

CITY OF KELOWNA

BYLAW NO. 8712

Amendment No. 6 to "Subdivision, Development and Servicing Bylaw No. 7900"

The Municipal Council of the City of Kelowna, in open meeting assembled, enacts as follows:

1. THAT "Subdivision, Development and Servicing Bylaw No. 7900" be amended as follows:
 - (a) Replacing **Schedule 1 - Works & Services Requirements** with a new **Schedule 1 - Works & Services Requirements** as attached to this bylaw;
 - (b) Adding a new Part 7 Hillside Standards to **Schedule 4 – Design Standards** as attached to this bylaw;
 - (c) Replacing Part 2 Drawing Index of **Schedule 5 – Construction Standards** with a new Part 2 Drawing Index as attached to this bylaw; and
 - (d) Adding Drawings SS-H1 to SS-H15 inclusive to **Schedule 5 – Construction Standards** as attached to this bylaw.
2. This bylaw shall come into full force and effect as and from the date of adoption.
3. This bylaw shall be cited as "Bylaw No. 8712, being Amendment No. 6 to "Subdivision, Development and Servicing Bylaw No. 7900".

Read a first, second and third time by the Municipal Council this

Adopted by the Municipal Council of the City of Kelowna this

Mayor

City Clerk

WORKS & SERVICES REQUIREMENTS

KEY SHEET

<u>ABBREVIATION</u>	<u>REQUIREMENT</u>
WTR	Community water system. In subdivisions which are to be provided with a community water system, each Parcel within the proposed subdivision, or Parcel being Developed, must be supplied by a water distribution system, including service connections, and with adequate fire flow and protection, which is designed in accordance with the standards prescribed in the Design Standards Water Section.
WELL	Where a community water system is not available a proven water supply located on each parcel is permitted.
SWR	Community sanitary sewer system.
SWRSEP	Sanitary sewer collection and disposal or Sanitary sewage effluent ground disposal in accordance with Part 2, Section 5.2 (o)(viii) of this bylaw.
DITCH	Drainage collection and disposal system by open ditches and culverts.
STM	Closed drainage collection and disposal system (i.e. a system other than open ditches).
SL	Street lighting throughout the subdivision.
SLI	Street lighting at street intersections only.
OH	Overhead electrical and communication wiring.
UG	Underground electrical and communication wiring.
W	Communication and electrical wiring to conform to the highest standard of existing adjacent facilities.

WORKS & SERVICES REQUIREMENTS

ZONE ⁽⁴⁾	UTILITIES (REFER TO KEY SHEET)					STREET REQUIREMENTS (REFER TO STANDARD DRAWINGS)			
	WATER	SEWER	DRAIN	WIRING	LIGHTING	ROAD CHARACTER	ROAD CLASSIFICATION		
							LOCAL ⁽¹⁾	COLLECTOR ^{(1) (2)}	
								NO BIKE LANE	WITH BIKE LANE
A1	WELL	SWRSEP	DITCH	OH	SLI	RURAL	SS-R3/R4	SS – R7	SS – R6
A2	WELL	SWRSEP	DITCH	OH	SLI	RURAL	SS-R3/R4	SS – R7	SS – R6
RR1	WTR	SWRSEP	DTICH	OH	SLI	RURAL	SS-R3/R4	SS – R7	SS – R6
RR2	WTR	SWR	DITCH	OH	SLI	RURAL	SS-R3/R4	SS – R7	SS – R6
RR3	WTR	SWR	STM	UG	SL	URBAN	SS-R3/R4	SS – R7	SS – R6
RU1	WTR	SWR	STM	UG	SL	URBAN	SS-R3/R4	SS – R7	SS – R6
RU2	WTR	SWR	STM	UG	SL	URBAN	SS-R3/R4	SS – R7	SS – R6
RU3	WTR	SWR	STM	UG	SL	URBAN	SS-R3/R4	SS – R7	SS – R6
RU4	WTR	SWR	STM	UG	SL	URBAN	N/A	SS – R7	SS – R6
RU5	WTR	SWR	STM	UG	SL	URBAN	N/A	SS – R7	SS – R6
RU6	WTR	SWR	STM	UG	SL	URBAN	N/A	SS – R7	SS – R6
RM1	WTR	SWR	STM	UG	SL	URBAN	N/A	SS – R7	SS – R6
RM2	WTR	SWR	STM	UG	SL	URBAN	N/A	SS – R7	SS – R6
RM3	WTR	SWR	STM	UG	SL	URBAN	N/A	SS – R7	SS – R6
RM4	WTR	SWR	STM	UG	SL	URBAN	N/A	SS – R7	SS – R6
RM5	WTR	SWR	STM	UG	SL	URBAN	N/A	SS – R7	SS – R6
RM6	WTR	SWR	STM	UG	SL	URBAN	N/A	SS – R7	SS – R6
RM7	WTR	SWR	STM	UG	SL	URBAN	N/A	SS – R7	SS – R6
C1	WTR	SWR	STM	UG	SL	URBAN	N/A	SS – R5	SS – R6
C2	WTR	SWR	STM	UG	SL	URBAN	N/A	SS – R5	SS – R6
C3	WTR	SWR	STM	UG	SL	URBAN	N/A	SS – R5	SS – R6
C4	WTR	SWR	STM	UG	SL	URBAN	N/A	SS – R5	SS – R6
C5	WTR	SWR	STM	UG	SL	URBAN	N/A	SS – R5	SS – R6
C6	WTR	SWR	STM	UG	SL	URBAN	N/A	SS – R5	SS – R6

IN ACCORDANCE
WITH 'MAJOR
ROAD
NETWORK
PLAN'
CLASSIFICATION

	UTILITIES (REFER TO KEY SHEET)					STREET REQUIREMENTS (REFER TO STANDARD DRAWINGS)					
ZONE ⁽⁴⁾	WATER	SEWER	DRAIN	WIRING	LIGHTING	ROAD CHARACTER	ROAD CLASSIFICATION				
							LOCAL ⁽¹⁾	COLLECTOR ^{(1) (2)}			ARTERIAL ⁽¹⁾
								NO BIKE LANE	WITH BIKE LANE		
										IN ACCORDANCE WITH 'MAJOR ROAD NETWORK PLAN' CLASSIFICATION	
C7	WTR	SWR	STM	UG	SL	URBAN	N/A	SS – R5	SS – R6		
C8	WTR	SWR	STM	UG	SL	URBAN	N/A	SS – R5	SS – R6		
C9	WTR	SWR	STM	UG	SL	URBAN	N/A	SS – R5	SS – R6		
C10	WTR	SWR	STM	UG	SL	URBAN	N/A	SS – R5	SS – R6		
I1	WTR	SWR	STM	UG	SL	URBAN	N/A	SS – R5	SS – R6		
I2	WTR	SWR	STM	UG	SL	URBAN	N/A	SS – R5	SS – R6		
I3	WTR	SWRSEP	DITCH	OH	SLI	RURAL	N/A	SS – R5	SS – R6		
I4	WTR	SWR	STM	UG	SL	URBAN	N/A	SS – R5	SS – R6		
I5	WELL	SWRSEP	DITCH	OH	SLI	RURAL	N/A	SS – R5	SS – R6		
P1	WTR	SWR	STM	UG	SL	RURAL	N/A	SS – R5	SS – R6		
P2	WTR	SWR	STM	UG	SL	RURAL	N/A	SS – R7	SS – R6		
P3	WELL	SWRSEP	STM	W	SLI	RURAL	N/A	SS – R7	SS – R6		
P4	WELL	SWRSEP	STM	W	SL	RURAL	N/A	SS – R7	SS – R6		
W1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
W2	AS REQUIRED BASED ON DEVELOPMENT PROPOSAL					AS REQUIRED BASED ON DEVELOPMENT PROPOSAL					
CD ⁽³⁾	WTR	SWR	STM	UG	SL	URBAN	AS SPECIFIED IN EQUIVALENT ZONE		SS – R6		
CD12	WTR	SWR	STM	UG	SL	URBAN	N/A	SS – R5	SS – R6		

Notes: (1) Sidewalks: Urban Local: No sidewalk required.
Urban Collectors: Class 1, sidewalk on both sides, Class 2, sidewalk on one side.
Urban Arterial: Sidewalk on both sides.
Rural Roads: No sidewalks required.
Note: Sidewalks are required on any road fronting a school or major recreational facilities.

- (2) Where the collector road is on a bikeway route, as defined by the City's Bikeway Network Plan the road requirement will be based on Drawing Standard SS – R6.
- (3) Comprehensive Development Zones listed in Section 17 of the Zoning Bylaw, except the CD12 – Airport zone.
- (4) The zones identified in this table are the zones designated in the Zoning Bylaw. Properties with an 's' as part of the zoning designation shall comply with the works and services requirements of the parent zone (e.g. RU1s shall comply with the requirements of the RU1 zone.) Similarly properties with a 'b' or 'h' as part of the zoning designation shall comply with the works and services requirements of the parent zone (e.g. RU6b shall comply with the requirements of the RU6 zone and RU1h shall comply with the requirements of the RU1 zone).

DESIGN STANDARDS**7. HILLSIDE STREET STANDARDS**

- 7.1 General
- 7.2 Street Trees
- 7.3 Hillside Street Classification
 - 7.3.1 Arterial Streets
 - 7.3.2 Village Collector Streets ("Main Street")
 - 7.3.3 Collector Streets
 - 7.3.4 Minor Collector Streets
 - 7.3.5 Village Local Streets
 - 7.3.6 Local Streets
 - 7.3.7 Public Lanes
 - 7.3.8 Cul-de-Sac Streets and Hillside Emergency Accesses

LIST OF TABLES (located at back of section)

<u>NO.</u>	<u>TITLE</u>
Table 1	Hillside Street Standards
Table 2	Alignment Design Criteria

HILLSIDE STREET STANDARDS**7.1 General**

Where development lands receive hillside ("h") zoning, these standards may be utilized in place of the specific sections in the HIGHWAY DESIGN STANDARDS (Section 4 of this Schedule). The Hillside Street Standard drawings are included in Schedule 5, Section 2 (Drawings) of this Bylaw.

The hillside standards have been designed for environmental sensitivity with reduced physical impacts in mind. Generally, the street standards proposed herein have been drawn from the following principles:

- The public interest requires safe, liveable and attractive streets that contribute to the urban fabric;
- Streets should be designed to suit their function. Many streets, especially local ones, have purposes other than vehicular traffic;
- A hierarchical street network should have a rich variety of types, including bicycle, pedestrian and transit routes; and
- Standards should be developed to enhance local streets' contributions to urban design. Issues such as sense of enclosure, landscaping, parking, building setbacks, surface materials, street furniture, signs and street lighting are vital determinants of liveability in neighbourhoods.

These street standards have largely been designed for application under specific traffic volumes and development densities. Traffic volume determines which general street type (Arterial, Collector, Minor Collector, Local, etc.) is required to service an area and, in most cases, density of fronting development determines which specific street condition (“Condition A”, “Condition B”, “Condition C”, etc.) will be applied. In the case of Collector Streets, whether or not the street acts as a village centre “main street” is also a factor. For Arterial Streets, proximity to a village centre and local environmental conditions are the determinants of “condition” application.

Development that has direct public street access is defined as “fronting” the street. In other words, only those units that are oriented to the street are considered to “front” on it. This will most often occur in areas of fee-simple single family, mixed-use, or apartment development. Circumstances where strata units “front” onto a public street may also arise; however, strata and bareland strata developments will primarily be serviced by Private Streets. Standards for Public Lanes, Cul-de-sac Streets and Hillside Emergency Accesses are also included.

7.2 Street Trees

Street trees contribute to the liveability of a street. Trees modify the microclimate and foster a sense of comfort and safety for drivers and pedestrians by creating an edge between the sidewalk and the moving traffic. In hillside areas it is desired that the natural landscape be more prominent. While in some instances, such as along Arterials and Collectors and in a village centre, street trees are thought to be appropriate, even necessary, in other areas a more natural approach is desired, and the retention of natural vegetation is encouraged.

Therefore, those hillside street standards that will be applied to areas that will have a tighter “fit” to the natural landscape will not be required to incorporate street trees. For Minor Collector Streets and Local Streets street trees are considered optional. The planting of stands of native trees and vegetation is encouraged in these areas to contribute some of the elements of liveability that would otherwise be missed with the elimination of formal street tree plantings. Street trees and landscaping are to be to the satisfaction of the Parks Department.

A discussion of each class of street follows.

7.3 Hillside Street Classification – See Table 1

An overall plan is required allocating the location of each street type and its relationship to adjacent land uses proposed.

A discussion of each class of street follows.

7.3.1 Arterial Streets

Arterial streets provide a continuous drive path for inter-community through traffic. The Arterial corridors of hillside areas will be different in that, while they will continue to provide a throughway for automobiles, the experience will take on qualities of a scenic drive.

7.3.2 Village Collector Streets (“Main Street”)

Collector streets perform the dual function of land access and traffic movement between arterial and local roads. In the village centre the unique and very social function of this more localized type of street will be reflected in a more urban feel than will be found on collectors elsewhere throughout the site.

7.3.3 Collector Streets

Collector streets perform the dual function of land access and traffic movement between arterial and local roads; however, this more localized type of street plays a social as well as a functional role in the neighbourhood. Street design, therefore, must balance all objectives including, but not limited to, the need to provide a driving path for automobiles to access the neighbourhood.

7.3.4 Minor Collector Streets

There is the potential for some portions of Collector streets to experience lower traffic volumes. In these instances, Minor Collector streets will be utilized. Toward reducing the street section, a sidewalk will be provided on only one side of the street for all Minor Collectors.

7.3.5 Village Local Streets

The residential areas of the village centre will be more urban than those that will be found elsewhere within the Hillside areas. Narrow local streets with on-street parking and framed by street trees and sidewalks on both sides will provide a comfortable environment for all users in the neighbourhood. This condition is for use where development fronts at least one side of the street.

7.3.6 Local Streets

Local streets serve a multitude of functions that are important in the day-to-day lives of residents: residents walk their dogs on the street, they wash their cars on the street and they meet and talk to their neighbours on the street. Children play on the street, they learn to ride their bicycles on the street; they treat the street as an extension of the local neighbourhood park system. At this level, the street plays a very social role. Local street design, therefore, should continue to be sensitive to the needs of non-vehicle street users as well as seeking the best fit between street and landscape.

7.3.7 Public Lanes

Public Lanes are also used by the residents of a community as a venue for social interaction and play and they can contribute greatly to the fabric of a liveable community. One opportunity for their use, however, is in areas such as the village centre. Such higher density development is generally located in more gently sloping areas where steeply sloping terrain is not an issue. The inclusion of Public Lanes in these neighbourhoods will contribute to the more urban feel envisioned as well as provide an alternate route for bikes and pedestrians.

7.3.8 Cul-de-Sac Streets and Hillside Emergency Accesses

Some of the Local streets within complex topographic areas will take the form of a cul-de-sac. Generally, cul-de-sac streets are used where street connectivity is not possible (i.e. steep terrain) or not warranted (i.e. serves very few homes). Although the appropriate Local street standard will also apply to cul-de-sac streets, there are two additional street specifications unique to this street form that must be addressed in relation to liveability: permitted length and the design of the street turnaround.

In complex topographic areas long streets may be required to access developable pockets within areas of steep terrain. Due to the complex topography it will often not be advisable, or even possible, for connectivity to be achieved at both ends of a street.

Longer cul-de-sac streets will result and systems of branching cul-de-sacs will be established to access some areas of extremely difficult terrain. In response to public safety issues, it is desirable that emergency access routes to such areas are available – Hillside Emergency Access standards are included below. This is considered more acceptable from a liveability stance than requiring street connectivity in all situations as the lower standards required for an emergency access will result in a lesser impact to the hillside. Maintaining street connectivity wherever possible will remain a priority.

The radius of a cul-de-sac also plays a role in the liveability of a street. Laying a cul-de-sac requires a relatively large flat area. The larger this area is, the greater the impact to the landscape, particularly in complex topographic areas. Large cul-de-sacs can also decrease the social quality of a street by terminating the public corridor with a large, barren paved surface. A reduction of the cul-de-sac radius is feasible if parking is restricted in the cul-de-sac, which will ensure a large enough circumference for car turning. It is noted that provision must be made on a case by case basis for emergency vehicle turning.

Cul-de-sac

- ROW: min 13.0m radius;
- Radius to edge of paved surface: min 12.0m radius;
- Alternative types of street turnarounds will be considered for use based on site specific topographic conditions. In certain circumstances reduced cul-de-sac radii or hammer head type turnarounds will be permitted.
- Cul-de-sac streets may exceed the maximum length as specified by the City of Kelowna - mid-block turnarounds should be considered in this situation;
- A secondary emergency access must be provided for all public cul-de-sac streets that are in excess of the maximum length as specified by the City of Kelowna.

Hillside Emergency Access

- Maximum grade: 15%;
- 4.5m ROW; 4.5m roadway;
- Restrict non-emergency vehicles access through the use of removable bollards or gates;
- Shared use with pedestrian trails.

TABLE 1
Hillside Street Standards

Street Conditions		Street Section Specifications							
Street Type and Condition (Std Drawing number)	Max. Units Served	Design Speed ¹ (km/h)	Max. Grade (%)	ROW (m)	Street Width ² (m)	Parking	Curb & Gutter	Sidewalk ³	Street Trees
Arterial Streets		>600							
Condition A (median) (SS-H1)	within village centre where environmental conditions permit	60 (50) ⁴	8 (10) ¹¹	23.0	16.0 ⁵	none permitted	barrier curb required	required both sides ⁶	required both sides and in median
Condition B (SS-H2)	within 10-minute walking distance ⁷ of village centre; or, within village centre where environmental conditions do not permit the use of Condition A	60 (50) ⁴	8 (10) ¹¹	17.0 ⁸	10.0 ⁸	none permitted	barrier curb required	Required both sides ⁶	required both sides
Condition C (SS-H3)	greater than a 10-minute walking distance ⁷ from village centre.	60 (50) ⁴	8 (10) ¹¹	15.5 ⁸	10.0 ⁸	none permitted	barrier curb required	Required one side ⁶	required both sides
Village Collector Streets (main street)		600							
Condition A (SS-H4)	• where commercial development fronts street	50	10	20.8	12.8	required on-street both sides	barrier curb required	required both sides	required both sides
Condition B (SS-H5)	• where no commercial development fronts street	50	10	20.8	12.8	required on-street both sides	barrier curb required	required both sides	required both sides
Collector Streets		600							
Condition A (SS-H6)	• development ⁹ fronts both sides	50 (40) ⁴	10 (12) ¹¹	18.6 ⁸	8.6 ⁸	required above curb both sides	rollover curb required	required both sides ⁶	required both sides
Condition B (SS-H7)	• development ⁹ fronts one side only	50 (40) ⁴	10 (12) ¹¹	15.1 ⁸	8.6 ⁸	required above curb one side	rollover curb required ¹²	required one side ⁶	required both sides
Condition C (SS-H8)	• no development ⁹ fronts street	50 (40) ⁴	10 (12) ¹¹	14.1 ⁸	8.6 ⁸	none permitted ¹⁰	rollover curb required ¹²	required one side ⁶	required both sides
Minor Collector Streets		300							
Condition A (SS-H9)	• development ⁹ fronts both sides; or, • development ⁹ fronts one side only	50 (40) ⁴	10 (12) ¹¹	13.5 ⁸	7.0 ⁸	required above curb one side	rollover curb required	required one side ⁶	optional
Condition B (SS-H10)	• no development ⁹ fronts street	50 (40) ⁴	10 (12) ¹¹	12.5 ⁸	7.0 ⁸	none permitted ¹⁰	rollover curb required	required one side ⁶	optional

TABLE 1 (continued)
Hillside Street Standards

Street Conditions		Street Section Specifications							
Street Type and Condition (Std Drawing number)	Max. Units Served	Design Speed ¹ (km/h)	Max. Grade (%)	ROW (m)	Street Width ² (m)	Parking	Curb & Gutter	Sidewalk ³	Street Trees
Village Local Streets	100								
Village Local (SS-H11)	• development ⁹ fronts at least on side	40 (30) ⁴	12	16.7	8.7	required on-street both sides	barrier curb required	required minimum one side ⁶	required both sides
Local Streets	100								
Condition A (SS-H12)	• development ⁹ fronts both sides	40 (30) ⁴	12	14.5	6.0	required above curb both sides	rollover curb required	optional one side ⁶	optional
Condition B (SS-H13)	• development ⁹ fronts one side only	40 (30) ⁴	12	12.5	6.0	required above curb one side	rollover curb required	optional one side ⁶	optional
Condition C (SS-H14)	• no development ⁹ fronts street	40 (30) ⁴	12	10.5	6.0	none permitted ¹⁰	rollover curb required	optional one side ⁶	optional
Public Lane	--								
(SS-H15)	• all cases	20	12 (15) ¹¹	6.0	5.7	on edge of paved surface	rollover curb required	none	--
Hillside Emergency Vehicle Access	--								
• provide a secondary access route, if possible, where a cul-de-sac exceeds maximum street length as specified by the City of Kelowna		--	15	4.5	4.5	--	--	--	--

Footnotes:

1. See Table 2 for alignment design criteria for each design speed.
2. Street width measured from curb face (gutterline).
3. For all conditions, sidewalks should terminate at a destination or connect with another sidewalk or trailhead.
4. Minimum permitted design speed reduction, where necessary due to topographic constraints, and approved by the City.
5. Separate left turn lanes to be provided in the medians.
6. Where issues of livability warrant, (eg. extreme topographic conditions) sidewalk(s) may be located in a separate dedicated corridor and street ROW width reduced accordingly. Unless necessary for pedestrian connectivity to schools, parks, commercial areas or land beyond, a sidewalk is not required for local streets accessing 30 lots or less. Street right of way may be reduced accordingly if a sidewalk is not required. (see Standard Drawings)
7. For this purpose, the 10-minute walking distance is considered to be ½ mile (0.8 km).
8. Where required, ROW and street widths will be increased at major intersections to provide for separate turning lanes.
9. “Development” includes all residential, mixed-use, commercial, institutional and park uses.
10. All parking shall be managed on-site or within small parking pullouts, as required.
11. Maximum grade permitted where necessary due to topographic constraints and as approved by the City.
12. Where no fronting development (driveway access not required), barrier curbs to be considered to restrict illegal parking on sidewalks.

Table 2
Alignment Design Criteria

1. Horizontal Curve Radii				
Criteria	60 km/h	50 km/h	40 km/h	30 km/h
Roadway Crossfall				
normal crown (-2%)	260m	165m	90m	45m
2% superelevation	205m	120m	65m	30m
4% superelevation	150m	80m	45m	22m
6% superelevation	120m	-	-	-
Through Intersections	200m	120m	70m	40m
2. Superelevation				
Criteria	60 km/h	50 km/h	40 km/h	30 km/h
Maximum Superelevation	6%	4%	4%	4%
Maximum Superelevation at Intersections	4%	4%	4%	4%
3. Superelevation Transition Lengths				
Criteria	60 km/h	50 km/h	40 km/h	30 km/h
Transition Lengths (2 / 4-lane roadways)				
normal crown to +2%	24m / 36m	22m / 34m	20m	20m
normal crown to +4%	38m / 54m	33m / 50m	30m	30m
normal crown to +6%	48m / 72m	-	-	-
Min Tangent Length between reversing				
2% superelevation (2 / 4-lane	15m / 22m	13m / 20m	12m	12m
4% superelevation	28m / 42m	26m / 40m	24m	22m
6% superelevation	42m / 64m	-	-	-
1	Values for transition lengths include tangent runoff applied at the same rate as superelevation runoff.			
2	60% of superelevation runoff occurs on the tangent approach and 40% on the curve, resulting in a minimum length of tangent between reversing curves of 120% of the superelevation runoff length.			

Table 2 (continued)
Alignment Design Criteria

4. Gradients				
Criteria	60 km/h	50 km/h	40 km/h	30 km/h
Minimum Grade	0.5%	0.5%	0.5%	0.5%
Maximum Grades				
on horizontal tangents	8% ¹	10% ²	12%	12%
on minimum radius horizontal curves ³	8%	9%	10%	10%
Grades Through Intersections				
with design speed on major road	8%	8%	8%	-
approach distance for major road ⁴	15 / 5m ⁵	5m	0m	-
with design speed on minor road	5% ⁶	5%	6%	6%
approach distance for minor road ⁷	20m	15m	5m	5m
1 Under special circumstances, grades up to 10% may be permitted. 2 Under special circumstances, grades up to 12% may be permitted. 3 Applies where radius is less than 1.5 times minimum allowable radius. 4 Minimum distance back from the gutter line of the minor road that the specified grade may not be exceeded. 5 Distances for design road approach to intersection with collector road / local road. 6 4% desirable. 7 Minimum distance back from the gutter line of the major road that the specified grade may not be exceeded.				
5. Vertical Curve K Values				
Criteria	60 km/h	50 km/h	40 km/h	30 km/h
Minimum Crest	15	8	4	2
Minimum Sag	10	7	4	2
Crest / Sag on approach to stop	4	3	2	2
<i>K values listed assume that new roadways will be illuminated</i>				
6. Stopping Sight Distances				
Criteria	60 km/h	50 km/h	40 km/h	30 km/h
Down grades: 12%	109	78	52	34
9%	101	73	50	32
6%	94	69	48	31
3%	89	66	46	30
0%	85	63	45	30
Up grades: 3%	81	61	44	29
6%	78	59	42	29
9%	76	57	41	28
12%	73	56	40	28
7. Decision Sight Distance				
Minimum decision sight distance for 60 km/h: 175m – 235m.				
1. Note that decision sight distance applies only to multi-lane roads at intersections. 2. The range of values recognizes the variation in complexity that occurs at various sites. For less complex situations, values towards the lower end of the range are appropriate and for more complexity, values at the upper end are used.				

CITY OF KELOWNA STANDARD DRAWINGS INDEX AND CROSS-REFERENCE TO MMCD

MMCD Standard Drawings		City of Kelowna Standard Drawings		
Dwg.	Title	Comment	Dwg.	Title
	GENERAL DETAILS			
G1	General Legend for Contract Drawings	Deleted		<i>(Per City A-size Drawing Block)</i>
G2	Legend for Materials	MMCD	G2	Legend for Materials
G3	Legend for Street Light and Traffic Signal Drawings	Deleted		<i>(Future Amendment – Refer to Utility)</i>
G4	Utility Trench	Replaced	SS-G4	Utility Trench
G5	Pavement Restoration	MMCD	G5	Pavement Restoration
G6	Concrete Encasement for Water Main/Sewer Separation	MMCD	G6	Concrete Encasement for Water Main/Sewer Separation
G7	Concrete Protection for Underground Utilities	MMCD	G7	Concrete Protection for Underground Utilities
G8	Pipe Anchor Blocks	MMCD	G8	Pipe Anchor Blocks
	STORM AND SANITARY SEWERS			
S1	Standard and Sump Manholes	Replaced	SS-S1a SS-S1b	Manholes Manhole Frame and Cover
S2	Standard Manhole Connection Details	Replaced	SS-S1a	Manholes
S3	Manhole Connection Details – Drop and Ramp Type	MMCD	S3	Manhole Connection Details – Drop and Ramp Type
S4	Inside Drop Manhole	MMCD	S4	Inside Drop Manhole
S5	Precast Riser Manhole	MMCD	S5	Precast Riser Manhole
S6	Sewer Clean-Out	Replaced	SS-S6	Clean-Out Detail (Temporary)
S7	Sanitary Sewer Service Connection	MMCD	S7	Sanitary Sewer Service Connection
S8	Storm Sewer Service Connection	MMCD	S8	Storm Sewer Service Connection
S9	Inspection Chamber for 100 to 200 Sanitary Sewer Connection	MMCD	S9	Inspection Chamber for 100 to 200 Sanitary Sewer Connection
S10	Inspection Chamber for 250 to 375 Storm Sewer Connection	MMCD	S10	Inspection Chamber for 250 to 375 Storm Sewer Connection

MMCD Standard Drawings		City of Kelowna Standard Drawings		
Dwg.	Title	Comment	Dwg.	Title
S11	Top Inlet Catch Basin	Replaced	SS-S11a SS-S11b SS-S11c	Catch Basin 900 mm diameter Catch Basin Castings Combined Side and Gutter Inlet Catch Basin – Top Slabs
S12	Lawn Drains	MMCD	S12	Lawn Drains
S13	Storm Sewer Inlet with Safety Grillage	MMCD	S13	Storm Sewer Inlet with Safety Grillage
S14	Concrete Block Endwall	MMCD	S14	Concrete Block Endwall
S15	Driveway Culvert with Concrete Block Endwalls	MMCD	S15	Driveway Culvert with Concrete Block Endwalls
		Added	SS-S50	Manhole Requirement for Services
		Added	SS-S51	Drainage Drywell
		Added	SS-S52	Drainage Drywell Installation
		Added	SS-S53	Pipe Perforation and Bedding Detail for Ground Water Recharge
		Added	SS-S54	Catch Basin Trapping Hood
	WATERWORKS			
W1	Typical Thrust Block Arrangements	MMCD	W1	Typical Thrust Block Arrangements
W2a	Water Service Connection	Replaced	SS-W2	Water Service Connection
W2b	Water Service Connection	Replaced	SS-W2	Water Service Connection
W3	Gate Valve Installation	MMCD	W3	Gate Valve Installation
W4	Fire Hydrant Installation	Replaced	SS-W4	Hydrant
W5	Test Point Installation	MMCD	W5	Test Point Installation
W6	Air Valve Assemblies – 25 and 50 mm Valves	MMCD	W6	Air Valve Assemblies – 25 and 50 mm Valves
W7	Air Valve Assembly – 100 mm Valve	MMCD	W7	Air Valve Assembly – 100 mm Valve
W8	Blow-Off for Water Main	MMCD	W8	Blow-Off for Water Main
W9	Blow – Down Chamber	MMCD	W9	Blow – Down Chamber
W10	Waterworks Chamber Drain	MMCD	W10	Waterworks Chamber Drain
		Added	SS-W50	Irrigation Service
		Added	SS-W51	Joint Restraint Detail (Pipe Crossing Conflict)

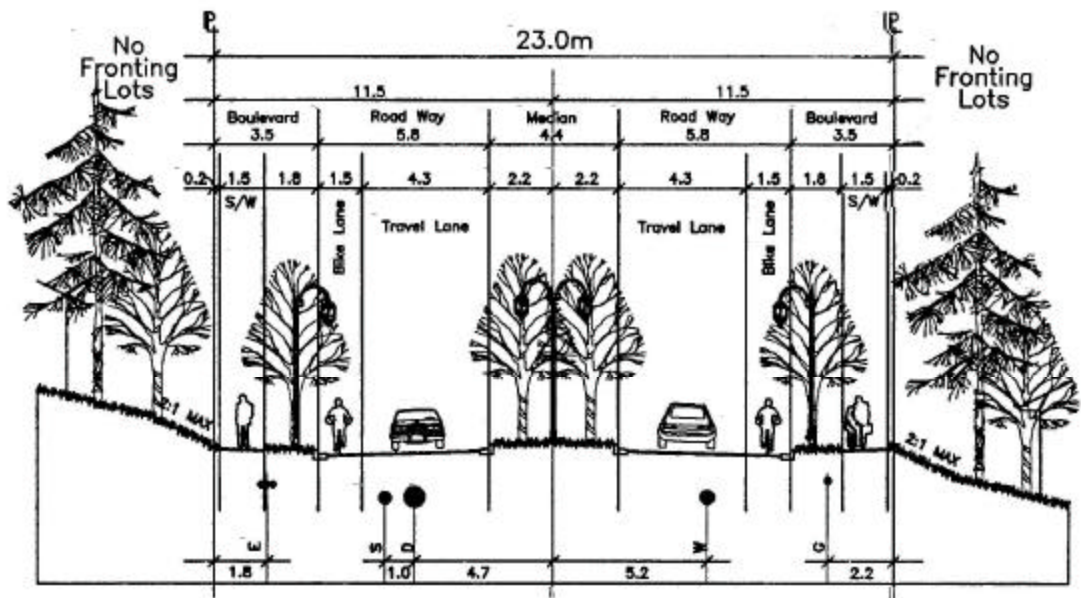
MMCD Standard Drawings		City of Kelowna Standard Drawings		
Dwg.	Title	Comment	Dwg.	Title
	CONCRETE AND MISCELLANEOUS DETAILS			
C1	Concrete Sidewalk, Infill and Barrier Curb	MMCD	C1	Concrete Sidewalk, Infill and Barrier Curb
C2	Concrete Sidewalk and Barrier Curb	MMCD	C2	Concrete Sidewalk and Barrier Curb
C3	Concrete Sidewalk and Roll-Over Curb	MMCD	C3	Concrete Sidewalk and Roll-Over Curb
C4	Concrete Curbs – Narrow Base	Partial Change	SS-C4 and C4	Concrete Curb – Barrier Curb with Gutter (NOTE: For Roll-Over Curb use MMCD C4)
C5	Concrete Curbs – Wide Base	MMCD	C5	Concrete Curbs – Wide Base
C6	Concrete Median Curb and Interim Curbs	MMCD	C6	Concrete Median Curb and Interim Curbs
C7	Driveway Crossing for Barrier Curbs	MMCD	C7	Driveway Crossing for Barrier Curbs
C8	Wheelchair Ramp for Sidewalk, Infill and Barrier Curbs	MMCD	C8	Wheelchair Ramp for Sidewalk, Infill and Barrier Curbs
C9	Wheelchair Ramp for Sidewalk and Barrier Curbs	MMCD	C9	Wheelchair Ramp for Sidewalk and Barrier Curbs
C10	Concrete Walkway	Replaced	SS-R28	Walkway Gate
C11	Bicycle Baffle	Replaced	SS-R28	Walkway Gate
C12	Removable Restriction Post	Replaced	SS-R28	Walkway Gate
C13	Chain Link Fence for Walkway	MMCD	C13	Chain Link Fence for Walkway
C14	Handrail on Concrete Retaining Wall	MMCD	C14	Handrail on Concrete Retaining Wall
C15	Concrete Block Retaining Wall	MMCD	C15	Concrete Block Retaining Wall
	ROAD WORKS			
R1	Paved Shoulders	MMCD	R1	Paved Shoulders
		Added	SS-R2	Lanes and Emergency and Private Access Roads
		Added	SS-R3	Local – Class 1 (18 m)
		Added	SS-R4	Local – Class 2 (15 m)
		Added	SS-R5	Collector – Class 1 (20 m)
		Added	SS-R6	Collector – Class 1 with Bike Lanes (22 m)
		Added	SS-R7	Collector – Class 2 (20 m)

MMCD Standard Drawings		City of Kelowna Standard Drawings		
Dwg.	Title	Comment	Dwg.	Title
	<u>ROAD WORKS (Cont'd)</u>			
		Added	SS-R8	Arterial – Class 1 Parkway, 4(6) Lanes (35 m)
		Added	SS-R9	Arterial – Class 1 Parkway, 2(4) Lanes (30 m)
		Added	SS-R10	Arterial – Class 1 Rural, 2(4) Lanes (30 m)
		Added	SS-R11	Arterial – Class 2 Residential, 4 Lanes (30 m)
		Added	SS-R12	Arterial – Class 2 Residential, One Way – 3 lanes (20 m)
		Added	SS-R13	Arterial – Class 2 Rural, 2 lane (20 m)
		Added	SS-R14	Arterial – Class 3 Town Centre 4 Lane (28 m)
		Added	SS-R15	Arterial – Class 3 Town Centre, One Way – 3 lanes (25 m)
		Added	SS-R16	Arterial – Class 3 – 2 lane (28 m)
		Added	SS-R17	15 m Local cul-de-sac
		Added	SS-R20	Left Turn Lane (Raised Median)
		Added	SS-R21	Left Turn Lane (Painted) and Two-Way Left Turn Lane
		Added	SS-R22	Curbed Driveway Widths
		Added	SS-R23	Concrete Drainage Swale Across Asphalt
		Added	SS-R24	Density Payment Adjustment Chart
		Added	SS-R25	Noise Mitigation Criteria
		Added	SS-R26	Hydrants and Poles Near Ditches
		Added	SS-R27	Street Name and Stop Sign Standards
		Added	SS-R28	Walkway Gate
		Added	SS-H1	Arterial Condition –A (Village Parkway)
			SS-H2	Arterial Condition B (With 0.8 km Walking Distance of Village)
			SS-H3	Arterial Condition C (Greater than 0.8 km Walking Distance of Village)
			SS-H4	Village Collector Condition A (Retail/M.F. Fronting)
			SS-H5	Village Collector Condition B (No Retail Fronting)
			SS-H6	Collection Condition A (Development Both Sides)
			SS-H7	Collector Condition B (Development One Side)
			SS-H8	Collector Condition C – (No Development Either Side)

MMCD Standard Drawings		City of Kelowna Standard Drawings		
Dwg.	Title	Comment	Dwg.	Title
	<u>ROAD WORKS</u> (Cont'd)			
			SS-H9	Minor Collector Condition A
			SS-H10	Minor Collector Condition B
			SS-H11	Village Local – Residential
			SS-H12	Local Condition A (Development Both Sides)
			SS-H13	Local Condition B (Development One Side)
			SS-H14	Local Condition C (No Development Either Side)
			SS-H15	Public Land
	ELECTRICAL AND TRAFFIC SIGNAL DETAILS			<i>(Future Amendment – Refer to Utility)</i>

STANDARD DETAIL DRAWINGS

HILLSIDE ZONE STANDARDS



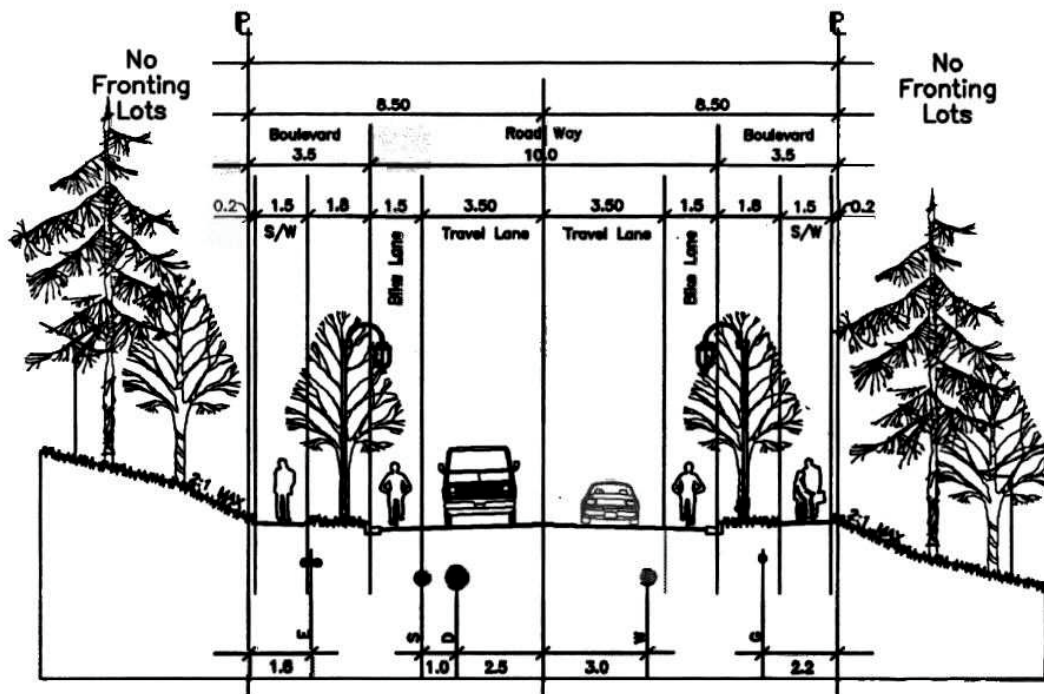
\\VU\DRAWING\STD-DWG\MMCD-STD\HILLSIDE\SS-H1.DWG

ARTERIAL CONDITION-A
(VILLAGE PARKWAY)

OCT. 01/01

SS-H1

STANDARD DETAIL DRAWINGS



ARTERIAL CONDITION B
(WITH 0.8 KM WALKING DISTANCE OF VILLAGE)

SS-H2

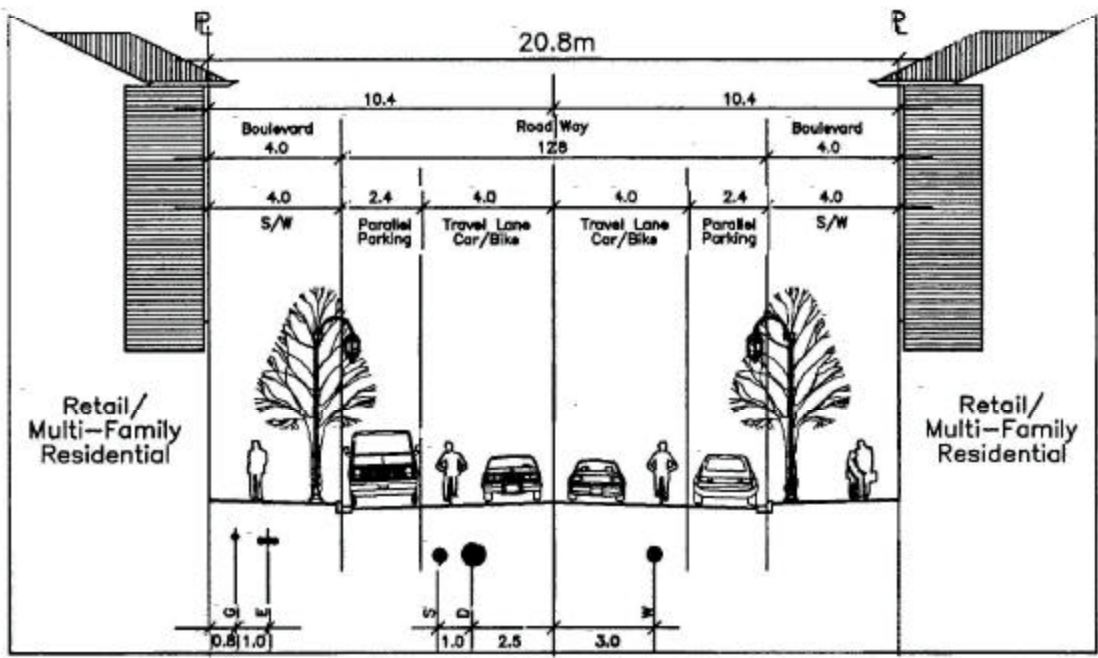
OCT. 01/01

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OCT. 01/01

STANDARD DETAIL DRAWINGS

HILLSIDE ZONE STANDARDS



\\VU\DRAWING\STD-CMG\MAKCO-STD\HILLSIDE\SS-H4.DWG

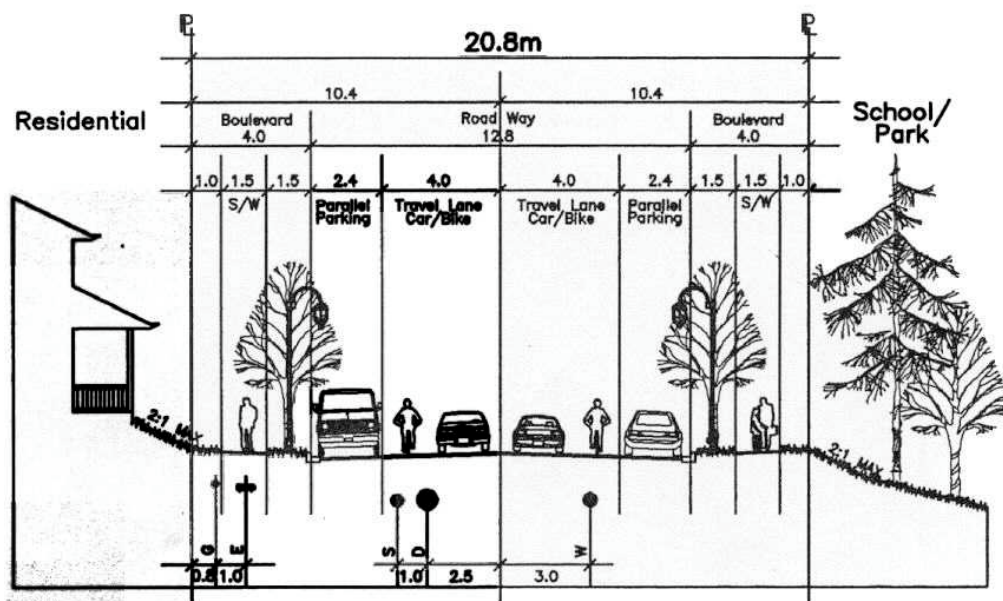
VILLAGE COLLECTOR CONDITION A
(RETAIL/M.F. FRONTING)

OCT. 01/01

SS-H4

STANDARD DETAIL DRAWINGS

HILLSIDE ZONE STANDARDS



\\WU\DRAWING\STD-ORIG\MAK-STD\HILLSIDE\SS-H5.DWG

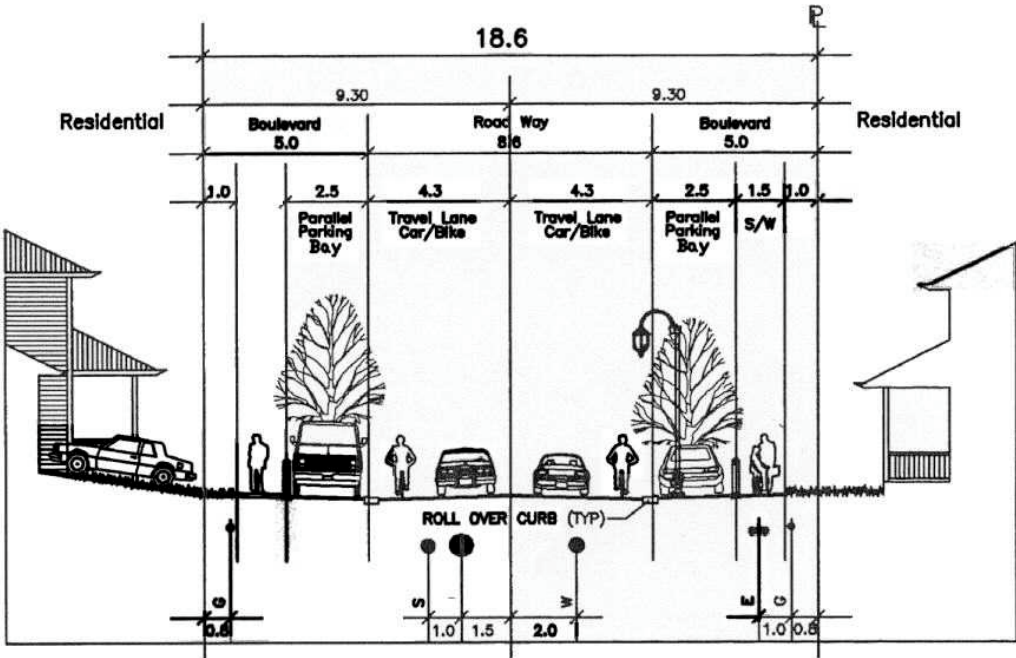
VILLAGE COLLECTOR CONDITION B
(NO RETAIL FRONTING)

OCT. 01/01

SS-H5

STANDARD DETAIL DRAWINGS

HILLSIDE ZONE STANDARDS



\\VIA\DRAWING\STD-DWG\MAJOR-STD\HILLSIDE\SS-H6.DWG

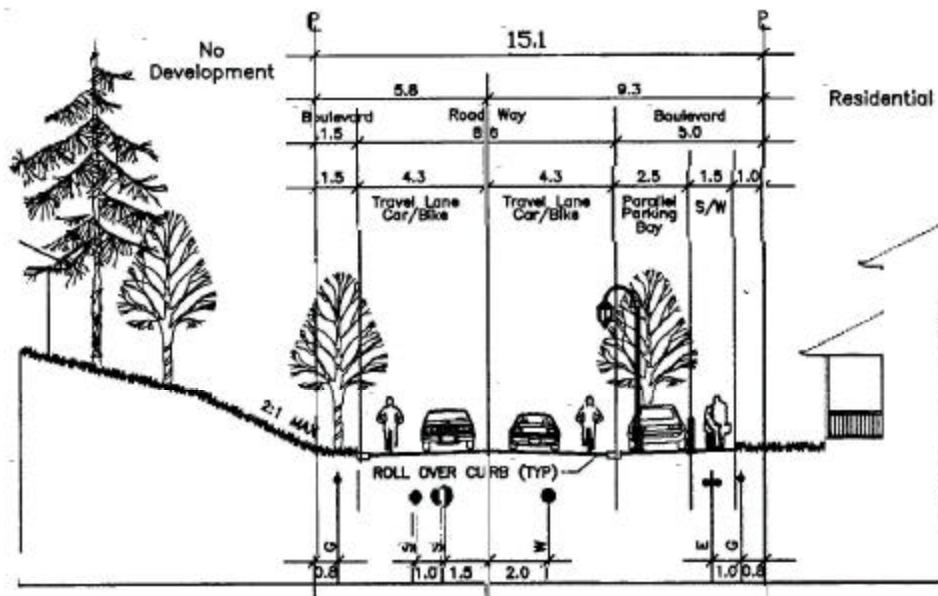
COLLECTOR CONDITION-A
(DEVELOPMENT BOTH SIDES)

OCT. 01/01

SS-H6

STANDARD DETAIL DRAWINGS

HILLSIDE ZONE STANDARDS



COLLECTOR CONDITION-B
(DEVELOPMENT ONE SIDE)

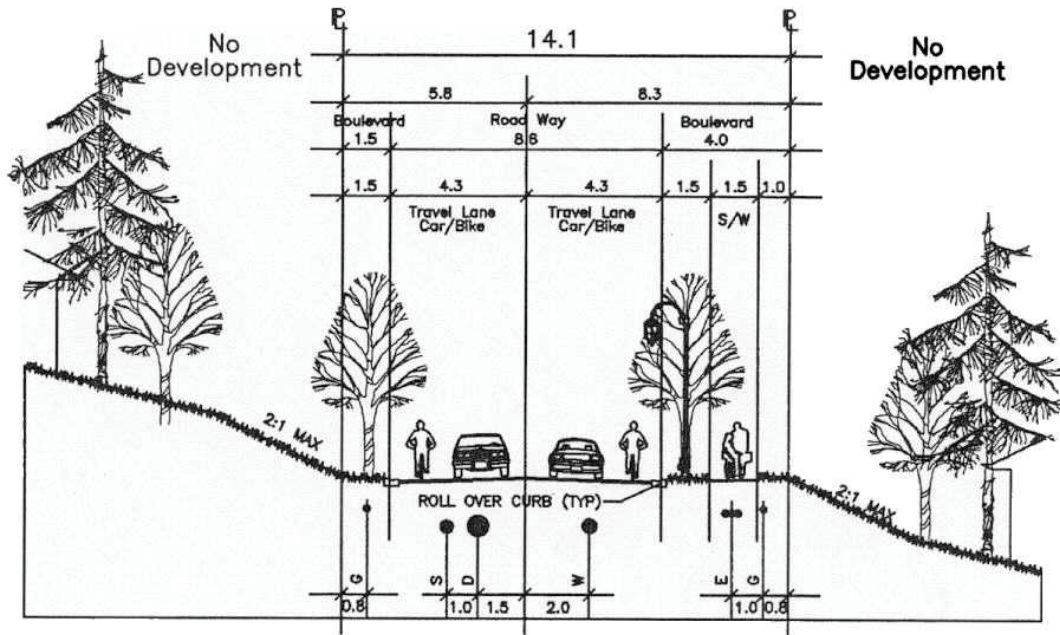
OCT. 01/01

SS-H7

\\WA\DRAWING\STD-DWG\MAJCD-STD\HILLSIDE\SS-H7.DWG

STANDARD DETAIL DRAWINGS

HILLSIDE ZONE STANDARDS



COLLECTOR CONDITION-C
(NO DEVELOPMENT EITHER SIDE)

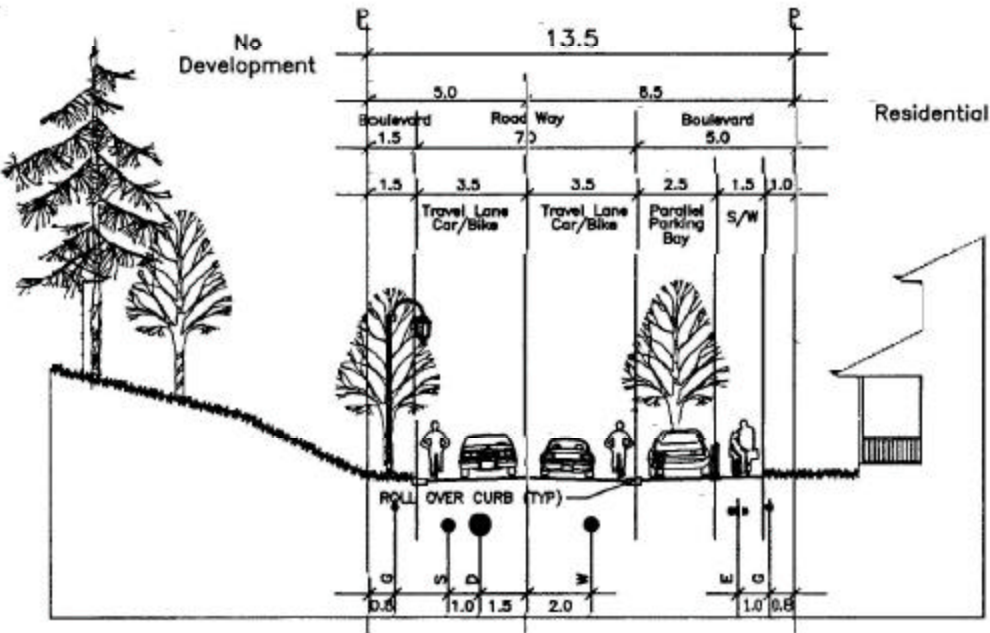
SS-H8

OCT. 01/01

\\WA\DRAWING\STD-DWG\MACD-STD\1 SIDE\SS-H8

STANDARD DETAIL DRAWINGS

HILLSIDE ZONE STANDARDS



\\VIA-DRAFTING\STD-CWG\WOOD-STD\HILLSIDE-SS-H9.DWG

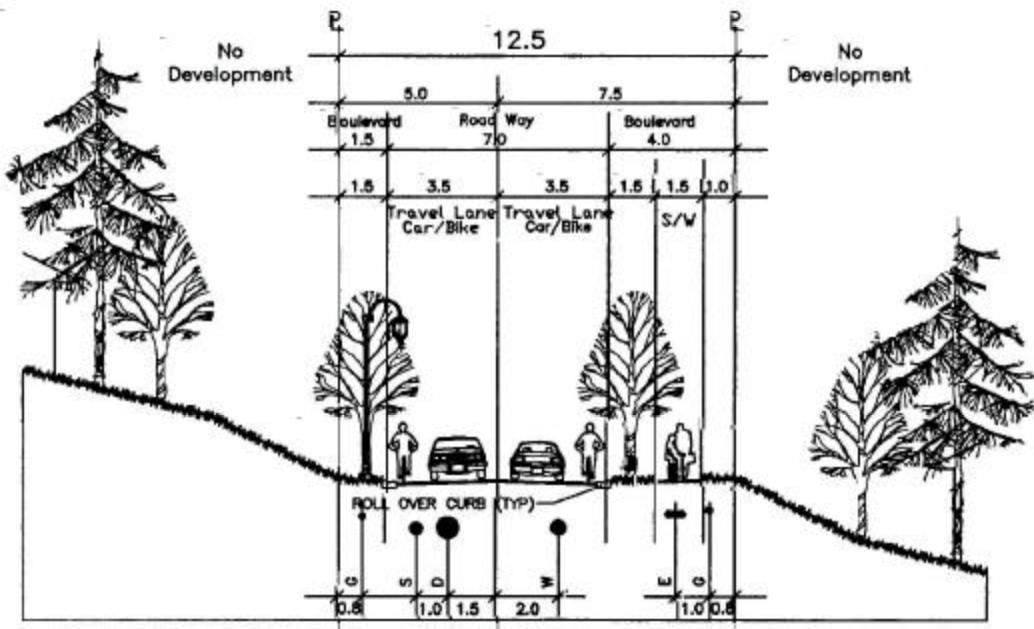
MINOR COLLECTOR CONDITION -A

OCT. 01/01

SS-H9

STANDARD DETAIL DRAWINGS

HILLSIDE ZONE STANDARDS



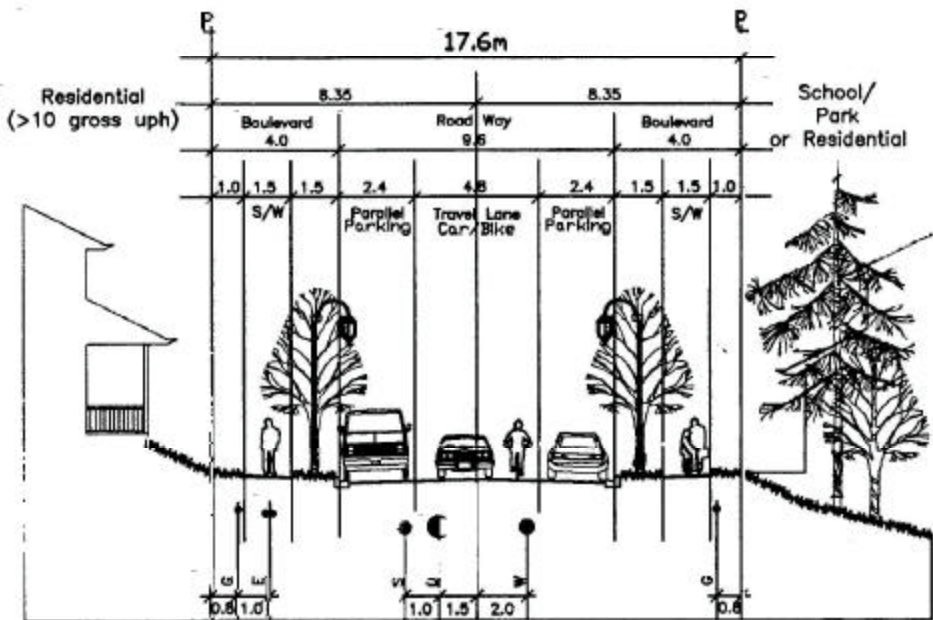
MINOR COLLECTOR CONDITION-B

OCT. 01/01

SS-H10

STANDARD DETAIL DRAWINGS

HILLSIDE ZONE STANDARDS



W:\DRAFTING\STD-DWG\AMCO-STD\HILLSIDE\SS-H11.DWG

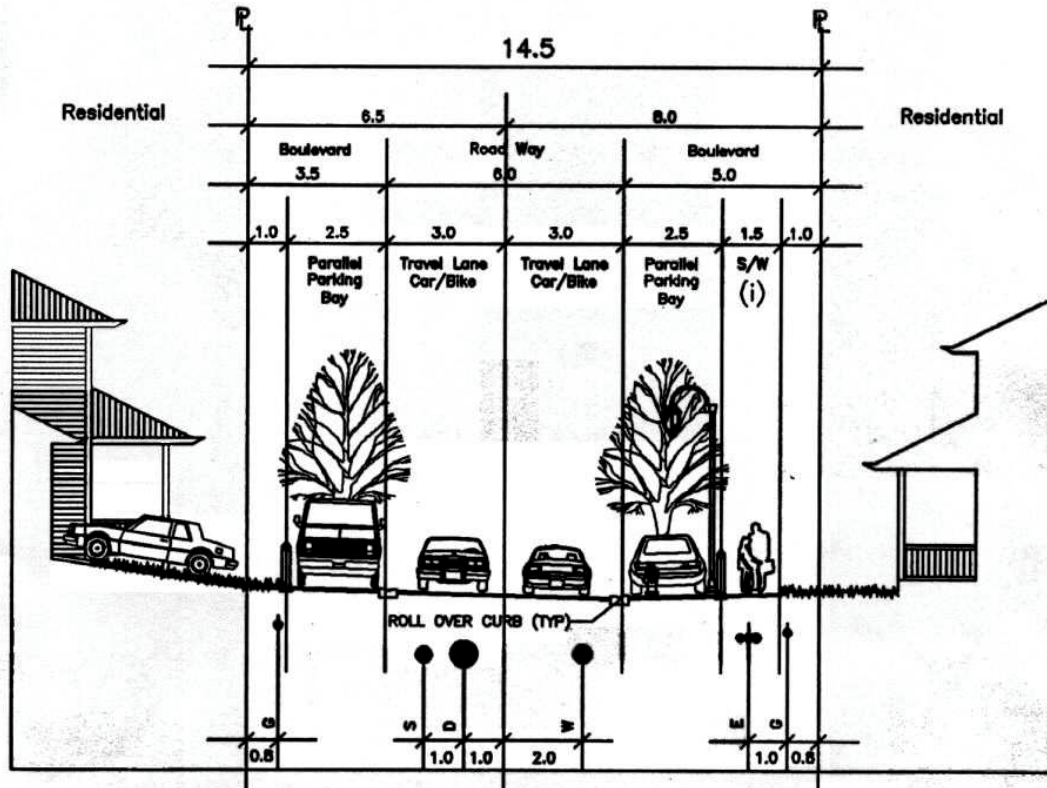
VILLAGE LOCAL-RESIDENTIAL

SS-H11

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STANDARD DETAIL DRAWINGS

HILLSIDE ZONE STANDARDS



(i) UNLESS NECESSARY FOR PEDESTRIAN CONNECTIVITY TO SCHOOLS, PARKS, COMMERCIAL AREAS OR LANDS BEYOND, A SIDEWALK IS NOT REQUIRED FOR LOCAL STREETS ACCESSING 30 LOTS OR LESS. THE STREET ROW WIDTH MAY BE REDUCED ACCORDINGLY IF SIDEWALK IS NOT REQUIRED. (SEE TABLE 1)

LOCAL-CONDITION A
(DEVELOPMENT BOTH SIDES)

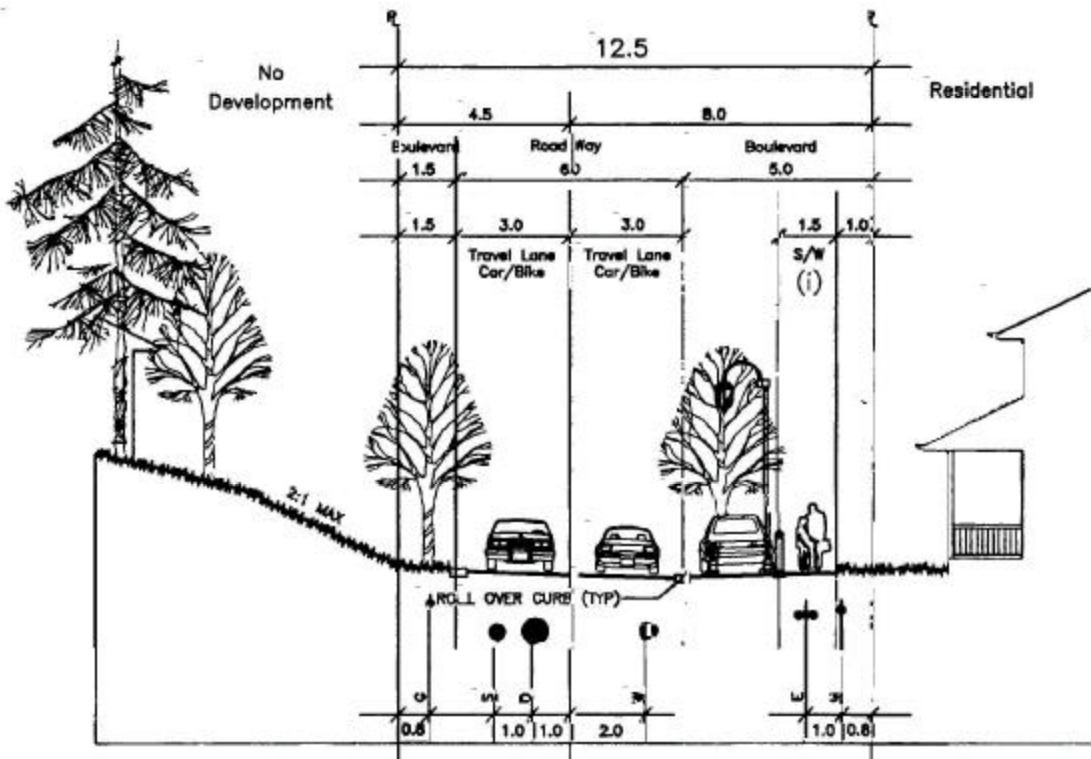
SS-H12

OCT. 01/01

W:\A DRAFTING\1-DWG\MAJOR-STUD\HILLSIDE\SS-H12.DWG

STANDARD DETAIL DRAWINGS

HILLSIDE ZONE STANDARDS



- (i) UNLESS NECESSARY FOR PEDESTRIAN CONNECTIVITY TO SCHOOLS, PARKS, COMMERCIAL AREAS OR LANDS BEYOND, A SIDEWALK IS NOT REQUIRED FOR LOCAL STREETS ACCESSING 30 LOTS OR LESS. THE STREET ROW WIDTH MAY BE REDUCED ACCORDINGLY IF SIDEWALK IS NOT REQUIRED. (SEE TABLE 1)

LOCAL CONDITION B
(DEVELOPMENT ONE SIDE)

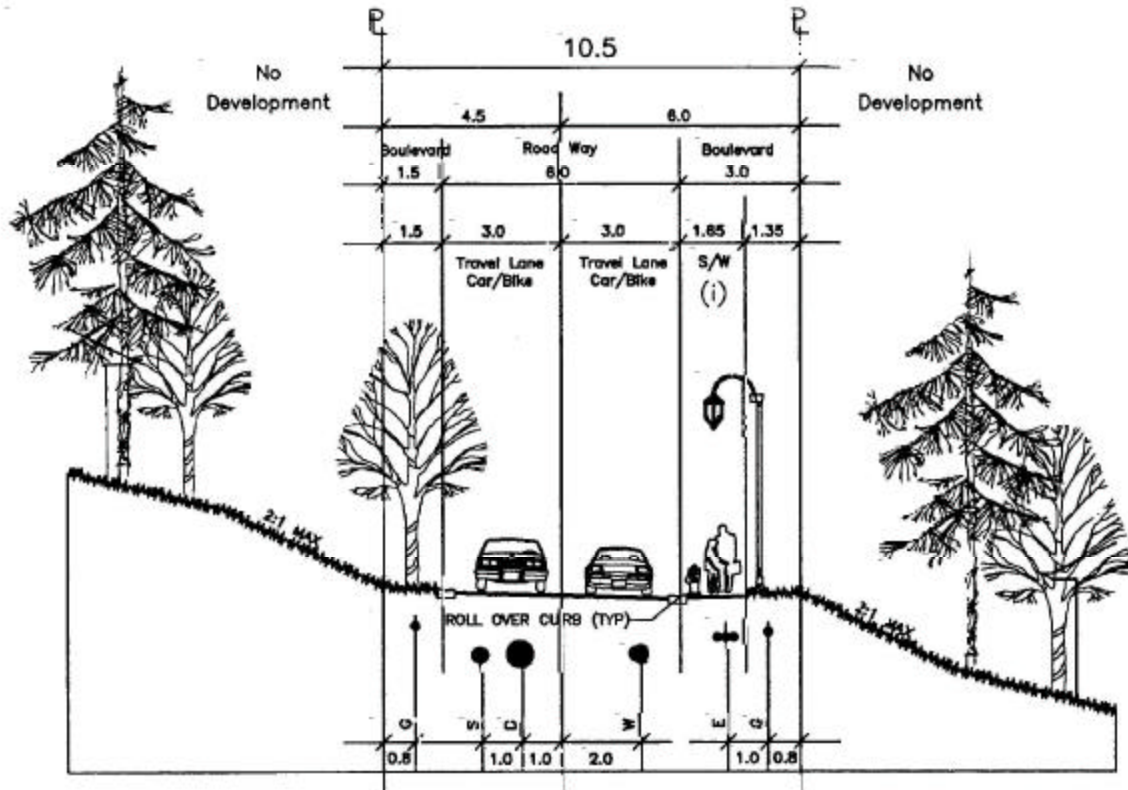
SS-H13

OCT. 01/01

\\NA\DRAWING\STD-CW\NA\SS-H13.DWG

STANDARD DETAIL DRAWINGS

HILLSIDE ZONE STANDARDS



- (i) UNLESS NECESSARY FOR PEDESTRIAN CONNECTIVITY TO SCHOOLS, PARKS, COMMERCIAL AREAS OR LANDS BEYOND, A SIDEWALK IS NOT REQUIRED FOR LOCAL STREETS ACCESSING 30 LOTS OR LESS. THE STREET ROW WIDTH MAY BE REDUCED ACCORDINGLY IF SIDEWALK IS NOT REQUIRED. (SEE TABLE 1)

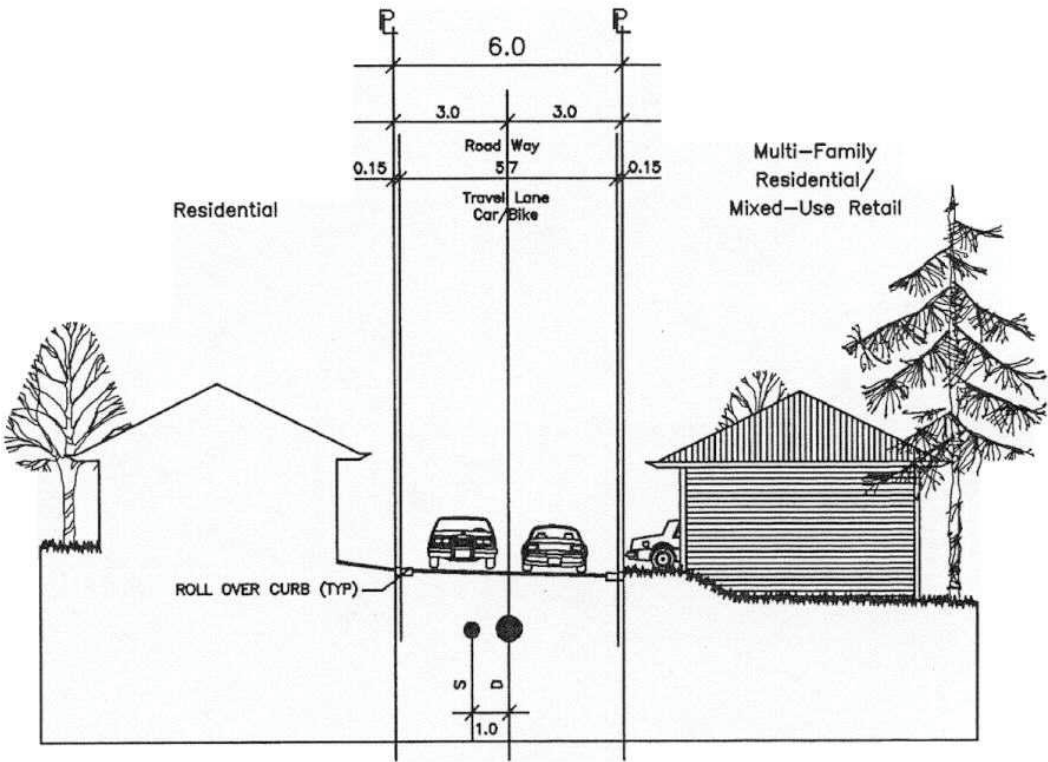
LOCAL CONDITION C
(NO DEVELOPMENT EITHER SIDE)

SS-H14

OCT. 01/01

STANDARD DETAIL DRAWINGS

HILLSIDE ZONE STANDARDS



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PUBLIC LANE

OCT. 01/01

SS-H15