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**Project No.:** 2021-130

Development Officer  
Northern Beaches Council.

**Peer Review of Geotechnical Assessment Report for Development Application at  
11 Wyndora Avenue, Freshwater.**

We understand that a Development Application for a new residential development is proposed at the site, 11 Wyndora Avenue, Freshwater. A geotechnical report was previously completed for an original design, however that geotechnical company is no longer available, therefore a peer review of the geotechnical report and confirmation that it is still valid is requested to allow submission with the slightly altered Development Application design.

As a result we have reviewed the following documents:

1. Jack Hodgson Consultants Pty Ltd, report titled "Geotechnical Assessment for Proposed New Residence at 11 Wyndora Avenue, Freshwater", Project No.: MR30863, Dated: 4<sup>th</sup> November 2016.
2. Development Application design drawings by North by North, Project No.: 2300, Drawing No.: DA0001 to 0003, DA0005, DA0007, DA1000, DA1002 to 1004, DA2000 to 2003, DA2500, DA2501, Issue: 2, Dated: 20/05/21.

It is understood that the design involves demolition of existing structures and the construction of a new three level residential house on the front to centre of the block. The excavations will be to a maximum of 3.0m depth to achieve the design finished floor levels of the Garden Level below the rear of the house and to maximum 1.75m depth for the Lower Ground Level, with the excavation depths decreasing to the north at each level due to the natural ground surface slope. In general excavations will be approximately 0.75m from side boundaries however in part they may extend to the boundaries.

The geotechnical report identified sandstone bedrock at shallow depth and indicates that no geotechnical hazards were identified on site at present. It does define the potential for instability in the excavation with assessment of risk to persons within the excavation only. The report also provides recommendations for control of ground vibrations, excavation stability and for footing design and construction.

An assessment of landslide risk related to the proposed excavations with respect to adjacent properties was undertaken as part of this review (attached) and indicates that risk levels are generally within "Acceptable" levels when compare to AGS 2007 "Practice Note Guidelines for Landslide Risk Management". The assessment was made without implementation of the recommendations of the geotechnical reports.

Where all the recommendations of the geotechnical report and this report are implemented then the likelihood of instability becomes 'Rare' in all situations, therefore risk is within "Acceptable" levels from the development.

The geotechnical report is considered suitable provided the recommendations of the report are implemented along with the following conditions:

- Rock breakers are limited to  $\leq 250\text{kg}$  dead weight for all demolition work of existing in/onground masonry structures and that where larger hammers are used that vibration monitoring is implemented (limit  $8\text{mm/s}$  PPV)
- Geotechnical inspection must occur following demolition of existing structures and the clearing of bedrock surface for assessment of defects and soil batter stability with respect to property boundaries
- The sides of the excavation perimeters must be saw cut, to reduce potential for deflection of rock across property boundaries prior to rock hammering
- Rock breakers are limited to  $\leq 250\text{kg}$  dead weight for all rock excavation and that where larger hammers are used that vibration monitoring is implemented (limit  $5\text{mm/s}$  PPV due to continuous nature)
- Geotechnical inspection of exposed excavations occur at  $1.50\text{m}$  depth and at completion of excavation

Hope the above comments meet Council's requirements, if we can be of further assistance in regard to this matter please don't hesitate to contact the undersigned.

Yours faithfully,



Troy Crozier  
Principal

TABLE : A

## Landslide risk assessment for Risk to life

HAZARD	Description	Impacting	Likelihood of Slide	Spatial Impact of Slide		Occupancy	Evacuation	Vulnerability	Risk to Life
<b>A</b>	Landslip (rock slide <2m <sup>2</sup> ) from excavation for Lower Ground Floor level		Appears <0.50m of soil over rock excavation to maximum 1.50m deep excavation	a) house 1.0m from boundary, excavation to boundary, impact 1% b) pathway on boundary, excavation to boundary, impact 20% c) house is 1.00m from nboundary, excavation to 1.0m from boundary, impact 1% d) pathway on boundary, excavation to 1.0m from boundary, impact 20%		a) Person in house 20hrs/day ave. b) Person on pathway 0.5hr/day ave. c) Person in house 20hrs/day ave. d) Person on pathway 0.50hr/day ave.	a) Likely to not evacuate b) Possible to not evacuate c) Likely to not evacuate d) Possible to not evacuate	a) Person in building, minor damage only b) Person in open space, unlikely buried c) Person in building, minor damage only d) Person in open space, unlikely buried	
			<b>Unlikely</b>	<b>Prob. of Impact</b>	<b>Impacted</b>				
		a) House No. 9	0.0001	0.01	0.01	0.8333	0.75	0.05	<b>3.13E-10</b>
		b) Pathway No. 9	0.0001	0.75	0.20	0.0208	0.5	0.25	<b>3.91E-08</b>
		c) House No. 13	0.0001	0.01	0.01	0.8333	0.75	0.05	<b>3.13E-10</b>
		d) Pathway No. 13	0.0001	0.10	0.01	0.0208	0.5	0.25	<b>2.60E-10</b>
<b>B</b>	Landslip (rock slide <5m <sup>2</sup> ) from excavation for Garden Level		Appears <0.50m of soil over rock excavation to maximum 3.0m deep excavation	a) house 1.0m from boundary, excavation to 1.0m from boundary, impact 1% b) pathway on boundary, excavation to 1.0m from boundary, impact 20% c) house is 1.00m from boundary, excavation to 1.0m from boundary, impact 1% d) pathway on boundary, excavation to 1.0m from boundary, impact 20%		a) Person in house 20hrs/day ave. b) Person on pathway 0.5hr/day ave. c) Person in house 20hrs/day ave. d) Person on pathway 0.50hr/day ave.	a) Likely to not evacuate b) Possible to not evacuate c) Likely to not evacuate d) Possible to not evacuate	a) Person in building, minor damage only b) Person in open space, possible buried c) Person in building, minor damage only d) Person in open space, possible buried	
			<b>Possible</b>	<b>Prob. of Impact</b>	<b>Impacted</b>				
		a) House No. 9	0.001	0.05	0.01	0.8333	0.75	0.05	<b>1.56E-08</b>
		b) Pathway No. 9	0.001	0.25	0.20	0.0208	0.5	0.50	<b>2.60E-07</b>
		c) House No. 13	0.001	0.05	0.01	0.8333	0.75	0.05	<b>1.56E-08</b>
		d) Pathway No. 13	0.001	0.25	0.20	0.0208	0.5	0.50	<b>2.60E-07</b>

\* hazards considered in current condition and/or without remedial/stabilisation measures or poor support systems

\* likelihood of occurrence for design life of 100 years

\* Spatial Impact - Probability of Impact refers to slide impacting structure/area expressed as a % (i.e. 1.00 = 100% probability of slide impacting area if slide occurs).

Impacted refers to expected % of area/structure damaged if slide impacts (i.e. small, slow earth slide will damage small portion of house structure such as 1 bedroom (5%), where as large boulder roll may damage/destroy >50%)

\* neighbouring houses considered for impact of slide to bedroom unless specified, due to high occupancy and lower potential for evacuation.

\* considered for person most at risk, where multiple people occupy area then increased risk levels

\* for excavation induced landslip then considered for adjacent premises/buildings founded off shallow footings, unless indicated

\* evacuation scale from Almost Certain to not evacuate (1.0), Likely (0.75), Possible (0.5), Unlikely (0.25), Rare to not evacuate (0.01). Based on likelihood of person knowing of landslide and completely evacuating area prior to landslide impact.

\* vulnerability assessed using Appendix F - AGS Practice Note Guidelines for Landslide Risk Management 2007

**TABLE : B****Landslide risk assessment for Risk to Property**

HAZARD	Description	Impacting	Likelihood		Consequences		Risk to Property
<b>A</b>	Landslip (rock slide <2m³) from excavation for Lower Ground Floor level	a) House No. 9	Rare	The event is conceivable but only under exceptional circumstances over the design life.	Minor	Limited Damage to part of structure or site or INSIGNIFICANT damage to neighbouring properties, requires some stabilisation .	Very Low
		b) Pathway No. 9	Possible	The event could occur under adverse conditions over the design life.	Minor	Limited Damage to part of structure or site or INSIGNIFICANT damage to neighbouring properties, requires some stabilisation .	Moderate
		c) House No. 13	Rare	The event is conceivable but only under exceptional circumstances over the design life.	Minor	Limited Damage to part of structure or site or INSIGNIFICANT damage to neighbouring properties, requires some stabilisation .	Very Low
		d) Pathway No. 13	Unlikely	The event might occur under very adverse circumstances over the design life.	Minor	Limited Damage to part of structure or site or INSIGNIFICANT damage to neighbouring properties, requires some stabilisation .	Low
<b>B</b>	Landslip (rock slide <5m³) from excavation for Garden Level	a) House No. 9	Unlikely	The event might occur under very adverse circumstances over the design life.	Minor	Limited Damage to part of structure or site or INSIGNIFICANT damage to neighbouring properties, requires some stabilisation .	Low
		b) Pathway No. 9	Possible	The event could occur under adverse conditions over the design life.	Minor	Limited Damage to part of structure or site or INSIGNIFICANT damage to neighbouring properties, requires some stabilisation .	Moderate
		c) House No. 13	Unlikely	The event might occur under very adverse circumstances over the design life.	Minor	Limited Damage to part of structure or site or INSIGNIFICANT damage to neighbouring properties, requires some stabilisation .	Low
		d) Pathway No. 13	Possible	The event could occur under adverse conditions over the design life.	Minor	Limited Damage to part of structure or site or INSIGNIFICANT damage to neighbouring properties, requires some stabilisation .	Moderate

\* hazards considered in current condition, without remedial/stabilisation measures and during construction works.

\* qualitative expression of likelihood incorporates both frequency analysis estimate and spatial impact probability estimate as per AGS guidelines.

\* qualitative measures of consequences to property assessed per Appendix C in AGS Guidelines for Landslide Risk Management.

\* Indicative cost of damage expressed as cost of site development with respect to consequence values: Catastrophic : 200%, Major: 60%, Medium: 20%, Minor: 5%, Insignificant: 0.5%.

\* Cost of site development estimated at

**\$2,000,000**