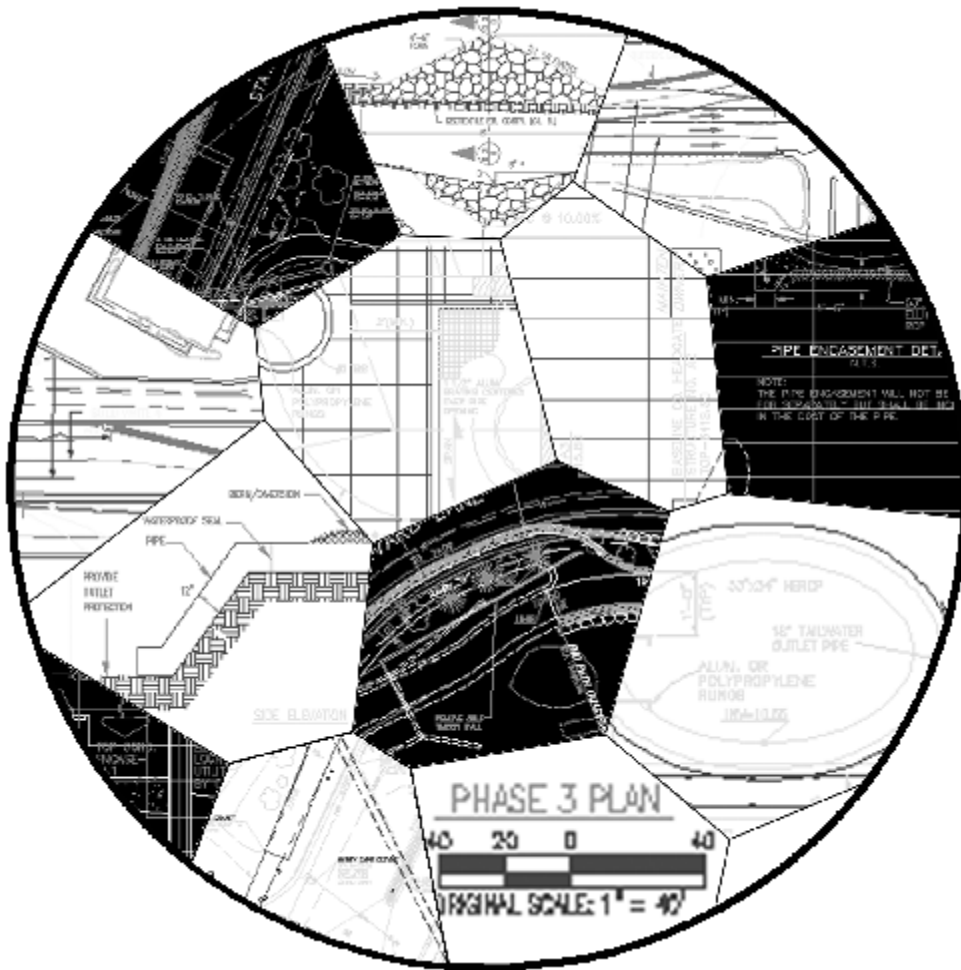


Final Construction Documents Engineering

Attachment to *Technical Document Review Application*



City of Boulder Planning and Development Services Center

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FINAL CONSTRUCTION DOCUMENTS – ENGINEERING APPLICATION REQUIREMENTS

Projects that include construction of public infrastructure (e.g. water mains, streets) or private infrastructure affecting the public right-of-way (e.g. stormwater detention ponds) require approval of final construction documents prior to application for building permits and/or right-of-way permits. The final drawing set with a city approval stamp must be used for construction and kept available on the job site.

Construction documents are technical in nature and must be prepared by a professional engineer licensed in the State of Colorado. The engineer must be experienced in the areas of design submitted and may be asked to provide credentials for staff review. The engineer will need to obtain a copy of the *City of Boulder Design and Construction Standards* at the Planning and Development Services Center or at www.boulderplandevlop.net in order to become familiar with the detailed design requirements within the city.

All construction documents required for a project must be submitted concurrently. Construction drawing sets must include the standard notes and detail drawings specified in the *City of Boulder Design and Construction Standards*. Chapter 1 of the *Design and Construction Standards* includes general submittal information for all construction plans and reports.

For projects that will be constructed in multiple phases, a Phasing Plan must be provided to delineate the boundaries of each phase. Phased construction must be done in such a manner that each phase will still meet city standards in the event that future phases are not constructed.

REVIEW CLASSIFICATIONS

Fees for review of engineering documents are determined based on the criteria below. Complexity is evaluated separately for each document category. A project classified as complex during Land Use Review will not necessarily be considered complex for engineering review purposes.

Simple

Water/Wastewater – Review of plans for extension of the public water system to provide a single fire hydrant outside of the public right-of-way. Systems requiring branches, loops, or multiple hydrants are not classified as simple.

Stormwater - Review of analysis submitted to demonstrate that detention facilities are not necessary and/or feasible for a project. Where staff determines that improvements are required, any review of those improvements will be a standard submittal.

Transportation – Review of plans to alter a single component of a transportation corridor along a single property frontage such as striping, curb and gutter, or sidewalk.

Standard

All projects not meeting the criteria for Simple or Complex are considered Standard.

Complex

Water/Wastewater – Review of plans that include a water system network with more than one loop or a wastewater system with more than one branch.

Stormwater – Review of plans and reports for projects with more than one detention or water quality facility, or public storm sewer systems with more than one branch.

Transportation – Review of plans that modify or create more than two street intersections.

FINAL CONSTRUCTION DOCUMENT TYPES

Stormwater Plan & Report

Plan & Profile

A stormwater plan & profile is required for projects where new public stormwater facilities such as storm sewers, culverts, ditches, and ponds are to be constructed. Privately owned and maintained detention and water quality facilities require construction plans since they directly impact the public storm sewer system. Stormwater quality “Best Management Practices” and erosion and sediment control must be addressed on the plans.

Stormwater Report

A stormwater report will be required to support all designs. Plans for construction of stormwater infrastructure need to be supported by appropriate design calculations. These calculations must be submitted in the format established in Chapter 7 of the *Design and Construction Standards*.

Geotechnical Soils Report

Geotechnical soils reports are required where existing or proposed conditions warrant an analysis of subsurface conditions. Soils reports are generally required for sites with steep slopes, retaining walls or where subsurface dewatering may be required. Soils reports for foundation design do not require a technical document review and should be submitted with the building permit application.

Street Plan & Profile

Plan & Profile

All new public streets and alleys require plan and profile drawings showing horizontal and vertical alignment. Plan submittals must also include cross-sections showing pavement, sidewalks, ditches, paths, landscaping and other relevant information.

Pavement Design Report

A pavement design report provides geotechnical soils conditions, design requirements, and structural cross-sections for roadways, sidewalks, trails, and parking lots. A Pavement Design Report is required for all proposed public streets and may also be required for other improvements. Pavement design may be included as part of the geotechnical soils report to avoid duplication of general soils information.

Traffic Control Plan

Where proposed construction will have an impact on existing transportation facilities, a traffic control plan is required. The plan must be in compliance with the Manual on Uniform Traffic Control Devices and Section 8-5-10, “Traffic Control,” B.R.C., 1981. Traffic control plans include provisions for detouring of vehicles, bikes and pedestrians.

Transportation Striping & Signage Plan

Construction document submittals that include new streets and alleys must identify proposed signs and striping. For less complex projects, this information can be included on the street plan & profile drawings.

Utility Plan & Profile

Plan & Profile

New water and sewer main construction requires plan and profile drawings showing horizontal and vertical alignment. For some cases where only private services and fire hydrants on private property are to be constructed, the profile requirement may be waived.

Utility Report

Utility reports are generally required for those projects which are determined to have a significant impact on the city’s water/sewer treatment, distribution, or collection systems. Projects will typically include industrial uses and large commercial facilities. Projects that go through a Site Review process will need to provide a Utility Report at that time and will not need an additional report at Technical Document Review unless design assumptions have changed.

HINTS FOR AVOIDING REVISIONS

Plans and reports which do not address all requirements of the city of Boulder *Design and Construction Standards* and *Boulder Revised Code, 1981* will require revisions. Some helpful hints for avoiding revisions are provided below:

1. It is rarely beneficial to submit incomplete or inaccurate information in order to get your review started on an earlier track. Poor quality initial submittals often require multiple revisions and result in longer and more expensive review processes than would otherwise be necessary.
2. Any requested variances must be clearly documented in the application materials and address the criteria provided in the *Design and Construction Standards*. Deviations from city standards which are not documented as variance requests will generally be identified as deficiencies and require revisions.
3. Include explanations of any unusual design features or assumptions. Information that is unclear may result in request for clarification or be identified as a deficiency.
4. All utility mains and services including water, sanitary sewer, and storm sewer must be located a minimum of 10-feet from existing and proposed trees. Tree locations must be shown on the Utility Plan and must be identical to those shown on the proposed Landscaping Plan.
5. Utility lines must meet the minimum horizontal and vertical separation requirements listed in the *Design and Construction Standards*. Please note that all distances are measured from outside of pipe to outside of pipe.
6. The city provides detail drawings for most infrastructure needs in the *Design and Construction Standards*. Drawings are available on the city web site in both .PDF and AutoCAD .DWG format for easy insertion into your construction documents. Drawings from other sources are generally not acceptable unless they provide information not available in the city drawings.
7. The city of Boulder and Boulder County do not use the same specifications. Be sure to use the city of Boulder *Design and Construction Standards*, latest edition.
8. Stormwater Plans and Reports must address all criteria listed in the *Design and Construction Standards*. Be sure to address items such as maintenance of water quality features and to include plans to address erosion and sediment control.
9. Street Plan & Profile submittals must include signing and striping plans. For larger projects a separate signing and striping plan sheet may be appropriate.
10. The city's standard construction notes must be included on the cover sheet of all submittals.
11. Fire hydrants must be installed to meet the coverage requirements outlined in the *Design and Construction Standards*. Fire access distance is measured based on hose length and must account for any obstacles. In general, no exterior point on a structure can be more than 175-feet of access distance from the nearest hydrant. Single family residential structures must have a fire hydrant within 250-feet.
12. With the exception of single family residential properties, all properties require a separate tap and service line for irrigation purposes.
13. Utility Plans must include both city utilities (water, sanitary sewer, stormwater) and private utilities (gas, electric, telecommunications, street lights).

14. All parking spaces require a 24-foot back up area measured from the rear of the space.
15. All plan and profile sheets must have a horizontal scale of 1 inch equals 20 feet and a vertical scale of 1 inch equals 5 feet. Other drawings must be at a standard engineering scale between 1 inch equals 10 feet and 1 inch equals 100 feet.
16. Street plans and profiles must address the requirements for vertical and horizontal curves specified in the *Design and Construction Standards*.
17. All intersections must meet the sight distance requirements specified in Section 9-9-7 *Sight Distance*, Boulder Revised Code, 1981.
18. Signing and striping plans need to show the location of existing and proposed trees. Trees must not obstruct signs.