Design Review

Reviewer Instructions (first submission)

Reviewer Instructions (subsequent submissions)

Designer Instructions

Comment Ref No.	Package Reference	Section reference
1	SW and Flood Management report, Woods, 24-06-2026	Exec Summary
2	SW and Flood Management report, Woods, 24-06-2026	2.4 Existing Hydrological Features
3	SW and Flood Management report, Woods, 24-06-2026	2.5 Flooding and Overland Flowpaths
4	SW and Flood Management report, Woods, 24-06-2026	5 Proposed Development
5	SW and Flood Management report, Woods, 24-06-2026	5 Proposed Development
6	SW and Flood Management report, Woods, 24-06-2026	6.3 Catchment 1 Management

7	SW and Flood Management report, Woods, 24-06-2026	6.3.1 Water Quality Management
8	SW and Flood Management report, Woods, 24-06-2026	6.4.1.1 Zone A (Catchment 2)
9	SW and Flood Management report, Woods, 24-06-2026	6.5 Primary and Secondary Networks
10	SW and Flood Management report, Woods, 24-06-2026	6.5.2 Culverts and bridges
11	SW and Flood Management report, Woods, 24-06-2026	6.5.3 Secondary Network Design
12	SW and Flood Management report, Woods, 24-06-2026	6.5.3 Secondary Network Design
13	SW and Flood Management report, Woods, 24-06-2026	6.5.3 Secondary Network Design
14	SW and Flood Management report, Woods, 24-06-2026	7.1.1 Hydrology Model
15	SW and Flood Management report, Woods, 24-06-2026	7.1.1 Hydrology Model

16	SW and Flood Management report, Woods, 24-06-2026	Appendix C Model Build Memo: Figure 2 Subcatchments Parkburn
17	SW and Flood Management report, Woods, 24-06-2026	Appendix C Model Build Memo: Rainfall data
18	SW and Flood Management report, Woods, 24-06-2026	Appendix C Model Build Memo: Land Use
19	SW and Flood Management report, Woods, 24-06-2026	Appendix C Model Build Memo: CN Curve Number
20	SW and Flood Management report, Woods, 24-06-2026	Appendix C Model Build Memo: 1D network
21	SW and Flood Management report, Woods, 24-06-2026	Appendix C Model Build Memo: Figure 9 Preliminary SW pipe network
22	SW and Flood Management report, Woods, 24-06-2026	Appendix C Model Build Memo: 3.0 Flood Modeling Results

23	SW and Flood Management report, Woods, 24-06-2026	Appendix C Model Build Memo: 3.0 Flood Modeling Results Appendix B
24	SW and Flood Management report, Woods, 24-06-2026	8 Alluvial Fan Hazards
25	Draft EMP for Parkburn Subdivision, Landpro, 20_06_2026	Full report
26		
27		

Page	Discipline	Grounds for comment
5	**Sediment and Debris**	Request further information
4	**Dam/Lake Boundary**	Request further information
6	**Flood Management**	Request further information
9	**Earthworks / geotechnical**	Request further information
9	**Typical Details**	Request further information
13	**Soakage**	Request further information

13	**Stormwater Infrastructure**	Request clarity
14	**Stormwater Infrastructure**	Request further information
16	**Stormwater Infrastructure**	Request clarity
17	**Stormwater Infrastructure**	Request further information
17	**Stormwater Infrastructure**	Request further information
17	**Flood Management**	Request further information
17	**Flood Management**	Request clarity
19	**Flood Management**	Request further information
19	**Flood Management**	Request further information

P3	**Flood Management**	Request clarity
P4	**Flood Management**	Request further information
P5	**Stormwater Infrastructure**	Request further information
P6	**Flood Management**	Request clarity
P10	**Stormwater Infrastructure**	Request further information
P10	**Stormwater Infrastructure**	Request further information
P12	**Flood Management**	Request further information

	Flood Management	Request further information
27	**Fan Hazard**	Request further information
		Other

Comment From	Comment Date
Nick Keenan	14-Jul-26
Nick Keenan	14-Jul-26
Nick Keenan	14-Jul-26
Nick Keenan	14-Jul-26
Nick Keenan	14-Jul-26
Nick Keenan	14-Jul-26

Nick Keenan	14-Jul-26
Nick Keenan	14-Jul-26
Nick Keenan	14-Jul-26
Nick Keenan	14-Jul-26
Nick Keenan	14-Jul-26
Nick Keenan	14-Jul-26
Nick Keenan	14-Jul-26
Nick Keenan	14-Jul-26
Nick Keenan	14-Jul-26

Nick Keenan	14-Jul-26
Nick Keenan	14-Jul-26
Nick Keenan	14-Jul-26
Nick Keenan	14-Jul-26
Nick Keenan	14-Jul-26
Nick Keenan	14-Jul-26
Nick Keenan	14-Jul-26

Nick Keenan	14-Jul-26
Nick Keenan	14-Jul-26
Nick Keenan	14-Jul-26

Review Comments
Provide sediment transport capacity from SH6 culverts through proposed development site. Further assessment information including potential for blockage at the narrowings or asymmetries present in the indicated floodway, and potential bypassing impact if structures are blocked by sediment/debris during a major event.
Provide evidence of Contact Energy Ltd dam operating range and spillway levels. Consider using a conservative understanding of the Clutha Dam operation to apply to design boundary conditions for flood modelling. LandPro Page 9 "*reported daily fluctuation of approx. 750 mm (with a normal operating range of 193.5 to 194.5 m AOD* ." What is Clutha Dam emergency spillway overflow operation level and PMF level (for context).
Figure 4 - show flowpaths and subcatchment areas. Include labelled contours. Combine info from LandPro contours.
Provide cross sections or long sections of proposed cut/fill depths required to build site floor levels. Provide a few typical conceptual earthwork cross sections to indicate proposed finished levels relative to north/south boundaries, SH6 levels and lake levels. This to support the bulkearthworks plan view model outputs (LandPro drawings 113.01 to 113.19 EMP, Appendix A)
Provide proposed areas for other land zoning: community centre, education, commercial, etc. A list or table of conceptual areas. This information to show relative runoff coefficients for different development land use areas.
Provide typical details of a Caudwell Pit and include into typical Lot detail to indicate intended use. State the level of service the Caudwell pit will provide (justify a case for less than 1%AEP). Provide more conceptual details of soakage disposal over Catchment 1. Provide a typical conceptual detail of soakage disposal infrastructure for a private house lot and for public road corridor. State the intended level of service of the soakage infrastructure and discuss assumptions with regards to normal engineering constraints of groundwater, elevation, spatial footprint. Confirm that freeboard to floor levels is feasible. Describe assumed operation and maintenance responsibility and feasibility. Describe secondary overland flowpaths through Catchment 1 that

With all water quality management strategies - clarify assumed responsibilities for operations and maintenance of toolbox devices. Provide evidence of Council engagement and acceptance of the proposed stormwater treatment approach and device responsibility.
Provide conceptual design long section drawings of channel connectivity and show levels/gradients and context with Lake levels (typical and extreme). Indicate the effects of the 0.74m lowering of the central conveyance channel. Show how buried pipes connect to 6 shallow depth vegetated swales, and connect to corridor conveyance.
Provide a rationale for designing the primary network to 5 year ARI level of service with respect to best practice and climate change risk at this site. Confirm the proposed residential zoning - is the zone considered "rural residential" as per NZS4404?. Consider a 10 year ARI level of service to NZS4404 for rural residential areas (ref NZS4404, Table 4.1).
Provide hydraulic calculations and hydraulic grade line through culverts and bridge to demonstrate appropriate sizing. Confirm the level of service of the culverts is 1%AEP. Show modelling that includes the structures and the flood levels in a 1%AEP post-development scenario.
Confirm freeboard assumptions. Provide a typical cross section of the road corridor and building platforms indicating freeboard allowances. Show a flood map from modelling output indicating flood extents in a 1%AEP event assuming pipelines are neglected/blocked as a conservative case.
Confirm what software was used to model the pipelines and state how flood mapping was prepared on the proposed earthworks surfaces. 1D or 2D model software, was rain applied to grid or at 'catchment' injection points?
State how blockage risk is proposed to be managed at catchpits, pipes, culverts and bridge. Discuss secondary overland flowpaths system.
Provide working that shows the critical time of concentration for the Parkburn at the northern boundary of the site. Use a range of 3 or 4 ToC methods and justify the critical duration storm event. Using the ARC TP108 time of concentration method along with 3 other methods. Compare peak design discharge with other hydrology methods for context (for example, the Regional Flood Frequency method subject to catchment size considerations) Provide design hydrographs at boundary line including allowance for future-developed upstream residential area, narrowed flood flow channel, SH6 culverts blocked/unblocked (which may change the location of some of the overland flows?)
State the top elevation of the Parkburn catchment and show profile of the catchment

Figure 2 catchment wide delineation model. State the sub-catchment areas in km2 or hectares draining through the proposed site. Label the subcatchments, indicate catchment connectivity to Parkburn. Show that Catchments 1,2,3,7 connect for Parkburn. Show how other catchments 4,5,6,8 drain through the Site to the Lake.
Provide full NIWA HIRDS design rainfall table for the site for RCP8.5. Show the nested temporal profile.
Provide typical details drawing of proposed private residential lot size and building platform size. Demonstrate 60% impervious surface inside residential lots is appropriate, using assumption of typical Lot drawing, showing full area and roof footprint assumptions
Provide discussion of conservative CN=81 runoff scenario for upper elevation subcatchments of Parkburn. Minimal vegetative cover (ref: TP108, Table 3.3). What effect on peak channel design discharge and corridor width. Is the corridor width conservatively sized? Provide discussion.
Show 1%AEP rainfall event HGL and assess freeboard to building levels. Catchment 2, Zones A-D. Provide a typical conceptual design long section drawings of pipeline infrastructure relative to typical and extreme Lake operation levels and Parkburn hydraulic grade line flood levels. Demonstrate that buried pipelines will be clear of Lake levels and indicate proposed finished ground levels in all zones. Provide pipe outlet velocities and outlet details including scour protection especially for outlets into the Parkburn stream where sediment transport and erosion/deposition may influence the design and performance.
Indicate how SH6 and perimeter lots will drain to the Lake. What is proposed in southwest corner of development against SH6, where there is ponding shown. Any impacts on NZTA drainage?
referring to Appendix B flood model results: 1. provide long section hydraulic grade line profiles of Parkburn and central corridor drainage lines. 2. provide velocity information in Parkburn at main cross sections. Identify if scour is to be mitigated. 3. provide discharge hydrographs at upstream property boundary, bridge and oputlet to Lake. State the peak design discharges from the model. 4. Indicate effects of Lake level changes on drainage and freeboard during typical and extreme lake levels 5. Describe concept bridge: lanes, span, abutment types, deck and soffit elevation, indicative scour protection, freeboard assessment. 6. Provide erosion and scour assessment, gradient, hydraulic gradient, including bridge, including delta, including variations in lake level, debris loading and sediment transport, conservative hydrology assessment, conservative Lake level assessment, cross section drawing showing side slopes and base width, scour protection if needed.

Flood maps: show contours and water surface elevations, show velocity information, show a combined flood map of Parkburn through development into Lake delta. Provide more model outputs for context and assessment by CODC / ORC.
Provide design flow velocity in the proposed resultant Parkburn cross section. More alluvial fan hazard assessment is needed to consider potential effects and mitigations. A fan exists and debris or sediment entrained flow is likely. Assessment of flood levels in a 3x100yr event should extend to building platforms and discuss available freeboard within the subdivision lower levels. The channel cross section Figure 23 is artificial looking with triangular section. Show the modified Parkburn channel gradient, design peak flow, design velocity, and available buffer room for channel to move to manage debris into the delta and Lake edge. Is the sediment transport capacity relatively uniform, or are there constrictions that could cause localised deposition, blockage, and avulsion (flow leaving the channel and finding other pathways)
EMP information reviewed with the SMP. No comments on the EMP.