Capital Projects Drafting Standards

The Capital Projects Drafting Standards provide guidance for the preparation and delivery of accurate and consistent drawings and are managed by Denver Water’s Design Drafting Section. Project setup and deliverables will be established prior to project initiation and include AutoCAD production and methods in accordance with the Denver Water CAD Standards; the project deliverable definition; the preparation of AutoCAD instructions for the project; and the establishment of project drafting standards.

Production Applications

Projects shall be produced with Denver Water’s current version of AutoCAD.

The CAD Standards External Requirements (CAD Standards) shall be utilized for guidance on layering, pen settings, color setting files (CTB), coordinate system, and templates, including title borders.

When creating documentation for capital project drawings, see the current editions of the Capital Projects Construction Standards (CPCS) and the Engineering Standards.

Project Drawing Deliverables

A preliminary list of drawings will be prepared by Denver Water’s Design Project Manager (DPM). Drawings shall not be added without the knowledge and approval of the DPM. Drawings shall be coordinated with the Drafting Supervisor or his/her designated representative.

Scope of Work

After a project is assigned, the project Drafter will receive design data and be briefed by the DPM and/or the Drafting Supervisor. Before beginning the project, the full scope of work needs to be considered by the project Drafter. The project Drafter is responsible for Denver Water’s written standards that include, but are not limited to:

- thoroughly and methodically reviewing all disciplines required to support the project.
- understanding the drawing scales required for plans, sections, elevations, plans and profiles, and details.
- arranging the layout on the drawing so that all work lies within the work area of the sheet border.
- evenly spacing objects and not having too much white space.
- working with the DPM to determine the necessary drawings to best depict the work to be done.
- logically arranging drawings to utilize space and subject accordingly.

A project frequently requires several drawings, each of which shall be laid out as described herein and cover each specific discipline.

Drafting Fundamentals

Definitions

CPCS Details – Denver Water’s standard design details; arranged by division and numerically sequenced with a 5-digit number. CPCS details shall be referenced in the Contract Drawings; they shall not be added to the Contract Drawings.

Plan – A drawing that depicts an object, assembly, or floor plan from above. Civil plans are the aerial (top) views; architectural plans show floor plans and roof plans; structural plans show foundation plans; mechanical plans represent work within an architectural plan or structural plan.
Profile – A drawing showing a vertical section of ground, usually taken along the centerline of a construction project. Civil profiles are existing ground surfaces and proposed ground surfaces that are created to provide vertical data along an alignment. Profiles are set up using Denver Water’s template styles.

Elevation – (Alphabetic) A view or drawing of the interior or exterior of a structure as projected onto a vertical plane. Structural and architectural elevations are the front, rear, and sides of an object (e.g., a building).

Section – (Alphabetic) A drawing of an object or construction member cut through to show the interior (i.e., a linear cut through a surface). Architectural, structural, and mechanical sections are cutaway views through a structure or a view of the interior of a part or assembly.

Details – (Numeric) A large-scale architectural or engineering drawing indicating specific configurations and dimensions of construction elements. If the large-scale drawing differs from the general drawing, the large-scale drawing shall be used to clarify the general drawing.

**General Drawing Information**

- Do not use periods on abbreviations in the drawing.
- Periods for abbreviations shall be used only when abbreviating in the Project title, to match the Specifications.
- Only abbreviations identified in Division 1 of the CPCS shall be used in drawing sets.
- Do not use the CU-WATR-CNTR line type when identifying the centerline of a pipe that is showing full pipe width, use a line 1 width and center line type. CU-WATR-CNTR should only be use on a single line pipe representation in the Plan view.
- Hatch patterns shall be scaled the same density throughout the plan set. This can be done by creating the hatch pattern in paper space and pushing it through to model space using CHSPACE.
- Modified CPCS details shall be approved by the DPM and shall appear in ascending numerical order beginning at the end of the plan set discipline the detail corresponds to.
- Duplicate detail callouts pointing to the match line window shall be followed by “SIM” if the match line window is not typical to every callout.
- Dimensions shall be created and kept on one of the pre-defined L100 dimension styles.
- Place a blank space underline before and after (Alt 0160) plan titles; use PLAN Title from the General Drafting tab on the Startup Tools palette.
- Reference the Capital Projects Procedures Manual (CPPM) for instructions on issuing drawings associated with 30%-60%-90% Reviews, Final for Bid, Addendum, Final for Construction, Field Order, Request for Quotations, Work Change Directives, or Change Order Requests.

**Drawing Discipline Control**

Drawing sets shall adhere to the following discipline order as defined in the National CAD Standards:

- G – General
- B – Geotechnical
- C – Civil
- L – Landscape
- S – Structural
- A – Architectural
- M – Mechanical
- E – Electrical
- EI – Electrical Instrumentation
- R – Reference/Information Only
X – Other Disciplines

Drawing numbers shall begin with the discipline indicator followed by a dash and end in a numeric sheet count (e.g., G-1, C-1, M-1).

If drawing series are required, drawing numbers shall begin with a specific location signified by a number followed by a dash, the discipline indicator followed by a dash, and end in a numeric sheet count (e.g., 1-G-1, 2-C-1, 2-M-1).

**Drawing Index**

Place the drawing index on G-1. If the index is too large for G-1, place it on G-2 or multiple drawings if necessary. To create a drawing index, access the Sheet Set Manager (SSM). Right-click the project name and click Insert Sheet List Table. Under Table Style Setting, select Table Style Name: Drawing Index. Click OK and the table will appear on the drawing. The sheet set will automatically populate the drawing index.

![Drawing Index Table](image)

**Lines**

Lines are represented by line thicknesses and line types that represent features in a drawing. Denver Water represents existing information using screened lines, which are defined in the Color Dependent Plot Style Table in Denver Water's CAD Standards, Appendix A.

**Line Thicknesses**

In AutoCAD, colors are most commonly used to represent line weights. In addition, line thicknesses represent the following:

- Fine lines (pen 1 width) include dimension lines, leader lines, extension lines, centerlines, and construction lines within detailed information. Fine screened lines are similar and represent existing information.
Medium lines (pen 2 width) are used to outline new information, planes, surfaces, solid shapes, and hidden (dashed) lines. Medium screened lines are similar and represent existing information.

Heavy lines (pen 3 and pen 4 width) show new information or information that needs to stand out.

Heavy bold lines (pen 5 width and heavier) are used for borders, match lines, cutting plane lines, and any objects that need to be focused upon.

**Line Types**

- An object (continuous) line is a solid line used to indicate the visible edges of an object. It stands out in contrast to other lines so that the shape of an object is apparent.

- A hidden line is a dashed line used to show surfaces, edges, or corners of an object that are hidden from view.

- A centerline is a line used to show the center of holes and symmetrical features. It consists of alternate long and short dashes.

- A phantom line is a line used to illustrate features that do not exist such as match lines, right of ways, a ground system, future work, or an area of representation.

NOTE: There are additional line types that represent specific descriptions.

Denver Water has established line types, line weights, and layer names within its templates: [https://www.denverwater.org/contractors/construction-information/design-standards/cad-standards](https://www.denverwater.org/contractors/construction-information/design-standards/cad-standards). Each type of line means something; do not randomly draw lines.

**Scales**

Drawings shall be drawn to a scale. Two types of drawing scales are used based on Engineer’s and Architect’s scales. No other scales will be accepted.

- Architectural/mechanical/structural using feet and inches or fractions: 1/4” = 1'-0", 3/8” = 1'-0", 1/2” = 1'-0", 3/4” = 1'-0", or 1" = 1'-0", etc.

- Civil using multiples of 10, with divisions from 10 to 60: 1" = 50’, 1” = 1000’, or 1" = 5’, etc.
North Arrow

The North arrow is located on Denver Water’s tool palette, Section Tools, Civil tab on the Section Tools palette, and placed on layer G-ANNO-SYMB. This block will be used on all Denver Water projects. Place the North arrow in the upper right corner of the drawing and place it on drawing plans; orient the North arrow to the top of the drawing or up to 90 degrees to the left or right, exceptions will be accepted with approval by Denver Water’s Design Drafting Manager. North arrows on multiple drawings shall be oriented in a consistent direction. If multiple plans are shown on the same drawing and North is oriented in the same direction, only one North arrow is required.

Multileader

- Denver Water’s CAD multileader styles shall be used.
- Text will be left justified.
- Text size and arrow head size are determined by multileader style.
- Do not use periods in a multileader; use a comma if a notation break is necessary and parentheses to clarify or as an aside.
- Set the Leader Extension property field value to YES.
- Leader lines will not cross text, other leaders, or dimension lines.

Leader Placement
Labels and Specification Section Callouts

Coordinates shall be represented as follows. Add a space between North and the first number and take the number to the 100th decimal point at a minimum.

N 123456.00
E 987654.00

Elevations shall be represented as follows and be taken to the 100th decimal point.

EL 5280.00

Stations shall be represented as follows and be taken to the 100th decimal point. There shall not be a leading “0” on single digit stations.

STA 0+00.00, STA 2+00.00 not 02+00.00, STA 150+00.00, etc.

Deflection angles and bearings shall be represented as follows. There shall not be a leading “0” on single digit degrees.

42°57’29”, 5°27’36” not 05°27’36”
N 86°38’12” E

Numeric text with fraction will be represented as follows:

1 1/4”, not 1-1/4” (fractions shall be unstacked)

Specifications shall be represented as follows:

Drawing reference note: SPEC SECT 12 34 56.78
Drawing notes: SPECIFICATION SECTION 12 34 56.78

Notes

When describing an object, use hyphens as shown in the following examples:

- 12-INCH PIPE
- PIPE, 12 INCH AND SMALLER
- 6-INCH BY 6-INCH POST
- STEEL GAUGE BLOCK 5/16 INCH THICK
- 6 INCHES DEEP
- 18 INCHES ON CENTER

Notes relating to the whole drawing are placed on the bottom right of the drawing:
Notes relating to a specific Plan, Profile, Section, Elevation, or Detail are placed between the title and the drawing:

\[\text{NOTES.}\]

1. TOP AND BOTTOM SLAB REINFORCEMENT INTERRUPTED BY THE OPENING SHALL BE REPLACED WITH ADDITIONAL REINFORCEMENT EQUAL TO THAT INTERRUPTED. PLACE HALF OF THE ADDITIONAL REINFORCEMENT EACH SIDE OF OPENING (1 BAR MINIMUM) AND EXTEND IT SAME LENGTH AS REQUIRED FOR THE INTERRUPTED REINFORCEMENT.

2. BOXED OUT OPENING, RECESSED BOXES AND PIPE SLEEVE CLUSTERS SHALL BE TREATED AS SLAB OPENING.

3. SEE PLAN FOR OPENING GREATER THAN 36-INCH X 36-INCH. CORNER BARS REQUIRED AT OPENINGS OF ALL SIZES GREATER THAN 12-INCH X 12-INCH.

\text{TYPICAL REINFORCING AT ONE WAY
CONCRETE SLAB OPENING
SCALE: 1" = 1'-0"}

Notes shall be created as follows:

\text{Multiple Notes}

\[\text{NOTES:}\]

1. 316 STAINLESS STEEL FOR ALL CHANNELS, ASSOCIATED FASTENERS, AND CLAMPS.
2. WASHDOWN PIPE SHALL BE SCHEDULE 80 PVC.
3. PIPE CONFIGURATION SHOWN FOR TANK NUMBER 2 AND TANK NUMBER 3. PIPE CONFIGURATION FOR TANK NUMBER 1 IS OPPOSITE HAND. SEE STRUCTURAL DRAWINGS FOR DETAILS.
4. TANK NUMBER 1 AND 2 SAMPLE LINES TERMINATED AT COLUMN 5F. TANK NUMBER 3 SAMPLE LINES TERMINATE AT COLUMN 5E.
5. STAIRS NOT SHOWN FOR CLARITY.

\text{Single Note}

\[\text{NOTE:}\]

INTAKE FILTER BOX NOT SHOWN FOR CLARITY.
**Tables**

In AutoCAD, select *Table* from the *Annotate* menu or type *TB* in the command line. In *Insert Table*, select *DW_Table* and adjust the column and row settings to the desired number.

NOTE: Titles, headers, and data fields are center justified.

**Text Rotation**

Text shall be legible from the bottom or right side of the drawing.

**Subtitles**

Subtitles are necessary when details show multiple views of an object. Subtitles shall be accompanied by an overall plan/detail title. The subtitle uses L175 multiline text style created on the L175 annotation layer. Maintain the rules of 3rd angle projection when laying out details with multiple views.
Plan View Text

Generally, annotation used in drawings shall be L100 text style. However, there are instances when L120, L140, L175, and L200 text shall be used.

L120 text shall be used in plans for improper nouns which inform the reader of site features or conditions that are significant. The use of L120 text is specific to the plan set being developed and may vary from drawing to drawing.

ACS RD, GVL ACS RD, ACS GATE, CONTRACTOR ACS, DW ESMT, PUMP RM, ELEC RM, HEADWORKS BLDG, PS STAGING AREA, RES HYDROELECTRIC POWERHOUSE

L140 text shall be used in plans for proper nouns which inform the reader of site features that are significant. L140 text is also used to callout drawing numbers on key maps and existing conduits.

L175 text shall be used in plans identifying plan subject piping systems and conduits.

L200 text shall be used in plans for identifying titles (already defined on the DW Tool Palette).
Civil Profile Text

The following profile shows the format for a station equation. The Equation Station delineation line resides on layer C-ANNO-MATC. The profile uses the 50-scale left to right style.

PROFILE

SCALE: 1" = 50' HORIZ
1" = 5' VERT

STATIONING IS TYPICALLY IN ASCENDING ORDER FROM LEFT TO RIGHT

"PROFILE VIEW" LABEL
LEADER RESIDES ON "C-ANNO-L140" W/ AN ARROWHEAD SIZE = 0.25

"ENGINEERING PROFILE LABELS" PIPES - LEFT ON LAYER "C-ANNO-L140"

"MULTILINE TEXT" ON LAYER "C-ANNO-L140"
This profile shows the format for piping. Profile used when corresponding yard piping plan resides in a separate plan drawing. The example profile uses the 20-scale left to right style.

**Hatch Patterns**

- Make hatch patterns consistent by displaying patterns graphically the same size to appear the same in views that have different viewport scales.
- Be consistent with layer names within the disciplines.
- Demolition hatch patterns shall extend slightly outside of the objects being hatched.
- Hatch patterns representing building outlines will be ANSI 31 hatch pattern and the hatch will offset the building outline by 5-feet.

**Numbering Non-Standard CPCS Details**

When placing non-standard CPCS details, if approved, in a contract drawing set shall be numbered by division first, followed by 900 series and increase sequentially. For example, details in Division 33 would be numbered using the following format 13900, 13901, etc. Use the title shown below with a rectangular detail number box. (Use the CPCS Detail Title – revised on the DW Design Drafting tool palette.)
Abbreviations and Symbols

For abbreviations and symbols, follow Division 1 of the CPCS. If an abbreviation or symbol is not represented and is required on the drawing set, an abbreviation and/or legend shall be placed on the drawings.

See the Detailing Convention located at the end of this document when labeling structural steel, bolts, and anchors on drawings.

Dimensions

A dimension line shall be a fine, solid line terminated by arrowheads. The dimension line nearest the object shall be 5/16 inch from the object. Other parallel dimension lines shall be at least 3/8-inch offset. The spacing of dimension lines shall be uniform.

An extension line shall be a fine, solid line that extends from a point on the drawing to which a dimension refers. The dimension line meets the extension line at a right angle except in unusual cases. Provide a gap of 1/16 inch where the extension line joins the object line. The extension line shall extend 1/16 inch beyond the dimension line.

Only use dimension styles defined in the CAD Standards.

An arrowhead indicates the extent of dimensions. The default arrowhead provided within the template is the arrowhead style to be used on plans. The general rule is the length is three times the width. The arrowhead length is 1/8 inch.

Text shall be placed above the dimension line and within the extension lines when space permits.

A leader line shall be a fine, solid line leading from a note or dimension and terminated by an arrowhead touching the object. A leader line shall be an inclined straight line with a short horizontal landing of 1/8 inch in length. A leader to a circle shall be radial, so that if extended it shall pass through the center of the circle. If leader lines are near each other, the leader lines shall be drawn parallel to one another. Leader lines shall not cross each other nor cross dimension lines. It is acceptable to cross extension lines if the extension line is broken.

Diagonal and horizontal stacking shall not be used, fraction type is not stacked in the properties. In the following examples, the first example of stacking is correct.
If there is not enough space inside the extension lines, place the dimension lines and the text outside the extension lines. Do not extend the dimension line across the open space between the extension lines; the second example is correct.

Use the dimension styles within Denver Water’s CAD templates.

_Civil Template_
Dimension lines shall be drawn at right angles to the extension lines; however, an exception may be made in the interest of clarity. Avoid dimensioning to hidden lines.

Legibility shall not be sacrificed by crowding dimensions into a limited space.

Dimensions shall not be repeated on the same view or on additional views nor shall the same dimension be presented in two different ways. Dimensions shall be shown clearly so they can be interpreted in only one way.

Dimensions shall be presented in a way that will not make it necessary to calculate, scale, or assume any dimension.

Dimensions of one foot and smaller are expressed in inches.

Dimensions larger than one foot are expressed in feet and inches.

For steel plate dimensions, width and thickness shall be shown in inches even if wider than one foot; length shall be shown in feet and inches.

Keep text and dimensions outside the object whenever possible.

**Preliminary Watermark**

If drawings are required prior to issuing Final for Bid documents, a PRELIMINARY watermark stamp shall be placed on the drawing.

1. Create an 11x17 PDF drawing set.
2. In Adobe Acrobat go to Edit PDF.
3. Click on Watermark, Add.
4. The Add Watermark window will appear. Populate as shown.
Select **Appear behind page** for drawings without photos.

Select **Appear on top of page** if the drawing uses photos.

The watermark will populate all sheets in a multiple sheet drawing set.
<table>
<thead>
<tr>
<th>Description</th>
<th>Drafting Convention</th>
<th>Written Description</th>
<th>Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angle</td>
<td>4&quot;x3&quot;x3/8&quot;<em>x_0'-10&quot; SST</em> 4&quot;x3&quot;x3/8&quot;<em>x_0'-10&quot; GALV_STL</em> 4&quot;x3&quot;x3/8&quot;_x_0'-10&quot;</td>
<td>Angle Symbol, 4&quot; leg by 3&quot; leg by 3/8&quot; overall thickness by 10&quot; long</td>
<td></td>
</tr>
<tr>
<td>Hollow Structural Shape -</td>
<td>HSS_6&quot;x4&quot;x1/2&quot;_x_1'-3_1/2&quot; AL_HSS_6&quot;x4&quot;x1/2&quot;_x_1'-3_1/2&quot; GALV_STL_HSS_6&quot;x4&quot;x1/2&quot;_x_1'-3_1/2&quot;</td>
<td>Hollow Structural Shape, 6&quot; by 4&quot; rectangular shape by 1/2&quot; wall thickness by 1'-3 1/2&quot; long</td>
<td></td>
</tr>
<tr>
<td>Square or Rectangular</td>
<td>HSS_1.900&quot;x0.145&quot;_x_2'-6&quot; FRP_HSS_1.900&quot;x0.145&quot;_x_2'-6&quot; GALV_STL_HSS_1.900&quot;x0.145&quot;_x_2'-6&quot;</td>
<td>Hollow Structural Shape, 1.9&quot; outside diameter, round by 0.145&quot; wall thickness</td>
<td></td>
</tr>
<tr>
<td>Hollow Structural Shape -</td>
<td>RND_BAR_4&quot;x1/2&quot;_x_2'-6&quot; SST_BAR_4&quot;x1/2&quot;_x_2'-6&quot; GALV_STL_BAR_4&quot;x1/2&quot;_x_2'-6&quot;</td>
<td>Bar, 4&quot; wide by 1/2&quot; thick by 2'-6&quot; long</td>
<td>6&quot; or less in width, 0.203&quot; and over in thickness. Over 6&quot; to 8&quot; in width, 0.230&quot; and over in thickness.</td>
</tr>
<tr>
<td>Round</td>
<td>RND_BAR_3/4&quot;_x_0'-9_5/8&quot; AL_RND_BAR_3/4&quot;_x_0'-9_5/8&quot;</td>
<td>Round Bar, 3/4&quot; diameter by 9.5/8&quot; long</td>
<td></td>
</tr>
<tr>
<td>Plate</td>
<td>Pl_1/2&quot;x8&quot;_x_0'-10_3/4 FRP_Pl_1/2&quot;x8&quot;_x_0'-10_3/4 GALV_STL_Pl_1/2&quot;x8&quot;_x_0'-10_3/4</td>
<td>Plate, 1/2&quot; thick by 8&quot; wide by 10.3/4&quot; long</td>
<td>Over 8&quot; to 48&quot; in width, 0.230 and over in thickness. Over 48&quot; in width, 0.180&quot; and over in thickness.</td>
</tr>
<tr>
<td>Pipe</td>
<td>1_1/2&quot;_SCHED_40_STLPIPE 1_1/2&quot;_SCHED_40_STLPIPE 1_1/2&quot;_SCHED_40_STLPIPE</td>
<td>One and one half inch nominal diameter steel pipe (or other pipe type), Schedule 40 wall thickness</td>
<td></td>
</tr>
<tr>
<td>Wide Flange</td>
<td>W16x31</td>
<td>Wide flange shape, 16&quot; nominal depth by 31 pounds per linear foot</td>
<td></td>
</tr>
<tr>
<td>S shape</td>
<td>S4x9.5</td>
<td>S shape, 4&quot; nominal depth by 9.5 pounds per linear foot</td>
<td></td>
</tr>
<tr>
<td>HP shape</td>
<td>HP13x100</td>
<td>HP shape, 13&quot; nominal depth by 100 pounds per linear foot</td>
<td></td>
</tr>
<tr>
<td>Description</td>
<td>Drafting Convention</td>
<td>Written Description</td>
<td>Limitations</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>---------------------</td>
<td>--------------------------------------------------------------------------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>WT shape</td>
<td>WT7x31</td>
<td>WT shape, 7&quot; nominal depth by 31 pounds per linear foot</td>
<td></td>
</tr>
<tr>
<td>Standard Channel</td>
<td>C15x33.9</td>
<td>Standard Channel, 15&quot; nominal depth by 33.9 pounds per linear foot</td>
<td></td>
</tr>
<tr>
<td>Miscellaneous Channel</td>
<td>MC6x12</td>
<td>Miscellaneous Channel, 6&quot; nominal depth by 12 pounds per linear foot</td>
<td></td>
</tr>
<tr>
<td>Structural Bolt</td>
<td>3/4&quot;_BOLTS</td>
<td>Quantity of 2, 3/4&quot; diameter structural bolts</td>
<td></td>
</tr>
<tr>
<td>Anchor Bolt</td>
<td>1_1/4&quot;_AHR_BOLT_x_10&quot;</td>
<td>One and one quarter inch diameter anchor bolt by 10&quot; long</td>
<td></td>
</tr>
<tr>
<td>Expansion Anchor</td>
<td>1/2&quot;_EXP_AHR_x_3&quot;</td>
<td>One half inch diameter expansion anchor by 6&quot; long</td>
<td></td>
</tr>
<tr>
<td>Adhesive Anchor</td>
<td>3/4&quot;_ADH_AHR_x_1'-2&quot;</td>
<td>Three-quarter inch diameter adhesive anchor by 1'-2&quot; long</td>
<td></td>
</tr>
<tr>
<td>Headed Concrete Anchor</td>
<td>4-1/2&quot;_HAS_x_5&quot;</td>
<td>Quantity of 4, 1/2&quot; diameter headed concrete anchors by 5&quot; long</td>
<td></td>
</tr>
<tr>
<td>Anchor Embedment Depth</td>
<td>....w/_4_3/4&quot; EMBED</td>
<td>Described Anchor has a minimum embedment depth of 4.3/4&quot;</td>
<td></td>
</tr>
<tr>
<td>Drilled Hole</td>
<td>9/16&quot;_DRILL</td>
<td>Drilled hole 9/16&quot; in diameter</td>
<td></td>
</tr>
<tr>
<td>Slotted Hole</td>
<td>SLOT_15/16&quot;_x_1_1/8&quot;</td>
<td>Slotted hole 15/16&quot; in diameter by 1 and 1/8&quot; long</td>
<td></td>
</tr>
<tr>
<td>Drill and Counterbore</td>
<td>3/4&quot;_THRU_COUNTERBORE_2&quot;_x_1&quot;_DEEP</td>
<td>Drill 3/4&quot; diameter hole thru the plate or material then counterbore in same hole 2&quot; diameter by 1&quot; deep.</td>
<td></td>
</tr>
<tr>
<td>Description</td>
<td>Drafting Convention</td>
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<td>Limitations</td>
</tr>
<tr>
<td>-------------------------------------</td>
<td>---------------------</td>
<td>----------------------------------------------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>Reinforcing Steel (sections)</td>
<td>#5@12&quot;_EW_EF</td>
<td>Number 5 rebar at 12&quot; on center, each way, each face</td>
<td></td>
</tr>
<tr>
<td>Reinforcing Steel (plans)</td>
<td>84-#4x24'-6&quot;</td>
<td>Eighty-four number 4 rebar, each bar is 24'-6&quot; long</td>
<td></td>
</tr>
<tr>
<td>Reinforcing Steel (plan or section)</td>
<td>22-#7x10'-0&quot;@12&quot;_IF</td>
<td>Twenty-two number 7 rebar at 12&quot; on center on inside face, each bar is 10'-0&quot; long. (OF = Outside Face)</td>
<td></td>
</tr>
<tr>
<td>Reinforcing Steel clearance</td>
<td>3&quot;_CLR</td>
<td>3&quot; clearance between face of concrete and face of reinforcing steel</td>
<td></td>
</tr>
<tr>
<td>Reinforcing Steel Hoops</td>
<td>#4_HOOPS@12&quot;</td>
<td>Number 4 rebar hoop at 12&quot; on center</td>
<td></td>
</tr>
<tr>
<td>Repetitive Features or Dimensions</td>
<td>13_SPA@12&quot;=_13'-0&quot;</td>
<td>13 equal spaces at 12&quot; on center totaling 13'-0&quot; in dimensional length</td>
<td></td>
</tr>
</tbody>
</table>

Notes:

- Structural shapes and bars, including angles, HSS and channels can be steel, aluminum or fiberglass. Carbon steel is implied if no other description is used. Drafting Convention description on the second line defines how to describe the element if it is stainless steel (SST), aluminum (AL) or Fiberglass (FRP). Drafting Convention for galvanized steel is on the third line.
- Underscore (_) indicates intentional space.
- Inch and feet marks are only used where shown.
- Small case x indicates "by."