CP000772 Ruisseau Park Ravine Rehabilitation:
Summary of changes between functional design (Class EA) and detailed design

Item No.	Description	Functional Design	Detailed Design	Reason For Change
1	**Channel realignment and hardening**	Included approximately 185m of channel hardening and realignment. No Channel hardening between weirs No. 1 & 2 or weirs No. 5 & 6	Continuous channel hardening and realignment between weir No. 1 and weir 6 (additional 75m).	Additional channel hardening and realignment is necessary due to worsening site conditions and drastically increased erosion along the existing channel in the last 2 years. The channel hardening and re-grading is a long-term solution to the creek bed / slope erosion.
2	**Log wall at downstream bends in creek**	Landscaping log wall protection at two downstream bends in the existing creek channel	The proposed channel realignment extends downstream between weirs No. 5 and No. 6.	Log walls are now redundant with the creek realignment extending through this area.
3	**Location of weir No. 1**	Location of weir No. 1 shown in line with the property line of 17/19 Sprucewood Place	Weir No. 1 proposed 12m upstream of the location shown in the functional design	Shift is necessary due to continued erosion along the creek bed and at the root ball of a mature tree that has been undermined at the location.
4	**Creek hardening material**	Creek realignment cross section - 400mm thick rip-rap (30cm in diameter).	Rip-rap reduced to 250mm (15cm in diameter).	As the project has progressed from the concept design stage into detailed design we have undertaken more detailed hydraulic analysis. The flow velocities determined through this analysis support the use of the 250mm thickness and smaller diameter stone mix. This rip-rap will also improve vegetation re-establishment in the channel.
5	**Slope stability repairs / Rehabilitations**	Clay backfill indicated for slope stability repairs.	Engineered backfill with layered geogrid at slope stability repairs	The clay backfill proposed in the functional design is not suitable due to it's expansive properties and susceptibility under seismic conditions (earthquake checks). A system of engineered fill and layered geogrid is required to provide a stable slope rehabilitation.
6	**Tree planting on slope repair areas**	Tree plantings indicated throughout the side slopes of slope repair areas	No trees proposed on the engineered backfill at slope stability repairs. Instead, small vegetation is proposed with erosion protection measures.	Tree plantings on top of slope repair areas are not advisable due to conflict with the tree pits and the geogrid system that reinforces the slope. Additional tree plantings are supplemented in the surrounding areas where possible. New tree plantings within the project area will be maximized to the extent possible.
7	**Geometry of rock weir and pool structures**	Rock weir/pool structure approximately 10m long.	Rock weir/pool structure approximately 15m long.	The extended ramp at the back side of weir structures will provide a more gradual reduction in water velocity coming out of the weir. The more gradual structure geometry also integrates more smoothly with the surrounding creek channel and banks.

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8	**Limits of disturbance**	Smaller and more selective limits of disturbance	Increased limits of disturbance	The detailed design analysis has taken the steep slopes and variable terrain of the site into consideration when determining the actual limits of disturbance resulting from construction, which differ somewhat from the high level review completed as part of the functional design. Limits of disturbance were also extended to encompass the extended creek realignment.
9	**Tree removals**	Trees surveys and removals based on functional design disturbance area. Approximately 77 trees identified for removal with a further 40 as possible removal.	Increased number of trees to be removed with the extended realignment work and more accurate area of disturbance. Approximately 153 trees identified for removal (36 additional trees impacted).	The original tree inventory was updated in 2023 to capture an updated condition of existing trees and to incorporate all areas of expected disturbance. There are some additional tree removals due to the extended channel realignment and larger area of disturbance, however, many of these trees are in poor condition and are compromised by the increased creek bed/bank erosion that has occurred in the last 2 years. Extensive new tree plantings are planned to compensate for the removals.
10	**Grassed maintenance access track**	Grassed maintenance access track on east side of ravine	Grassed maintenance access track on the west side of the Ravine, connects to existing stormwater management pond access road.	Placing the maintenance access on the west side of the creek greatly reduced tree impacts, ground disturbance and is more sympathetic to the natural topography of the site. Note this access is intended to be used during construction and for future maintenance only and is not intended as a public trail (a new gate will be installed to block access to the public).
11	**Staging area reinstatement and plantings**	Staging area for contractor in the open space next to Ruisseau Park. To be reinstated with grass when project complete.	Staging area for contractor in the open space next to Ruisseau Park. To be reinstated with landscaped area with mounded tree / shrub plantings when project complete.	One of the key objectives of the project is the beneficial reuse of excess soil on the site. To help achieve this goal it is proposed to create a landscaping mound in the open space adjacent to the park and provide additional tree and shrub plantings in this area. Reusing the soil on site is beneficial from environmental, legislative and budgetary perspectives.