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PART III – MINIMUM DESIGN STANDARDS

SECTION 95.

CONSTRUCTION PLAN SUBMITTAL REQUIREMENTS AND PROCEDURES

95.1 DRAWINGS AND SPECIFICATIONS SUBMITTAL PROCEDURE

95.1.1 General

Consulting engineers and developers seeking approval and acceptance of civil engineering reports and construction plans shall follow the procedures outlined below. Initial submittal of reports and/or plans without a City of Arvada “Request for Engineering Review of Plans/Plats/Development Plans” shall constitute an incomplete submittal and will not be processed until receipt of a completed submittal form. The associated fee shall be due prior to final City Engineer approval of the plans. This fee shall be collected by the City’s Community Development Department. Initial submittals shall be to the City’s Community Development Department. Resubmittals shall be directly to the Engineering Division. These Specifications shall apply to all new construction within the City of Arvada.

95.1.2 Presubmittal Meetings

The City’s Community Development Department conducts weekly Presubmittal meetings at which applicants to the various City land development processes may ask questions, obtain direction and/or information from the Community Development Department, Engineering Division and Traffic Division. These meetings may be used by the applicant to obtain very basic information about City procedures, practices or standards as a basis on which to begin development planning.

It is recommended that the applicant consult directly with the City Engineering Division for general information regarding applicable design criteria, required procedures, possible utility or drainage problems, and specific submittal requirements of the Engineering Division.

95.1.3 Final Plat/Final Development Plan

The final plat/final development plan application submitted to the Community Development Department for any subdivision or planned development, whether residential, retail, commercial or office shall include adequate detail drawings for the water distribution system, sewage collection system and storm drainage system (including Drainage Reports), grading plans and roadway design, including preliminary pavement design and supporting geotechnical report. Final pavement design and supporting geotechnical report is due after overlotting has been completed and subgrade has been established.

95.1.4 Engineering Review Objective

The Engineering Division objective for new submittals is to complete initial reviews and issue comments in 30 working days from date of initial submittal to the Community Development Department. The actual time required is a function of the submittal complexity and overall workload of the Engineering Division.

95.1.5 Engineering Consultant Revision and City of Arvada Approval of Engineering Plans and Reports

The consulting engineer will make all the revisions requested on their original plans/report and resubmit according to the instructions. The Engineering Division will normally process the resubmitted plans within 10-20 working days. Seriously deficient plans may require several reviews prior to approval. All engineering plans and reports must be approved and signed by the City Engineer prior to the issuance of any Public Improvement Permits in connection with the plans and/or reports.

When plans or reports have been accepted by the Engineering Division, the Consultant shall submit either a reproducible original set or original black line set of construction plan prints. The City Engineer will sign the reproducible originals or original black line prints. The original set will then be returned to the engineering consultant. The original set shall remain in possession of the engineering consultant for preparation of the construction sets and preparation of an as-built set of construction drawings after construction. The engineering consultant shall deliver eleven (11) sets of all signed and approved construction plans to the City Engineer. Three (3) sets of these must be signed and sealed by the stamp of the professional engineer (P.E.) who prepared the plans.

95.2 REVISIONS TO APPROVED PLANS

- A. Construction plans, pavement design reports with supporting geotechnical report, drainage reports, and other documents are approved initially for 24 months (2 years). If construction has not begun during this time period, the plans and/or reports are subject to review by the Engineering Division. The plans and/or reports must be updated to current Engineering Division criteria as necessary before any further permits can be issued.
- B. Revisions or Updates to Approved Final Construction Plan - The following must accompany the Submittal Form:
 - 1. Letter stating the scope and purpose of the construction plan revisions.
 - 2. The previously approved construction plan sheets, marked up with revisions.
 - 3. The revised final construction plan sheets, including all appropriate notes and details.
- C. Whenever updates or revisions to previously approved construction plans, specifications or drainage reports are necessary; the consulting engineer will revise the original set and will submit updates or revisions through the normal document submittal process. After all Engineering Division comments and revisions have been incorporated, new reproducible originals or original blackline prints of construction plans shall be submitted for signature by the City Engineer.

95.3 CONSTRUCTION PLAN CHECKLIST

Developers shall submit for review construction plans including the following items to the City of Arvada Engineering Division with submittal of the Final Plat, Final Development Plan, or Site Plan.

- A. Street construction. Plan and profile.
- B. Water mains. Plan and profile.

- C. Sanitary sewer mains. Plan and profile.
- D. Storm sewer mains. Plan and profile.
- E. Storm drainage structures and/or calculations.
- F. Irrigation ditch piping and/or channelization.
- G. Overlot grading and erosion control plan (including interim erosion control). All construction erosion control shall be in compliance with the Urban Drainage and Flood Control District Urban Storm Drainage Criteria Manual Standards. (Volume 3 – Best Management Practices)
- H. Landscape plan.
- I. Phasing Plan, as required.
- J. Traffic signing and striping plan.
- K. Preliminary Pavement Design Report. The Final Pavement Design Report shall be submitted after overlot grading has been completed and subgrade has been established. Both the preliminary and final report shall include the proposed pavement design and alternatives along with a supporting geotechnical engineering report.
- L. Plan for traffic control during construction (to be submitted prior to construction by Contractor doing work in public right of way).
- M. Drainage Report. Written drainage report on letter size paper shall be submitted along with the drainage plans. The information listed below, if relevant and not shown on the drawings shall be included in this report.
 - 1. Runoff calculations and method of analysis for both the initial storm and major storm submitted in tabulated form.
 - 2. Open flow calculations.
 - 3. Storm sewer and storm inlet flow calculations for initial storm runoff and major storm runoff.
 - 4. Culvert design flow calculations for initial and major storm runoff.
 - 5. Street capacities and flow calculations at critical street sections for initial and major storm runoff.
 - 6. Summation of all design variables used and design assumptions made.
 - 7. Soil classification and depth of underground water table within the study area if necessary.
 - 8. The boundary and designation of all tributary drainage areas and the area of each.

9. The designation and location of each design point referred to in the calculations.
10. The reference source and a copy of all other nomographs or design aids used in the calculations if they are not included in these Specifications, the Urban Drainage Manual, or in the Bureau of Public Roads Hydraulic Engineering Circulars Numbers 1, 3, 5, or 10.

All drainage studies must conform to the "City of Arvada Engineering Code of Standards and Specifications for the Design and Construction of Public Improvements."

11. Flood plain limits where applicable.
- N. Landscape plans. Landscape plans are required for any landscaping proposed within the Public Right-Of-Way, or which would affect the sight-distance of a Public street. Landscape plans must show all landscaping which could affect sight distance and all landscaping within the Public R.O.W. including, but not limited to, location of all plants, shrubs, trees, underground utilities, proposed street-cuts, direction of drainage flows both on the street and on the proposed landscaped area, street names, vicinity and key maps, general notes, signature block, etc.
 - O. Final construction plans for city roadway access. Plan and profile of existing street(s) showing access point(s) construction details. The extent of existing streets to be shown is 150' (minimum) in each direction from the access point(s). At the discretion of the City Engineer, plan and profile of existing streets may be extended beyond the minimum distance.
 - P. Cash escrow or letter of credit in accordance with Arvada City Code Section 78-298 (Due prior to issuance of any Public Improvements Permits, amount is \$100,000 for developments of five (5) acres or more, \$50,000 for developments of less than five (5) acres).
 - Q. A copy of the Colorado Department of Public Health and Environment Stormwater Construction Permit. (Due prior to start of construction).

95.4

INSTRUCTIONS FOR COMPLETING CITY OF ARVADA SUBMITTAL FORM

- A. The name, address, and telephone number of the project or property owner shall be provided. If applicant is a company, provide the company name and the name of the individual responsible for contact with the City.
- B. The name, address, and telephone number of the engineer or contractor who prepared the documents submitted shall be provided. The name of an individual who is responsible for contact with the City on the project shall be provided.
- C. Project name shall be supplied.
- D. Project location can be specified by township, range, section and quarter section; by proximity to an adjacent street intersection; and/or by legal address of the project.
- E. The applicant shall specify the type of documents submitted by checking the appropriate box on the form.

- F. The applicant shall identify the application as an initial submittal or resubmittal for the action being requested. Final construction plans submitted for the first time are considered an initial submittal.
- G. The application shall specify quantities of each of the following public improvements so the review fee can be established:
 - 1. Storm Drainage (Gross Project Area)
 - 2. Monuments
 - 3. Irrigation Ditch
 - 4. Sanitary Sewer Mains
 - 5. Water Mains
 - 6. Curb, Gutter & Sidewalk
 - 7. Streets
 - 8. Number Residential Lots
- H. The person submitting the documents shall sign and date the application (this means the responsible person representing the project owner, not the messenger or delivery person).

95.5 SUBMITTAL REQUIREMENTS FOR CONSTRUCTION PLANS

The following documentation is required in conjunction with the submittal of construction plans for any utility, roadway or storm drainage improvement which will ultimately be maintained by the City of Arvada

95.5.1 General

All construction plans and drainage reports, soils reports and pavement designs shall be prepared by, or under the direction of, a professional engineer, registered in the State of Colorado, and shall be reviewed for the minimum requirements set forth herein. The engineer should be aware that whenever unusual or serious problems are anticipated in conjunction with a proposed construction, additional information and analysis beyond the minimum requirements of these Specifications and criteria will be required.

95.5.2 Certification

Construction plans submitted for review and comment shall be prepared by a professional engineer registered in the State of Colorado. The plans must include a statement on the cover sheet:

"These construction plans for (name of subdivision, development, or project) were prepared by me (or under my direct supervision) in accordance with the requirements of the City of Arvada "Engineering Code of Standards and Specifications for the Design and Construction of Public Improvements"

Name of Engineer
Name of Firm

General Notes

- A. All construction shall be in accordance with the City of Arvada "Engineering Code of Standards and Specifications for the Design and Construction of Public Improvements", latest edition, unless otherwise specified herein.
- B. All contractors and subcontractors shall be licensed with the City of Arvada Engineering Division.
- C. All work will require a City of Arvada Engineering Division Public Improvement Permit prior to the start of construction. All contractors and subcontractors must obtain a separate permit for the work being completed by the particular contractor or subcontractor. Any construction within the Colorado Department of Transportation (CDOT) right-of-way will require a CDOT construction permit prior to any work in their right-of-way.
- D. All contractors and subcontractors shall have a set of approved drawings signed by the City Engineer and a printed copy of the current City of Arvada "Engineering Code of Standards and Specifications for the Design and Construction of Public Improvements" on site at all times.
- E. The City of Arvada Engineering Division shall be notified (Phone # 720-898-7640) a minimum of 24 hours prior to the start of any construction.
- F. The Engineer assumes no responsibility for buried utilities. The Contractor is responsible to verify the location of all utilities prior to construction and to protect them during construction.
- G. The Contractor is responsible for all project safety including, but not limited to, trench excavation and shoring, traffic control and security.
- H. Benchmark location, elevation and datum are as noted.
- I. As-built drawings showing all changes from the approved construction drawings shall be submitted to the City Engineer prior to initiation of the required two year warranty period. Utility as-builts shall include stationing of all fittings, services and pertinent elevations. Certificates of Occupancy for any buildings or structures within the development will not be issued until the as-builts have been received, reviewed and approved by the City of Arvada Engineering Division.
- J. A City of Arvada Tax Certification form must be completed by all contractors and subcontractors performing work on this project. This form details all materials which have been included in the work by contractors and subcontractors. Copies of all paid invoices for materials shall be attached to the form. Certificates of Occupancy for any buildings or structures within the development will not be issued until this form has been received, reviewed and approved by the City of Arvada Engineering Division.
- K. Owner/developer shall obtain a Stormwater Construction Permit from the Colorado Department of Public Health and Environment, Water Quality Control Division, prior to clearing, grading, or excavating a site of one (1) acre or more or less than one acre and part of a layer development. A copy of the approved permit must be submitted to the City of Arvada Engineering Division prior to the start of clearing, grading or excavating of the site. A copy of the approved permit must also be available on the project site at all times during construction.

- L. Contractor shall obtain a Colorado State Construction Dewatering Discharge Permit from the Colorado Department of Public Health and Environment for all areas where dewatering is required from an excavation and water is discharged into a storm sewer, channel, irrigation ditch or any waters of the United States. A copy of the approved permit must be submitted to the City of Arvada Engineering Division prior to the start of any dewatering. A copy of the approved permit must also be available on the project site at all times during construction.
- M. All curb ramps shall comply with the latest City of Arvada and ADA standard. Contractor to check with the City of Arvada Engineering Division to verify the latest curb ramp standard prior to construction of any ramp.
- N. All materials and workmanship shall be subject to inspection by the City of Arvada Engineering Division. The City reserves the right to accept or reject any such materials and workmanship that does not conform to its "Engineering Code of Standards and Specifications for the Design and Construction of Public Improvements".
- O. A plan for traffic control during construction shall be submitted to the City of Arvada Traffic Engineering Division for acceptance with the Public Improvements Permit application. A public improvements construction permit will not be issued without an approved traffic control plan for traffic control on existing roads during construction.

95.7.2 Street

- A. Contractor shall have on site a copy of the City of Arvada approved subgrade soils and pavement design report showing minimum required subgrade preparation requirements and minimum required pavement thicknesses.
- B. All trench backfill and subgrade preparation shall be tested to ensure compliance with City of Arvada Standards and shall be tested at City required frequencies by a City approved private soils testing firm. Test results shall be submitted to, reviewed, and approved by, the City of Arvada Engineering Division prior to installing base course, asphalt or concrete on prepared subgrade. All base course density shall also be tested by the private soils firm at City required frequencies to ensure compliance with City of Arvada requirements. Base course test results shall also be approved by the City of Arvada Engineering Division prior to installing pavement. All concrete and asphalt placed shall be tested in accordance with City of Arvada minimum materials testing standards. Test results shall be reviewed and approved by the City of Arvada Engineering Division prior to initiation of the required two year warranty period.
- C. The subgrade material shall be removed to a depth required by the City of Arvada according to information obtained from laboratory tests and/or as required in the pavement design report. Additives or approved material may be required if the native material is unsatisfactory. The subgrade shall be compacted to a minimum density determined in accordance with AASHTO designation T180 or T99 and in accordance with CDOT standard specifications Section 203.07.
- D. The Contractor shall proof roll all subgrade and base course in a manner acceptable to the City of Arvada in accordance with the City of Arvada "Engineering Code of Standards and Specifications for the Design and Construction of Public Improvements". Proof rolling shall be inspected and accepted by the City prior to installation of pavement and/or concrete flatwork.

- E. All concrete curb, gutter, sidewalk and other flatwork within the City right of way shall be minimum 6" thickness. Crosspans shall be minimum 8" thickness and minimum 8 foot width. All concrete shall be minimum 3750 psi design strength reinforced with 1.5 lbs/cy fibermesh in accordance with the City of Arvada "Engineering Code of Standards and Specifications for the Design and Construction of Public Improvements".

95.7.3

Irrigation

- A. Contractor is to notify affected irrigation company a minimum of 24 hours prior to beginning any construction in irrigation easements or on irrigation ditches.
- B. All irrigation pipe joints shall be watertight and pass a low air pressure test.

95.7.4

Utilities

- A. Contractor shall notify all affected parties, City of Arvada Utility and Engineering Divisions, a minimum of 24 hours prior to any water or sewer service interruption.
- B. Contractor is to coordinate the operation of all water valves, fire hydrants, and other appurtenances with the City's Water T & D Division through the City's Engineering Inspector.
- C. All fire hydrant branch pipe shall be Class 200 AWWA C900 PVC or Class 150 AWWA C909 PVC. All fire lines to buildings with interior sprinkler systems shall be Class 200 AWWA C900 PVC pipe or Class 200 AWWA C909 PVC pipe only.
- D. All metallic fittings shall be wrapped with minimum 8 mil thickness polyethylene encasement.
- E. All PVC water mains shall be installed with white #12 Type UF or USE cable single copper conductor as a tracer wire spirally wrapped around the pipe. Tracer wire to extend from main to a cathodic protection box located on the right side of all fire hydrants. Tracer wire shall be connected to existing tracer wire where possible. Where no tracer wire exists, ends of tracer wire shall be stripped and grounded into native soil a minimum of 12" deep.
- F. All meter pits shall be 24 inch diameter concrete or plastic in accordance with Section 30 of the City of Arvada "Engineering Code of Standards and Specifications for the Design and Construction of Public Improvements".
- G. Storm, Sanitary and Water manhole covers shall say "City of Arvada Storm, Water or Sanitary" where applicable in accordance with the City's standard lid detail.
- H. Blow-offs, both permanent and temporary, shall be in accordance with City of Arvada Standard Detail Drawing W-9.
- I. All sanitary sewer mains installed shall be high pressure jet cleaned after completion of the final lift of asphalt placement and prior to required television inspection by the City's Wastewater Division.

Erosion Control

- A. The City of Arvada stormwater inspector must be met on site and provided with a stormwater management plan after installation of temporary best management practices (BMPs), but before construction or grading begins.
- B. There shall be no earth-disturbing activity outside the limits designated in the accepted plans.
- C. All required perimeter silt and construction fencing shall be installed **prior** to any land disturbing activity (stockpiling, stripping, grading, etc). All other required erosion control measures shall be installed at the appropriate time in the construction sequence as indicated in the approved project schedule, construction plans, and stormwater management plan.
- D. At all times during construction, the Developer shall be responsible for preventing and controlling on-site erosion including keeping the property sufficiently watered so as to minimize wind blown sediment. The Developer shall also be responsible for installing and maintaining all erosion control facilities shown herein.
- E. Pre-disturbance vegetation shall be protected and retained wherever possible. Removal or disturbance of existing vegetation shall be limited to the area(s) required for immediate construction operations, and for the shortest practical period of time.
- F. All soils exposed during land disturbing activity (stripping, grading, utility installations, stockpiling, filling, etc.) shall be kept in a roughened condition by ripping or disking along land contours until mulch, vegetation, or other permanent erosion control BMPs are installed. No disturbed areas, except those within the project street rights-of-way, shall remain exposed for more than thirty (30) days before temporary or permanent erosion control (e.g. seed/mulch, landscaping, etc.) is installed, unless otherwise approved by the City of Arvada stormwater inspector.
- G. In order to minimize erosion potential, all temporary (structural) erosion control measures shall:
 - 1. Be inspected at a minimum of once every fourteen (14) days and after each significant storm event and repaired or reconstructed as necessary in order to ensure the continued performance of their intended function.
 - 2. Remain in place until such time as all the surrounding disturbed areas are sufficiently stabilized. The City of Arvada stormwater inspector must be notified prior to removal.
 - 3. Be removed when they are no longer functional or after the site has been sufficiently stabilized as determined by the stormwater inspector. The City of Arvada stormwater inspector must be notified prior to removal.
- H. When temporary erosion control measures are removed, the Developer shall be responsible for the clean up and removal of all sediment and debris from all drainage infrastructure and other public facilities.
- I. The contractor shall immediately clean up any construction materials inadvertently deposited on existing streets, sidewalks, or other public rights of

way, and make sure streets and walkways are cleaned at the end of each working day.

- J. All soil stockpiles shall not be placed within one hundred (100) feet of a drainageway, where possible, and shall be protected from sediment transport by appropriate erosion control methods. Any soil stockpile that will be dormant for over thirty (30) days shall be seeded.
- K. The stormwater volume capacity of detention ponds will be restored and storm sewer lines will be cleaned upon completion of the project and before turning the maintenance over to the property owner or Homeowners Association (HOA).
- L. City Ordinance requirements make it unlawful to discharge or allow the discharge of any pollutant or contaminated water from construction sites. Pollutants include, but are not limited to discarded building materials, concrete truck washout, chemicals, oil and gas products, litter, and sanitary waste. The developer shall at all times take whatever measures are necessary to assure the proper containment and disposal of pollutants on the site in accordance with any and all applicable local, state, and federal regulations.
- M. A designated area shall be provided on site for concrete truck chute washout. The area shall be constructed so as to contain washout material and located at least fifty (50) feet away from any waterway during construction. Upon completion of construction activities the concrete washout material will be removed and properly disposed of prior to the area being restored.
- N. Masonry activities will be contained with appropriate lot-specific BMPs, such as stockpile perimeter control and bermed washout pits. All waste products from masonry activities will be removed and disposed of properly.
- O. To ensure that sediment does not move off of individual lots sediment/erosion control BMPs shall be installed and maintained at one or more of the following locations until the lots are landscaped.
 - 1. Below all gutter downspouts.
 - 2. Out to drainage swales.
 - 3. Along lot perimeter.
 - 4. Other locations, if needed.
- P. A vehicle tracking pad shall be installed wherever it is necessary for construction equipment including but not limited to personal vehicles exiting existing unpaved areas onto roadways. No earthen materials, i.e., stone, dirt, etc., shall be placed in the curb & gutter or roadway as a ramp to access temporary stockpiles, construction materials and/or building sites.
- Q. Conditions in the field may warrant erosion control measures in addition to what is shown on these plans. The Developer shall implement whatever measures are determined necessary, as directed by the City of Arvada.
- R. The City of Arvada stormwater inspector may be reached by calling 720-898-7800.

95.7.6 Materials Quantities List (to appear on the cover sheet of all construction plans)

1. All pipeline linear footage, size and type (Water, Sanitary, Storm and Irrigation Pipes)
2. All water main fitting quantity, size and type (bends, tees, plugs, etc.)
3. Water main Air/Vacuum Valve assembly quantity
4. Water main Fire Hydrant assembly quantity
5. Water main blowoff assembly (permanent and temporary) quantity
6. Water main valves, quantity, size and type of each (including hydrant valves)
7. Connections to existing facility (Total for each water, sanitary, storm and irrigation pipelines)
8. Total number of water and sanitary services
9. Sanitary manhole quantity and diameter
10. Storm manhole quantity and diameter
11. Storm inlets quantity, type and size
12. Irrigation junction boxes and control structures, quantity and type
13. Concrete curb and gutter, quantity (LF) and type of each
14. Concrete sidewalk quantity (LF) and width
15. Concrete curb ramps, quantity and type of each
16. Concrete crossspan, quantity (LF) and width
17. Asphalt surfacing quantity (SY)
18. Length of each street (Feet)
19. Other material quantities required as per specific construction plan

95.8 REQUIREMENTS FOR CONSTRUCTION PLAN AND PROFILE DRAWINGS

Refer to Table 95.2 for construction plan requirements.

95.9 PRIVATE IMPROVEMENTS

- A. Private improvements such as roadways, driveways, utilities, etc. shall be clearly shown and labeled as such on each sheet of the construction plans. The note below shall appear on each sheet of the constructions plans that private improvements occur:
- B. "The City of Arvada shall not be responsible for the maintenance of roadway and appurtenant improvements, including storm drainage structures and pipes, for the following private streets." (List)
- C. When a request is made for the City to assume maintenance of any private improvement, it shall be the responsibility of the person(s) making the request to satisfactorily demonstrate that the private improvement is in fact constructed in accordance with the City of Arvada Standards.
- D. Private improvements that were not constructed in accordance with all applicable design and construction standards and the City of Arvada "Engineering Code of Standards and Specifications for the Design and Construction of Public Improvements" will not be accepted for maintenance by the City of Arvada.

**TABLE 95.2
ENGINEERING DIVISION REQUIREMENTS
CITY OF ARVADA, COLORADO - CONSTRUCTION PLAN CHECKLIST**

TC: Traffic Signing & Striping Plan L: Landscape Plan
 SS: Sanitary Sewer W: Water Line
 SD: Storm Drains ST: Street Construction
 OG: Overlot Grading Plans DM: Drainage Map

	PLAN						PROFILE					
	TC	L	DM	OG	SS	SD	W	ST	SS	SD	W	ST
CONSTRUCTION SHEET SIZE 24" X 36"	X	X	X	X	X	X	X	X	X	X	X	X
TITLE BLOCK - ENGINEER - FIRM- PROFESSIONAL SEAL - PROJECT NAME	X	X	X	X	X	X	X	X	X	X	X	X
SCALE 1" : 50' MINIMUM	X	X	X	X	X	X	X	X				
REVISION AND DATE BLOCK	X	X	X	X	X	X	X	X	X	X	X	X
REVISION REFERENCED BY SYMBOL AND NUMBER TO PLAN 1	X	X	X	X	X	X	X	X				
CITY OF ARVADA APPROVAL BLOCK	X	X	X	X	X	X	X	X	X	X	X	X
North Arrow	X	X	X	X	X	X	X	X				
Property Lines	X	X	X	X	X	X	X	X				
Ownership and Subdivision Information	X	X	X	X	X	X	X	X				
Street Names, Easements and Right-of-Way showing limit dimensions	X	X	X	X	X	X	X	X				
Location, Description and Elevation of Bench Mark used (City of Arvada datum)	X	X	X	X	X	X	X	X				
Location and Description of recorded monument control corners used	X	X	X	X	X	X	X	X				
Bearings of street centerline and statement as to how determined	X	X		X	X	X	X	X				
CONTOUR INTERVAL (Foot maximum)			2	2	5	5	5	5				
EXISTING FACILITIES - Dimensioned from property lines and street centerline (dotted lines) - Contours		X	X	X	X	X	X	X				
" " - Cross pans, gutters and drainage ways indicating flow direction	X	X	X	X	X	X	X	X				X
" " - Curb, sidewalks, inlet and outlet structures	X	X	X	X	X	X	X	X				
" " - Water lines, valves, vaults, hydrants, meter pits, curb stops				X	X	X	X	X	X	X	X	
" " - Sanitary sewers, manholes, indicating rim and flow line elevation				X	X	X	X	X	X	X	X	
" " - Water and sanitary sewer service lines				X	X	X	X	X				
" " - Storm drains, manholes indicating rim and flow line elevations			X	X	X	X	X	X				
" " - Irrigation ditches, diversion boxes and structures			X	X	X	X	X	X				
" " - Buried utilities (gas, telephone, power, etc.)				X	X	X	X	X	X	X	X	

	PLAN							PROFILE				
	TC	L	DM	OG	SS	SD	W	ST	SS	SD	W	ST
EXISTING FACILITIES - (Cont.)												
(dotted lines) - Overhead utilities (telephone, power, etc.)				X	X	X	X	X				
" " - Water, sanitary, storm drain and services crossing new installations									X	X	X	
" " - Offsite drainage way and/or open channel tied to project			X	X		X		X		X		
" " - Offsite transmission main tied to project							X					
PROPOSED CONSTRUCTION - Dimensioned from property lines and street centerline												
(solid lines) - Contours			X	X	X	X	X	X				
- Cross pans, gutters and drainage ways indicating flow direction						X		X				X
- Water lines, valves, fittings, hydrants, vaults, meter pits, curb stops							X				X	
- Sanitary sewers, manholes, and services by stationing and number					X				X			
- Storm sewers, manholes, and vaults by stationing and number			X			X				X		
- Manhole, rim, invert in and out									X	X		
- Manhole spacing, diameter, type of material and slope gradient					X	X			X	X		
- Underdrain - diameter, type of material, gradient, structures, etc.									X	X	X	
- Wye, riser, water service stationing					X		X					
- Pipe fittings - T's, Y's, X's, reducers, bends, plugs, valves, etc., size					X	X	X		X	X	X	
- Line pipe size and material					X	X	X		X	X	X	
- Special structures - complete working drawings and details					X	X	X		X	X	X	
- Pump stations - lift stations complete working drawings and details			X	X	X	X	X		X	X	X	
- Open channels - complete working drawings and details						X				X		
- Street centerline and back of curb or sidewalk - each side with horizontal stationing	X							X				X
- Stationing and elevation of radius points; vertical curve PO, PI and PT	X							X				X
- Stationing and elevation of horizontal curve PO, PI and PT	X							X				X
- Slope and tangent lines as percent												X
- Flow calculation for 3.5 year storm and 100-year runoff			X	X		X						
- Path of 100-year storm flow			X	X								
- Critical minimum finished floor elevation - Protected for 100-year storm			X	X		X						
- Typical street X-Section dimensioned								X				
- Limits of construction to assure continuity				X	X	X	X	X				X
- Limits of construction tied to existing or proposed grade 1000 ft. off-site												X
- Limits of construction tied to existing facilities					X	X	X	X	X	X	X	

95.10

RECORD DRAWINGS -- "AS BUILTS"

95.10.1

Criteria

Record drawings shall be submitted to the Engineering Division for all improvements constructed by private Developers and/or Contractors.

- A. Prior to submittal of final Record Drawings to the Engineering Division, the Professional Engineer in responsible charge shall provide two black line "check sets" to be reviewed by the City.
- B. Three (3) Sealed and Signed copies of the record drawings must be submitted prior to warranty commencement of the constructed public improvements. The three (3) copies of record drawings shall consist of: one complete set of the civil construction plans and two sets of the utility drawings, including the cover sheet, overall utility plan and plan/profile drawings. Certificates of occupancy may not be issued for any buildings or structures constructed in a development until the record drawings have been submitted and approved for the phase in which the building or structure is located.
- C. The complete set of record drawings shall be submitted as one (1) professional engineer's signed, dated and stamped blackline or mylar set suitable for reproduction in a format acceptable to the Engineering Division.
- D. Certification of the record drawings is required as follows:
 - 1. Registered Professional Engineer: The responsible professional engineer for the project shall state: "I hereby affirm that the public improvements for (Name of Subdivision or project) have been constructed in substantial compliance with the construction plans approved by the City of Arvada."
- E. The Engineering Division will compare the certified record drawing information with the approved construction drawings. A Certificate of Warranty Commencement for the public improvements will be issued only if:
 - 1. The record drawing information demonstrates that the construction is in compliance with the design intent.
 - 2. The record drawings are certified by the responsible professional engineer.
- F. Record Drawings shall verify the following "As-Built" Information:
 - 1. Record drawings shall verify the size, type and elevation of all pipes (including pipe class), inlet, riprap, headwalls, and all other storm drainage infrastructure shown on the construction plans, including those improvements located in areas outside of public right-of-way.
 - 2. Record drawings shall verify (and note any changes to) all pipe and drainageway longitudinal grade percentages.
 - 3. Record drawings or a certification letter shall verify detention pond depths, dimensions and calculated volume which shall be certified by the responsible professional engineer.

4. Record drawings shall verify all signage and striping as shown on the construction plans.
5. Record drawings shall verify other information as specifically requested by the City Engineering Division, and as identified on the approved construction plans.