

River Thames Scheme

Supplementary Consultation 3 September to 7 October 2024 Ferris Meadow Lake Options Appraisal Report

Appendix B - Technical and Feasibility Appraisal Matrix



APPENDIX B: TECHNICAL AND FEASIBILITY APPRAISAL MATRIX

1.1 Impact on Existing Structures Appraisal Matrix

| IMPACT ON EXISTING STRUCTURES APPRA | ISAL MATRIX | | | | | | | |
|--|--|---|---|--|---|--|--|-------------|
| Report: ENVIMSE500260-CBI-ZZ-3C3-RP-C | | | | | | | | |
| Impact to Existing Structures RAG rating def | | | | | | | | |
| Red: Significant changes to existing structure red Amber: Some changes to existing structures red Green: No changes to existing structures required. | quired | | | | | | | |
| Option 1 - Retain current flood relief channel alignment through Ferris Meadow Lake | Option 2 - Direct the flood relief cha of Ferris Meadow Lake into the Cha | | Option 3 - Divert the flood relief cha the west side of Ferris Meadow Lake | | Option 4 - Divide the flood relief char between the Chap and west of Ferris Lake | | Option 5 - Underground engineere | d solution. |
| Comment Rating | Comment | Rating | Comment | Rating | Comment | Rating | Comment | Rating |
| There are no impacts to existing structures. No changes to existing structures required | Removal of existing Culvert under Ferry Lane, to be replaced by a new bridge (LA12). This will also require the alignment of Ferry Lane to be altered (moved to the west) order to construct the bridge due to close proximity to properties in Desborough Close. Relocation of the sailing club building and access road. Boat mooring/berths will need to be removed along the south bank of the Chap (and potentially for the north bank) for construction and reinstated afterwards. | Significant changes to existing structures required | There are no impacts to existing structures. | No changes to existing structures required | Removal of existing culvert under Ferry Lane, to be replaced by a new bridge (LA12). Possible relocation of the sailing club building and access road. Boat mooring/berths may need to be removed along the south bank of the Chap (and potentially for the north bank) for construction and reinstated afterwards. | Some changes to existing structures required | There are no impacts to existing structures. | |

| IMPACT TO EXISTING STRUCTURES | APPRAISA | L MATRIX | | | | | | | |
|---|----------------------------|---|--|--|--|--|--|---------|--------|
| Report: ENVIMSE500260-CBI-ZZ-30 Impact to Existing Structures RAG ra | | | | | | | | | |
| Red: Significant changes to existing Amber: Some changes to existing stru Green: No changes to existing structu | structures rectures requir | equired red | | | | | | | |
| Option 6a - Retain current flood relie alignment through Ferris Meadow La augmented flow diversion into the Cl without additional control structure | f channel ke with | Option 6b - Retain current flood relie alignment through Ferris Meadow La augmented flow diversion into the Cl additional control structure | ke with | Option 7 - RTS Channel and Swimmi separation | ing Lake | Option 8 – Open Connection to Riv with Future Potential for a Marina | er Thames | | |
| Comment | Rating | Comment | Rating | Comment | Rating | Comment | Rating | Comment | Rating |
| Connection into "the Chap" for augmented flow is via the existing culvert under Ferry Lane. Condition survey needed to confirm if any minor repairs are required. There are no other impacts to existing structures. | No | Connection into "the Chap" for augmented flow would be via the existing culvert under Ferry Lane. Condition survey needed to confirm if any minor repairs are required. There are no other impacts to existing structures. | No changes to existing structures required | There are no impacts to existing structures. | No changes to existing structures required | There are no impacts to existing structures. | No changes to existing structures required | | |
| | | | | | | | | | |

1.2 Buildability Appraisal Matrix

| BUIDABILITY APPRAISAL MATRIX | | | | | | | | | |
|--|--|--|---|--|---|--|---|--|---|
| Report: ENVIMSE500260-CBI-ZZ-30 | 3C3-RP-C- | 00001 | | | | | | | |
| Buildability RAG rating definitions: | | | | | | | | | |
| Red: High risk to programme/high le Amber: Moderate risk to programme/ builda Green: Low risk to programme/ builda | buildability | y issues | | | | | | | |
| Option 1 - Retain current flood relief channel alignment through Ferris Me Lake | f | Option 2 - Direct the flood relief Ferris Meadow Lake into the Cha | | Option 3 - Divert the flood relief along the west side of Ferris Mea | | Option 4 - Divide the flood reli between the Chap and west of Lake | | Option 5 - Underground engin | eered solution. |
| Comment Ratio | ting | Comment | Rating | Comment | Rating | Comment | Rating | Comment | Rating |
| excavation, remediation programmediation | w risk to gramme/ ildability ssues. | Construction of FCS19 to west of Ferry Lane and hence excavation through landfill site more extensive than Options 1, 6a, 6b & 7 LA12 footprint smaller than in Option 1, 3, 6a & 6b Sailing club, demolish existing and construct replacement. Multiple residences affected on "The Chap". Sheet piling works increased and closer to residents. LA12 may affect private residents. Excavation through Chap and banks | High risk to programme/high level buildability issues | Construction of FCS19 to west of Ferry Lane Construction can be done without a cofferdam in the lake. Large cofferdam into Thames River LA12 as per current design Increased sheet piling works including lake top of bank. Excavation through landfill site more extensive than Options 1, 6a, 6b, 7 & 8. Removes existing storage land by lake Restricts access to construct ATR bridge over River Thames Increase in excavation of natural grounds Archaeological risk south of lake | Moderate risk to programme/ buildability issues | Construction of FCS19 to west of Ferry Lane and hence excavation through landfill site more extensive than Options 1, 6a, 6b & 7 Construction can be done without a cofferdam in the lake. Sailing Club access bridge required. LA12 may affect private residents. Removes existing storage land by lake Restricts access to construct ATR bridge over Thames Multiple residences affected by works on The Chap. | High risk to programme/high level buildability issues | Uncertainty over technical feasibility due to underlaying aquifers and ground conditions Large laydown and hardstand area required for duration of works. Heavy cranage to feed TBM material. Deep shaft through poor ground and consider groundwater Extensive excavation through landfill site. FBR7 not required. Water treatment and dewatering for shafts. Large delivery and construction logistics required at launch and retrieval locations. | High risk to programme/high level buildability issues |

| BUIDABILITY APPRAISAL MATRIX | | | | | | | |
|---|---|---|--|---|---|---|--|
| Report: ENVIMSE500260-CBI-ZZ-3C3-R | RP-C-00001 | | | | | | |
| Buildability RAG rating definitions : | | | | | | | |
| Red: High risk to programme/high level by Amber: Moderate risk to programme/ buildability Green: Low risk to programme/ buildability | lability issues | | | | | | |
| Option 6a - Retain current flood relief cha alignment through Ferris Meadow Lake w augmented flow diversion into the Chap without additional control structure | with alignment through Ferris Meadow La | ake with | Option 7 - RTS Channel and Swimn separation | ning Lake | Option 8 – Open Connection to Riv with Future Potential for a Marina | rer Thames | |
| Comment Ratin | ng Comment | Rating | Comment | Rating | Comment | Rating | |
| Flow control structure required from RTS channel to Chap. Mod risl progra build: | Flow control structure required from RTS channel to Chap. Full gated structure and associated compound required between RTS channel and Ferris Meadow Lake. Small increase in material excavated through landfill compared with Option 1. Large cofferdam into Thames River and lake. Additional sheet pile work compared with Option 1. LA12 as per current design. Construction of FCS19 & FBR7 Silt and pollution control in Ferris Meadow Lake required. | Moderate risk to programme/ buildability issues | Landfill excavation, remediation and processing as per Option 1 Large cofferdam into Thames and lake. Construction of FCS19 & FBR7 LA12 as per current design Silt and pollution control in Ferris Meadow Lake required. Additional pile work with 2no. pile runs and tie ins to banks. Large quantity of imported fill material. Requirement for marine barge and plant. Ferris Meadow Lake occupied for duration of works. Substantial material deliveries and road use. Significant construction programme but likely to be able to carry out, concurrently with other works. | Moderate risk to programme/ buildability issues | Large cofferdam into Thames and lake. LA12 as per current design FCS19 relocated west of Ferris Meadow Lake. Construction of FCS19 to west of Ferry Lane and hence excavation through landfill site more extensive than option 1, 6a, 6b & 7. FBR7 remains at current scope location. Reduced construction programme and interface with Ferris Meadow Lake compared with Option 1. | Moderate risk to programme/ buildability issues | |

1.3 Operations and Maintenance

| OPERATIONS AND MAINTENAN | | | | | | | | | |
|--|--|-------------------------------|------------------|-------------------------------|------------------|-------------------------------|---------------|---|------------------|
| Report: ENVIMSE500260-CBI-2 | | | | | | | | | |
| Operation and Maintenance RAG | 3 rating definition | ons: | | | | | | | |
| Red: Significant operation and Amber: Moderate operation and r Green: Low operation and mainte | maintenance req | uirements | | | | | | | |
| | n 1 - Retain current flood relief channel nent through Ferris Meadow Lake of Ferris Meadow Lake into the Chap, including widening the Chap | | | | | | | Option 5 - Underground engine solution. | ered |
| Comment | Rating | Comment | Rating | Comment | Rating | Comment | Rating | Comment | Rating |
| Channel inspection and | Low | Channel inspection and | Moderate | Channel inspection and | Moderate | Channel inspection and | Moderate | Significant maintenance and | Significant |
| maintenance of sheet piles to | operation and maintenance | maintenance consisting of | operation and | maintenance of sheet piles to | operation and | maintenance consisting of | operation and | inspection requirements for | operation and |
| both sides of channel to west | requirements. | sheet piles to both sides of | maintenance | both sides of channel to west | maintenance | sheet piles to both sides of | maintenance | all aspects of the option. | maintenance |
| of Ferry Lane (1.4km). | | channel to west of Ferry Lane | requirements | of Ferry Lane and channel | requirements | channel to west of Ferry | requirements | | requirements |
| | | and south side of Chap | | around southwest side of lake | | Lane, south side of Chap and | | | |
| Ferry Lane bridge (LA12) | | (1.8km). | | (2.5km). | | channel around southwest | | | |
| inspection & maintenance. | | Level control weir to west of | | Level control weir to west of | | side of lake (3km). | | | |
| Outlet weir (75m) and bridge | | Ferry Lane (96m long) | | Ferry Lane (96m long) | | Level control weir to west of | | | |
| inspection & maintenance. | | requiring inspection & | | requiring inspection & | | Ferry Lane (96m long) | | | |
| mspection & maintenance. | | maintenance. | | maintenance. | | requiring inspection & | | | |
| | | | | | | maintenance. | | | |
| | | North bank and bed of Chap | | | | | | | |
| | | which contains scour | | | | | | | |
| | | protection requiring | | | | | | | |
| | | inspection & maintenance. | | | | | | | |
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OPERATIONS AND MAINTENANCE APPRAISAL MATRIX

Report: ENVIMSE500260-CBI-ZZ-3C3-RP-C-00001

Operation and Maintenance RAG rating definitions :

Red: Significant operation and maintenance requirements
Amber: Moderate operation and maintenance requirements
Green: Low operation and maintenance requirements.

| Option 6a - Retain current Nood Felfed Channel alignment through Ferris Needoor Lake with augmented flow diversion into the Chapy shigh addouble and with augmented flow diversion into the Chapy shigh addouble and with augmented flow diversion into the Chap with additional control structure | | | | | | | | | | |
|---|--|------------------------------------|---|---------------------------------------|--|------------------------------------|--|------------------------------------|---------|--------|
| Channel inspection and maintenance of sheet piles to both sides of channel to west of Ferry Lane (from chertsey Road) and augmented flow channel (1.6km). Ferry Lane bridge (LA12) inspection & maintenance. Outlet weir (75m) and bridge inspection & maintenance. Outlet weir (75m) and bridge inspection and maintenance. Inspection and maintenance. Outlet weir (75m) and bridge inspection & maintenance of the existing culvert under ferry Lane. Penstook to close off the augmentation channel will need operation and maintenance. Large, gated structure will have significant to perational arequirements when RTS is used in flood conditions and this will also be a significant to perational maintenance. Channel inspection and maintenance to sheet piles to west of ferry Lane (from Chertsey Road) (1.4km). Channel inspection and maintenance to sheet piles to west of ferry Lane (from Chertsey Road) (1.4km). Channel inspection and maintenance to sheet piles to both sides of channel to west of ferry Lane (from Chertsey Road) (1.4km). Inspection and maintenance of the sheet piled bund which would divide Ferris Meadow Lake. Length of sheet piles for inspection and maintenance of the existing culvert under ferry Lane. Penstook to close off the augmentation channel will need operation and maintenance. Large, gated structure will have significant operational requirements when RTS is used in flood conditions and this will also be a significant. | channel alignment through Fer Lake with augmented flow dive the Chap <u>without</u> additional con | ris Meadow rsion into | alignment through Ferris Meado augmented flow diversion into the | w Lake with | | mming Lake | | Thames with | | |
| maintenance of sheet piles to both sides of channel to west of ferry tane (from Chertsey Road) and augmented flow channel (1.6km). Ferry Lane bridge (LA12) inspection & maintenance of the existing culvert under Ferry Lane. Untel tweir (75m) and bridge inspection & maintenance of the existing culvert under Ferry Lane. Penstock to close off the augmentation channel will need operation and maintenance. Large, gated structure will have significant of this will also be a significant will as one a significant will also be a significant will as one a significant will as one a significant will also be a significant to sheet piles to both sides of channel to west of channel to west of ferry Lane (from Chertsey Road) (1.4km). maintenance to sheet piles to both sides of channel to west of ferry Lane (from Chertsey Road) (1.4km). Inspection and maintenance of the sheet piles to both sides of channel to west of ferry Lane (from Chertsey Road) (1.4km). Inspection and maintenance of the sheet piles to both sides of channel to west of ferry Lane (from Chertsey Road) (1.4km). Inspection and maintenance of the sheet piles to both sides of channel to west of ferry Lane (from Chertsey Road) (1.4km). Inspection and maintenance of the sheet piles to both sides of channel to west of ferry Lane (from Chertsey Road) (1.4km). Inspection and maintenance of the sheet piles to both sides of channel to west of ferry Lane (from Chertsey Road) (1.4km). Inspection and maintenance of the sheet piles to both sides of channel to west of ferry Lane (from Chertsey Road) (1.4km). Inspection and maintenance of the sheet piles to both sides of channel to west of ferry Lane (from Chertsey Road) (1.4km). Inspection and maintenance of the sheet piles to both sides of channel to west of ferry Lane (from Chertsey Road) (1.4km). Inspection | Comment | Rating | Comment | Rating | Comment | Rating | Comment | Rating | Comment | Rating |
| | Channel inspection and maintenance of sheet piles to both sides of channel to west of Ferry Lane (from Chertsey Road) and augmented flow channel (1.6km). Ferry Lane bridge (LA12) inspection & maintenance. Outlet weir (75m) and bridge inspection & maintenance of the existing culvert under Ferry Lane. Penstock to close off the augmentation channel will need operation and | Moderate operation and maintenance | Channel inspection and maintenance of sheet piles to both sides of channel to west of Ferry Lane (from Chertsey Road) and augmented flow channel (1.6km). Ferry Lane bridge (LA12) inspection & maintenance. Outlet weir (75m) and bridge inspection & maintenance of the existing culvert under Ferry Lane. Penstock to close off the augmentation channel will need operation and maintenance. Large, gated structure will have significant operational requirements when RTS is used in flood conditions and this will also be a significant | Significant operation and maintenance | Channel inspection and maintenance to sheet piles to both sides of channel to west of Ferry Lane (from Chertsey Road) (1.4km). Inspection and maintenance of the sheet piled bund which would divide Ferris Meadow Lake. Length of sheet piles 0.8km. Total sheet piles for inspection | Moderate operation and maintenance | Channel inspection and maintenance to sheet piles to both sides of channel to west of Ferry Lane (from Chertsey Road) (1.4km). Level control weir to west of Ferry Lane (96m long) requiring inspection & maintenance. Inspection and maintenance of sheet piles at outlet from Ferris | Moderate operation and maintenance | | |

1.4 Impact to Utility Services

| | | OWNED STRUCTURES APPRAISAL N | //ATRIX | | | | | | |
|---|---------------------|--|---------------------|---------------------------------------|---------------------|--|-------------|--|---------------------|
| Report: ENVIMSE500260-CBI-ZZ-3C | | | | | | | | | |
| Impact on and issues surrounding un | - | | | | | | | | |
| Red: Significant utility service diversi | | | | | | | | | |
| Amber: Moderate utility service diversions requirements of the service diversions requirements. | | | | | | | | | |
| Option 1 - Retain current flood relief | channel | Option 2 - Direct the flood relief char | nel north | Option 3 - Divert the flood relief ch | annel | Option 4 - Divide the flood relief c | hannel | Option 5 - Underground engineer | ed |
| alignment through Ferris Meadow La | ke | of Ferris Meadow Lake into the Chap | , including | along the west side of Ferris Mead | ow Lake | between the Chap and west of Fer | ris | solution. | |
| Comment | Rating | widening the Chap Comment | Rating | Comment | Rating | Meadow Lake Comment | Rating | Comment | Rating |
| The flood relief channel will | Moderate | This option requires similar | Significant | | Moderate | | Significant | The construction of a level | Moderate |
| | utility | | utility | This option requires the same | utility | This option requires the same | utility | retention structure and the | utility |
| require a diversion of an existing 500mm diameter water main | service | diversions of services as Option | service | service diversions as Option 1. | service | service diversions as Option 2. | service | tunnel shaft in the field to the | service |
| which runs from the west of Ferry | diversions required | 1. However, as the construction of Ferry Lane Crossing (LA12) | diversions required | | diversions required | In addition, the 500mm water main, electricity and | diversions | west of Ferry Lane will require | diversions required |
| • | required | , , , | required | | required | | required | | required |
| Lane and travels east on the | | now replaces the existing Ferry | | | | communications services | | a diversion of the 500mm | |
| northern edge of Ferris Meadow Lake. | | Lane culvert into the Chap and is further north than in Option 1 | | | | running towards the sailing club will need to be diverted to | | existing water main to the west of Ferry Lane (as with | |
| Lake. | | • | | | | cross a | | Option 1, 2 & 3). | |
| Construction of Ferry Lane | | there are additional multiple | | | | new bridge which will provide | | Ορτίστι 1, 2 & 3). | |
| • | | electricity cables present which | | | | access to the sailing club over | | Tunnelling underneath Ferry | |
| Crossing (LA12) will result in the following services being | | travel north from an electricity substation to the east of Ferry | | | | the channel to the west of the | | Lane (where there are a | |
| temporarily diverted: | | · | | | | Lake. | | significant number of services) | |
| - Water main | | Lane requiring diverting. | | | | Lake. | | should mean that the services | |
| - Openreach Telecom (BT) | | The 500mm diameter water main | | | | The construction of a pumping | | in the lane can remain. | |
| cables (overhead) | | running in an east/west direction | | | | station north of Ferry Lane | | However, consultation with | |
| - Foul water drainage | | would not require such an | | | | Crossing (LA12) (rather than to | | utility companies will be | |
| - Low and high voltage | | extensive diversion as option 1 | | | | the south)would be necessary | | required to confirm that | |
| electrical cables | | but is likely to require an | | | | to enable the foul water gravity | | tunnelling underneath the | |
| - Low pressure gas pipes | | additional diversion further east | | | | main to cross the channel and | | utilities won't affect them. | |
| - Street lighting | | along the sailing club access | | | | feed to the existing Thames | | dilities won't direct them. | |
| - Street lighting | | track, together with electricity | | | | water pumping station to the | | In addition, a gas main and | |
| The construction of a pumping | | and communications services to | | | | south. | | foul water main are visible | |
| station to the south of Ferry Lane | | the sailing club. | | | | 33.5.1 | | inside the Ferry Lane culvert. | |
| Crossing (LA12) would be | | The construction of a pumping | | | | This could also enable the foul | | Due to the increased flow | |
| necessary to enable the foul | | station north of Ferry Lane | | | | water main visible inside Ferry | | through the culvert, there is an | |
| water gravity main to cross the | | Crossing (LA12)(rather than to | | | | Lane culvert to be diverted. | | increased risk of blockage from | |
| channel and feed to the existing | | the south) would be necessary to | | | | The gas main visible inside the | | debris, and potential for | |
| Thames water pumping station to | | enable the foul water gravity | | | | Ferry Lane culvert would also | | damage to the pipes. Solutions | |
| the north of the Ferry Lane | | main to cross the channel and | | | | require diverting. | | to mitigate this would have to | |
| Crossing (LA12). | | feed to the existing Thames | | | | require diverting. | | be investigated. This could | |
| | | water pumping station. This | | | | | | mean a diversion of the pipes | |
| | | could also enable the foul water | | | | | | or a means of keeping debris | |
| | | main visible inside Ferry Lane | | | | | | out of the culvert. Potentially | |
| | | culvert to be diverted. | | | | | | there may also be a need for a | |
| | | | | | | | | | |

| The gas main visible inside the | | pumping station for the foul |
|---------------------------------|--|------------------------------|
| Ferry Lane culvert would also | | water main. |
| require diversion. | | |
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| UTILITY SERVICES AND OTHER STAKEH | IOLDER OWNE | ED STRUCTURES APPRAISAL | MATRIX | | | | | | |
|--|-------------|--|--|---|------------------|--|------------------|---------|--------|
| Report: ENVIMSE500260-CBI-ZZ-3C3-RP | | LD OTROOTORED ATTRABAL | THE STATE OF THE S | | | | | | |
| Impact on and issues surrounding utility \$ | | rating definitions: | | | | | | | |
| Red: Significant utility service diversions r | required | | | | | | | | |
| Amber: Moderate utility service diversions re | required | | | | | | | | |
| Green: Minimal service diversions required | | n Ch. Datain assured flood valid | f ahammal | Ontion 7 DTC Channel and Cuimma | in a Laka | Ontion 9 Ones Compositor to Biv | ar Thamas | 1 | |
| Option 6a - Retain current flood relief char alignment through Ferris Meadow Lake wi | | n 6b - Retain current flood relie nent through Ferris Meadow La | | Option 7 - RTS Channel and Swimm separation | ing Lake | Option 8 – Open Connection to Riv with Future Potential for a Marina | er inames | | |
| augmented flow diversion into the Chap | augme | ented flow diversion into the C | | | | | | | |
| without additional control structure | additio | onal control structure | | | | | | | |
| Comment Ratio | | | Rating | Comment | Rating | Comment | Rating | Comment | Rating |
| Life Common Comm | 4ili4s / | ame utility diversions as | Significant utility | This option requires the same | Moderate utility | This option requires the same | Moderate utility | | |
| option 1, including the | rvice | on 1, including the | service | service diversions as Option 1. | service | service diversions as Option 1. | service | | |
| | | ruction of a pumping | diversions | | diversions | | diversions | | |
| , | | on to the south of Ferry | required | | required | | required | | |
| Lane Crossing (LA12) to enable | | Crossing (LA12) to enable | | | | | | | |
| the foul water gravity main to | | oul water gravity main to | | | | | | | |
| cross the channel and feed to | | the channel and feed to | | | | | | | |
| the existing Thames water | | xisting Thames water | | | | | | | |
| pumping station to the north. | pump | oing station to the north. | | | | | | | |
| In addition a gas main and faul | In add | dition a gas main and faul | | | | | | | |
| In addition, a gas main and foul water main are visible inside the | | dition, a gas main and foul r main are visible inside the | | | | | | | |
| Ferry Lane culvert. Due to the | | Lane culvert. Due to the | | | | | | | |
| increased flow through the | | ased flow through the | | | | | | | |
| culvert, there is an increased risk | | rt, there is an increased risk | | | | | | | |
| of blockage from debris, and | | ockage from debris, and | | | | | | | |
| potential for damage to the | | ntial for damage to the | | | | | | | |
| pipes. Solutions to mitigate this | | . Solutions to mitigate this | | | | | | | |
| would have to be investigated. | | d have to be investigated. | | | | | | | |
| This could mean a diversion of | | could mean a diversion of | | | | | | | |
| the pipes or a means of keeping | | ipes or a means of keeping | | | | | | | |
| debris out of the culvert. | | s out of the culvert. | | | | | | | |
| Potentially there may also be a | Poten | ntially there may also be a | | | | | | | |
| need for a second pumping | | for a second pumping | | | | | | | |
| station for the foul water main | | on for the foul water main | | | | | | | |
| to the north. | to the | e north. | | | | | | | |
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1.5 Materials Management Appraisal Matrix

| MATERIALS MANAGEMENT APPRAISAL MA | TRIX | | | | | | | |
|--|---|---|--|--|--|---|--|---|
| Report: ENVIMSE500260-CBI-ZZ-3C3-RP-C- | 00001 | | | | | | | |
| Materials Management Appraisal Criteria: | | | | | | | | |
| Red: Significant amount of materials and was | ste excavated | | | | | | | |
| Amber: Moderate amount of materials and wast | te excavated | | | | | | | |
| Green: Minimal amount of materials and waste | excavated | | | | | | | |
| Option 1 - Retain current flood relief channel alignment through Ferris Meadow Lake | Option 2 - Direct the flood relief channel r Ferris Meadow Lake into the Chap | north of | Option 3 - Divert the flood relief channel the west side of Ferris Meadow Lake | along | Option 4 - Divide the flood relief ch between the Chap and west of Ferr Meadow Lake | | Option 5 - Underground engineered solution. | |
| Comment Rating | Comment | Rating | Comment | Rating | Comment | Rating | Comment | Ratin |
| Has least total volume of material to be excavated compared with all other options and also the lowest excavated material in landfill (within land to west of Ferry Lane). Minim al amoun t of materials and waste excavated and waste excavated waste excavated materials in landfill (within land to west of Ferry Lane). | Fourth greatest total volume of material to be excavated. Third greatest of excavation in landfill (within land to west of Ferry Lane). This waste material is unlikely to be suitable for reuse without processing / treatment. If the excavated waste material is hazardous, it may not be suitable for placement on site even after processing and may incur off-site disposal costs. | Modera te amount of materia Is and waste excavat ed | Second greatest total volume of material to be excavated with second greatest of excavation in landfill (within land to west of Ferry Lane). This waste material is unlikely to be suitable for reuse without processing / treatment. If the excavated waste material is hazardous, it may not be suitable for placement on site even after processing and may incur off-site disposal costs. There are significant quantities of excavation required for new channel to west and south of Ferris Meadow Lake. But this is assumed to be naturally occurring material so reuse would potentially be more straight forward. | Signific ant amount of materia Is and waste excavat ed | Third greatest total volume of material to be excavated. The volume in landfill (west of Ferry Lane) is as Option 2. There are significant quantities of excavation required for new channel to west and south of Ferris Meadow Lake, but this volume is less than Option 3 due to the smaller channel required. This is assumed to be naturally occurring material so re-use would potentially be more straight forward. | Modera te amount of materia Is and waste excavat ed | Greatest volume of waste material proposed to be excavated. This includes significant quantities from both landfill to west of Ferry Lane and non-landfill to east of Ferry Lane. Excavated waste material from landfill is unlikely to be suitable for reuse without processing / treatment. If the excavated waste material is hazardous, it may not be suitable for placement onsite even after processing and may incur off-site disposal costs. There is a probable recovery of London Clay from tunnelling which could be of benefit to the scheme as there is a potential deficit of impermeable naturally occurring material that will need to be imported. | Significant amount of materials and waste excavated |

MATERIALS MANAGEMENT APPRAISAL MATRIX

Report: ENVIMSE500260-CBI-ZZ-3C3-RP-C-00001

Materials Management RAG rating definitions:

| Red: Significant amount of materia | ls and waste | excavated | | | | | | | |
|--|---|---|---|--|---|--|--|---------|--------|
| Amber: Moderate amount of materials | s and waste | excavated | | | | | | | |
| Green: Minimal amount of materials a | and waste ex | cavated | | | | | | | |
| Option 6a - Retain current flood relicalignment through Ferris Meadow Laugmented flow diversion into the Carthout additional control structure | ake with Chap | Option 6b - Retain current flood relie alignment through Ferris Meadow La augmented flow diversion into the Cl additional control structure | ke with | Option 7 - RTS Channel and Swimm Separation | ing Lake | Option 8 – Open Connection to Riv with Future Potential for a Marina | er Thames | | |
| Comment | Rating | Comment | Rating | Comment | Rating | Comment | Rating | Comment | Rating |
| Has second lowest volume of material to be excavated compared with all other options. This is similar to Option 1 but with additional excavation in landfill for augmented flow channel. | Minimal amount of materials and waste excavated | Very similar to Option 6a with an increase in material to be excavated in landfill due to need to create operational compounds for control structure. | Minimal amount of materials and waste excavated | Has an equal volume of material to be excavated to Option 1 and hence joint lowest out of all options. However, there is a need to place fill material between the lake division sheet piles and this can only be clean and naturally occurring material. | Minimal amount of materials and waste excavated | Fifth greatest option for total volume of material to be excavated. The excavation required in landfill (within land to west of Ferry Lane) is similar to that of Option 2. This waste material is unlikely to be suitable for reuse without processing / treatment. If the excavated waste material is hazardous, it may not be suitable for placement onsite even after processing and may incur off-site disposal costs. | Moderate amount of materials and waste excavated | | |

1.6 Carbon Appraisal Matrix

CARBON APPRAISAL MATRIX

Report: ENVIMSE500260-CBI-ZZ-3C3-RP-C-00001

Carbon RAG rating definitions:

| Option 1 - Retain current flood reli channel alignment through Ferris Lake | | Option 2 - Direct the flood relief char of Ferris Meadow Lake into the Chap | | Option 3 - Divert the flood relief ch along the west side of Ferris Mead | | Option 4 - Divide the flood relief char between the Chap and west of Ferris Lake | | Option 5 - Underground engineered | solution |
|--|-----------------------------------|---|-----------------------------------|--|--------------------------------------|---|--------------------------------------|---|--|
| Comment This option includes the smallest use of sheet piles and concrete and hence has the smallest carbon footprint. | Rating Minimal carbon footprint. | Based on the assumption that sheet piles will only be required on the south bank of the Chap this option has a carbon footprint almost double that of Option 1. Concrete usage makes up approximately 40% of the carbon footprint, sheet piles approximately 45% with rip rap for bed protection making up approximately 15%. | Rating Moderate carbon footprint. | The carbon footprint of this option is just under 2.5 times greater than Option 1. This assumes the need for sheet piles along both sides of the proposed channel to the west of the lake. In this option sheet piles make up over 50% of the carbon footprint, concrete just over 30% and the remainder rip rap for bed protection. | Rating Significant carbon footprint. | The carbon footprint of this option is just over 2.5 times that of option 1. The option contains a large amount of sheet piles as the two separate flood channels are required. In this option sheet piles make up over 60% of the carbon footprint, concrete approximately 25% and rip rap for bed protection 15%. | Rating Significant carbon footprint. | Comment This option has a carbon footprint 3 times that of Option 1 and has the highest footprint of all option. This is mainly due to the large volume of concrete required to line the shafts and tunnel. There are, however, still a significant quantity of sheet piles required in the level retaining structure and the augmented flow channel as in land classed as landfill. | Rating Signific carbo footpri |
| | | | | | | | | | |

CARBON APPRAISAL MATRIX

Report: ENVIMSE500260-CBI-ZZ-3C3-RP-C-00001

Carbon RAG rating definitions:

The carbon footprint is a high level calculation covering significant contributors (steel, concrete and rip rap)

Red: Significant carbon footprint with and limited carbon mitigation measures available.

Amber: Moderate carbon footprint with some mitigation measures available.

| Green: Minimal carbon footprint Option 6a - Retain current flood relief channel alignment through Ferris Meadow Lake with augmented flow diversion into the | Option 6b - Retain current flood relief channel alignment through Ferris Meadow Lake with augmented flow diversion into the Chap with additional control structure | | Option 7 - RTS Channel and Swimming Lake Separation | | Option 8 – Open Connection to River Thames with Future Potential for a Marina | | | |
|---|---|---|---|---|--|---|---------|--------|
| Chap <u>without</u> additional control structure | | | | | | | | |
| Comment Rating | Comment | Rating | Comment | Rating | Comment | Rating | Comment | Rating |
| This option has the second smallest carbon footprint. The requirement to use sheet piles / concrete base to construct the augmented flow channel as in land classed as landfill is the reason for the carbon footprint being greater than Option 1. | There is requirement to use sheet piles / concrete base to construct the augmented flow channel as in land classed as landfill is the reason for the carbon footprint being greater than Option 1. There is also an increase compared with Option 6a due to the additional gated structure. | Moderate carbon footprint with some mitigation measures available | This option contains the same amount of concrete as Option 1 but requires two rows of sheet piles to form a separation bund and hence an increase in carbon footprint. There is a similar carbon impact from the piling as in Option 3 but it does not include as much concrete or rip rap. | Moderate carbon footprint with some mitigation measures available | This option has a similar carbon footprint to Option 7 but the carbon impact is due to extensive requirements for sheet piling and concrete to the west of Ferry Lane as this option contains a large weir structure (also required in Options 2, 3, 4 and 5). | Moderate carbon footprint with some mitigation measures available | Comment | Rating |



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