Sunfield Fast-track

Auckland Council Specialist Memo

Annexure 12:

Regional Earthworks

Matthew Byrne

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Regional Earthworks Memo

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1. This memorandum addresses the landscape aspects of the Sunfield proposal.

Qualifications and experience

2. My qualifications are a Bachelor of Environmental Studies from the University of Waterloo, Ontario, Canada.

3. I am a director of Babington & Associates (2004) Limited, an environmental consultancy that specialises in environmental management, including erosion and sediment control, ecology, civil and environmental engineering design, and implementation.

4. I am a Consultant Earthworks & Streamworks Specialist, contracted to the Earth, Stream and Trees Team which is part of the Specialist Unit in Resource Consents at Auckland Council. Up until December 2024, I was also contracted to the Environmental Monitoring Team, part of the Council's Licensing and Regulatory Compliance Unit.

5. I have held the above positions for the past thirteen years. Prior to that, from July 2004, I was employed by both the legacy Auckland Regional Council and the current Auckland Council in a similar role, undertaking processing and compliance monitoring of regional earthworks and streamworks consents.

6. From 1993 I was employed as a Project Manager for an environmental consultancy, Soilcon Laboratories Ltd, which specialised in the investigation, assessment, and remediation of contaminated land in British Columbia, Canada.

7. I have over 29 years' experience in the field of environmental protection. This includes over nine years' experience as a contaminated land expert, including all aspects of site investigation and remediation of predominantly petroleum contaminated sites, and over 20 years' experience as an erosion and sediment control and streamworks management consultant.

8. I am a member of the International Erosion Control Association (Australasia). I have prepared expert evidence and technical assessments for resource consent applications, plan changes, notices of requirement for designation and fast-track applications, and have appeared as an expert witness before consent authorities and the Environment Court on multiple occasions.

Code of Conduct

9. I confirm that I have read the Environment Court Practice Note 2023 – Code of Conduct for Expert Witnesses (Code), and have complied with it in the preparation of this memorandum. I also agree to follow the Code when participating in any subsequent processes, such as expert conferencing, directed by the Panel. I confirm that the opinions I have expressed are

within my area of expertise and are my own, except where I have stated that I am relying on the work or evidence of others, which I have specified.

Executive Summary

10. The applicant is seeking consent to undertake earthworks associated with a comprehensive community development at Ardmore, Auckland. The development is known as "Sunfield". Approximately 3,390,000m^3 of cut to fill earthworks are proposed across 244.5ha.

11. I do not support the proposal as it stands as the application has three (3) significant information gaps in my opinion, which are as follows:

    a. The lack of any detail whatsoever surrounding the earthworks and erosion and sediment control (**ESC**) methodologies for the construction of the Awakeri Wetlands ahead of bulk earthworks commencing at the site.
    b. The lack of an ESC methodology or plans for Stages 1 and 6 of the project's bulk earthworks, which covers an area of approximately 125ha.
    c. The lack of an adaptive management plan (**AMP**) and information pertaining to open area restrictions.
    d. The earthworks required to complete the project are significant and I have sought to address these deficiencies by recommending amendments to existing conditions and by recommending additional conditions of consent. Provided the earthworks are completed in accordance with the application documents and the additional and/or amended conditions which I have recommended, I can support the earthworks proposal as I consider that compliance with these additional and/or amended conditions, will result in the potential effects associated with sediment discharge being appropriately managed.

Documents reviewed

- Sunfield Planning Report.
- Sunfield Draft Conditions.
- Sunfield Infrastructure Report.
- Sunfield Engineering Plans (all parts).
- Sunfield Draft Construction Management Plan.
- Sunfield Geotechnical Assessment – Part A.
- Sunfield Ecological Assessment.

Reasons for Consent

12. Regional land use consent for a restricted discretionary activity under rules E11.4.1 (A5) and (A9) of the AUP:OP is required as the earthworks proposed are greater than 5.0ha (A5) and on land located within the sediment control protection area (A9).

13. Consent for a restricted discretionary activity is required under Regulation 39 and 45C of the National Environmental Standards for Freshwater (**NES:F**), as the proposal includes

earthworks for the purpose of wetland restoration (39), and for the construction of urban development (45C), within and within 10m of a natural inland wetland.

Assessment of Effects

14. The potential environmental effects of the proposed earthworks are those primarily associated with erosion of exposed surfaces at the site and the subsequent sedimentation of the receiving environment, being freshwater tributaries and natural inland wetlands on site that drain in a westerly direction to the Pahurehure Inlet of the inner Manukau Harbour.

15. Sediment can degrade aquatic values such as water quality, smother habitat for aquatic fauna within these receiving environments, and directly impact aquatic fauna by blocking their breathing apparatus. The applicant has stated that the project will utilise erosion and sediment control (ESC) measures, designed in accordance with GD05, to help ensure the proposal does not result in any adverse effects on the receiving environment.

Summary of the Earthworks and Erosion and Sediment Control Proposal

16. During assessment of the application, NZTA lodged a notice of requirement for the Mill Road Stage 2 designation, which transects the eastern portion of the Sunfield site as it runs from Airfield Road in the north, to Old Wairoa Road and Clevedon-Papakura Road in the south. At the time of drafting this memo, the applicant had not provided updated figures relating to the volume and area of earthworks which will effectively be "removed" from the Sunfield application, nor had they provided updated erosion and sediment control plans (**ESCPs**) for the area affected by the designation. However, given the "high level" of the ESCPs that have been provided, these omissions have not affected my overall assessment.

17. Based on the information provided to date, approximately 3,290,000m^3 of cut to fill earthworks are proposed across 244.5ha. An additional 100,000m^3 of earthworks associated with pre-loading, based on pre-loading up to 27 stages, one at a time, is also proposed.

18. The proposal includes the initial excavation and construction of stormwater channels through the site, followed by the construction and / or installation of erosion and sediment (ECS) measures for bulk earthworks. ESC measures include clean and dirty water diversion bunds, stabilised construction entrances, progressive stabilisation, sediment retention ponds, decanting earth bunds and silt fences.

19. The application documents include a set of ESCPs that show the proposed locations of some of the structural controls noted above. These plans, however, are incomplete and do not show ESC measures for all areas of the site where earthworks are proposed.

Erosion and Sediment Control

20. An assessment of the technical aspects of the earthworks and ESC methodologies has been undertaken, and in general, I do not consider that the applicant has provided sufficient details to adequately assess the proposal from an earthworks and ESC point of view.

21. The application documents include a set of earthworks cut and fill plans, which broadly show how the applicant intends to achieve the desired gradients for the overall

development. These plans also include notes indicating areas of the site where a series of stormwater channels are proposed to be excavated / constructed. These notes state: *"PROPOSED STORMWATER CHANNEL TO BE EXCAVATED FIRST ONSITE"*. These stormwater channels are associated with the Awakeri Wetland project and are effectively proposed "online" of existing watercourses through the site with the general intention being to widen the channels for flood management, and to install the necessary infrastructure associated with the wider development such as culvert crossings and stormwater infrastructure.

22. A general methodology for channel construction has been included in the applicant's Infrastructure Report, which involves the following:

- Fish removal and relocation;
- Damming and diversion of existing stream flows to create a dry length of channel where excavation / construction works is to occur;
- Construction works including the installation of culverts, weirs and other flood control structures where required, and the removal of any existing culverts or instream structures where these devices are no longer required; and,
- The removal of temporary dams and diversions prior to the next section of works occurring.

23. The methodology noted above is to be repeated until all stormwater channel excavations have been completed, and whilst the construction methodology is generally fit for purpose, the applicant has not indicated the area or volume of earthworks associated with channel construction, and aside from the temporary diversion of existing channel flows, they have not indicated what ESC measures are to be implemented during channel excavations. It is this lack of any clear or indicative ESC methodology that is problematic from an assessment point of view.

24. Based on my experience and given the length and sizes of some of the proposed stormwater channel excavations, I consider that detailed ESCPs will be required and must be implemented ahead of any stormwater channel excavations commencing. Further, earthworks within "live" channels can be difficult, particularly during the wetter winter months and during intense rainfall events, which are often encountered during summer periods, and these factors must be considered when preparing the final ESCPs associated with this aspect of the proposal.

25. As such, I consider that at minimum, a detailed construction methodology and a detailed ESCP, specific to the initial stormwater channel construction, must be provided a minimum of 60 days prior to earthworks commencing. This 60-day period will allow Auckland Council sufficient time to properly assess this particular aspect of the proposal as I consider that an assessment by a suitably qualified and experienced person (SQEP)

will be required. I have therefore recommended an additional condition in Table 1 below, to bridge this information gap.

26. Once construction of the initial stormwater channels (Awakeri Wetland project) has been completed, the applicant intends to commence bulk earthworks across the site in six (6) stages. The application documents include an overall ESCP associated with these 6 stages of work, however, the ESCPs only show full ESC management over two (2) of the 6 stages.

27. The ESC measures proposed in Stage 1 include silt fencing installed along the margins of the Awakeri Wetland stormwater channels, the establishment of diversion bunds along the non-stormwater channel boundaries of the area, and the establishment of a stabilised construction entrance and haul road, generally through the stage. No other ESC measures have been proposed, nor has the applicant indicated where runoff is to be diverted for treatment. Based on my experience, significant ESC measures will be required as the Stage 1 area covers approximately 45ha.

28. Stage 6 is similar, with only silt fences along the margins of the stormwater channels, silt fences around a proposed stockpile area, perimeter diversion bunds around other boundaries, and the establishment of a stabilised construction entrance and haul road through the stage. As with Stage 1, no indication of where the diversion bunds will direct dirty runoff has been provided, and no other ESC measures have been proposed. Stage 6 appears to cover approximately 80ha.

29. More detailed ESCPs for the remaining stages of works have been provided in the application documents, which include not only silt fences, diversion bunds and stabilised entrances and haul roads, but also sediment retention ponds (SRPs) as the main method of sediment control. In general, the SRPs will manage catchments of up to 5ha each and will be chemically treated to maximise their sediment removal efficiencies.

30. 21 chemically treated SRPs have been proposed across these four (4) remaining stages. I consider that whilst simplistic, these plans at least demonstrate that ESC in accordance with GD05 is required and can be undertaken on site. Regardless, more detained design plans must be provided ahead of earthworks commencing, which the applicant has proposed, however, their proposal is for the provision of a single ESCP ahead of the project commencing, and based on my experience, several ESCPs over several years will be required. These ESCPs must contain further details such as the location of all clean and dirty water diversion bunds for construction water management purposes, and how dirty runoff will be pumped and chemically treated where gradients will not allow for gravity fed diversion.

31. The remaining ESC measures proposed include progressive stabilisation of exposed areas as the desired gradients are achieved, and monitoring and maintenance of all ESC

measures in accordance with GD05. These measures represent industry best practice, and I support the applicant's earthworks and ESC proposal in this regard.

32. As noted above, the applicant has proposed the provision of a finalised ESCP ahead of earthworks commencing, however, given the overall area of earthworks proposed, the length of time over which earthworks are to be undertaken, and the level of detail which is required, I consider that the applicant's proposed condition in this regard is not robust enough. A requirement for a finalised ESCP ahead of works commencing does not reflect the dynamic nature of the bulk earthworks which will be required over multiple years, up to fifteen (15) in this case, particularly on a site where the gradients are very low and where construction water management will be difficult.

33. As such, rather than a requirement for a finalised ESCP ahead of earthworks commencing, I recommend that an annual ESCP be provided to Council for written certification ahead of any earthworks commencing for the following twelve (12) months of earthworks. The annual ESCP should include, but not be limited to, the flowing measures:
    a. Any areas of the 244ha site where earthworks are proposed over the following 12 months;
    b. Detailed ESCPs associated with those earthworks; and
    c. Details of the earthworks which have been carried out over the previous 12 months, including any areas where earthworks have been completed and no further land disturbance is proposed.

34. I have proposed this amended condition in Table 1 (see page 12 onwards of this memo).

Adaptive Management

35. The application documents are silent on whether an adaptive management plan (**AMP**) will be developed and implemented throughout the duration of earthworks. Auckland Council's AMP Guidance Document suggests that adaptive management should be applied to the most significant and/or long-term earthworks activities, and as this proposal is for more than 244ha of earthworks which are likely to take up to 25-years or more to complete, and as the earthworks will be undertaken in close proximity to freshwater streams and in close proximity to or within a natural inland wetland, I consider that the proposal is indeed significant and should therefore be subject to adaptive management practices.

36. Whilst the applicant has proposed that all ESC measures are to be constructed and operated in accordance with GD05, an AMP does not replace the day-to-day ESC management recommended in GD05, nor does it apply to compliance with consented ESC methodologies. Its purpose is to address the management of sediment-related

effects that may still occur when full compliance with a consent is maintained in order to avoid or minimise adverse effects on the receiving environment.

37. For adaptive management to be successful, an earthworks regime must rely heavily on setting appropriate threshold trigger levels as part of a monitoring program and must detail the types of responses and actions that will be undertaken as part of a feedback loop that goes above and beyond any standard maintenance measures such as those detailed in GD05. An AMP must also provide a process for modification of the open area, erosion and sediment control devices and/or earthworks methodology to keep any potential adverse effects within a given range anticipated by a given consent.

38. AMPs also provide "real time" information which allows a project team to continuously improve the performance of ESCs on site, whilst also adapting to what does and doesn't work from an ESC point of view on any given site or portion of a site. Further, based on my more than 20 years of assessing and compliance monitoring earthworks sites in the Auckland Region, "appropriate monitoring and maintenance of all controls in accordance with GD05" is often touted, but rarely is it undertaken in full accordance with the guidance contained in GD05.

39. Provision and implementation of an AMP addresses this as a project's staff must regularly inspect their ESC measures and as a result, they develop a much better understanding of the ESC process that is specific to that site. Put simply, adherence to an AMP results in better erosion and sediment control and better environmental outcomes.

40. A typical AMP would include:
    a. Adaptive management "triggers". i.e., thresholds, that when exceeded, trigger a detailed assessment of on-site erosion and sediment control practices, including the collection of samples and/or readings, of discharges from on-site controls such as SRPs, that is over and above that which would be expected during normal, everyday earthworks operations. Typically, these triggers are set against rainfall events where more than 25mm of rainfall over a 24-hour period, as measured by on-site rain gauges, occur.
    b. Determining efficiency thresholds for SRPs. i.e., by analysing the turbidity of runoff entering any given SRP vs its turbidity at the pond's discharge point, the device's efficiency can be determined and when this efficiency is less than expected, specific actions on site can be undertaken.
    c. Construction monitoring including monitoring of the weather forecast to determine if pre-rainfall site inspections are required, and actual monitoring of onsite rain gauges to determine whether trigger event sampling is required.
    d. Baseline monitoring of an appropriately located reach of stream that is subject to discharges from the site's sediment retention and treatment devices,

including baseline monitoring of a reach of stream upgradient of the earthworks area as a "control" site.

e. An annual stream monitoring report which is intended to measure over time, the potential effects the earthworks might have on that reach of stream, throughout the duration of land disturbance.
f. Identification of appropriate responses to rainfall trigger events, and SRP efficiency thresholds, including but not limited to:
    i. completing a full audit of all ESC measures within the earthworks area.
    ii. remedying any causes on site that may contribute to a threshold breach as soon as practicable, including keeping a record what remedial measures were undertaken.
    iii. Auckland Council notification of any trigger level exceedances.
    iv. Ongoing monitoring of all ESC measure until baseline conditions have returned to normal.
    v. Reduction of open area.

41. As I consider the proposal represents a significant earthworks operation, I have included a recommended additional condition in Table 1 below, that requires provision of an AMP ahead of earthworks commencing, and that this AMP be implemented throughout the duration of earthworks at the site. If the applicant does not support the implementation of an AMP throughout the bulk earthworks operation (i.e., bulk earthworks only and not civil earthworks typically associated with subdivision), then I cannot support the applicant's proposal.

Staging & Open Area Restrictions

42. As noted above, the applicant has proposed 244ha of earthworks across 6 stages, however, they have not indicated how much of the total area is expected to be exposed at any one time. Based on my experience, it is highly unlikely that the entire 244ha will be exposed at the same time, nor is it considered appropriate for this to occur. Erosion and the generation of sediment is problematic over large areas of exposed ground as significant rainfall events or extended periods of rainfall create ground conditions that make ESC maintenance difficult and ineffective. Put simply, the larger the exposed area, the more sediment is generated.

43. Large developments in the Auckland region are typically subject to a 15-20ha open area restriction, whereby no more than 15-20ha of bulk earthworks can be undertaken at any one time. By imposing this restriction, the potential effects of the earthworks will be reduced and better environment outcomes achieved. As such, I have recommended an additional condition that imposes a 20ha limit for the earthworks. I note however, that the 20ha limit would apply to bulk earthworks only and would exclude exposed areas associated with civil or subdivision land disturbance. Further, without acceptance of this 20ha restriction, or additional information and/or justification which clearly

demonstrates the need for any more than 20ha to be exposed at any one time, I cannot support the applicant's proposal.

Timing and Seasonal Restrictions

44. The applicant has stated that the project will commence as soon as possible once the appropriate consents have been obtained and have implied that the initial earthworks and construction related works will take up to 15-years to complete while the subdivision earthworks could take up to 25-years to complete. They have not, however, sought an expiry date for the earthworks permit. Given the extent of earthworks, 25-years is not out of the ordinary and I have therefore included in my additional recommendations below, an additional condition which recommends an expiry date for the earthworks permit of 25-years.

45. Further, given the length of time it will likely take for all land disturbance to be completed, I have also recommended an amendment to the applicant's proposed review condition so that it includes to review the earthworks permit to deal with any adverse earthworks or sediment control related effects on the environment which may arise or potentially arise and which are appropriate to deal with at a later stage. This is typical of an earthworks operation granted consent for a 25-year period.

46. Regarding a seasonal restriction, the applicant has proposed that any works which are to be undertaken during the wetter winter months be subject to a seasonal restriction, which is typical of an earthworks operation of this nature in the Auckland Region. I support the applicant's proposed condition in this regard.

Conclusion

47. The application documents and their associated appendices imply that the proposed ESC measures will help ensure the proper management of earthworks and any potential sediment related effects that may arise throughout the duration of the project.

48. I do not support the proposal as it stands as the application has three (3) significant information gaps in my opinion. The first information gap is the lack of any detail surrounding the earthworks and ESC methodologies for the construction of the Awakeri Wetlands ahead of bulk earthworks commencing at the site. The second information gap is the lack of ESC methodologies for stages 1 and 6 of the project's bulk earthworks, and the third is the lack of an adaptive management plan (AMP) and information pertaining to open area restrictions associated with what I consider to be, a significant earthworks project.

49. Whilst I have identified information gaps in the application, I have also sought to address these deficiencies by recommending additional conditions of consent. To address the lack of information relating to ESC methodologies for the project's initial

stormwater channel construction, I have recommended a condition that requires provision of an ESCP which is specific to this aspect of the proposal. The additional condition I have recommended not only requires provision of a detailed ESCP for this aspect of the proposal, it also requires sufficient time for a SQEP to adequately assess the ESC proposal ahead of the stormwater channel works commencing.

50. To address the information gap relating to approximately 125ha of the project's earthworks and ESC methodologies, I have recommended an amendment to the applicant's proposed condition 22. This recommended amendment requires provision of an ESCP for Council's written certification, on an annual basis throughout the duration of any land disturbance associated with the project. Not only will this provide Council with the necessary information to assess the earthworks and ESC methodologies relevant to specific areas of the site where works are proposed, it will also allow for additional input based on changing ground conditions, as well as allowing for any advancements in best practice ESC management over the life of the project to be incorporated into the ESCPs.

51. Lastly, to address the significance of the overall 244ha of earthworks, I have recommended additional conditions that require provision and implementation of an AMP, and a condition that restricts the open area across the entire 244ha, to no more than 20ha at any one time.

52. Overall, provided the earthworks are completed in accordance with the application documents, all supporting information, and on the additional and / or amended conditions included in Table 1 below, I consider that the potential effects associated with sediment discharge will be appropriately managed.

53. However, if the applicant does not adopt my recommendations as noted above, I cannot support the proposal in its current form. The earthworks are significant and will occur over a long period of time and are of a nature and type that in Auckland, are typically managed with the assistance of the conditions I have recommended in Table 1.

Comment on Proposed Conditions

54. Table 1 below (see page 12 onwards) contains the relevant conditions proposed by the applicant, alongside my recommended amendments. Table 1 also includes additional conditions as per the assessment above.

Table 1 – Applicant's Proposed Consent Conditions and Recommended Amendments and Additional Recommended Conditions

	Proposed Condition		Recommended Amendment & Propose New conditions
		New (13A)	Resource consent LUC604447432 must expire 25-years from the date of issue unless it has been surrendered or cancelled at an earlier date pursuant to the RMA.
		New (13B)	The Council may, within one month following each anniversary of commencement of this consent, serve notice on the Consent Holder under section 128(1) of the Resource Management Act 1991, of its intention to review the conditions of resource consent LUC604447432 for the following purposes: (a) To deal with any significant adverse effects on the environment arising from the exercise of the consent which was not foreseen at the time the application was considered and which is appropriate to deal with at the time of the review. (b) To consider the adequacy of conditions which prevent nuisance and adverse effects beyond the boundary of the Site, particularly if regular or frequent complaints have been received and validated by an enforcement officer. (c) to consider developments in erosion and sediment control technology and management practices that would enable practical reductions in the discharge of sediment to the receiving environment. (d) Alter the monitoring requirements, including requiring further monitoring, or increasing or reducing the frequency of monitoring. Or, the consent may be reviewed by the Council at any time, if it is found that the information made available to the Council in the application contained inaccuracies which materially influenced the decision and the effects of the exercise of the consent are such that it is necessary to apply more appropriate conditions.

22	A finalised ESCP must be prepared in accordance with the Council's Guidance Document 2015/005, Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region (GD05) and submitted to Council at least 15 Working Days prior to earthworks commencing for certification in accordance with Conditions [7 to 13]. Earthworks activity on the Site must not commence until written certification from Council is provided that the ESCP meets the requirements of GD05 and contains sufficient detail to address the matters listed in Condition [23].	22	An annual ESCP prepared in accordance with the Council's Guidance Document 2015/005, Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region (GD05), including any amendments to this document, must be submitted to the Council no later than the 1st August of any year when earthworks are proposed on Site, for certification in accordance with Conditions [7 to 13]. Earthworks activity on the Site must not commence until written certification from the Council is provided that the ESCP meets the requirements of GD05 and contains sufficient detail to address the matters listed in Condition [23].
23	The ESCP must contain sufficient detail to address the following matters: a. Compliance with Conditions XX; b. Specific erosion and sediment control works (location, dimensions, capacity); c. Supporting calculations and design drawings; d. Catchment boundaries and contour information; e. Details of construction methods; f. Timing and duration of construction and operation of control works (in relation to the staging and sequencing of earthworks);	23	The ESCP must contain sufficient detail to address the following matters: ~~a. Compliance with Conditions XX;~~ a. Specific erosion and sediment control works (location, dimensions, capacity) planned for the following 12 months, commencing on 1st October of the year the plan is submitted; b. A summary of the earthworks which have been completed over the preceding 12 months; c. Supporting calculations and design drawings; d. Catchment boundaries and contour information; e. Details of construction methods; f. Timing and duration of construction and operation of control works (in relation to the staging and sequencing of earthworks);

	g. Details relating to the management of exposed areas (e.g. grassing, mulching); h. Monitoring and maintenance requirements; i. Details of the stormwater treatment devices that will be utilised on Site including sizing calculations; and j. Finalised erosion and sediment control drawings.		g. Details relating to the management of exposed areas (e.g. grassing, mulching); and, h. Monitoring and maintenance requirements. ~~i. Details of the stormwater treatment devices that will be utilised on Site including sizing calculations; and~~ ~~j. erosion and sediment control drawings.~~
		New (21A)	At least 60-days prior to the commencement of any land disturbance on the Site that is associated with development of the Awakeri Wetland project (stormwater channel works on the Site), an Erosion and Sediment Control Plan (ESCP) specific to these works and prepared in accordance with Auckland Council Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region, June 2016 (GD05), including any amendments to this document, must be submitted to the Council for written certification. Land disturbance must not commence until the Council has certified that the ESCP satisfactorily meets the requirements of GD05. The plan must contain sufficient details to address the following matters: • Specific details of any temporary stream diversion methodology, including location, type, and capacity in accordance with GD05, and confirmation that appropriate fish screens must be installed on any pumps; • Details of a fish removal and relocation plan; • Confirmation of any further erosion and sediment control measures dimensions, capacities) associated with the stormwater channel works; • Supporting calculations and design drawings as necessary; and • Monitoring and maintenance requirements.

			Advice Note: In the event that minor amendments to the ESCP are required, any such amendments must be limited to the scope of this consent. Any amendments which affect the performance of the ESCP may require an application to be made in accordance with section 127 of the RMA. Any minor amendments must be provided to the Council prior to implementation to confirm that they are within the scope of this consent.
		New (21B)	During any periods of flow greater than the capacity of any temporary stream diversion(s) required under condition 21A, a stabilised flow path, in accordance with GD05, must be provided. Any stabilised flow path must be designed and implemented to ensure that: • No scour or erosion occurs. • No sediment is generated or discharged to any freshwater receiving environment.
		New (21C)	No machinery must enter the wetted portion of any stream at any time. All machinery associated with the earthworks and/or streamworks activity must be operated (including maintenance, lubrication and refuelling) in a way, which ensures no hazardous substances such as fuel, oil or similar contaminants are discharged. In the event that a discharge occurs, works must cease immediately, and the discharge must be mitigated and/or rectified to the satisfaction of the Council. *Advice Note: Refuelling, lubrication and maintenance activities associated with any machinery should be carried out away from any water body with appropriate methods in place so if any spillage does occur that it will be contained and does not enter the water body.*
		New (26A)	No less than 20 working days prior to the commencement of any earthworks at the Site, an Adaptive Management Plan (AMP) must be prepared in general accordance with Auckland Council's guideline document "Erosion and Sediment Control

			Adaptive Management Plan Discussion Document", July 2020, and provided to the Council for written certification. The AMP must address monitoring requirements and changes to management procedures in response to the results of monitoring, and must include but is not limited to, the following details: (a) Preparation and provision of a Freshwater Baseline Report prepared by a suitably qualified and experienced Ecologist and/or Water Quality Scientist and provided to the Council for written certification, no less than 20 working days prior to any earthworks or streamworks commencing. The purpose of the Freshwater Baseline Report is to confirm pre-construction baseline environmental conditions of the receiving environment and include pre-construction in stream monitoring results. The Freshwater Baseline Report must include as a minimum, information on the following matters: o sediment quality such as description of sediment inputs, transport, substrate composition and embeddedness. o water quality measurements such as total suspended solids (TSS) and turbidity. o actual and potential inanga (Galaxias maculatus) spawning habitat. o identify the pre-construction condition of any Erosion Prone Streams against which to measure construction effects and possible mitigation measures. o The presence of any threatened aquatic species or habitat, susceptible to sediment discharge. (b) Details of weather forecasting and monitoring, including implementation of an onsite rain gauge with a telemetered system that provides text and email notifications; (c) Trigger levels for water quality and rainfall events (actual and forecasted events);

			(d) Details of an ongoing monitoring and sampling regime for the receiving environment, including turbidity and / or TSS monitoring downstream within the receiving environment; (e) An automated monitoring regime (inlet and outlet TSS and / or turbidity) on at least four (4) sediment retention ponds throughout the duration of earthworks at the site, and a manual sampling regime for all remaining sediment retention ponds and decanting earth bunds; (f) Management responses when a trigger level is exceeded, including the ability to reduce exposed area; and (g) Reporting to Council. *Advice Note: Turbidity results can be substituted providing a correlation between TSS and turbidity has been established.* *Any proposed revisions to the AMP must be submitted to the Council for written certification prior to formalising and implementing the revised Plan.*
		New (26B)	An appropriate efficiency of sediment retention ponds and/or decanting earth bunds should be established where efficiency measurements are only activated when inlet samples indicate high sediment loadings. i.e., the efficiency of a pond need not be scrutinised when both inlet and outlet samples show low TSS / NTU. *Advice Note: Further guidance on preparation of an Adaptive Management Plan can be found in Auckland Council guidance document - Erosion and Sediment Control Adaptive Management Plan Guidance Document, Report to support preparation of Adaptive Management Plans, RC 3.2.22, July 2020.*

		New (26C)	All monitoring and management procedures as detailed within the certified Adaptive Management Plan required by condition 26A, and any subsequent revisions, must be implemented on an ongoing basis throughout the duration of all earthworks activities on site. *Advice Note: The AMP is a live document, and updates are expected to address unforeseen circumstances or changes in the earthworks methodology as the site responds though its adaptive monitoring regime, to ensure sediment discharges are minimised and the potential for significant adverse effects are avoided.*
		New (26D)	An earthworks area which has been stabilised as a result of a trigger level exceedance or a management response as defined and required by the certified Adaptive Management Plan (required under condition 26A) and any subsequent revisions approved by the Council, can only be re-opened for earthworks on the written approval of the Council.
		New (26E)	As a result of observed inefficiencies upon site inspection or identified within the site reporting, Council may request that the Adaptive Management Plan be updated to address those inefficiencies. If such a request is made by the Council, the revised plan must be submitted to the Council within 5 working days of the request. The updated AMP must not be implemented without the Council's approval.
		New (26F)	The maximum area of exposed earth at any one time throughout the duration of the project when exercising this consent must be no greater than 20 hectares. *Advice note: The 20ha limit applies to "bulk" earthworks only and not to "post-construction" subdivision earthworks.*