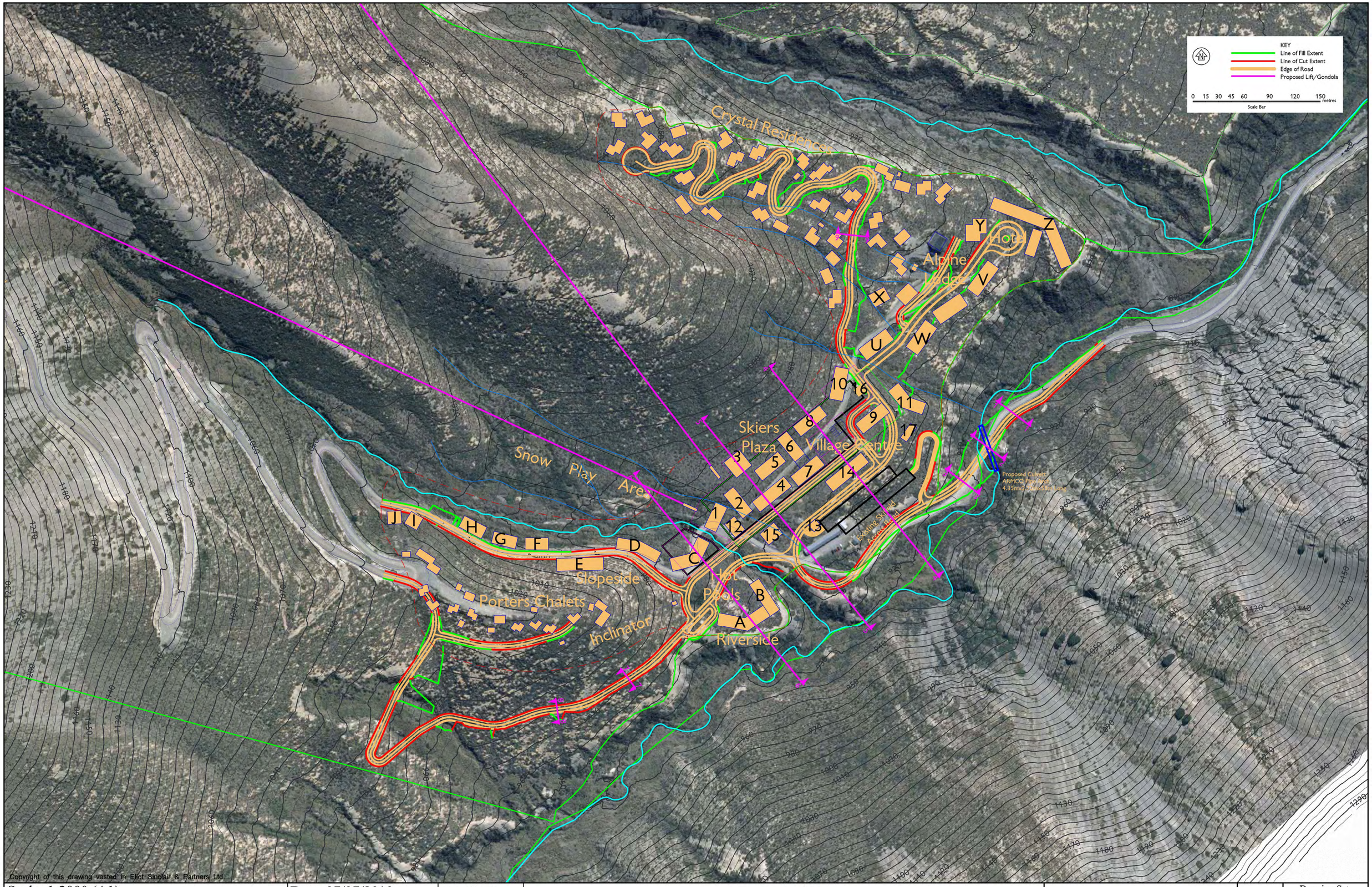

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Date: 07/07/2010

no.	amendment	initial	date

checked			
drawn	N. Burrowes		
designed	M. Sinclair	surveyed	RCP
manager	M. Sinclair	surv.date	Jan 10

origin of levels
UF66 (B85L)
0.3km North of
Dry Stream (SH73)
R.L. 771.3479
datum Lyttelton 1937

PROPOSED VILLAGE
VILLAGE ROADING LAYOUT
PROPOSED PORTERS SKI AREA EXPANSION

Eliot Sinclair & Partners Limited
Surveyors • Engineers • Planners
151 Kilmore Street, PO Box 4597, Christchurch 8140, N.Z.
Telephone: (03) 379-4014 Fax: (03) 365-2449

Drawing Set
298875 E2
PLOT E2 CITY PLAN

Sheet 1 of 3 rev.

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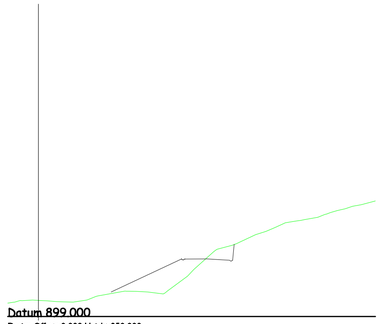

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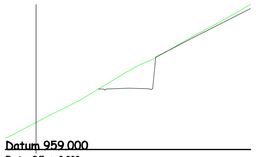

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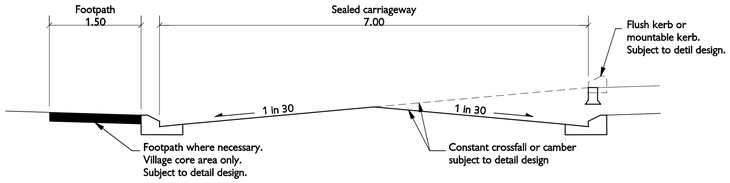

Typical Village Core Road Section

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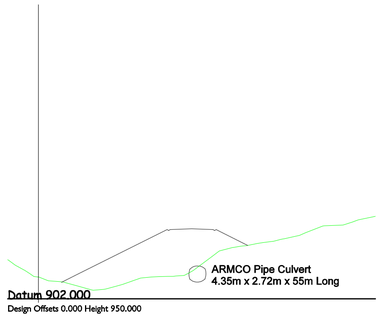

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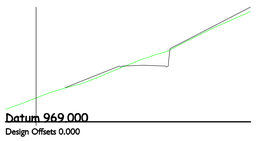

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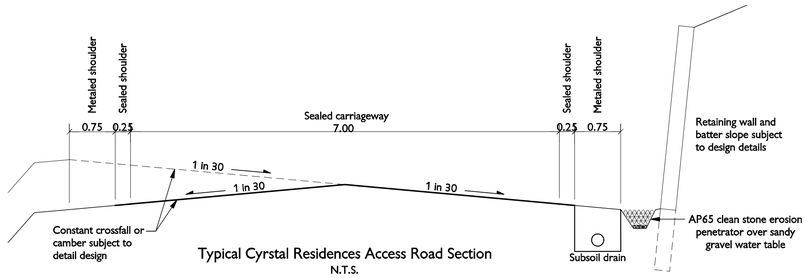

Typical Cyrstal Residences Access Road Section

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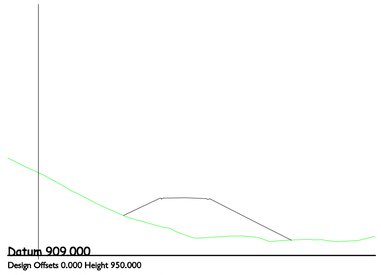

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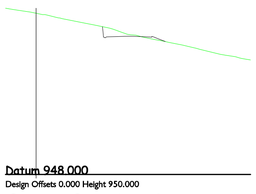

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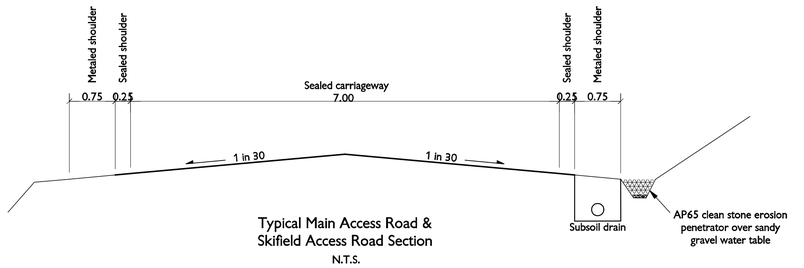

Typical Main Access Road &
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N.T.S.

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no.	amendment	initial	date

Date: 29/06/2010

checked	M. Sinclair		
drawn	N. Burrowes		
designed	N. Burrowes	surveyed	RCP
manager	M. Sinclair	surv.date	Jan 10

origin of levels
UF66 (B85L)
0.3km North of
Dry Stream (SH73)
R.L. 771.3479
datum Lyttelton 1937

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VILLAGE CROSS SECTIONS
PROPOSED PORTERS SKI AREA EXPANSION

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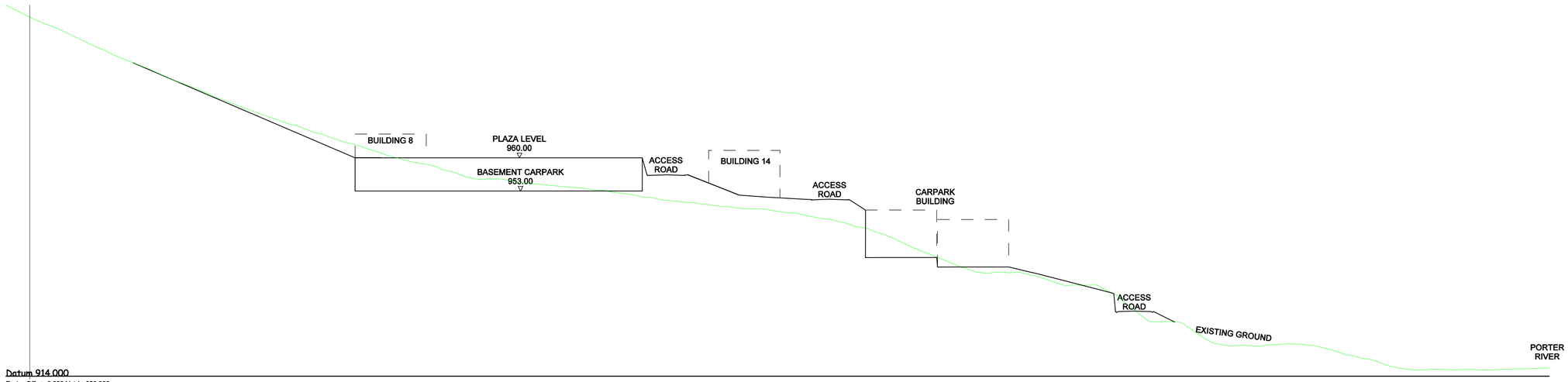
Sheet 2 of 3 | rev.

[Computer Operator: SB] [Project: G:\Jobs\29\298875\12d\DESIGN Main\Cristal DESIGN Tracks] [Plotted on: 01 07 2010]



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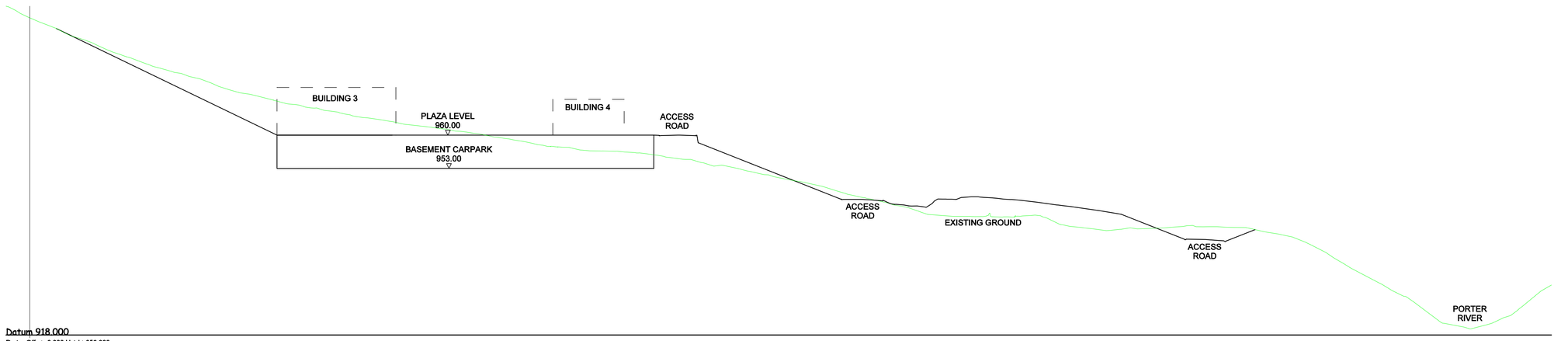

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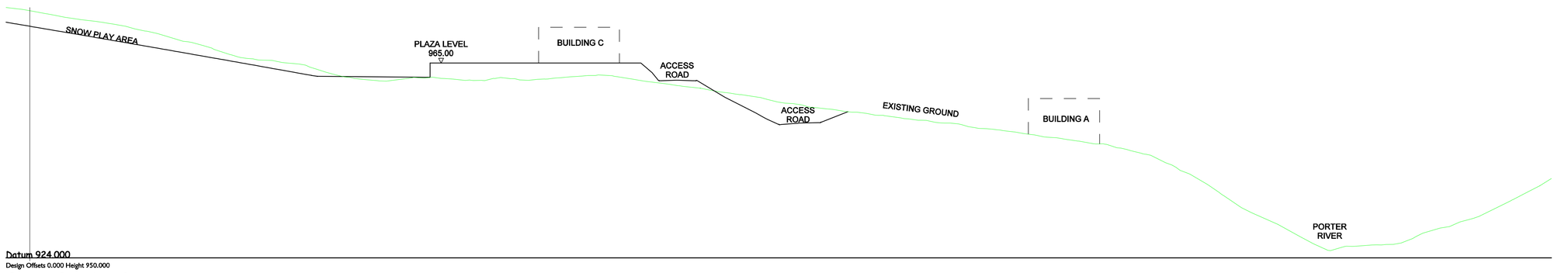

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Cross Section 6

HScale: 1:500 VScale: 1:500 (A1)

no.	amendment	initial	date

Date: 29/06/2010

checked	M. Sinclair		
drawn	N. Burrowes		
designed	N. Burrowes	surveyed	RCP
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Sheet 3 of 3 rev.

[Computer Operator: SB] [Project: G:\Jobs\29\298875\12d\DESIGN Main\Cristal DESIGN Tracks] [Plotted on: 01 07 2010]

Appendix B

Draft Consent Conditions for Construction Stage Stormwater Discharge

Details for CRC[xxxxxx](to be allocated)

Permit to discharge construction stage stormwater into Porters streamStream, Crystal Stream and Porters River of Porters Ski Area, associated with the construction of the proposed roads, ski trialstrails, ski lifts, Day Lodge, Village, Village, reservoir, all infrastructural facilities and upgrading of access road at Porters Ski Area.

Resource Consent Number: CRCxxxxxx

Subject to the following conditions:

1	**Limits** The discharge shall be only sediment-laden stormwater from the following four main areas of works; areas, namely snow making reservoir construction, hillside and internal road construction, ski trails, ski lifts, Day Lodge, existing access road widening and upgrading, and Village Centre Construction (including Crystal Chalets, Porters Chalets, Slopeside Accommodation, Hotel and Visitor Accommodation), and all infrastructural upgrading to support the Ski Area expansion all as shown on Plan [ ], which forms part of this consent. Stormwater from the construction activities within land (in these conditions called 'the site') legally described as Rural Section 39658, and within the area labelled as "Site" on Plan [drawing no.] which forms part of this consent. Treated stormwater shall only be only discharged into Porters Stream or Crystal Stream or Porters River at about [XXXX], [XXX] and [XXX] respectively, and within the area shown on Plan [drawing no]. The discharge shall only take place during the site construction period at the above mentioned site. During construction, all practicable measures shall be undertaken to minimise discharges of sediment-laden runoff.
2	Definitions (a) Stormwater: means rain-sourced runoff which may contain contaminants typical of site construction stormwater such as suspended sediments, organic matter, nutrients, heavy metals, hydrocarbons, micro-organisms and traces of hazardous substances that are entrained as the runoff that flows over land or hard surfaces. It excludes discharges to water or onto and into land of runoff from spilled or deliberately released hazardous substances and wash down of such spillage or releases. (b) Site construction: means all bulk earthworks and earthworks associated with the construction of the ski trails, ski lifts, lift terminals, Day Lodge and workshop, internal and public access roads, water reservoir, Village Centre, Crystal Chalets, Porters Chalets, Slopeside Accommodation, Hotel and Visitor Accommodation, and car parking. (c) AEP: means Annual Exceedance Probability Event. (d) The ESCP: means Erosion and Sediment Control Plan, prepared by CPG New Zealand Limited, dated July 2010, which forms part of this consent. (e) Earthworks: means the disturbance of land surfaces by blading, contouring, ripping, moving, removing, placing or replacing soil and earth, or by excavation, or by cutting or filling operations.

	(f) Bulk earthworks: means major cut/fill/waste works. (g) Stabilised: means an area inherently resistant to erosion such as rock (excluding sedimentary rocks), or rendered resistant to erosion by the application of aggregate, geotextile, vegetation or mulch. Where vegetation is to be used on a surface that is not otherwise resistant to erosion, the surface is considered stabilised once 80 percent vegetation cover has been established. (h) ESCG: means Environment Canterbury, "Erosion and Sediment Control Guidelines for the Canterbury Region" Report No. CRCR06/23, February 2007. (i) TP90: means ARC Technical Publication No.90, "Erosion and Sediment Control Guidelines for Land Disturbing Activities in the Auckland Region" , March 1999. (i) Manager: means the Canterbury Regional Council, RMA Compliance and Enforcement Manager, or nominated CRC staff acting on the Manager's behalf.
	Preconstruction
3	The consent holder shall ensure that all personnel involved in site construction are made aware of, and have access to, the conditions of this discharge permit and the latest version of the Erosion and Sediment Control Plan (ESCP).
4	At least twenty working days prior to the commencement of site construction, the consent holder shall submit a construction management plan in accordance with Condition 9 and inform the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, in writing, of the start date of the works.
5	Prior to commencement of works the consent holder or their agent shall arrange and conduct a pre-construction site meeting between the Canterbury Regional Council and all relevant parties, including the primary contractor. At a minimum, the following shall be covered at the meeting: (a) Scheduling and staging of the works; (b) Responsibilities of all relevant parties; (c) Contact details for all relevant parties; (d) Expectations regarding communication between all relevant parties; (e) Procedures for implementing any amendments; (f) Site inspection; (g) Maintenance of ESC measures and; (h) Confirmation that all relevant parties have copies of the contents of this consent document and all associated erosion and sediment control plans and methodology.
	ESCP
6	Subject to condition (13), the discharge of stormwater during construction shall occur in accordance with the Erosion & Sediment Control Plan ('the ESCP') or its subsequent revision.
7	Prior to the commencement of discharges from any earthworks associated with site construction, a certificate signed by the person responsible for designing the sediment and erosion control measures or other person accepted by the Canterbury Regional Council as being competent to provide such certification, shall be submitted to the Canterbury Regional

	Council to certify that the erosion and sediment control measures for that stage are constructed and installed in accordance with the ESCP.

8	During site construction, all practicable measures shall be undertaken to minimise: (a) Exposed surfaces; (b) Discharges of sediment-laden stormwater beyond the boundary of the site; and (c) Sediment being transported beyond the site boundaries.
9	The construction management plan which will incorporate detailed ESCP (also known as Progressive ESCP) shall set out clearly the sediment and erosion control measures that are to be implemented to manage stormwater discharged from each stage of the site construction works. Those measures shall represent the best practicable option for minimising, to the maximum extent practicable, erosion and sedimentation caused by or associated with the earthworks, or presence of exposed earth as a result of the earthworks, authorised by this consent. The ESCP shall include but not be limited to: (a) A locality map; (b) Detailed drawings showing the type and location of erosion and sediment control measures, on-site catchment boundaries, and off-site sources of run-off; (c) Drawings and specifications of all designated erosion and sediment control measures with supporting documentation; (d) Cut-off/diversion drains, (e) Sedimentation pond(s)/Decanting Earth Bunds; (i) Sediment fences; (j) Earth bunds; (k) Vegetated buffer strips. (l) The inspections and maintenance of erosion and sediment control measures; and (m) Details of when the erosion and sediment control measures are to be established and decommissioned.
10	The discharge of stormwater into Porters Stream, Crystal Stream and Porters River shall not cause erosion or scour.
11	Land subject to earthworks shall be stabilised as soon as is practicable following completion of earthworks or if the area is not to be subjected to further earthworks for a period of 14 days or more.
12	The ESCP may be amended at any time. Any amendments shall be: (a) For the purpose of improving the efficiency of the erosion and sediment control measures and shall not result in reduced discharge quality; and (b) Consistent with the conditions of this resource consent; and (c) Submitted in writing to the Manager, prior to any amendment being implemented.
	Standards and Monitoring
13	The discharge from the sediment retention pond shall not be the primary cause of a change in colour of the receiving water of greater than ten points, as measured using the Munsell Scale, or a reduction in the visual clarity of the receiving water by more than 20%, at monitoring station STN4 (at or near BW20913073) upstream of the site and STN3 (at or near BW21921080) downstream of the site subject to Condition 15(a).
14	The consent holder shall ensure that the temporary diversion channel and bunds, sediment fences, check dams, sediment traps and sediment retention ponds are inspected and maintained in accordance with guidelines given in the approved ESCP.

15	If any storm events resulting in rainfall depth of 5 millimetres occurring at project site during the term of this consent and there is evidence of a discharge from sediment retention pond, the consent holder shall, within eight hours of the event, (a) visually inspect the discharge from the sediment retention pond to determine if: (i) Sediment is being deposited at the outlet from the sediment retention pond; and/or; (ii) There is a conspicuous change in the colour or clarity of receiving water more than 50 metres beyond the point of discharge to receiving water that is attributable to the discharge from the sediment retention pond. (b) During each inspection in accordance with (a) above photographs shall be taken showing the point of discharge and up to 50 m from the point of dischargethe area beyond including the adjacent coastal waters. The photographs shall be retained and made available upon request by the Canterbury Regional Council. (c) Within 10 working days of any transgression of discharge standard outlined in Condition 13, the consent holder shall: (i) Identify and undertake mitigation and actions to prevent further exceedence of the visual clarity trigger value and to comply with Condition 13 of this consent. (ii) Review the ESCP. (iii) Provide a report to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, within 10 working days, that includes, but is not limited to, the following: (I) Identification of the source of sediment. (II) The mitigation implemented and actions undertaken. (III) An assessment of any potential effects of the sediment discharges. (IV) Measures undertaken to prevent recurrence, including any change to the ESCP
	Abandonment
16	If the consent holder abandons work on-site, they shall first take adequate preventive and remedial measures to control sediment discharges, and shall thereafter maintain those measures for as long as necessary to prevent sediment discharges from the site.
	Spills
17	During construction of the Ski area Area expansion, the consent holder shall take all practicable measures to prevent spills of contaminants being discharged into Crystal Stream, Porters Stream and Porters River. Such measures shall include, but not be limited to: (a) Maintaining bunds around the perimeter of areas used to store fuel or contaminants; (b) Providing materials used to clean up spills at each area used to store fuel or contaminants; and (c) Ensuring all vehicles used to transport or store fuel or contaminants have access to materials for cleaning up spills.
18	In the event of a spill of fuel or any other contaminant during construction of the reclamation, the consent holder shall: (a) Clean up the spill as soon as practicable and take measures to prevent a reoccurrence; (b) Inform the Canterbury Regional Council Pollution Hotline within 24 hours of a spill event, and shall provide the following information: (i) The date, time, location and estimated volume of the spill; (ii) The cause of the spill; (iii) The type of contaminant(s) spilled; (iv) Clean up procedures undertaken; (v) Details of the steps taken to control and remediate the effects of the spill on the receiving environment; (vi) An assessment of any potential effects of the spill; and

	(vii) Measures to be undertaken to prevent a reoccurrence.
19	Mitigation against erosion and scour from table drain outfalls and retention basin outfalls shall include but not be limited to: (a) Minimising outlet pipe grade; (b) Rock armour and rip rap placed on filter cloth or other similar approved scour protection measures; and (c) Energy dissipating devices if the estimated maximum flow velocity of the outfall pipe exceeds 2 metres per second.
20	The diversion drains, retention basins and stormwater outfalls shall be maintained, including but not limited to: (a) Removal of any visible hydrocarbon layers, debris and litter within five working days of an inspection; (b) Removal of accumulated sediment in the drains and retention basins when the sediment is greater than 100 millimetres in depth within the table drain and 20% of the storage capacity of the sediment ponds; and (c) Repair of any scouring or erosion within five working days of the inspection.
	Administration
21	The lapsing date for the purposes of section 125 of the Resource Management Act 1991 shall be 10 years. For the purposes of section 123 of the Act the period for which this consent is granted is 10 years.
22	The Canterbury Regional Council may, on any of the last five days of April or October each year, serve notice of its intention to review the conditions of this consent for the purposes of: (a) Dealing with any adverse effect on the environment which may arise from the exercise of this consent and which it is appropriate to deal with at a later stage; (b) Requiring the adoption of the best practicable option to remove or reduce any adverse effect on the environment; (c) Complying with the requirements of a relevant rule in an operative regional plan; (d) Requiring the consent holder to carry out monitoring and reporting instead of, or in addition to, that required by the consent; or (e) Reviewing the trigger values for contaminants specified in conditions of this consent.

APPENDIX C

Soil Dispersion Test

DISPERSION TEST ANALYIS

TWO LOESS SAMPLES, FROM TWO DIFFERENT SITES, WITHIN THE PORTER HEIGHTS SKI AREA

References: AS/NZS 1547:20000, Australian Department of Agriculture and Food Test Procedure (Farm Note 386).

SUMMARY:

A modified version of the Emerson Aggregate Test was carried out to determine whether two loess samples collected from two different sites, within the Porter Heights Village Area, showed any characteristic signs of dispersion.

The soil samples showed no signs of dispersion during any of the testing trials, which were carried out over a 24 hour period. It is therefore concluded that the loess soils around the Village Area are not dispersive in nature.

INTRODUCTION:

A modified version of the Emerson Aggregate Test, as described in AS/NZS 1547:2000 and by the Australian Department of Agriculture and Food Test Procedure (Farm Note 386), was carried out to determine whether two loess samples collected from two different sites (Site 1 and Site 2), within the Porter Heights Village Area, showed the characteristic properties associated with soil dispersion.

A dispersive soil is structurally unstable. In dispersive soils the soil aggregates collapse when the soil gets wet because the individual clay particles disperse into solution. This collapse of structure causes the soil to slump, lose porosity and become denser.

Soils often disperse when they are sodic which means they contain enough sodium to interfere with the structural stability of the soil. Clay particles have a negative charge on their surface which is balanced by positively charged cations distributed around the clay surface. Cation exchange capacity is a measure of the total number of exchange sites in a given mass of a soil. When the ratio of sodium to other ions at these exchange sites is high, clay particles are less tightly bound to each other and the soil aggregates easily disperse when the soil becomes wet.

SAMPLE COLLECTION SITES:

Two samples of loess where collected from within the Porter Heights Village area. The sites have been named Site 1 and Site 2. The samples were collected 200 to 300 mm below the organic soil layer in which tussocks at the location grow.

[The paragraph stated below is from an email asking for the samples. A photo and GPS location was also asked for. The information in the paragraph below may not be correct because the photograph and GPS locations have not been provided yet]

The location where the Site 1 Sample was collected is an exposed bank near the Ski Club Kitchen Parking Area. The Site 2 soil sample was collected from an exposed bank above the lower access road past the culvert over Porters Stream.

METHOD:

1. Two different loess samples, from two different sites within the Porter Heights Village Area, were tested and labeled Site 1 and Site 2.

2. 3 undisturbed soil aggregates, from each Site, were immersed in a container of distilled water and left free of vibration for 24 hours.

3. 3 reworked aggregates (texture ball), from each Site, were immersed in a container of distilled water and left free of vibration for 24 hours.

4. 1 undisturbed soil aggregate, from each Site, was placed in a large container of distilled water. The aggregates from both Sites were placed next to each other (100mm gap between each aggregate) allowing for a direct comparison between the level of dispersion between each Site.

5. The level of dispersion was visually inspected at time 0, 10 minutes, 30 minutes, 2 hours and 24 hours.

6. A control sample of top soil, known to be non-dispersive, was also tested and used for comparative purposes.

Table 1 shows how the level of dispersion was determined by visual inspection.

Table 1
Visual Determination of Dispersion

Possible Results	Time of Test	Categorization
No change to aggregate	24 hours	Non-dispersive soil
Aggregates slake, no dispersion	24 hours	Non-dispersive soil
Dispersion (milky halo) evident.	24 hours	Slightly dispersive
Dispersion (milky halo) evident	Approx 2 hours	Moderately dispersive soil
Dispersion (milky halo) evident	< 30 minutes	Highly dispersive soil