STANDARDS FOR PUBLIC WORKS IMPROVEMENTS

CITY OF
COLUMBIA FALLS
MONTANA

Approved by Council
May 2, 2005

PART I GENERAL PROVISIONS

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SECTION 10.01 PURPOSE

1.01 Establishment of Minimum Standards. This Public Work Standards Manual, based upon sound, practical and well-established principals of civil engineering, is prepared for the purpose of adopting minimum standards for the design of improvements, kind and use of materials, methods of construction, and the preparation of plans for construction, repair or alteration of streets, roadways, alleys, drainage, sewer, or water facilities which lie within municipal's right-of-way or easements.

1.02 Uniformity of Engineering and Construction Practices. This Public Work Standards Manual is established to promote the maximum uniformity of engineering and construction practices within the community and thereby reduce design, supply, construction and maintenance costs.

1.03 Adherence to Standards. It will be the policy of the City to require adherence to the Standards set forth herein; however, where unique circumstances or design considerations make it impractical to follow the Standards and where such adherence would actually create problems detrimental to the public interest, the City may consider alternate solutions and may approve departures from Standards when substantiated by design analysis.

SECTION 10.02 ADOPTION OF MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS

2.01 The City of Columbia Falls has adopted (City of Columbia Falls Municipal ordinance # 367) the current edition of the MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS (MPWS).

2.02 Modifications to the MPW S are set forth in this document. These changes and/or additions shall in all cases either govern over the MPWS where applicable, or shall work in conjunction with the MPWS where applicable.

SECTION 10.03 SUPPLEMENTAL GENERAL CONDITIONS - CITY

3.01 Montana Public Works Standards. Copies of the Montana Public Works Standards Specifications may be obtained by writing:

The Montana Contractor's Association, Inc.
1717 11th Ave
PO Box 4519
Helena, MT 59604

Telephone (406) 442-4162 Fax (406) 449-3199

3.02 City Standards. Copies of the Standard Construction Specifications and the Standard Drawings may be obtained from:

Columbia Falls City Hall
130 Sixth Street West, RM A
Columbia Falls, MT 59912

3.03 **Public Right-of Way Permit.** All construction, excavation or other work on public or private property which will necessitate the use of the public right-of-way or easement shall require a Public Right-of-Way Permit issued by the Public Works Department. The work authorized by the Permit includes, but is not limited to, street construction and repair, water, sewer, and storm system construction and repair, utility connections and repair, landscaping, sidewalk , curbing and driveway construction and repair. Also included are any other uses of the public right-of-way where there is a possibility of creating a hazard. Examples of hazards are scaffolding, storage of materials or equipment, crane and equipment operations, demolition, sandblasting and painting operations, temporary construction or demolition dumpster placement and any other use deemed a hazard by the Public Works Department. The Permit will not be issued until all insurance and bonding requirements of the City are met. Private utility companies and their subcontractors shall be required to purchase an excavation permit.

In an emergency which requires repairs to be made immediately, the Contractor may excavate and complete the repairs without first having obtained a Permit. Prior to beginning work at the site during normal working hours, the Contractor shall notify the Public Works Department.
Prior to beginning work after hours, the Contractor shall notify police dispatch. In either case, the Contractor shall describe the circumstances and provide the location of the emergency repairs. The Contractor shall obtain the Permit no later than the next scheduled City work day.
All provisions of the Standards for Design and Construction for the City of Columbia Falls, Montana, shall be complied with regardless of the circumstances of the construction.
Equipment with steel tracks are not allowed on pavement, curb and gutter or sidewalks. The contractor will be responsible for damages to existing improvements within the right-of-way.

3.04 Interruption of Service. No person or party shall interrupt or restore municipal service or access to any customer or property with the express consent of the City.

Any construction that will interrupt the normal operation of city sewer, water or transportation facilities requires notification of affected City departments and property owners and/or residents.

The Contractor shall notify the City of Columbia Falls Police and Fire Departments at least forty-eight (48) hours prior to any street closures.

Any street closures or interruptions of utility services, the City may also require the Contractor to provide a news release specifying the location of construction and the duration of the closure. If required the Contractor shall present the news release to the news media at least two (2) work days prior to the beginning of any construction activity. The Contractor may also be required to notify utility users affected by the interruption of the type and duration of the interruption at least forty-eight (48) hours prior to beginning construction.
In the event of an emergency interruption, the Contractor shall notify the Public Works, Police and Fire Departments as quickly as possible. The Contractor shall immediately dispatch members of his staff to notify affected individuals by telephone or personal contact

30.5 Liability Insurance and Bonding. Liability Insurance. The Contractor shall procure and maintain, at the Contractor's expense, during the construction period, Contractor's Liability Insurance in accordance with the Supplementary Conditions to the General Conditions of the Montana Public Works Standard Specifications.

Bonding. The Property Owner/Developer shall provide the City with a Performance Bond equal to the value of the project for all public infrastructure construction required by a subdivision, development, or phased development. Upon written acceptance of the project by the City, the Property Owner/Developer shall be required to provide the City with a Maintenance Bond of 10% of the value of the work performed. The Maintenance Bond shall remain in full force throughout the one year guarantee period.

All construction work within the public right-of-way or easement (sidewalk and curb construction, storm drainage and sanitary sewer service line installation, repair, etc.) will require the Property Owner/Contractor to provide the City with a Performance Bond. The bond shall be equal to the value of the project and shall remain in force for one year. Contractors furnishing the City with an annual bond of $5,000 will not be required to furnish additional bonding if the $5,000 bond meets the requirements of these standards.

Bonds may be in the form of a Surety Bond, a Certificate of Deposit (CD), a Certified Check or an irrevocable Letter of Credit issued by a bank licensed to do business in the state of Montana.

3.07 Topographical Hardships. In some locations, compliance with these standards may impose a hardship due to existing development or unusual topography. In such locations, the City may approve alternate standards. An investigation of such hardship must be requested in writing and sufficient evidence provided. The City's approval or denial shall be written.

3.08 Scope. These standards shall apply to all improvements within the public right-of-way, to all improvements within the proposed public right-of-way of new subdivisions, for all improvements intended for maintenance by the City, and for all other improvements for which the City requires approval .

3.09 Standard Specifications. Standard Construction Specifications, Standard Drawings and the Montana Public Works Standard Specifications have been adopted by the City of Columbia Falls. These standard specifications and drawings shall be used in the design and construction of improvements intended for public use and/or maintenance in the City of Columbia Falls. Where improvements are not covered by their design standards nor by standard drawings, the City shall establish appropriate standards.

3.10 Project Plans. The drawing may be comprised of one (1) or more sheets. Each sheet shall be either 18" x 24" or 24" x 36" in size and shall be drawn to a scale not greater than 200 feet to an inch (1inch equals 40 feet is preferred) . The following information shall be shown on the face of the drawing:

A. A vicinity map shall be shown on the first page and the name and location of the subdivision or tract, scale and north point.
B. North direction shall be shown on every page and drawing where the orientation is different than the first page;
C. Location of all section corners or subdivision corners or property pins pertinent to the project boundary;
D. Ground contours sufficient to illustrate drainage plans or more intense if topography will require substantial cut or fill, or result in slopes that approach the maximum allowable.
E. [illegible] of the facility at intervals of not less than 100 feet; 50 feet if slopes approach maximum allowable.
F. Where symbols are used, each plan sheet must include a legend defining the symbols used.

3.11 Engineer Certification of Plans. Plans for improvements in the public right of way shall bear the stamp and signature of an engineer licensed to practice in the State of Montana. The designer shall submit calculations or other appropriate materials supporting the

utilities, pavement, and storm drainage. The designer shall submit calculations for structures and other designs when requested by the City.

3.12 Licenses. Contract construction in the public right of way must be by a contractor licensed in the State of Montana, in addition within the city limits a contractor must have a City Business License.

3.13 Meeting Regional Needs. All public improvements shall be designed as a logical part of the development of the surrounding area. Storm sewers and sanitary sewers shall be sized to accommodate the entire drainage basin they will ultimately serve. Water mains shall be designed to provide distribution and looping to adjoining systems. Arterial streets will be developed to the required width for street type. Utilities and street improvements will be extended to the boundaries of the development for future extensions to adjoining areas. The City may require construction of facilities larger than required to merely meet the need of the project, to accommodate future growth of the City.

Where existing City utility lines do not adjoin the proposed development, the developer will be required to extend the lines to the development as necessary. Where the existing roadway improvements do not extend to the proposed developments, the developer may be required to improve the roadway to the development. Except as provided below, these extensions will be no cost to the City.

3.14 Recovering Costs. When the improvements serve adjoining properties (e.g. extensions of existing utilities or improvements along the boundary of the development), a portion of the cost can be recovered from owners of the adjoining property by one of the following methods.

A. A private agreement between the various property owners;
B. A Sewer/Water Extension Agreement, requiring owners of adjoining property to pay an equitable share of the costs in the future at the time they connect to the improvements in accordance with CFMO Chapter 13.20 Water And Sewer Main Extension Agreements may be incorporated with the Water and Sewer Extension Agreement.
C. ~~Street~~
D. A Special Improvement District (SID), which authorizes the City to make the improvements and to distribute the costs to the benefited property owners, usually allowing ten years for repayment (requires City Council approval and usually agreement of more than 50% of the property owners).

3.15 City Participation in Cost. The City may share the cost of increasing the size of facility improvements for public use in excess of the following, provided that the increase is for the purpose of meeting regional requirements and that exceed the requirements of the specific project being built.

A. Water lines, valves and associated materials in excess of 6" in diameter;
B. Sanitary sewers in excess of 8" in diameter;
C. Storm sewers in excess of 12" in diameter;
D. Street widths in excess of 32' (curb back to curb back), unless an alternate is chosen
E. Arterial street pavement structural sections in excess of minimums shown in Standard Drawings.

The City's share of the cost of increased size will be based on the extra material costs caused by the increase. The City's share of materials cost will be determined by the City based upon recent bids received by the City, price quotations from reputable suppliers, and similar impartial information. Any agreement by the City to share the costs of the increase is subject to the availability of City funds, must be in writing, and must have the prior approval of the City Council by resolution. Any work completed prior to City Council approval of an agreement will not be eligible for City .

3.16 Deferred Construction. When projects are located remote to existing roadway improvements, portions of street work may be deferred to a later date to allow more orderly construction of a complete project. The developer will be required to provide security for the estimated cost of deferred work in an amount and form approved by the City Council. At the sole discretion of the City Council, deferment may be achieved by the signing of a waiver of protest to create an Special Improvement District.

3.17 Final Submittals Before Approval And Acceptance. At the completion of the project, and before final acceptance by the City, the developer shall provide the City a digital drawing of the project construction as built and the final plat. The drawing shall be in AutoCAD format (DWG or DXF), or other Computer Aided Drafting System acceptable to the city and mounted on a CD disk compatible in format and medium with City's access capability. In addition to the diskette, the Developer shall provide "As Built Documents" in paper format of the same quality and nature as provided in the original submitted and approved plan. The digital drawing shall, at a minimum, be a reproduction of the paper as built drawing; other pertinent information or photographs may be included.

At the completion of the project, and before final acceptance by the City, the Developer shall submit to the City, the value of public infrastructure including street, sidewalk, curb, storm drainage, water and sewer mains and appurtenances. The submittal shall be in a format approved by the City Finance Director.

All documentation shall be given to the City at least 30 days before acceptance is expected. All test documentation and certifications shall have an Engineer's certification.

3.18 Warranty. Developer shall warranty for two years all labor, materials and workmanship, from the date of acceptance by the City.

PART II DESIGN CRITERIA

PART II DESIGN CRITERIA GENERAL REQUIREMENTS

SECTION 20.01 ROAD & STREET IMPROVEMENTS

1.01 Purpose. The purpose of the design requirements in this section is to provide minimum standards for road and street design and construction that will insure adequate facilities for the benefit and safety of the general public.

SECTION 20.02 STREET AND ACCESS-WAY TYPES

2.01 "Arterial"(Type A) means a street or road having the primary function of moving traffic and the secondary function of providing access to adjacent land. Arterials generally carry relatively large volumes of traffic. Access to abutting property is restricted; access to business lots should require turning lanes; no access is permitted that allows vehicles to back into the street; and pedestrian crossing are well marked at specific intervals.

2.02 "Collector"(Type B) means a street or road having the equally important functions of moving traffic; providing access to adjacent land; and allowing pedestrian crossing. Collector streets have two moving traffic lanes and two parking lanes.

2.03 Local Street (Type C) . Streets which provide access to individual lots or areas; through traffic is a minor volume. Cul-de-sacs are within this category. Traffic flow of 400 vehicles per day or less.

2.04 (D) Alley. Secondary city street, which serves primarily as a service access to individual lots.

2.05 (E) Bicycle Paths and/or Walkways. Access-ways for people to use with non-motorized vehicles, primarily for recreational use, the minimum width shall be 9 feet, all slopes and grades shall meet ADA requirements.

SECTION 20.03 DESIGN REQUIREMENTS - STREETS .

3.01. General . Designs shall be done in order to provide safe streets that require only normal maintenance to keep them in good condition.

A. Vertical Design should seek to attain the following objectives:
1. Match existing driveways where possible.
2. Minimize retaining wall usage and reduce embankment slope.
3. Minimize sighting obstructions.
4. Provide drainage of the roadway and dissipate drainage within the right-of-way.

B. Horizontal Design. The construction centerline normally will coincide with the right-of-way centerline. Where ROW width is sufficient, and to maintain safety, the construction centerline may be shifted to attain the following objectives:

1. Reduction of retaining wall requirements.
2. Reduction of slope easement requirements.
3. Facilitation of intersection alignment.
4. Reduction of utility reallocations.
5. Retain mature health trees or cultural artifacts.

3.02 Design Parameters . The following table gives the minimum design parameters to use in the vertical and horizontal design of streets. See the table in section (17.16.090) of the City of Columbia Falls Subdivision Regulations. In the event of any conflict between these standards and the Subdivision Regulations of the City of Columbia Falls, the more restrictive shall apply.

A. Horizontal Design

	PARAMETERS	STREET TYPE				
		A	B	C	D	E
1.	ROW width	100 ft.	80 ft.	60 ft.	20 ft.	20 ft.
2.	Developed width (Developed width is the right angle horizontal measure between the outside of the curbs)	52 ft.	40 ft.	32 ft	15 ft.	10 ft.
		Type B: City may permit 24 feet minimum driving surface if on-street parking is prohibited and access is severely restricted				
		Type C: City may permit 24 feet minimum driving surface if on-street parking is prohibited				
3.	Minimum radius of curvature	560 ft	300 ft	120 ft.	N.A.	N.A.
4.	Superelevation	case-by-case basis	none			
5.	Curb type (preferred)	standard	standard	drive over	N.A.	N.A.
6.	Curb radius	25 ft.	15 ft	15 ft.	N.A.	N.A.
7.	Maximum Cul-de-sac length	N.A.	N.A.	600 ft.	N.A.	N.A.
8.	Minimum Cul-de-sac radius	N.A.	N.A.	50 ft.	N.A.	N.A.
		Developed width. Provide a 60 foot radius right-of-way.				

B. Vertical Design

		A	B	C	D	E
1.	Minimum Grade	0.30%	0.30%	0.30%	0.30%	0.30%
		May be 0.0% if surface is sufficiently drained to side.				
2.	Maximum Grade	7%	8%	9%	10%	ADA std.
		For Type B and C, City may permit grade to exceed 10% for a length not to exceed 100 feet and south exposure is available.				
3.	Cross slope on pavement	2%	2%	2%	ADA Req	ADA Req
4.	Cross slope gravel surface	3%	3%	3%	ADA Req	ADA Req.
5.	Maximum grade of major street at intersection	City will review on a case by case basis				

		A	B	C	D	E
6.	Maximum grade of minor street for 30 ft. from intersection with major street	2.0%	2.0%	2.0%	2.0%	N.A.
7.	Minimum grade around a curb return	0.5%	0.5%	0.5%	0.5%	N.A.
8.	Minimum grade PCC valley	0.3%	0.3%	0.3%	0.3%	N.A.
9.	Minimum grade AC valley gutter	0.6%	0.6%	0.6%	0.6%	N.A.
10.	Vertical curve design speed	40 mph	30 mph	25 mph	20 mph	N.A.
11.	Vertical curve reaction time	2.5 sec	2.5 sec	2.5 sec	2.5 sec	N.A.
12.	Vertical curve eye height	3.75 ft.	3.75 ft.	3.75 ft.	3.75 ft.	N.A.
13.	Vertical curve object height	0.5 ft.	0.5 ft.	0.5 ft.	0.5 ft	N.A.
14.	Grade break is allowed for changes in grade less than two percent	NO	YES	YES	YES	N.A.

C. Miscellaneous Design Requirements.

1. Valley gutters shall be allowed only on the minor streets at intersections.
2. Cut and fill slopes.
   (a) Finish cut slopes shall be approved by Public Works Director.
   (b) The minimum fill slope shall be 2 feet horizontal to 1 foot vertical with approval by the PWD.
   (c) Slopes shall not exceed the angle of repose for the sloped material.
   (d) All graded areas where people will be walking shall not have a slope equal to or less than 4:1.
3. The stopping sight distance shall be considered for horizontal curves.
4. Super elevation of horizontal curves shall be considered where practical and shall not exceed 0.06 feet per foot. Transition to the superelevated section shall be obtained through the runoff length with 2/3 of the runoff on the tangent and 1/3 on the curve. Super elevation runoff length shall be determined by the degree of curve, design speed, and super elevation rate.
4. Cul-de-sac or "hammer head" turnarounds shall be provided at the ends of temporary dead-end streets.
5. Angle parking is not permitted in city right-of-way unless the developer can demonstrate that vehicles backing from the angle stalls will not interfere with traffic in the nearest driving lane. A waiver may be approved by the City, based upon a written presentation of special circumstances. The standards for off-street parking shall be applied to any requests for on-street angle parking.
7. Where water and sanitary lines are located within the paved surface, service connections shall be provide to all lots prior to pavement placement. Cutting of the pavement for a period of five years after installation is permitted only under the
8. [illegible] provide for snow removal and storage.

9. In-situ soil types within the roadway prism must meet the standard for approved subgrade soils type.
10. Vertical curves shall be symmetrical parabolic curves.
11. The design shall provide for safe pedestrian access along the street, and safe and frequent pedestrian crossings.

D. Signing. Proper traffic control signs shall be required as follows. Per Manual on Uniform Traffic Control Devices (M.U.T.C.D.)

1. Guard rails and guide posts shall be provided where conditions of poor visibility or other hazards would result in danger to vehicles accidentally leaving the roadway. Generally, such points are fills along steep grades or sharp curves on non-level terrain.
2. All streets within an improvement shall be named and all names shall be approved the City. Duplication of street names is not allowed. Street name signs shall be placed at all intersections and where available, placed on top of an approved post that bears a stop or yield sign. All sign posts shall be of a breakaway type.

3. Stop signs, yield signs, speed limit signs, etc. shall be required on and along all type A streets. Such signs may be required on other streets if the situation warrants such. All sign posts shall be of a breakaway type.

E. Lighting . The City will require lighting along streets at intersection of streets, pedestrian crossings. The City may approve lights at intermediate spaces where intervals between light is determined excessive. Luminaries and supports placed on the public right-of-way shall meet City standards. Decorative lighting will be considered if meeting the City's standard specification or an approved equal.

All commercial luminaries will be shielded to minimize fugitive light especially where lighting may impact surrounding residential areas. Residential lot lighting shall not extend beyond the property line.

F. Pavement Design. The design of the pavement mix and pavement course shall be in accordance with the City's standard specifications and drawings, and in accordance with current and widely accepted practice for asphalt design.

F. Traffic Volumes . Traffic volumes will be calculated on the basis of 10 vehicle trips per lot per day. Per day volumes will be used for design purposes of determining Type B or C streets.

G. Public Sidewalks And Curbs. Public sidewalks and curbs are required on both sides of a street. Sidewalks along arterial streets shall be at least 8 feet in width. Sidewalks on all other streets shall be a minimum of 5 feet wide. Sidewalks adjoining curbs may include the width of the curb level in the required sidewalk width. Sidewalks may be omitted on interior streets of industrial parks with the approval of the City.
Sidewalks and curbs may be omitted in subdivision if the developer will substitute a 40 foot paved street and develops an open drainage system (swales) with the approval of the Director of Public Works.

Sidewalks in commercial districts shall meet ADA accessibility standards contained herein. All street intersection sidewalks shall meet ADA accessibility standards contained herein.

H. Driveways. Driveways located within the City's right-of-way must be asphalt or concrete. A Street Excavation Permit is required prior to construction of driveway.

Driveways containing sidewalks shall meet ADA accessibility standards for the sidewalk portion of the driveway.

Driveways containing sidewalks, the sidewalk thickness shall be reinforced or thickened sufficient to bear driveway loading.

SECTION 20.04 DRAINAGE IMPROVEMENTS

4.01 GENERAL. All developments being constructed within the City of Columbia Falls shall be protected from drainage problems by the use of proven engineering techniques as set forth and described hereinafter. Problems resulting from natural waters such as creeks, springs, and groundwater, from storm water runoff, from winter icing accumulations, and from spring breakup waters, will be considered in determining the necessary drainage improvements that will be required for any specific project.

4.02 TYPES OF REQUIRED IMPROVEMENTS. The following improvements, if based on or designed in accordance with proven engineering techniques, are viable alternatives which may be used in solving drainage problems: Placement of proper drainage easements or reserves, construction of subsurface storm drains, open channels, placement of culverts, construction of temporary storage areas, construction of sub-drains, constructions of dry wells, construction of metering basins, placement of staggered culverts, and other methods or combinations of the above if the situation warrants such use.

4.03 BASIS FOR REQUIRED IMPROVEMENTS. The need for drainage improvements may be based on one or more of the following items: topographic maps, field inspections, historical information, soil tests, existing storm drainage improvement studies, and any future drainage related studies, reports, or ordinances as may be adopted for use by the City.

4.04 DESIGN OF IMPROVEMENTS: GENERAL.

A. Design Size. Storm drain inlets, pipes and drainage structure shall be sized to carry storm drainage runoff based on engineering calculation for the following minimum storm recurrence frequency and require an Engineer's certificate:

For drainage areas less than 50 acres, a ten-year storm frequency- 6 hour duration; for drainage areas greater than 50 acres but less than 100 acres, a 20-year storm- 6 hour duration; for drainage areas greater than 100 acres, a 50-year storm- 6 hour duration; for improvements to drainage channels in the floodway, a 100-year storm- 6 hour and 24 hour duration which ever produces the greater flow.

The rational formula may be used in calculating storm runoff utilizing rainfall intensity.

B. Discharge Design. Plans for storm drainage shall indicate where the storm water will be discharged. If the proposed development will increase the rate or energy of runoff, it must be shown that the pipes and channels downstream from the discharge point can carry the proposed runoff without damage to the adjoining properties. Provisions should be made for retaining of storm water within the development, with no net increase in discharge after development.

C. Easements. Where storm drains run outside an existing public right of way, easements will be required for public maintenance. Such easements shall be a minimum of 10 feet in width. Where the City is to construct the sewer, construction easements will be required to have a minimum width of 20 feet.

D. Discharge In Wellhead Zone. Discharge points within the city's well head protection zone shall install approve wet/dry wells.

SECTION 20.05 SANITARY SEWERS

5.01 Design Capacity. Sanitary sewers shall be sized to carry the design volumes when flowing full. In residential areas, the design volume shall be based on 100 gals. Per capita daily, 2.83 per dwelling unit, and a number of dwelling units consistent with existing development and zoning. From the book, The Design of Small Water Systems, by Joseph A. Salvato, Jr., P.E., the use of figure 1, "Probable maximum momentary water demand" shall be acceptable to calculate peak flows. In other areas, the design volumes shall be calculated based on the development which can be reasonably expected in the area. Sanitary sewer shall be designed in accordance with "Circular WQB 2 Standard for Water Works" published by the State of Montana Department of Environmental Quality.

5.02 Easements. Where sewers run outside an existing public right of way, easements will be required for public maintenance. Such easements shall be a minimum of 20 feet in width.

5.03 Minimum Cover. Sewers should have a minimum cover of 4 feet.

5.04 Septic effluent. Septic effluent will not be allowed.

5.05 Lift Stations.

A. All new sewage pumping stations shall be either above ground, self priming, suction liftype and the pumps shall be equal to that manufactured by the Gorman Rupp Company Flygt Pumps or submersible pumping stations manufactured by Flygt.

B. All sewage pumping stations shall be equipped with a submersible transducer control system or Flygt Multitrode level monitoring and control systems as approved by the City.

C. All new sewage lift stations shall be equipped with a backup, redundant level control system.

D. All new pumping stations shall be powered by 460 three phase power unless other source is approved by the DPW.

E. The City may require providing emergency power generator at the lift station. Pumping stations shall be equipped with an emergency power receptacle and a manual transfer switch. The emergency power receptacle shall be a Hubbell circuit lock pin and sleeve mechanical interlock cat#460 MI7W, 60 amp, 480VAC.

F. Pumping stations shall be equipped with an alarm system detecting unauthorized entry, power interruption, high water, and high pump temperature conditions. The alarm signal shall be directed to optional remote locations by telephone dialer system.

G. Pumping station shall be equipped with Flygt Mt2pc digital controllers, Monitor Pro station supervisor in Multitrode pump panels.

H. A 2500 gal emergency storage tank shall be provided to buy time in the event of failures.

5.06 Manholes. The maximum spacing between manholes is 430 feet.

5.07 Extent of Sewer Lines. Sewer lines shall be extended to the furthest boundary of the development within any right-of-way where serving the development.

5.08. Sewer Service Lines. Sewer service lines shall be extended to every developable lot within the development. Service lines shall be delivered at the lot line at a depth not greater than 8 feet below the ground surface where the building site is likely located.

constructed deep enough to service a basement on the lot where the main is sufficiently deep to allow gravity flow from the basement to the main.

5.06 Video Survy Inspection. A video survey will be conducted on all sewer mains prior to acceptance and approval by the City. Inspection will be done with water in the line to visually indicate sags and bellies. There will be a footage counter and services will be noted. There will be a written inspection report indicating service line taps, defects and other items of note. The video record and written log will be provided to the City.

5.07 Sewage flow meters may be approved by the City. Approved meters shall be of the magnetic or ultrasonic type. Dezurik plug valves will be installed on each side of the meter. A spool will be provided, that can be inserted in place of the meter for repairs. A totalizer will be provided. A circular chart recorder, or provisions for electronic data collection will be provided when flows are more than 5000 gal per day.

SECTION 20.06 WATER SUPPLY IMPROVEMENT

6.01 Design Domestic Flows. Water mains shall be designed in accordance with "Circular WQB 1, Standard for Water Works" published by the State of Montana Department of Environmental Quality. Water mains shall be sized to provide a combined fire flow and peak day flow in accordance with the standards shown below.

Water mains in residential areas shall be designed to supply 920 gals. per dwelling unit per day (based on average usage of 130 gpcd; 2.83 persons per dwelling unit; peak day demand of 2.5 times average demand) plus fire flow. The number of dwelling units used for design shall be consistent with existing development and the zoning of undeveloped land. Alternate design bases may be used if justified by the designer and approved by the City. From the book, The Design of Small Water Systems, by Joseph A. Salvato, Jr., P.E. the use of figure 1, "Probable maximum momentary water demand" shall be acceptable to calculate peak flows.

In non-residential areas, water lines shall be sized to serve developments which can be reasonably expected in the areas based on zoning and topography.

6.02 Design Fire Flows. For design purposes, minimum fire flows shall be 1000 gpm in low and medium density residential areas, 2500 gpm in commercial and high density residential areas, and 3500 gpm in industrial areas. The design shall provide for the system to provide the minimum fire flow at each fire hydrant, assuming one hydrant flowing at any given time and a minimum pressure of 20 psi.

Where special conditions exist, greater or lesser design fire flows may be approved by the Fire Chief for new and existing buildings.

6.03 Design Pressure. Water systems shall be designed to provide a minimum pressure of 40 psi with no fire flow. With fire flow, a minimum pressure of 20 psi in all areas. Water Systems shall be designed by consulting the latest water system model of pressure zones. Some areas of the City have experienced a maximum static pressure approaching 120 psi at some buildings on the Southwest side of the City. Pumping stations and pressure reducing valves may be required to meet these requirements. Pipes shall be specified to withstand the maximum test pressures but in no case shall pipes be classed less than 150 psi. The designer should contact the Water Superintendent for information on the pressure zones and water supply available for the area.

6.04 Valves. Water valves on mains 12 inches or less in diameter shall be resilient wedge gate valves which meet the latest American Water Works Association standards. Valve type and models on larger mains will be approved by the Water Superintendent. Generally, valves should be located so that a water line can be shut off without eliminating service to more than 20 homes or more than one fire hydrant.

6.05 Minimum diameter. Water mains for public maintenance shall have a minimum diameter of 6 inches.

6.06 Line Valves in distribution pipe. Three or four valves shall be installed at a "cross" intersection. Two or three valves at a "Tee" intersection.

6.07 Hydrant Spacing. Fire hydrant spacing shall not exceed 500 feet measured along the curb line in areas zoned R-1 or R-2 and shall not exceed 450 feet in other areas. The Fire Chief may require additional hydrants in accordance with currently adopted fire code. All hydrants will have secondary valves.

6.08 Blowoff Valves. A blow off valve or a fire hydrant must be located within 20 feet of the end of any dead-end water main including temporary dead-end mains in phased developments. Blow off valves and their installation shall be as approved by the Water Superintendent.

6.09 Air Relief Valves. An air relief valve will be required at the high point of each water main. Pipe grade design shall minimize the use of air relief valves wherever possible.

6.10 Easements. Where water mains and/or fire hydrants are constructed outside of existing public right-of-way, easements will be required. The easements for maintenance of lines must have a minimum width of 20 feet.

6.11 Minimum Cover. Water lines should have a minimum cover of 6 feet.

6.12 Water Hydrant Color Code. Hydrants which flow greater than 3000 gpm shall be painted yellow with a blue bonnet. Hydrants which flow greater than 2000 gpm shall be painted yellow with a green top. Hydrants which flow less than 2000 gpm, or are a scissors type, or very old shall be painted yellow with an orange bonnet.

6.13 List of Standard Materials.

NO	ITEM	STANDARD MATERIAL TYPE
A.	Gate Valve	Mueller Resilient Wedge Gate Valve A2360-20 MJ x MJ
B.	Butterfly Valve	Mueller butterfly valve B3211-20 minimum 150 psi
C.	Tapping Valve	Mueller Resilient Seat Tapping Valve A2360-16mj Mueller Resilient Wedge Gate Valve
D.	Tapping Saddle	Powerseal Stainless Steel Model 3490AS or 3490 ASMJ Romac "SST III" Stainless tapping sleeve
E.	Valve Boxes	Tyler 68680 Series "DD"-screw type #6 Base for water
F.	Corporation Stops	Mueller B-25005 ¾" & 1" cc x inst Mueller B-25008 1 ½" & 2" cc x 110 cts poly All repair items to be Mueller. All service fittings to be Mueller.
G.	Service Saddles	Smith Blair Model 372 4" - 12" 1 ½" & 2" taps Mueller Brass BR2B ci or pvc Romac Model 306 2"-12" PVC

NO	ITEM	STANDARD MATERIAL TYPE
.		& 1" taps
H.	Service Pipe	Main to Building- PE Pipe (IPS) SDR 7- 3/4" & 1" PE Tube(IPS) () SIDR7 9- 1 1/2" & 2" (200 PSI)
I.	Curb Stop	Mueller B-20283 w/2 H-15426 inst ¾" & 1" Mueller B-20283 1 ½" & 2" c110 x c110 All repair items to be Mueller. All service items To be Mueller.
J.	Curb Boxes	Mueller H-10334 w/stationary rod pentagon nut lid ¾" & 1" Mueller H-10336 w/pentagon nut 1 ½" & 2"
K.	Water Valve Boxes	Tyler 64-A & 65-B Solid Sleeve-Ductile Iron-
L.	Joint Restraint	Megalug or thrust blocks EBBA series 2000PV C900 or IPS PVC EBBA series 1100 Ductile iron Romac Industries Grip Ring pipe restraint
M.	Fire Hydrant	Mueller Super Centurion 250, 5 1/4", 3-way
N.	Manhole F/C	Inland Foundry Model 771 solid cover Olympic Foundry MH
O.	Meters	ATMeters---Sensus SR II The standard for all new construction is Invenyses radioread meters. Multiple dwellings will have the mutiplexer for radioread installation.
P.	Meter Pits	Muller/McCullough Thermal Coil Meter Box
Q.	Backflow Preventers	All new construction 3/4" and 1" use dual check valve if low degree of hazard. All others to survey system to assess degree of hazard. Backflow prevention is customer responsibility. All assemblies shall be on the approved list of the Foundation for Cross Connection Control and Hydraulic Research, University of Southern California
R.	Distribution main	Ductile iron or C900 PVC Minimum pressure class 150
S.	Resetters.	McDonald meter resetter series 10-1H 5/8 x ¾"Larger sizes to be approved by Water Superintendent
T.	Sewer Saddle	DPW/HPI flexible saddle Inserta Tees for SDR 35 and IPS/Sch 40
U.	Repair Clamps	Large sizes-Smith Blair full circle clamp coupling Series 200 or Romac Style SS1 Mueller Style 221 pipe repair clamp ¾"-2"
V.	Couplings.	Large sizes-Romac Style 501, XR 501 or Smith-Blair Omni coupling system series 44 Smith-Blair compression couplings ¾"-2" Mj x mj iron coupling Dresser style 262 (2100 series) HYMAX coupling
Any non-standard materials shall approved by the City.		

6.14 Waterlines. Water lines will be stubbed to property lines for future development and will be approved by CFPWD.

6.15 Accessible Meter. This shall mean that the meter is installed in an approved pit, or in a wall where the meter is not more than 6 inches behind a removable panel with an opening of at least 2 S.F. with the least dimension being not less than 16 inches, or in a crawl space where access is at least 24 inches by 18 inches, the access tunnel is at least 30 inches high and 24 inches wide and the meter is not more than 20 feet from the access opening.

6.16 Accessible Reader. This shall mean the reader is installed on the front of the building or within 18" of a corner that is the front of the building. The reader shall be mounted on a solid surface not less than 18inches above nor more than 60 inches above the average immediately adjacent ground surface within three feet of the reader. The area above the reader shall be unobstructed from the ground to a point 60 inches above the ground or 6 inches above the reader which ever is higher and for a width of not less than 24 inches.

PART III ADDITIONAL CONSTRUCTION SPECIFICATIONS

30.01 Miscellaneous
30.02 Standard Drawings and Designs

SECTION 30.01 MISCELLANEOUS- ADDITIONAL CONSTRUCTION SPECIFICATIONS.

1.01 Utility Location. The location of utilities in the public right of way shall be as approved by the Director of Public Works. Franchised utilities should normally be located in a common trench with trenches parallel to the street located within three feet of the right-of-way line. Franchised utility trenches will not be allowed within three feet of a City utility. Public utilities located outside the public right-of-way are discouraged. Valves, manholes, and cleanouts located in undeveloped terrain shall be marked with a partially buried reinforced concrete or steel post with a cleated base to prevent withdrawal.

1.02 Site Plans.

A. Private development shall have vehicular access to the street in accordance with the Standard Drawings, off street parking in accordance with Columbia Falls Municipal Code 17.12.180, and adequate access and egress for fire vehicles. The Director of Public Works may restrict the number, location, and design of driveways where necessary to protect the safety of vehicular and pedestrian traffic in the public right-of-way.

B. The developer must provide evidence that parking areas would provide the minimum number of parking stalls required by CMC 17.12.180 in accordance with the minimum standards for parking lots.

C. Parking areas shall be paved, including the driveways serving the parking areas. Driveways serving loading areas and fire access lanes shall have a minimum width of 23 feet, of which at least 20 feet shall be paved, and the remainder must be gravel surfaced. "Gravel surfaced" means a thickness of not less than 4 inches of compacted gravel over the entire area. "Paved" means, as a minimum, 3 inches of asphalt pavement The City may require curbs along driveways in parking areas where necessary to control storm water or restrict vehicular access.

D. The City may require the developer to improve the public streets used for access to the site as necessary to control dust and erosion and to provide for traffic safety and/or the potential increase in vehicular traffic. Improvements may include paving, curb and gutter, sidewalks, storm drainage, turn lanes, signing, street lighting, signals, and similar improvements. The improvements required shall be limited to those necessitated by the new traffic movements to be generated by the private development. A traffic study may be required to aid in determining any necessary improvements.

E. Roof drains, sub-drains, and surface drains shall be shown on the site plan. Discharge from these collectors shall be retained on site. Where development will increase the rate or energy of storm runoff and/or change the

increase the rate or energy of storm runoff and/or change the location of the storm runoff discharge, provisions must be made so that there is no net increase in the natural runoff.

F. A grading plan may be required if any of the following conditions are present:

1. If any fill will exceed 10 feet in height; or,
2. If any excavation will exceed 10 feet in depth; or,
3. If the final cut or fill slope will exceed 2:1.

A grading plan must be adequate to show all new cuts, fills and changes in drainage. Grading (cut and fill) should be kept to a minimum. Grading should be designed to minimize the visual impacts from surrounding properties. Cut slopes and fill slopes steeper than 1 1/2:1 will require a retaining wall or other protection to insure slope stability. A slope steeper than 2:1 and more than 10 feet in height will be required to have a pedestrian railing or other protection at the top of the slope. Where cuts or fills greater than 20 feet in height are proposed, a report must be submitted, signed by a registered engineer showing the methods that will be used to ensure stability of the fills and slopes. Grading plans shall include provisions for drainage and erosion control during construction.

G. Proposed connections to the public water and sewer lines must be shown on the site plan. If existing public water and sewer lines are not adequate to accommodate the increased demand created by the proposed development, the City may require the developer to improve or replace existing public water and sewer lines at no cost to the City.

H. Additional fire hydrants may be required along the adjoining street or within the development when determined necessary by the Fire Chief in accordance with utility coded. All fire hydrants and all water lines serving fire hydrants within the public right-of-way shall be dedicated for City.

I. Except as noted below, each building must have pedestrian access separate from vehicular driveways and at least one pedestrian access route shall be usable by the handicapped. EXCEPTIONS: residential building containing four dwelling units or less; warehouses and industrial structures where the need for pedestrian access is negligible.

J. The City may require the construction of a public walkway along the adjoining street if none exists. The City may require replacement of an existing sidewalk along a public right of way if the existing walk does not meet current City standards.

K. The City will assign a street address or addresses for each development and will designate the various units of the development by numbers, letters, or otherwise (e.g., Apartment No. 101, Space 3-A, Unit 5, etc.) If the development consists of more than 6 units, the owner will submit a reproducible copy of the system of unit numbers, etc., and the system will be used for postal addresses, building permits, etc. The City will not assign individual street addresses to the various units of a single structure development having more than two units.

L. Any development in the Floodplain must meet the requirements of The City of Columbia Falls Municipal Code 15.44.

1.03 Plat Maps

A. Final subdivision/planned development plat maps, short plat maps, and all certifications and approvals shall be signed before the map is recorded with the Office of Flathead County Clerk and Recorder.

B. Durable black ink shall be used in plat maps, including signatures, to assure clear reproduction on standard printing equipment All plats shall be drawn on sheets no larger than 24 x 36 inches. If the plat is more than one sheet, each sheet shall be labeled "sheet #____ of #_____." A standard sheet size of 24 x 36 inches is preferred for all plats and short plats.

C. Residential subdivision plats should include utility easements 5 feet wide along each front lot line.

D. If grading is to occur outside the limits of roadway improvements, a grading permit may be required prior to final plat approval. See requirements under "Site Plans."

SECTION 30.02 Repairing Utility Cuts. The design of all excavations, including ground and surface water control, where necessary should be made available for review by the public works agency. See MPWSS Drawing No. 02221-1

A. When requested, the construction equipment and procedures to be used shall be described in the permit application.

B. Pipe installation shall be done according to the requirements of the appropriate agency specifications in use. The required granular material should meet the material requirements for Select Granular Fill in the current Standard Specifications in use.

C. Pavement shall be cut at termination points of pavement replacement.

D. Pavement and shoulder removal shall be done in a manner that provides for proper restoration of the replacement section.

E. Straight vertical cuts of the pavement are required. Pavement surfaces that become undermined shall be cut back and removed. . Any cut in the pavement will have an additional 12" of asphalt removed in all directions beyond the undisturbed soil sections.

F. The backfill material shall be placed and compacted according to established standards for back-filling structures, culverts, pipes conduits, and direct burial cable.

G. Generally cuts shall be filled at the end of each work day. With prior approval, steel cover plates may be used; recessing of these plates may be required.

H. The proper backfill material shall be brought to the optimum moisture content, placed in lifts not to exceeding 6 inches and thoroughly compacted in accordance with backfill type. The contractor, i.e.; holder of the permit, will be liable for repairs for a period of two years from the date of completion.

I. Under the permit, construction which adversely affects the subsurface drainage of the pavement structure shall be corrected by the addition of surface or subsurface drain.

J. The replacement pavement shall be similar shall meet current standards. The selection of the material type, composition, and placement methods should be approved by the city. All joints to be tacked.

K. The limit of pavement replacement shall be such that the replacement pavement is supported by thoroughly compacted sub-base material and the pavement is restored to the proper grade, cross-slope, and smoothness. . Pavement thickness at all repairs will be a minimum of 3" or match existing, whichever is greater; depths greater than 6 inches will be assessed by the City. In addition the replacement section shall be at a minimum, 12 in. greater in all directions than the disturbed soils. All joints to be tacked. Repaving in the summer months will be performed within 5 working days. In the winter months a "cold patch" such as UPM will be a suitable temporary pavement. The permanent repaving shall be placed no later than 15 days after the Asphalt plants have resumed operations.

SECTION 31.00 **STANDARD DRAWINGS AND DESIGNS**

1.	**Street Section at Railroad Crossing**	**L-1**
2.	**Asphalt Section for Residential Streets**	**L-2**
3.	**Asphalt Section for Residential Streets**	**L-3**
4.	**Standing Curb**	**L-4**
5.	**Sidewalk and Curb**	**L-5**
6.	**Wheelchair Ramp Details L-6**	
7.	**Standard Symbols - Legend**	**L-7**
8.	**Decorative Lighting Standard**	**L-8**

PLAN

SECTION A-A

Notes:

1. If railroad has placed planking or prefabricated crossing material adjacent to rails, delete asphalt sidewalk and continue concrete sidewalk to match crossing placed by railroad.
2. Street crown to rail crossing slope transition design shall be submitted to city for approval.
3. Design must be approved by railroad for new construction.

Street Section at Railroad Crossing

Standard Drawing

L-1

City of Columbia Falls
Department of Public Works

Adopted _____

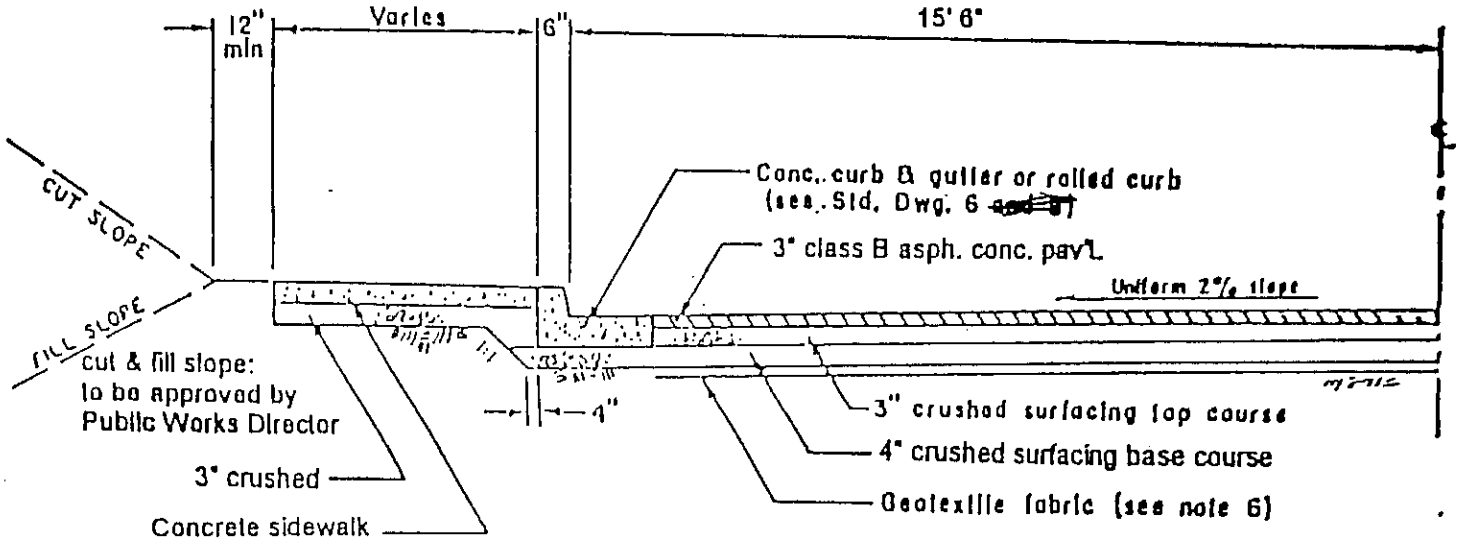
City of Columbia Falls
Department of Public Works

Asphalt Section for Residential Streets

L-2

Adopted _____

Standard Drawing 2



TYPICAL HALF-SECTION

Notes:

1. *Section is symmetrical about centerline.*
2. *All Dimensions are minimums.*
3. *This section is designed for typical clayey-silt soils found in the Columbia Falls area.*
4. *In solid rock, cut slope may be steepened from 1½:1 to ½:1.*
5. *In cuts greater than 6 feet in height, acceptable side slopes will be determined by the engineer based on engineering analysis.*
6. *Geotextile fabric (if needed) shall be a woven material meeting or exceeding the following:*
   Tensile strength – ASTM D 1682-200 PSI,
   Puncture Strength – ASTM D 751-80 PSI,
   Elongation – ASTM D 1682-20%,
   Mullen Burst Strength – ASTM D 3786-450 PSI

This is a Typical : if on site testing needs to be done to do to standards

Notes:

1. *Typical 60 foot ROW section is 32 foot curb back to curb back, 28 foot asphalt pavement, 2 foot curb, 26 foot boulevard, and 2 foot easement area.*

Asphalt Section for Residential Streets

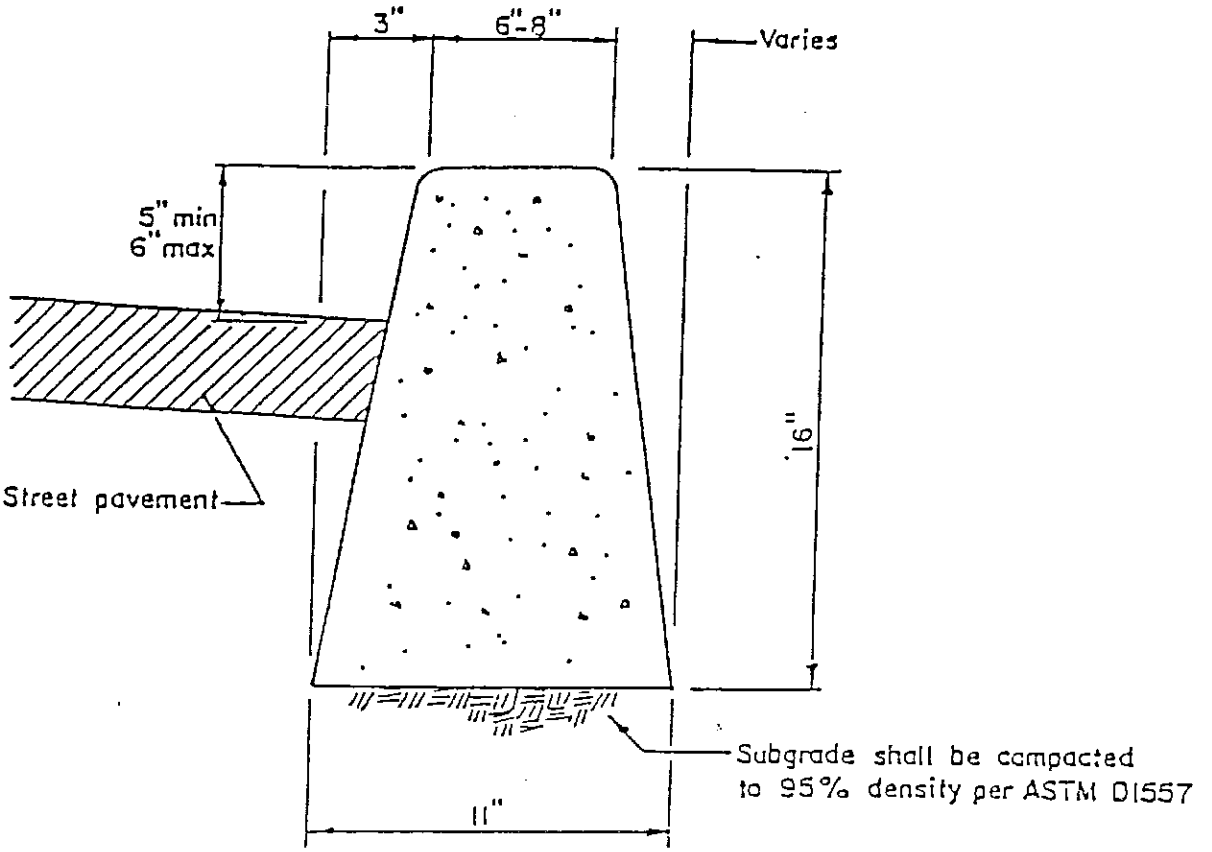
Standard Drawing

3

City of Columbia Falls
Department of Public Works

L-3

Adopted _____



TYPICAL SECTION

Notes:

1. *Contraction joints with tooled edges shall be cut 1/4 to 1/3 the section depth at 10 foot intervals.*
2. *Through joints and full through form plates shall not be used except where specifically approved by the engineer.*
3. *All exposed corners shall be finished to a 1/2 inch minimum radius.*

take out

Standing Curb

To be used only when matching existing curbs.

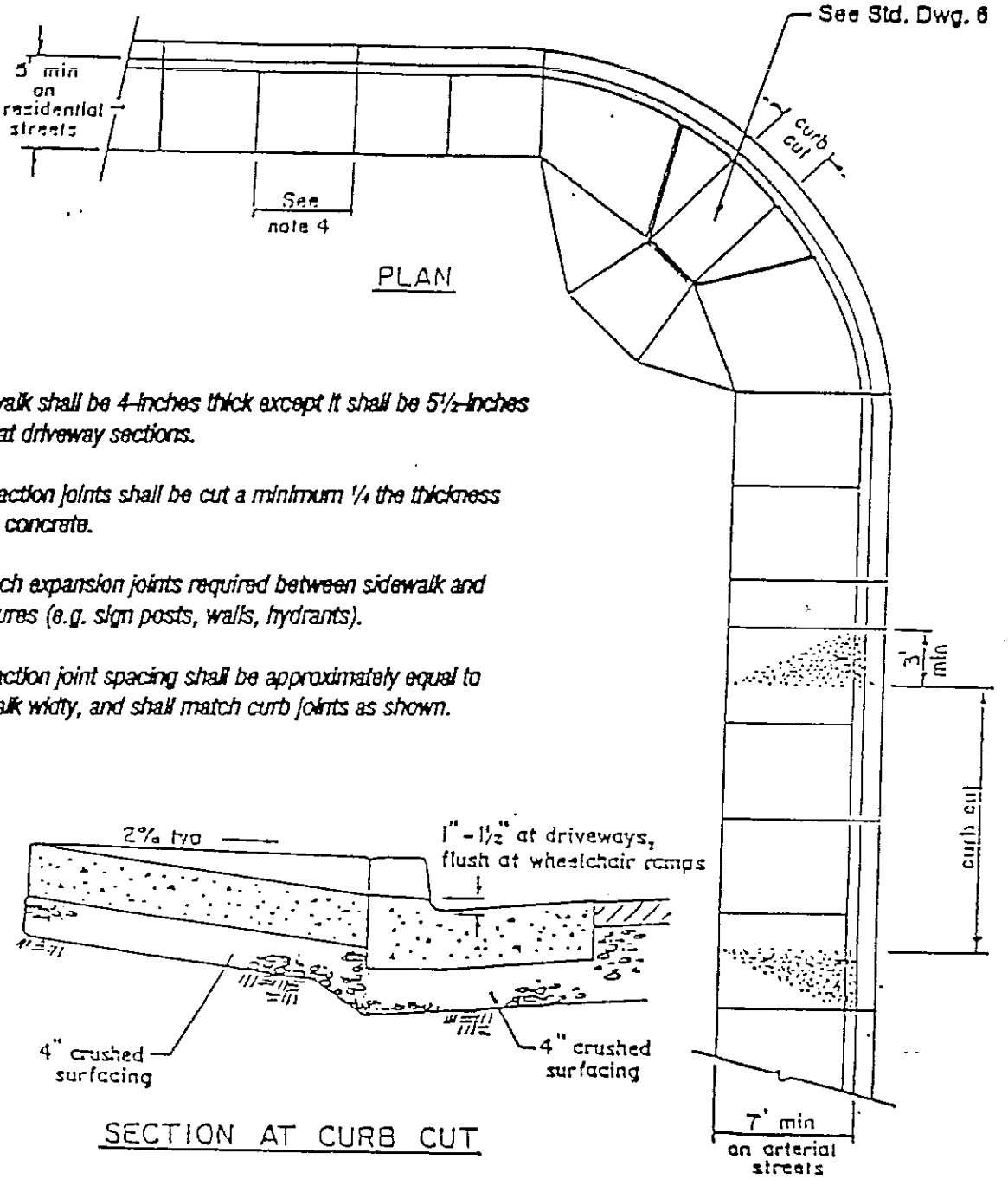
Standard Drawing

4

City of Columbia Falls
Department of Public Works

L-4

Adopted _____



PLAN

Notes:

1. *Sidewalk shall be 4-inches thick except it shall be 5½-inches thick at driveway sections.*
2. *Contraction joints shall be cut a minimum ¼ the thickness of the concrete.*
3. *3/8-inch expansion joints required between sidewalk and structures (e.g. sign posts, walls, hydrants).*
4. *Contraction joint spacing shall be approximately equal to sidewalk width, and shall match curb joints as shown.*

SECTION AT CURB CUT

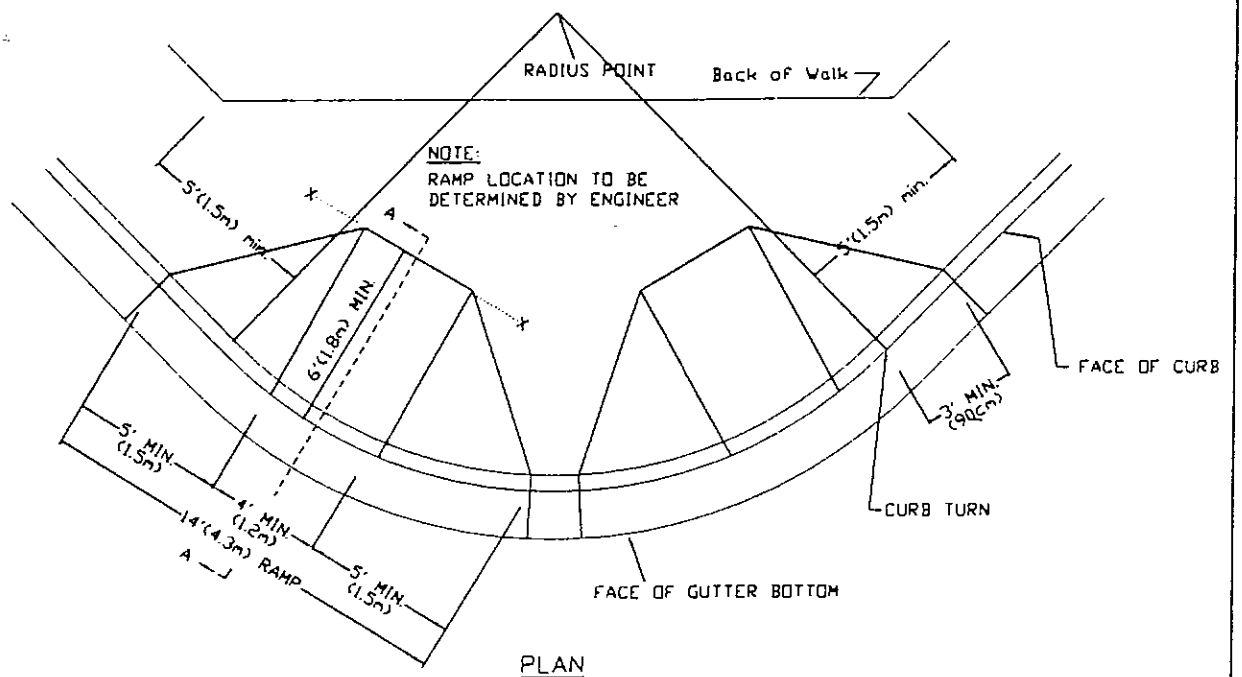
Sidewalk and Curb

Standard Drawing 5

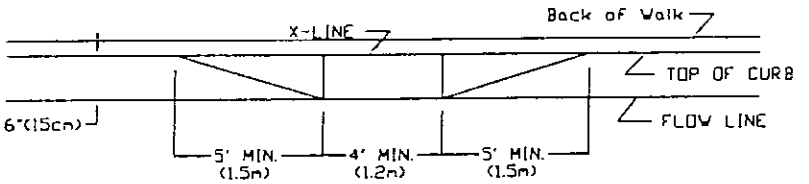
City of Columbia Falls
Department of Public Works

L-5

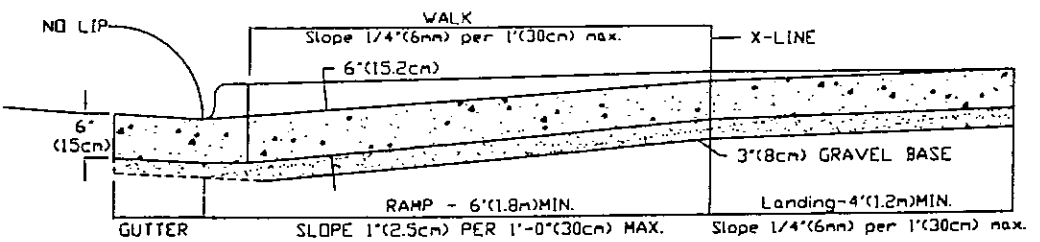
Adopted _____



PLAN



RAMP-FRONT



RAMP SECTION A-A

NOTES:

1.) NOT ALL INTERSECTIONS WILL HAVE TWO RAMPS PER CORNER; ENGINEER SHALL DECIDE IF TWO RAMPS ARE REQUIRED.

2.) PLACE TWO (2) ADA RAMPS AT UNCONTROLLED INTERSECTIONS

3.) DIAGONAL OR MID-RADIUS RAMPS ARE NOT ALLOWED

4.) DOWEL WALK TO CURB AND GUTTER WITH 2' (60cm) MAX. ON CENTER, EPOXY COATED #4 REBAR, 2'(60cm) IN LENGTH

REVISED: 4/3/02

MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS	SCALE: NONE	ACCESSIBILITY RAMP DETAIL	STANDARD DRAWING NO. 02529-8

Attachment

STANDARD DRAWINGS - DESIGN

STANDARD SYMBOLS - LEGEND

PROPOSED	EXISTING	
		SANITARY SEWER
		SEWER EASEMENT
		MANHOLE
		WATERTIGHT MANHOLE
		DEEP SEWER CONNECT
		STORM DRAIN
		STORM DRAIN MANHOLE
		UNDERGROUND GAS MAIN
		CLEANOUT
		WATER MAIN
		VALVE
		FIRE HYDRANT
		POWER POLE
		TELEPHONE POLE
		JOINT POLE
		GUY WIRE & ANCHOR
		LIGHT POLE
		DRAINAGE ARROWS
		UNDERGROUND POWER
		UNDERGROUND TELEPHONE
		PAVEMENT WITH CURBS
		PAVEMENT OR GRAVEL ROAD
		CULVERT N/HDWLS
		CREEK
		DITCH
		FENCE

PROPOSED	EXISTING	
		BRIDGE
		EARTHWORK SLOPE
		CENTER LINE
		CATCH BASIN
		PROPERTY LINE
		UTILITY EASEMENT
		TEMPORARY EASEMENT
		RAILROAD, SCALE
		TREE
		SIGNS
		POND
		SECTIONAL LINE 1/4,1/16 et
		MONUMENT
		STUB
		TEST HOLE
		TEMPORARY BENCH MARK
		WELL
		CESSPOOL
		ELECTRIC SERVICE BOX
		ELECTRIC VAULT
		RADIUS BACK OF CURB
		SECTION CORNER
		1/4 CORNER