

IN THE MATTER OF the Resource Management Act 1991

AND

IN THE MATTER OF a resource consent application by Jace Investments Limited to the Western Bay of Plenty District Council to develop land at 404 Omokoroa Road for town centre purposes

STATEMENT OF EVIDENCE OF DANIEL HIGHT

Introduction

1. My name is Daniel James Hight.

2. I am the Engineering Team Leader at Lysaght Consultants, an engineering, surveying, planning and land development consultancy. I am a Chartered Professional Engineer with a Bachelor of Engineering Degree (Honours) from the University of Canterbury. I have approximately 13 years of engineering consultancy experience, including 10 years in the Bay of Plenty. I have been involved in large complex development projects including:
 - (a) The Three Creeks Estate SHA development in Adler Drive, Tauranga, a complicated 180+ lot residential development including the resolution of considerable earthworks, retaining wall, and stormwater issues.

 - (b) The Golden Sands development in Papamoa, a multi-stage, large-scale residential development.

- (c) Bayfair Shopping Centre upgrade, a large-scale redevelopment including carparking, roading, and servicing elements.
3. I act on behalf of Lysaght's client, Jace Investments Limited, the applicant. I was the author of the Resource Consent Servicing Report (dated 15 May 2020, Revision 1), and led the team responsible for the engineering design presented within it. Further, I have assisted with the various subsequent responses to requests for further information from Western Bay of Plenty District Council ("**WBOPDC**").
 4. Lysaght was engaged by the applicant to provide engineering design consultancy services, sufficient to support and obtain an application for land use consent. The site layout was designed by others, with Lysaght's input being limited to the engineering and servicing design required to enable that layout.
 5. Lysaght was also the land development consultant for the Kaimai Views residential development immediately north of the subject site. I was not directly involved in that project, but Lysaght has detailed internal knowledge of that site that I was able to draw on in working on this application.

Code of Conduct for Expert Witnesses

6. I confirm that I have read the Code of Conduct for Expert Witnesses contained in the Environment Court Practice Note 2014 and that I agree to comply with it. I confirm that I have considered all the material facts that I am aware of that might alter or detract from opinions that I express, and that this evidence is within my areas of expertise.

Scope of evidence

7. My evidence will cover:

- (a) Earthworks and the associated retaining walls required to enable the proposal;
 - (b) Roading vertical geometry (to supplement the evidence prepared by Ian Carlisle) design;
 - (c) Stormwater disposal design;
 - (d) Wastewater disposal design;
 - (e) Potable water supply design;
 - (f) Related matters raised through submissions; and
 - (g) The section 42A report and the proposed consent conditions.
8. I have read and am familiar with the submissions, the section 42A report and the proposed consent conditions.

Executive summary

9. I consider that the engineering elements of the application above present no reason for the land use consent not to be granted. Detailed design and construction of the site can be carried on in accordance with WBOPDC and engineering best practice, subject to the recommendations made within the engineering servicing report and subsequent responses to WBOPDC requests for further information. The effects of the servicing and earthworks elements of the proposal can be adequately mitigated by adhering to the recommendations of that correspondence, and the WBOPDC Development Code.

Engineering Servicing Report

10. I was the author of the Lysaght Consultant's Engineering Servicing Report Revision 1, dated 15 May 2020. The report described the proposed conceptual earthworks and servicing design and was submitted as part of the original land use consent application. The content of that report remains a valid description of how the proposal is to be conceptually serviced.

Responses to WBOPDC's Requests for Further Information

11. I have worked within the applicant's consultant team on preparing responses to WBOPDC's requests for further information, and on revising the design accordingly. The engineering, earthworks, and servicing content of those responses further develop the concept presented in the engineering servicing report.
12. I consider the level of detail provided in our reporting and subsequent responses to be equivalent to what is ordinarily expected of a resource consent application for a development of this complexity.

Summary of Engineering, Earthworks, and Servicing Elements of the Proposal

Earthworks

13. Lysaght has carried out an earthworks design, and prepared drawings showing the works required. The proposed earthworks are predominantly a fill operation, and approximately 113,000m³ of material will need to be imported to site to complete the works. An earthworks consent application has been lodged with Bay of Plenty Regional Council ("**BOPRC**") (by others) to allow earthworks to commence. Provided the conditions of that consent and the rules within BOPRC's "Erosion and Sediment Control Guidelines for Land

Disturbing Activities” are adhered to, then the environment effects of the proposed works will be effectively mitigated.

14. Dust control will be required for the duration of the earthworks, as dictated by BOPRC’s “Erosion and Sediment Control Guidelines for Land Disturbing Activities”. Those guidelines prescribe the methodologies and dust control water quantities required, as well as the necessary complaints system. I understand that a consented groundwater take is present on site, which is being varied to enable the take of sufficient water to suppress dust during the works. I consider the risk of dust nuisance arising as a result of the works to be negligible provided that the guidelines are adhered to.
15. A geotechnical investigation report has been carried out by CMW Geotechnics. I understand that CMW (or a similarly qualified geotechnical engineer) will be engaged by the applicant to monitor the earthworks operations on site, including the testing and certification of cutting and filling works. That certification will be required to enable the subsequent construction of the proposed buildings.
16. A contaminated site investigation report has been carried out by Geohazard Environmental. The recommendations of that report are to be followed in remediating any contaminated land present at the subject site. It is recommended that this mitigation be completed during the top soil stripping phase as it relates to localised soil contamination around tanalised posts.
17. The section 42a report states that underground springs require management. The applicant and consultant team are aware of the need to manage the springs, and have resolved to address this issue during detailed design and construction. Given the extent of filling proposed at the site, it is anticipated that a network of subsoil drains or similar will be the best solution. Those drains will likely reticulate the springs to the gully head in the north, or to the proposed stormwater network. The design of those systems will be carried out by a suitably qualified geotechnical engineer.

18. Retaining walls are to be constructed as part of the works, given the relatively steep nature of the site. Those walls are to be held either entirely within private lots, or within party wall easements where they are situated on proposed boundaries. All walls will be designed by a suitably qualified professional, feature adequate fall protection, and building consents will be sought for each. Underground services will be located such that they are accessible for maintenance without compromising the structural integrity of nearby walls.

Roading Vertical Geometry

19. Geometric roading design was carried out in conjunction with Ian Carlisle, Transportation Engineer at Stantec, and the greater consultant team. Lysaght was not involved in the design of the road layout, or in the urban design of the roading cross sections. Lysaght did however carry out the design of the roading network's vertical geometry. Wherever possible, the minimum and maximum longitudinal grades defined by the WBOPDC Development Code are adhered to. The proposed level of the Omokoroa Road upgrade, the as-built level of Sentinel Avenue in Kaimai Views, and the existing level at the gully north of the site, meant that compliant longitudinal grades could not be provided in all cases. Accessible access to all parts of the site does however remain possible.

Stormwater Collection, Treatment, and Disposal

20. The primary stormwater collection and reticulation network has been conceptually designed in accordance with the WBOPDC Development Code. Runoff from hardstand areas within the lots and road corridors (in a one in 10-year storm) is to be collected in downpipes and catchpits and reticulated by an underground pipe network to the gully in the north of the subject site in Lot 102. The erosive effects of the discharge to the gully will be mitigated using appropriate rock armouring or similar. From the discharge point, runoff will flow overland through the gully in lot 102 to the north, and into the existing

stormwater pond constructed as part of the Kaimai Views development. All stormwater infrastructure is intended to be vested with WBOPDC. Wherever the infrastructure is to be located within private lots, the appropriate easements in gross in favour of WBOPDC are to be created to ensure ongoing maintenance access.

21. The secondary stormwater reticulation network has also been conceptually designed in accordance with the WBOPDC Development Code. Primarily, the roads are intended to function as overland flow paths, conveying runoff (in storms up to the one in 50-year event) to the gully. Where the road layout does not provide a direct route to the gully, dedicated overland flow paths have been provided. As is the case for the primary network, all overland flow paths through private lots are to be protected with easements in gross in favour of WBOPDC.
22. Overland flow from a portion of the Ministry of Education (“**MOE**”) site (as presently formed) immediately southwest of the site cannot be conveyed overland across the subject site without inducing a degree of ponding within the MOE site. Therefore, a piped secondary flow path is proposed as an option to convey that portion of the site to the gully. However, the preferred alternative would be to agree with MOE to place fill within their site to enable overland flow to freely enter the subject site in a more traditional manner for secondary stormwater. I understand that dialogue is underway with MOE to reach an agreement to do so. A third possible outcome is that the applicant installs the proposed piped solution in the short term, on the understanding that when MOE develop their site into a school, they will undertake the necessary filling to establish a traditional overland flow path route. Once that is done the pipe will become redundant.
23. Stormwater Treatment and Attenuation is provided for in the large stormwater pond downstream of the site, constructed in conjunction with the Kaimai Views subdivision. Lysaght designed and observed the construction of that pond, which was sized to accommodate the stormwater runoff from the fully

developed subject site. The pond will therefore remove pollutants and contaminants from the subject site's runoff, and attenuate it such that the post-development run-off rate will be no greater than that of the pre-development scenario. The subject site layout is such that opportunities for at-source stormwater treatment are limited. At-source treatment has therefore not been extensively considered, other than to suggest that bioretention tree pits be explored for use in the road corridors during detailed design.

Wastewater Collection and Disposal

24. The wastewater collection and reticulation network has been conceptually designed in accordance with the WBOPDC Development Code. Wastewater from lots is to be received into the proposed network at lot connections, and reticulated by an underground pipe network to a new pump station located centrally within the site. That pump station has been located such that wastewater from the entire site (including the future stage to the northwest) can flow to it by gravity without the need for the pump chamber to be deeper than approximately 4m. The pump station will discharge via a new rising main into the existing wastewater network in Omokoroa Road. All wastewater infrastructure is intended to be vested with WBOPDC. Wherever the infrastructure is to be located within private lots, the appropriate easements in gross in favour of WBOPDC are to be created to ensure ongoing maintenance access.

25. The downstream off-site network has been analysed for capacity, and it is apparent that some lengths of pipe in Omokoroa Road lack the capacity to convey the runoff from the future fully developed catchments that they serve. Depending on which developments are completed, and when, it is possible that the subject site could be developed without compromising the capacity of those pipe lengths (i.e. it is completed prior to the other presently undeveloped sites in the catchment). On the other hand, if enough of the other sites in the catchment were to be developed prior to the subject site, then off-site upgrades may be required prior to the completion of the subject site

works. This has been discussed already with WBOPDC, and it is expected that a consent condition will be required to ensure that the development of the site does not compromise the functionality of the downstream network.

26. A wastewater pump station is proposed for the site. Analysis of the proposed location was undertaken, with consideration given to the entire site including future stages. The pump station is located near the lowest part of the site and can receive runoff by gravity from the entire site. The furthest point of the future stage (the critical location in determining the depth of the pump station) is likely to be serviced by a wastewater main route approximately 220m from the pump station and has a design ground level of around RL27.0m. Assuming 1m minimum cover, a minimum longitudinal grade of 0.55%, and an assumed six manholes along the route (with 50mm of fall in each), the invert of that critical line at the pump station will be approximately RL24.5m. The design ground level at the pump station is also approximately RL27.0m, meaning that the minimum depth necessary to serve the entire catchment is approximately 2.5m. However, the invert of the wetwell has been conservatively set at a depth of 4.0m, at RL23.0m, to provide additional freedom in the detailed design of the wastewater network.
27. It is noted that Lot 101 that contains the pump station is not in compliance with the WBOPDC Development Code. The detailed design of the pump station has not been carried out, and it is therefore not known what the required footprint will be to contain it. Should the proposed Lot 1 prove to be too small, there is freedom in the design to extend the lot to the west into the future stage area (lot 7). Therefore, I do not consider the non-compliance noted in the consent conditions advice note to be an issue that cannot simply be resolved.
28. The section 42a report states that an alternative location further northwest is preferred by WBOPDC, in order to service areas beyond the application site. I disagree that this is necessary or desirable. A densely vegetated and incised stream gully runs along the northwest boundary of the future stage, meaning

that the pump station will be unable to service the neighbouring properties on the opposite side of the gully (38 and 60 Prole Road), regardless of location within the subject site. Those sites are better served by the proposed network within Prole Road itself. I therefore consider that the proposed location is well located for its intended purpose.

Water Supply Reticulation

29. The water supply reticulation network has been conceptually designed in accordance with the WBOPDC Development Code. A network of water mains and rider mains are to be reticulated through the subject site, primarily within the proposed roading corridors. All water infrastructure is intended to be vested with WBOPDC. Wherever the infrastructure is to be located within private lots, the appropriate easements in gross in favour of WBOPDC are to be created to ensure ongoing maintenance access. All water metering will be carried out in accordance with the WBOPDC Development Code, in that meters will be provided on all private lot connections. In cases where multiple tenants are held within a single building and connected to one meter, then internal private meters may be required to allow water bills associated with readings from the single public meter to be divided fairly amongst the users. This situation will be avoided as best as possible during detailed design. The ideal solution for simplicity's sake is for each individual water user to be provided with a standalone public water meter.

30. The engineering servicing report presents the expected water demand from the site. Details of the end users are not yet known, so an assumed per-hectare rate for commercial land has been conservatively provided. It has been assumed that the WBOPDC municipal network can provide the necessary flow rate and pressure to service the site. As part of the ongoing WBOPDC requests for further information, it has been agreed that Lysaght will work with WBOPDC engineers to confirm that this assumption is valid. Initial contact has been made with development engineer, Ken Lawton, and water infrastructure engineer, Paul Van Den Berg, to get this process underway. Given the

recent/proposed upgrades to the Omokoroa water supply network, and the fact that the site has been identified for this use in the Omokoroa Structure Plan for some time, it is considered unlikely that off-site upgrades are required. However, in the unlikely event that they are required, the completion of those upgrades could be completed during the urbanisation of Omokoroa Road from Prole Road to the railway line, anticipated to commence construction this year.

31. Standard fire-fighting water supply will be provided by a network of fire hydrants within the proposed road networks, sufficient to comply with the New Zealand Fire Service Firefighting Water Supplies Code of Practice (SNZ PAS 4509:2008). Where a building is sufficiently large or its proposed use is such that a higher fire water classification is required, then an internal private fire fighting water system will be necessary, such as on-site water storage, pumps, sprinklers, etc.

Roading Corridors

32. Lysaght was not directly involved in the design of the 20m roading corridor, which is narrower than the code mandated 26m for developments such as this one. I understand that the narrower road corridors have been sought to create an intimate setting in terms of urban design. Lysaght prepared cross sections demonstrating how infrastructure can be placed within the road reserve. As depicted in those cross sections, I consider that the road corridors as proposed are sufficient to allow the placement of utilities in the berm, the placement of street trees and streetlights adjacent to the kerb, and for drainage to be installed beneath the carriageway without minimum separations being compromised. There is sufficient redundancy in the network to allow roads to be partially or fully closed for short periods of time, as is standard practice, should maintenance of the drainage beneath the roads be required.

Engineering Approval

33. Detailed design of the proposed works will be carried out at a later date by a suitably qualified engineer, in accordance with the WBOPDC Development Code. During that process it will be demonstrated in detail to WBOPDC that all infrastructure design has been carried out satisfactorily. No construction of infrastructure will be carried out until WBOPDC's approval of the respective design elements has been provided.

Construction Works and Observation

34. Construction works are to proceed in accordance with BOPRC's "Erosion and Sediment Control Guidelines for Land Disturbing Activities" and with WBOPDC's Development Code. It is recommended that NZS3910:2013 ("Conditions of Contract for Building and Civil Engineering Construction") contracts be used to engage contractors, and that a suitably experienced civil engineer act as Engineer to the Contract and as lead construction supervisor. BOPRC, WBOPDC and consultant engineers will therefore inspect and test all relevant works in accordance with best practice and the necessary certifications will be provided at the completion of the works.
35. Sequencing of the infrastructure works will be as required to enable each stage as defined by the MPAD Staging Plan. Stage 1 will require the construction of the majority of the site's infrastructure, including most of the roading works and all downstream stormwater and wastewater infrastructure (including the pump station). Subsequent stages will be considerably less intensive for infrastructure, and can effectively be connected to the stage 1 networks.

Submissions

36. I confirm that I have read the submissions summary provided by WBOPDC. Below are responses to those submissions deemed relevant to Lysaght's scope of engagement.

37. In response to submission #13 from Ailsa Fisher and her concern regarding the lack of low impact stormwater design, I consider that the treatment and attenuation provided by the existing stormwater pond north of the site is sufficient. As noted above, Lysaght carried out the design and construction monitoring of that pond, and the development of the subject site to 90% imperviousness was allowed for in that design.
38. In response to submission #39 from Jonathan Lewis at the Omokoroa Golf Club regarding the flow of stormwater runoff through the creeks at the golf course, I consider that the existing stormwater pond north of the site has been suitably designed and constructed to attenuate the flow from the developed subject site to a rate less than or equal to the pre-development scenario. Therefore, the effect of the proposal on the golf course is expected to be imperceptible.
39. In response to submission #56 from Fire and Emergency New Zealand regarding firefighting water, requesting a consent condition regarding water supply and access for firefighting purposes. That request is understood and not considered to be an issue. Design will be undertaken in accordance with the WBOPDC Development Code and with New Zealand Fire Service Firefighting Water Supplies Code of Practice (SNZ PAS 4509:2008), which will ensure that the required access and supply will be available throughout the site. As noted in the Engineering Servicing Report, the design of the fire-fighting systems in buildings in higher fire water classifications will be undertaken by suitably qualified professionals in support of the subsequent building consent applications.
40. In response to submission #58 from Powerco regarding provision of electricity to the site, I understand that the applicant will work collaboratively with Powerco to resolve any capacity issues, and to ensure that the necessary network upgrades are completed prior to construction of the buildings. Further, I understand that space will need to be provided for electricity infrastructure within the development, both underground and above ground,

as is standard practice. During the detailed design of each respective stage, that space will be identified and made available in accessible areas to enable maintenance. Powerco also noted that compliance with “Electricity (Hazards from Trees) Regulations 2003” will be required. This is understood and not considered a major issue. Minimum separations between trees and underground electricity services will be maintained throughout the site design.

41. In response to submission #67 from Sinead and Stephen Nicholls, and submission #72 from Jana Reichelt and Taylor Dines, regarding the earthworks nuisance, an application has been made to BOPRC for an earthworks consent. Dust control will be conditioned into the consent, meaning that the consent holder will be responsible for all dust control for the duration of the works. The BOPRC guidelines for dust suppression will need to be followed at all times, and a complaints process will be available to all nearby residents. Therefore, I do not consider the risk of dust nuisance to nearby residents to be significant, provided the conditions of the yet to be issued earthworks consent are adhered to.

Section 42A Report

42. I confirm that I have read the section 42a report authored by Anna Price of WBOPDC. I consider that the content of this statement adequately addresses the relevant concerns raised within it.

Proposed Conditions

43. I received the conditions on 16 February 2021, the date that they were sent to the applicant.
44. I make the following general comments in relation to the conditions:
 - (a) In relation to condition 85(b) relating to stormwater reticulation, back entry catchpits will not always be possible in carparks as the catchpits

will not all be set in a kerb line. I therefore recommend this condition requirement is removed. It is best practice to include back entry catchpits wherever possible to maximise runoff collection capacity, and that solution will be pursued wherever practical.

- (b) In relation to condition 88(b) which relates to power reticulation capacity, it may not be desirable to require electricity upgrades to be completed at the consent holder's expense. While I appreciate that the Council does not wish to contribute, Powerco may offer contributions, for example if the upgrades provide network capacity improvements beyond what the subject site requires. A simple condition that power shall be supplied to each new lot and/or new building should be adequate.

Conclusion

- 45. I consider that the earthworks, roading vertical geometry, stormwater, wastewater, and water supply elements of the proposal have been adequately considered to allow the approval of the land use consent. I have been involved in the preparation of the conceptual designs for each of those disciplines and consider that the subsequent detailed design and construction of the subject site can be carried out in accordance with local territorial authority requirements and with engineering best practice.

Daniel Hight
19 February 2021