

Appendix G

Hydrology impact assessment



**WAKOOL
SHIRE
COUNCIL**

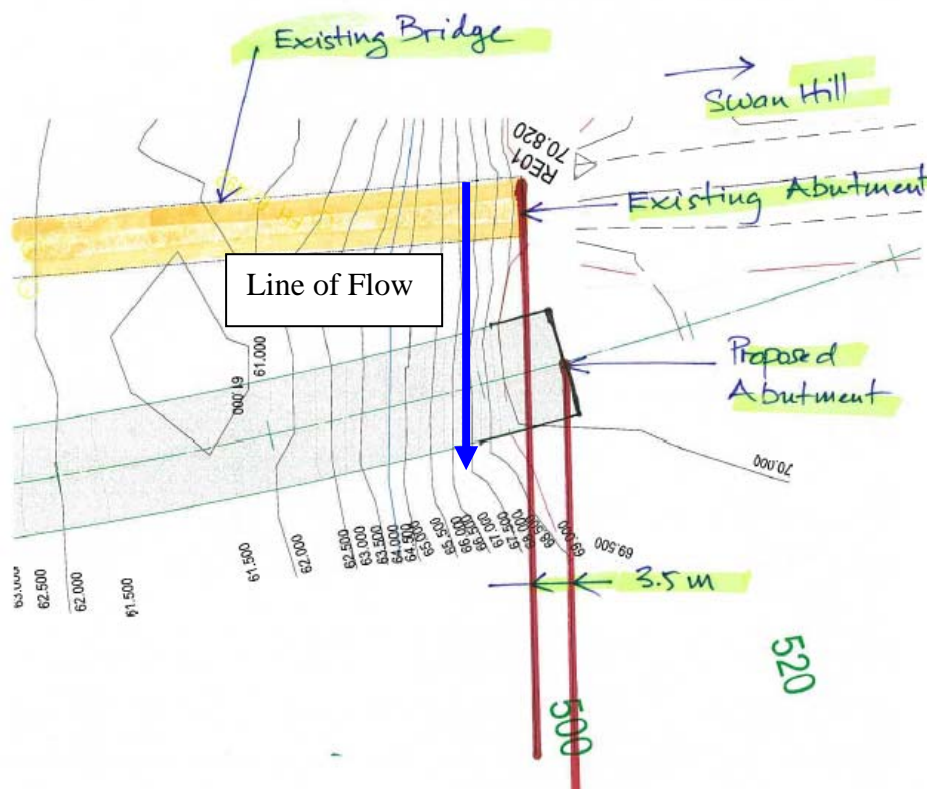
GEE GEE BRIDGE AND APPROACH OVER WAKOOL RIVER

PROPOSED BRIDGE ALIGNMENT
AND PLACEMENT

STATUS	PRELIMINARY	Proj No.	BR - NR/WR - 001	P1
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Main Channel Bridge - Swan Hill Approach Abutment – It appears that the abutment is located at the top of the river bank and too close to the river



The proposed location for the new bridge abutment is 3.5m behind the existing bridge abutment and behind the flow line of the river.



View Upstream of the road embankment between the two bridges - Remove road embankment to match existing natural level

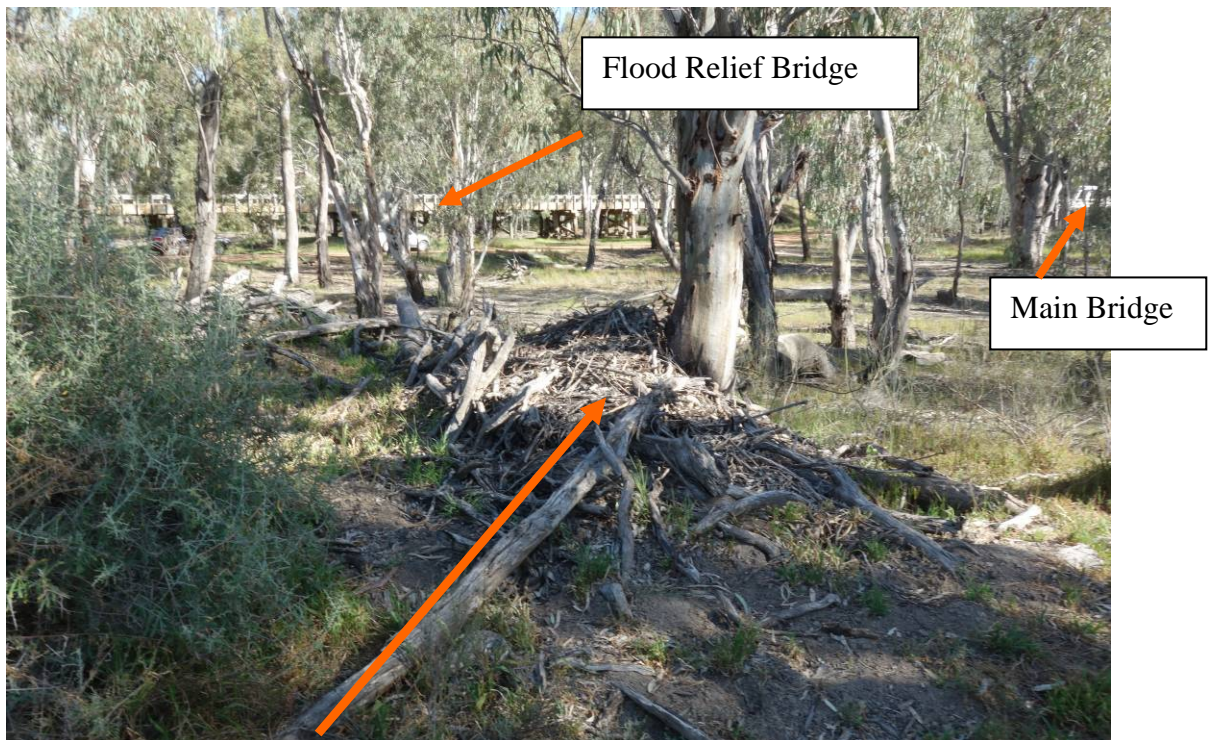


View Downstream Road Embankment between the two bridges – Remove road embankment and access track to match existing natural level

Wakool Abutment Location



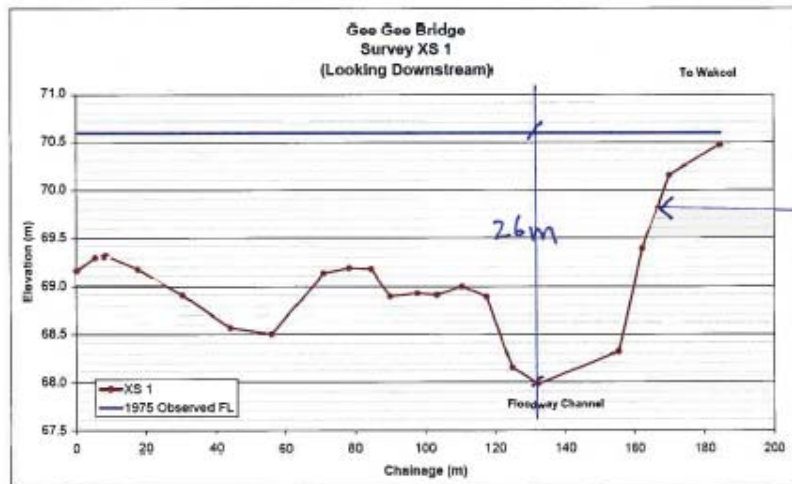
Flood Relief Approach Bridge – Downstream embankment in line with the bridge abutment on Wakool Approach



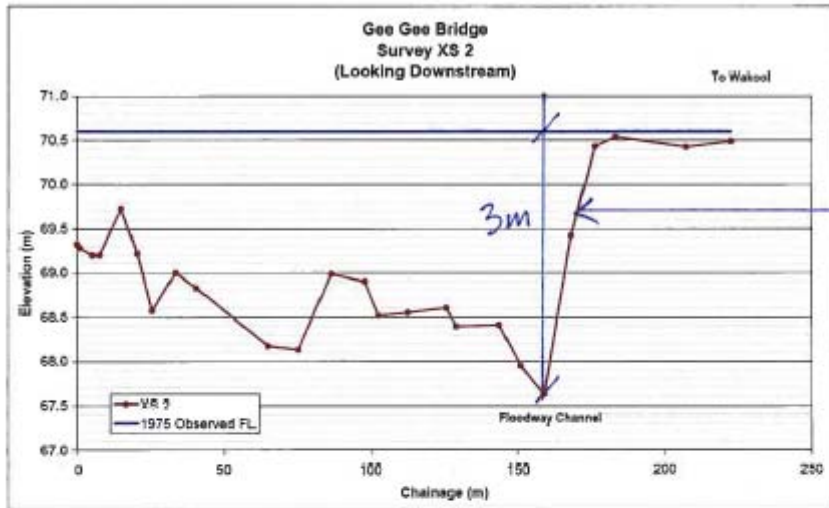
Evidence of flood debris deposited at the bottom of the embankment on Wakool Approach. Evidence of debris location is inline with the flood relief abutment.



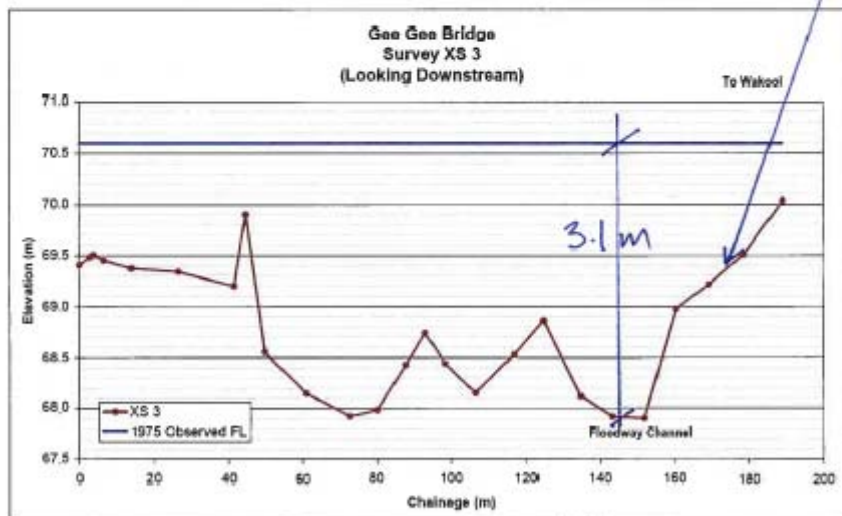
Google Map shows existence of Flood Channel

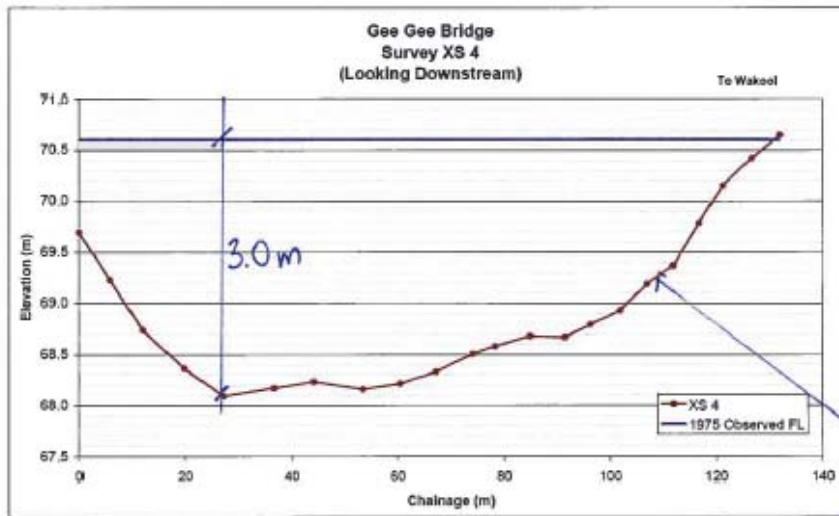


Flood channel Bank in line with the Abut.

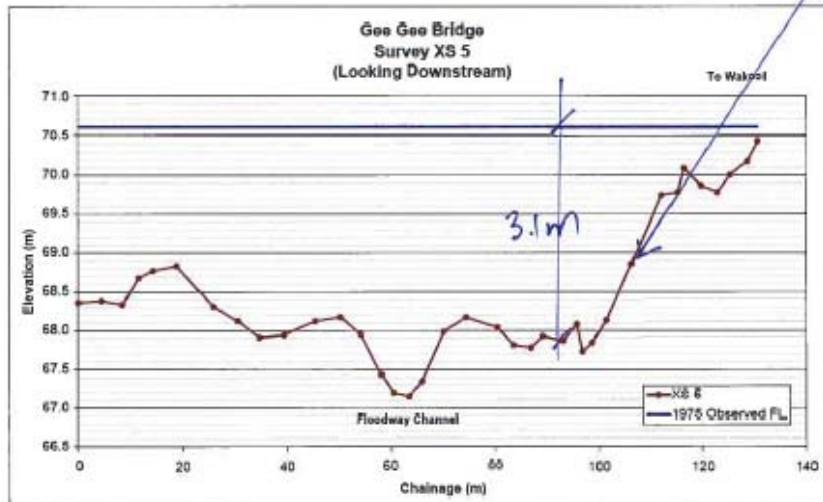


Flood channel
Bank inline
with the
bridge abut

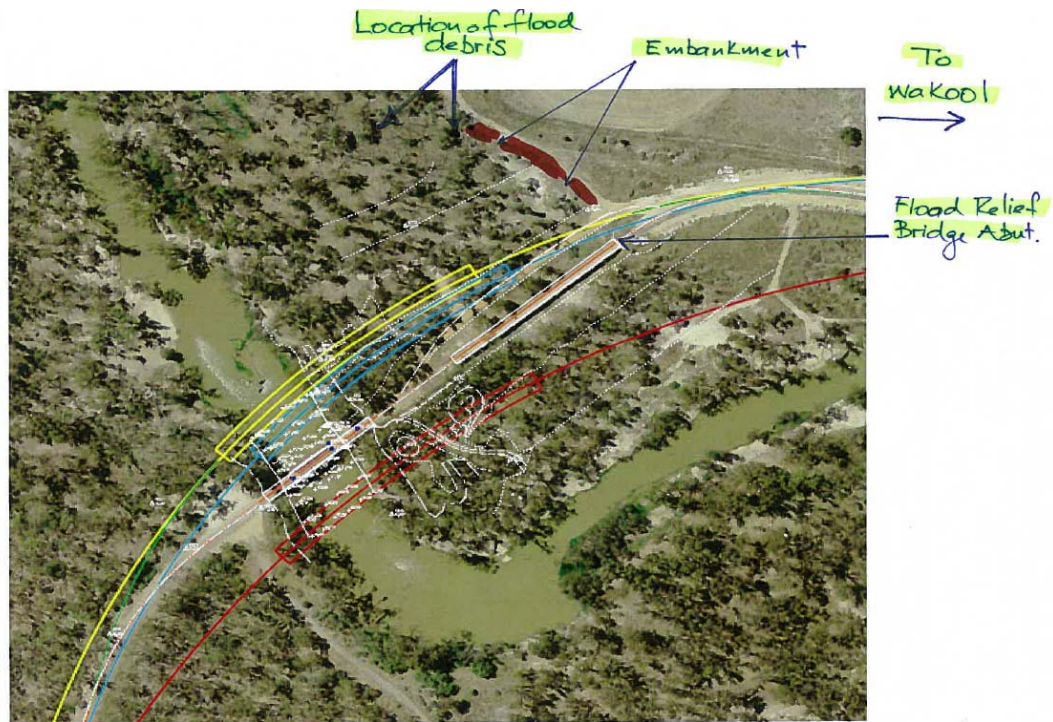




Flood channel
BANK
in line with
the bridge
abutment



The location of the Wakool bridge abutment is based on the alignment of the bank of the flood channel. Plot of cross section X1, X2, X3, X4 and X5 confirm that the river flow break the river bank upstream of the existing road and flow through the floodplain channel.

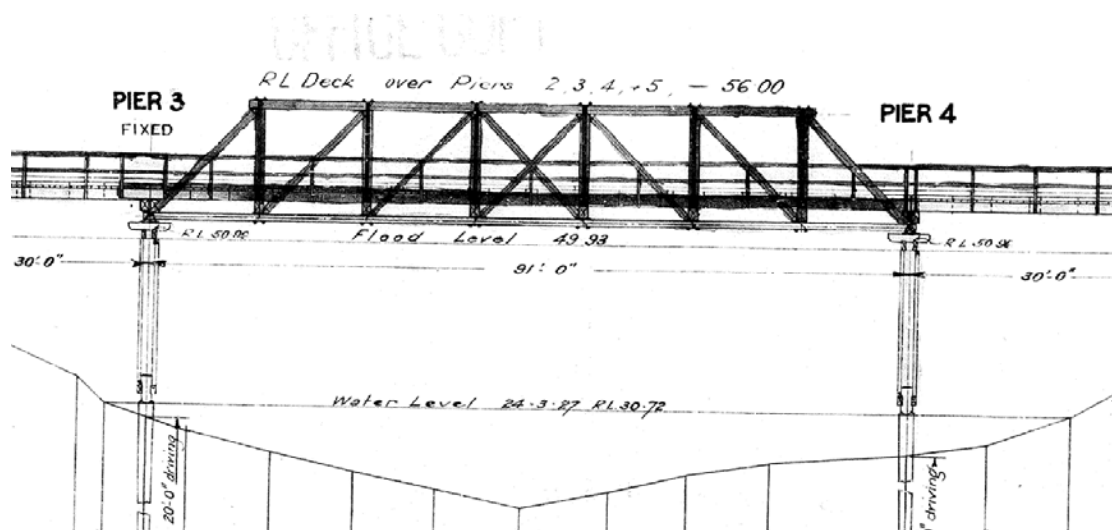


Moving the flood relief abutments toward the river would direct more flow to the main channel and result in a significant change in flow distribution. Option Blue and Yellow is not recommended.

Red Option is too close to the river bend. This option is also not recommended for hydraulic reason.



1975 Observed Flood Level RL 70.6 – about 0.2m below the deck
1993 Observed Flood Level RL 70.5 – about 0.3m below the deck
From Bridge Drawing - 1928 High Flood Level 1.8m below the deck



It is assumed that the 1975 flood is the biggest flood for the crossing.

Existing and Proposed

		Existing 2 Bridges	Proposed One Bridge
Flood Relief Bridge			
Deck Level	RL	71.82	71.82
Depth of Super Structure	m	1.01	1.2
Soffit Level	RL	70.81	70.62
1975 Flood Level		70.6	70.6
Soffit above 1975 Flood		0.21	0.02
Main Channel Bridge			
Deck Level Wakool Approach	RL	70.63	71.82
Deck Level Swan Hill Approach	RL	70.84	71.82
Depth of Super Structure	m	1.0	1.95
Soffit Level Wakool Approach	RL	69.63	69.87
Soffit Level Swan Hill Approach	RL	69.84	69.87
1975 Flood Level	RL	70.6	70.6
Depth of Super structure submerged Average Depth	m	0.865	0.73

	Bridge Length Existing	Bridge Length Proposed
Flood Relief Bridge Length (m)	112	248
Main Channel Bridge Length (m)	72	
Total Length (m)	184	

Obstruction of Waterway Area below 1975 Flood

	Existing (m ²)	Proposed (m ²)
Flood Relief Bridge	0	0
Road Embankment	100	-100 (remove road embankment)
Main Bridge	62	57
Total Obstruction	162	-105

The proposed bridge provides more waterways opening by **105m²**. This is achieved by removing the road embankment between the two existing bridges. The obstruction of waterway area did not take into consideration the proposed raising the Swan Hill road approach.

Conclusion

The proposed alignment downstream of the existing bridge will provide more waterway area when compared to the existing conditions. The flood channel is maintained to its original flow width. Removing the existing road embankment between the two existing bridges would provide additional 100m² of waterway opening and reinstate the river flow distribution back to 1928.