GENERAL

Construction Documents

Construction Documents shall be developed from the approved Design Development Documents. These shall be complete in all respects to permit intelligent bidding and construction. All elements shall be shown and appropriately detailed.

The Construction Documents usually consist of the component parts listed below. Please note that this is not a complete list of all the Contract Documents that will be used during the Bidding and Construction Phase.

- Advertisement for Bids (provided by CM/GC or required for open bids only)
- Instructions to Bidders (required for open bids only)
- The Form of Bid (required for open bids only)
- General Conditions
- Supplementary Conditions
- Special Conditions
- Technical Specifications
- Drawings

The Architect is responsible for developing the Technical Specifications and Drawings in conformance with these Design Guidelines. The other documents listed above will be developed by the Owner's Representative utilizing Colorado College forms: Refer to Appendix B and C.

Construction Documents shall not be started until the Design Development Documents have been approved in writing.

During the development of the Construction Documents it may be necessary for the Architect to obtain some additional information from the Building users. Any need for such additional help should be requested through the Owner's Representative who will make the necessary arrangements with the personnel concerned. At no time should the Architect meet with College personnel without the knowledge of the Owner's Representative.

Informal reviews should be scheduled with College personnel at appropriate points in the development of the drawings and specifications to ensure that all interested parties are satisfied with the documents.

The above meetings and reviews are to be requested by the Architect and it is the
The Architect’s responsibility to assure that they occur at such times so as to avoid changes to the Construction Documents resulting in the owner incurring extra expenses or time delay to the project.

The project Architect must furnish a letter stating that no asbestos containing products (ACM) as defined by the Environmental Protection Agency (EPA) were specified in the Project Documents or included as building materials. At the conclusion of this project, please forward the document to the Owner's Representative for filing.

No materials, components, systems and equipment shall be specified approved or used which will be discontinued or redesigned from the manufacturer or suppliers in the near future, (preferably within 5 years). This shall include “Year 2000” computer compliance. The Architect and their Consultants shall perform a diligent investigation to assure the College of this.

Particularly, remodel and renovation Projects, adequate field investigations, beyond the information provided by the Owner, shall be performed and indicated on the Documents by the Architect to insure an accurate description of the scope of work and feasibility of Construction.

SUBMITTAL REQUIREMENTS

The following shall, as a minimum, be provided as part of the Construction Documents submittal. The Architect may submit additional information as appropriate.

Drawings

All drawings submitted to the College shall be titled and dated accurately, show scale and orientation of drawing, and shall carry the title of the project and identify the Architect with their Consultants. Each project is given an official title, which must be used with consistency on all documents.

Drawings shall be prepared on standard 24” x 36” or 30” x 42” sheets whenever possible. Owner shall be provided electronic generated drawings using the latest version of AutoCad.

Separate site plans shall be prepared for above ground features and for subsurface utility lines unless the latter are very minimal and the finished drawing is fully clear in all
respects.

Drawings shall be carefully checked by the Architect to achieve coordination between all consultants, civil, structural, mechanical, electrical specialized consultant and fixed equipment.

All Floor Plans and Room Finish Schedules shall have building program room names and numbers. Room Numbers shall be assigned by the Architect and approved by the Owner's Representative.

Notes and dimensions on the drawings shall be large enough to be read easily without eyestrain. This is especially true if drawings are to be reproduced at half size for bidding documents. Spelling shall be checked carefully.

Do not use propriety product names on the drawings, except when instructed by the Owner’s Representative or identified in this Specification.

Room Finish and Door Schedules should be incorporated in the drawings.

All items of mechanical equipment such as air handlers, pumps, fans, steam pressure reducing valves, etc. shall be scheduled on the Construction Drawings. Include all design and operating parameters for each unit.

Provide a title sheet for each set of drawings identifying all abbreviations and symbols used on the drawings in a key or legend. Provide vicinity location map(s) and index of drawings.

The form of and data to be incorporated in the Title Block used on all drawings shall be checked with the Owner's Representative before finalized. The Title Block shall include the names, addresses and telephone/fax numbers of all Consultants.

Construction Drawings shall bear the Architect's and/or Engineer's seal and certification with signature and registration number.

One stamped set, with the official City’s approval notice, shall be delivered to the College as a permanent record set.

CD Submittal

The following information should be included in Construction Document Submittal for

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Code review purposes. Plans should be fully dimensioned and drawn to scale and should be of sufficient clarity to indicate the precise location, nature and extent of the work proposed.

Provide Construction drawings, which shall include, at a minimum, the following: The scale and complexity of the project will determine which specific drawing will be required.

**Title Sheet**

- Table of Contents
- Names, addresses and contact numbers of Architect, Engineers and Consultants
- Building Code Analysis (see Schematic Design Submittal requirements)
- Note Type of Work, new construction, addition, remodel/renovation or tenant finish
- Vicinity Map
- Based on information provided by the College, identify types, amounts and locations of all hazardous materials intended to be stored or used. List actual quantities and compare to exempt amounts. Note, Projects with extensive quantities of hazardous materials will be required to submit a “Hazardous Materials Management Plan” as prepared by the College Environmental Health and Safety Office.

**Site Plan** shall include:

- Property lines, street names, scale, north arrow
- Building location, set backs, finish floor elevation, dimensions
- Contours, existing, new grades/elevation marks and drainage direction
- Existing and new paving, parking lot plan
- New and existing sidewalks, steps, curbs, curb cuts and drives
- Fences, gates, walls and retaining walls
- Existing structures, trees and shrubs to remain or to be removed
- New landscaping, trees, shrubs, ground cover
- New and existing utilities
- Site Details including handicap curb ramps, signage, etc.

Because the Campus is contiguous land, generally without internal property lines, the Limits of Work shall be defined as the area necessary for the project grading, planting, utility work, walkways, roads, construction staging, etc. connects uninterrupted to the adjoining land and utilities: the interface between existing grading and new landscaping shall be carefully coordinated.

**Demolition Plan (Optional)**

When the delineation between portions of existing construction to remain and to be removed becomes sufficiently complicated, a separate Demolition Plan will be required.
Clearly note the specific demolition Scope of Work.

**Architectural Floor Plan(s)**

Code Compliance Plan: See Appendix A

- **Dimensions**: overall, building break, grid lines, room, & opening dimensions, north arrow.
- **Rooms**: room names and numbers. Cross-reference enlarged plans where applicable.
- **Floors**: floor elevations, change in materials, ramps/stairs, floor breaks, etc.
- **Walls**: indicate existing and new walls, wall types, material and fire rated assemblies by legend and on graphics
- **Doors**: door swing and number
- **Windows**: Identify size, operation, style, etc or provide a Window Schedule.
- **Toilet Rooms**: plumbing fixtures, accessories, stalls, floor drains, and cross reference to Enlarged Plans

**Stairs**: dimension stair enclosures, risers/treads, landings, handrails, etc and cross-reference stair details/sections: coordinate framing with the Structural Engineer.

**Miscellaneous Items**: fire extinguisher cabinets, access doors, drinking fountains, folding partitions, ladders, lockers, shelving, railings, guardrails, elevators, etc.

**Alterations**: Existing opening and new openings

**Interior Elevations**: Details and Sections: cross-reference on the Floor Plans

**Expansion and Control Joints**: show clearly and coordinate with the Structural Engineer.

**Architectural Roof Plan**

- **Materials**: Type of roofing
- **General Roof Information**: Roof drains, overflow drains, scuppers, gutters, leaders, roof high point and low points, crickets, skylights, vents, fans, mechanical equipment and roof access indicated the direction and slope of the drainage and relative elevation of the drainage surface at the working point. Identify the point of discharge of the downspouts.
- **Miscellaneous**: Roof pavers, ladders, splash blocks, ventilation, expansion joints, etc.
- **Miscellaneous Vertical Elements**: Show all tall elements, flagpoles, mechanical stacks and flues, antennas, etc, shall be properly structurally supported with the associated flashing and roofing details.
- **Expansion Joints**: show clearly and coordinate with the Structural Engineer.

**Architectural Exterior Elevations**

- **Materials**: identify all exterior finish materials and color selections. On addition and renovation projects, clearly differentiate between new and existing materials.
- **Windows and Doors**: provide window and door openings, window head and sill heights
and indicate window and door type. Identify glazing types and tempered glazing locations.
Dimensions: grid lines, vertical dimensions, floor levels, grade elevations
Miscellaneous: ladders, louvers, railings, gutters and downspouts
Grade: show the intersection of the grade at the building accurately

Architectural Building Sections

Dimensions: vertical dimensions relating to floor, ceiling, roof, openings, casework and other relevant information.
Cross Reference all details
Materials: note and indicate material.
Fire Rated Assemblies: Show the extent of fire rated assemblies accurately

Architectural Reflected Ceiling Plan

Ceiling Construction: show ceiling breaks, or change in height, materials, grid pattern, diffusers, light fixtures, exit signage and access panels. Coordinate this information with the engineering disciplines.
Walls: indicate walls extending above the roof plane with wall type and fire rated assemblies as described on the Floor Plans.
Coordinat: adequate interstitial ceiling space shall be provided to reasonably accommodate all mechanical, plumbing, piping, electrical and structural elements.

Architectural Enlarged Floor Plan(s)

Commercial Kitchen Plans: required for commercial kitchen equipment layout with an Equipment Schedule, including any Owner furnished or relocated equipment, identifying and coordinating all required service connections with the Engineering disciplines.
Laboratory Plan: required when complexity warrants with an Equipment Schedule, including Owner furnished or relocated equipment, identifying and coordinating all required service connections with the specialized Consultants and the Engineering disciplines.
Stage Plan: required for theatrical rigging and lighting with a Rigging Schedule coordinating all required service and structural connections with the specialized Consultants and Engineering disciplines.
Stair Plans and Sections: identify horizontal dimensions coordinated vertically to the Stair Sections.

Architectural Interior Elevations

Room Number: identify in the title.
Toilet Room Elevations: plumbing fixture and accessories mounting heights and handicap accessibility requirements.
Materials: indicate wall finish materials and extent: coordinate with Room Finish
Schedule. On renovation and addition projects, clearly identify the Scope of Work, existing verses new with any secondary work, patching, painting, etc.
Casework and Equipment: Provide interior elevations and all applicable cabinet configuration descriptions.

Architectural Schedules

Room Finish Schedule: identify interior finishes and extent of use. Provide a Finish Materials Schedule that is coordinated with the Specification terminology.
Door Schedule: door types, sizes and fire rating, door hardware groups
Window Schedule: window types, frames, fire rating, and glazing type and size. Note, depending on the application, the College may exceed the minimum Code requirements for the use of tempered or safety glazing.

Architectural Building and Wall Sections

Building Sections: provide adequate sections to describe the specific project and cross-reference the location on the Floor Plans. Provide vertical dimensions to major design elements. Identify the extent of all fire rated assemblies.
Wall Sections: provide typical and atypical sections identifying the materials, thermal insulation values, roofing system, vertical dimensions, etc with particular detail to the connections to the primary structural system: coordinate with the Structural Engineer. Cross-reference the location of all section cuts. Identify the extent of all fire rated assemblies.
Deflection, Expansion and Control Joints: show all vertical and horizontal joints and coordinate with the Structural Engineer. Provide adequate details.

Architectural Details and Enlarged Sections

Stairs: Provide section(s) riser and tread dimensions, headroom clearance, and handrail details and attachment details. Coordinate with Structural Engineer.
Guardrails: Height and distance between intermediate rails and attachment details
Ramps: Slope, length and handrails
Wall Types: Fire-rated construction, corridor walls, shaft walls, area separation walls, occupancy separation walls. Indicate extent of fire rated construction/assemblies: cross-reference to the Floor Plans. Specify fire penetration sealants at rated walls.
Joints: provide adequate detailing for deflection, expansion and control joints.

Structural Notes

Live Loads: provide floors, roof, snow, earthquake and wind load criteria.
Dead Loads: provide large mechanical and electrical equipment weights and soil bearing pressure information.
Material Strength: identify concrete, masonry, steel and wood unit strengths. Identify any “Special Testing” requirements and review the Scope of Work with the Owner’s Rep.

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Foundation design: reference the Soils Report by origin, number and date.

Lintel and Opening Schedules

Special Finishes and Grades: identify special architectural finishes for exposed concrete, steel fabrication, concrete floors, etc and areas requiring restrictive tolerances. Coordinate with the Architect.

**Structural Floor and Roof Plans** shall include:

Foundation Plan and Structural Framing Plans: provide foundation, floor, and roof plans of all full and partial levels. Use elevation datum reference consistent with the Architectural drawings. Coordinate floor elevations with the Architect. Coordinate and identify primary openings.

**Structural Wall, Plan Details and Details** shall include:

Provide wall, plan and detail sections as necessary to describe the construction. On structural steel stud framed exterior walls, provide adequate information on the stud characteristics and framing details.

**Mechanical Plans** shall include:

1. **Specifications**
   Complete sets of Specifications corrected to meet CC Standards.

2. **Mechanical and Plumbing**
   All Mechanical and Plumbing systems shall be indicated on the contract drawings to include the following:
   a. All plumbing riser diagrams complete with pipe sizes, valves and F.U. notations.
   b. All piping riser diagrams representing each type of system complete with pipe sizes and valves and capacities.
   c. Plumbing and piping equipment connection details for all equipment/devices
   d. Plumbing drawings indicating all roof and storm system piping.
   e. Coil piping detail indicating all valve, drains, vents and piping arrangements.
   f. High temperature piping drawing showing all pipe, valves and fittings as found applicable.
   g. Heat exchanger piping connection details indicating all valves, drains and vent piping.
   h. Water heater and miscellaneous piping detail.
   i. Access doors as required for plumbing and piping access.
   j. Design calculations for plumbing, piping and HVAC.
   k. Equipment Installation details where required.
   l. Cross section drawings where required.
   m. Control diagrams with detailed sequence of operations.
n. Drawings of each area showing double line supply, return, exhaust ductwork with corresponding riser diagrams.
o. Air Flow Balancing Riser Diagram showing airflow quantities throughout the building including exhaust.
p. Complete HVAC and Plumbing Equipment/Devices Schedule with capacities and design criteria.
q. Detailed Mechanical Room drawings showing all equipment with cross section drawings where required.
r. Show all fire dampers and/or combination smoke & fire dampers.
s. Kitchen and fume hood exhaust systems including sizes of all ductwork including grease traps.
t. Fire suppression sprinkler and standpipe system locations and main connections.
u. Smoke control devices in ductwork as found applicable.
v. Indicate type and size of all flues. BTUH input/output capacities and gas pipe sizing for equipment.
w. Deliver one complete set of CADD files corrected to meet CC Standards prior to contract award.

**Electrical Plans shall include:**

- Electrical service and distribution equipment location, transformers, electrical meter, main and sub-panel, etc.
- Exit sign locations, light fixtures layout and emergency lighting
- Fixture types and schedule. Specify fixture types to minimize the number of lamp types required for maintenance.
- Electrical outlets and circuits
- Coordinated Tele/Data rough-out locations
- Fire alarm/detection system
- Light fixture schedule
- Panel circuit schedule/calculations
- One-line distribution system diagrams
- Coordinated door security system rough-out locations
- Specify fixture luminaries as to minimize the number of types required for maintenance

**Technical Specifications:**

Shall include the Owner’s Project Intent and written Basis for Design.
Describe structural, mechanical and electrical systems.
Complete specification sections for principle materials and finishes.

Remodel/addition projects should additionally indicate interface with existing conditions and limits of work within the existing building and provide information on the connection point data schedule.

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The importance of complete and thorough Specifications cannot be too strongly stressed. Specifications shall be carefully checked to include all items pertaining to the project and to eliminate inclusion of items not incorporated into the project. The terminology, references and abbreviations used on the drawings shall be consistent with the specifications.

The Specification shall include a complete summary list of all required shop drawing, samples and product data. The Specifications shall include a complete list of standard warranty and extended guarantee items and list of items for which operations and maintenance data are required. The Architect shall be responsible for reviewing and approving Operations and Maintenance (O&M) Manuals from the Contractor(s) and delivering them to the Owner's Representative. Consult with Facilities Services before proceeding with this work.

The Specification shall include a summary list of Owner's Stock Items, additional quantities beyond that require to complete the construction to be used for future maintenance such as carpet, luminaries, paint, etc.

References to industry standards shall be checked to verify correct identification of numbers and date of issue.

During the reviews by College personnel, the Specifications will be checked, but the Architect should not rely upon this, including requirement of this Design Guideline, in lieu of their careful preparation and personal checking.

Specifications shall be prepared using the AIA-CSI format.

This Manual incorporates certain College requirements in the selection of materials and quality of workmanship to be incorporated in the technical sections of the Specifications: refer to Part 3.

The terms “to be”, “must be”, “should be” and “will” are not acceptable. The mandatory “shall” or “shall be” are the only forms with full legal force.

Throughout the Specifications, the Architect shall use a performance type description as far as possible, meeting certain established and recognized industry standards (e.g., ASTM). Where this is not feasible because such standards have not been established, list three equally acceptable manufacturers or suppliers. The name of one type followed by “or equal” or “or approved equal” is not considered to be an adequate specification. As a possible alternative to this procedure, the statement “equal to item 'X' as manufactured by 'ABC Company' will be acceptable as a means of establishing the quality desired. Approval of “equal” items shall occur during bidding and issued in addenda.

For consistency in format the following rules should be observed:

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(a) The term "Architect", refers to the Architect and/or their Consultants and Engineers who prepares the Documents. The terms should be capitalized.

(b) The term "Owner" should be capitalized, and no other term should be used in reference to the College and/or the Owner’s Representative.

(c) References to the "Drawings" should be that, and not to less inclusive term "plans". Drawings refers to that portion of the Construction Documents.

(d) "Specification" should be capitalized when reference is made to those trade sections generally and refers to that portion of the Construction Documents.

(e) "General Conditions", “Supplementary Conditions”, and "Special Conditions" are conditions of the Contract and are not parts of the Specifications.

(f) The term "Contractor" should be capitalized and refers to the prime Contractor and/or the Sub-contractor and Suppliers contracted directly by them.

(g) When reference is made to the "Contract" between a Contractor and the Owner it should be capitalized.

(h) The term Contract Documents refers to all the documents identified in the Contract Between Owner and Contractor and in the General Conditions.

(i) The terms “Project”, “Architect”, “Owner” and “Owner’s Representative” should be capitalized.

Project Manual

The “General Conditions”, “Supplementary Conditions”, “Special Conditions”, and other bidding requirements should be bound together with the “Technical Specifications” to form the Project Manual. The Architect shall obtain special permission from the Owner's Representative before placing other documents such as schedules and detail drawings in the Project Manual. All pages shall be numbered. It is optional with the Architect that individual paragraphs have their own numbers.

An index or table of contents for the entire Project Manual is essential. The use of different colored paper for the major divisions is required as follows:

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Boiler Plate
- Index - White
- Advertisement for Bids - Optional
- Instructions to Bidders - Provided by the Contractor in CM/GC Contracts
- Form of Bid – White - Provided by the Contractor in CM/GC Contracts
- General Conditions - AIA A201
- Supplementary Conditions - Colorado College Standard Form
- Special Conditions - project specific modification as reviewed and approved by the Owner

Technical Specifications
- Architectural Specification - White
- Mechanical Specification – Blue (preferred)
- Electrical Specification – Yellow (preferred)

Copies of the Project Manual should be bound in such a manner that they will not fall apart in use. Substantial cover stock and binders should be used.

The Project Manual should carry official Project title, Architect's and primary Consultants name and date on the cover. This date shall be the same as that on the Drawings and, in the case were earlier editions exist, shall be titled Contract Edition. Architect's and Engineer's seals shall be placed on the title page.

Colorado College’s standard forms will be used for all projects. The sample forms included in Appendix B are for the Architect's information only. Final copies tailored to each project will be provided by the Owner's Representative for insertion into the Project Manual.

**Tabulation of Areas**

The Architect shall prepare a final tabulation of areas (updated from Design Development Phase). The tabulation shall indicate the Net Assignable Square Feet (NASF) of all spaces.

**Cost Estimate**

When required by the Agreement Between Owner and Architect, the Architect shall advise the Owner's Representative of any adjustments in probable construction cost during this phase. When the Owner employs an independent Cost Consultant or Construction Manager/General Contractor (CM/GC), the Architect shall review the reports and notify the Owner in writing if the Architect takes exception to any item or items in said reports.

**REVIEWS**

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At completion of the submittal for the Construction Documents Phase, the Architect shall Submit Drawings and Specifications in the number designated by the Owner's Representative and simultaneously submitted to the Code Official. The Architect is required to secure all required City of Colorado Springs and State approvals necessary for the Building Permit. Copies of the governmental agency’s review comments and the Architect resolution shall be provided to Colorado College with one (1) officially stamped and approved set of Construction Documents. Transmit approval statements to the Owner's Representative.

Because changes will probably be required, the reproduction in multiple copies for bidding should not be made until after the Reviews are completed. If major or numerous minor changes are required due to the Code Review, Addendum(a) and/or Owner’s Review, the Owner's Representative may request the Architect to consolidate these addenda into final Construction Documents: this shall be completed at no additional cost to the Owner.

The Architect shall include provisions for alternate proposals in the bidding to permit a reduction in the scope of the Project should this be necessary to award contracts within the budgeted funds. Alternates to be incorporated in the bidding documents should be approved by the Owner's Representative before they are established in the proposal form.

Bidding strategies and the use of standardized Project Manual Documents shall be developed in cooperation with the Owner's Representative, and in the case of a CM/GC Contract, with the Contractor.

The Construction Documents will be critically examined by the Building Committee, Owner’s Representative, Owner’s Commissioning Authority, Facilities Services Staff, Environmental Health/Safety, Information Technology, and other College Administrative Staff to insure that the requirements of the Building Program are satisfied. The primary emphasis is to assure that the approved Design Development has been describe in adequate technical terms to complete the Project on time and within budget. Some of the primary concerns are construction durability, life/safety related to the Codes, sustainability goals, building atmospheric controls, energy efficiency and general completeness/coordination of the documents. Colorado College is not the Code Official and compliance to all applicable Codes is the responsibility of the Architect and their Consultants.

The Scope of the Work must be sufficiently defined in the documents to prevent unreasonable cost escalation during construction. The Owner’s written and “redlined” comments will be transmitted to the Architect. The Architect and their Consultants shall respond to the Owner’s Comments and incorporated all necessary change into the final Construction Documents.

After the Construction Documents have been approved by the Owner, the Architect will be notified in writing to issue the final Construction Documents for Bidding.