolished materials, construction debris, and wastes are to be recycled to reduce the amount of material that goes to landfills. Language shall be included in the General Conditions of construction contracts requiring contractors to total the amount of material recycled or taken to alternative disposal places and provide the documentation to the Campus Project Manager.

4.4A-2.3 Site Plan:

1. Locate all new work by coordinates or dimensions from prominent existing structures.
2. Clearly distinguish new facilities from existing.
3. Indicate the following:
 - a. Building location
 - b. Access Roads
 - c. Parking
 - d. Survey Control Points
 - e. Benchmarks
 - f. Sidewalks
 - g. Finished Floor Elevations

4.4A-2.4 Grading Plan:

Grading Plan should be the same orientation and scale as the existing topography plan. Existing contours shall be clearly distinguishable from new contours. Indicate the following:

1. High and low points and grade breaks with spot elevations. Additional spot elevations should be provided along ditches at culverts, inverts and at all other critical surface positions to indicate surface run-off. Spot elevations on the ground shall be shown to the nearest tenth of a foot (31mm) and those on structures or pavements to the nearest one-hundredth of a foot (3mm).
2. Finish floor elevations for all buildings and concrete slabs.
3. Top elevations and inverts of all drainage structures and ditches.
4. Limits of grading.
5. Vertical control benchmark.
6. Buildings, structures and pavement areas.
7. Erosion and Sediment Control Measures.

4.4A-2.5 Paving Plan:

Paving Plan should be the same orientation and scale as the site plan. Indicate the following:

1. Roads, curbs, gutters and shoulders in section view.
2. Type and thickness of structure including base course and sub-base.
3. Joint pattern and details for rigid pavement layout.
4. Pavement markings and stripping.

4.4A-2.6 Utility Plan (Including Fire Protection):

Utility Plan should be the same orientation and scale as the Site Plan. Indicate the following:

1. Location, alignment, type of utility, and pipe size of all new and existing utilities. These utilities will normally include domestic water, fire protection, water, sanitary sewers, storm sewers, natural gas, electrical, steam, high-temperature hot water, compressed air and P.O.L. product lines.
2. Horizontal alignment at a dimensional offset from and parallel to the edge of a building or structure, the centerline or edge of a road or street, a fence line or other physical feature.
3. Vertical alignment or grade by a defined nominal distance below finish grade for water lines, gas lines, electrical duct bank and P.O.L. product lines.
4. Vertical alignment for sanitary and storm sewer lines by invert and top elevations at all manholes, catch basins and curb inlets. Point of Connection (P.O.C.) of new utilities, including Fire Protection.
5. Detailed sections and enlarged plans as required.

4.4A-3 Architectural Drawings:

Include the following:

4.4A-3.1 ARCHITECTURAL SITE PLAN:

Indicate new and existing buildings, structures, roads, parking, sidewalks, and site improvements. Identify all structures and site features. Provide campus plan for multiple building developments.

4.4A-3.2 Demolition Plan:

For renovation work and additions to existing facilities, indicate existing construction, items to be removed or altered, and new work.

4.4A-3.3 Floor Plans:

Indicate all required spaces. Provide space identification, number, and function. Indicate all windows, doors, walls, partitions, moveable partitions, built-in equipment, and significant features of the facility. Indicate collateral equipment which affects the plan layout (such as machinery, laboratory equipment, etc.) or are necessary for accurate placement of utilities. Indicate overall and critical dimensions.

4.4A-3.4 Roof Plans:

Indicate type of roof, direction of slopes, roofing type, access to roof and mechanical and electrical equipment to be mounted on the roof.

4.4A-3.5 Exterior Elevations:

Show all exterior elevations. Indicate height of floors and major vertical dimensions. Indicate type and extent of finish materials.

4.4A-3.6 Building Sections:

Show sections through entire facility indicating floor and ceiling heights, major structural elements, and major equipment.

4.4A-3.7 Wall Sections:

Indicate wall sections including foundation and roof which illustrate and identify the construction elements and locations. Indicate significant dimensions.

4.4A-3.8 Room Finish Schedule:

Indicate finishes of floors, bases, walls, partitions, and ceilings for all spaces.

4.4A-3.9 Door and Window Schedules:

Indicate door and window symbols, sizes, finishes, reference to head and jamb details, etc.

4.4A-3.10 Large Scale Plans:

Show enlarged plans of complex spaces (such as kitchens, laboratories, restrooms, etc.) and typical spaces (such as dormitory rooms, etc.)

4.4A-3.11 Interior Elevations:

Show elevations of interior spaces. Indicate finishes, trim, shelving, and equipment. Indicate heights of cabinets, work surfaces, wainscots, and ceilings.

4.4A-3.12 Equipment Schedule and Layouts:

Indicate and identify major furniture and equipment. Indicate items which exist and relocated, new collateral equipment, or equipment to be provided as part of the construction contract.

4.4A-3.13 Reflected Ceiling Plans:

Show ceiling plan and identify grid systems, hard surfaces, light fixtures, smoke detectors, diffusers, and any special features.

4.4A-3.14 Louver Schedules:

Show blade types and louver mount types.

4.4A-4 Structural Drawings:

Include the following:

4.4A-4.1 General Notes and Typical Details:

Include all loads, roof and floor loads, wheel loads, seismic criteria, and wind loads. List any special loads for other concentrated loads and, if necessary for clarity, provide a diagram. State dead, live and total allowable loads on the soils and corresponding loads actually used. Include the application/location and units of measure for each load. Design data shall be separated from the General Notes. Material notes shall identify all materials used such as structural steel, concrete, masonry, etc.

4.4A-4.2 Foundation Plan:

Use the same scale and orientation as the architectural plans. Show the sizes, location and arrangement of all significant features of the foundation system. Include the layout of all slabs, footings, piers, grade beams, piles, caissons, pile/caisson caps, trenches, pits, openings, depressed and thickened slabs, etc. Provide a column-line grid system oriented about the axes, usually length and width, of the structure and along the center-lines of the major support columns and walls. Elevations may be given using any datum consistent throughout the structural drawings so long as the chosen datum is referenced to the true elevation. Show adjacent existing structures and foundations which will impact the new construction.

4.4A-4.3 Floor and Roof Framing Plans:

Orientation of framing plans shall match the foundation plan. Show the sizes,

location and arrangement of all significant features of the horizontal framing system. Include the layout of all beams, joists, stingers, slabs, decks, plates, grating, etc. showing all dimensions and elevations necessary to fully describe the basic structural system. The elevations shall be referenced to some finished datum such as top of steel, slab, finished floor, concrete, joist, deck, etc. Special construction features and site conditions which have a significant impact on project cost shall be shown as well.

4.4A-4.4 Elevations:

Line drawings representing the lateral load resisting systems shall be indicated.

4.4A-4.5 Sections and Details:

Provide sufficient information to identify the types of materials and method of construction required such that a reliable cost estimate can be developed for the structure. All parts or pieces shall be identified and shown in sufficient detail to provide relationships to other structural/architectural features.

4.4A-5 Mechanical Drawings:

Provide a general layout of the systems proposed, including total loads and single-line drawings and schematic diagrams, showing general arrangement of mechanical equipment, piping, and ductwork. Include the following drawings:

- Demolition Plans (when required)
- Plot or Site Plans (for projects with extensive external systems)
- Mechanical Plans
- Schematic Diagrams
- Equipment Schedules.
- Fire Protections System(s)

4.4A-5.1 Demolition Plan:

Demolition shall be shown on separate plans.

1. Indicate equipment, ductwork and piping to be demolished including type of material, sizes and dimensions.
2. Hazardous material such as asbestos and lead paint shall be identified and quantified.

4.4A-5.2 Site Plan

Required for projects with extensive external mechanical systems, such as power plants, central heating plants, and steam distribution systems. Include the following:

1. Site Plan shall be drawn at the same scale as the Civil and Architectural site plans.
2. Show all new utility system, and points of connection.
3. Show dimensions of new systems from a permanent reference point on the project site.
4. Profiles shall be shown on the same sheet and directly underneath the plan for all outside underground mechanical piping systems. Indicate invert elevations, slopes, and finish grades.

4.4A-5.3 Large Scale Site Plans

Provide when outside mechanical systems are so extensive as to preclude their indication on the site plan discussed above. Provide key plan for reference.

4.4A-5.4 Mechanical Plans

Provide for each floor, as well as for foundation, attic and roof spaces containing equipment ductwork and or piping. Mechanical plans shall:

1. Be drawn at a scale not less than 1/8"=1'-0", 1:100. All ductwork shown in double line to scale.
2. Include legends, notes, etc. to assure clarity.
3. Show provisions for controlling expansion and anchoring of piping and ductwork.
4. Do not combine HVAC work with Plumbing system work without the specific approval of the District.

4.4A-5.5 Large Scale Mechanical Plans

Provide for Mechanical equipment rooms. Large Scale Mechanical Plans shall:

1. Be drawn at a scale of 3/8"=1'-0" or 1/2"=1'-0", 1:25.
2. Include equipment in the room drawn to scale.
3. Include piping in the room over 3", 750mm diameter drawn to scale using double lines, piping 3", 750mm and less can be shown single line.
4. Identify (using dashed lines for example) adequate space for maintenance, including removal of tube bundles, etc.

4.4A-5.6 Elevations/Sections

Provide when vertical dimensions and/or potential interferences are significant in the design. The scale of the elevations/section shall be large enough to clearly show the characteristics of the system, and to allow accurate take-offs of vertical lengths and fittings.

4.4A-5.7 Details

Show adequate details to enable the contractor to properly fabricate, assemble, install, attach, and suspend the equipment and piping that is shown on the plans, sections and elevations. Key the details to the other drawings using the bubble system described elsewhere.

4.4A-5.8 Isometric and Schematic Diagrams

Include piping, equipment configurations, flow directions, and connection points. The scale of the diagrams shall permit easy tracing of fluid (liquid and gaseous) flow paths.

4.4A-5.9 Control Diagrams

1. Indicate the function of the control system involved.
2. Identify the type of controls (pneumatic, electronic, DDC)
3. Clearly show the limits of the system and the items being controlled.
4. Coordinate with the Electrical drawings as well as the Mechanical drawings to ensure all of the electro-mechanical devices function together.

4.4A-5.10 Sequence of Operation

Provide a complete, step by step, written sequence of operation explaining the control system logic. It is preferred that this sequence be shown on a drawing next to the control diagram, however, it may be shown in the specification. The sequence of operation shall:

1. Be consistent with the control diagram.
2. Identify values for the set points for start-up, normal running conditions, shutdown, etc.
3. Define emergency conditions and procedures.

4.4A-5.11 Equipment Schedules

Show separately and include:

1. Name, location, and identifying symbol of each major piece of equipment.
2. Engineering data (flow, pressure, temperature, special operating conditions, etc.) Note: this information need not be totally complete at 50% submittal)
3. Electrical requirements for equipment requiring electrical power (voltage, amperage, phase, frequency, horsepower, etc.)

4.4A-6 Plumbing Drawings:

Provide a general layout of the systems proposed, showing the general arrangement of the fixtures, equipment, and piping. Include the following drawings:

4.4A-6.1 Demolition Plans (when required)

1. Demolition shall be shown on separate plans.
2. Indicate equipment and piping to be demolished including type of material, sizes or dimensions.
3. Hazardous material such as asbestos and lead paint shall be identified and quantified.

4.4A-6.2 Plot or Site Plans (for projects with extensive external systems)

Plumbing systems such as central domestic hot water plants. Site plan shall:

1. Be drawn to as large of a scale as possible, providing the scale is adequate to show initial installation and future maintenance. Scale shall not be smaller than 1"=50' FOR 1:500.
2. Show all new utility systems, existing systems, and points of connection
3. Show all new and existing structures.
4. Show dimensions of new systems from a permanent reference point on the project site.
5. Profiles shall be plotted on the same sheet and directly underneath the plan for all outside underground piping systems.
6. Indicate invert elevations, slopes, and finish grades.

4.4A-6.3 Large Scale Site Plans

Provide additional large scale Site/Plot Plans where outside plumbing systems are so extensive as to preclude their indication at a reasonable scale on a single plan. In this case, the site Plan shall serve as a key plan.

4.4A-6.4 Plumbing Plans

Plumbing Plans are required for each floor, as well as for foundation, attic, and roof spaces containing equipment and or piping. Plumbing Plans shall:

1. Be drawn at a scale not less than 1/8" =1"-0" , 1:100.
2. Include legends, notes, etc. to assure clarity.
3. Show provisions for controlling expansion and anchoring of piping.
4. Do not combine HVAC work with plumbing system work without the specific approval of the District.

4.4A-6.5 Large Scale Plumbing Plans

Large scale Plumbing Plans shall be submitted for equipment rooms. Large scale plans shall:

1. Be drawn at a scale of 1/2"=1'-0", 1:20.
2. Include equipment in the room drawn to scale.

3. Include piping in the room over 3", 750 mm diameter drawn to scale using double lines, piping 3", 750mm and less can be shown single line.
4. Identify (using dashed lines for example) adequate space for maintenance, including removal of filters, chlorinators, etc.

4.4A-6.6 Elevations/Sections

Provide elevations and/or sections where vertical dimensions and/or potential interferences are significant in the design. The scale of the elevations/sections shall be large enough to clearly show the characteristics of the system, and to allow accurate take-offs of vertical lengths and fittings.

4.4A-6.7 Details

Show adequate details to enable the contractor to properly fabricate, assemble, install, attach, and suspend the equipment and piping that is shown on the plans, sections and elevations. Key the details to the other drawings using the bubble system described elsewhere in this document.

4.4A-6.8 Isometric & Schematic Diagrams

Isometric and/or schematic diagrams showing the piping and equipment configurations, flow direction, and connection points shall be included. The scale of the diagrams shall permit easy tracing of the fluid flow paths.

4.4A-6.9 Fixture & Equipment Schedules

The Equipment Schedules shall be shown separately and shall include:

1. Name, location, and identifying symbol of each major piece of equipment
2. Engineering data (flow, pressure, temperature, special operating conditions, etc) Note this information need not be totally complete at the 50% submittal)
3. Electrical requirements for equipment requiring electrical power (voltage, amperage, phase, frequency, horsepower, etc.)

4.4A-6.10 Water Distribution

Location and size of existing or new sprinkler system supply mains, new fire hydrants, valves, sprinkler risers, etc.

4.4A-6.11 Fire Rated Walls, Doors and Exits

1. Show and identify fire rated walls, partitions, doors and windows.
2. Show all exits to building exterior and mark the route of travel and travel distance from any point in a room or portion of the facility to the exits.

4.4A-6.12 Gaseous Type Extinguishing Systems

1. Location of the storage cylinders, control panel and source of AC power to the control panel. (To be tapped off ahead of the main disconnect through a fused disconnect.)
2. Location of warning signs/devices, detectors, manual release stations, and locations of auxiliary functions.
 - a. HVAC shut-down
 - b. Power shut-down
3. Areas to be protected by these systems: Kitchen/Laboratory Extinguishing Systems.
4. Location of the storage cylinders, warning signs/devices, manual release stations and auxiliary functions.
5. Pre-Action/Deluge Systems (in addition to Gaseous Type Extinguishing System requirements above).

6. Location of the detection system control panel, detectors, and areas to be protected by these systems, and location of the source of AC power to the control panel, (to be tapped off ahead of the main disconnect through a fused disconnect)

4.4A-6.13 Fire Pumping Systems

1. Location in non-combustible shelters, if exterior or fire rated construction, if interior.
2. Single line layouts per NFPA No. 20.
3. AC power supplies from controller connection to the electrical distribution system and power arrangement per NFPA No. 20.
4. Locations of the controllers, pumps, test headers, pressure relief valves, pressure relief discharge lines, and by-pass lines.

4.4A-6.14 Fire Alarm System

1. Location of the fire alarm control panel, (to be in a normally occupied location), manual pull stations and audio/visual horns.
2. Location of the Master Box/Transmitter and annunciator panel/interface panel.
3. Locations of the fire protection system control panels and fire protection system pressure switches.
4. Areas to be protected by the automatic detection systems, if required. The locations of these devices are not to be shown on the drawings.
5. Do not show conduit runs, conduit sizes, wire sizes, or sire counts for the interior systems and single line diagrams, unless specifically directed.
6. Show the location of the connection of the control panel to the Master Box or Transmitter and annunciator panel or interface panel.
7. Show the location of the fire alarm loop and a two (2) inch, 51mm concrete encase conduit from the Master box to that location.

4.4A-7 Electrical Drawings

Include the following:

- Notes, Legends, Symbol List
- Existing Site and Demolition Plan
- Site Plan
- Single Line Diagrams
- Floor Plan(s)

4.4B 90% Construction Documents

In order to help ensure that the A/E and the project Management Team come to a similar conclusion as to the completeness of the Construction documents at the final submittal stage, the A/E will submit CD's at a level deemed by the A/E to be 90% complete.

The Campus Project Manager will then submit the CD's for 90% constructability review. The A/E will receive the constructability comments in sufficient time to be incorporated into their own "in-house" interdisciplinary check.

4.4B-1 90% Construction Document Review and Approval:

The Campus Project Manager reviews and verifies that all requirements listed on the **DSA Submittal Checklist** have been completed. The Campus Project Manager obtains a check from the DISTRICT for DSA fees and submits Construction Drawings to DSA with the A/E. The Campus Project Manager is responsible for completing and submitting a check request form 14 days in advance of the scheduled DSA submittal date. SDCCD

check approval process requires County Board of Education review, hence the need for 14 days advance planning.

4.4C Final Construction Document Review and Approval

Prior to the Final submittal the A/E shall have completed an "in-house" interdisciplinary coordination check, dimension check, terminology and spelling check and detailed technical check of the Construction Documents. A formal Review Meeting will be held at final completion of Construction Documents. At this meeting, the A/E presents the final documents and highlights any changes from previous submittals and any newly created drawings or documents. The Commissioned A/E shall submit:

- a. One original set of the completed:
 1. Interdisciplinary Coordination Check
 2. The Checklist of all Infrastructure, Utilities & Easements
 3. HVAC Checklist
 4. Fire Protection Drawing Checklist
 5. Plumbing Drawing Checklist
 6. Architectural Drawing Checklist signed by the checker and the A/ E.
 7. Small Scale Plot Plan
 8. Evacuation Drawing
 9. Shut-Off Manual
- b. Requirements for Final submittal for Civil, Mechanical, Electrical, Structural and Landscape Drawings per ***Final CD Checklist***.
- c. Detailed review of plans and specifications to ensure that all District design standards have been incorporated, including technology, interior design and furnishings, hardware, plumbing fixtures, carpet, HVAC control systems, etc. As the District completes over \$1.4 billion dollars in new and improved facilities, it is imperative that consistent standards are applied to each project.
- d. Detailed cost estimate.

The A/E shall provide copies of all drawings and specifications on CD-ROM as well as hard copy. The number of hard copies shall be determined by the District Architect.

The Campus Project Manager and the Design Review Team ensure completeness of the final CD submittal as described in the ***Final CD Checklist***. They also verify cost estimates against project budgets. The Campus Project Manager arranges for appropriate specialists to attend the Review Meeting or to review documents as needed.

Following the meeting, the Campus Project Manager collects any additional comments from members of the Design Review Team and meets with the DISTRICT to identify all modifications that the A/E is to incorporate into the Final Construction Documents.

The A/E shall submit the documents to the Health Department and Industrial Waste Management if required.

Once all comments have been received from the DSA plan check, constructability review "back check", and any other agency or specialty consultants, the Campus Project Manager notifies the A/E and schedules a meeting to review all comments. At the meeting, a written schedule is established for correcting the documents and meeting with appropriate governmental agencies to obtain their approvals. The Campus Project Manager also prepares a letter directing the A/E to incorporate the comments into the drawings. Copies of all Final CD submittals and corrections are forwarded to the project file.

The A/E completes DSA (Structural Safety, Fire & Life Safety, and Access Compliance), local Fire Department, Health Department, Industrial Waste Department corrections as required to receive clearance and signed approvals from each agency. The A/E must comply with Division of Industrial Safety, (Cal/OSHA) Title 8, and Energy Conservation Standards and Regulations. The A/E is required to contact all utility companies (water, gas, power, telephone, and cable) and advise the DISTRICT of fees and requirements.

4.5 VALUE ENGINEERING

4.5A Overview

The intent of this section is to establish the requirements and provide the general instructions for a Value Engineering review. The eight-hour (maximum) reviews are to be attended by representatives from the A/E team in major disciplines as required, and the Campus Project Manager. A schedule, agenda, and suggested areas of study are to be developed by the Campus Project Manager, in consultation with the District Architect and the Project A/E team.

The reviews are to consist of an initial program design review, research of alternative solutions, evaluation of alternatives and Value Engineering proposals (based on a consensus determination) on advantageous alternate design solutions. If required and determined at these reviews, a full and complete Value Engineering workshop may be necessary. This guide does not waive any contractual requirements.

4.5B Value Engineering Methodology Engineering

Value engineering is an organized, systematic, specialized design review and cost control technique that analyzes the functions of a facility, system, or materials and matches the most cost effective design to the functions. Some team members may also know this program tool as *Value Analysis*.

The Value Engineering effort consists of the review of the cost, quality and time influences of proposed building materials, systems and construction methods relative to design objectives in order to identify options for obtaining maximum value for the District.

The objective of the Value Engineering process is to perform the required function at the lowest life cycle cost consistent with requirements for performance, reliability, quality, maintainability, and safety. Cost considerations include operation and maintenance costs as well as initial costs. The Value Engineering methodology requires a systematic evaluation of initial costs and life cycle costs for various design approaches to achieve the requirements of the project. The purpose is to select that combination of alternatives, which best meets the program requirements with the lowest projected life cycle cost, and which provides for an initial cost within the approved project budget.

The Value Engineering approach is a creative team effort aimed at eliminating or modifying design features that add unnecessary cost without adding to overall function.

Separate Value Engineering reviews will be arranged and conducted by Campus Project Manager at the end of the following phases as necessary:

1. Schematic Design Stage
2. Design Development Stage
3. 50% Construction Documentation Stage
4. At the 90% Construction Document Review stage, a back check only of the recommendations will be required with the Constructability review.

The District will review the proposals developed at the reviews. The accepted proposals are to be incorporated into the project before moving to the next step.

4.6 ESTIMATING

Overview

The intent of this section is to establish the general requirements and provide the instructions for preparation of cost estimates. This guide does not waive any contractual requirements.

Project estimates based on plans and specifications shall be provided with each submission as required.

The objective is to develop accurate cost estimates at each submittal stage considering all factors affecting costs including bidding climate. In the event that bids received on projects require clarification and analysis before an award can be made, the A/E shall provide that analysis at no additional cost.

Note: The final cost estimates are to be marked by the A/E with "For Official Use Only". Access to or disclosure of information within the estimate is limited to those personnel whose duties require knowledge of the estimate. The A/E shall consider all cost estimates to be confidential documents.

4.6A Purpose of Estimate

Properly prepared project cost estimates provide a check of plans and specifications for constructability, coordination conflicts, discrepancies, omissions and cost control. They provide checks during design development to assure the project can be built with available funds. Estimates are also used to establish and assure that sufficient money is requested to fund the project, to develop historical data for future estimating and to verify contract bid prices.

4.6B Submittal Documentation

Submittal Documentation must be in a format and contain appropriate information that San Diego Community College District can verify and confirm.

The cost estimate from the A/E is due along with Plans and Specifications for each of the following phases of the project: Schematic Development, Design Development, 50% Construction Documents, 90% Construction Documents and Final Documentation. Each phase requires a different set of documents as outlined below:

4.6B-1 SD: Schematic Development:

Building Areas Calculation*
Schematic Cost Estimate

4.6B-2 DD: Design Development:

Building Areas Calculation*
Detailed CSI Cost Estimate

4.6B-3 CD: 50% Construction Documents:

Building Areas Calculation*
Detailed CSI Cost Estimate

4.6B-4 CD: 90% Construction Documents (DSA Submittal) :

Building Areas Calculation*
Detailed CSI Cost Estimate

4.6B-5 CD: Final Documentation:

Building Areas Calculation*
Detailed CSI Cost Estimate

***Note:** Building Areas Calculation must correspond with the accompanied floor plans /

diagrams. They shall contain enough information for review and crosscheck. Refer to “Section: Measurement of Proposed New Building Areas for instruction in computing the building areas”.

4.6C Instruction for the Preparation of Schematic Cost Estimate:

Schematic Cost Estimates can be prepared in one of two formats:

- CSI Format: Current CSI Classification System Master Format.
- Assemblies Format: 12 Divisions of the Unifomat Classification:

4.6D Instruction for the Preparation of Detailed CSI Cost Estimate

Detailed CSI Cost estimates shall be submitted with Design Development, 50% Construction Documents, 90% Construction Documents (DSA Submittals) and Final Documentation submittals (Bid Set). All items listed in the cost estimate must be clearly organized into the 16 CSI Divisions.

Should San Diego Community College District require multiple contracts or multiple funding applications, the commissioned Architect shall submit separate detailed CSI cost estimates for each bid package of funding application.

All costs in the CSI Cost estimates shall be independently prepared based on true costs. All construction costs within the scope of the project shall be included to reflect the plans and specifications.

Cost estimates shall be prepared on 8-1/2” x 11” sheets containing the following:

4.6D-1 First or cover sheet:

1. Title block indicating:
 - a. Name of San Diego Community College DISTRICT
 - b. Name and project and address of proposed new facilities
 - c. Name of commissioned Architect
 - d. Name of Firm/Person(s) responsible for preparing and checking the estimate
 - e. Current date
2. Summary with subtotal amount for each division.
3. Sheet containing basis of estimate, qualifications, inclusions, exclusions, etc.
4. Additional sheets containing:
5. Cost breakdowns organized into the current CSI divisions
 - a. Cost breakdowns must reflect the plans and specifications
 - b. Each line item shall include a detailed description, quantity, unit, unit cost, and subtotal.
 - c. Lump sum allowances will not be acceptable for final estimates

4.6D-2 Cost Breakdowns:

- In division 2 – “Site work” shall be arranged into four categories:
- a. Service site
 - b. Off site
 - c. Utility site
 - d. General site.

4.6D-3 Schematic Design Estimates: Prepare Schematic Design estimates in as much detail as possible. Make sure that the scope of the project is clear. It is necessary to carefully evaluate escalation and design development contingencies.

4.6D-4 50 Percent Construction Documents Estimates: Prepare 50 percent Construction Documents estimates in as much detail as possible. Make sure that the scope of the project is clear. Fully develop the estimate summaries at the 50 percent stage even though the detailed work breakdown structure system by subsystem may lack full detail. It is necessary to carefully evaluate escalation and design development contingencies.

4.6D-5 90 Percent Construction Documents Estimates: The 90 percent Construction Documents estimates shall be developed from completed drawings and specifications and shall be a firm and realistic estimate of the project cost based on a detailed and accurate quantity take-off, extended with current unit costs. The summaries shall reflect costs by Bid Items as described in the bid documents and shall follow the approved or revised format furnished with the 50 percent review comments. Response to the summary and explanation to other review comments is mandatory and shall be provided as part of the Final Estimate Submittal.

4.6D-6 Final Estimates: The final estimate shall require a back check only of the 90 percent review comments if the project scope has not changed. If there is significant change in cost between the 90 percent and Final Submittal, verification will be required.

4.6D-7 General: Prepare all estimates in sufficient detail to permit verification of quantities and pricing. Do not use "Lump Sum", "Job" or similar expressions unless no alternative is possible. As an example of the detail required, do not lump footing concrete with column concrete since labor costs for concrete placement in these separate cases are most likely different. Cubic yard costs including formwork, reinforcing, concrete placing, curing and finish for each concrete element (footings, columns, etc.) may be acceptable for a 50 percent submittal but are not acceptable for a 90 percent or Final Estimate. Cost estimating judgment, however, does not require the breakout into finite detail of minor items that have little significance in the total job cost.

4.6D-8 Units of Measure: Use standard units of measure common to the trade involved. The units used shall be those used in purchasing the principal material involved. Sufficiently describe the size, material, quality and type of items, or tasks to be performed in the item description to permit unit cost verification without constant reference to plans and specifications. Failure to do so may be grounds for rejection of the estimate. The accuracy of quantity take-offs should be carefully verified. Include a reasonable allowance for waste where applicable (concrete piping, etc.).

4.6E Unit Costs

General and Sub-Contractor unit costs for materials and equipment shall include delivery and applicable sales taxes less trade and payment discounts. Labor costs shall include all man-hour costs of base rates plus taxable fringe benefits and applicable insurance benefits for the appropriate labor classification. Include subsistence, premium portion of overtime (when required), travel expenses and similar costs in the General Requirements, Division 1.

When the mechanical or electrical contractor is the prime contractor, do not add Overhead and Profit (OH&P) in unit prices.

4.6F Other Cost Factors

General Requirements are included in Division 1 of the estimate and are summarized in Division 1 of the General Summary. Include Quality Control costs in General Requirements. There is a significant cost difference between jobs that require a QC Representative and support staff and the jobs that require a QC Representative only (See specifications).

4.6F-1 Escalation: Add escalation to each design estimate. Escalate the project costs to the mid-point of the estimated construction period. The current annual escalation factor used is 7%.

4.6F-2 Estimate Design Contingency: Add a percentage for contingency to allow for cost increases due to items of work that will become more clearly defined as the design develops. The added percentage shall be based on the judgment of the estimator. Delete Design Contingency from the Final Estimate.

4.6F-3 Additive Bid Items: Additive bid items shall be prepared and presented in the estimate in the same manner as the base bid estimate. Normally, each Additive Bid Item should be within 2 to 10 percent of the base bid item with the total of all additive bid items not to exceed 25 percent of the base bid item. Limit additive bid items to four items unless otherwise authorized.

4.6F-4 Submittal Guidance: The submittal requirement is the same for schematic, design development, 50 percent construction documents, 90 percent construction documents and the final documentation estimate. Review comments will be provided at each submittal stage. A/E response to review comments at each submittal is mandatory.

4.6F-5 Change Order Request Estimates:

Change Order Request (COR) estimates are required when changes must be negotiated after the construction contract has been awarded. There are significant differences between development of COR Estimates and the Project Estimate previously discussed. Prepare separate estimates of direct costs for deductive and additive costs. Prepare a separate estimate for the Prime Construction Contractor's work and for each sub-contractor involved in the changed work.

4.6G Bid Analysis

The A/E is to provide an analysis of the low bid when the low bidder is greater than the Final Estimate or when there is substantial variance with the other bidders and viability of the low bid is questionable. This involves the comparison of estimates with the low bidders to the extent that areas of differences can be identified and evaluated for responsiveness to project requirements. The confidentiality of the Final Estimate shall be maintained and quantitative elements shall be divulged only as is necessary to obtain information for analysis and conclusions.

4.7 CONSTRUCTABILITY

Overview

Construction Documents are Construction Contract Documents and are therefore a binding instrument between the Owner and the Contractor for construction services, and, as such, must be as accurate as possible to protect the interests of both parties. Studies have found that the majority of construction change orders are the result of poor coordination of the disciplines – Architect, Civil Engineer, Structural Engineer, Mechanical, Electrical, Plumbing, Fire Protection to name a few.

Change Orders are often the things that fall into the “Crack Zone” - like the ice machine with only hot water service piping, or the masonry wall opening that is too small for the specified window or the 8” column that doesn’t fit into the 6” wall. The average project contains five coordination errors per contract drawing. Change orders due to design conflicts and discrepancies in construction documents are costly, cause disputes, construction delays, and ultimately disrupt the construction progress. We all know that the Contractor’s pencil is always sharper on bid day than during Change Order negotiation. Good Interdisciplinary and Constructability Reviews prior to award of construction will realize a reduction in change orders, timesavings, and the ability to provide the project within budget.

The goals for performing Interdisciplinary and Constructability Reviews are:

- A reduction in the amount of change orders.
- A reduction in construction delays caused by change orders.
- A reduction in the Request for Information (RFI’s).
- A savings in construction administration time and effort.
- A smoother, non-adversarial relationship between the parties involved.
- A better construction project at final delivery.

Constructability reviews provide a systematic document review that specifically addresses potential points of conflict between different disciplines. The review also focuses on the clarity of the construction documents such as: the documents being clear, concise, and thorough; do the documents leave too much room for contractor interpretation; will the documents achieve the desired result during construction; and, are the documents bid-able. These are just some of the questions that must be asked during the review process.

Note: Interdisciplinary/Constructability Reviews have a proven track record of reducing Change Orders.

4.7A Constructability Review Procedures

The project management team will provide a series of Constructability Review/Interdisciplinary Coordination Reviews for each project within the program. Reviews will be conducted on each project at the completion of the following design phases:

- 100% Design Development Documents
- 50% Construction Documents
- 90% Construction Documents

The Constructability Review Process is described as follows:

1. Each Campus Project Manager will be responsible for keeping Look Forward schedule for each of the projects within his/her responsibility.
2. At each of the milestones outlined above, the A/E will provide the required documentation to the assigned Construction Manager. The Construction Manager shall provide the necessary documents appropriate to the level of Constructability Review to the Constructability Review team members.

3. The Construction Manager will coordinate the Constructability Review/ Interdisciplinary Coordination Review process including distribution of documents to the Review Specialists and consolidation of all review comments at the completion of the review process. At the conclusion of the Constructability Review, the Construction Manager will provide Constructability Review Comments utilizing the form included in this Section to the Campus Project Manager.
4. In addition to the Interdisciplinary Review, the 50% and 90% Construction Documents shall also be reviewed by the following:
 - a. District Architect
 - b. District Project Manager
 - c. District Public Safety Officer
 - d. Facility Management Services representative(s)
 - e. District Technology Representative
5. The Campus Project Manager shall convene a Post Review Meeting of these representatives to collect and record information, and schedule a formal meeting to provide direct feedback to the A/E.
6. Following the Constructability Review Coordination Meeting, the A/E shall document the response to each review comment on the Constructability Review Comment Form and incorporate all comments into the Design Development or Construction Documents. Revised documents shall be provided to the review comment providers via the Campus Project Manager for a back-check Review.
7. The Construction Manager will manage the back-check Review process and provide a Constructability Review Comment back-check Report to the Campus Project Manager upon its completion.
8. Constructability Reviews conducted do not alleviate the A/E of record of their contractual obligation to provide complete and accurate construction documents.

4.7B Items Required for Constructability Review

4.7B-1 100% Review of Design Development Package:

The A/E shall provide the following:

1. One (1) Complete Full Size Set of Construction Drawings
2. One (1) Unbound Copy of the Project Specifications

The District shall provide:

1. One (1) copy of the Geotechnical Report

4.7B-2 50% and 90% Review of the Construction Documents:

The A/E shall provide the following:

1. One (1) Complete Full Size Set of Construction Drawings
2. One (1) Unbound Copy of the Project Specifications
3. One (1) Copy of the Structural Calculations at 90%/100%

The District shall provide:

1. One (1) copy of the Geotechnical Report
2. One (1) copy of any Environmental Impact Reports (EIR's)

4.7B-3 Back-Check Reviews:

The A/E shall provide the following:

1. Two (2) Complete Full Size Sets of the Design Development or Construction Documents incorporating changes and revisions in response to the Constructability Review Comments.
2. Two (2) Bound Copies of the Project Specifications incorporating changes and revisions in response to the Constructability Review Comments.
3. Two (2) Copies of the Constructability Review Comments including A/E responses to each of the comments.

END OF DIVISION 4