2.02 DESIGN DEVELOPMENT PHASE

GENERAL

The Architect shall prepare the Design Development Documents from the approved Schematic Design. The Design Development Documents shall consist of drawings and other documents, including specifications, to fix and describe the size and character of the entire project as to kinds of materials, type of structure, mechanical and electrical systems, and other work that may be required for construction of the project.

During the preparation of the Design Development Drawings, the Architect will meet with the Building Committee, Facilities Services, Environmental Health and Safety, to determine specific and detailed requirements of all spaces in the proposed building and surrounding site requirements. The mechanical and electrical systems to serve the building shall be determined during this period and shall be described in the Design Development Documents.

The Architect's study and analysis during this phase shall be in such detail that all data is sufficient to begin construction drawings, when so directed, without additional consultation with the using departments.

All sustainability or LEED goals shall be determined, identified in the Documents and integrated into the Cost/Budget Estimate in the Design Development Submittal.

All substantial design decisions and budget confirmation shall be resolved for the College to approve the Design Development Submittal.

SUBMITTAL REQUIREMENTS

In addition to that required in the Schematic Design Submittal, the following shall, as a minimum, be provided as part of the Design Development submittal. The Architect may submit additional information as appropriate.

Drawings

All drawings submitted to the College shall be dated, show scale and orientation of drawing, and shall carry the title of the project and the Architect and their Consultants. Each project is given an official title, which must be used with consistency on all documents.
Included in the Drawings, a Code Compliance information identifying Occupancy Type and Construction Type allowable and actual calculations in sufficient detail to support the specific design. Additional Code excerpts shall be included as applicable. The Code Compliance must be reviewed and accepted by the Building Official prior to submittal of the Design Development: the Owner shall included in these reviews with the Building Department.

Design Development drawings shall be at the same scale as that to be used for the Construction Documents drawings, normally not less than 1/8" = 1' - 0". These drawings shall develop the design approved in the Schematic Design Phase. They shall show all room and space uses, including location of items of fixed equipment and major pieces of movable equipment whether Owner or Contractor supplied. Basic structural, mechanical and electrical systems shall be determined and shown on the drawings. Program room numbers and computed net areas of rooms shall be shown. Elevations and sections shall be developed to a degree that illustrates the range of materials, final appearance and nature of the structure of the building. Drawings shall include major control dimensions and enough other dimensions to determine all room sizes. The site plan shall show necessary utility lines and connections.

The following information should be included in Design Development Submittal Documents for Code review purposes. Plans should include overall dimensions, drawn to scale, and should be of sufficient clarity to indicate fully the development of the projects’ location, nature and extent of the work proposed.

Provide Design Development drawings indicating, at a minimum, the following technical information.

**Site Plan**

Show property lines, streets, roads, sidewalks, accessible routes, curbs, curb cuts, building location, future additions, existing buildings, driveways, parking lot layout, walks, steps, ramps, fences, gates and walls. Show north arrow. Provide dimensions for all setbacks and where exterior wall/opening protection may be required. Any required associated Variance shall be granted.
Floor Plan(s)

Dimensions: Provide overall building and additional basic room dimensions. Show north arrow and identify the drawing(s) scale.
Room: Room names and numbers, and cross references to enlarged plans (as applicable) and the Room Finish Schedule. The room numbering shall be finalized.
Floors: Show floor elevations, ramps, and stairs
Walls: Indicate existing and new walls. Show all fire rated corridors, occupancy separations, area separation, shaft enclosures, etc.
Doors: Door with door numbers and associated hardware schedules.
Curtainwall, Storefront, Windows and Glazing: Accurately identify the proper framing system required to support the design application. Indicate any fire rated assemblies. Identify overall glazed opening sizes, particularly of operable vents.
Toilet Rooms: Identify plumbing fixtures, stalls, accessories and cross-references to enlarged plans (as applicable).
Stairs: Dimension of stairway enclosures and risers/treads in plan and section.
Miscellaneous Items: Locate drinking fountains, folding partitions, fire extinguisher cabinets, elevators, etc.
Code Compliance Plan: see Appendix A.
Coordination Plan: Provide Consultant coordination plan(s) identifying general workstation layout with the associated electrical, tele/data and other specialized utility connection locations.
Demolition Plan(s): On remodel/addition projects when substantial demolition occurs, provide a Demolition Plan clearly identifying the Scope of Work.

Roof Plan

Show drainage direction, crickets and skylights. Show drainage to roof drains, overflow drains, scuppers, etc. and all points of on-grade discharge. Identify roofing materials, minimum roof pitch. On surface mounted gutters, show the gutters, collection boxes, downspouts and point of discharge. Identify the relative elevation of the roof drainage surfaces.

Exterior Elevations

Show floor elevations, finish grades and vertical dimensions of the building elements, floors, ceilings, and openings. Show roof slope, door and window locations. Indicate all materials and, on addition Projects, graphically differentiate between existing and new.

Building Sections

Show vertical dimensions relating to floor, ceiling, roof height and openings. Note and indicate all materials and extent of the fire rated assemblies.
**Reflected Ceiling Plan**

Indicate ceiling materials. Show proposed ceiling, lighting, grilles/registers, acoustic panels, access panels, etc locations: coordinate the layout with all Consultants.

**Enlarged Floor Plan(s) and Section(s) (as applicable)**

Toilet Room Plans: Show plumbing fixtures, accessories, stall layout and handicap accessibility. Verify plumbing fixture count with local Code Official and Owner’s Representative, particularly on renovation and addition Project. Kitchens: Provide a commercial kitchen equipment plan and schedule when applicable. Stair and Elevator Section(s): Show vertical/horizontal dimensions and hand/guardrail design.

**Schedules**

Develop profiles for doors, windows and associated frames including a preliminary Door Schedule with required ratings and hardware groups. Provide a Room Finish Schedule.

**Wall/Partition Types and Rated Assemblies**

Provide a legend identifying the materials used and fire/acoustic rating as applicable. Properly cross reference to the plans and sections.

**Structural Notes**

Outline to include:
Live Loads: Floor, stairs, corridors, roof, snow, earthquake and wind.
Dead Loads: Material weight, mechanical and electrical weight, wet-pipe or dry-pipe fire sprinkler system, and soil bearing pressure.
Materials Strength: Concrete, masonry, steel and wood.
Foundation design based on Soils Report.

**Structural Schematics**

Provide Foundation Plan and Structural Plan that include floor, roof and wall construction. Particularly in buildings containing sensitive equipment, the Architect and Engineer shall incorporate vibration analysis and mitigation appropriate to the projects requirements.
Technical Design Development Drawings

Mechanical Drawings (see additional requirements in Division 15)

a. Updated narrative description of the proposed HVAC system.
b. Scaled plans of each floor, showing double-line duct layouts, equipment locations, typical heating and cooling devices (e.g., scaled VAV boxes and branches with supply and return diffusers).
c. Mechanical-room drawings, showing locations and sizes of AHU(s), fans, pumps, compressors, heat exchangers, etc. Show elevation cross sections where necessary.
d. Update HVAC load calculations
e. Provide sufficient accessibility to all equipment and devices (e.g., coil pull, VAV, AHU, HX equipment).
f. System schematics showing all system components and control devices and “detailed” sequence of operation.
g. Roof layout drawing indicating intake and exhaust louver location and orientations relative to plumbing vents and lab exhaust.
h. To ensure “fit” in small or confined spaces with other disciplines, develop scaled composite drawings as found necessary.
i. Show smoke control system operation in narrative and single line diagram.

Particularly in buildings containing sensitive equipment, the Architect and Engineer shall incorporate vibration analysis and mitigation appropriate to the projects requirements.

Plumbing Drawings (see additional requirements in Division 15)

a. Updated narrative document.
b. Plans of each floor, noting fixture locations and types. Indicate routing of main distribution lines with sizes.
c. General arrangement of all piping systems (domestic water, hot water, gas, sewer, storm, specialty lab gases and Fire Protection).
d. Location and sizes of all water, sanitary sewer, primary & overflow storm drain and sprinkler piping.
e. Location of all floor drains, roof drains and floor sinks in toilet rooms, mechanical rooms etc.
f. Tentative fixture schedule.
g. Location, sizes and types of water heaters, heat exchangers, sump pits, and flues where required.
h. Provide a fixture-count calculation sheet.
i. Utility connections to the tunnel piping distribution systems if required by the design.
j. Proposed janitors closet location and mop sink fixtures at each floor.
k. Roof layout drawing indicating proposed roof penetrations for storm drains and all roof vents.
HVAC Drawings (see additional requirements in Division 15)

a. Updated narrative description of the proposed HVAC system.
b. Plans of each floor, showing double-line duct layouts, equipment locations, and typical heating and cooling devices (e.g., a VAV box, branches & GRDs
c. Equipment schedules with tentative sizes, capacities, features, etc.
d. Mechanical-room drawings, showing locations and sizes of fans, pumps, Compressors, heat exchangers, etc. Show elevation drawings to ascertain fit among other disciplines.
e. HVAC load calculations.
f. Accessibility to all equipment and devices.
g. System schematics showing all system components and control devices and sequence of operation.
h. Roof layout drawing indicating louver intake and exhaust orientations relative to plumbing vents and lab exhaust.
i. M.E. smoke control exhaust system where required.

Electrical Drawings (see additional requirements in Division 16)

a. Updated narrative description of the Electrical system.
b. Identify proposed electrical room/closet areas.
c. Identify main electrical feed type of service and location.
d. Identify and locate proposed electrical sub-panel locations, type and size at each floor.
e. Tentative lighting fixture layout, type and count.

Show electrical service and electrical panel location(s).
Show light fixtures layout.

Specification Outline

Particularly in buildings containing sensitive equipment and/or sound sensitive applications, the Architect and Engineer shall incorporate vibration analysis and mitigation appropriate to the projects requirements. Use caution when selecting and locating Transformers. Also refer to Division 16 “Transformers”.

The College is very concerned that lighting design is accomplished in a maintainable and efficient manner: use of an excessive number of fixtures and/or different types of fixtures/lamps is not acceptable.

Describe structural, mechanical and electrical systems including fire protection. Establish specification sections for principle materials and finishes.

All Floor Plans and Room Finish Schedules shall the approved room numbers. Room numbers shall be assigned by the Architect and reviewed by the Owner's Representative.
Technical Specifications

A specification (based on Schematic Design Phase outline) listing the major components of the design is required including a description of the items of equipment that will be required to be furnished by the Contractor. The Architect shall provide a list of materials or equipment items that are being proposed that vary from the requirements and standards stated in this Manual or the Building Program. Product data and technical information shall be provided for materials and systems recently developed, requiring specific performance criteria, or unfamiliar to the Colleges’ Technical Staff: review with the Owner’s Representative. Provide major mechanical system component, lighting fixture and plumbing fixture product information.

Tabulation of Areas

The Architect shall prepare a tabulation of areas (updated from Schematic Design Phase). The tabulation shall indicate the Net Assignable Square Feet (NASF) of all spaces. Programmed spaces shall identify Building Program room name.

Cost Estimate

When required by the Agreement Between Owner and Architect, the Architect shall prepare a statement of probable construction cost of the Project based on the Design Development Documents. Appropriate amounts for contingency and inflation shall be included in the construction estimate to reflect anticipated condition at the time of bidding. When the Owner employs an independent Cost Consultant or Construction Manager/General Contractor, the Architect shall review the Cost Consultant's reports and notify the Owner in writing if the Architect takes exception to any item or items in said reports. These cost issues will be discussed and resolved with the Owner and Cost CC Consultant/(CM/GC) Contractor. The documents shall be revised as required to correspond to the budget estimate with no additional charge to the Owner.

Energy Report

The Architect shall prepare a report describing energy considerations and recommendations including building operations cost projections. These shall be reviewed with the Owner’s Representative.
REVIEWS

A formal College review is made after the Design Development Submittal has been presented to and approved by the Building Committee.

The Building Committee will critically examine this submission, other representatives of the using departments, Facilities Services, Environmental Health and Safety, and other Administrative and Academic personnel to ensure that all requirements of the Building Program have been satisfied. Written and/or “redlined” drawing comments will be assembled by the Building Committee then transmitted to the Architect for inclusion in the design or for further study or discussion. Each comment requires a response and resolution by the Architect or their Consultant. All substantial issues must be resolved to the Owner’s satisfaction: a revised Design Development Submittal may be required.

The cost estimate will be reviewed at this time to determine that the estimated construction cost is within the limits of the available funds. If estimated costs exceed the budgeted funds, the Architect will be required to make changes to reduce the cost.

The Architect shall review the drawings with all required City of Colorado Springs and State agencies including the Regional Building, Utility, Fire and Health Departments. Copies to the governmental agency’s review comments and the Architect’s responses shall be provided to Colorado College. All substantial issues shall be resolved before proceeding to the Construction Document phase.

The City of Colorado Springs Planning Department requires submittal and approval of a Development Plan: refer to the City of Colorado Springs Zoning Ordinance for requirements.

After the Design Development submittal has been approved by the Building Committee and Design Review Board, the Architect will be notified, in writing, to begin preparation of the Construction Documents.