Chapter 14
CIVIL DRAWINGS AND DESIGN

SECTION 1401 - CONTENTS

1401.1 General: The drawings shall present all information relative to the size, form, location and arrangement of the civil components and systems of the project. The drawings shall indicate complete design. Prior written acceptance is required of any design-build components. Civil drawings shall be fully coordinated with Landscape drawings. The following shall be included on the civil engineering drawings, when applicable to the specific project:

A. Benchmarks, station points, survey markers, inverts, geometric layout
B. Existing contours, final contours, grading profiles, slopes.
C. Demolition, removals, stockpiles, spoils storage and disposal, haul routes, wash out
D. Existing and final drainage flowlines, drainage structures, erosion control and stormwater quality Best Management Practices
E. Site boundaries, easements, fences, gates, structures, appurtenances, lighting, signage
F. Roadways, paving, curbs, gutters, ramps, parking lots, walkways, steps, traffic control
G. All utilities, including but not limited to water (potable, non-potable), sewer, stormwater, natural gas, electricity, communications (fiber, copper, coaxial), steam, chilled water.
H. Trees, shrubs and landscaped area, protection boundaries
I. Existing irrigation main lines and boxes for controls and valves
J. Utility and roadway profiles and sections
K. Tunnels and sleeves for existing and final utilities and irrigation
L. Roof storm drainage, foundation drainage
M. Soil boring or test pit logs including locations.

1401.2 Categories:

A. General Civil Notes
B. General Contract Layout Plan
C. Abbreviations and Symbols
D. Contract Quantities Schedules
E. Soil Boring Logs
F. Typical Cross-sections
G. Roadway Alignments and Alignment Data
H. Parking Plans
I. Site Grading Plans
J. Drainage Plans and Details
K. Utility Plans and Profiles
L. Paving Plans and Details
M. Marking Plans and Details
N. Electrical and Lighting Plans and Details
O. Signage Plans and Details
P. Cross-Sections

1401.3 Sheet Numbers. Civil drawings are divided into specific groups. Drawings within a group are numbered consecutively, ie CE.01, CE.02, etc. The group designation shall always remain the same, regardless of the size or scope of the individual project. If specific projects do not include work related to a group, that group shall be eliminated from the drawings. When appropriate, the Consultant shall obtain written permission from the Project Manager to vary the sequence.

- C0.xx Civil: Index, Symbols, Abbreviations, Key Plan, Notes
- C1.xx Civil: Demolition
- C2.xx Civil: Grading and Erosion Control Plan
- C3.xx Civil: Profiles
- C4.xx Civil: Details
- C5.xx Civil: Parking and Traffic Marking
- U0.xx Utility Notes
- U1.xx Utility Demolition
- U2.xx Utility Plan
- U3.xx Utility Profiles
- U4.xx Utility Details
- CS0.xx Civil Structural: Notes
- CS1.xx Civil Structural: Demolition
- CS2.xx Civil Structural: Plan
- CS3.xx Civil Structural: Sections
- CS4.xx Civil Structural: Details
- CE0.xx Civil Electrical Notes
- CE1.xx Civil Electrical Demolition
- CE2.xx Civil Electrical and Lighting Plan
- CE2.xx Civil Electrical Riser Diagrams
- CE3.xx Civil Electrical Fixture / Panel Schedules
- CE4.xx Civil Electrical Details
- CW.xx Civil Wayfinding and Traffic Signage


SECTION 1402 - PLANS

1402.1 General: The Civil Consultant shall coordinate grading paving and utility equipment with the landscape design. The Civil Consultant shall coordinate utility equipment and service lines with mechanical design at the building edge.

1402.2 Scale and layout: Use a standard scale and divide plans into multiple sheets if necessary to minimize clutter. Always show a bar scale, do not use only text to indicate scale. Except for linear projects, north should be towards the top of the page or to the left. Linear projects shown on plan and profile sheets may have north rotated so the pipe alignment is parallel to the sheet’s long side. Leave all drawing layers turned on and shown as grayscale to help minimize conflicts. When layout is divided among multiple sheets, call out match line or match points on each sheet. Show boundaries of staging and laydown area(s). Where plans and system layouts are continued on another drawing, place a note at the point of break in the plans or systems layouts referencing the continuation drawing. When clustered utilities hinder interpretation at the scale drawn, provide a separate detail referenced to the area.
SECTION 1403 - PROFILE DRAWINGS

1403.1 General: Show profiles with exaggerated vertical scale for clarity. Use standard scales. Show all existing and proposed utilities, call out minimum burial depths and crossing separation distances.

SECTION 1404 - GRADING AND EROSION CONTROL

1404.1 Contours: Show contours at no more than 1-foot intervals. Clearly label all control points and existing bench marks. Indicate datum used for contours and elevations. Show contours beyond project boundaries to a distance that facilitates meeting existing grades.

1404.2 Grading: Clearly show existing grades as grayscale, and proposed lines and grades as bold.

1404.3 Erosion Control: Show construction Best Management Practices (BMPs) to be used at beginning of project. Use notes and/or a separate erosion control drawing to indicate expected construction BMP changes as work progresses. Use standard abbreviations as in general conformance with the “Urban Storm Drainage Criteria Manual, Volume 3 – Best Management Practices”, Urban Drainage and Flood Control District, Denver, Colorado. Address stormwater management plan requirements in notes on drawings.

SECTION 1405 – DRAINAGE

1405.1 General: Show all drainage features including slope, size, and equipment. Positive drainage away from the building must accommodate all roof drainage and site drainage without resulting in rills or erosion gullies. No drainage into or adjacent to the building foundation is permitted. Foundation or underdrain systems shall be shown. Coordinate with mechanical to account for and indicate any foundation drain sump pump design and discharge. Surface infiltration of potentially polluted stormwater is preferred over direct connection to buried storm sewers. Clearly show surface infiltration areas and direct-connect storm pipes. Indicate whether receiving body (pipe, ditch or river) is owned by others and indicate any coordinate required during construction. Show all permanent BMPs with details for any rip rap, orifice plates, inlet/outlet structures and other equipment and transitions.

SECTION 1406 – UTILITIES

1406.1 General: Show elevation of each manhole rim and invert to nearest hundredth of foot. Show all existing utilities in grayscale and all proposed utilities in bold lines. Show point of entry at each building edge; coordinate with mechanical. Show each utility as a different line type, include a legend. Provide details of all utility equipment, manholes, vaults, connections and crossings. Show all utility equipment details including thrust blocks, vaults, valves, connections, crossings and fittings. Show trench details and pipe penetrations. Draw all utility vaults and tunnels to actual dimension. Dimension exact spacing to the inch between underground utilities.

SECTION 1407 – CIVIL DESIGN

1411.1 General: Prior to commencing design, the Consultant shall study and be familiar with the CSU Construction Standards, Part III, Divisions 2 Existing Conditions, 31 Earthwork, 32 Exterior Improvements and 33 Utilities, along with all other parts of the CSU Construction Standards (Administrative, Design and Construction Standards), current edition, as posted on the Facilities Management website.

END OF CHAPTER 14