Chapter 2. Submittal Requirements for Public Improvement Construction Plans

2.1 General

2.1.1 General Submittal Criteria & Procedures

This chapter gives criteria and procedures for submitting engineering drawings as required for these STANDARDS AND SPECIFICATIONS and including all planning reports. All other requirements for planning can be found in the City of Northglenn Municipal Code.

2.1.2 Authorization/Certification

Designer's Signature

All documents, including plans and other submittals noted below, shall be prepared, stamped, signed, and dated by a Colorado Professional Engineer. Each sheet in the plan set shall contain the Designer's Statement as shown in this chapter and shall be signed and stamped by the Designer and submitted to the City. The City may reject any construction requests or work that is not designed by a Colorado Professional Engineer.

Additional Requirements

The Designer should be aware that whenever unusual or serious problems are anticipated or encountered for a proposed construction project, additional information, and analysis beyond the minimum requirements of these STANDARDS AND SPECIFICATIONS will be required to be provided to the City.

Final Authorization

No plans are considered final and ready for construction until signed and stamped by the Designer and accepted by the City officials. No construction of public improvements in City of Northglenn, whether in the Right of Way or easements is permitted until and unless all required Permits are issued including, but not limited to, Right of Way permits (Refer to ***Chapter 3 - Permits)*** and Grading permits (Refer to ***Chapter 3 - Permits*** and ***Chapter 6 – Earthwork and Erosion Control***).

Construction Traffic Control Plans

Plans for traffic control during construction of projects must be accepted and approved by the City of Northglenn prior to any issuance of permits. (Refer to ***Chapter 16 – Temporary Traffic Control*** and the ***Manual on Uniform Traffic Control Devices.)***

2.2 Submittals & Content

Table 2.1 describes the submittals and content requirements.

Table 2.1: Submittals & Content

Submittal	Description
Checklist	The Engineering Division has provided a checklist that identify the specific information requirements for each of the design documents including plans and reports. Refer to ***Appendix A*** for the checklist.
Public Involvement Construction Plans	Refer to Information Requirements for Construction Plans in Section 2.4 of this chapter, for further description and requirements.
Soil Investigation Report	Refer to ***Chapter 5 - Design Report Requirements***, for the content and requirements for the Geotechnical Report requirements.
Pavement Design Report	Refer to ***Chapter 5 - Design Report Requirements***, for the content and requirements for the pavement design report.
Utilities Report (Water and Sewer)	Refer to ***Chapter 5 - Design Report Requirements***, for the content and requirements for the utilities report.
Drainage & Hydrologic Reports	The Designer is required to submit drainage, erosion control, and hydrologic reports. (Subsurface water – See ***Chapter 5 - Design Report Requirements***)
Traffic Impact Study	For Traffic Impact Study Requirements, process, and report contents, refer to ***Chapter 5- Design Report Requirements.***
Opinion Costs	As a separate attachment to the Plans, an Opinion of Costs for all Public Improvements will be required. The Opinion of Costs shall include, but not be limited to, the items listed below. The items shall be identified by unit price and total cost for each item for each type of Project. These costs shall be used in determining the value to use for surety requirements.

2.3 Final Plans – Public Improvement Construction Plans Only

- All final plans shall include all plans, profiles, notes, and details of improvements.
- The plans shall be submitted electronically and, if requested by Engineering Division, printed on 11” x 17” sheets.
- Includes Record Drawings and Construction Plans.
- Digital record drawings files are to be saved in AutoCAD, latest version, the DWG file shall be submitted on thumb drive or via email or online file sharing.
- Each record drawings shall be plotted and submitted on paper and submitted electronically in .pdf format.

2.3.1 Record Drawings

Updating Plans with Design Changes

The Public Improvement Construction Plans shall be updated with all design changes that occurred after plan acceptance. Record utility (water, sewer, drainage) drawings shall document the size and invert elevation of all pipes (including pipe class), inlets, riprap, headwalls, detention pond volumes, swale cross-sections, manholes, valves, PRVs, and all other utility infrastructure shown on the construction plans, including those improvements located in areas outside of the public Right of Way if appropriate. Record drawings shall also show all pipe and/or drainageway/swale grade percentages.

Street construction record drawings shall identify the actual pavement type and grade or mix type used; if the subgrade was treated; and document changes to widths, lengths for streets, sidewalks, curbs, crosspans, and ramps. The Record drawings shall identify all signage, striping and traffic signal controller and pole locations as actually placed.

Record drawings shall verify other information as specifically requested by the Engineering Division.

Minor Design Changes

Minor changes are not required to be included on the Record Drawings. Minor changes include incorrect references and grade changes less than 0.1 foot.

Submittal of Record Drawings

The Designer, a Colorado Professional Engineer, shall update and stamp the Record Drawings for the Public Improvement Construction Plans and submit the plans electronically, and on 11” x 17” paper, if requested, to the City for acceptance prior to the release of the Warranty Guarantee. No Certificate of Occupancy will be issued before the Designer submits Record Drawings.

2.4 Information Required for Public Improvement Construction Plans

2.4.1 Plan Set

The Developer/Designer is required to submit a complete Plan covering the design for all Public and Private Improvements in the Project. This plan set shall include as a minimum one cover sheet with general notes, construction notes sheet, improvement design sheet(s) (one for each improvement), cross sections (every fifty feet (50’) and appropriate detail sheets.

2.4.2 Expiration of Plan Set

The Public Improvement construction plans shall be valid for a period of one year from the date of acceptance by the City. If construction has not started at one year, the Developer may be notified to update and re-submit plans prior to any issuance of a Right of Way permit or Grading permit.

In case a Developer/Contractor unusually stops construction for a period of more than one year (after the commencement of construction), the City has the right to require the Developer/Contractor to ensure a safe site by adding traffic control, fencing and other such measures as required by the City. In order to re-start such a project, the Developer/Contractor shall meet with the Engineering Division and determine if a new Right of Way permit is required.

If the construction site transfers ownership, the new Owner/Developer will be required to meet all requirements for a new permit.

2.5 General Formatting & Required Information

The following information included in Table 2.2 is provided for the Designer when determining Plan format and design requirements. This information should be considered the minimum information to be provided.

Table 2.2: General Formatting & Required Information

Information Required	Description
Checklist	The City requires the review and use of the checklist of all plan requirements for the development of the plans. Refer to the ***Appendix A.***
Size of Plan Sheets	All sheets in the construction plan set shall be scaled for 24-inch x 36-inch sheets unless requested from the City at 11" x 17". The text on the smaller plan set shall be readable.
Title Block	A title block is required on every sheet and cover sheet submitted for review and acceptance. The title block shall be located in the extreme lower right-hand corner, the right-side margin or along the bottom edge of the sheet. The required information includes: • The subdivision or project name and filing number or project number, if applicable. • Type of Improvements. • Designer's Name, address, email, and phone number. • Developer's name, Address, email, and phone number. Refer to the Unified Development. • Ordinance Administrative Manual) • Sheet Number (Consecutive, start with cover sheet).
Incomplete Plans	Incomplete plan submittals will not be reviewed but returned to the Applicant.
Stamped Plans & Designer Statement	All sheets shall include the Designer's signature, stamp and date and stamped and signed in accordance with the latest regulations established by the State of Colorado Board of Registration.

Scale	General • Horizontal. 1 inch = 20, 30, 40 or 50 feet. • Vertical. 1 inch = 5, 10 feet. • Overall Plan. 1 inch = 100 feet. • Cross Sections. Vertical exaggeration ratio shall be 5:1. Bar Scale Show bar scale on each sheet. Key Map The key map should be at 1 inch = 1,000 feet. Vicinity Map The vicinity map should be at 1 inch = 1,000 – 1,500 feet.
Dates	All sheets shall have dates shown in the Title Block for both Plan preparations and subsequent revisions. An electronic date shall appear on all electronic files to be submitted.
North Arrow	All design sheets shall have a north arrow oriented towards the top or right side of the applicable sheets
Background Facilities	Each sheet shall show all existing facilities in a ghosted or alternate line weight or type.
Private Improvements	Private Improvements, such as roadways, driveways, utilities, etc. shall be clearly shown and labeled as such on each sheet of the Construction Plans.
Legend of Symbols	Each sheet shall include a legend that identifies the symbols pertaining to the sheet.
Key Map	For plan sets that include three or more plan and profile sheets, each plan and profile sheet shall provide a key map showing the location of the improvements being detailed.

2.6 Sheet Title Names & Specific Requirements

This section outlines the minimum required information to be included on specific sheets of the Plan set. The following sheets are listed in the order they should appear in the Plan set. Some sections of the Plan set may have more than one sheet but should be labeled alike.

2.6.1 Cover Sheet

All sets of construction drawings shall include a cover sheet with the following information provided in Table 2.3:

Table 2.3: Cover Sheet Requirements

Information Required	Description	
General Construction Notes	General Notes shall be shown on this sheet. They are listed in ***Appendix B***.	
Vicinity Map	Information to Include	The vicinity map shall show the location and name of all Arterial roadways within one mile of the proposed construction, and all other roadways within 1/2 mile of the proposed construction. The project area shall be indicated by shading. The vicinity map shall show all Arterial roadways and major drainage ways. Section, Township, and Range shall also be shown.
	Size	Minimum size of vicinity map shall be 10 inches x 10 inches and to a scale.
Designer/Owner Contacts	The name, address, and phone number of the Developer (owner) and Designer (Developer's engineer) shall be listed on the cover sheet.	
Index	Each cover sheet shall include an index of all sheets within the Plan set.	
Indemnification Statement	The indemnification statement shall be shown on the cover sheet. Annotate the following on Cover Sheet only: These plans have been reviewed by the City for concept only. The review does not imply responsibility by the reviewing department, the Public Works Director, or the City for accuracy and correctness of the calculations. Furthermore, the review does not imply that quantities of items on the plans are the final quantities required. The review shall not be construed for any reason as acceptance of financial responsibility by the City for additional quantities of items shown that may be required during the construction phase.	
Preamble (Project Title)	The project title and general location shall be shown in the top middle of the page. The title shall begin as follows and shall be in bold/large font: PUBLIC IMPROVEMENT CONSTRUCTION PLANS For <Name of Project> CITY OF NORTHGLENN, CO	

2.6.2 Construction Notes

Refer to ***Appendix* C** for standard construction notes that are to be included on each set of Public Improvements Construction plans.

2.6.3 Right-of-Way Grading & Erosion Control

The Plans sheet shall be drawn at a legible scale (1" = 10' to 1" = 50') which will clearly convey design and construction intent. Plan sheets shall display a legend of symbols as shown on Standard Drawings for Erosion Control. All erosion control devices (temporary and long term) shall be included, as well as revegetation methods with specific notes. Plan must show grades of all drainage facilities. All project limits shall be designated.

2.6.4 Utility Improvements

The Plans shall include Plan and Profile views for each utility proposed in the development or project as well any or all existing utilities. If two utilities cross within two vertical feet (2') of each other, the distance shall be noted on the plan.

Plan View

The plan view shall include, but not be limited to, the following:

- Stationing shall read in ascending order in the direction of the north arrow or to the right.
- Station and critical elevation (flowline, invert of pipe, etc.) of all existing and proposed utility or drainage structures. Location of utilities shall be identified with horizontal and vertical dimensions as measured from roadway centerline profile grade.
- Location of all manholes, valves, inlets, pump stations, PRVs or any other proposed appurtenances for the utilities.
- All utility easements shall be shown.
- Storm drainage flow direction arrows, particularly at intersections and all high and low points.
- Match lines, stations, and consecutive sheet numbers, beginning with cover sheet.
- Existing utilities and structures (shown as phantom lines), including, but not limited to:
    - Storm sewer and appurtenances.
    - Fence lines and gates.
    - Water lines and appurtenances.
    - Ditches or swales.
    - Electric lines and appurtenances.
    - Curbs and gutters.
    - Sewer lines and appurtenances.
    - Pavement limits.
    - Telephone lines and appurtenances.
    - Bridges or culverts.

- CATV lines and appurtenances.
- Gas lines and appurtenances.
- Easement.

Profile

All proposed utilities shall be shown on profile with conflicts noted.

Key Map

A key map is required highlighting the sheet being shown.

2.6.5 Street Improvements

The Plans shall include Plan and Profile views for each street proposed in the development. Cross-section sheets are required for all Arterial and some Collector roadways. Cross sections will be provided for every fifty feet (50'). In addition to the requirements set forth elsewhere in these STANDARDS AND SPECIFICATIONS, the following information shall be shown on all Roadway plans submitted for review and approval.

2.6.6 Street Improvements

The Plans shall include Plan and Profile views for each street proposed in the development. Cross-section sheets are required for all Arterial and some Collector roadways. Cross sections will be provided for every fifty feet (50'). In addition to the requirements set forth elsewhere in these STANDARDS AND SPECIFICATIONS, the following information shall be shown on all Roadway plans submitted for review and approval.

Plan View

The plan view shall include, but not be limited to, the following:

- Existing and proposed Property and/or Right of Way lines, easements, and/or tracts. Type and dimension of easement or tract is to be clearly labeled. Dimensions of property and right-of-way lines are to be marked.
- Survey lines and stationing lines shall normally be based on centerline of street; other profiles may be included but shall be referenced to centerline stationing. Stationing in cul-de-sacs shall be on the centerline to the center of the bulb with flowlines dimensioned within the bulb. Survey lines and stationing lines shall deviate from centerline of street to parallel the roadway for situations where two sides of a divided roadway are not parallel.
- Stationing shall read in ascending order in the direction of the north arrow or to the right.
- Roadways and Roadway names.
- Existing utilities and structures (shown as phantom lines), including, but not limited to:
  - Storm sewer and appurtenances.
  - Fence lines and gates.
  - Water lines and appurtenances.
  - Ditches or swales.
  - Electric lines and appurtenances.
  - Curbs and gutters.
  - Sewer lines and appurtenances.
  - Pavement limits.

- Telephone lines and appurtenances.
- Bridges or culverts.
- CATV lines and appurtenances.
- Guardrails.
- Signs.
- Gas lines and appurtenances.
- Limits of work.
- Any easements.

- Station and critical elevation (flowline, invert of pipe, etc.) of all existing and proposed utility or drainage structures. Location of utilities shall be identified with horizontal and vertical dimensions as measured from roadway centerline profile grade.
- Storm drainage flow direction arrows, particularly at intersections and all high and low points.
- Match lines, stations, and consecutive sheet numbers, beginning with cover sheet.
- Station and elevation of all horizontal curves including PI's, PC's, PT's, etc.; high or low point and PI of all vertical curves; existing and proposed, centerline bearings, distances, and complete curve data.
- Curb return radii, existing and proposed. Stations and elevations of all curb returns; mid-point elevations and additional locations necessary, flowline-flowline intersection elevations, and percent of grade from the P.C.R. to flowline-flowline intersections of all crosspans.
- Mid-block handicap ramp locations at "T" intersections.
- Centerline stations of all proposed driveways and all intersecting roadways.
- Survey tie lines to section corners or quarter corners, consistent with that shown on the plat.
- Typical roadway cross-section for all roadways, existing or proposed, within and adjacent to the proposed development. These cross-sections shall appear on the detail sheet, or if no detail sheet has been used, the first sheet of the submittal showing roadway design.
- Intersections. Any roadway intersections shall include construction and lane details for the new construction and existing facilities for a minimum of 150 feet beyond the limits of construction.
- Basis of plan view and profile elevations shall be the same, i.e., flowline and flowline, top of curb and top of curb, etc.
- Cul-de-sacs. High point and grades shown with percent arrows at critical points (cross-slope and flow line).

Profile

Profiles shall include, but not be limited to, the following:

- All streets shall be designed to show profile of center line and flow lines. This requirement may be waived by the Engineering Division when profile grades exceed 1.0% for flow lines and standard cross sections and cross slopes are used. In such cases, additional vertical data may be required at intersections and on curves.
- Original ground (dashed) and design grade (heavy, solid). Both grades are to be plainly labeled for all centerline and flowline profiles.

- Design elevations shall be provided for the centerline and for curb and gutter flowlines. The basis of Record Drawing information shall be the same as the design and grade (flowline and centerline, etc.).
- Stationing shall be depicted as a continuous line for the entire portion of the Roadway shown in the plan view, with the centerline station of all proposed driveways and all intersecting roadways clearly labeled.
- All existing curbs, gutters, sidewalks, and pavement adjacent to the proposed design. The existing profile grades shall be measured by survey. Previously approved designs or Record Drawings are not an acceptable means of establishing existing grades.
- Existing and New Utilities. Elevation and location of all utilities in the immediate vicinity of the construction shall be shown on the plans.
- Station and elevation of all vertical grade breaks, existing (As-Built) and proposed.
- Distance and grade between Vertical PIs (curves).
- Vertical curves, when necessary, with VPI, VPC, and VPT, high or low point (if applicable) stations and elevations. All vertical curves shall be labeled with length of curve (L) and K=L/A where A is the algebraic difference in slopes, in percent.
- Profiles for all curb returns (except medians).

Typical Street Section(s)

Provide any applicable horizontal or vertical dimensions, in addition to providing a section of all improvements within the Right of Way. A section should be provided for each roadway type planned within the project.

Cross-Sections

Roadway cross-sections shall be provided at intervals deemed necessary by the City to effectively evaluate connection with the existing facilities, (typically every 50 feet horizontally).

Cross-sections shall be required on arterials and any other roadways as deemed necessary by the Engineering Division. The cross-sections shall indicate:

- Profile grade design point (centerline, flowline, top of curb, lip of gutter, etc.).
- Roadway width.
- Right of Way.
- Pavement cross slope.
- Pavement thickness.
- Structural material components of the pavement, base, and subbase, together with specifications for treatment of subgrade and installation of pavement structural members.
- Tie in of proposed improvements with existing ground.

Key Map

Clearly depict each sheet's relative position compared to the overall project. The Roadway or area that the design pertains to will be shaded.

Minimum scale is 1 inch = 500 feet, showing the location and name of all roadways within and adjacent to the proposed construction and all future roadways. Scale should be indicated. The key map should be oriented consistent with detail in the sheet, i.e., same north.

2.6.7 Street Improvements Details

All pertinent details related to street improvements shall be shown on a detail sheet (or sheets) for the Project.

2.6.8 Traffic Signing & Pavement Markings

All permanent and temporary traffic signing, and pavement markings shall be shown on the signing and striping plan, with the existing and proposed street system used as the base layout. Locations of signs and pavement markings shall be indicated by station/offset, or other specific dimensions indicating exact locations. This sheet shall also contain any construction or application notes, (e.g., application temperatures, surface cleaning methods to be used prior to application, etc.).

Area Map

Separate signage and striping plans are to consist of an overall area map noting all specific use areas, such as schools, parks, recreation centers, library, commercial, industrial, etc.

Road Segment Pages

The pages following the area map are to be broken down into road segments, for notation of signage and striping details.

Signing Plan

The permanent signing plan should:

- Show the general longitudinal location of each sign (horizontal offset and station).
- Specify the sign legend and sign type (from MUTCD).
- Specify the sign size.
- Provide the construction drawing with installation dimensions (height, distance from curb, etc.).
- Detail post and base dimensions and installation plan (showing sleeves, depth below surface, and materials used, according to the standards in ***Chapter 12 – Traffic Operation Devices***).
- Specify the blank gauge of the sign.
- Note the reflectorization provided.

Striping Plan

The striping plan must show:

- Color and type.

- Lane widths, taper lengths, storage lengths, etc.
- Striping/skip interval.
- Typical treatments for acceleration/deceleration lanes, turning lanes, and crosswalks.
- Type of material (epoxy, latex, thermoplastic).
- Station and offset or dimensions to all angle points, symbol locations, and line terminations.

2.6.9 Landscape/Revegetation Plan

Landscape Plan sheets shall show all Plan views and details necessary for construction. The Landscape/Revegetation Plan sheets shall include all existing and all proposed plantings, shrubbery, trees, and all irrigation systems and appurtenances.

All utilities shall be shown on the landscaping plans to ensure there are no conflicts.

Irrigation System. The construction plan set should include any planned irrigations systems. In addition to plan view, the details shall be shown as well as irrigation tap details.

If tree lawns exist between curb and detached sidewalk, the landscape treatments and plans shall be clearly delineated.