Sediment Discharge Management Plan (SDMP)

Prepared to meet the requirements of CRC214226

Christchurch City Council

August 2021

This plan is set to be revised in early 2022 so it can be submitted for approval by ECan

Christchurch City Council

Version Control and Approvals

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Revision 1	2020	Final for approval	Peter Christensen
Revision 2	2020	Minor updates	Peter Christensen
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Internal Document Review and Approval

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1. Background

1.1. Impact of sediment on waterways

Sediment from development and construction activity can enter waterways and cause harm to aquatic plants, invertebrates and fish, in much the same way as a dust storm might impact humans. There are many different impacts, such as:

- Poor clarity from sediment in water can reduce photosynthesis and therefore primary productivity within streams
- Sediment can make feeding more difficult by smothering the food supply of some species
- Suitable habitat for some species becomes clogged
- Fine sediment can clog the gills of some species, making respiration difficult.

Poor water quality from sediment discharges affects the mauri of waterways and coasts, reducing their ability to be a source of food, medicine and resources for Mana Whenua.

Excessive sediment can reduce the flood carrying capacity of waterways and increase the costs of removing sediment and weed growth. Sediment in the stormwater network can also clog treatment devices prematurely, resulting in increased maintenance and a reduction in treatment.

For these reasons it is important to reduce the amount of sediment in stormwater and the best place to do that is to stop it at source.

1.2. Purpose of the Sediment Discharge Management Plan

The Comprehensive Stormwater Network Discharge Consent (CSNDC, CRC214226, referred to as the 'consent' in this Plan) was granted to Council on 20 December 2019. The consent defines the conditions under which the Council may discharge stormwater from its network into the territory's water bodies, into land and to the coast.

The consent sets out the purpose of the Sediment Discharge Management Plan (SDMP) in Condition 44, stating that it is,

> "to set out reasonably practicable processes and practices to be implemented to manage the discharges of stormwater from development sites into the stormwater network to mitigate adverse effects of discharges from the stormwater network on the receiving environment's water clarity and aquatic biota. The effectiveness of the processes and practices will be measured against the fine sediment and TSS Attribute Target Levels for waterways and coastal areas within Schedules 7 and 8."

The success of the SDMP, then, is defined by a reduction in fine sediment and Total Suspended Solids (TSS) levels in waterways within the consent area.

1.3. Consent requirements

Condition 43 of the consent requires that,

> "The Consent Holder shall develop Sediment Discharge Management Plan (SDMP) and present it to the Canterbury Regional Council, Attention: Regional Leader –Monitoring and Compliance within twelve months of the operative date of this resource consent, for certification that it is consistent with the purpose and required content of the SDMP."

The requirements of the SDMP are set out in Condition 45 and repeated below. The SDMP is required to be submitted to Environment Canterbury by 20 December 2020.

Table 1 Consent requirements for SDMP

SDMP requirements (Condition 45)	SDMP Section
The required content of the SDMP shall include, but not be limited to, the following means to achieve the purpose:	
a. A risk assessment to determine the TSS concentration trigger levels for the discharge of stormwater into the stormwater network from development sites. The risk assessment will include factors of slope, soil type, whether the discharge will be treated downstream by a Council treatment facility prior to reaching the receiving environment, and the sensitivity of the receiving environment.	4
b. In the event of a trigger level exceedance, a feedback process to identify and implement any changes to the erosion and sediment control practices in place on the development site. These may include reducing the area exposed to erosion by stabilisation or improving the efficiency of sediment laden water treatment.	8
c. A description of the process for how TSS concentration trigger levels will be included in authorisations by the Christchurch City Council for discharges into the network from individual sites	7
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f. Details of how records will be kept (such as site TSS concentration trigger level exceedance, compliance monitoring and enforcement action), with records made available to the Canterbury Regional Council on request	9

In addition, to the requirement of Conditions 44 and 45, there are also requirements under Condition 41 to:

> "…use reasonably practicable measures to ensure that a site specific Erosion and Sediment Control Plan (ESCP):
>
> a. Is prepared and implemented for development sites that discharge to the Council's network;
> b. Is prepared by a suitably qualified and experienced professional prior to commencement of stripping of vegetation or earthworks;
> c. Is prepared in accordance with the Erosion and Sediment Control Toolbox for Canterbury (or successor document); and
> d. Adopts a Best Practicable Option approach"

This SDMP sets out how conditions 41, 44 and 45 will be met. The effectiveness of the processes and practices will be measured against the fine sediment and TSS Attribute Target Levels for waterways and coastal areas within Schedules 7 and 8 of the consent.

1.4. Scope of the SDMP

Sediment in Christchurch waterways comes from a range of sources including wind borne dust, runoff from hillsides, tyre and brake wear of vehicles, combustion, discharges during construction, etc. The focus of the SDMP is on managing sediment from development sites which discharge into the Council's stormwater network.

The SDMP, as per the consent, excludes discharges into stormwater (Condition 2) in the following situations:

a. Emanating from land within Banks Peninsula that is outside the Settlement Areas of Banks Peninsula; and
b. From private stormwater systems that bypass the stormwater network and discharge into the Coastal Marine Area; and
c. Emanating from hardstand areas of non-residential existing sites discharging onto or into land via private networks unless the discharge has been previously authorised by the Christchurch City Council.
d. From any activity not existing at the commencement of this resource consent, re-development, or development site on the Canterbury Regional Council's Listed Land Use Register that is considered by the Christchurch City Council to pose an unacceptably high risk of surface water or groundwater contamination; and
e. e. Emanating from any stage of a development site with a total area of disturbance exceeding 5 hectares on flatland or 1 hectare on hill land; and
f. f. From any site listed on the attached Schedule 1 'Sites excluded from the Christchurch City Council Comprehensive Stormwater Network Discharge Consent'
    i. at commencement of this resource consent; or
    ii. as a result of the process set out in Condition 3 below; or
    iii. as a result of the process set out in Condition 47.

In addition, in the consent, there are additional exclusions which can be found in Condition 3.

1.5. Key instruments for implementing the SDMP

The following are the key instruments for implementing the SDMP and will be referred to throughout:

- Water Supply, Wastewater and Stormwater Bylaw 2014, or proposed Stormwater Bylaw
- Building Consent (BC) process
- Resource Consent (RC) process

Note that at the time of writing this SDMP, the Christchurch City Council Water Supply, Wastewater and Stormwater Bylaw 2014 is under review. It is proposed that the current stormwater clauses will be replaced by a stand-alone Stormwater Bylaw. A public consultation process is planned for 2021. The proposed new bylaw will more closely align with the consent, to the extent possible, and will help to implement the actions required to achieve the outcomes sought under the consent. ***The SDMP refers to the draft wording in the proposed new Stormwater Bylaw and is subject to change, depending on the wording of the final bylaw adopted by the Council.***

The proposed Stormwater Bylaw will apply to earthworks[1] activities that occur within the Christchurch district and result in discharges to the Council stormwater network. It will set the basic expectations around erosion and sediment control plans, and implementation of measures to reduce erosion and sediment from sites. However, though it provides a catch-all, it is anticipated that most sites undertaking earthworks will require a Building and/or Resource Consent. The application, approval, monitoring and enforcement processes associated with consents under the Building Act 2004 and the Resource Management Act 1991 provide more appropriate means for ensuring erosion and sediment matters are appropriately managed onsite.

[1] As defined in the following sections.

2. Interpretation of Key Terms

Interpretations of key terms which are relevant to the SDMP are described below. These are important as they describe how 'best practicable option' and 'reasonably practicable' have been defined by Council with regards to implementing erosion and sediment control measures under the consent.

2.1. Authorisation

Condition 45(c) requires a "description of the process for how TSS concentration trigger levels will be included in **authorisations** by the Christchurch City Council for discharges into the network from individual sites." For clarity, Council only authorises discharges to the network under clause 30 of the Water Supply, Wastewater and Stormwater Bylaw 2014. Council may, however, also explore other means of including TSS concentration trigger levels, but these are not discharge authorisations.

2.2. Best practicable option

The Resource Management Act 1991 defines best practicable option as:

> "in relation to a discharge of a contaminant or an emission of noise, means the best method for preventing or minimising the adverse effects on the environment having regard, among other things, to—
>
> a) the nature of the discharge or emission and the sensitivity of the receiving environment to adverse effects; and
> b) the financial implications, and the effects on the environment, of that option when compared with other options; and
> c) the current state of technical knowledge and the likelihood that the option can be successfully applied"

The Environment Canterbury Erosion and Sediment Control Toolbox for Canterbury describes best practicable option with regards to erosion and sediment control in these terms:

"We know that all projects are different. We expect you to apply the best options that are practical bearing in mind these factors about your specific project:

- The scale of the project and the activity
- The physical nature of your site and the receiving environment
- Techniques and resources available to you
- Practical considerations and cost
- Any project-specific sensitivities, eg the need to keep particular communities or stakeholders informed, or to protect activities downstream or downwind of your project."[2]

2.3. Reasonably Practicable

"Reasonably practicable" is not defined in the RMA. The following text is from *A guide to section 32 of the Resource Management Act: Incorporating changes as a result of the Resource Legislation Amendment Act 2017*.[3]

[2] https://www.esccanterbury.co.nz/project/our-expectations/
[3] Ministry for the Environment. 2017. *A guide to section 32 of the Resource Management Act: Incorporating changes as a result of the Resource Legislation Amendment Act 2017*. Wellington: Ministry for the Environment. Accessed from

"Section 77 of the Local Government Act (LGA) also requires local authorities to "seek to identify all reasonably practicable options for the achievement of the objective of a decision". The High Court has commented that the requirement to identify all reasonably practicable options in this context will always involve "at least two options" and "consequently, there will always be a choice to be made between doing nothing and doing something".[4] The Court of Appeal has also commented that the range of reasonably practicable options must be seriously considered before choosing the preferred option.[5] In other words, the options should not be pre-determined."

The measures outlined within the SDMP are those that are considered 'reasonably practicable'. While additional measures could be included (e.g. an ESCP for any excavation, even if by hand), these are not considered to meet the definition of reasonably practicable.

2.4. Development Site

The consent defines a development site as:

> "any individual area within a site or sites that is undergoing construction and/or earthworks activities but excludes sealed pavement repair where base course is not exposed."

However, there is a practical limit to what can be considered a development site within the SDMP. The focus of the Council is on those construction and earthworks activities that present high or medium ESC risks[6]. This is largely those activities that are already caught by a regulatory mechanism – building and / or resource consents – and strengthening the ESC requirements and processes within those existing mechanisms.

There are some larger works that may not require a building consent, but may still present erosion or sediment risks, such as exempted building work. Under the Christchurch District Plan, earthworks that are not associated with a subdivision or building consent must comply with certain requirements or a resource consent will be needed. If a resource consent is required, this will be the mechanism for requiring the preparation, acceptance (for high risk sites only), implementation and monitoring of an ESCP. If a resource consent is not needed, these types of projects will be captured by the proposed Stormwater Bylaw's requirements. The definition of earthworks in the proposed Stormwater Bylaw intentionally focuses the coverage away from lower risk everyday activities. A very broad interpretation of 'earthworks' would capture activities that homeowners undertake in their gardens, for example, so the definition refers to mechanical or substantial manual excavation to avoid this. Smaller scale activities are best addressed through educational behaviour change approaches, rather than regulatory approaches, in order to balance the likely costs and benefits.

As such the definition of 'earthworks' in the proposed Bylaw (below) is used in the SDMP as being synonymous with 'development site' to define the activities covered by the SDMP.

2.5. Earthworks

The proposed Bylaw defines earthworks as:

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https://www.mfe.govt.nz/sites/default/files/media/RMA/guide-to-section-32-of-resource-manangemnt-amendment-act-1991.pdf 7 September 2020.

[4] *Whakatane District Council v Bay of Plenty Regional Council*, CIV-2007-463-000606 (HC), para 40(iii).

[5] *Whakatane District Council v Bay of Plenty Regional Council*, CA258/2009, 2010 (NZCA), para 57.

[6] Table 4 Site risk assessment

> "Earthworks means any mechanical excavation, or substantial manual excavation, such as levelling, filling, retaining, contouring, or landscaping a site; and includes moving, removing, placing or replacing earth, rock or soil."

The context in which "earthworks" is used in the bylaw couches it in terms of risk and potential for erosion and sediment impacts. This definition excludes small hand excavations, such as home gardening activities. While these activities have the potential to have an adverse impact on the receiving environment in highly sensitive environments, it is impractical to monitor compliance for excavations of such a small scale.

The proposed Bylaw assumes construction or building work will be captured by the building consent process (and, in many cases, the resource consent process) and this are the best regulatory mechanisms for managing erosion and sediment. In those cases where neither consent is required (for example, exempted building work), the bylaw will provide a catch-all.

2.6. Erosion and Sediment Control Toolbox for Canterbury

The ESC Toolbox "contains Environment Canterbury's guidelines for land and waterway disturbing activities that can cause sediment and dust discharge to water and air. It updates and replaces the Canterbury Erosion and Sediment Control Guidelines (2007). The toolbox reflects improvements in the techniques and tools of erosion and sediment control made by industry since the 2007 Guidelines, and the then Auckland Regional Council's TP90. It uses considerable material from Erosion and sediment control guide for land disturbing activities in the Auckland region. Auckland Council Guideline Document GD2016/005, and subsequent industry-led improvements."[7]

The Toolbox can currently be found at https://esccanterbury.co.nz/ and is only available online.

The proposed Bylaw requires that ESCPs are prepared in accordance with Environment Canterbury's Erosion and Sediment Control Toolbox. ESCPs are generally already a standard requirement for Building and Resource Consent applications.

[7] As described on the website, https://esccanterbury.co.nz/project/about/

3. Erosion and Sediment Management Process

The general ESC management process is as follows:

1. The SDMP sets the TSS concentration trigger levels for discharges to the stormwater network (Section 4)
2. An ESCP is prepared (Section 5) by a 'suitably qualified and experienced professional' (Section 6) as determined by the site risk assessment
3. The TSS concentration trigger levels for the site are included in authorisations or conditions where possible (Section 7)
4. The ESC measures are implemented onsite
5. Monitoring takes place, either self-monitoring, as part of scheduled inspections or in response to complaints (Section 8)
6. If ESC measures are insufficient, compliance action may be required following Council's Voluntary, Assisted, Directed and Enforced (VADE) model (Section 8)
7. The ESC measures remain in place until the area disturbed by the earthworks has been stabilised, and the erosion and sediment risk has sufficiently diminished.
8. Once site has stabilised all ESC controls are to be removed and disposed of appropriately.

3.1. Implementation

Development sites with the potential to discharge sediment to the Council network will be managed through either the Bylaw, Building Consent or Resource Consent processes. This section describes how the SDMP will be implemented within each of those situations. The table below summarises this.

Table 2 Scenario requirement and response table

Activity Requirement	Legislation	ESCP requirements	Monitoring
Resource Consent	Resource Management Act	Prepare and implement ESCP pre site works High risk sites must provide ESCP with application, other sites to have it available onsite Condition requiring no discharge of 'muddy water' with an advice note stating this is interpreted to be a TSS concentration no greater than 50 mg/L	For high risk sites no earthworks shall commence on site until an Engineering Completion Certificate, signed by an appropriately qualified and experienced engineer, is completed and presented to Council to certify that the erosion and sediment control measures have been properly installed
Building Consent	Building Act	Provide ESCP with application and implement onsite Advice note stating that the intent of the ESCP is to prevent discharge of 'muddy water' from the site, stating this is	• High risk sites; a pre-site works inspection is scheduled to inspect that ESC measures are in place • Medium and low risk sites, ESC measures are inspected as part of other inspections (e.g. the pre-pour inspection)

		interpreted to be a TSS concentration no greater than 50 mg/L	• All sites; a visual check of ESC measures on all subsequent inspections
Anything not covered by Consents	Bylaw (Local Government Act)	Prepare and implement ESCP. Plan available onsite. Measures must be in place before and during earthworks to prevent muddy water flowing off the site, stabilise the land to prevent slipping, prevent mud from being tracked off the site, and reduce dust. There is a clause enabling the setting of stormwater quality standards, which could include setting a TSS concentration of no greater than 50 mg/L for sites undertaking earthworks. The approval for a new discharge to the network may include a condition limiting TSS concentrations to no more than 50 mg/L.	Complaint response monitoring only

3.2. Proposed draft Stormwater Bylaw

The draft Stormwater Bylaw covers all development sites where earthworks[8] are undertaken and which may cause sediment laden run-off to enter the Council stormwater network. Most of the development sites will also be covered by either a Building Consent or a Resource Consent or both.

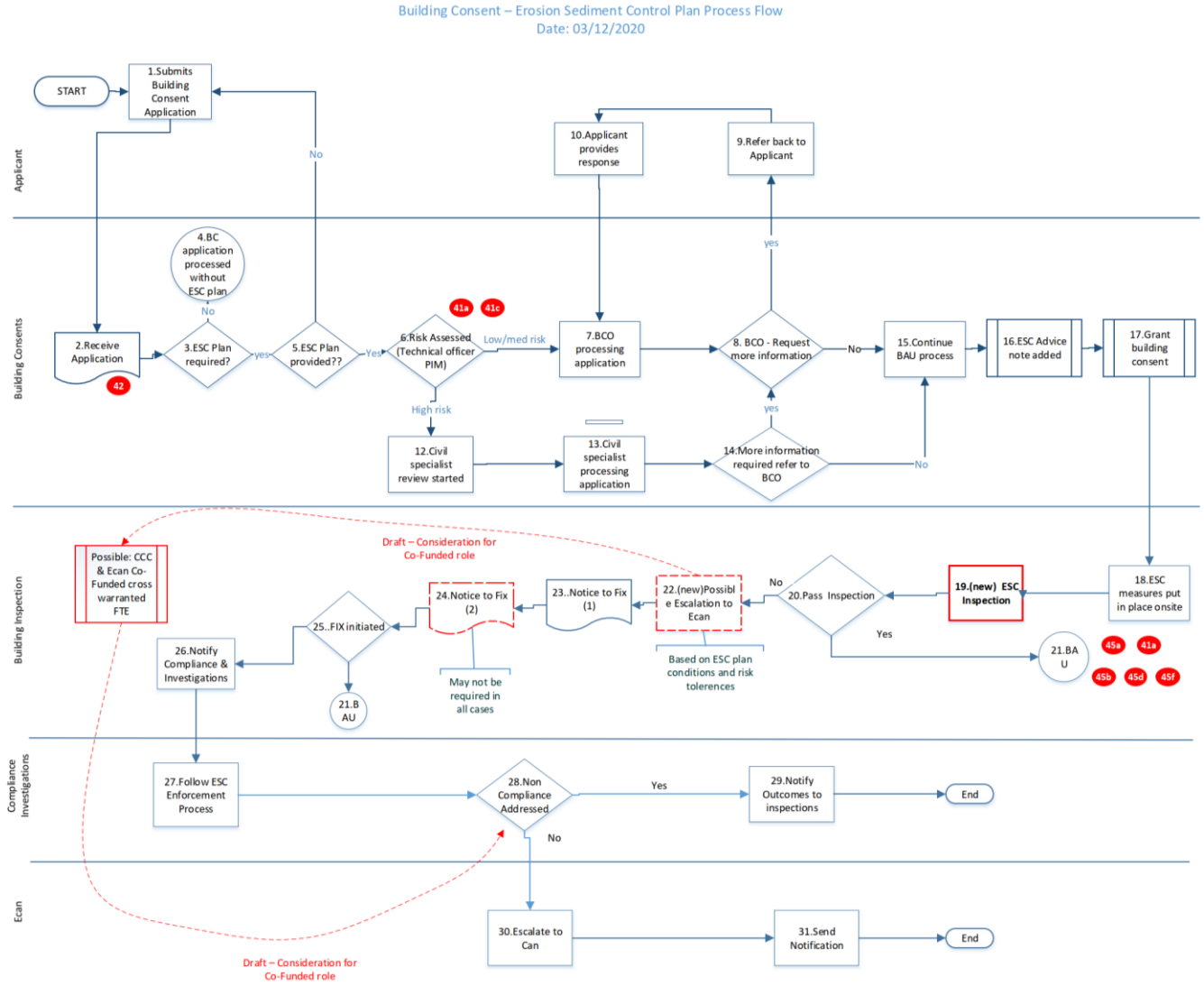
Where covered by neither a Building Consent nor a Resource Consent, the Bylaw still needs to be complied with. However, as Council will generally not be informed that the activity is taking place, active monitoring will not take place. Instead the monitoring will be in reaction to observations or complaints.

3.3. Sites covered by Building Consents

The process for sites covered by Building Consents is summarised in Figure 1. This is a high level process diagram which does not include all the procedures which may occur within each step. These are described in later sections of the SDMP.

[8] As defined in Section 2.5.

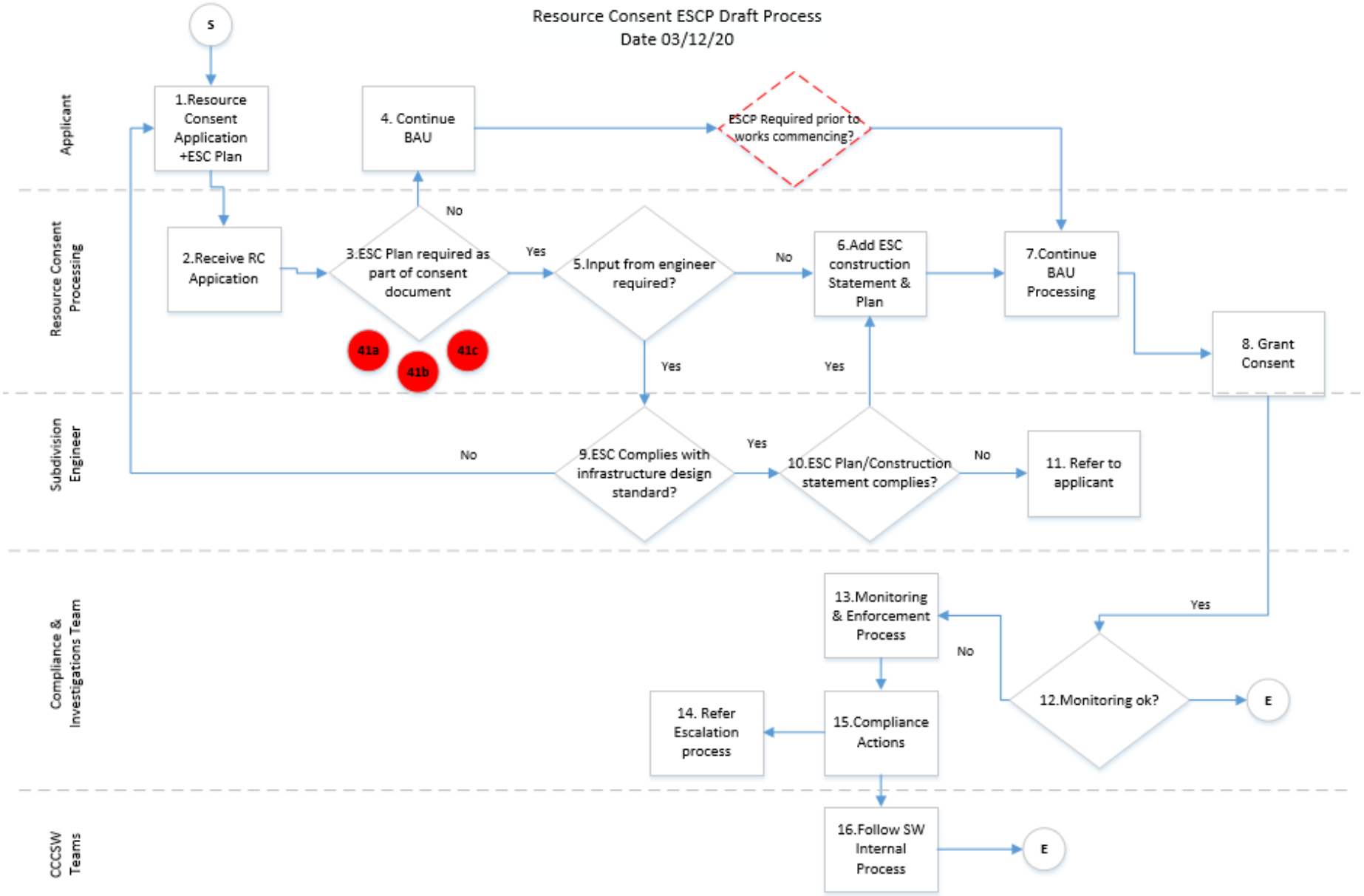
Figure 1 ESC Building consent process



3.4. Sites covered by Resource Consents

The process for sites covered by Resource Consents is summarised in Figure 2. This is a high level process diagram which does not include all the procedures which may occur within each step. These are described in later sections of the SDMP.

Figure 2 ESC Resource consent process



4. Concentration Trigger Levels

The SDMP is required to include (Condition 45a):

> *A risk assessment to determine the TSS concentration trigger levels for the discharge of stormwater into the stormwater network from development sites. The risk assessment will include factors of slope, soil type, whether the discharge will be treated downstream by a Council treatment facility prior to reaching the receiving environment, and the sensitivity of the receiving environment.*

Using a range of different criteria results in significant complexity in the assessment of TSS concentrations and is not considered practicable. The approach Council wishes to take is that staff discuss high sediment discharge with the site owner/manager regardless of the concentration, with a message that if sediment discharge is visible it should be fixed. As such Council has made the decision to set a single trigger level for all discharges of 50 mg/L, where the appropriate mechanism exists for setting a TSS level. 50 mg/L is considered a practical level for a visual assessment of significant sediment discharge, as well as providing an objective concentration level should any enforcement be required. It is also an achievable level with good practice.

5. Requirements for Erosion and Sediment Control Plans

Council has three mechanisms for requiring preparation of ESCPs for new developments that include an element of earthworks. In some cases the ESCPs must be provided to and accepted by Council prior to earthworks commencing. However, there are instances where it is not reasonably practicable to implement a requirement for provision of an ESCP to Council, with subsequent auditing and monitoring by Council staff for all situations.

5.1. Resource consent process

Where a resource consent is required to authorise earthworks on a high risk site, the conditions of that resource consent will require the provision of an ESCP to Council's Compliance Team prior to works commencing. Works cannot commence until the ESCP has been audited by suitably experienced Council staff and accepted as suitable. For low and medium risk sites an ESCP only needs to be prepared, kept onsite, and available to staff on request. Regardless of the risk level the ESCP must be implemented prior to the works commencing.

5.2. Building consent process

Where a building consent is required to undertake building work that includes an element of earthworks, the application for that building consent must include an ESCP. All ESCPs submitted as part of a building consent application are assessed by suitably experienced building consent authority staff. Ensuring an ESCP where the maximum TSS concentration level will not be exceeded is equated with compliance with building code performance E1.3.1. Once approved and the building consent is issued, the ESCP will form an integral part of that building consent.

5.3. Bylaw Process

Council will rely on the Bylaw where a Building or Resource consent is not required to authorise earthworks. The proposed Bylaw includes the following with regards to ESCPs (refer to the Appendix for the full text):

(1) Any person intending to undertake earthworks[9] must, before stripping vegetation or beginning earthworks, engage a suitably qualified person to prepare an Erosion and Sediment Control Plan that sets out how erosion and sediment from the site will be managed during the earthworks.

(2) The Erosion and Sediment Control Plan must set out how the site of the earthworks will be managed to:
   a. prevent earth or sediment from being washed off the site or otherwise carried in water onto neighbouring properties, roads, or into the stormwater network;
   b. stabilise land to prevent earth slipping onto neighbouring properties, roads, or into the stormwater network;
   c. stabilise entranceways and prevent earth or sediment from being spilled or tracked off the site by people or vehicles; and
   d. control or minimise dust.

(3) An Erosion and Sediment Control Plan must be prepared by a suitably qualified person and in accordance with Environment Canterbury's Erosion and Sediment Control Toolbox.

(4) Any person undertaking earthworks must make the Erosion and Sediment Control Plan available to the Council on request.

[9] As defined in Section 2.5

(5) The site manager or person undertaking the earthworks must ensure the measures set out in the Erosion and Sediment Control Plan are implemented, monitored and fit for purpose.

Where a Building or Resource consent (that incorporates the need for an ESCP) is not required to authorise earthworks on a development site, these clauses form the primary means of meeting the requirements of Condition 41 and 42 of the consent.

5.4. Summary of ESCP review process

Table 3 Summary of ESCP review process

Situation	**ESCP reviewed by Council?**	**Activity covered by**		
		Bylaw[1]	**Building Consent**	**Resource Consent**
Sites that do not require building or land use consent	No (unless complaint received)	✓		
Sites that require building consent only, and are part of a recently approved subdivision	Yes		✓	
Sites that require building consent only, NOT part of a recently approved subdivision	Yes		✓	
Sites that require resource use consent	Yes, for high risk sites		✓ (sometimes)	✓
Sites that require land use consent for subdivision	Yes, for larger scale or greenfield sites		✓ (sometimes)	✓

[1]Including permitted activities under the District Plan.

6. Site Risk Assessment

Projects are to be categorised according to the degree of risk of erosion and sediment discharge in stormwater arising from the works. Three risk categories will be used, these being Low, Medium and High Risk. Risk is defined in terms of:

- The area/extent of the works
- Proximity to a waterway
- Slope i.e. hill vs flat sites
- Whether or not they are Permitted Activities under the District Plan and/or Building Act

Table 4 Site risk assessment

Risk level*	**Criteria which must be met**		
	Disturbed area	*Distance of site boundary to waterway*	*Slope*
Very Low	Sites which are Permitted Activities under the District Plan and/or Building Act.		
Low	<150 m^2	>20 m	<5°
Medium	<500 m^2	<20 m	Any
	<500 m^2	Any	>5°
	150-1,000 m^2	>20 m	<5°
High	501-1,000 m^2	<20 m	Any
	501-1,000 m^2	Any	>5°
	>1,001 m^2	Any	Any

*To achieve the risk rating the site must fulfil all criteria on any one row.

This risk assessment is used to determine whether the level of qualification and experience of the person preparing an ESCP for a site or work area is suitable to ensure that ESC risks are identified and adequately planned for.

6.1. Suitably qualified and experienced professional

Condition 41(b) of the consent requires that ESCP's are "prepared by a suitably qualified and experienced professional…"

The concept of a suitably qualified and experienced professional needs to be assessed in terms of the environmental risk and factors affecting this such as the scale and location of the development. The ESCP requirements for a small building extension will be less than those expected of a large subdivision. Requiring the ESCP for a small extension to be done by suitably qualified and experienced professional may be unduly onerous.

The qualification and experience level required needs to be in keeping with the particular complexities, constraints and issues associated with the project. The following sections outline how site risk will be assessed, as well as providing definitions of 'suitably qualified and experienced professional' based on the risk of the project works.

6.2. Very low risk sites

Sites with works that qualify as Permitted Activities are generally very low risk otherwise they would require a land use consent and/or building consent. For these Permitted Activity works a suitably qualified and experienced person can be the landowner or any other person undertaking the physical works. All aspects of the draft Stormwater Bylaw will still need to be complied with.

6.3. Low risk sites

For Low Risk sites, a suitably qualified and experienced person can be any one of the following:

- Any person listed as suitable for Medium or High Risk sites
- Anyone who can prepare and demonstrate that the ESCP adopts a Best Practicable Option approach and is prepared in accordance with the Toolbox.

6.4. Medium risk sites

For Medium Risk sites, a suitably qualified and experienced person can be any one of the following:

- Any person listed as suitable for High Risk sites
- A civil works contractor
- An architect
- Licensed Building Practitioner
- Drain layer
- Anyone that Council approves outside of the persons listed above, with approval sought and confirmed prior to the building consent stage.

Council may request the experience and qualifications be demonstrated prior to review and acceptance of the ESCP by Council.

6.5. High risk sites

For High Risk sites, only the following will be considered a suitably qualified and experienced person:

- A Chartered Professional Engineer (CPEng) in Environmental or Civil Engineering
- A Certified Practitioner in Erosion and Sediment Control (CPESC)
- A Certified Environmental Practitioner (CEnvP)
- Anyone that Council approves outside of the persons listed above, with approval sought and confirmed prior to the building consent stage.

All of the above must hold at least two years' experience in preparing, implementing or managing ESCPs on High Risk construction sites. This must include experience of onsite management and/or oversight of construction environmental management (including erosion and sediment control).

An environmental professional (other than above) with at least five years' experience in preparing, implementing or managing ESCPs on High Risk construction sites. This must include experience of onsite management and/or oversight of construction environmental management (including erosion and sediment control).

7. Process for Including TSS Concentration Trigger Levels in Authorisations

A description of how the trigger level was set is included in Section 4. This table below shows where the trigger levels can be included in authorisations for Building and Resource Consents. As previously described, there are currently no mechanisms for Council to set a TSS trigger level for earthworks which are not authorised by a consent.

Table 5 Summary of where TSS concentration trigger levels can be set

Situation	Ability for TSS trigger levels to be set by Council?	Activity covered by		
		Bylaw[1]	Building Consent	Resource Consent
Sites that do not require building or land use consent or discharge authorisation	No	✓		
Sites that require authorisation to discharge into the stormwater network	Yes - conditions can be attached to the discharge authorisation letter	✓		
Sites that require building consent only, and are part of a recently approved subdivision	Yes – advice note stating that no muddy water (TSS>50 mg/L) can leave site		✓	
Sites that require building consent only, NOT part of a recently approved subdivision	Yes - conditions can be attached to the discharge authorisation letter (if required) and/or advice note on BC stating that no muddy water (TSS>50 mg/L) can leave site	✓ (sometimes)	✓	
Sites that require land use consent	Yes - conditions can be set on the Land Use Consent if stormwater servicing / earthworks is a matter of discretion (for restricted discretionary activities, fully discretionary activities or non-complying activities)		✓ (sometimes)	✓
Sites that require land use consent for subdivision	Yes, if they involve earthworks, servicing and/or building works	✓ (sometimes)	✓ (sometimes)	✓

[1]This includes earthworks permitted under the District Plan.

7.1. TSS concentration levels in Bylaw authorisations

The bylaw regulates earthworks activities that are not otherwise caught by an existing regulatory mechanism (activities that do not require either Building or Resource Consent). These will be lower risk and less extensive. The proposed bylaw will require that ESC measures are in place before earthworks begins, and until land is stabilised. This applies to all earthworks – providing a catch-all.

Council has the ability to set a TSS concentration trigger level as a standard under the bylaw or as a condition on an authorisation to discharge to the stormwater network. This will be set at 50 mg/L for construction phase discharge

Where the discharge is permitted or existing, as no authorisation is required, there will be no TSS concentration trigger level set.[10]

7.2. TSS concentration levels in Resource Consents

For Resource Consents, where appropriate, a standard condition will be included (refer APPENDIX B) with wording similar to:

> *Run-off must be controlled to prevent muddy water flowing, or earth slipping, onto neighbouring properties, legal road, or into a river, stream, drain or wetland. Sediment, earth or debris must not fall or collect on land beyond the site or enter the Council's stormwater system. All muddy water must be treated, using at a minimum the erosion and sediment control measures detailed in the site specific Erosion and Sediment Control Plan, prior to discharge to the Council's stormwater system.*

An advice note will be included stating that 'muddy water' is considered to be water with a TSS concentration greater than 50 mg/L.

7.3. TSS concentration levels in Building Consents

The Building Act requires that when granting a Building Consent Council is satisfied on reasonable grounds that if the approved plans and specifications are followed it would meet the performances of the Building Code. Conditions are not allowed to be relied upon to satisfy Council that building work (including ESCP measures) will comply. Advice notes can be used to provide clarification, but cannot be used to say how the building work is to be done and make up for lack of design.

Council currently includes an advice note to the Building Consent to make applicants aware they need to follow the approved plan. This currently says:

> ***Management plan for the control of stormwater and sediment****: The management plan for the control of stormwater and sediment during construction must be made known to the building contractor before any siteworks are carried out. Failure to comply with the management plan may lead to enforcement action being taken under the Building Act 2004.*

It is proposed to amend the advice note to change some of the terminology to be consistent with wording in authorisations and Resource Consents. This could have wording similar to:

> ***Erosion and sediment control plan:*** *The plan for the control of erosion and sediment during construction must be made known to the building contractor before any site works are carried out. The objective of this plan is to control run-off to prevent muddy water flowing, or earth slipping, onto neighbouring properties, legal road (including kerb and channel). Muddy water is defined being water with a total suspended solids (TSS) concentration of greater than 50mg/L. Failure to comply with the plan may lead to enforcement action being taken under the Building Act 2004.*

[10] Although the proposed Bylaw will contain a provision to enable the setting of standards for stormwater, we anticipate that this will not be utilised in relation to erosion and sediment control because of the suggested practice of requiring changes on site if visibly muddy stormwater is being discharged. Additionally, setting a TSS limit through the approval of an ESCP as a condition of a building or resource consent will apply where relevant.

8. Monitoring and Compliance

Condition 45 requires that the SDMP includes:

> b. In the event of a trigger level exceedance, a feedback process to identify and implement any changes to the erosion and sediment control practices in place on the development site. These may include reducing the area exposed to erosion by stabilisation or improving the efficiency of sediment laden water treatment.
>
> d. A process for monitoring the erosion and sediment control management and sediment discharges from development sites
>
> e. Determination of a rainfall intensity which will trigger monitoring of sediment discharges from development sites into the Council's network.

The following sections outline how monitoring to meet the requirements of Condition 45 will be undertaken.

8.1. Determination of a rainfall intensity which will trigger monitoring

Due to the number of development sites at any one time, only the discharge from high risk sites will be actively monitored by Council staff during rainfall events which are likely to result in a discharge that exceeds the TSS concentration trigger level. As forecasts are typically given in rainfall depth, depth will be used as a surrogate for intensity.

Analysis of the last 10 years of rainfall data from the Botanic Gardens meteorological site allows for an assessment of the frequency of various rainfall depths, intensities and durations, and this can be compared against NIWA's High Intensity Rainfall Design System (HIRDS) v4.[11] Using a minimum storm depth of 10mm and a minimum storm gap[12] of 12 hours, the data was analysed to identify the frequency of events that exceed 10mm for a given duration.

For the 10 year period analysed, there were 196 events with a rainfall depth greater than 10mm and a storm gap of 12 hours or more. Of these events, 181 were of 24 hours duration or less with a rainfall depth greater than 10mm (92%). This equates to approximately one every three weeks on average, which is considered to be impracticable for current resource availability.

Maintaining the rainfall depth at 10mm, but requiring this rainfall to occur in 3 hours or less, reduces the number of events exceeding this criteria to 71 (36%), or approximately one every two months. This is considered practicable for current resources, although it is noted that not all high risk sites could be visited each time. This is equivalent to an intensity of 3 mm/hr for 3 hours or more.

However, this does not address longer duration lower intensity storm events, which may after a time also mobilise sediment. Therefore it is proposed to add in a condition that where >25 mm is forecast for a period of 24 hours or less, then these events should also be monitored. This increases the number of events from the past 10 years to 90 (or 46%), and increases the average frequency of occurrence to approximately once every six weeks. This is still considered practicable.

[11] https://hirds.niwa.co.nz/
[12] The minimum gap between 15 minute rainfall records to define a distinct storm event.

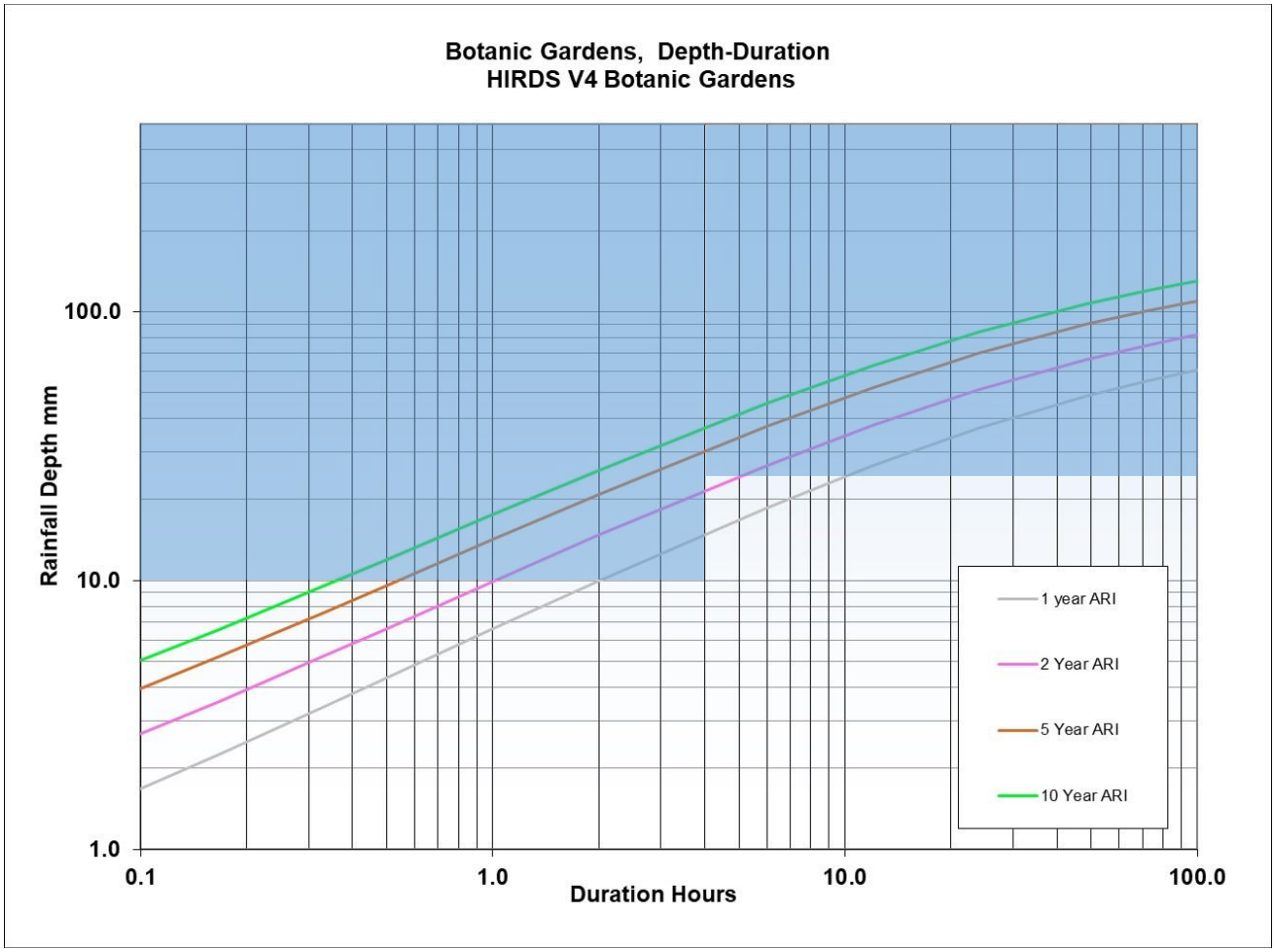
For comparison purposes the Waterways, Wetlands and Drainage Guide (WWDG) considers the 'first flush depth', the depth at which most contaminants are mobilised prior, to be 25 mm.

In summary the proposed rainfall monitoring criteria are:

- Short duration events – 10 mm forecast for a period of 3 hours or less
- Longer duration events – 25 mm forecast for a period of 24 hours or less

This is shown graphically against ARI determined by HIRDS v4 below.

Figure 3 Botanic Gardens – Depth-Duration frequency from HIRDS v4



8.2. Process for monitoring the erosion and sediment control management and sediment discharges from development sites

8.2.1. Self-monitoring

Monitoring is an essential part of an ESCP. Where an ESCP is submitted to Council for approval it should include details of monitoring (such as frequency and methodology). However, there is an expectation that as all ESCPs must be prepared in accordance with the Toolbox and this will include monitoring.

The owner, site manager or person specified in the ESCP is expected to monitor the site to ensure that ESC measures are in place and appropriate to the activity, and that other discharge conditions (if applicable) are complied with. As a minimum, it is expected that the advice of the Environment Canterbury Toolbox is complied with, which states:

Regularly inspect, monitor and maintain ESC tools and check their performance.

Inspection and maintenance of controls is especially important prior to and following a storm event. A large or intense storm can leave ESC measures in need of repair, replacement, reinforcement or cleaning out. Maintaining and repairing measures as soon as possible after a storm event will maximise the ongoing efficiency of the measures and minimise adverse environmental effects.

Assessment and adjustment is an important ESC practice – it must figure prominently in the ESC Plan. It is also important to assign responsibility for implementing the ESC Plan and monitoring control measures as the project progresses.

Monitor the performance of your tools – check water quality and monitor dust discharges during strong winds, and record the results of monitoring. You will find out whether your measures are effective, or whether they need to be adjusted.

8.2.2. Council monitoring

Due to the number of development sites active at any one time, active monitoring during a rainfall event will only take place at a proportion of the highest risk sites when staff resources are available. The trigger for active monitoring will be based on forecast rainfall as described above.

Scheduled monitoring will take place during routine inspections as a part of the Building Consent or inspections of greenfield subdivisions. This means that Council staff will inspect the ESC measures when visiting a site for other inspections, and raise any issues with the site manager.

In addition to active monitoring of the highest risk sites, reactive monitoring will take place when complaints are received. The customer services team will be provided with information on where to direct these complaints so that appropriate action can be taken.

As resources become available there may be scope to increase the level of monitoring.

8.3. Trigger level exceedances

Staff will be encouraged to discuss with site managers ESC measures whenever a visible discharge is noticed from a site, regardless of the concentration in the runoff. This is to encourage a voluntary response from the site manager to undertake the necessary measures required to improve the ESC measures. This will require site managers to identify and implement changes to the erosion and sediment control practices in place on the development site. These may include reducing the area exposed to erosion by stabilisation or improving the efficiency of sediment laden water treatment.

For building work being undertaken under a Building Consent, if the ESC measures are not in place as per the approved building consent documents there is the option to issue a Notice to Fix – a statutory notice requiring a person to remedy a breach of the Building Act 2004 or regulations under that Act. Where a Notice to Fix is not complied with, then the compliance team is notified and follow-up action taken, which will include consulting the consent holder (or their representative) to request action.

For Resource Consents, where there is inadequate action from the site manager, the matter will be referred to the Compliance and Investigations Team in the Regulatory Compliance Unit for follow up.

9. Record Keeping

9.1. Record keeping for ESCP's

Condition 42 of the consent requires that ESCP's submitted to or prepared for Council are to be made available to Environment Canterbury on request. The following sections describe how Council can achieve this through reasonably practicable means.

9.1.1. ESCP's for sites requiring consent

For sites requiring Building consent, ESCP's will be submitted for review as part of the consent application process. These Plans will be stored with the building consent file and can be extracted upon request.

For high risk sites requiring Resource consent, ESCP's must be submitted to Council's Compliance Team a specified number of days prior to works commencing. These Plans will be stored with the resource consent file and can be extracted upon request.

It is considered reasonably practicable to only provide individual ESCP's to Environment Canterbury upon request, and not to provide all ESCP's at any time a request is made. It is expected that a request for an ESCP will only be made where there is concern about how the site is being managed, and that provision of the relevant ESCP will allow for review against the requirements of Condition 41.

9.1.2. ESCP's for sites under the proposed Stormwater Bylaw

For sites which are only covered by the Bylaw, Council will generally be unaware that the activity is taking place, and it is unlikely that there will be any records held by Council regarding the activity. The proposed draft Stormwater Bylaw does not require a site owner to submit the ESCP to Council. However, the ESCP must be made available to Council upon request. The proposed Stormwater Bylaw requires that effective ESC measures are put in place, and that they remain in place until the land is sufficiently stabilised.

A request for an ESCP from the site owner will only be made where there is concern about how the site is being managed. The ESCP can then be reviewed against the requirements of the Bylaw. The ESCP, and any subsequent action, will be stored on the Council's property file.

9.2. Other record keeping

Condition 45(f) requires that the SDMP includes details of how records will be kept (such as site TSS concentration, trigger level exceedance, compliance monitoring and enforcement action). These will be captured in Council's system and records made available to Environment Canterbury on request.

10. Review Process

Condition 46 allows for Council to,

> *Review and amend the SDMP so as to better achieve the purpose of the SDMP and in response to any updates to the relevant Attribute Target Levels. Any amendments to the SDMP shall not replace the previous version until the plan has been certified by the RMA Compliance and Enforcement Manager of the Canterbury Regional Council as being consistent with the purpose and required content of the SDMP.*

The SDMP will be reviewed on a 5 yearly basis or more frequently, as required by process changes.

11. Glossary

BC – Building Consent

Consent – where not otherwise specified this refers to the CSNDC

Council – Christchurch City Council

CSNDC - Comprehensive Stormwater Network Drainage Consent

ESC – Erosion and Sediment Control

ESCP – Erosion and Sediment Control Plan

IDS – Infrastructure Design Standards

RC – Resource Consent

RMA – Resource Management Act 1991

SDMP – Sediment Discharge Management Plan

SMP – Storm water Management Plan

Toolbox – Environment Canterbury Erosion and Sediment Control Toolbox

WWDG – Waterways Wetlands and Drainage Guide

12. Revision History

Version	Date	Name	Description
DRAFT A	22/10/2020	Peter Christensen	First draft
DRAFT B	24/11/2020	Peter Christensen	Second draft – first round of comments incorporated
Final – Rev 1	4/12/2020	Peter Christensen	Final (Rev 1) for approval
Final – Rev 2	11/12/20	Peter Christensen	Final (Rev 2) for approval
Final – Rev 3	5/8/2021	Clive Appleton	Review to include ECan feedback and latest version of the proposed draft Bylaw

APPENDIX A. Proposed Stormwater Bylaw ESC Text

Note that at the time of writing this SDMP, the Christchurch City Council Water Supply, Wastewater and Stormwater Bylaw 2014 is under review. It is proposed that the current stormwater clauses will be replaced by a stand-alone Stormwater Bylaw. A public consultation process is planned for 2021. The proposed new bylaw will more closely align with the consent, to the extent possible, and will help to implement the actions required to achieve the outcomes sought under the consent. ***The SDMP refers to the draft wording in the proposed new Stormwater Bylaw and is subject to change, depending on the wording of the final bylaw adopted by the Council.***

Definition of "earthworks" for the purposes of the bylaw:

Earthworks *means any mechanical excavation, or substantial manual excavation, such as levelling, filling, retaining, contouring or landscaping a site; and includes moving, removing, placing or replacing earth, rock or soil.*

REQUIREMENTS FOR EARTHWORKS

Explanatory Note: *Reducing erosion and sediment from earthworks helps to prevent habitat degradation in our waterways and protects the stormwater network from damage or reduced functionality from sediment.*

1. EROSION AND SEDIMENT MANAGEMENT

(1) Any person intending to undertake earthworks must, before stripping vegetation or beginning earthworks, engage a suitably qualified person to prepare an Erosion and Sediment Control Plan that sets out how erosion and sediment from the site will be managed during the earthworks.
(2) The Erosion and Sediment Control Plan must set out how the site of the earthworks will be managed to:
    a. prevent earth or sediment from being washed off the site or otherwise carried in water onto neighbouring properties, roads, or into the stormwater network;
    b. stabilise land to prevent earth slipping onto neighbouring properties, roads, or into the stormwater network;
    c. stabilise entranceways and prevent earth or sediment from being spilled or tracked off the site by people or vehicles; and
    d. control or minimise dust.
(3) An Erosion and Sediment Control Plan must be prepared by a suitably qualified person and in accordance with Environment Canterbury's Erosion and Sediment Control Toolbox.
(4) Any person undertaking earthworks must make the Erosion and Sediment Control Plan available to the Council on request.
(5) The site manager or person undertaking the earthworks must ensure the measures set out in the Erosion and Sediment Control Plan are implemented, monitored and fit for purpose.

Explanatory note*: Erosion and sediment control requirements for earthworks associated with a building or resource consent will be managed in the consent conditions. Projects that are exempt from building consent requirements (such as demolishing a building or replacing a small driveway), will need an Erosion and Sediment Control Plan to meet the requirements of this bylaw.*

The skills and experience of a person suitably qualified to prepare an Erosion and Sediment Control Plan will vary depending on the complexities and level of risk associated with the earthworks, including the extent of the works, proximity to any waterways and the slope of the site.

The Council's Traffic and Parking Bylaw has clauses to prevent material or debris from being deposited on roads, and enforcement action could be taken under that bylaw or under section 357 of the Local Government Act 1974 (Penalties for damage to roads) in relation to mud on roads, or under this bylaw in relation to stormwater contamination arising from mud on roads.

More detailed information on Erosion and Sediment Control Plan requirements is available on the Council's website – **www.ccc.govt.nz**.

2. MEASURES MUST BE IN PLACE BEFORE AND DURING EARTHWORKS

(1) To ensure that any risk of sediment entering the stormwater network is minimised, a person undertaking earthworks must:
   (a) put appropriate erosion and sediment control measures in place before beginning the earthworks; and
   (b) keep those erosion and sediment control measures in place until such time as the area disturbed by the earthworks has been stabilised, and the risk has sufficiently diminished.

***Explanatory note**: The appropriate measures will depend on the scale and duration of the earthworks, the slope of the site, the closeness to any waterways, and the potential for rainfall. Likely measures include preventing runoff, protecting waterways, installing perimeter controls, and managing vehicle access to reduce mud on the road near the site.*

APPENDIX B. Standard Earthworks Conditions for Resource Consents

Assessment matter/reason for condition	Conditions
8.9.4.1 Nuisance ***a. The extent to which any potential dust nuisance, sedimentation and water or wind erosion effects can be avoided or mitigated.***	***Low/medium risk sites (Use 1-6 for flat land and simple/single hill sites)*** 1. All earthworks shall be carried out in accordance with a site specific Erosion and Sediment Control Plan (ESCP), prepared by a suitably qualified and experienced professional, which follows the best practice principles, techniques, inspections and monitoring for erosion and sediment control contained in ECan's Erosion and Sediment Control Toolbox for Canterbury http://esccanterbury.co.nz/. The ESCP must be held on site at all times and made available to Council on request. 2. Run-off must be controlled to prevent muddy water flowing, or earth slipping, onto neighbouring properties, legal road (including kerb and channel), or into a river, stream, drain or wetland. Sediment, earth, or debris must not fall or collect on land beyond the site or enter the Council's stormwater system. All muddy water must be treated, using at a minimum the erosion and sediment control measures detailed in the site specific Erosion and Sediment Control Plan, prior to discharge to the Council's stormwater system. *For the purposes of Condition 2 muddy water is defined as water with a total suspended solid (TSS) content greater than 50mg/L.* 3. No earth working shall commence until the ESCP has been implemented on site. The ESCP measures shall be maintained over the period of the construction phase, until the site is stabilised (i.e. no longer producing dust or water-borne sediment). The ESCP shall be improved if initial and/or standard measures are found to be inadequate. All disturbed surfaces shall be adequately top soiled **and** vegetated or otherwise stabilised as soon as possible to limit sediment mobilisation. 4. Dust emissions shall be appropriately managed within the boundary of the property in compliance with the *Regional Air Plan*. Dust mitigation measures such as water carts, sprinklers or polymers shall be used on any exposed areas. The roads to and from the site, and the site entrance and exit, must remain tidy and free of dust and dirt at all times. 5. The consent holder must notify Christchurch City Council no less than three working days prior to works commencing, (email to rcmon@ccc.govt.nz) of the earthworks start date and the name and contact details of the site supervisor. The consent holder shall at this time also provide confirmation of the installation of ESCP measures as per the plan prepared under Condition 1 above. 6. All loading and unloading of trucks with excavation or fill material shall be carried out within the subject site.

High risk sites (Use 7 or 8 for larger sites – greenfield subdivisions, commercial developments, large scale earthworks. Use 7 where standard or 8 where other overlapping matters to tie together such as waterways, NES etc.).

7. The draft ESCP provided with the application is accepted in principle. All filling and excavation work shall be carried out in accordance with an OR a final (use if draft approved in principle) Erosion and Sediment Control Plan (ESCP). Unless approved as part of a separate Environment Canterbury (ECan) resource consent for stormwater discharge or ECan resource consent for excavation/filling, the ESCP will require formal acceptance by Christchurch City Council's Subdivision Engineer (email to rcmon@ccc.govt.nz) prior to any work starting on site. The accepted ESCP shall be implemented on site during the construction phase and no works are permitted to commence until such time as the ESCP has been accepted. The ESCP is to be designed by a suitably qualified person and a design certificate (Appendix IV in IDS Part 3) supplied with the ESCP for acceptance at least 5 working days prior to any earthworking commencing. The performance criteria for the ESCP shall be based on ECan's Erosion and Sediment Control Guidelines (2007). The ESCP shall include (but is not limited to):
   - Site description, i.e. topography, vegetation, soils, sensitive receptors such as waterways etc.;
   - Details of proposed activities;
   - A report including the method and time of monitoring to be undertaken;
   - A locality map;
   - Drawings showing the site, type and location of sediment control measures, on-site catchment boundaries and off-site sources of run on/runoff;
   - Drawings and specifications showing the positions of all proposed mitigation areas with supporting calculations if appropriate;
   - Environmental monitoring and auditing, including frequency;
   - Corrective action, reporting on solutions and update of the EMP;
   - Stabilised entrance/exit and any haul roads;
   - Site laydown and stockpile location(s) and controls;

8. The draft EMP provided with the application is accepted in principle. All filling and excavation work shall be carried out in accordance with an OR a final (use if draft approved in principle) Environmental Management Plan (EMP) which shall include an Erosion and Sediment Control Plan (ESCP). Unless approved as part of a separate ECan resource consent for stormwater discharge or ECan resource consent for excavation/filling the EMP will require formal acceptance by Christchurch City Council's Subdivision Engineer (email to rcmon@ccc.govt.nz) prior to any work starting on site. The EMP shall be designed by a suitably qualified person and a design certificate (Appendix IV in IDS Part 3) supplied with the EMP for acceptance at least 5 working days prior to the works commencing.

   The best practice principles, techniques, inspections and monitoring for erosion and sediment control shall be based on ECan's Erosion and Sediment Control Toolbox for Canterbury **http://esccanterbury.co.nz/** . The EMP shall include (but is not limited to):

   - The identification of environmental risks including erosion, sediment and dust control, spills, wastewater overflows, dewatering, and excavation and disposal of material from contaminated sites;
   - A site description, i.e. topography, vegetation, soils, etc;

	• Details of proposed activities; • A locality map; • Drawings showing the site, type and location of sediment control measures, on-site catchment boundaries and off-site sources of runon/runoff; • Drawings and specifications showing the positions of all proposed mitigation areas with supporting calculations if appropriate; • Drawings showing the protection of natural assets and habitats; • Stabilised entrance/exit and any haul roads; • Site laydown and stockpile location(s) and controls; • A programme of works including a proposed timeframe and completion date; • Emergency response and contingency management; • Procedures for compliance with resource consents and permitted activities; • Environmental monitoring and auditing, including frequency; • Corrective action, reporting on solutions and update of the EMP; • Procedures for training and supervising staff in relation to environmental issues; • Contact details of key personnel responsible for environmental management and compliance. Note: IDS clause 3.8.2 contains further detail on Environmental Management Plans. ***Use 9 in conjunction with condition 7 or 8*** 9. The accepted EMP or ESCP shall be implemented on site over the construction phase. No earthworks shall commence on site until: • The contractor has received a copy of all resource consents and relevant permitted activity rules controlling this work; • the EMP or ESCP has been installed; • an Engineering Completion Certificate (Appendix VII in IDS Part 3), signed by an appropriately qualified and experienced engineer, is completed and presented to Council. This is to certify that the erosion and sediment control measures have been properly installed in accordance with the accepted EMP or ESCP.
8.9.4.1 Nuisance ***b. The extent to which effects on neighbouring properties, and on the road network, of heavy vehicle and other vehicular traffic generated as a result of earthworks can be avoided or mitigated.***	***Use 10 if earthworks up to road boundary, RoW, large volume (e.g. >300m^3)*** 10. Any public road, shared access, footpath, landscaped area or service structure that has been damaged, by the persons involved with the development or vehicles and machinery used in relation to the works under this consent, shall be reinstated as specified in the Construction Standard Specifications (CSS) at the expense of the consent holder and to the satisfaction of Council. ***Use 11 for arterial roads, very narrow roads (e.g. Lyttelton), large volume for residential (e.g. >1000m3), works affecting footpath*** 11. An approved Traffic Management Plan (TMP) shall be implemented for this earthworks / construction activity and no works are to commence until such time as the TMP has been installed. The TMP shall be prepared by an STMS accredited person, submitted through the web portal www.myworksites.co.nz and approved by the Christchurch Transport Operation Centre – please refer to www.tmpforchch.co.nz.

8.9.4.1 Nuisance ***c. The extent to which any potential changes to the patterns of surface drainage or subsoil drains can be avoided or mitigated if those changes would put the site or adjoining land at higher risk of drainage problems, inundation run-off, flooding, or raise that site's or adjoining land's water table.***	***Use 12 generally for flat land filling, especially if changing levels near site boundary. Use second part in red where some risk exists*** 12. Any change in ground levels shall not cause a ponding or drainage nuisance to neighbouring properties. All filled land shall be shaped to fall to the road boundary. Existing drainage paths from neighbouring properties shall be maintained. Following the completion of the filling and associated work an engineering report including a finished section level as built, with retained wall height and slope batter details, shall be submitted to the Subdivision Engineering Section of the Council. This report must be undertaken by a suitably qualified engineer. The information contained in this report will be placed on the property record. ***Use 13 generally for hill sites where changing runoff patterns*** 13. Stormwater runoff must be mitigated so that it does not cause a nuisance to neighbouring properties. ***Use 14 for hill sites where earthworks/construction involves concentrating stormwater*** 14. All concentrated stormwater or collected groundwater, including that from behind the retaining walls, shall be discharged in a controlled manner to the Council network.
8.9.4.1 Nuisance ***d. Whether any change in ground level would be likely to impact on trees in terms of access to water and drainage.***	***As advised by arborist if necessary to consider***
8.9.4.1 Nuisance ***e. The extent of any potential adverse effects on the quality of groundwater and whether any such can be avoided or mitigated.***	***No standard. conditions – consider as required***

8.9.4.1 Nuisance ***f. The extent to which any adverse effects from noise and vibration associated with earthworks and land improvement can be avoided or mitigated, and the effectiveness of any methods to mitigate such effects.***	***Use below as an advice note (intro text and first bullet for all, in addition to second for residential zone, or third for non-res) – these are activity standards (Rule 6.1.6.1.1 P2 a. and 8.9.2.1 P1 std. e. and f.) and must be complied with unless consent is sought to breach them. Note we shouldn't be imposing permitted activity standards as conditions, nor should we be imposing conditions that are more stringent than permitted activity standards*** Advice Note: It is the consent holder's responsibility to ensure that the activity, including where carried out by contractors on their behalf, complies with the below district plan standard - failure to do so may result in enforcement action and the need for additional land-use consent: • Rule 6.1.6.1.1 P2 - All earthworks related construction activities shall meet relevant noise limits in Tables 2 and 3 of NZS 6803:1999 Acoustics - Construction Noise, when measured and assessed in accordance with that standard. AND for residential zones • Rule 8.9.2.1 P1 Activity Standard e. - Earthworks involving mechanical or illuminating equipment shall not be undertaken outside the hours of 07:00 – 19:00 in a Residential Zone. Between the hours of 07:00 and 19:00, the noise standards in Chapter 6 Rule 6.1.5.2 and the light spill standards at Chapter 6 Rule 6.3.6 both apply. OR outside of residential zones • Rule 8.9.2.1 P1 Activity Standard f. - Earthworks involving mechanical equipment, other than in residential zones, shall not occur outside the hours of 07:00 and 22:00 except where compliant with NZS 6803:1999. Between the hours of 07:00 and 22:00 the noise standards in Chapter 6 Rule 6.1.5.2 apply except where NZS 6803.1999 is complied with, and the light spill standards in Chapter 6 Rule 6.3.6 apply. ***Use below as an advice note – it is an activity standard (Rule 8.9.2.1 P1 std. d.) and must be complied with unless consent is sought to breach it. Use where rock or ground improvement works*** • Earthworks involving soil compaction methods which create vibration shall comply with German Standard DIN 4150 1999-02 (*Structural Vibration – Effects of Vibration on Structures*) and compliance shall be certified via a statement of professional opinion provided to the Council (via email to rcmon@ccc.govt.nz) from a suitably qualified and experienced chartered or registered engineer. The statement of professional opinion is to be submitted to Christchurch City Council via rcmon@ccc.govt.nz a minimum of five working days prior to any compacting activities commencing.

8.9.4.2 Resources & assets **Relates to versatile soils/national grid/electricity distribution lines**	***No std. conditions – consider as required***
8.9.4.3 Land stability ***a. Whether the earthworks affect the stability of adjoining land and its susceptibility to subsidence or erosion upon excavation taking place.*** ***b. The extent of any alteration to natural ground levels in the vicinity and, consequently, to the height and bulk of buildings that may be erected on the site.*** ***c. Whether the earthworks affect the future development potential of land for permitted activities, taking account of the nature of filling material proposed and the degree of compaction.***	***Use 15 where some risk (e.g. large cut >3m, fill>2m, large volume >300m³, rockfall, no B.C.*** 15. The earthworks and construction work shall be under the control of a nominated and suitably qualified engineer. ***Use 16 on hill sites where cut >0.75m depth or within 1m of site boundary*** 16. No permanent unsupported cut or batter shall be formed any steeper than 26° in loess soil, unless approved by a chartered professional engineer. ***Use 17 for all fill applications*** 17. The fill sites shall be stripped of vegetation and any topsoil prior to filling. The content of fill shall be clean fill (as defined by the Christchurch District Plan – Chapter 2 definitions). ***Use 18 where works within a few metres of boundary*** 18. Any change in ground levels shall not affect the stability of the ground or fences on neighbouring properties ***Use 19 where height of fill > distance to boundary. Use second note for subdivision earthworks only.*** 19. The consent holder shall submit a report and calculations detailing any filling proposed against existing boundaries and the mitigation proposed to avoid adverse effects on adjoining properties. Any retaining wall construction over 0.5m high shall be included and certified as part of the Earthfill Report in condition 20. <u>Note:</u> *a. Any retaining wall that exceeds 6m² is regarded as a building and requires a separate resource consent if not specifically addressed within the application supporting this consent.* *b. This report may be presented as part of the Design Report for the subdivision works under condition xxx.*

	Use 20 for any fill that could accommodate future buildings, house extension etc. 20. All filling exceeding 300mm above excavation level shall be in accordance with the Code of Practice for Earthfill for Residential Purposes NZS 4431:1989. At the completion of the work an Earthfill report including a duly completed certificate in the form of Appendix A of NZS 4431 shall be submitted to Council at rcmon@ccc.govt.nz so that the information can be placed on the property record. This report shall detail depths, materials, compaction test results and include as-built plans showing the location and finished surface level of the fill.
8.9.4.4 Coastal hazards	***No std. conditions – consider as required***
8.9.4.5 Quarries	***No std. conditions – consider as required***
8.9.4.6 Amenity	***No std. conditions – consider as required***
8.9.4.7 Indigenous biodiversity, natural character, and landscape features	***No std. conditions – consider as required***
8.9.4.8 Historic Heritage	***No std. conditions – consider as required***
8.9.4.9 Sites of Ngāi Tahu Cultural Significance **Where the earthworks are within a Site of Ngāi Tahu Cultural Significance**	***As advised by MKT*** 21. At least 10 working days prior to any earthworks being undertaken, the consent holder shall contact Te Ngāi Tūāhuriri Rūnanga (change if different Rūnanga) via Mahaanui Kurataiao Ltd (email mkt.admin@ngaitahu.iwi.nz or phone 03 377 4374). This shall allow a Rūnanga representative trained in the recognition of archaeological deposits the opportunity to be onsite to assist and offer cultural insights/advice during all excavations. 22. In the event of the discovery/disturbance of any archaeological material or sites, including taonga (treasured artefacts) and koiwi tangata (human remains), the consent holder shall immediately:

identified in Appendix 9.5.6, the matters set out in Rule 9.5.5 as relevant to the site classification: **Rule 9.5.5.1 - Wāhi Tapu / Wāhi Taonga, Mahaanui Iwi Management Plan Silent Files and Kaitōrete Spit;** **Rule 9.5.5.2 - Ngā Tūranga Tūpuna; and** **Rule 9.5.5.3 - Ngā Wai.**	a. Cease earthmoving operations in the affected area of the site; and b. Advise the Council of the disturbance via email to rcmon@ccc.govt.nz c. Advise appropriate agencies, including Heritage New Zealand Pouhere Taonga and the local Mana Whenua (Ngāi Tūāhuriri Rūnanga or swap in relevant rūnanga) of the disturbance.
8.9.4.10 Coastal environment	***No std. conditions – consider as required***