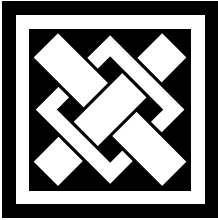


APPENDIX D



HILLSIDE STREET STANDARDS

CITY OF KELOWNA
HILLSIDE STREET STANDARDS

BYLAW No. 8712

ADOPTED NOVEMBER 2001

PREPARED FOR
THE CITY OF KELOWNA

PREPARED BY

EKISTICS

WITH THE ASSISTANCE OF
INTERCAD SERVICES LTD.

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 15th day of October, 2001.

Read a second and third time as amended by the Municipal Council this 5th day of November, 2001.

Adopted by the Municipal Council of the City of Kelowna this

Mayor

City Clerk

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

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<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	15.0 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	20.0	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	20.0	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	18.2 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	14.9 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	14.0 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	13.3 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	12.4 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)	<ul style="list-style-type: none"> development⁹ fronts at least on side 	40 (30) ⁴	12	17.4	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)	<ul style="list-style-type: none"> development⁹ fronts both sides 	40 (30) ⁴	12	14.1	6.0	required above curb both sides	rollover curb required	optional one side ⁶	optional
Condition B (SS-H13)	<ul style="list-style-type: none"> development⁹ fronts one side only 	40 (30) ⁴	12	12.3	6.0	required above curb one side	rollover curb required	optional one side ⁶	optional
Condition C (SS-H14)	<ul style="list-style-type: none"> no development⁹ 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)	<ul style="list-style-type: none"> all cases 	20	12 (15) ¹¹	6.0	5.7	on edge of paved surface	rollover curb required	none	--
Hillside Emergency Vehicle Access		--							
<ul style="list-style-type: none"> 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.