



Memorandum

To	Steve Hurley; Claudia Hellberg
Copy	Liam Foster; James Reddish
From	Amanda Kirk
Date	25 June 2024
File/Ref	3-AWD05.47
Subject	Tauriko West Flood Risk Assessment - Supplementary Information

This memorandum has been prepared to provide supplementary information to support Tauranga City Council's (TCC) response to queries from Bay of Plenty Regional Council (BOPRC) regarding the Tauriko West Flood Risk Assessment (FRA) report.

The Tauriko West FRA was completed in accordance with the Bay of Plenty Regional Policy Statement Appendix L – Methodology for risk assessment (Appendix L). Based on the information presented in the Tauriko West FRA report, BOPRC identified three buildings outside of the development area where there is a notable percentage increase in water depth above floor level in the 1% annual exceedance probability (AEP) event:

- Building ID 4418823; 30A Belk Road
- Building ID 4418737; 50 Belk Road
- Building ID 4450071; 60 Taniwha Place

Flood modelling results have been assessed for the 1% AEP base scenario and the 1% AEP development scenario with the indicative Tauriko West Landform 5. The base scenario and development scenario include all consented development and the Tauriko Business Estate (TBE) Stage 4 landform. *Table 1* provides an overview of the scenarios considered with the corresponding climate change conditions applied.

Table 1: Details of baseline and development scenarios for 1% AEP event

Scenario	Rainfall event	Tidal condition	Development	Climate change scenario
1: Base scenario 1% AEP	1% AEP	5% AEP	Pre-development	RCP8.5 (2130) river inflow RCP8.5+ (2130) rainfall 1.6m sea level rise
2: Development scenario 1% AEP	1% AEP	5% AEP	Post-development	RCP8.5 (2130) river inflow RCP8.5+ (2130) rainfall 1.6m sea level rise

It is noted that modelling results show that all three of the identified buildings are functionally compromised (i.e. the flood level is above the building floor level) in both the baseline and development scenarios. However, due to the modelled increase in water depth in these buildings, BOPRC have requested further information regarding flood risk at these properties.

30A Belk Road

Building 4418823 is located at 30A Belk Road as shown by the orange building polygon in Figure 1 below. The building is a secondary dwelling on Lot 4 DP 457710 and has a surveyed floor level of 8.1mRL.

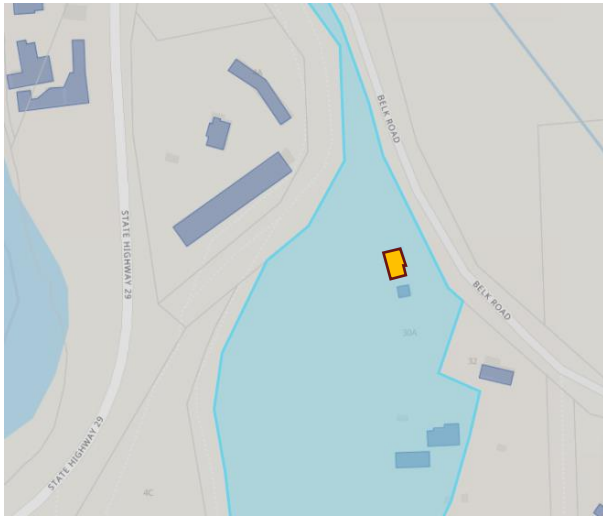


Figure 1: Location of Building 4418823 (30A Belk Road)

It is also noted that this building is located within the land requirement area for the proposed State Highway 29 upgrade as shown in Figure 2, and it is therefore proposed to be removed in the future.

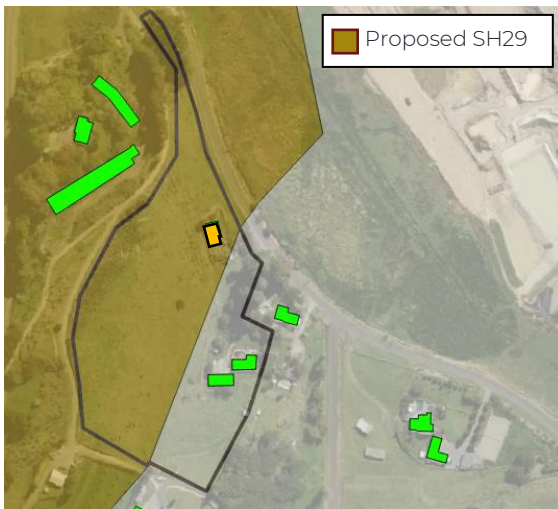


Figure 2: Land Requirements for SH29 Upgrade

Flood Modelling Results

A summary of key results from flood modelling for the 1% AEP baseline and development scenarios is set out in Table 2 below. While there is an increase in water depth, there is no material change to velocity and the Australian Rainfall and Runoff (ARR) flood hazard classification remains the same.

Table 2: Flood modelling results for Building ID 4418823 (30A Belk Rd)

	Baseline Scenario 1% AEP	Development Scenario 1% AEP
Building floor level (mRL)	8.10	
Modelled flood level (mRL)	8.958	9.144
Modelled water depth (m)	0.913	1.099
Modelled velocity (m/s)	0.309	0.308
ARR Flood Hazard Classification	3	3

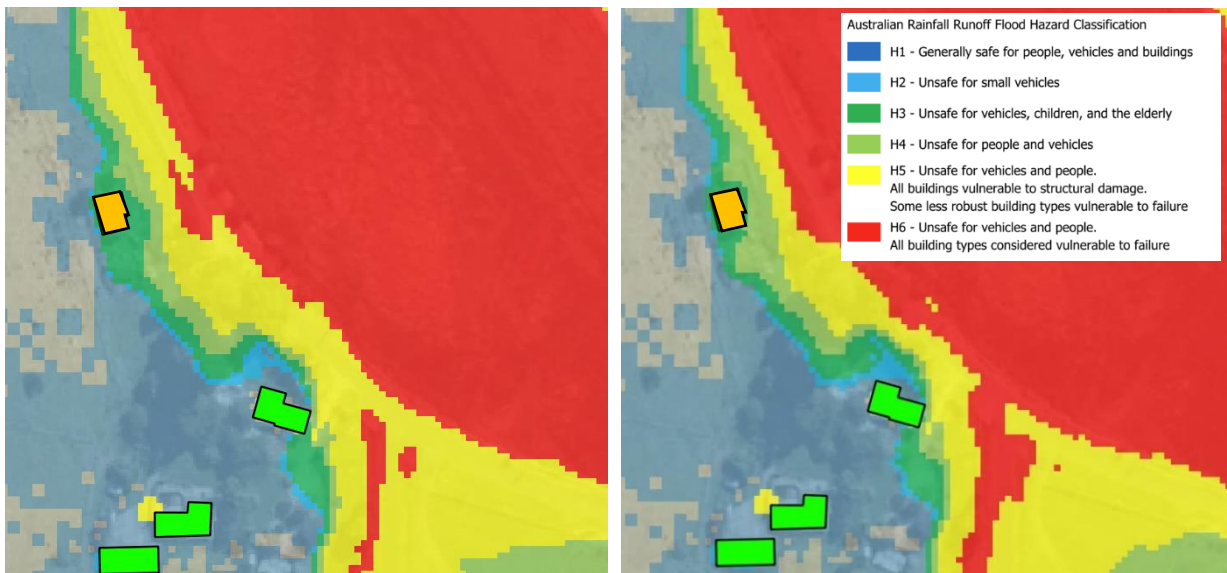


Figure 3: ARR Flood Hazard Classification, baseline scenario (left) and development scenario (right)

Evacuation Route

Due to flood depths, Belk Road cannot be safely accessed as an evacuation route in both the baseline and development scenarios. However, there is another dwelling located on the same property (Building ID: 4418807) which can provide safe refuge. Building 4418807 has a surveyed floor level of 11.96mRL which is well above the 1% AEP modelled flood level.

Figure 4 below shows an evacuation route that is available for occupants of Building 4418823 to walk to higher ground and find safe refuge in Building 4418807. Figure 5 demonstrates that the maximum depth x velocity along the evacuation route is 0.4 m²/s.

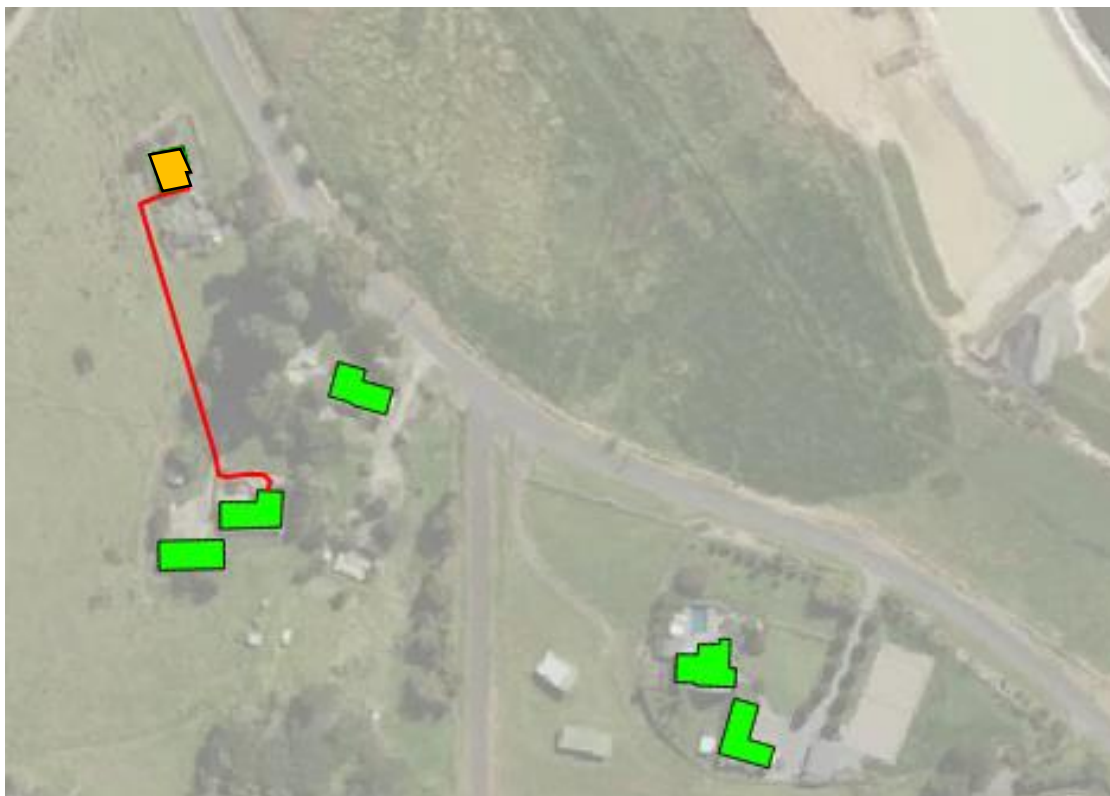


Figure 4: Evacuation route for Building ID 4418823 (30A Belk Road)

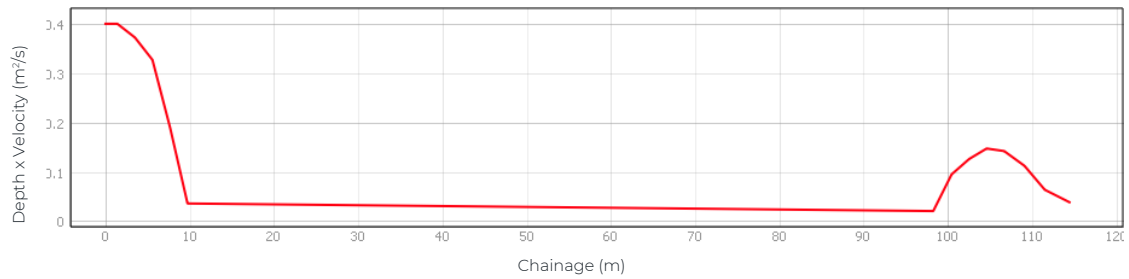


Figure 5: Depth x Velocity (m^2/s) along evacuation route for Building ID 4418823 (30A Belk Rd)

Conclusions

1. There is no change in the ARR flood hazard classification for this building.
2. This dwelling is located within the land requirement area for the proposed future SH29 upgrade, and the building is therefore proposed to be removed in the future.
3. Safe refuge is available at another dwelling (Building 4418807) located on higher land on the same property.
4. A safe evacuation route is available to reach Building 4418807. The evacuation route has a maximum depth x velocity of $0.4 m^2/s$.

50 Belk Road

Building 4418737 is located at 50 Belk Road as shown by the orange building polygon in Figure 6 below. The building is a minor dwelling (studio) located on Lot 1 DPS 87394 and has a surveyed floor level of 8.22mRL.

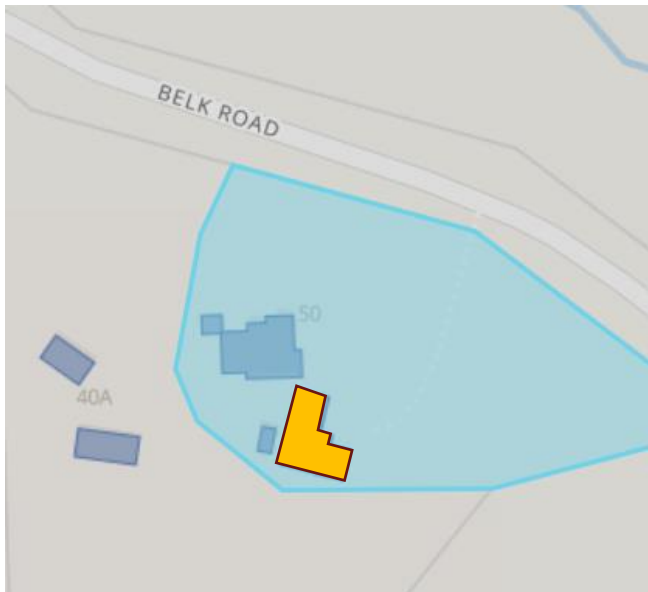


Figure 6: Location of Building 4418737 (50 Belk Road)

Flood Modelling Results

A summary of key results from flood modelling for the 1% AEP baseline and development scenarios is set out in Table 3 below. While there is an increase in water depth, there is no material change to velocity and the ARR flood hazard classification remains the same.

Table 3: Flood modelling results for Building ID 4418737 (50 Belk Rd)

	Baseline Scenario 1% AEP	Development Scenario 1% AEP
Building floor level (mRL)	8.220	
Modelled flood level (mRL)	8.958	9.144
Modelled water depth (m)	0.590	0.776
Modelled velocity (m/s)	0.245	0.244
ARR Flood Hazard Classification	3	3

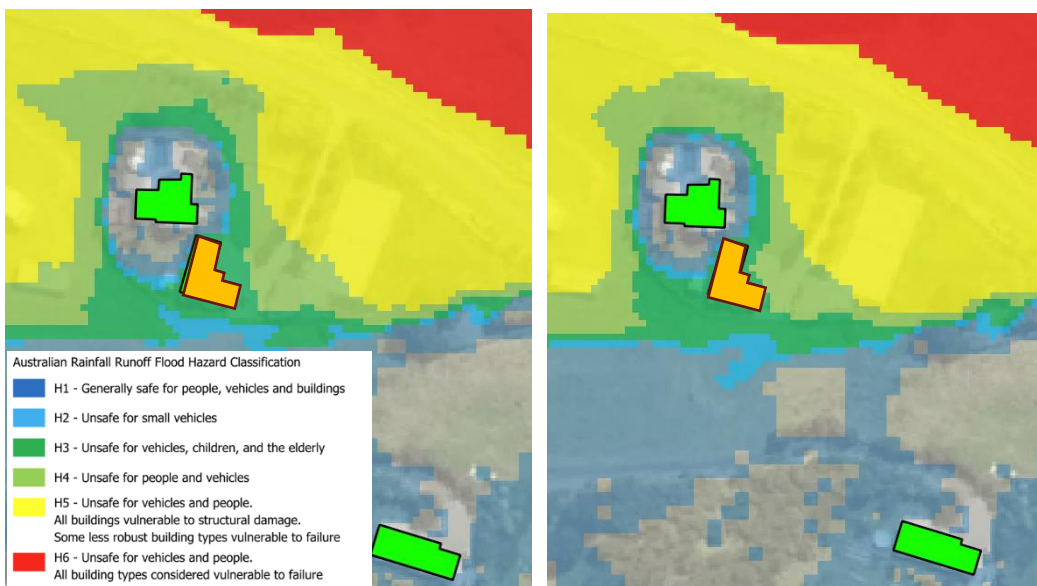


Figure 7: ARR Flood Hazard Classification, baseline scenario (left) and development scenario (right)

Evacuation Route

Due to flood depths, Belk Road cannot be safely accessed as an evacuation route in both the baseline and development scenarios. However, the main dwelling located on the same property (Building ID 4418697) can provide safe refuge. The main dwelling has a surveyed floor level of 10.80mRL which is well above the 1% AEP modelled flood level.

Figure 8 below shows an evacuation route that is available for occupants of Building 4418737 to walk to higher ground and find safe refuge in Building 4418697. Figure 9 demonstrates that the maximum depth x velocity along the evacuation route is 0.07 m²/s.

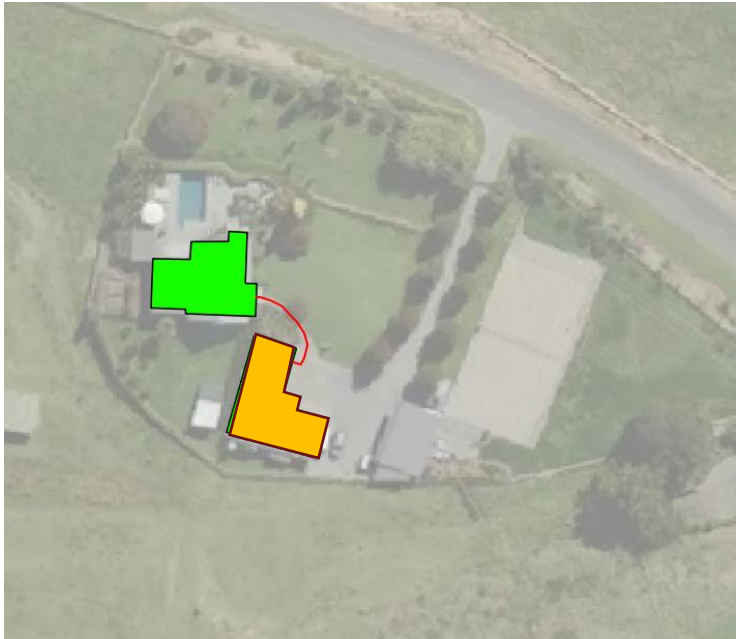


Figure 8: Evacuation route for Building ID 4418737 (50 Belk Road)

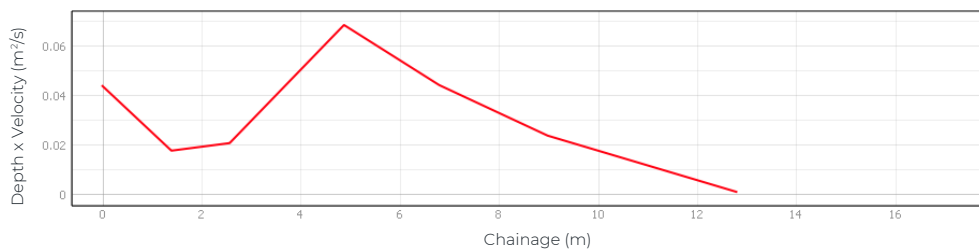


Figure 9: Depth x Velocity (m²/s) along evacuation route for Building ID 4418737 (50 Belk Rd)

Conclusions

1. There is no change in the ARR flood hazard classification for this building.
2. This building is a minor dwelling (studio) located adjacent to the main dwelling on the property.
3. Safe refuge is available in the main dwelling with a floor level of 10.80mRL which is well above the 1% AEP modelled flood level.
4. A safe evacuation route is available to reach the main dwelling. The evacuation route has a maximum depth x velocity of 0.07 m²/s.

60 Taniwha Place

Building 4450071 is located at 60 Taniwha Place as shown by the orange building polygon in Figure 10 below. The building is a commercial building used for the operation of the Waimarino Water & Adventure Park and it is understood that the ground floor of this building is used primarily for the storage of water sports equipment. The building is one of many located on parcel Allot 12 Te Papa DP 922.

The floor level of Building 4450071 has not been surveyed. The floor level is assumed to be 3.741mRL, which is 150mm above ground level as set out in the assumptions of the Tauriko West FRA report.



Figure 10: Location of Building 4450071 (60 Taniwha Place)

Flood Modelling Results

A summary of key results from flood modelling for the 1% AEP baseline and development scenarios is set out in Table 4 below. While there is an increase in water depth and velocity, there is no change to ARR flood hazard classification which remains at H1 (generally safe for people, vehicles and buildings) for the 1% AEP event.

Table 4: Flood modelling results for Building ID 4450071 (60 Taniwha Pl)

	Baseline Scenario	Development Scenario
Building floor level (mRL)	3.741	
Modelled flood level (mRL)	3.876	3.940
Modelled water depth (m)	0.123	0.187
Modelled velocity (m/s)	0.837	0.917
ARR Flood Hazard Classification	1	1

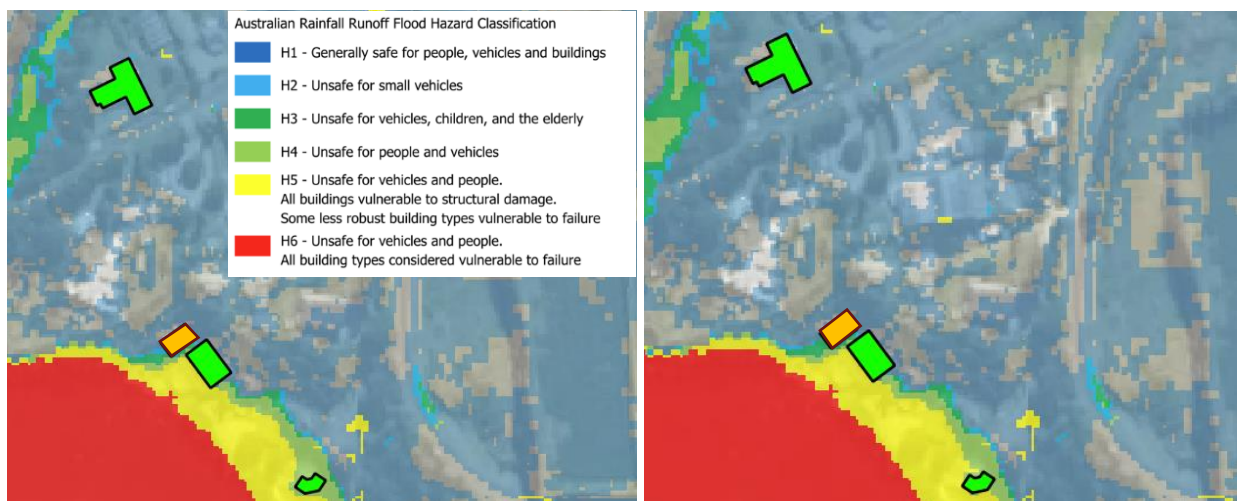


Figure 11: ARR Flood Hazard Classification, baseline scenario (left) and development scenario (right)

Evacuation Routes

As shown in Figure 11, land to the north of Building 4450071 and Taniwha Place itself are both classified by the ARR flood hazard classification as H1 (generally safe for people, vehicles and buildings) in the 1% AEP event. Safe evacuation routes are therefore readily available to:

- a) reach safe refuge at other buildings located on higher ground at the same property; or
- b) evacuate offsite by vehicle via Taniwha Place to State Highway 2.

Conclusions

1. There is no change in the ARR flood hazard classification for this building which remains at H1 (generally safe for people, vehicles and buildings) for the 1% AEP event.
2. This is a commercial building used for the operation of the Waimarino Water & Adventure Park. It is understood that the ground floor of this building is used primarily for the storage of water sports equipment.
3. Safe refuge is available at other buildings located on higher ground at the same property.
4. Safe evacuation routes are available to reach other buildings on higher ground at the same property or to evacuate offsite by vehicle on Taniwha Place. The ARR flood hazard classification for all evacuation routes is H1 (generally safe for people, vehicles and buildings) in the 1% AEP event.

Disclaimers and Limitations

This memorandum ('Memo') has been prepared by WSP New Zealand Limited ('WSP') exclusively for Tauranga City Council ('Client') in relation to the flood risk assessment for the Tauriko West Urban Growth Area ('Purpose') and in accordance with the Statement of Work Agreement with the Client dated 23rd March 2023 ('Agreement'). The findings in this Memo are based on and are subject to the assumptions specified in the Memo, the Tauriko West Flood Risk Assessment report, and the Statement of Work dated 23rd March 2023. WSP accepts no liability whatsoever for any use or reliance on this Memo, in whole or in part, for any purpose other than the Purpose or for any use or reliance on this Memo by any third party.