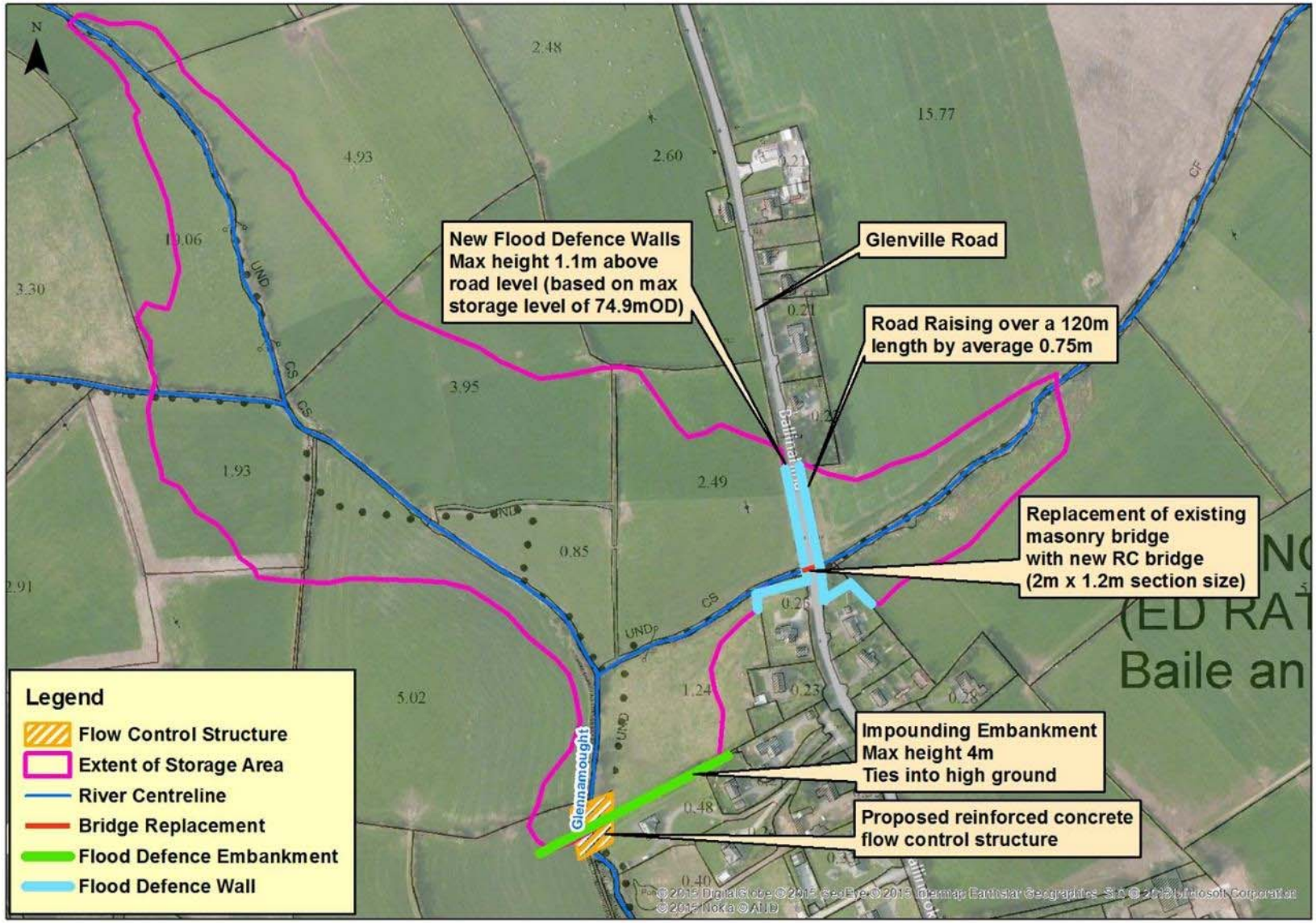

Figure 33 Option 2 – Flood Storage Area at Ballincrokig

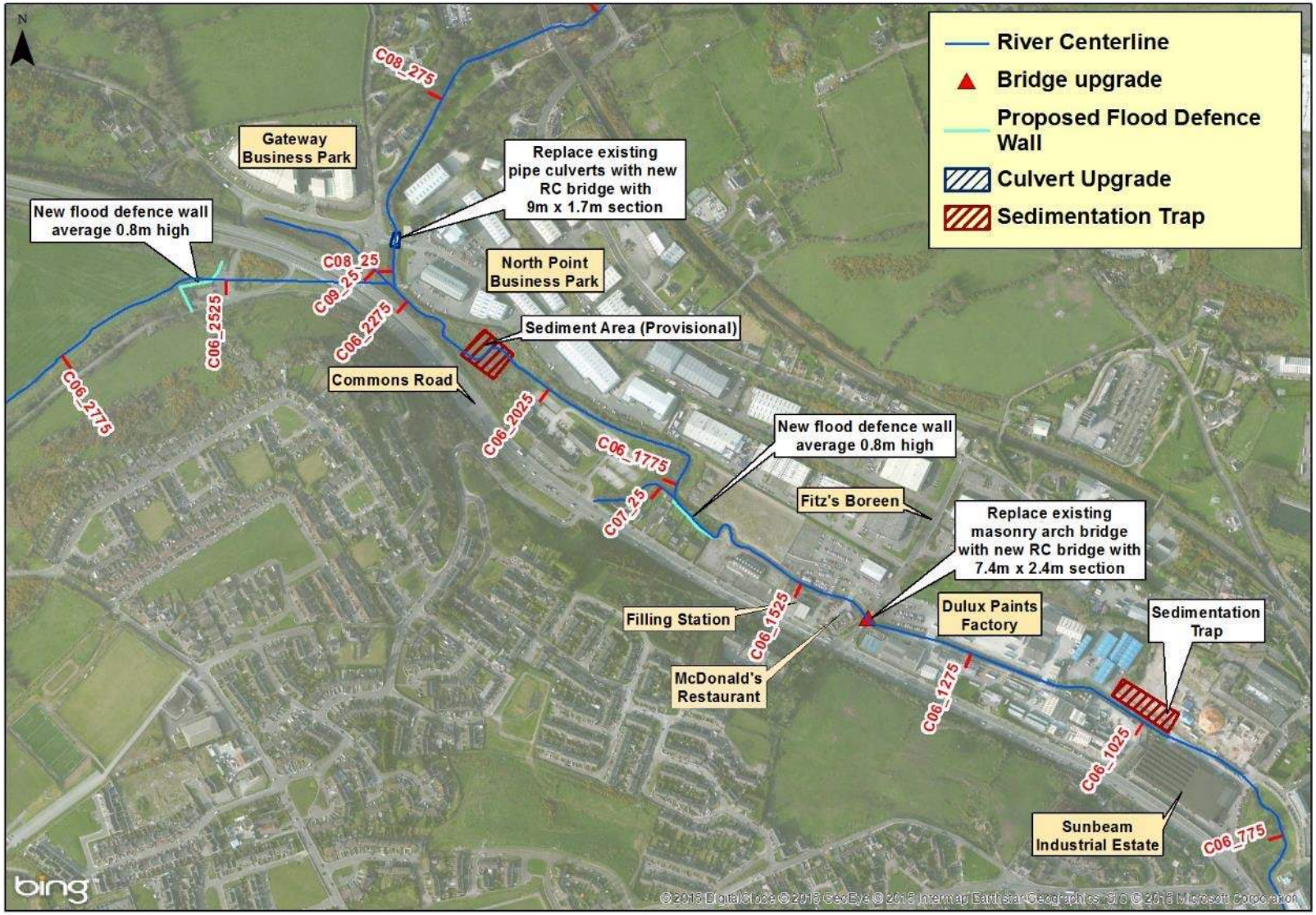

Figure 34 Option 2 – Common's Road

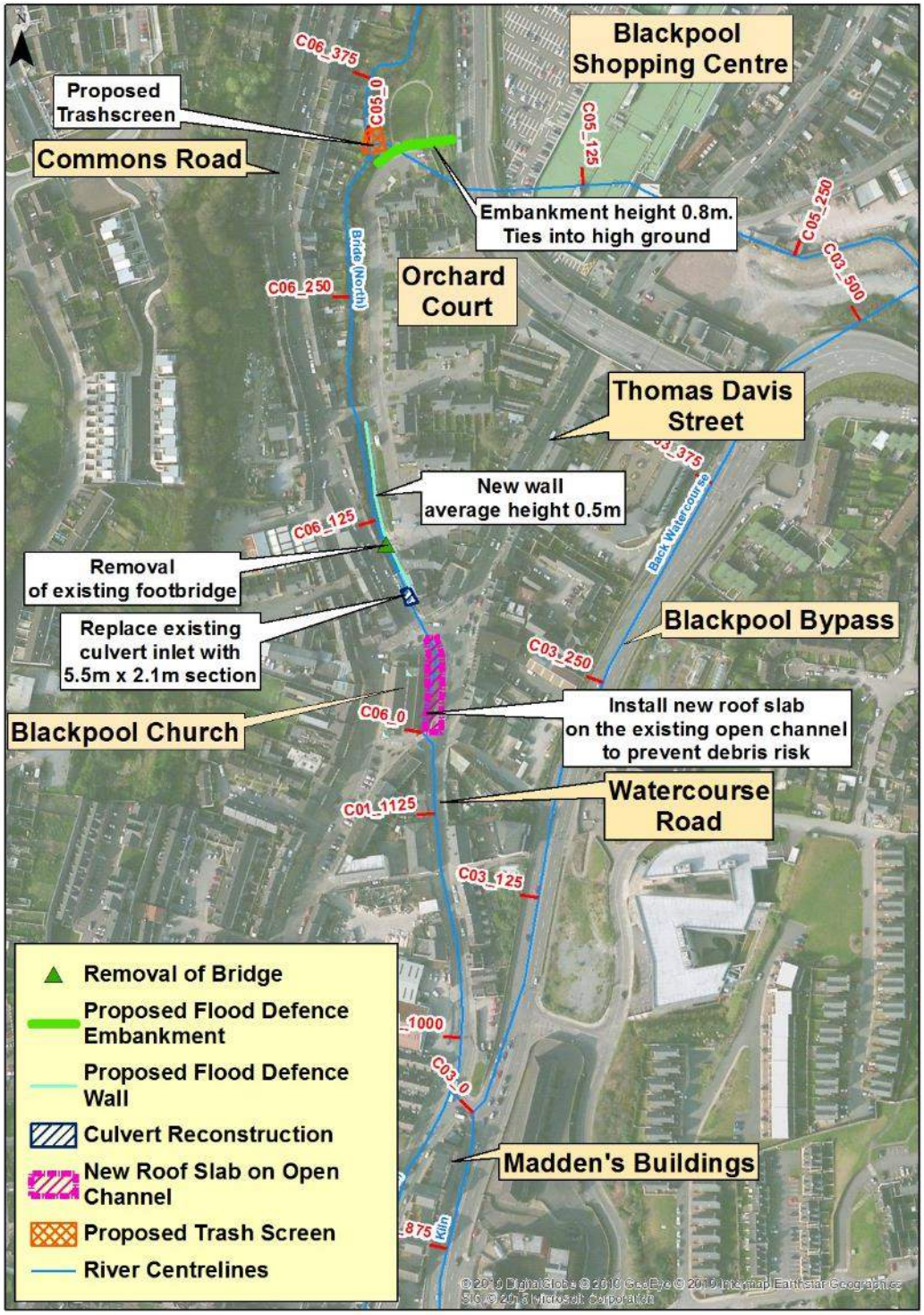

Figure 35 Option 2 – Blackpool Village

Table 3 Option 2 - Ballincrokig flood storage, combined with conveyance improvements and direct defences in Common's Road/Blackpool Summary

Area	Measure category	Chainage	Location (and Total Length of Channel Affected)	Description	Comments
ALL	Maintenance	C6_2306 to C6_0000, C01_1180 to C01_0000, C02_0824 to C02_0000	The Bride River from its confluence with the Glenamought River, downstream to its outfall to the River Lee (total length approximately 3470m). This measure also includes the Brewery Branch reach of the Kiln River (approximately 825m long)	Implementation of an organised channel maintenance programme throughout the reach with particular attention paid to locations where debris is likely to accumulate, such as at structures, sharp bends, culvert inlets etc. Programme to include checking and cleaning of culverted reaches.	
	Storage	C08_3360	Ballincrokig	Construction of an impounding embankment approximately 4m high, approximately 150m long. The embankment will incorporate an approximately 10m long reinforced concrete flow control structure containing a large hydrobrake and maintenance bypass sluice gate. On the Glenville Road, replace the existing masonry bridge with a new 2m x 1.2m reinforced concrete culvert. A 120m length of the Glenville Road is to be raised by average 0.75m Construct 2no. new 140m long flood defence walls on either side of Glenville Road just north of Ballincrokig, to prevent the stored water from inundating the road. (average height 1.1m). Walls to be stone clad both sides.	The design maximum water level in the storage reservoir is 74.9mOD. Existing ground levels in the area of the storage reservoir range from approximately 69.3mOD to 74.9mOD.

Table 3 (continued) - Ballincrokig flood storage, combined with conveyance improvements and direct defences in Common's Road/Blackpool Summary

Area	Measure category	Chainage	Location (and Total Length of Channel Affected)	Description	Comments
Commons Road Area	Defence Wall	C06_2542 to C06_2590	Lower Kileens Road	New flood defence wall, approximately 110m long, average 0.8m high	Wall to tie into high ground at each end
	Conveyance Improvement	C08_0057	North Point Business park (Approximately 20m)	Replace existing culvert to improve conveyance. New RC culvert to be 7m wide by 1.5m high	
	Sediment Management	C06_2150 to C06_2100	North Point Business park (Approximately 50m)	Provisional Natural Sediment Area	Consideration would only be given to this item if following implementation and monitoring of the scheme, it was considered necessary to supplement the function of the main sediment trap at Dulux
	Defence Walls	C06_1757 to C06_1690	Upstream of Fitz's Boreen, to the rear of the properties which face out onto the N20 (approximately 65m)	Construction of a new solid RC defence wall 65m long, on the right bank of the Bride River with a maximum height of 0.8m above dry side ground level. Wall to be stone clad on one side.	The wall will be constructed to the rear of the residential properties. Works will be carried out from the watercourse side.
	Conveyance Improvement	C06_1429 to C06_1417	Fitz's Boreen Arch Bridge (Approximately 12m)	Replace existing 1m wide by 1.5m high twin masonry arch bridge with new RC rectangular bridge (cross section dimensions approximately 7.4m x 2.4m high)	Existing bridge provides access to the adjacent industrial park. Alternative temporary access route available.
	Sediment Management	C06_1077 to C06_0989	Dulux Paints Factory (Approximately 88m)	Creation of a sedimentation trap, on the left bank of the River immediately upstream of Sunbeam Industrial Estate	

Table 3 (continued) - Ballincrokig flood storage, combined with conveyance improvements and direct defences in Common's Road/Blackpool Summary

Area	Measure category	Chainage	Location (and Total Length of Channel Affected)	Description	Comments
Blackpool	Debris Control	C06_0330	Orchard Court (northern end, in-channel) (approximately 15m)	New trashscreen structure to be constructed in the channel	Final location of screen subject to detailed design. May be located further downstream.
	Defence Embankment	C06_0360 to C06_0315	Orchard Court (Approximately 45m)	Construction of a new flood defence embankment, 45m in length, 0.8m high to be constructed along the boundary of the green area just north of Orchard Court.	A significant amount of Japanese knotweed is present along the channel in this reach.
	Defence Walls	C06_0360 to C06_0093	Orchard Court (left bank) (Approximately 94m)	Construction of a new stone clad RC walls on the left bank. Average height of wall is 0.5m above ground level. Total length of wall is approximately 94m.	A significant amount of Japanese knotweed is present along the channel in this reach.
	Conveyance Improvement	C06_0115 to C06_0110	Orchard Court pedestrian bridge (Approximately 5m)	Permanent removal of Orchard Court pedestrian bridge	The existing bridge causes significant heading up of water levels during flood events. Alternative pedestrian access to Orchard Court is available.
	Conveyance Improvement	C06_0093 to C06_0084	Orchard Court culvert inlet (Approximately 9m)	Reconstruction of the existing culvert inlet to remove flow constriction on the Bride. New inlet to be 5.5m x 2.1m.	This measure involves the removal of existing precast cover slab, steel support beams and concrete channel walls to install new culvert inlet. This measure will require works in close proximity to the existing domestic property. Temporary works may be required to secure the property during construction. Access to the residence will be affected during construction.
	Conveyance Improvement	C06_0055 to C06_0000	Blackpool Church open channel (Approximately 55m)	Installation of a new roof slab on the existing open channel adjacent to Church to prevent debris risk.	

5.4 Option 3 - Conveyance improvements and direct defences with (high walls in Orchard Court)

Refer to **Figure 36, Figure 37** and **Table 4** for a description of Option 3.

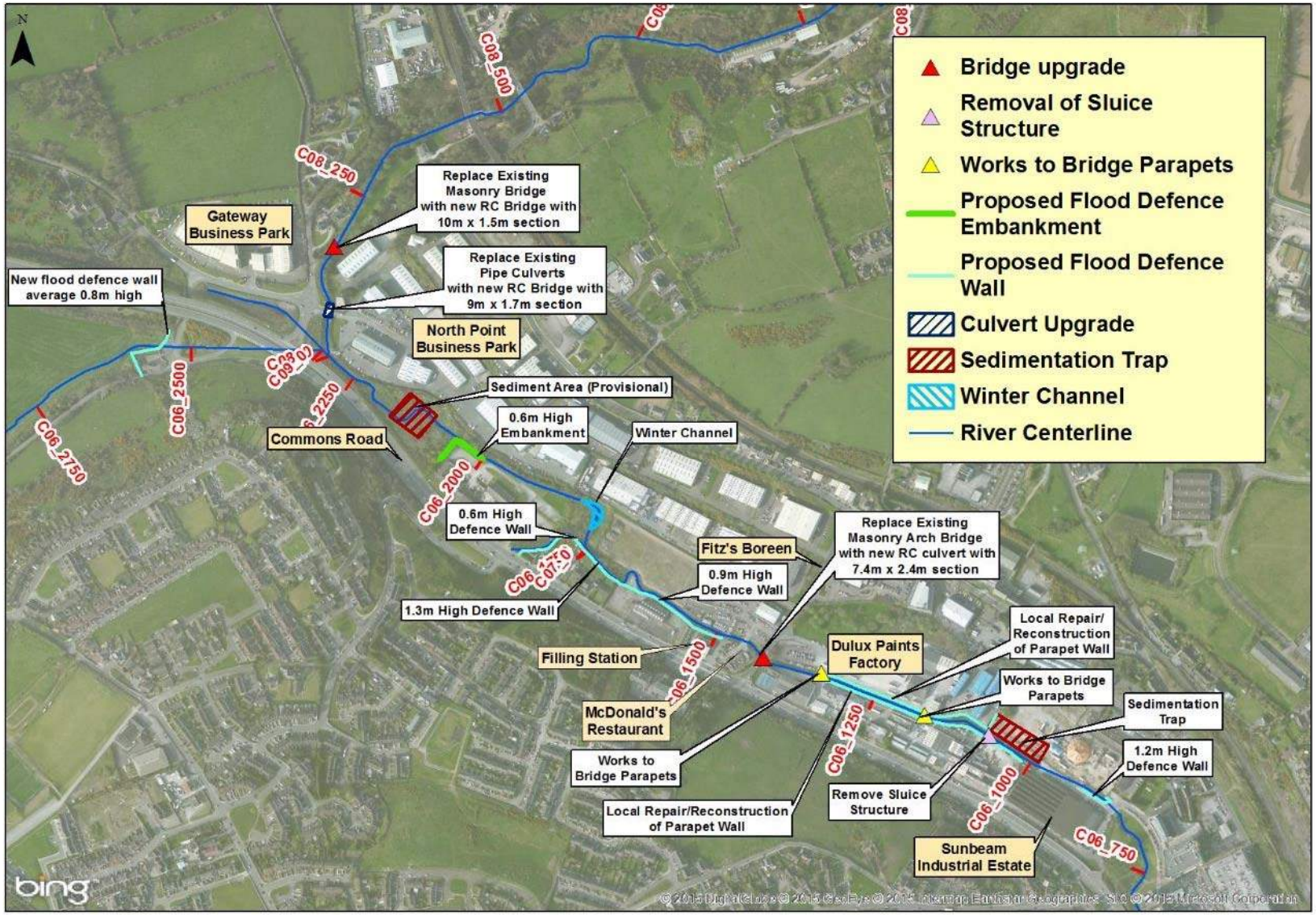

Figure 36 Option 3 – Common's Road

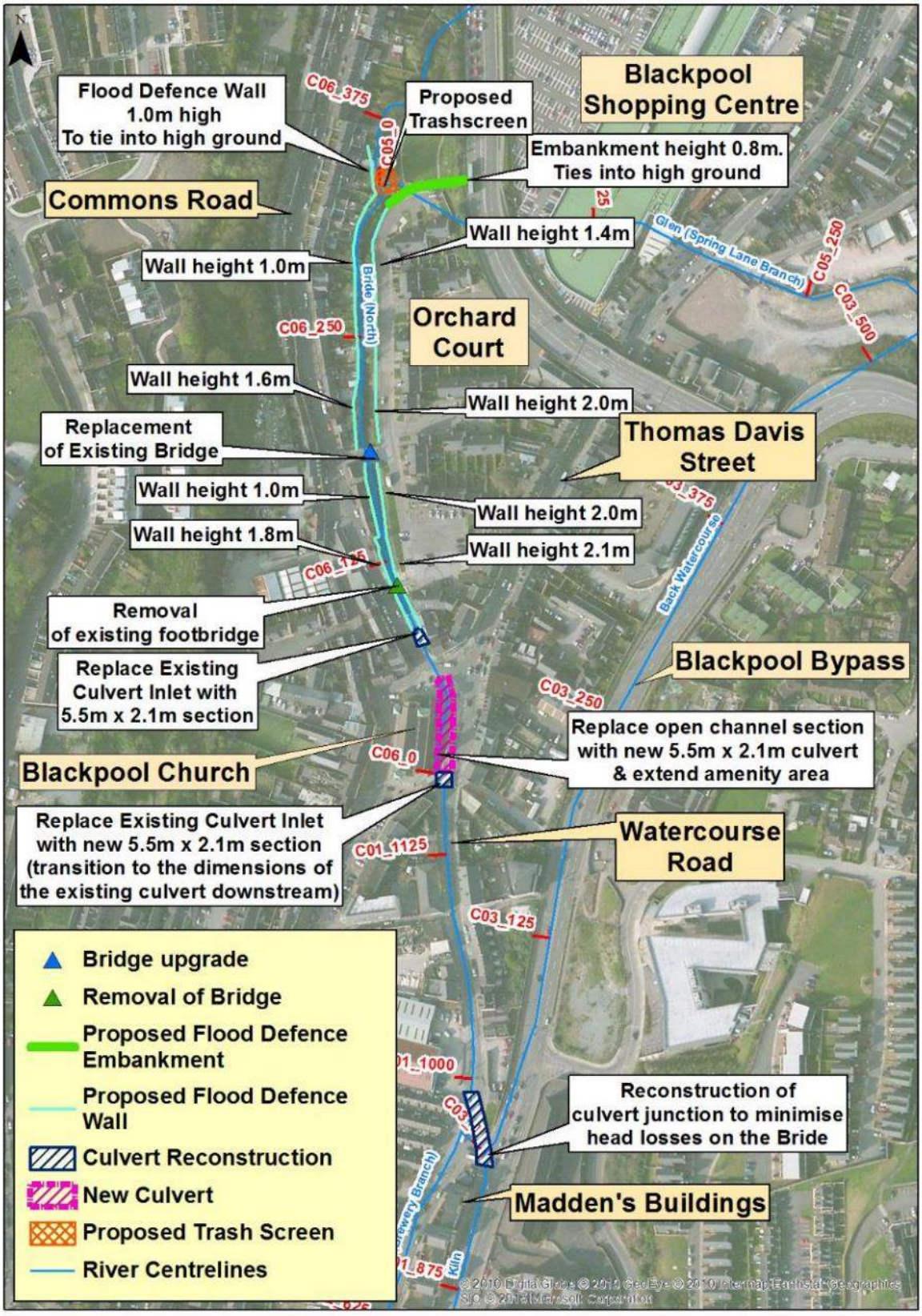

Figure 37 Option 3 – Blackpool Village

Table 4 Option 3 Conveyance Improvements and direct defences with (high walls in Orchard Court) Summary

Area	Measure category	Chainage	Location (and Total Length of Channel Affected)	Description	Comments
All	Maintenance	C06_2306 to C06_0000, C01_1180 to C01_0000, C02_0824 to C02_0000	The Bride River from its confluence with the Glenamought River, downstream to its outfall to the River Lee (total length approximately 3470m). This measure also includes the Brewery Branch reach of the Kiln River (approximately 825m long)	Implementation of an organised channel maintenance programme throughout the reach with particular attention paid to locations where debris is likely to accumulate, such as at structures, sharp bends, culvert inlets etc. Programme to include checking and cleaning of culverted reaches.	
Commons Road Area	Defence Wall	C06_2542 to C06_2590	Lower Kileens Road	New flood defence wall, approximately 110m long, average 0.8m high	Wall to tie into high ground at each end
	Conveyance Improvement	C08_0160	Upstream of North Point Business Park (Approximately 7m)	Replace existing masonry bridge with a new RC bridge, 10.5m wide wide x 1.5m high	Existing bridge provides access to a residential property. Alternative access to be provided during construction.
	Conveyance Improvement	C08_0000	North Point Business park (Approximately 20m)	Replace existing 3no pipe culverts with a new RC bridge 9m wide by 1.7m high	Existing bridge provides access to the business park. Alternative access to be provided during construction.

Table 4 (continued), Option 3 Conveyance improvements and direct defences with (high walls in Orchard Court) Summary

Area	Measure category	Chainage	Location (and Total Length of Channel Affected)	Description	Comments
Commons Road Area	Defence Embankment	C06_2053 to C06_2001	Commons Inn (upstream end of property) (Approximately 52m)	Construction of a new 0.6m high, 85m long flood defence embankment along right bank.	The embankment will be constructed along Commons Inn perimeter, away from any buildings.
	Sediment Management	C06_2150 to C06_2100	North Point Business park (Approximately 50m)	Provisional Natural Sediment Area	Consideration would only be given to this item if following implementation and monitoring of the scheme, it was considered necessary to supplement the function of the main sediment trap at Dulux
	Conveyance Improvement	C06_1845 to C06_1785	Commons Inn (downstream end of property) (approximately 60m)	Creation of a compound "winter channel", facilitating higher flows to remain in bank. Measure involves reducing ground levels on the right bank by approximately 1.5m - 2m over a 60m length to create the enlarged compound channel section.	
	Defence Walls	C06_1855 to C06_1490	Upstream of Fitz's Boreen, to the rear of the properties which face out onto the N20 (approximately 270m on Bride, approximately 85m on side channel)	Construction of a new 1.3m high (maximum height), 355m long, RC defence wall along right bank of the Bride River and a side channel of the Bride.	The wall will be constructed to the rear of the residential & commercial properties. Works will be carried out from the watercourse side.
	Conveyance Improvement	C06_1425 to C06_1420	Fitz's Boreen Arch Bridge.	Replace existing 1m wide by 1.5m high twin masonry arch bridge with new RC rectangular bridge (cross section dimensions approximately 7.4m x 2.4m high)	Existing bridge provides access to the adjacent industrial park. Alternative temporary access route available.

Table 4 (continued), Option 3 Conveyance improvements and direct defences with (high walls in Orchard Court) Summary

Area	Measure category	Chainage	Location (and Total Length of Channel Affected)	Description	Comments
Commons Road Area	Defence Walls	C06_1327 to C06_1010	Dulux Paints Factory (Approximately 317m)	Existing channel walls are generally high enough to contain the 1 in 100 year event including 500mm freeboard. Local concrete repairs/joint sealing will be required over the full 317m length of the existing walls on both banks. Local reconstruction of the existing parapet wall may also be required over approximately 40% of the length.	Works will be carried out on an active industrial site.
	Defence Walls	C06_1340 to C06_1327	Dulux Paints Factory upstream bridge	Extend existing RC parapets by approximately 200mm	This measure will ensure that water does not overtop the bridge.
	Defence Walls	C06_1175 to C06_1167	Dulux Paints Factory downstream bridge	Extend existing RC parapets by approximately 300mm	This measure will ensure that water does not overtop the bridge.
	Conveyance Improvement	C06_1072	Sluice structure at Dulux Paints	Permanent removal of steel sluice structure	This measure will reduce blockage risk at this location. Existing structure appears to be abandoned and in disrepair.
	Sediment Management	C06_1077 to C06_0989	Dulux Paints Factory (Approximately 88m)	Creation of a sedimentation trap, on the left bank of the Bride River immediately upstream of Sunbeam Industrial Estate	
	Defence Walls	C06_0916 to C06_0875	Sunbeam Industrial Estate (approximately 30m)	Construction of a new 0.6m high solid RC defence wall along both banks of the Bride adjacent to Sunbeam Industrial Estate. Length of new wall to be approximately 60m	The wall will be constructed to the rear of an industrial property on the right bank and along an internal access road on the left bank.

Table 4 (continued), Option 3 Conveyance improvements and direct defences with (high walls in Orchard Court) Summary

Area	Measure category	Chainage	Location (and Total Length of Channel Affected)	Description	Comments
Blackpool	Debris Control	C06_0330	Orchard Court (northern end, in-channel) (approximately 15m)	New trashscreen structure to be constructed in the channel	
	Embankment	C06_0360 to C06_0315	Orchard Court (northern end, left bank) (Approximately 45m)	Construction of a new flood defence embankment, 45m in length, 0.8m high to be constructed along the boundary of the green area at the northern end of Orchard Court.	
	Defence Walls	C06_0360 to C06_0093	Orchard Court (full length, both banks) (Approximately 267m)	Construction of a new stone clad RC walls on both banks. Maximum height of wall is 2.1m above ground level (average height approximately 1.8m above ground level). Total length of wall is approximately 500m.	Construction of the defence on the right bank will be along the rear of residential properties, with construction to be mainly carried out from the watercourse side. A significant amount of Japanese knotweed is present along the channel in this reach.
	Conveyance Improvement	C06_0190 to C06_0180	Orchard Court vehicular access bridge (Approximately 10m)	Orchard Court vehicular access bridge to be replaced with a new bridge with an approximately 170mm higher soffit than existing. New bridge to be approximately 8m x 10m on plan.	The road bridge is the only vehicular access to Orchard Court. Temporary vehicular access arrangements to be provided during construction. Local amendments to road levels will be required on either side of the bridge to tie into the new bridge levels.
	Conveyance Improvement	C06_0115 to C06_0110	Orchard Court pedestrian bridge (Approximately 5m)	Permanent removal of Orchard Court pedestrian bridge	The existing bridge causes significant heading up of water levels during flood events. Alternative pedestrian access to Orchard Court is available.

Table 4 (continued), Option 3 Conveyance improvements and direct defences with (high walls in Orchard Court) Summary

Area	Measure category	Chainage	Location (and Total Length of Channel Affected)	Description	Comments
Blackpool	Conveyance Improvement	C06_0093 to C06_0084	Orchard Court culvert inlet (Approximately 9m)	Reconstruction of the existing culvert inlet to remove flow constriction on the Bride. New inlet to be 5.5m x 2.1m.	This measure involves the removal of existing precast cover slab, steel support beams and concrete channel walls to install new culvert inlet. This measure will require works in close proximity to the existing domestic property. Temporary works may be required to secure the property during construction. Access to the residence will be affected during construction.
	Conveyance Improvement	C06_0055 to C06_0000	Blackpool Church open channel (Approximately 55m)	Installation of a new 5.5m x 2.1m RC culvert section to replace existing open channel adjacent to Church.	
	Conveyance Improvement	C01_1171 to C01_1157	Blackpool Church culvert inlet (Approximately 20m)	The existing inlet to the culvert just downstream of the church is to be reconstructed to minimise head losses at this point. New culvert to be 5.5m x 2.1m tapering to 1.6m.	
	Conveyance Improvement	C01_0960 to C01_0900	Madden's Buildings (Approximately 60m)	Reconstruction of the existing culvert junction to minimise head losses for the Bride flow passing through the junction into the Kiln culvert.	Significant traffic disruption during construction. Significant number of services will need to be diverted to facilitate construction.

5.5 Option 4 - Conveyance improvements and direct defences (with culvert through Orchard Court)

Refer to **Figure 38, Figure 39** and **Table 5** for a description of Option 4.

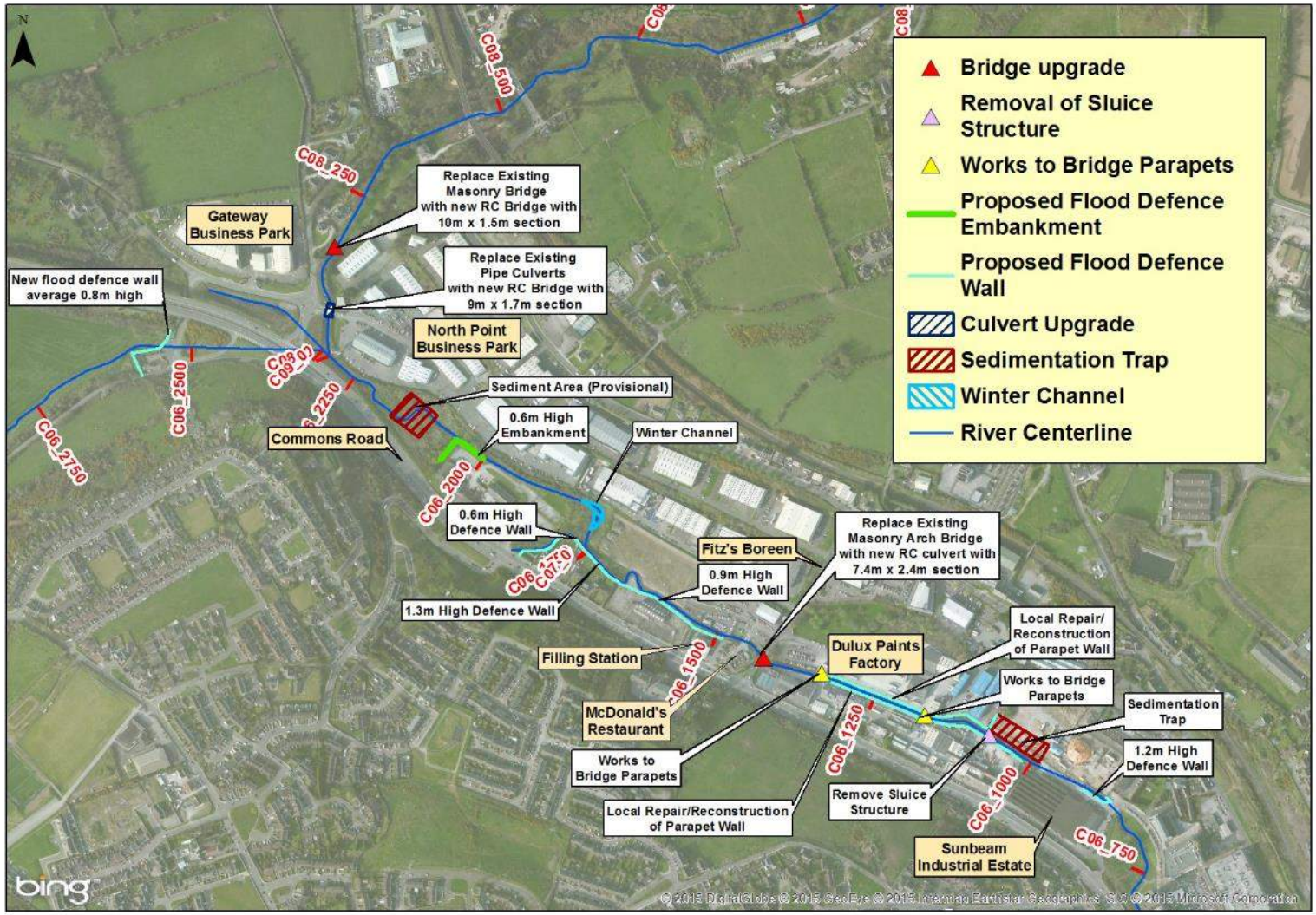

Figure 38 Option 4 – Common's Road

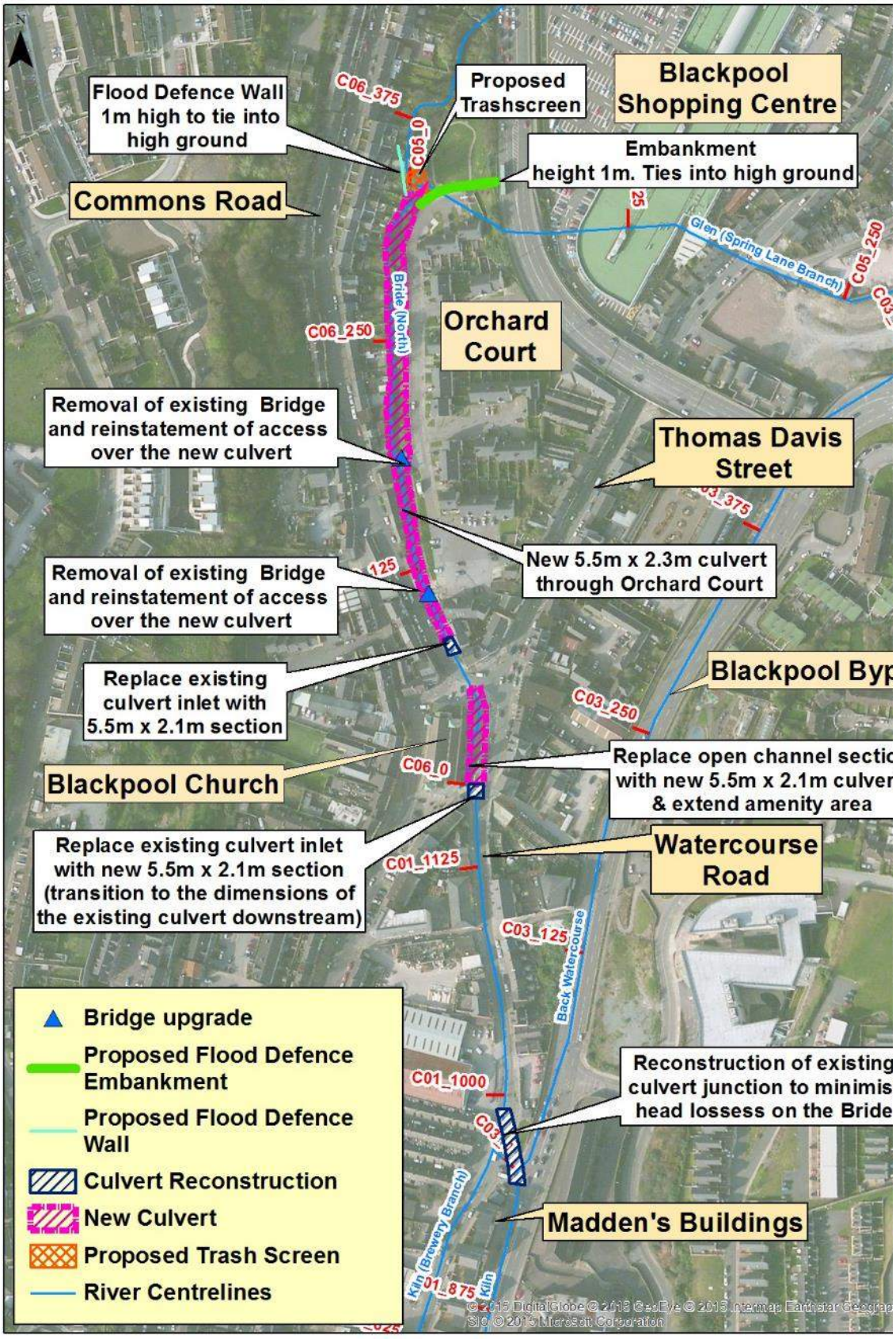

Figure 39 Option 4 – Blackpool Village

Table 5 Option 4 Conveyance improvements and direct defences (with culvert through Orchard Court) Summary

Area	Measure category	Chainage	Location (and Total Length of Channel Affected)	Description	Comments
All	Maintenance	C06_2306 to C06_0000, C01_1180 to C01_0000, C02_0824 to C02_0000	The Bride River from its confluence with the Glenamought River, downstream to its outfall to the River Lee (total length approximately 3470m). This measure also includes the Brewery Branch reach of the Kiln River (approximately 825m long)	Implementation of an organised channel maintenance programme throughout the reach with particular attention paid to locations where debris is likely to accumulate, such as at structures, sharp bends, culvert inlets etc. Programme to include checking and cleaning of culverted reaches.	
Commons Road Area	Defence Embankment	C06_2542 to C06_2590	Lower Kileens Road	New flood defence wall, approximately 110m long, average 0.8m high	Wall to tie into high ground at each end
	Conveyance Improvement	C08_0160	Upstream of North Point Business Park (Approximately 7m)	Replace existing masonry bridge with a new RC bridge, 10m wide x 1.5m high	Existing bridge provides access to a residential property. Alternative access to be provided during construction.
	Conveyance Improvement	C08_0000	North Point Business park (Approximately 20m)	Replace existing 3no pipe culverts with a new RC bridge 9m wide by 1.7m high	Existing bridge provides access to the business park. Alternative access to be provided during construction.

Table 5 (continued), Option 4 Conveyance improvements and direct defences (with culvert through Orchard Court) Summary

Area	Measure category	Chainage	Location (and Total Length of Channel Affected)	Description	Comments
Commons Road Area	Defence Embankment	C06_2053 to C06_2001	Commons Inn (upstream end of property) (Approximately 52m)	Construction of a new 0.6m high, 85m long flood defence embankment along right bank.	The embankment will be constructed along Commons Inn perimeter, away from any buildings.
	Sediment Management	C06_2150 to C06_2100	North Point Business park (Approximately 50m)	Provisional Natural Sediment Area	Consideration would only be given to this item if following implementation and monitoring of the scheme, it was considered necessary to supplement the function of the main sediment trap at Dulux
	Conveyance Improvement	C06_1845 to C06_1785	Commons Inn (downstream end of property) (approximately 60m)	Creation of a compound "winter channel", facilitating higher flows to remain in bank. Measure involves reducing ground levels on the right bank by approximately 1.5m - 2m over a 60m length to create the enlarged compound channel section.	
	Defence Walls	C06_1855 to C06_1490	Upstream of Fitz's Boreen, to the rear of the properties which face out onto the N20 (approximately 270m on Bride, approximately 85m on side channel)	Construction of a new 1.3m high (maximum height), 355m long, RC defence wall along right bank of the Bride River and a side channel of the Bride.	The wall will be constructed to the rear of the residential & commercial properties. Works will be carried out from the watercourse side.
	Conveyance Improvement	C06_1425 to C06_1420	Fitz's Boreen Arch Bridge.	Replace existing 1m wide by 1.5m high twin masonry arch bridge with new RC rectangular bridge (cross section dimensions approximately 7.4m x 2.4m high)	Existing bridge provides access to the adjacent industrial park. Alternative temporary access route available.

Table 5 (continued), Option 4 Conveyance improvements and direct defences (with culvert through Orchard Court) Summary

Area	Measure category	Chainage	Location (and Total Length of Channel Affected)	Description	Comments
Commons Road Area	Defence Walls	C06_1327 to C06_1010	Dulux Paints Factory (Approximately 317m)	Existing channel walls are generally high enough to contain the 1 in 100 year event including 500mm freeboard. Local concrete repairs/joint sealing will be required over the full 317m length of the existing walls on both banks. Local reconstruction of the existing parapet wall may also be required over approximately 20% of the length.	Works will be carried out on an active industrial site.
	Defence Walls	C06_1340 to C06_1327	Dulux Paints Factory upstream bridge	Extend existing RC parapets by approximately 200mm	This measure will ensure that water does not overtop the bridge.
	Defence Walls	C06_1175 to C06_1167	Dulux Paints Factory downstream bridge	Extend existing RC parapets by approximately 300mm	This measure will ensure that water does not overtop the bridge.
	Conveyance Improvement	C06_1072	Sluice structure at Dulux Paints	Permanent removal of steel sluice structure	This measure will reduce blockage risk at this location. Existing structure appears to be abandoned and in disrepair.
	Sediment Management	C06_1077 to C06_0989	Dulux Paints Factory (Approximately 88m)	Creation of a sedimentation trap, on the left bank of the Bride River immediately upstream of Sunbeam Industrial Estate	
	Defence Walls	C06_0916 to C06_0875	Sunbeam Industrial Estate (approximately 30m)	Construction of a new 0.6m high solid RC defence wall along both banks of the Bride adjacent to Sunbeam Industrial Estate. Length of new wall to be approximately 60m	The wall will be constructed to the rear of an industrial property on the right bank and along an internal access road on the left bank.

Table 5 (continued), Option 4 Conveyance improvements and direct defences (with culvert through Orchard Court) Summary

Area	Measure category	Chainage	Location (and Total Length of Channel Affected)	Description	Comments
Blackpool	Defence Walls	C06_0360 to C06_0330	Orchard Court (Approximately 30m)	Construction of a new, stone clad RC wall on right bank, maximum height of 1m above ground level.	Construction of the defence will be carried out along the rear of residential properties. Work will be carried out from the watercourse side. A significant amount of Japanese knotweed is present along the channel in this reach.
	Defence Embankment	C06_0360 to C06_0315	Orchard Court (Approximately 45m)	Construction of a new flood defence embankment, 45m in length, 1.0m high to be constructed along the boundary of the green area just north of Orchard Court.	A significant amount of Japanese knotweed is present along the channel in this reach.
	Debris Control	C06_0330	Orchard Court (northern end, in-channel) (approximately 15m)	New trashscreen structure to be constructed in the channel	A significant amount of Japanese knotweed is present along the channel in this reach. Significant temporary flow management will be required during construction.
	Conveyance Improvement	C06_0330 to C06_0093	Orchard Court (Approximately 237m)	Installation of a new RC culvert through Orchard Court. Culvert size to be 5.5m x 2.1m	A significant amount of Japanese knotweed is present along the channel in this reach.
	Conveyance Improvement	C06_0190 to C06_0180	Orchard Court (Approximately 10m)	This measure involves the removal of the existing vehicular access bridge to Orchard Court and constructing a new access road over the new culvert.	
	Conveyance Improvement	C06_0115 to C06_0110	Orchard Court (Approximately 5m)	This measure involves the removal of Orchard Court Pedestrian Bridge and reinstating pedestrian access over the new culvert.	

Table 5 (continued), Option 4 Conveyance improvements and direct defences (with culvert through Orchard Court) Summary

Area	Measure category	Chainage	Location (and Total Length of Channel Affected)	Description	Comments
	Conveyance Improvement	C06_0093 to C06_0084	Orchard Court Culvert inlet (Approximately 9m)	Reconstruction of the existing culvert inlet to remove flow constriction on the Bride. New inlet to be 5.5m x 2.1m.	This measure involves the removal of existing precast cover slab, steel support beams and concrete channel walls to install new culvert inlet. This measure will require works in close proximity to the existing domestic property. Temporary works may be required to secure the property during construction. Access to the residence will be affected during construction.
	Conveyance Improvement	C06_0055 to C06_0000	Blackpool Church (Approximately 55m)	Installation of a new 5.5m x 2.1m RC culvert section to replace existing open channel adjacent to Church.	
	Conveyance Improvement	C01_1171 to C01_1157	Blackpool Church (Approximately 20m)	The existing inlet to the culvert just downstream of the church is to be reconstructed as a 5.5m x 2.1m culvert, tapering to the dimensions of the existing culvert downstream (i.e. 4.8m x 1.6m).	
	Conveyance Improvement	C01_0960 to C01_0900	Madden's Buildings (Approximately 60m)	Reconstruction of the existing culvert junction to minimise head losses for the Bride flow passing through the junction into the Kiln culvert.	Significant traffic disruption during construction. Significant number of services will need to be diverted to facilitate construction.

5.6 Option 5, Conveyance Improvements & Direct Defences (culvert replacement from Orchard Court to Madden's Building)

Refer to **Figure 40, Figure 41** and **Table 6** for a description of Option 5.