Chapter 12
GENERAL DRAWING REQUIREMENTS

1201 - SCOPE

1201.1 Computer Assisted Drafting Required: The Design Consultant shall use computerized design systems unless otherwise directed in writing by the Project Manager. All drawings requiring a CAD submittal must be delivered according to CSU CAD Requirements (Chapter 25). Each Design Consultant shall use internal corporate quality control procedures to ensure accurate, adequate, and safe work. The CSU Design Standards set forth preferred formats for size, media, title block, line weights, symbols, etc. These standards serve as a supplement to the Design Consultant’s existing procedures.

Drawings shall be submitted in reproducible hard copy and electronic media. Generally the electronic media submittals shall be required three (3) times during the design phase and then with the record drawings as specified in the Design Consultant’s contract.

1201.2 No Specifications on Drawings: Specifications and schedules shall be placed in the Project Manual and not on the drawings unless the Project Manager provides a written variance.

1202.3 Restriction on Access: Consultants may not provide drawings or data for uses not directly related to the Project. The Consultant shall secure written authorization from the Project Manager prior to release of any information. This includes reviewing of documents or project requirements with contractors or vendors prior to issue for bid.

1202.4 Designer Supervision: Drawings and documents shall be prepared under the supervision of design professionals licensed in the State of Colorado as required by Colorado State Boards of Licensing.

1202 - PROJECT DRAWINGS & QUALITY CONTROL

1202.1 Quality Control: The Consultant is solely responsible for the completeness and quality of the design product. The licensed responsible Designer of Record shall check all drawings and technical documents for complete coordination and compliance with code requirements and CSU Standards. The following are minimal quality control measures:

A. Completing design work or drawings
B. Checking the drawing for conformance with design calculations
C. Conformance to design standards and criteria
D. Coordination with and among other disciplines and departments
E. Conformance to technical standards and engineering/architectural design principles
F. Obtaining acceptances and approval signatures when applicable
G. General quality of drawings, including use and control of line weighted for graphic communication and legible contrast for grayline background plans and dimensions.
H. Elimination of all conflicts between drawings and specifications
I. Issuance and release of drawings
J. Signing and sealing/stamping of drawings

1202.2 Legibility: The drafter or CAD operator shall remember that the drawing is a means of communication and that it must be clear, legible, accurate and clean. Illegible, cluttered, crowded and visually confusing drawings are unacceptable. The Consultant shall assure its work and that of subconsultants are orderly and completely legible.

A. Arrange drawing sheets with adequate white space to avoid crowding.
B. Keep large scale drawings clear of small scale detail by using layer control, especially with computer-assisted drawings generated using automated building assembly routines.
C. Plan details, annotation and dimensions to avoid multiple crossing lines and overwriting.
D. Use keyed leaders and identifiers to reference full annotation in a legend or table.
E. Group and pattern placement of leader keys, symbols and indicators so they are easy to find.
F. Avoid using CAD colors with low visual contrast to white paper. Although standard yellow, green and cyan are bright in AutoCAD model space, they are difficult to see in paper space. Substitute darker hues from the AutoCAD Color Index (ACI), such as 54 for yellow, 94 for green, 134 for cyan. Verify that screened, dithered and greyscale drawing elements are not too faint to see and copy.

1202.3 Issue of Drawings: The issuance purpose shall be recorded on the drawing as a revision note: e.g., "ISSUED FOR______", and shall be identified by revision number as described in this Chapter. Issue titles and dates shall agree with specifications footer issue titles and dates. Where applicable, issued prints or drawings shall be stamped to indicate any restrictions on the release of the drawings.

1202.4 Canceled Drawings: Canceled or superseded drawings shall be clearly and boldly marked on the face of the drawing and recorded on the drawing as a revision note: "VOID-SUPERSEDED BY DWG. NO.____"; and issued to the parties affected by this revision. Drawing numbers of superseded and voided drawings shall not be reused.

1202.5 Supplemental Documents: Issue of supplemental documents shall conform to CSU Design Standards requirements for Construction Administration. It is the Consultant’s sole responsibility to coordinate with code agencies in a timely manner to secure approval from code agencies of changes prior to issue of supplemental documents. The Consultant shall provide the same number and quality of documents as required in the “Issue for Construction” submittal, including signed and stamped sets where required by the Consultant’s contract.

1202.6 Existing Conditions: The drawings shall utilize different line weights for depicting existing conditions versus new work or work to be demolished. All line weights shall be legible and reproducible. Drawings with faint, illegible or irreproducible lines will not be accepted and shall be immediately revised at no cost to the University.

1202.7 Demolition Work: Drawings indicating work to be removed or demolished shall carry line weights or types that differentiate demolition work from new or existing work. All line weights shall be legible and reproducible. Drawings with faint, illegible or irreproducible lines will not be accepted and shall be immediately revised at no cost to the University.

1202.8 New Work: New work shall be depicted in a heavier or bolder line than existing or demolished work. Drawings shall clearly depict routing of systems.

1202.9 Background Plans: When the architectural floor plan or other drawing of existing and/or new work is used as a background for showing work designed by a particular design discipline or intended for construction by a particular trade, subcontractor or group, the background plan shall be legible and reproducible. Faint, illegible or irreproducible background drawings will not be accepted and shall be immediately revised at no cost to the University.

1202.10 Depicting Work in Operational Areas: Where new work must be installed adjacent to, above or below existing equipment, systems or facilities that must remain in operation during construction, the Consultant shall draw the entire affected facility/equipment including conduit runs, piping, duct work, etc. along with the new work. Indicate code-required and practical operational clearances to existing equipment and facilities on the drawings. This work shall not be “design build” and shall not be left to the Contractor to decide how to stage, place or route the new work. The Consultant shall coordinate staging and scheduling requirements into the Contract Documents to assure continuous and unobstructed operation of the existing systems and facilities. The Consultant shall develop Division 01 specifications to define all work constraints, including limitations on means and methods available to the Contractor for execution of the work in these circumstances.

SECTION 1203 - SHEET SIZE
1203.1 **Standard Sheets:** Standard default drawing sheet shall be 24" x 36" (Arch D) unless otherwise approved by the Project Manager. Each set of project drawings shall be the same size. All dimensions of sheet size are outside edge dimensions for finished print size and include all title blocks and border space.

1203.2 **Addendum Sheets:** Addendum or change order sheets shall be the same size as the bid document sheet. No partial sheets may be issued without written acceptance from the Project Manager. If partial sheets are approved, partial sheets shall be 8 1/2" x 11" (Letter, ANSI A) unless otherwise directed by the Project Manager.

1203.3 **Special Sheets:** Special sizes for unique projects shall be used only with the written acceptance of the Project Manager. Maximum sheet size for construction shall be 30" x 42" (Arch E1).

1203.4 **Reductions:** Reduced half-size prints (12" x 18" - Arch B) may be issued for bidding purposes and field reference with the written acceptance of the Project Manager. For convenience, ledger size (11" x 17" – ANSI B) reductions or copies of drawings may be issued, but if printed at less than 50% reduction, they shall marked "NOT HALF SIZE".

1203.5 **Borders:** Standard 24" x 36" sheet borders shall be 1" on top, bottom, and right side and 1-1/2" on left side for binding.

**SECTION 1204 - TITLE BLOCK STRIP**

1204.1 **The Consultant shall submit a mockup of the project title block to the Project Manager at the beginning of the work for review and approval. The title block for all drawings shall include:**
   - A. Colorado State University
   - B. CSU Project Name
   - C. CSU Project Number
   - D. Building Name
   - E. Building Number
   - F. Designer of Record
   - G. Subconsultant(s) responsible for the design shown in the drawing

1204.2 **Date:** On Preliminary Drawings, the date shall be shown in soft pencil. On contract CAD drawings, it shall be shown in ink. The date shall be formatted dd/mmm/yy: "28JAN10"

1204.3 **Signature Block:** The first initial and full last name of the designer, drafter and checker shall be shown. Each drawing shall be signed individually by the Licensed Design Supervisor and Project Engineer/Architect immediately prior to the printing of final submittal of Construction Document drawings. Signatures of Design Consultant drawings shall be signed by responsible Consultant personnel, i.e., Project Architect and Engineering Manager. Enter date of submittal to CSU in dd/mmm/yy format. Comply with Colorado State Licensing Board requirements.

1204.4 **Drawing Title:** The drawing title shall include no more than four lines; Title shall agree with the drawing control log.

1204.5 **Drawing Sequence:** Drawings shall be sequenced defined in the CSU Design Standards Manual, i.e. C101, L102, A403, M202, E301, etc.

1204.6 **Sheet Number:** All drawing sheets in a package shall be consecutively numbered and the total number of sheets indicated, "4 of 10". The sheet number shall be located in the title block below the sequence number.
1204.7 CAD Drawings: All drawings done by CAD shall be identified by a block placed along the lower left hand border listing the complete file path and plot date.

SECTION 1205 - DRAWING ORIENTATION

1205.1 General: Drawings shall be oriented so that the stationing progresses from left (increase to the east) to print across the sheet. Any deviation requires written approval by the Project Manager.

1205.2 Project Drawings: Drawing content shall be carefully organized so that the designer's intent can be easily understood. Related information shall be grouped together in an orderly arrangement.

1205.3 Drawing Notes: Notes, key plan and other references shall be shown on the right hand side of the sheet in a 6” wide column.

1205.4 North Arrow: The north arrow shall be displayed in the upper right hand corner of plan sheets, directed to the TOP of the drawing where feasible or otherwise directed to the right. Where there is a difference between project north and true north, site drawings shall show a combined Project North and Universal Transverse Mercator (UTM) grid North Arrow. Building plans shall show Project North only. Drawing sets shall use the same orientation for all drawings.

SECTION 1206 - SCALE

1206.1 Minimum Standard: Generally, drawing scales shall be appropriate to the material and detail represented and clearly indicated on the drawing. Scales shall not be less than the following minimum standards, unless otherwise accepted by the Project Manager:

<table>
<thead>
<tr>
<th>Category</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site Plans</td>
<td>1&quot; = 30'-0&quot;</td>
</tr>
<tr>
<td>Floor Plans</td>
<td>1/8&quot; = 1'-0&quot;</td>
</tr>
<tr>
<td>Detail Plans</td>
<td>1/4&quot; = 1'-0&quot;</td>
</tr>
<tr>
<td>Elevations</td>
<td>1/8&quot; = 1'-0&quot;</td>
</tr>
<tr>
<td>Building Sections</td>
<td>1/8&quot; = 1'-0&quot;</td>
</tr>
<tr>
<td>Detail Sections</td>
<td>1/4&quot; = 1'-0&quot;</td>
</tr>
<tr>
<td>Details</td>
<td>1/2&quot; = 1'-0&quot;</td>
</tr>
</tbody>
</table>

Refer to the requirements for each discipline for specific scales.

1206.2 Indications of Scale: Scale indications of each drawing or element shall be printed following or below the title of the drawing or element. Graphic scales shall be shown on all drawings. See CAD requirements for standard graphic scale.

1206.3 Composite Drawings (2D): For projects not being designed with three-dimensional Building Information Modeling (BIM), the Consultant shall prepare Composite Drawings. Composite 1/8” scale drawings shall be used to cross-check plan drawings from various disciplines for interferences. Section drawings used to cross check for interferences shall be 1/2” scale. Composite drawings shall indicate all elements and disciplines on a single drawing to show areas of possible interference. Composite drawings shall be submitted with the 60% CD and final CD drawing submittals.

SECTION 1207 - SYMBOLS

1207.1 Symbols: Use symbols considered standard for the industry and discipline involved. Avoid proprietary, trademark or custom symbols. Modify prime AE and subconsultant standard details as needed to coordinate them with the rest of the project.
1207.2 Symbol Key: Explain all symbols used in a symbol key for each set of drawings. Do not use a boilerplate symbol key; remove unused symbols from the key.

1207.3 Special Symbols: If standard symbols do not exist for certain conditions, special symbols may be used with approval of the Project Manager.

1207.4 Identifiers: In CAD, names and attributes of symbols and other identifiers shall be descriptive, not alphanumeric codes. In projects dealing with remodel or additions to existing facilities, wall types and other identifiers of the existing facility shall be indicated with the same identifiers and legends as the original as-built drawings where appropriate.

1207.5 Match Line: Match lines shall be utilized where a portion of a drawing is continued on another sheet. The wording "Match Line - FOR CONTINUATION SEE SHEET NO. ________." shall appear centered on the length of the Match Line.

1207.6 Grid/Column References: Structural grid and building grid and column reference graphics for certain CSU buildings are available upon request. Review and coordinate with the Project Manager to assign nomenclature to the grid for each building or facility.

SECTION 1208 - LETTERING

1208.1 Consistency: Lettering shall be consistent in style throughout the drawing set.

1208.2 Height: Lettering height shall be appropriate for the type of information to be presented and adequate to make multiple copies legible after reproduction. All text shall be upper case and must be easily readable on half-size prints. Default lettering height shall be 3/32". The following lettering classes should be mapped to the corresponding standard height:

<table>
<thead>
<tr>
<th>Height</th>
<th>Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/32&quot;</td>
<td>Normal Text, Notes, Dimensions</td>
</tr>
<tr>
<td>1/8&quot;</td>
<td>Sub-headings (notes)</td>
</tr>
<tr>
<td>5/32&quot;</td>
<td>Headings (notes)</td>
</tr>
</tbody>
</table>

1208.3 Style: Standard font is proportional. Use ARIAL and AutoCAD style ROMANS. Use of non-proportional text is discouraged; if necessary use Monospac821 BT and AutoCAD MONOTXT.

1208.4 Drawing / Detail Titles: Uniform 3/16" height upper case shall be used for drawing and detail titles in the body of the sheet (other than title block). All titles shall be underlined with a single line having the same weight as the lettering used. Subtitle lettering height shall be 3/32".

1208.6 Annotation and Dimensions: Use 3/32" height upper case lettering. Stacked fractions shall not use reduced letter height.

1208.7 Orientation: All lettering shall be oriented to facilitate reading from the bottom or right hand edge of the sheet.

SECTION 1209 - LINES

1209.1 Consistency: Line weight and style usage shall be consistent throughout.

1209.2 Line Weight: Line weight shall be appropriate for the type of information to be presented, with adequate thickness, screen percentage and color shade to make multiple copies legible when using a typical black/white photocopier or fax.
A. Thin 0.18 mm / 0.007 in.
   Dimension lines and leaders, object lines seen in the distance, and most patterns.

B. Medium 0.25 mm / 0.010 in.
   Minor object lines, line terminators (arrowheads and ticks), hidden lines, note leader lines.

C. Medium thick 0.35 mm / 0.014 in.
   Most object lines, text, schedule boxes, and charts.

D. Thick 0.50 mm / 0.020 in.
   Minor title underlining, title text, object lines requiring special emphasis.

E. Extra thick 0.70 mm / 0.028 in.
   Use sparingly for underlining titles, separating portions of drawings, elevation grade lines, building footprints, top of grade markings.

SECTION 1210 - NOMENCLATURE

1210.1 Terminology: Standard terminology used in all documents shall be in accordance with the terms established in these Standards and in general use throughout the industry.

1210.2 Abbreviations: Abbreviations shall conform to the standard Abbreviations listed in Division 01 and the Definitions Appendix to these Standards. Abbreviations shall be used only as necessary and shall be explained in an abbreviation table contained on a drawing in the document set.

1210.3 Consistency: Nomenclature shall be consistent throughout the document set, and coordinated with the project manual specifications.

1210.4 Generic Terms: Generic terms shall be used on the drawings. Names of manufacturers, trade names, and model numbers shall be listed and explained in the project manual specification only.

SECTION 1211 – ANNOTATION

1211.1 General: Annotation shall be appropriate to the scale of the drawing. Materials that cannot be distinguished at the drawing scale shown should not be annotated. Avoid excessive description on the drawings. Detailed material description shall be written in the appropriate Technical Specification section.

1211.2 Specificity: Annotations, legends and general notes that do not apply to any drawing on a sheet shall be removed from that sheet. Design submittals containing drawing sheets with irrelevant “rubber stamp” annotation, legends and notes are not acceptable.

1211.3 Arrangement: To the extent possible, leader notes shall be arranged neatly in stacked groups alongside the drawing in an order that does not require leader lines to cross. Do not place leader notes randomly in and around the drawings.

1211.4 Complete Identification: All materials shown in a detail shall be identified, preferably with specification-linked keyed annotation. Details must be drawn at a scale sufficient to distinguish the materials annotated. If the drawing scale is not fine enough to distinguish individual components, identify building systems using a specification-linked keyed note or specific assemblies using an assembly indicator.

1211.5 Specification-Linked Keyed Notes: A specification-linked system is preferred for the annotation of materials. Text for leaders that identify materials on the drawings should be limited to the
relevant Section number from the Technical Specifications, followed by an alphabetic suffix, such as “09 29 00.E”. Each drawing sheet should include a legend on the right side of the sheet, listing the material leader notes that appear on that sheet in order, accompanied by a brief generic description, such as “09 29 00.E – 5/8” Type X Gypsum Board”, in upper/lower case.

A. The same leader text and legend description shall be used consistently throughout the drawing set for each specific material.

B. Do not list materials in the legend if they do not appear on that drawing sheet.

C. It is NOT required to coordinate leader alphabetic suffixes with the outline letters in the specification section.

D. For general scale drawings such as building elevations and sections where individual components cannot be distinguished, descriptions may be limited to building systems, such as “Single membrane roof system.”

E. Leader notes for material used in different sizes may be supplemented with dimensions, such as “05 50 00.G - 2”x1”x1/8”, which directs to the legend text “05 50 00.G – Hot dip galvanized steel angle”.

1211.6 Consecutive Alphanumeric Keyed Notes: The Consultant shall use a consecutive alphanumeric keyed note system for repetitive directive annotation. Leader notes that direct specific work or action to be performed shall use consecutive numbers or letters inside a specific regular shape (circle, square, diamond). Use the same regular shape for directions of a similar nature. Each drawing sheet shall include a legend on the right side of the sheet, listing consecutively all the alphanumerical leader symbols that appear on that sheet, grouped by the regular shape used for a class of work or action, followed by brief text explaining the action or work required. The same number / letter and shape shall be used for the same direction on all sheets within a discipline. Symbols and descriptions in the legend shall be deleted or changed to “not used” if the annotation does not appear on the drawing sheet.

1211.7 Verbose Notes: The Consultant shall use verbose leader notes sparingly, concisely and with careful attention to arrangement. When lengthy description is needed, annotation shall be referenced to the legend using an alphanumeric keyed note. Do not use verbose notes to list components of a building system, such as “EPDM on coverboard on tapered insulation on steel decking.”

1211.8 Assembly Indicators: The Consultant shall use standardized indicators for assemblies such as partitions, doors, windows, etc. shown in floor plans and building elevations. Such indicators shall be described briefly in the legend similar to keyed notes, with reference to the relevant detailed assembly drawings (partition types, door and window types, etc.)

SECTION 1212 - DIMENSIONS

1212.1 General: Dimensions shall be in UNITED STATES CUSTOMARY UNITS. The project coordinate control system, contour designations and elevations shall contain whole number and decimal fractions of feet. Layout work may use whole numbers and decimal fractions of feet to conform to the coordinate control system and to employ a large unit (feet) to measure a large dimension, e.g., earthworks, overall building dimension, etc. In detail design work, use feet and inches to conform to the most commonly accepted practice, to keep within the tolerance necessary for the work, and to employ a small unit to measure relatively small dimensions, e.g., structural joints, mechanical fittings, etc.

1212.2 Unit of Measure: The appropriate unit of measure shall be defined by a note on the drawing for principal dimensions: "MEASUREMENTS ARE BASED ON THE UNITED STATES CUSTOMARY SYSTEM". Half size sets and other reduced size drawings shall be marked: "REDUCED DRAWINGS - DO NOT SCALE FOR DIMENSION".
1212.3 Location of Dimensions: To reduce the possibility of error due to changes or revisions, dimensions shall be shown in one location only on the drawing and referenced on other drawings or details as necessary for clarity. Draw dimensions from base structural grid or site grid for overall dimension control. Larger scale drawings have precedence for dimension control and shall be developed accordingly.

1212.4 Dimensions on Layout Drawings: Symbols for floor elevations and horizontal dimensions shall be shown on plan view only, unless the dimensioning cannot be made clear by this method. Vertical dimensions and elevations shall be shown on sections and elevations.

A. Basic vertical elevations of piping and equipment shall be designated by means of vertical dimensions above floor level or a given reference point instead of dimensions from other piping and structures.
B. Repetition of dimensions within a single sheet shall be avoided. Dimensions of lines crossing matchlines shall be repeated on the matching sheet so each will be complete.
C. Dimensions that are out of scale shall be undermarked “NTS”. However, every effort shall be made to keep drawings to accurate scale.
D. Dimensions, etc., undefined or for temporary information during the design phase shall be encircled and marked "CHECK".

SECTION 1213 - DETAILS, SCHEDULES AND PRODUCT DATA SHEETS

1213.1 Detail Limits: Details shall be identified by encircling the area to be clarified and connecting this circle with the detail symbol. The larger scale detail as developed shall include the entire area encircled on the smaller scale drawing. Detail as drawn shall not be encircled.

1213.2 Orientation and Arrangement: The orientation of the detail drawing shall be identical to that of the plan, elevation, etc., where it is identified. Arrange collected detail sheets using a modular grid layout of sufficient size to prevent crowding. Combine modules as needed for details of differing size.

1213.3 Identifying Symbols and Titles: All details shall be designated by numbers. Wherever practical, details shall be listed consecutively, 1, 2, 3, etc., from left to right and from top to bottom on the sheet on which they are drawn. Whenever possible refer to typical details WHERE THE DETAILS ARE IDENTICAL. Never annotate a detail as “similar” - provide complete detailing.

1213.4 Schedules: Standardize schedule formats across AE team disciplines. Identifiers and marks in schedules shall be consistent throughout the project.

1213.5 Product Data Sheets: Product Data Sheets are required with the final Contract Documents submittal. These sheets shall include all components specified in the Contract Documents. Updated Product Data Sheets are also required as part of the Record Documents submittal by the Design Consultant and shall include updated as-built information regarding the installed components.

SECTION 1214 - DRAWING REVISIONS

1214.1 Revisions to Preliminary Design Drawings: For ease of identification revised areas on Preliminary Design Drawings shall be circled with a revision cloud and marked with a lettered symbol. "Description of Revisions" shall be designated by letter on each sheet title block.

1214.2 Revision of Final Design Drawings: Whenever drawings are revised after Final Submittal for Bid Documents and prior to issuance for bid, the following procedures shall apply:

A. All revised drawings, as well as Drawing Sheets on the Drawing Index, shall be marked Rev. 1, 2, etc. as appropriate. Newly added sheets shall be added to the revised Index to Drawings Sheet.
B. Enter a brief description of the technical change. The "Rev" column entry shall be the figure revision number.

C. To avoid confusion between changes made before issuance for bid and those made during or after bid, changes made before the bid shall not be identified on the drawing.

1. (NOTE: For changes during and after bid, revised areas of the drawing shall be circled and the changes described in the revision block, i.e., ADD01, COB01, etc).

D. Coordinate with the Project Manager when subsequent revisions require modification of revision circle or addition of circles conflicting with existing circles.

1214.3 Voided Drawings: Where portions of a drawing are voided, outline and place an "X" across each area voided and print the word "VOID" across the center of the "X". If an entire sheet is voided, place an "X" from corner to corner of the sheet with the word "VOID" at the center. Also, place the word "VOID" across the title block sheet number and on the appropriate sheet title on the index of drawings. Do not delete the underlying drawing.

1214.4 Description of Changes to Drawings: The Design Consultant shall prepare a written summary of the revision changes to the drawings.

1214.5 Transmittal: After revisions are completed, the following items shall be delivered to the Project Manager: Summary of Changes to Drawings, Originals of Revised Drawings, Revised List of Drawings.

SECTION 1215 - REVISION BLOCKS

1215.1 Preliminary Drawing Revisions: For Preliminary Design Drawings, the following might describe the purpose of issue such as: "SCOPE STATEMENT", "IN-HOUSE REVIEW", "30%".

1215.2 Indications:

A. On Preliminary Design Drawings of Sketches, each revision shall be indicated alphabetically: A, B, C, etc. in a triangle.
B. On Final Design and Contract Drawings of Sketches, each revision shall be indicated numerically, in triangle.
C. Each revision shall be dated with day, month and year.
D. Initials of drafter or lead designer/engineer shall be entered.
E. Group Project Architect/Engineer shall enter his initials as the other revision checker.
F. When applicable, signature shall be hand-initialed at time of issue, and a facsimile of the initials shall be entered in the appropriate area on the CAD file.

1215.4 Number of Revisions: When the number of revisions exceeds the number of revision spaces allowed on the standard title block, modify the title block to accommodate additional revisions.

SECTION 1216 - PROJECT PRESENTATION

1216.1 General: The Design Drawings shall be organized into contract sets as determined by the Project Manager.

1216.2 Contract Drawing Package:

A. Organization
1. Title Sheet
2. Index of Drawings, General Notes, Symbols & Abbreviations
3. Access and Traffic Control Plans
4. Staging Plans
5. Site Plan
6. Master Column Grid
7. Key Plan
8. Quantity Schedules
9. Phasing Drawings
10. Design Drawings

B. Title Sheet: The Project Manager shall provide the title sheet format to the Consultant in CAD format. The title sheet shall include:

1. Colorado State University
2. CSU Project Name and Project Number
3. CSU Building Name, Number and Street Address
5. List of Consultants, Addresses, Voice / FAX / Mobile phones, Email addresses.
6. Project Location Map
7. Project Vicinity Site Plan

C. Index of Drawings: All drawings shall be listed by page/drawing number and title. This sheet must be updated any time that additions or deletions of drawings occur.

D. General Notes and Symbols: The general notes drawing shall include all notes, symbols, abbreviations, etc. that are of general information to the project.

Do not duplicate specification language on the drawings.
Do not place information on the drawings that belongs in the specifications.

E. Site Plan: Site drawings shall be provided by the Project Manager when available and adapted for final design drawings by the Design Consultant.

F. Key Plan: Overall plan oriented in same direction as large drawings, indicating how project is organized and how drawings are organized. Use the building/facility location and grid indicators and coordinate nomenclature on Key Plan with the Project Manager.

G. Quantity Schedules: On Civil Construction Contracts incorporating unit pricing, quantity schedules shall be included on the drawings indicating contract quantities for all bid items/pay items. The schedule shall itemize all units included in the Design Consultant's final cost estimate and shall also correlate with unit pricing on the Bid Form. The schedule shall itemize pay item by specification section number, unit of measure and estimate of quantity. On other construction contracts, where per unit costs are desired, simply itemize anticipated per unit items on the Bid Form for contractor's unit pricing.

H. Drawings: A "Layout Index" or "Area Key Plan" is a scaled plan (s) of the University space covered by the contract package. Graphically indicate the outline locations of all area plans or plan/profile drawings involved. Each drawing location indicated on the index shall be given a number (placed near the upper right hand corner) as well as the drawing number. Major structures and stations and their Plan drawing numbers shall also be indexed on this plan.

I. Sequence: Design drawing sequence shall be as set forth below.

SECTION 1217 - LAYOUT CONTROL
1217.1 **Horizontal Control:** The alignment control of all roadway, utility and facility drawings shall be based on and referenced to HORIZONTAL DATUM: NAD83 COLORADO STATE PLANES – NORTH ZONE – US FOOT.

1217.2 **Vertical Control:** Elevations for profile, contour, bench mark and other vertical control points shall be based on and referenced to VERTICAL DATUM: NGVD 29.

The elevation of finished floor, top of steel, bottom of foundation, depressions, etc., of major structures may be reference datum plane. On these drawings, the reference datum plane shall be equated to the CSU survey datum by a note on the drawing. For example: “Reference Datum Plane EL = 100'-0" (for building projects) or EL = 100.0’ (for civil projects) = 5382.67’ NGVD 29”.

**SECTION 1218 - SEQUENCE**

1218.1 **Drawing Sets:** Drawings shall be bound in a single set whenever feasible and arranged in the following sequence. See later chapters for specific drawing organization within each design discipline. When appropriate, the Consultant shall obtain written permission from the Project Manager to vary the sequence.

1) Title and general information sheets,
2) Phasing / Staging drawings / Overall site key plan
3) Civil drawings
4) Landscape drawings
5) Architectural drawing
6) Structural drawings
7) Mechanical drawings
8) Plumbing drawings
9) Fire suppression drawings
10) Electrical drawings
11) Food Service drawings
12) Other special disciplines, i.e. Signage and Graphics, Furniture, etc.

For larger projects which require the contract document drawings sets to be bound in several sets, do not break apart any of the drawing groups unless approved by the Project Manager.

1218.2 **Alternates:** Alternate drawings shall be prepared separately to clearly define the extent of work to be bid as an alternate or separate price basis.

1218.3 **Revisions:** Revisions shall be clearly indicated on the drawings and cross referenced to the revision listing on each drawing sheet as a COB number.

1218.4 **Standards:** The drawings shall not refer to compliance with the CSU Construction Standards by name or incorporate by reference any of its standard details. These Standards shall be used as a guide to the design of a project and not as contract documents for construction.

**SECTION 1219 - CONTRACT DOCUMENT NUMBERING SYSTEM - CAD TRACKING NUMBER**

1219.1 **General:** All documents shall be numbered according to the criteria outlined in this section. The purpose of this numbering scheme is to electronically track both hardcopy and electronic copies of all contract documents used on the project.
1219.2 Definition of Documents: Contract documents shall be broken down into two broad categories, hardcopy documents and softcopy or electronic documents. The Project Manager defines "documents" as the following:

A. Hardcopy: Drawings, Design Analysis, Specifications, Engineering Reports, Project Schedules, Estimates, Contract Documents, Vendor and O & M Manuals

B. Softcopy: These are Electronic Files of Drawings, Specifications, Estimates, Project Schedules, Change documents and other project records such as logs, minutes, correspondence, photographs and email generated or residing in electronic form.

1219.3 Document Numbering: Design Consultants must number drawings, sketches, and certain non-drawing documents.

A. Submittal Level: Note in the Issue block of EACH drawing the date of the submittal. The numbering shall be sequential and shall include a brief description of the reason of the submittal up until the date of Issue for Bid advertisement. At bid advertisement, the entry shall be "00 Issue for Bid __/__/__.

   Revision Numbers - 2 DIGITS

   #A First issue of document, prior to bid
   #B-Z Revisions to documents issued prior to construction documents shall use letters.
   00 Issue for Bid
   01 Subsequent documents Issued for Construction with revisions (COB numbers).

B. Drawing Numbering System:

1. The AE team shall use this sheet numbering system unless alternate numbering systems have been approved in writing by the Project Manager.

2. Use 4 DIGITS to identify all sheets using XX.XX format (G0.00, E1.01).
   a. Exceptions using 5 digits are noted in the relevant sections.

3. Sheet Alpha Prefixes

   G General
   D Demolition
   A Architectural
   C Civil
   U Utility
   L Landscape
   S Structural
   M Mechanical
   F Fire suppression
   E Electrical
   T Telecommunications and Data Systems
   Q Equipment
   V 3D Views and Photographs
   W Wayfinding, Signage and Graphics
   I Interiors and Furniture

4. Sheets indicating the identical area but issued for different disciplines shall contain the same 3 digit series for ease of coordination. For example, when A101 is the first floor plan of a building, S101 shall be the structural plan for the first floor.
C. Non-Drawings -- Documents that are to be officially submitted to the University must follow the identical numbering sequence as drawings except that sheet number is replaced with a document designation code.

D. Sketches -- Sketches by design Consultants shall use formats provided by the Project Manager. Each sketch shall be labeled with a number assigned by the design Consultant, the date, design Consultant name, design contract number, CSU project number and revision number. Sketch numbering shall be coordinated with the Project Manager prior to issue of sketches during the construction phase,

Sketches to be issued to the Contractor shall be submitted only to the Project Manager and shall include 1 copy bearing the seal and signature of a Colorado-licensed architect or engineer. This includes sketches attached to RFI responses.

1219.4 Electronic Drawing File Name Requirement – no exceptions.
    Drawing file names shall include the sheet number and descriptive sheet title.
    For example: M202 Mechanical Plan Level 2.dwg

END OF CHAPTER 12