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CONSTRUCTION PLANS
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CHAPTER 3 – INFORMATION REQUIRED FOR PUBLIC IMPROVEMENT CONSTRUCTION PLANS

3.1 GENERAL

3.1.1 Plan Set

The Developer 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 note sheet(s), improvement design sheet(s) (one for each improvement), and appropriate detail sheets.

A. Loveland (City Limits Only)

The checklist in **Appendix E-4** is required with any submittal to the City of Loveland. This checklist must also be included in all resubmittal packages.

3.1.2 Final Mylars

Final mylar plan sheets shall be 4 mils thick, matted both sides, photostat, (silver) or original mylar plot. Sticky backs are allowed, however, a sepia mylar must be submitted for the Local Entity final mylar set. In Fort Collins (city limits only) mylars must be of scannable quality and sticky backs generally will not provide scannable quality. Refer to **Chapter 2, Submittal and Review Procedures**, for additional detail.

A. Loveland (City Limits Only)

Electronic files of all drawings will be required upon the submittal of Record Drawings.

B. Fort Collins (City Limits Only)

Final mylars submitted must be of good quality to obtain clear computer scanned copies for archiving, see **Appendix E-6, Scannable Quality Mylars**, for detailed requirements.

3.1.3 Vertical Datum

Plans shall conform to vertical datum criteria provided by the Local Entity. **Assumed vertical datum or adjustment equations are not allowed.**

Fort Collins (City Limits Only) All projects within the Fort Collins (city limits only) must use benchmarks documented in the City of Fort Collins Vertical Control Network. The information is available at the City Engineer's office.

Loveland (GMA and City Limits) The Loveland bench network must be extended to the project site, at the developer's expense, for all projects in Loveland GMA. The reference benchmark from the City of Loveland '95 Level Net Survey shall be identified in the Public Improvement Construction Plans.

3.1.4 Expiration of Plan Set

Public improvement construction plans shall be valid for a period of three years from the date of approval by the Local Entity Engineer, except as noted below.

A. Fort Collins (City Limits Only)

In Fort Collins (city limits only) plans shall be valid for a period of three years from the date of Development approval or plan approval, whichever is earliest.

B. Larimer County GMA

In Fort Collins (GMA only) and Loveland (GMA only), expiration shall be as stated in the development agreement.

C. New Review after Expiration Date

Use of these plans after the expiration date will require a new review and approval process by the Local Entity prior to commencement of any work shown in these plans.

3.2 GENERAL FORMATTING AND REQUIRED INFORMATION

The following information is provided for the Developer when determining Plan format and design requirements required by the Local Entity. This information should be considered the minimum information to be provided.

3.2.1 Checklist

The Local Entities require the use of the checklist in **Appendix E-4**.

3.2.2 Size of Plan Sheets

All sheets in the construction plan set shall be 24 inches x 36 inches.

3.2.3 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. For Fort Collins(city limits only), provide an area 4” x 6” on each sheet for the Local Entity to place a stamp of approval.

A. Required Information

List of information that shall appear in title block on each sheet:

1. The subdivision or Development name and filing number (if applicable).
2. The type of improvement.
3. Designer's Name, address, including zip code, and telephone number, and FAX number;
4. Sheet number (consecutive, beginning with the cover sheet).

3.2.4 Standard Signature Blocks

All sheets including the cover sheet should display standard Local Entity signature blocks in the lower right hand quadrant of the sheet. Annotate the signature blocks as shown in **Appendix E-3**. These are the signatures required only for the Local Entity signoffs.

3.2.5 Incomplete Plans

Incomplete plan submittals will not be reviewed but returned to the Applicant.

3.2.6 Stamped Plans & Designer Statement

All sheets shall include the Designer's signature, stamp and date and shall be wet-stamped and signed in accordance with the regulations established by the State of Colorado Board of Registration.

3.2.7 Scale

A. General

All Plan and profile sheets:

1. Horizontal. 1 inch = 20, 30, 40, or 50 feet.
2. Vertical. 1 inch = 5 or 10 feet.
3. Overall Plan. 1 inch = 100 feet.
4. Cross Sections. Vertical exaggeration ratio shall be 5:1.

B. Bar Scale and Other Options

Show bar scale. Other scales may be used upon Local Entity approval.

C. Signing and Striping

All signing and striping plans require a scale of 1 inch = 30 feet.

D. Key Map

1 inch = 1,000 feet

E. Vicinity Map

1 inch = 1,000- 1,500 feet

3.2.8 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.

3.2.9 North Arrow

All design sheets shall have a north arrow oriented toward the top or right side of applicable sheets.

3.2.10 Background Facilities

Each sheet shall show all existing facilities in a ghosted or alternate line weight or type.

3.2.11 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.

3.2.12 Legend of Symbols

Each sheet shall include a legend that identifies the symbols pertaining to the sheet.

3.2.13 Key Map

For plan sets that include 3 or more plan and profile sheets, each Plan and profile sheet shall provide a key map showing the location of the street being detailed.

3.3 SHEET TITLE NAMES AND 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.

3.3.1 Cover Sheet

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

A. General Construction Notes

General Notes shall be shown on this sheet. They are listed in **Appendix E**.

B. Vicinity Map

1. 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.
2. Size. Minimum size of vicinity map shall be 10 inches x 10 inches and to a scale.

C. Engineer/Owner Contacts

The name, address, and phone number of the Developer (owner) and Consultant Engineer shall be listed on the cover sheet.

D. Index

Each cover sheet shall include an index of all sheets within the Plan set.

E. 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 Local Entity for concept only. The review does not imply responsibility by the reviewing department, the Local Entity Engineer, or the Local Entity 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 Local Entity for additional quantities of items shown that may be required during the construction phase.

F. 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

(MARKETING NAME OF PROJECT)

(OFFICIAL PLATTED NAME OF PROJECT)

Name of Local Entity

G. Legend of Symbols

Provide standard symbols for all appurtenances related to each type of facility.

3.3.2 Construction Notes

Refer to **Appendix E-2** for standard construction notes.

3.3.3 Right-of-Way Grading and Erosion Control

These Plan sheets 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. 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.

For average lot sizes under 1 acre, the plan must show overlot grading with topographic contours before and after completion of grading.

3.3.4 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. In addition to the requirements set forth elsewhere in these Urban Street Standards, the following information shall be shown on all Roadway plans submitted for review and approval.

A. Plan View

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

1. 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.
2. 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.

3. Stationing shall read in ascending order in the direction of the north arrow or to the right.
4. Roadways and Roadway names.
5. Existing utilities and structures (shown as phantom lines), including, but not limited to:
 - a. Storm sewer and appurtenances.
 - b. Fence lines and gates.
 - c. Water lines and appurtenances.
 - d. Ditches or swales.
 - e. Electric lines and appurtenances.
 - f. Curbs and gutters.
 - g. Sewer lines and appurtenances.
 - h. Pavement limits.
 - i. Telephone lines and appurtenances.
 - j. Bridges or culverts.

- k. CATV lines and appurtenances.
 - l. Guardrails.
 - m. Signs.
 - n. Gas lines and appurtenances, etc.
6. 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.
 7. Storm drainage flow direction arrows, particularly at intersections and all high and low points.
 8. Match lines, stations and consecutive sheet numbers, beginning with cover sheet.
 9. Station and elevation of all horizontal curves including PI, 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.
 10. 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.
 11. Mid-block handicap ramp locations at "T" intersections.
 12. Centerline stations of all proposed driveways and all intersecting roadways.
 13. Survey tie lines to section corners or quarter corners, consistent with that shown on the plat.
 14. 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.
 15. 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.
 16. Basis of plan view and profile elevations shall be the same, i.e., flowline and flowline, top of curb and top of curb, etc.
 17. Cul-de-sacs. High point and grades shown with percent arrows at critical points (cross-slope and flow line).

B. Profile

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

1. All streets shall be designed to show profile of center line and flow lines. This requirement may be waived by the Local Entity Engineer 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.
2. Original ground (dashed) and design grade (heavy, solid). Both grades are to be plainly labeled for all centerline and flowline profiles.
3. 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.).
4. 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.
5. 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.
6. Existing and New Utilities. Elevation and location of all utilities in the immediate vicinity of the construction shall be shown on the plans.
7. Station and elevation of all vertical grade breaks, existing (as-built) and proposed.
8. Distance and grade between VPI's.
9. 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.
10. Profiles for all curb returns (except medians).

C. 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.

D. Cross-Sections

1. Roadway Cross-Sections. Roadway cross-sections shall be provided at intervals deemed necessary by the Local Entity 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 Local Entity Engineer. The cross-sections shall indicate:

- a. Profile grade design point (centerline, flow-line, top of curb, lip of gutter, etc.).
- b. Roadway width.

- c. Right-of-way.
- d. Pavement cross slope.
- e. Pavement thickness.
- f. Structural material components of the pavement, base and subbase, together with specifications for treatment of subgrade and installation of pavement structural members.
- g. Tie in of proposed improvements with existing ground.

E. Key Map

1. Clearly depict each sheet’s relative position compared to the overall project. The Roadway or area that the design pertains to will be shaded.
2. 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.

3.3.5 Street Improvements Details

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

3.3.6 Traffic Signing and 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.).

A. 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.

B. Road Segment Pages

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

C. Signing Plan

The permanent signing plan should:

1. Show the general longitudinal location of each sign (horizontal offset and station).

2. Specify the sign legend and sign type (from MUTCD).
3. Specify the sign size.
4. Provide the construction drawing shown in Appendix “A” of installation dimensions (height, distance from curb, etc).
5. Detail post and base dimensions and installation plan (showing sleeves, depth below surface, and materials used, according to Local Entity standards).
6. Specify the blank gauge of the sign.
7. Note the reflectorization provided.

D. Striping Plan

The striping plan must show:

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

3.3.7 Landscape Plan

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