

**CENTRAL STORT CROSSING OPTIONS REPORT:
ADDENDUM**



Major Highways and Structures Proposals

VD17516-CSC-ADD

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Primary Author	Mike Standring	Initialled:	MS
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Contributor	Niall Mizban	Initialled:	NM
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Review By	Mike Standring	Initialled:	MS
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1 EXECUTIVE SUMMARY

1.1 CSC

1.1.1 The Gilston Area forms part of the wider growth within the Harlow area that is anticipated to deliver circa 16,000 homes by the end of the plan period (which includes 3,000 homes in the Gilston Area) and a further 7,000 in the Gilston Area post plan period. The Gilston Park Estate comprises 8,500 homes within the overall total of 23,000 homes. To serve this wider growth, Hertfordshire and Essex County Councils have identified the need for additional strategic infrastructure including additional capacity across the Stort Valley.

1.1.2 Following the initial planning submission in May 2019, an iterative process of dialogue, consultations and informed amendments to the detailed application pack has been carried out by the Client team. Where new design documents have become available, such as the new editions of DMRB, the schemes have been checked and updated to meet the latest design standards. The current proposals for the CSC and ESC deliver a robust package of highway improvements that achieve the overarching Garden Town principles fundamental to the Gilston Park Estate; delivering high quality homes in close proximity to local business and enterprise.

1.1.3 This Addendum Report identifies the key changes made to the CSC scheme submitted in the May 2019 Detailed Application.

1.1.4 The CSC proposals prioritise walking, cycling and public transport; with consistent soft verges and landscaping to accentuate a green transport corridor.

1.1.5 The CSC extends into Village 1 via the bus access only junction at the north extent of the CSC scheme, encouraging use of public transport and the adjacent sustainable active route over use of private vehicles. Private vehicle access to Village 1 and the connecting village loop road from the CSC is via the recently added second Village 1 access junction, forming the western extent of the ESC Road 1.

1.1.6 The Eastwick Road grade separated cycle & footbridge conveys the main pedestrian and cycle sustainable active route between Harlow, Village 1 and the wider Gilston Area residential development.

1.1.7 The recently added Village 1 East traffic signal controlled junction includes full pedestrian and cycle crossing facilities, thereby providing a second pedestrian and cycle sustainable active corridor linking Harlow to Village 1 and the other villages, via Burnt Mill Lane.

- 1.1.8 Resilient SuDS features are now shown in much greater detail to deliver substantial treatment levels of surface water runoff from the CSC within the Stort Valley, with coordinated landscaping to provide drainage that serves both practical and aesthetic benefits.
- 1.1.9 To the west of the CSC, the Village 6 Access has been changed from a roundabout to a fully traffic signal-controlled junction with bus priority measures on the existing A414. Consistent with the sustainable objectives of Gilston Park Estate, segregated pedestrian and cycle routes via formal crossing points provide easy and clear connectivity to the Stort Valley and beyond to Harlow Town.
- 1.1.10 Full details of the proposed CSC Detailed Application drawings in located in Appendix A.

2 SCOPE OF REPORT

2.1 Introduction

- 2.1.1 The Harlow and Gilston Garden Town is planned to experience significant growth in the coming years. This comprises the Gilston Area but also other developments in the Harlow area. To cater for that growth new infrastructure is planned. The overarching objective is to promote sustainable transport options but inevitably additional highway infrastructure is also required, in part to free up other road space for sustainable modes.
- 2.1.2 An Options Report was prepared for the CSC (and ESC) and submitted in May 2019, in support of the detailed application, which summarises the highway alignments and bridge structure options considered. Each report describes the proposed scheme forming the detailed planning application submission and includes a set of the Detailed Application drawings as developed to reflect external constraints, stakeholder consultation responses and pre-application public consultation feedback.
- 2.1.3 The Options Reports should be relied upon to act as a source of information to demonstrate the factors considered when preparing the detailed proposals, and to complement the EIA documentation.
- 2.1.4 Subsequent to the initial detailed application submission in May 2019, the major highway proposals have been further developed pursuant to continuing dialogue with the Local Authorities and consultations. The changes are primarily influenced by the aspiration for Gilston Park Estate to form a Garden Town, encouraging a 60% modal shift from private vehicles to sustainable methods of transport.
- 2.1.5 Addendum Reports have been prepared for both the CSC and ESC schemes to summarise the key changes, in principle; discuss improved Village Access proposals and to provide a final position on the CSC and ESC on which Full Planning Consent may be granted. An updated pack of General Arrangement drawings and detailed application drawings have been produced to reflect these changes.
- 2.1.6 This Addendum Report specifically identifies the design changes that have been implemented on the CSC scheme.
- 2.1.7 Independent of the CSC scheme and to the west on the A414; a new access is being delivered to Village 6 of the Gilston Park Estate development. This Addendum summarises the proposals but acknowledges the Village 6 Access forms part of the Outline Application. It is not to be considered as part of the detailed CSC & ESC schemes but has been included for the reader to view the schemes in completeness.

3 ALIGNMENT OPTIONS – ISSUES AFFECTING THE CHOICE OF ROUTE ALIGNMENT

3.1 Introduction

3.1.1 Please refer to the Options Report April 19 for a broader description and background to the Central Crossing scheme.

3.1.2 The principle changes that have been implemented on the CSC since the May 19 submission focus on; improved dual access proposals to Village 1, which is sited to the north of the existing A414 Eastwick road; and developing the scheme to emphasise sustainable transport corridors and promoting modal shift.

3.2 Consultations

3.2.1 For a record of consultations up to the May 19 submission, please refer to the Options Report in Appendix I. This Addendum Report shall detail all consultations and meetings post-May 2019 that influenced the final CSC layout. The meetings being referenced in this Report are as follows:

- Structures and Drainage Meeting 1 – 26/11/2019
- Remaining Matters Meeting – 12/02/2020
- Structures and Drainage Meeting 2 – 18/03/2020
- Highway Drainage Meeting – 22/05/2020
- HCC Structures Comments 1 – 05/06/20 & Vectos Response
- HCC/WSP Crossings and RSA1 Review – August 2020 & Vectos Response
- HCC Structures Comments 2 – 28/08/2020 & Vectos Response

3.2.2 Appendix F contains copies of Minutes taken from each meeting, where available. The pertinent items arising from each meeting have been referenced below followed by a brief description of how and where the current Application Pack drawings satisfy these points.

3.2.2.1 Structures and Drainage Meeting 1 – 26/11/2019

- **2. Environment Agency - Flood Modelling & Compensation**
 - 2.6 Noting the need to resolve the modelling issues, the meeting discussed the flood compensation proposed. In respect of the CSC, Aecom explained that the compensation area was located outside flood zone 3 and was created by lowering existing ground levels. Aecom agreed to provide the relevant plans.
 - 2.7 Regarding the ESC, Aecom explained the approach and agreed to provide plans and sections to aid understanding of the compensation areas.
 - 2.9 EA requested calculations to demonstrate volume of lost storage due to proposed crossings. AECOM advised this would be covered in their response.
 - In response to the above items, a cross section has been provided through the proposed CSC and extending to the proposed Flood Compensation area. Referring to drawing VD17516-CC-506 in Appendix A, the Section demonstrates the compensation area provides a 'Level for Level' replacement. An accompanying table of replacement flood storage volumes, which cumulatively cancel out any proposed fill created by the CSC, confirms the Flood Compensation is adequate for the development.
- **Environment Agency - Surface Water & Water Quality**
 - 2.13 *The HAWRAT results (see Appendix 17.5 of the ES) indicated that there are no failures against EQS other than where road catchments E2 & E3 were considered cumulatively. However, with the treatment measures proposed this cumulative effect would be negligible but that the scheme was still committed to incorporating suitable SuDS treatment options (generally grass swales followed by small pond/wetland, other than road catchment E3 where only a pond/wetland is proposed). In addition, vortex flow separators have also been proposed as additional betterment beyond the SuDS proposals to provide additional and complimentary treatment of highway runoff.*
 - *Consideration has also been given to the Simple Index Approach for highway outfalls from the CSC and ESC:*
 - *The EA stated in their planning response that under this approach there would be a small (0.05) short fall in treatment provision for road catchments C1, C2, E1 and E2 due to hydrocarbons. However, this assumed the pond option for the second component of the treatment train. If the wetland option is used the mitigation indices would exceed the pollution risk. The SuDS Manual does not provide mitigation indices for vortex flow separators, but they would provide further treatment, subject to regular maintenance according to the manufacturer's guidance.*
 - *The EA stated that insufficient treatment for multiple pollutant types was being provided for road network E3. The treatment provision for this road catchment has since been clarified and will include two sets of grass swale followed by a pond/wetland. The outcome is therefore the same as for C1, C2, E1, and E2 above. The SuDS Manual does not provide mitigation indices for vortex flow separators, but they would provide further treatment, subject to regular maintenance according to the manufacturer's guidance.*
 - *Finally, the EA have also raised concerns that under the Simple Index Approach insufficient treatment for multiple pollutants is being provided for E4. If the wetland option was selected this would only be the case for hydrocarbons. Hydrocarbons are typically adsorbed onto the surface of fine sediment, which a vortex flow separator would help to remove, although the*

SuDS Manual does not provide mitigation indices for vortex flow separators. This treatment would be subject to the separator being regularly maintained according to the manufacturer's guidance. Hybrid SuDS may provide greater treatment and avoid the need for a vortex flow separator, but there might be a trade off with the need for additional space and this location is constrained by existing roads, development, topography, trees and shrubs. Please note that the Simple Index Approach should be used as a guide to inform appropriate decision making and interpretation does require an element of professional judgement on the risk to the water environment.

- To satisfy concerns that were raised in the above items, all SuDS treatment trains for the CSC have been designed to provide three levels of treatment; Swale – Wetland – Vegetated Ditch.
- To improve the resilience of the SuDS, all treatment trains have been reviewed so that the channels are above the 1 in 30yr + 70% Climate Change flood level, to satisfy a direct request from Herts LLFA. Detailed Long Section drawings of each Swale are included in Appendix A and described in the Drainage Strategy in Appendix E.
- **HCC Comments Re CSC**
 - *3.5 The meeting discussed the 4.5m width cycle and footway proposed for the new east verge over the existing railway bridge. Sustrans guidance permits localised narrowing of an established cycle and footway though this usually relates to minimum width provision where 3m cycleway/footways are narrowed. The remaining cycleway/footway along the east side of the CSC is 5m plus buffer zones. The opportunity exists for the locally reduced 4.5m cycleway/footway width to be widened to 5m by accommodating a reduction in south bound carriageway width from the 7.3m provided to 6.8m. MS proposed the highway authority (ECC) consider this opportunity and confirm to the Designer if acceptable prior to detailed design commencing. MS noted the adjacent sustainable transport corridor (bus lane) offered the opportunity for cyclists to use either the cyclelane or the bus lane in the currently proposed scheme.*
 - A series of comparative cross sections were provided to ECC to review how the eastern footway could be widened at the expense of narrowing the carriageway from 7.3m to 6.7m. Following subsequent dialogue, no instruction was received from the highway authority therefore the 7.3m carriageway width and reduced section of footway & shared routes were retained. This Report notes ECC's desire for all proposed roads to be DMRB compliant therefore the 7.3m carriageway is more suitable in this respect. A record of the Cross Sections and email correspondence are included in Appendix G.
- **Highway Drainage**
 - *4.2 ECC requested confirmation that all SUDS features were located outside of the floodplain. Aecom to confirm. Post meeting note - Aecom confirmed that SUDS detailed as part of the Outline Planning Application are outside the flood plain. SUDS proposed within the Stort Valley for the two crossings are in places within the flood plain. In such specific locations, storage of runoff to reflect greenfield runoff rate for storms of up to the 1 in 30 year return period would be accommodated within the piped drainage network prior to discharge to the SUDS features within the valley.*

- To improve the resilience of the SuDS, all treatment trains have been reviewed so that the channels are above the 1 in 30yr + 70% Climate Change flood level, to satisfy a direct request from Herts LLFA. A series of long sections for each proposed swale have previously been provided to the LFAs for comment. These drawings VD17516-CC-(503-505) are also included in Appendix D for ease of reference with the design rationale explained in the Appended Drainage Strategy.
- The subject of attenuation and controlled discharge rates was discussed in more detail at the 22nd May 2020 SuDS and Drainage meeting; the proposed Drainage Strategy in Appendix E identifies and assesses the controlled run-off rates for a variety of storm events, whilst the Proposed Drainage Strategy drawings VD17516-CC-(502-502.1) identify indicative areas for attenuation storage for both the 30yr and 100yr+40% CC events.

3.2.2.2 Remaining Matters Meeting – 12/02/2020

- 2. CSC and ESC Design Approach
- **CSC – Railway Bridge Central Reserve Barrier**
 - *2.9 ECC previously raised concern that the CSC proposals omitted a central reserve barrier over the railway bridge. Vectos provided reasons previously stated at Structures and Drainage 1 meeting (26 November 2019) and ECC were asked why a barrier was deemed necessary.*
 - Vectos built on their existing assessment by producing a Report, reviewing DMRB standards on whether a VRS system was required on the central reserve between the existing and new Railway Bridges. This Report concluded that no VRS was required to DMRB. An additional assessment was carried out to local road standards which also concluded no VRS was required on the central reserve. This initial report was provided to ECC in March 2020. Essex highway authority responded in April 2020 asking for the Report to be updated with respect to new DMRB standard CD377 being introduced. The Report was updated and once again concluded no VRS is required on the Central Reserve, the current proposals reflect this conclusion. For a record of the Reports and email correspondence please refer to Appendix G.
- **RSA1 – Stage 1 Road Safety Audit**
 - *2.14.1 MS to instruct RSA1 in a phased manner, progressing initially an RSA1 to reflect the main crossing proposals and a Supplementary RSA1 to reflect village junction updates still to be concluded.*
 - The RSA1 was commissioned in March 2020 and a full pack of drawings issued to the independent auditor for reference, including the updated junction and alignment proposals for ESC Road 1 passing between Pye Corner and Terlings Park, as had been the basis of discussions with HCC earlier in the year. The Audit Team were advised of the proposed amendments to the junction layouts of Village 1 (V1 – sustainable access only), Village 1 East (V1E – access for all other vehicles) and Village 2 (V2) and the auditor would consider the proposals once issued. The Audit Brief, including HCC and ECC comments, was issued along with the updated CSC and ESC GA layouts to the

Auditor to allow the auditor to prepare the Audit, all drawings assessed being listed in the Audit. For completeness, the Interim V1/V1E and Interim V2 junction layouts were issued, illustrating junction access proposals to be put in place ahead of the full crossings. Village 6 (V6) junction layout has also been changed and the proposed V6 GA was also included in the pack to be Audited. The ESC pack of drawings issued for audit include the River Way roundabout junction inclusive of the proposed new cycle and foot bridge over the railway.

- The RSA1 is Appended to this Report along with a draft Designers Response, which is awaiting comments from the highway authorities before finalising.
- **Eastwick Road Pedestrian and Cycle Bridge Amendments**
 - *3.1 EHDC requested a discussion regarding the impacts of the Pedestrian and Cycle Bridge. Furthermore, EHDC addressed that their desire was to have flexibility in parameters in order to have a meaningful design competition. AH raised concern over pedestrian and cyclist conflict, particular along the chicanes.*
 - *3.2 EHDC requested simplified drawings of the technical drawings provided by Vectos.*
 - Vectos reviewed the chicanes among other design considerations for the bridge, with the Report issued to the local authorities for review.
 - The General Arrangement drawings in Appendix A have been simplified, with scheme detail transferred on to other supporting drawings where more appropriate. Less text on each layout allows the reviewer to identify the key proposals and puts more emphasis on the landscaped areas and sustainable transport links.

3.2.2.3 Structures and Drainage Meeting 2 – 18/03/2020

- 3. Central Stort and Eastern Stort Crossing
 - *3.1 Rail Bridge Central Reserve (CSC) and RSA1 (CSC & ESC). MS to circulate previous "RSA1 Audit Brief for Approval" emails from early 2019 and more recently. (Note – includes previous auditor details). Vectos to issue current TMS Audit Brief to FS (ECC) and HCC as soon as possible (ie on 19-03-20). Vectos confirmed RSA1 is booked for w/c 24-03-20 and as such, ECC/HCC to respond by return with any comments to the current Brief*
 - Refer to response under sub-heading 3.2.2.2 above on RSA1 timetable and Report.
- 4. Sustainable Drainage System/ Compensatory Flood Storage
 - *4.11 in 30-year flood zone response to LLFA comments*
 - *Vectos to provide long section through E4 "treatment", including proposals for landscaping of vegetated ditch, (eg details and heights of vegetation proposed for "vegetated ditch")*
 - *Vectos to prepare Adoption Boundary for both CSC and ESC to detail ECC/HCC boundaries. (Note – previously, ECC/HCC advised they would sort, but drawings can be prepared for the basis of ECC/HCC discussion, inc structure ownerships as previously proposed collectively by ECC/HCC).*
 - *Vectos to identify outfall locations for each SUDS treatment and discharge destination (to be shown on the plan), confirming the final discharge route to canal/River Stort.*
 - *MS confirmed an updated volume assessment of lost flood storage in the 1 in 1000-year storm flood zone had been undertaken for the CSC.*

- *The previously identified replacement flood storage area has been reviewed and offers circa 5885 cum of replacement storage, compared to the circa 5489 cum of lost storage. Drawings tabled to demonstrate.*
- *Actions - Vectos to provide Cut Fill table (long section) showing “level for level” replacement of flood storage lost.*
- *Vectos to provide long and cross sections across valley showing raised swale, valley bed, proposed storage mitigation to assist demonstrate the above.*
- *Vectos to provide long section through swale (west of CSC) to demonstrate invert gravity drains at 1 in 30-year flood level into River Stort.*
- *Refer to response explained above under sub-heading 3.2.2.1 for raising SuDS above the 1 in 30yr Flood Level and how ‘Level for Level’ Flood Compensation has been demonstrated. Revised figures for flood compensatory storage are confirmed in drawing VD17516-CC-506 as 5233m³ of storage provided for a loss of 5185m³.*

3.2.2.4 Highway Drainage Meeting – 22/05/2020

- i. *Drainage Strategy*
 - *To be recirculated, following updates as set out later in Minutes*
- ii. *Drainage Hierarchy*
 - *Drainage Strategy to reaffirm the reasons for infiltration being unavailable.*
 - *Drainage Strategy sets out that highway runoff is to be attenuated within piped network prior to discharge to SUDS (though SUDS have substantial storage capability, this is used to achieve dwell time in the SUDS to reflect SUDS Manual (9 minutes)).*
 - *Confirms SUDS are set to operate at 1 in 30 year flood condition.*
- iii. *SUDS discharge locations*
 - *MS confirmed current drawings detailed each highway runoff discharge location, SUDS proposals (modelled in 3D) and discharge locations.*
 - *MS advised that CRT (re Stort Navigation) has provided correspondence regarding future requirements (post planning) to apply for discharge consent to the Stort Navigation. Details to be included with the Drainage Strategy*
- iv. *Ditches proposed for SUDS discharge*
 - *Vectos to provide details of proposed discharge routes and rates (ordinary watercourses and non-designated ordinary watercourses (ie ditches)) for both LLFAs to review. Vectos to issue ASAP to LLFAs.*
- v. *Preliminary highway drainage networks*
 - *Vectos to prepare preliminary highway drainage networks and undertake a Quick Storage assessment which will identify volume of storage required, discharge rate, confirm period of any standing water on the carriageway*
 - *AECOM to provide discharge rates discussed with EA.*
 - *Quick storage to assess 1 in 1, 1 in 30, 1 in 100, 1 in 100+40%*
- vi. *Exceedance*
 - *LS interested to understand period standing water will sit on c/way – unlikely to be long as c/ways elevated 3-6m above flood level (1 in 1000) in Stort Valley.*
 - *Main area of interest is around Terlings Park, west of Fiddlers Brook road bridge.*

- *JR proposed this can be conditioned.*
- vii. *Detailed Maintenance Plan*
 - *Will list SUDS features*
 - *Will provide an indication that maintenance frequencies and maintenance schedules will be in accordance with CIRIA Best Practice Guidelines for SUDS Maintenance, full details to be provided as part of the detailed design process*
 - *Provision of full details to be conditioned.*
 - *The Drainage Strategy will reference the “Exceptional Maintenance Schedule”, to be prepared at detailed design stage, to set out additional maintenance needs following storm periods in excess of 1 in 30 year period (up to 1 in 100 year storm), typically to include additional inspections of SUDS for damage/blockage/specific cleaning out and follow up inspections of control devices.*
- viii. *River Way Roundabout SuDS*
 - *LS queried if possible to install any bioretention at this location.*
 - *NM advised location, visibility and levels make this unviable. LS requested a statement in the drainage strategy that evidences and discounts bioretention features here should be acceptable.*
 - *The Appended Drainage Strategy and SUDS Drawings respond to each of the above items and clarify how each requirement will be dealt with, namely via detailed design.*

3.3 CSC Route description

3.3.1 General Summary

3.3.2 A summary list of the main changes to the CSC scheme is provided below, with a more detailed review of each location provided in Section 3.4:

- Northern Arm of signalised crossroads to be Bus Only access to Village 1
- New all-traffic, residential access to Village 1 provided to the east
- Sustainable transport improvements to Burnt Mill Lane/Eastwick Road junction now form part of CSC scheme
- Minor pedestrian and cycling improvements to Fifth avenue to promote Sustainable transport
- Road 1 realignment

- Improvements and clarifications to SuDS and Flood Compensation measures
- Burnt Mill Roundabout improvements updated (ECC designed and delivered scheme)
- Interim CSC Scheme layout developed

3.3.3 The proposed highway alignment is compliant with current DMRB standard and the geometric requirements of the highway authorities.

3.4 CSC Detailed Changes

3.4.1 Village 1 Bus Access

3.4.1.1 North arm now single lane entry and exit, Bus Only enforced through bus gates, appropriate signage and coloured surfacing. The north arm of the proposed signalised crossroads will form a sustainable transport corridor, with a Bus Only access to Village 1 and no entry to private vehicles.

3.4.1.2 Segregated ped/cycle route provided along east side. Footway provided along west side with verge buffer to nearside and rear.

3.4.2 Fifth Avenue

3.4.2.1 Southbound Bus Lane extended to commence at signalised junction. At the southern end, a full width lay-by is being provided for the relocated bus stop in accordance with ECC's Burnt Mill roundabout design.

3.4.2.2 Pedestrian crossing added across south arm, in response to consultation comment.

3.4.2.3 Carriageway widths and reduced footway/cycleway sections clarified over existing Stort and Railway Bridges through dialogue with ECC.

3.4.2.4 Northbound entry to Village 1 prohibited for all traffic except Buses (and cyclists). Two entry lanes, as opposed to three in Options report, with both as right turn only for all traffic except buses.

3.4.2.5 Advanced Stop Lines (ASLs) provided on north and south entry arms.

3.4.2.6 Northbound Bus lane extended to commence at exit from Burnt Mill Roundabout. Current ECC proposals show only one lane of traffic will be northbound at any one phase, therefore extending the bus lane improves bus priority whilst negating the need for two lanes of merging traffic.

3.4.3 **Village 1 Residential (East) Access**

3.4.3.1 A new residential access to Village 1, for all traffic, is to be delivered to the east. This forms the new extents of the CSC scheme. A 4-arm signalised junction will be delivered with the north arm forming the Village 1 residential access and the south arm creating a junction with the existing Eastwick Rd (and on to Burnt Mill Lane). Road 1 has been realigned to accommodate the junction and to tie in to changes at the Terlings Park/Pye Corner junction, which form part of the ESC scheme and are identified in more detail in the ESC addendum report.

3.4.3.2 Segregated left turn lane provided to Village 1 for traffic from the west.

3.4.3.3 Eastern arm shall be constructed just beyond proposed controlled crossing, including refuge island that will house secondary signal heads. This arm will then terminate and access blocked off with temporary fixtures or landscaping.

3.4.4 **Road 1**

3.4.4.1 May 19 scheme tied back in with existing Eastwick Road to east of signalised Fifth Avenue crossroads. Current scheme continues on new alignment that reflects the final ESC scheme, up to and including the Village 1 Residential Access.

3.4.4.2 Designed in accordance with DMRB CD 109 for 70kph design speed. Continuation of Road in ESC via Terlings Park has been moved north at Fiddlers Brook. Section being delivered during CSC ties in with that.

3.4.4.3 Existing eastbound 'egress only' from commercial units on the north side of the A414, to the west of the signalised junction, is to be closed off as deemed unnecessary and potentially problematic according to the Stage 1 Road Safety Audit Report.

3.4.5 **Eastwick Road/Burnt Mill Lane Junction**

- 3.4.5.1 Sustainable transport improvements to Eastwick Road’s existing junction with Burnt Mill Lane are now incorporated into the CSC scheme, with foresight to the eventual connectivity up to Terlings Park to be delivered when the ESC comes forward.
- 3.4.5.2 Vehicular access to Terlings Park retained via Eastwick Road, achieved through the redesigned Village 1 Residential crossroads.
- 3.4.5.3 Eastwick Road realigned to the north to accommodate segregated westbound ped/cycle route on south side.
- 3.4.5.4 Controlled Toucan crossing provided across Eastwick Road to the east of the Burnt Mill Lane junction. Uncontrolled crossing point provided over Burnt Mill Lane.
- 3.4.5.5 Existing Eastwick Road alignment, to east of new junction with Road 1, retained and converted to segregated ped/cycle route. Agricultural and private driveway accesses all retained at existing levels.
- 3.4.5.6 Right turn facility provided to retains occasional access to Stort Valley via existing gate. Access also option for future maintenance of new SuDS feature.
- 3.4.6 **SuDS & Flood Compensation**
- 3.4.6.1 As per dialogue with both LLFAs, all SuDS features verified or raised to be above the 1 in 30yr+70CC flood level.
- 3.4.6.2 Further detail added to verify 3 no. Treatment trains, in parallel with AECOM Flood Assessment, Indices-led approach. Each SuDS Treatment Train now installed as swale – wetland – vegetated ditch before out-falling to River Stort or Stort Navigation.
- 3.4.6.3 Footpath to east of Fifth Avenue, through Stort Valley, now aligns along west side of SuDS instead of in between SuDS and road earthworks. 3.0m offset between earthworks allows for maintenance access.
- 3.4.6.4 Flood Compensation demonstrated through VD17516-CC-506 provides Level for Level replacement for the 1 in 1000yr event, in accordance with current EA preferred method.
- 3.4.7 **Burnt Mill Roundabout**

- 3.4.7.1 As part of ECC's Town Centre improvements, the Burnt Mill Roundabout will be upgraded to improve capacity. ECC are leading the design of this element and Vectos note the current scheme has changed to that referenced in the May 19 submission. Notable changes include; increasing the central island diameter, removing the segregated left-turn lane on Elizabeth Way and removing a northbound circulatory lane.
- 3.4.7.2 Vectos obtained current CAD files from Essex June 2020, which differed to those referenced in the May 2019 submission, and have tied in the southern extents of the CSC scheme accordingly.
- 3.4.7.3 Station Approach will now be incorporated in ECC's design of the Burnt Mill roundabout improvements. The CSC Red Line application boundary has been cut to the north of Burnt Mill roundabout, whilst also being amended to reflect the true extents of ECC's highway boundary to the east of Fifth Avenue, south of Harlow Railway Bridge.
- 3.4.8 **Pedestrian and Cycle Bridge**
- 3.4.8.1 The footbridge entry and exit ramps have been clarified as a max gradient of 1 in 20 with appropriate landing strips, effectively a 1 in 25 gradient when modelling a long section straight profile.
- 3.4.8.2 As a consequence, the south ramp tie to ground is slightly further south. Where the at-grade and grade separated provision meet, additional tactile paving is shown to aid priority and reduce conflicts between cyclists.
- 3.4.8.3 An updated set of Design Parameters for the footbridge was circulated by the design team to HertsCC in March 2020 and are included under Appendix K of this Addendum.
- 3.4.9 **CSC Interim Scheme**
- 3.4.9.1 With the expected phasing and duration to deliver the major highway improvements, interim proposals for the CSC are required to allow development to commence in advance of the full CSC being completed.
- 3.4.9.2 The interim solution is to deliver the vast majority of permanent works to the north of the existing River Stort bridge, then tie back in to Fifth Avenue at the bridge. This approach avoids some abortive work and allows some permanent landscaping of the earthworks and verges. Both Village 1 accesses will be constructed in their entirety.

3.4.10 **Village 6**

- 3.4.10.1 A new signalised 3-arm junction on the A414, to the west of the CSC, is being delivered with the north arm to serve as the Access to Village 6. V6 junction has changed from roundabout to traffic signal controlled Tee junction.
- 3.4.10.2 Works are required to raise the west bound A414 carriageway to bring it level for a connection with the existing eastbound carriageway as part of new carriageway proposed to fill the existing central reserve.
- 3.4.10.3 Westbound offside carriageway widened into central reserve to create right turn lane to Village 6.
- 3.4.10.4 In the eastbound direction; widening in to the nearside verge will create an additional two lanes for access to Village 6. An all traffic lane that will be subject to signalised controls and also a segregated Bus Only left turn lane, priority access and not inhibited by signal controls, to promote sustainable transport choices.
- 3.4.10.5 5.0m wide shared foot/cycleway shall be installed on the west side of the Village Access, which links to the Stort Valley via, primarily, controlled Toucan crossings over the A414.
- 3.4.10.6 Widened verge shall be provided to the east of the Village Access that leads to 1 in 3, landscaped earthworks throughout.
- 3.4.10.7 Exiting the Village 6 Access; heading westbound, a bus priority lane is being provided alongside an all-traffic lane. A single all-traffic lane is provided for eastbound traffic.
- 3.4.10.8 An existing priority access to the south of the junction shall be retained, whilst earthworks have been minimised on the south side of the A414 to minimise impact on existing vegetation where possible.
- 3.4.10.9 This section of A414 is proposed to have a reduced 50mph speed limit imposed upon completion of Village 6 Access, allowing a DMRB compliant scheme for 85kph design speed to be delivered.

3.5 **General Considerations**

- 3.5.1 Existing speed limits are shown in drawing VD17516-EC-141.
- 3.5.2 Proposed speed limits associated with the CSC are detailed on drawing VD17516-EC-140.
- 3.5.3 Burnt Mill Lane being upgraded to a sustainable transport link.

3.5.4 Earthworks now proposed as 1 in 2.5 for fill, where achievable, or 1 in 2 in sections between structural fill (bridge abutments). Cut at 1 in 3 consistently across schemes, to allow more flexibility at detailed design. Flood Compensation area adjusted accordingly.

3.5.5 To introduce accessibility to the public for the purpose of generating and enjoying leisure uses within the Stort Valley west of the CSC, a 2m wide track has been provided to the west of the proposed SuDS trains, with a 3.0m buffer between the SuDS earthworks and toe of road earthworks provided for buildability and future maintenance access along the bottom of the new west embankment slope. The track is connected at the south extent to the canal tow path and via steps to the west footway along the CSC. The track connects to the cycleway/footway provisions at the signalised A414/Eastwick Road junction.

3.6 Alignment Standards

3.6.1 DMRB standards have been adopted for a 70kph (40mph) design speed for the Central Crossing as follows, reflecting standards current as of June 2020:

- CD 127 “Cross sections and Headroom” for dual carriageway cross section, including carriageway and central reserve;
- CD 109 “Highway Link Design” for design speed, sight distance, horizontal alignment, super-elevation and vertical alignment;
- CD 123 “Geometric Design of at-grade priority and signal-controlled junctions” for visibility standards, deceleration and merge lanes and junction radii;
- Traffic Signs Manual Chapters 1 (Original), 3, 4, 5 and 7;
- The Traffic Signs Regulations and General Directions 2016.
- CD 353 “Design Criteria for Footbridges” with respect to the proposed crossing above the new A414 junction;
- CD 116 “Geometric design of roundabouts”
- CD 377 “Requirements for Road Restraint Systems”
- HD 42/17 “Walking, Cycling & Horse-Riding Assessment and Review”.

3.6.2 **Departures**

- 3.6.2.1 A Departures Schedule is included in Appendix J, with the sole Departure on the CSC relating to the existing Burnt Mill Lane junction. Southbound SSD and junction visibility to the north are both obstructed by the River Stort (Nav) bridge parapet and secondary roadside barrier. The CSC proposals seek to maintain this existing departure and record it in the appended schedule purely for completeness.
- 3.6.2.2 The CSC proposals will improve on existing visibility from Burnt Mill Lane by moving the junction give-way line further west and moving all-traffic to the nearside lane.
- 3.6.3 'Right-Out' northbound manoeuvres will be prohibited, another betterment in that vehicles exiting Burnt Mill Lane need only consider southbound traffic.

4 STRUCTURES

4.1 Summary of changes to CSC proposed structures

- Harlow Railway Bridge – NO CHANGE TO PROPOSED, EXISTING RAILWAY BRIDGE EAST PARAPET TO BE REPLACED
- River Stort (Navigation) Bridge – NEGLIGIBLE CHANGE
- River Stort Bridge – NO CHANGE TO PROPOSED, EXISTING BRIDGE PARAPETS TO BE REPLACED
- Central Stort Crossing Cyclist/pedestrian bridges – NEGLIGIBLE CHANGE

4.1.1 Harlow Railway Bridge

4.1.1.1 Proposals for the new northbound structure are unchanged from April 19 Options Report, with the existing bridge retained to serve southbound traffic whilst a new bridge for the northbound dual carriageway will be installed parallel.

4.1.1.2 As requested by ECC, Vectos undertook a review of the central reserve to understand if a VRS barrier was required. The final Revision B of report *Gilston – CSC Railway Bridge Central reserve Barrier* was submitted to ECC via email in May 2020 and concluded no barrier was required for this 40mph road, based on both DMRB and Local Road risk assessments. Refer to Appendix G for copies of the Report and associated correspondence.

4.1.1.3 An updated review was carried out due to updated DMRB documents CG 300 and CD 351 being introduced in March 2020, with the outcome unchanged.

4.1.1.4 Following concerns raised by ECC, another assessment was carried out on to understand whether widening of the southbound footway to create a shared foot/cycleway was detrimental to the existing eastern pedestrian parapet. This Report concluded that no adverse impact or loading would be created by the new proposals, with the Report submitted to ECC via email in April 2020.

- 4.1.1.5 Acknowledging the dialogue referred to in 4.1.1.4; PfP agreed to replace the existing Railway Bridge east parapet with a fully compliant H4a system, able to take vehicle loading. This negates the need for a secondary roadside barrier, which when removed will enable the 5.0m segregated footway/cycleway (with 0.5m buffer to carriageway) to continue over the Railway Bridge. This realises an aim of ECC to remove any reduced width 'shared' sections of the cycle route.
- 4.1.1.6 As part of works to replace the existing east parapet with an H4a system; the existing east edge beam and adjacent two beams will be replaced.
- 4.1.1.7 To reflect discussions with ECC, the existing deck west edge beam and adjacent beam will be replaced, the existing deck west parapet being removed in any case as part of the proposed works.
- 4.1.2 **River Stort (Navigation) Bridge**
- 4.1.2.1 Proposals are largely unchanged from April 19 Options Report, with the existing bridge retained to serve southbound traffic whilst a new bridge for the northbound dual carriageway will be installed parallel.
- 4.1.2.2 The south wing wall is extended to the west to avoid earthworks encroaching into the riverbank.
- 4.1.3 **River Stort Bridge**
- 4.1.3.1 Proposals are largely unchanged from Apr 19 Options Report, with the existing bridge retained to serve southbound traffic whilst a new bridge for the northbound dual carriageway will be installed parallel.
- 4.1.3.2 The existing deck east pedestrian-grade parapet is to be replaced with 1.5m high systems, compliant with CD 377. These parapets are for pedestrian loading only and shall be bolted directly to the existing edge beam stringcourse, with the existing secondary vehicle restraint barriers to remain.
- 4.1.3.3 The direct taper length has been improved north of the new bridge for eastbound traffic, meeting current DMRB standards for a direct taper length.
- 4.1.4 **Central Stort Crossing Cyclist/pedestrian bridges**
- 4.1.4.1 Proposals unchanged and subject to design competition. Maximum gradient maintained at 1 in 20 for accessibility, with landing points clarified in accordance with DDA requirements.

4.2 Geology

4.2.1 The EIA includes the “Phase 1 Geotechnical and Geo-environmental Desk Study Report – River Stort Crossing Options” dated 2015, prepared by AECOM to assess the ground conditions for the identified crossing options. Site investigation has not been undertaken at this time along the highway corridor or at the proposed bridge/structure locations. Reference to the AECOM Report, which includes existing available borehole and other available geotechnical information, is included in the WSP/PB Report, specifically Section 3 and Section 4.6.

4.2.2 Further intrusive geotechnical investigation will need to be undertaken to determine ground conditions and ground material properties to inform the foundation design process for the structures along the crossing, to classify materials to be used in the highway works and to prepare the Geotechnical Design Report(s).

4.2.3 Structural foundations are currently expected to include abutments located on piles mindful of the following criteria:

- Piles are expected to extend down to the London Clay or Lambeth Group.
- Ground water is shallow (between 2m to 4m below ground).
- The valley ground surface is likely to be unstable and saturated.

4.3 Loading and lateral clearance

4.3.1 All highway structures shall be designed to withstand loading defined within DMRB and conform to current standards.

4.4 Environmental constraints

4.4.1 All environmental aspects are covered within the EIA, inclusive of specific impacts relating to Stort Navigation (canal) amenity value, flood storage loss (due to footprint of new structures and embankments) and visual intrusion.

5 ENGINEERING ASSESSMENT

5.1 Construction Access

5.1.1 Detailed consideration of any specific construction access and sequence requirements in order to erect the winning cyclist/pedestrian bridge design will form part of the design competition deliverables.

5.2 Temporary traffic constraints and requirements

5.2.1 The scope of proposed highway works for both the Central and Eastern Stort Crossing as shown on the General Arrangement layouts enable the CSC to be procured initially, with the ESC delivered at a later date with minimal impact at the tie in along Eastwick Road. Should the two schemes come forward concurrently, there will be a need to consider overall impacts on traffic flow along Eastwick Road and impacts on Terlings Park and Gilston Village to the east. Construction traffic and deliveries are not to be routed via Eastwick Road east of Fifth Avenue, or Burnt Mill Lane.

5.3 Construction phasing and timescales

5.3.1 Construction phasing has been considered in terms of the likely build programme and whether temporary construction access requirements may result in environmental impacts additional to the effects of the permanent works footprint.

5.3.2 Phasing plans have been prepared which identify the expected sequence of construction and associated access routes. The phasing plans are included in Appendix E.

5.4 Bridge Maintenance Boundaries

5.5 Bridge Material choice

5.5.1 The AAD Reports and drawings located in Appendix B include detailed plans and elevations of the proposed bridges.

5.6 Design life, operation and maintenance

5.7 Design standards

5.7.1 The proposed CSC shall be designed and procured in accordance with the DMRB.

5.7.2 The CSC proposed highway cross section shall be in accordance with CD 127 “Cross sections and Headroom” for an urban road classification. The urban classification reflects the presence of the new Gilston Area development, located at the north extent of the CSC, with Harlow town located at the south extent.

5.8 Constraints & Departure from Standard

5.9 Adapting for future infrastructure developments

5.9.1 The proposed carriageway cross section is deemed sufficient to cater for the traffic generated by the Gilston Area development and wider growth across Harlow, whilst providing congestion relief for the existing local road network.

5.9.2 The design has incorporated infrastructure for sustainable modes of transport by including a northbound and southbound bus lane to supplement the existing provision of a north and southbound lane in order to promote the HGGT vision of achieving a 60% modal shift for journeys.

5.9.3 The new bridge structures have been offset from the existing structures so as not to unreasonably restrict any future deck replacement and/or maintenance of the existing bridges.

5.9.4 Current bridge proposals are compliant with DMRB with No Departures from Standard required.

5.10 Utilities

5.11 Surface water discharge

5.11.1 Refer to SuDS drawings in Appendix D and the Highway Drainage Strategy in Appendix E for details of how the proposed CSC and ESC will be drained; how it is treated and discharge locations.

5.12 Health and Safety

5.12.1 Health and Safety matters will be overseen by the Principal Designer and Principal Contractor during the design and construction stages of the scheme. H&S Files shall be provided to the maintaining highway authorities detailing maintenance requirements and specific maintenance tasks.

5.12.2 The proposed CSC scheme shown on the detailed application plans contained within Appendix A has been subject to a Stage 1 Road Safety Audit (RSA1), Appendix H, carried out in June 2020 subject to GG119.

6 LIST OF DRAWINGS AND DOCUMENTS ACCOMPANYING THE REPORT

***Highlighted documents denote those updated since November 2020 Stort Crossings Full Application submission**

APPENDIX A

VD17516-CC-100-GA	Central Stort Crossing - General Arrangement (Sheet 1 of 2) P07
VD17516-CC-100.1-GA	Central Stort Crossing - General Arrangement (Sheet 2 of 2) P07
VD17516-CCi-100	CSC Interim Scheme P03
VD17516-CC-101-LS	Central Stort Crossing - Longitudinal Section (Sheet 1 of 3) P03
VD17516-CC-101.1-LS	Central Stort Crossing - Footbridge Longitudinal Section (Sheet 2 of 3) P03
VD17516-CC-101.2-LS	Central Stort Crossing - Longitudinal Section (Sheet 3 of 3) P03
VD17516-CC-105-RL	Central Stort Crossing - EIA Red Line Boundary (Sheet 1 of 2) P02
VD17516-CC-105.1-RL	Central Stort Crossing - EIA Red Line Boundary (Sheet 2 of 2) P02
VD17516-CC-106-XS	Central Stort Crossing - Typical Cross Sections (Sheet 1 of 2) P03
VD17516-CC-107-XS	Central Stort Crossing - Typical Cross Sections (Sheet 2 of 2) P03
VD17516-CC-109-TR	Central Stort Crossing - 16.5m Large Articulated Vehicle Swept Paths P02
VD17516-CC-110-TR	Central Stort Crossing - 10m Rigid Vehicle Swept Paths P02
VD17516-CC-111-VS	Central Stort Crossing - Proposed Visibility (Sheet 1 of 2) P03
VD17516-CC-111.2-VS	Central Stort Crossing - Proposed Visibility FIFTH AVENUE P03
VD17516-CC-111.4-VS	Central Stort Crossing - Proposed Visibility BURNT MILL LANE P03
VD17516-CC-112-VS	Central Stort Crossing - Proposed Visibility (Sheet 2 of 2) P03
VD17516-CC-120-EX	Central Stort Crossing - Existing Site Layout (Sheet 1 of 2) P02
VD17516-CC-120.1-EX	Central Stort Crossing - Existing Site Layout (Sheet 2 of 2) P02
VD17516-CC-121-COMP	Central Stort Crossing - FA414 Footbridge Design Plan (Sheet 1 of 2) P03
VD17516-CC-121.1-COMP	Central Stort Crossing - FA414 Footbridge Design Plan (Sheet 2 of 2) P03
VD17516-CC-122-PSL	Central Stort Crossing – Proposed Speed Limit Strategy P02
VD17516-CC-123-SURF	Central Stort Crossing – Proposed vs Existing Surfaces P02
VD17516-CC-123.1-SURF	Central Stort Crossing – Proposed vs Existing Surfaces P02
VD17516-CC-160-AR	Central Stort Crossing - Highway Areas Plan (Sheet 1 of 2) P03
VD17516-CC-160.1-AR	Central Stort Crossing - Highway Areas Plan (Sheet 2 of 2) P03
VD17516-CC-170-AP	Adoption Plan (Sheet 1 of 2) P02
VD17516-CC-170.1-AP	Adoption Plan (Sheet 2 of 2) P02
VD17516-CC-180-ST	Central Stort Crossing - Structures Location Plan (Sheet 1 of 2) P03
VD17516-CC-180.1-ST	Central Stort Crossing - Structures Location Plan (Sheet 2 of 2) P03

VD17516-CC-400-VRS Central Stort Crossing - Proposed VRS (Sheet 1 of 2) P05

VD17516-CC-400.1-VRS Central Stort Crossing - Proposed VRS (Sheet 2 of 2) P05

VD17516-SCH-400 Proposed VRS Schedule

VD17516-V6-100 Village 6 General Arrangement P02

APPENDIX B

AAD 2.1 Prelim Des CSC Harlow Railway Overbridge ISSUE 2

AAD 2.1 Prelim Des CSC River Stort Crossing Bridge ISSUE 2

AAD 2.1 Prelim Des CSC Stort Navigation Bridge ISSUE 2

VD17516-CC-180 CSC Structures Location Plan P03

VD17516-CC-180.1 CSC Structures Location Plan P03

VD17516-CC-STR-010 River Stort Bridge - Preliminary Design GA drawings P03

VD17516-CC-STR-020 Stort Navigation Bridge - Preliminary Design GA drawings P03

VD17516-CC-STR-050 Harlow Railway OverBridge - Preliminary Design GA drawings (Sheet 1 of 2) P03

VD17516-CC-STR-051 Harlow Railway OverBridge - Preliminary Design GA drawings (Sheet 2 of 2) P03

APPENDIX C

VD17516-CC-113-PH1 Central Stort Crossing - Construction Phase 1 of 7 (Sheet 1 of 2) P04

VD17516-CC-113.1-PH1 Central Stort Crossing - Construction Phase 1 of 7 (Sheet 2 of 2) P04

VD17516-CC-114-PH2 Central Stort Crossing - Construction Phase 2 of 7 (Sheet 1 of 2) P04

VD17516-CC-114.1-PH2 Central Stort Crossing - Construction Phase 2 of 7 (Sheet 2 of 2) P04

VD17516-CC-115-PH2 Central Stort Crossing - Construction Phase 3 of 7 (Sheet 1 of 2) P04

VD17516-CC-115.1-PH2 Central Stort Crossing - Construction Phase 3 of 7 (Sheet 2 of 2) P04

VD17516-CC-116-PH4 Central Stort Crossing - Construction Phase 4 of 7 (Sheet 1 of 2) P04

VD17516-CC-116.1-PH4 Central Stort Crossing - Construction Phase 4 of 7 (Sheet 2 of 2) P04

VD17516-CC-117-PH5 Central Stort Crossing - Construction Phase 5 of 7 (Sheet 1 of 2) P04

VD17516-CC-117.1-PH5 Central Stort Crossing - Construction Phase 5 of 7 (Sheet 2 of 2) P04

VD17516-CC-118-PH6 Central Stort Crossing - Construction Phase 6 of 7 (Sheet 1 of 2) P04

VD17516-CC-118.1-PH6 Central Stort Crossing - Construction Phase 6 of 7 (Sheet 2 of 2) P04

VD17516-CC-119-PH7 Central Stort Crossing - Construction Phase 7 of 7 (Sheet 1 of 2) P04

VD17516-CC-119.1-PH7 Central Stort Crossing - Construction Phase 7 of 7 (Sheet 2 of 2) P04

APPENDIX D

VD17516-CC-501 Central Stort Crossing - Impermeable and Permeable Areas (Sheet 1 of 2) P03

VD17516-CC-501.1 Central Stort Crossing - Impermeable and Permeable Areas (Sheet 2 of 2) P03

VD17516-CC-502 Prelim Drainage Strategy (Sheet 1 of 2) P05

VD17516-CC-502.1 Prelim Drainage Strategy (Sheet 2 of 2) P05

VD17516-CC-503	Swale C1A P03
VD17516-CC-504	Swale C1B P03
VD17516-CC-505	Swale C2 P01
VD17516-CC-506	Flood Compensation P01
VD17516-CC-507	SuDS Catchment Areas (Sheet 1 of 2) P02
VD17516-CC-507.1	SuDS Catchment Areas (Sheet 2 of 2) P02

APPENDIX E

EHUK-VEC-1XX-XX-TN-D-09001 Highways Drainage Strategy FINAL Rev B

APPENDIX F

MINUTES	Drainage & Structures Meeting no.1 - 26/11/2019
MINUTES	Remaining Matters Meeting – 12/02/2020
MINUTES	Drainage & Structures Meeting no.2 - 18/03/2020
MINUTES	Highway Drainage Meeting – 22/05/2020
REVIEW	HCC Structures Comments 1 – 05/06/20 & Vectos Response
REVIEW	HCC/WSP Crossings and RSA1 Review – August 2020 & Vectos Response
REVIEW	HCC Structures Comments 2 – 28/08/2020 & Vectos Response

APPENDIX G

Report	Harlow Railway Bridge – Central Reserve Barrier
Report	Harlow Railway Bridge – East Parapet
N105-MM-A414	Speed Reduction Strategy

APPENDIX H

15805	Road Safety Audit - Stage 1
15805-RSA1	RSA1 Designers Response DRAFT

APPENDIX I

Report	CSC Options Report, April 2019
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APPENDIX J
Report

Departures Schedule

APPENDIX K

Schedule

Footbridge Design Parameters Rev C (2020)

APPENDIX A – DETAILED APPLICATION DRAWINGS

APPENDIX B – BRIDGE AAD REPORTS AND ELEVATION DRAWINGS

APPENDIX C – CONSTRUCTION PHASING DRAWINGS

APPENDIX D – SUDS DRAWINGS

APPENDIX E – DRAINAGE STRATEGY

APPENDIX F – MINUTES OF CONSULTATIONS

APPENDIX G – REPORTS

APPENDIX H – RSA1

APPENDIX I – APRIL 2019 OPTIONS REPORT

APPENDIX J – DEPARTURES SCHEDULE

APPENDIX K – FOOTBRIDGE DESIGN PARAMETERS (2020)