

File ref - p:\d - projects\co04300392 - a28 sturry link rd\102,drawings\01, working\1700 structures\scheme drawings,dwg



Appendix B Estimated Project Costs

KCC STURRY LINK ROAD COST PLAN No. 2 - 26th January 2016 (DRAFT)

Total Project Cost Summary

		Road AB									
Ref	Cost Element	Option 1A	Option 1B	Option 2A	Option 2B	Option 3A	Option 3B	Option 4A	Option 4B	Previous	COMMENT
1	TOTAL CONSTRUCTION COST	£12,925,000	£11,587,500	£13,262,500	£12,125,000	£14,075,000	£13,150,000	£13,325,000	£12,412,500	£10,957,657	Previous Base Date 1Q15 now 1Q16
2	Developing Business Case	£210,000	£210,000	£210,000	£210,000	£210,000	£210,000	£210,000	£210,000	£210,000	As before. Historic costs written off.
3	Outline Design	£350,000	£350,000	£350,000	£350,000	£350,000	£350,000	£350,000	£350,000	£350,000	As before
4	Planning & Consultation Costs	£720,000	£720,000	£720,000	£720,000	£720,000	£720,000	£720,000	£720,000	£720,000	As before
5	Detailed Design Fees 7%	£904,750	£811,125	£928,375	£848,750	£985,250	£920,500	£932,750	£868,875	£876,613	
6	Supervision Fees 6%	£775,500	£695,250	£795,750	£727,500	£844,500	£789,000	£799,500	£744,750	£986,189	
7	Surveys & Studies *'	£60,000	£60,000	£60,000	£60,000	£60,000	£60,000	£60,000	£60,000	£60,000	As before
8	Archaeology Studies	£20,000	£20,000	£20,000	£20,000	£20,000	£20,000	£20,000	£20,000	£20,000	As before
9	Ecology Studies	£35,000	£35,000	£35,000	£35,000	£35,000	£35,000	£35,000	£35,000	£35,000	As before
10	Demolitions *8	£46,000	£46,000	£46,000	£46,000	£46,000	£46,000	£46,000	£46,000	£46,000	As before
11	Advance Works *6	£60,000	£60,000	£60,000	£60,000	£60,000	£60,000	£60,000	£60,000	£60,000	As before
12	Utilities *9	£250.000	£250.000	£250.000	£250.000	£250.000	£250.000	£250.000	£250.000	£250.000	As before
13	Accommodation Works	£180.000	£180.000	£180.000	£180.000	£180.000	£180.000	£180.000	£180.000	£180.000	As before
14	Highway Landscape Manitenance	£80.000	£80,000	£80.000	£80.000	£80.000	£80,000	£80.000	£80.000	£80.000	As before
15	KCC Direct Costs *5	£337,500	£337,500	£337,500	£337,500	£337,500	£337,500	£337.500	£337.500	£225,000	Duration increased from previous
16	KCC Legal Costs	£55.000	£55.000	£55.000	£55.000	£55.000	£55.000	£55.000	£55.000	£55,000	As before
17	KCC Clerk of Works *4	681.000	691,000	691 000	691,000	681 000	681 000	681 000	681 000	£50,000	
1.	Land Costs	£1 200 000	£1 200 000	£1 500 000	£1 500 000	£1 500,000	£1 500 000	£1 500,000	£1 500 000	£1 200,000	Compensation Land cost in 7A to 4B adds £300k
10	Land Disperal	11,200,000	11,200,000	11,500,000	L1,500,000	1,500,000	11,500,000	11,500,000	11,500,000	1,200,000	
1 20	Land Disposal	E2E 000	C2E 000	£35,000	As before						
20	LCA Part I Costs	125,000	E25,000	123,000	125,000	125,000	125,000	125,000	123,000	123,000	
21	Lane Rental **	£28,000	£28,000	£28,000	£28,000	£28,000	£28,000	£28,000	£28,000	£28,000	As before
22	Commuted Sums	£1,000,000	£1,000,000	£1,000,000	£1,000,000	£1,000,000	£1,000,000	£1,000,000	£1,000,000	£1,000,000	As before. KCC may maintain in the long run.
23	KCC Adoption Fees 6.5%	£0	£U	£0	£U	£0	£0	±0	£U	£0	to be from
24	Funder Monitoring	£10,000	£10,000	£10,000	£10,000	£10,000	£10,000	£10,000	£10,000	£10,000	As before
25	Network Rail **									£800,000	NK estimate now split but total as before.
26	Possessions	£250,000	£250,000	£250,000	£250,000	£250,000	£250,000	£250,000	£250,000		
27	Design Supervision	£475,000	£475,000	£475,000	£475,000	£475,000	£475,000	£475,000	£475,000		
28	TOC Compensation	£25,000	£25,000	£25,000	£25,000	£25,000	£25,000	£25,000	£25,000		
29	Track Monitoring	£50,000	£50,000	£50,000	£50,000	£50,000	£50,000	£50,000	£50,000		
30	Sundry Costs (Advertising etc)	£70,000	£70,000	£70,000	£70,000	£70,000	£70,000	£70,000	£70,000	£70,000	As before
31	Risks 25%	£4,756,688	£4,378,844	£4,927,031	£4,605,688	£5,156,563	£4,895,250	£4,944,688	£4,686,906	£1,789,926	Risk previously 10% + 18% to cap. Now all included in 25%.
	A	624 070 420	C22 000 242	005 001 455	C24 224 420	626 070 010	COT 670 050	COT 010 100	624 620 524	C20 094 205	
32	Sub-Total	£24,979,438	£23,090,219	£25,831,156	£24,224,438	£26,978,813	£25,672,250	£25,919,438	£24,630,531	£20,084,385	
33	Inflation (1Q 2016 - 1Q 2020)	£3,357,089	£2,971,120	£3,531,096	£3,202,842	£3,765,564	£3,498,632	£3,549,132	£3,285,807	£4,061,116	Inflation only on post commencment, activity cost such as planning & consultation deemed to be full costs.
							,,			,,	
54	TOTAL ESTIMATED PROJECT COST (excluding VAT)	£28,336,527	£26,061,339	£29,362,253	£27,427,280	£30,744,376	£29,170,882	£29,468,570	£27,916,339	£24,145,501	
											B 1
ш										£28,500,000	rrevious suggested cap

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Basis of Report - Relates to Road AB Only

Drawings:		Assumptions:		
Amey		A	Sections A-B & C-D will require band drains and 6 months of surcharging.	
CO04300392/SK02	Jan-16	В	Sewage Works & Nursery will be unaffected.	
CO04300392/SK03	Jan-16	С	Assumes Streetlights throughout at 30m centres.	
CO04300392/SK04	Jan-16	*1	Assumes 25 properties @ £10,000 each.	
CO04300392/SK05	Jan-16	*2	Sturry Road is designated KLR1 @£800/day. Estimate based on 36 days.	
C&A		* ³	Costs may depend on agreements with NR over level crossing closures.	
13-012-020	Jul-15	*4	Costs based on £4,500/month at 18 months.	
Other information:		*2	Costs based on £2,250/week at 150 working weeks.	
Amey Land Refernce Plan: 4300299/000/01		*6	Includes for ecological mitigation works.	
· · · ·		*7	Include Topo surveys, Geotech., Contamination and Utility Investigations.	
Exclusions:		*8	Demolitions assumes 2nr properties at £23,000 each.	
VAT		*9	Utilities information needs confirmation.	
Signalised Junction @ Station				
Works to Sturry Level Crossing				
Station Forecourt PT Interchange				
Closure of Milner Court Level Crossing				
New Pedestrian Footbridge to Station Car Pa	rk	-		
Sturry Railway Station		Indices:		
Station Car Park				
Road Access to Station Car Park & Substation	L	Base Date:		Jan-16
Finance costs		BCIS All IN TPI @ I	Base Date:	279
		Construction Com	mencement Date: (Q120)	336
		Addition for each	month slippage in Commencement Date:	+0.4%

Primary Pricing Information Used:												
A24 Boadbridge Heath (Highways & Grade Separated Junction) 2014 to date Hawards Heath Relief Road (Highways & Railway Bridge) 2013 to 2014												
Haywards Heath Relief Road (Highways & Railway Bridge)	2013 to 2014											
East Kent Access Phase 2 (incl. Railway Bridge)	2009 to 2012											
Rushenden Relief Road (incl. Railway Bridge & Band Drains)	2009 to 2011											
M20 Junction 4	2016											
Spon's Civil Engineering & Highways Price Book 2016	2016											
BCIS TPI Current @ 26 January 2016	Jan-16											
KCC Lane Rental Scheme 08 November 2012	2012											
KCC Commuted Sums Calc Sheet April 2014	2014											
Matrics: Option 1A	At Base Date	At Construction										
Chainage of Highway (m):	693	693										
Area of Carriageway (m2):	10,604	10,604										
Cost of Construction Works	£12,925,000	£15,565,591										
Cost of Construction Works Per m2 of Highway	£1,219	£1,468										
Cost of Construction Per m of Highway	£18,651	£22,461										
Total Project Cost	£24,979,438	£28,336,527										
Total Project Cost Per m2 of Highway	£2,355.66	£2,672.25										
Total Project Cost Per m of Highway	£36,045.36	£40,889.65										
Maximum Estimated Total Project Cost	£23,700,000	£28,500,000										
Minimum Estimated Total Project Cost	£21,200,000	£25,500,000										
Average Estimated Total Project Cost	£22,450,000	£27,000,000										

Prepared By

David Allen - Director 26th January 2016 .

Total Project Cost Summary

Ref	Cost Element		Road AB Option 1A	Road AB Option 1B	Road AB Previous	COMMENT
1	TOTAL CONSTRUCTION COST		£12,925,000	£11,587,500	£10,957,657	Previous Base Date 1Q15 now 1Q16
						As before 10 and a second and a ff
2	Developing Business Case		£210,000	£210,000	£210,000	As before. Historic costs written off.
3	Dianning & Consultation Costs		£350,000	£350,000	£350,000	As before
21	Planning & Consultation Costs	70/	£720,000	£720,000 £911 135	£976 613	As before
6	Supervision Fees	5%	£775 500	£695 250	£986 189	
, i	Surveys & Studies	*7	£60,000	£60,000	£60,000	As before
s l	Archaeology Studies		£20,000	£20,000	£20,000	As before
9	Ecology Studies		£35.000	£35,000	£35.000	As before
10	Demolitions	*8	£46.000	£46.000	£46,000	As before
11	Advance Works	*6	£60.000	£60,000	£60,000	As before
12	Litilities	.9	£250,000	£250,000	£250,000	As hefere
13	Accommodation Works		£180,000	£180,000	£180,000	As hefere
14	Highway Landscape Manitenance		£80,000	£80,000	£80,000	As before
15	KCC Direct Costs	*2	£337 500	£337 500	£225,000	Duration increased from previous
16	KCC Legal Costs		655,000	£55,000	£55,000	As before
17	KCC Clerk of Works	*4	£81.000	£81.000	£50,000	
18	land Costs		£1 200 000	£1 200 000	£1 200,000	Compensation Land cost in 2A to 4B adds £300k
19	Land Disposal		£0	£0	£0	
20	LCA Part 1 Costs	*1	£25.000	£25,000	£25.000	As before
21	Lane Rental	*2	£28.000	£28,000	£28,000	As before
22	Commuted Sums		£1.000.000	£1.000.000	£1.000.000	As before, KCC may maintain in the long run.
23	KCC Adoption Fees	6.5%	£0	£0	£0	
24	Funder Monitoring		£10,000	£10,000	£10,000	As before
25	Network Rail	*3			£800,000	NR estimate now split but total as before.
26	Possessions		£250,000	£250,000		
27	Design Supervision		£475,000	£475,000		
28	TOC Compensation		£25,000	£25,000		
29	Track Monitoring		£50,000	£50,000		
30	Sundry Costs (Advertising etc)		£70,000	£70,000	£70,000	As before
31	Risks	25%	£4,756,688	£4,378,844	£1,789,926	Risk previously 10% + 18% to cap. Now all included in 25%.
		C. 1. 7. 1. 1	624.070.420	C22 000 210	C20 004 205	
32		Sub-Iotai	£24,979,438	£23,090,219	£20,084,385	
33	nflation (10 2016 - 10 2020)		£3 357 089	£2 971 120	£4 061 116	inflation only on post commencement, activity cost such as planning & consultation deemed to be full costs
33	initiation (10 2010 - 10 2020)		23,337,085	12,571,120	14,001,110	miniation only on post commencine dealer, activity cost such as planning a consultation deemed to be full costs.
34	TOTAL ESTIMATED PROJECT	COST (excluding VAT)	£28 336 527	£26 061 339	£24 145 501	
-4		cost (evenualing thit)	220,000,027	223,001,333	124,143,301	
					COO 500 000	Dravieve suggested een
					£28,500,000	rievious sufficienceb

Basis of Report - Relates to Road AB Only

Drawings:	Primary Pricing Information Used:		
Amey	A24 Boadbridge Heath (Highways & Grade Separated Junction)	2014 to date	
CO04300392/SK02 Jan-16	Haywards Heath Relief Road (Highways & Railway Bridge)	2013 to 2014	
<u>C&A</u>	East Kent Access Phase 2 (incl. Railway Bridge)	2009 to 2012	
13-012 Figure 1 Rev A (Land at Sturry & Broad Oak	Rushenden Relief Road (incl. Railway Bridge & Band Drains)	2009 to 2011	
13-012-008 (A28 Sturry Bypass Option 4)	M20 Junction 4	2016	
13-012-020 Jul-15	Spon's Civil Engineering & Highways Price Book 2016	2016	
Other information:	BCIS TPI Current @ 26 January 2016	Jan-16	
Amey Land Refernce Plan: 4300299/000/01	KCC Lane Rental Scheme 08 November 2012	2012	
	KCC Commuted Sums Calc Sheet April 2014	2014	
			•
Exclusions:	Matrics: Option 1A		
VAT	Chainage of Highway (m):	At Base Date	At Construction
Signalised Junction @ Station	Area of Carriageway (m2):	693	693
Works to Sturry Level Crossing	Cost of Construction Works	10,604	10.604
Charles Francisco PT International			
Station Forecourt PT Interchange	Cost of Construction Works Per m2 of Highway	£12,925,000	£15,565,591
Closure of Milner Court Level Crossing	Cost of Construction Works Per m2 of Highway Cost of Construction Per m of Highway	£12,925,000 £1,218.88	£15,565,591 £1,468
Closure of Milner Court Level Crossing New Pedestrian Footbridge to Station Car Park	Cost of Construction Works Per m2 of Highway Cost of Construction Per m of Highway Total Project Cost	£12,925,000 £1,218.88 £18,650.79	£15,565,591 £1,468 £22,461
Station ForeCourt PT Interchange Closure of Milner Court Level Crossing New Pedestrian Footbridge to Station Car Park Sturry Railway Station	Cost of Construction Works Per m2 of Highway Cost of Construction Per m of Highway Total Project Cost Total Project Cost Per m2 of Highway	£12,925,000 £1,218.88 £18,650.79 £24,979,438	£15,565,591 £1,468 £22,461 £28,336,527
Station ForeCourt P1 Internange Closure of Milner Court Level Crossing New Pedestrian Footbridge to Station Car Park Sturry Railway Station Station Car Park	Cost of Construction Works Per m2 of Highway Cost of Construction Per m of Highway Total Project Cost Total Project Cost Per m2 of Highway Total Project Cost Per m of Highway	£12,925,000 £1,218.88 £18,650.79 £24,979,438 £2,355.66	£15,565,591 £1,468 £22,461 £28,336,527 £2,672.25
Station Forecourt P1 InterChange Closure of Milner Court Level Crossing New Pedestrian Footbridge to Station Car Park Sturry Railway Station Station Car Park Road Access to Station Car Park & Substation	Cost of Construction Works Per m2 of Highway Cost of Construction Per m of Highway Total Project Cost Per m2 of Highway Total Project Cost Per m of Highway Total Project Cost Per m of Highway	£12,925,000 £1,218.88 £18,650.79 £24,979,438 £2,355.66 £36,045.36	£15,565,591 £1,468 £22,461 £28,336,527 £2,672.25 £40,889.65
Station Forecourt P1 InterChange Closure of Miller Court Level Crossing New Pedestrian Footbridge to Station Car Park Sturry Railway Station Station Car Park Road Access to Station Car Park & Substation Finance costs	Cost of Construction Works Per m2 of Highway Cost of Construction Per m of Highway Total Project Cost Total Project Cost Per m2 of Highway Total Project Cost Per m of Highway Maximum Estimated Total Project Cost Minimum Estimated Total Project Cost	£12,925,000 £1,218.88 £18,650.79 £24,979,438 £2,355.66 £36,045.36 £23,700,000	£15,565,591 £1,468 £22,461 £28,336,527 £2,672.25 £40,889.65 £28,500,000
Station Forecourt P1 InterChange Closure of Miller Court Level Crossing New Pedestrian Footbridge to Station Car Park Sturny Railway Station Station Car Park Road Access to Station Car Park & Substation Finance costs	Cost of Construction Works Per m2 of Highway Cost of Construction Per m of Highway Total Project Cost Total Project Cost Per m2 of Highway Total Project Cost Per m2 of Highway Maximum Estimated Total Project Cost Minimum Estimated Total Project Cost	£12,925,000 £1,218.88 £18,650.79 £24,979,438 £2,355.66 £36,045.36 £23,700,000 £21,200,000	£15,565,591 £1,468 £22,461 £28,336,527 £2,672.25 £40,889.65 £28,500,000 £25,500,000

- Assumptions:

 A Sections A-B & C-D will require band drains and 6 months of surcharging.

 B Sewage Works & Nursery will be unaffected.

 C Assumes Streetlights throughout at 30m centres.

 * Assumes 25 properties @ £10,000 each.

 * 3 Sturry Road is designated KLR1 @£800/day. Estimate based on 36 days.

 * Costs based on £4,500/month at 18 months.

 * Costs based on £2,250/week at 100 weeks.

 * Includes for ecological mitigation works.

 * Include Top surveys, Geotech., Contamination and Utility Investigations.

 * Demolitions assumes 2n properties at £23,000 each.

 * Utilities information needs confirmation.

Indices: Base Date: BCIS All IN TPI @ Base Date: Construction Commencement Date: (Q120) Jan-16 279 336 Addition for each month slippage in Commencement Date: +0.4%

Prepared By

David Allen - Director 26th January 2016

Contruction Cost Summary

				Roa	d AB			
Section	Option 1A	Option 1B	Option 2A	Option 2B	Option 3A	Option 3B	Option 4A	Option 4B
Preliminaries	£2,585,000.00	£2,317,500.00	£2,652,500.00	£2,425,000.00	£2,815,000.00	£2,630,000.00	£2,665,000.00	£2,482,500.00
Site Wide Highways & Infrastructure	£10,340,000.00	£9,270,000.00	£10,610,000.00	£9,700,000.00	£11,260,000.00	£10,520,000.00	£10,660,000.00	£9,930,000.00
TOTAL	£12,925,000.00	£11,587,500.00	£13,262,500.00	£12,125,000.00	£14,075,000.00	£13,150,000.00	£13,325,000.00	£12,412,500.00

Item	Description	Quantity	Option 1A Unit Rate	£	Quantity	/ Unit	Option 1B Rate	£	Quantity	OUnit	Dption 2A Rate	£	Quantity Unit	Option 2B Rate	£	Quantity Un	Option 3A it Rate	£	Quantity Unit	Option 3B Rate	£	Quantity Un	Option 4A it Rate	£	Quantity Unit	Option 4B Rate	f
	Carden 200, Clas Classer																										_
	Series 200: Site Clearance																										
A	General allowance for site clearance	11,480	m2 0.5	5,739.90	11,480	m2	0.50	5,739.90	11,480	m2	0.50	5,739.90	11,480 m2	0.50	5,739.90	11,480 m	2 0.50	5,739.90	11,480 m2	0.50	5,739.90	11,480 m	2 0.50	5,739.90	11,480 m2	0.50	5,739.90
	Series 200: Site Clearance			5,739.90	,			5,739.90				5,739.90			5,739.90			5,739.90			5,739.90			5,739.90			5,739.90
	Series 300: Fencing																										
A	Knee Rails	100	m 25.0	0 2,500.00	100	m	25.00	2,500.00	100	m	25.00	2,500.00	100 m	25.00	2,500.00	100 m	25.00	2,500.00	100 m	25.00	2,500.00	100 m	25.00	2,500.00	100 m	25.00	2,500.00
в	Acoustic Fence (Allowance)	200	m 320.0	64,000.00	200	m	320.00	64,000.00	200	m	320.00	64,000.00	200 m	320.00	64,000.00	200 m	320.00	64,000.00	200 m	320.00	64,000.00	200 m	320.00	64,000.00	200 m	320.00	64,000.00
с	General Site Fencing	200	m 29.4	5,880.00	200	m	29.40	5,880.00	200	m	29.40	5,880.00	200 m	29.40	5,880.00	200 m	29.40	5,880.00	200 m	29.40	5,880.00	200 m	29.40	5,880.00	200 m	29.40	5,880.00
	Series 300: Fencing			72,380.00	,			72,380.00				72,380.00			72,380.00			72,380.00			72,380.00			72,380.00			72,380.00
	Series 400: Safety Barriers																										
	Vehicle Restraint System	800	m 415.0	332 000 00	800		415.00	332 000 00	980	_	415.00	405 700 00	980 m	415.00	405 700 00	1.083 m	415.00	449 445 00	1.083 m	415.00	449 445 00	1 160 m	415.00	481 400 00	1160 m	415.00	481 400 00
	Reiden Bornnet	505		250,073,00	505		F13.00	352,000.00	336		F13.00	166 012 00	226	F13.00	166 012 00	2,000	F13.00	114 176 00	2003	F13.00	114 176 00	146	F12.00	74 753 00	146	F13.00	74 753 00
•	bridge Parapet	506	m 512.0	259,072.00	506		512.00	259,072.00	320	m	512.00	166,912.00	326 m	512.00	166,912.00	223 m	512.00	114,175.00	223 m	512.00	114,176.00	146 m	512.00	74,752.00	146 M	512.00	/4,/52.00
	Series 400: Safety Barriers			591,072.00	, 	TT		591,072.00				573,612.00			573,612.00			563,621.00			563,621.00		1	556,152.00			556,152.00
	Series 500: Drainage																										
	Drainage to embankments and roundabout (ALL OPTIONS)																										
	Surface Water Drainage																										
	Drain or sewer in trench depth not exceeding 2.00 metres																										
A	Sewer; assumed an average 150mm dia pipe at 2m deep	219	m 74.00	16,187.50	219	m	74.00	16,187.50	193	m	74.00	14,245.00	193 m	74.00	14,245.00	193 m	74.00	14,245.00	193 m	74.00	14,245.00	193 m	74.00	14,245.00	193 m	74.00	14,245.00
в	Sewer; assumed an average 225mm dia pipe at 2m deep	175	m 82.00	14,350.00	175	m	82.00	14,350.00	154	m	82.00	12,628.00	154 m	82.00	12,628.00	154 m	82.00	12,628.00	154 m	82.00	12,628.00	154 m	82.00	12,628.00	154 m	82.00	12,628.00
с	Sewer; assumed an average 300mm dia pipe at 2m deep	131	m 95.00	12,468.75	131	m	95.00	12,468.75	116	m	95.00	10,972.50	116 m	95.00	10,972.50	116 m	95.00	10,972.50	116 m	95.00	10,972.50	116 m	95.00	10,972.50	116 m	95.00	10,972.50
D	Sewer; assumed an average 450mm dia pipe at 2m deep	88	m 125.00	10,937.50	88		125.00	10,937.50	77	m 1	125.00	9,625.00	77 m	125.00	9,625.00	77 m	125.00	9,625.00	77 m	125.00	9,625.00	77 m	125.00	9,625.00	77 m	125.00	9,625.00
F	Sewer: assumed an average 600mm dia nine at 2m deen	44	m 150.00	6 562 50	44		150.00	6 562 50	39		150.00	5 775 00	39 m	150.00	5 775 00	39 m	150.00	5 775 00	39 m	150.00	5 775 00	39 m	150.00	5 775 00	39 m	150.00	5 775 00
	Fourier argumed as granzes C75mm dia sino at 2m doos			4 069 75			100 00	4 069 75	10		186.00	2 580 50	10	196.00	3 590 50	10	100.00	3 580 50	10	196.00	3 590 50	10	100.00	3 580 50	10	186.00	3 590 50
ŗ	Deale or source in transfer don'th exceeding 2.00m but not exceeding	"	11 180.00	4,008.75		"	186.00	4,008.75	19		180.00	3,380.30	19 11	186.00	3,360.30	19 11	188.00	3,360.30	13 11	180.00	3,360.30	13	180.00	3,360.30	19 11	186.00	3,360.30
	4m																										
G	Sewer; assumed an average 150mm dia pipe at 2m to 4m deep	153	m 94.00	14,393.75	153	m	94.00	14,393.75	135	m	94.00	12,666.50	135 m	94.00	12,666.50	135 m	94.00	12,666.50	135 m	94.00	12,666.50	135 m	94.00	12,666.50	135 m	94.00	12,666.50
н	Sewer; assumed an average 225mm dia pipe at 2m to 4m deep	88	m 107.00	9,362.50	88	m	107.00	9,362.50	77	m 1	107.00	8,239.00	77 m	107.00	8,239.00	77 m	107.00	8,239.00	77 m	107.00	8,239.00	77 m	107.00	8,239.00	77 m	107.00	8,239.00
Т	Sewer; assumed an average 300mm dia pipe at 2m to 4m deep	44	m 125.00	5,468.75	44	m	125.00	5,468.75	39	m 1	125.00	4,812.50	39 m	125.00	4,812.50	39 m	125.00	4,812.50	39 m	125.00	4,812.50	39 m	125.00	4,812.50	39 m	125.00	4,812.50
L	Sewer; assumed an average 450mm dia pipe at 2m to 4m deep	26	m 155.00	4,068.75	26	m	155.00	4,068.75	23	m t	155.00	3,580.50	23 m	155.00	3,580.50	23 m	155.00	3,580.50	23 m	155.00	3,580.50	23 m	155.00	3,580.50	23 m	155.00	3,580.50
к	Sewer; assumed an average 600mm dia pipe at 2m to 4m deep	18	m 190.00	3,325.00	18	m	190.00	3,325.00	15	m 1	190.00	2,926.00	15 m	190.00	2,926.00	15 m	190.00	2,926.00	15 m	190.00	2,926.00	15 m	190.00	2,926.00	15 m	190.00	2,926.00
L	Sewer: assumed an average 675mm dia pipe at 2m to 4m deep	9	m 236.00	2.065.00	9		236.00	2,065.00	8	m 1	236.00	1.817.20	8 m	236.00	1.817.20	8 m	236.00	1.817.20	8 m	236.00	1.817.20	8 m	236.00	1.817.20	8 m	236.00	1.817.20
м	Manholes: assumed to average 1200mm dia and 2m to 4m deen	10	1 500 00	15,000,00			1 500 00	15 000 00		n 1	1 500 00	13 500 00	9 00	1 500 00	13 500 00	9 00	1 500 00	13 500 00	9 00	1 500 00	13 500 00	9 10	1 500 00	13 500 00	9 00	1 500 00	13 500 00
			1,500,000	15,000,00	10		1,500.00	15,000.00				10,000.00	1.0	1,500.00	13,500.00		1,500.00	13,500.00		1,500,000	15,500,00		1,500,000	25,500.00		1,500.00	13,500,00
N	Manholes; assumed to average 1500mm dia and to 4m deep	10	no 1,500.00	15,000.00	10	no	1,500.00	15,000.00	9	no 1,	1,500.00	13,500.00	9 no	1,500.00	13,500.00	9 no	1,500.00	13,500.00	9 no	1,500.00	13,500.00	9 no	1,500.00	13,500.00	9 no	1,500.00	13,500.00
0	Interantore	,	8,000,00	18 000 00	2		8 000 00	18 000 00	,		000.00	18 000 00	2 m	8 000 00	18 000 00	2 1	8 000 00	18 000 00	2 00	9,000,00	18 000 00	2	9,000,00	18,000,00	2 00	9,000,00	18,000,00
P	Guillion	-	325.00	12 650.00			375.00	13 650 00	27		225.00	12,005.00	27	335.00	13,035,00	27	375.00	10,000.00	27	335.00	13,035,00	27	375.00	10,000.00	27	335.00	12,000.00
r	Guines	42	no 325.00	13,650.00	42	no	325.00	13,650.00	3/	no a	325.00	12,025.00	3/ no	325.00	12,025.00	3/ no	325.00	12,025.00	37 no	325.00	12,025.00	37 no	325.00	12,025.00	37 NO	325.00	12,025.00
Q	Headwalls & outlet flow controls	4	nr 2,000.00	8,000.00	4	nr	2,000.00	8,000.00	4	nr 2,	2,000.00	8,000.00	4 nr	2,000.00	8,000.00	4 n	2,000.00	8,000.00	4 nr	2,000.00	8,000.00	4 n	2,000.00	8,000.00	4 nr	2,000.00	8,000.00
R	Attenuation Swales & Ponds (allowance)		item	100,000.00		item		100,000.00		item		100,000.00	item		100,000.00	iter	m	100,000.00	item		100,000.00	ite	m	100,000.00	iten		100,000.00
s	Foul Sewer Diversions (Roundabout)		item	50,000		item		50,000		item		50,000	item		50,000	ite	m	50,000	item		50,000	ite	m	50,000	iten		50,000
	Additional drainage to additional embankments:																										
	Surface Water Drainage																										
	Drain or sewer in trench depth not exceeding 2.00 metres																										
A	Sewer; assumed an average 150mm dia pipe at 2m deep	o	m 74.00	0.00	o	m	74.00	0.00	39	m .	74.00	2,913.75	39 m	74.00	2,913.75	62 m	74.00	4,581.06	62 m	74.00	4,581.06	79 m	74.00	5,827.50	79 m	74.00	5,827.50
в	Sewer; assumed an average 225mm dia pipe at 2m deep	0	m 82.00	0.00	0	_ m _	82.00	0.00	32	m	82.00	2,583.00	32 m	82.00	2,583.00	50 m	82.00	4,061.05	50 m	82.00	4,061.05	63 m	82.00	5,166.00	63 m	82.00	5,166.00
c	Sewer: assumed an average 300mm dia pipe at 2m deen		m 95.00	0.00			95.00	0.00	24		95.00	2,244,38	24 m	95.00	2,244 38	37 "	95.00	3,528 66	37 m	95.00	3.528.66	47 m	95.00	4,488 75	47 m	95.00	4,489.75
	Sower arrund an worang 450mm die pipe et an deep		m 105.00			[]	135.00	0.00			125.00	1 0 00 70	16	135.00	1 000 70	25	135.00	3,005 34	25	135.00	2,005,04	22	135.00	3 037 50		125.00	2 027 50
D	oewer; assumed an average 450mm dia pipe at 2m deep	v	125.00	0.00	°	"	125.00	U.00	10	m 3	125.00	1,968.75	10 m	125.00	1,968.75	25 m	125.00	3,095.31	25 m	125.00	3,095.31	32 m	125.00	3,937.50	32 m	125.00	3,937.50

Elemental Construction Costs

Description		Option 1A		-	Option 1B			Option ZA		-	Option 2B			Option 3A			Option 3B			Option 4A			Option 4B	
E Sewer: assumed an average 600mm dia nine at 2m deen	Quantity U	nit Kate	10.00	Quantity Un	t Rate 150.00	1.00	antity Unit	Rate 150.00	1 181 25	Quantity Unit	Rate 150.00	1,181,25	Quantity Uni	t Rate	1 857 19	Quantity Un	1t Rate	£ 1.857.19	Quantity U	m 150.00	2 362 50	Quantity U	nt Rate	2 362 50
5 Sever, assumed an average oppinn dia pipe at 211 deep		1 150.00	0.00	0	150.00	0.00		130.00	1,101.25		150.00	1,151.25		130.00	1,657.15		150.00	1,057.19		130.00	2,302.30		130.00	2,302.30
 Sewer; assumed an average 675mm dia pipe at 2m deep 		186.00	0.00	U m	186.00	0.00	* m	186.00	/32.38	4 m	186.00	/32.38	° "	186.00	1,151.40	о п	186.00	1,151.40		m 186.00	1,404.75	° (186.00	1,404.75
Drain or sewer in trench depth exceeding 2.00m but not exceeding 4m																								
G Sewer; assumed an average 150mm dia pipe at 2m to 4m deep	0	m 94.00	0.00	0 m	94.00	0.00	28 m	94.00	2,590.88	28 m	94.00	2,590.88	43 m	94.00	4,073.43	43 m	94.00	4,073.43	55	m 94.00	5,181.75	55 r	94.00	5,181.75
H Sewer; assumed an average 225mm dia pipe at 2m to 4m deep	0	^m 107.00	0.00	0 m	107.00	0.00	16 m	107.00	1,685.25	16 m	107.00	1,685.25	25 m	107.00	2,649.59	25 m	107.00	2,649.59	32	m 107.00	3,370.50	32 r	107.00	3,370.50
I Sewer assumed an average 300mm dia nine at 7m to 4m deen			0.00		10/.00	0.00	8 m	107.00	984 38	8 m	107.00	984 38	12 m	107.00	1 547 66	12 7	107.00	1 547 66	16		1 968 75	16	107.00	1 968 75
		125.00		-	125.00		-	125.00			125.00		-	125.00			125.00			125.00	1,500.75		125.00	1,500.75
J Sewer; assumed an average 450mm dia pipe at 2m to 4m deep		^m 155.00	0.00	0 m	155.00	0.00	5 m	155.00	/32.38	5 m	155.00	732.38	/ m	155.00	1,151.46	/ "	155.00	1,151.46	9 1	155.00	1,464.75	9 r	155.00	1,464.75
K Sewer; assumed an average 600mm dia pipe at 2m to 4m deep	0	^m 190.00	0.00	0 m	190.00	0.00	3 m	190.00	598.50	3 m	190.00	598.50	5 m	190.00	940.98	5 m	190.00	940.98	6 1	^m 190.00	1,197.00	6 r	190.00	1,197.00
L Sewer; assumed an average 675mm dia pipe at 2m to 4m deep	0	^m 236.00	0.00	0 m	236.00	0.00	2 m	236.00	371.70	2 m	236.00	371.70	2 m	236.00	584.40	2 п	236.00	584.40	3	^m 236.00	743.40	3 г	236.00	743.40
M Manholes; assumed to average 1200mm dia and 2m to 4m deep	0 1	1,500.00	0.00	0 nc	1,500.00	0.00	2 no	1,500.00	3,000.00	2 no	1,500.00	3,000.00	3 no	1,500.00	4,500.00	3 n	1,500.00	4,500.00	4 r	no 1,500.00	6,000.00	4 n	1,500.00	6,000.00
N Manholes; assumed to average 1500mm dia and to 4m deep	0 1	1,500.00	0.00	0 nc	1,500.00	0.00	2 no	1,500.00	3,000.00	2 no	1,500.00	3,000.00	3 no	1,500.00	4,500.00	3 n	1,500.00	4,500.00	4 1	no 1,500.00	6,000.00	4 n	o 1,500.00	6,000.00
O Inteceptors	0,	9,000.00	0.00	0 nc	9,000.00	0.00	1 no	9,000.00	9,000.00	1 no	9,000.00	9,000.00	2 no	9,000.00	18,000.00	2 n	9,000.00	18,000.00	2,	no 9,000.00	18,000.00	2 n	9,000.00	18,000.00
P Gullies	0 1	325.00	0.00	0 no	325.00	0.00	8 no	325.00	2,600.00	8 no	325.00	2,600.00	12 no	325.00	3,900.00	12 n	325.00	3,900.00	15 r	no 325.00	4,875.00	15 n	325.00	4,875.00
Q Headwalls & outlet flow controls	0	nr 2,000.00	0.00	0 nr	2,000.00	0.00	2 nr	2,000.00	4,000.00	2 nr	2,000.00	4,000.00	4 nr	2,000.00	8,000.00	4 n	2,000.00	8,000.00	4	nr 2,000.00	8,000.00	4 r	r 2,000.00	8,000.00
R Box culvert; 2m	0	m 2,388.00	0.00	0 m	2,388.00	0.00	0 m	2,388.00	0.00	0 m	2,388.00	0.00	72 m	2,388.00	171,458.40	66 m	2,388.00	156,652.80	108	m 2,388.00	257,187.60	98 r	2,388.00	234,979.20
Series 500: Drainage			322,908.75			322,908.75			346,079.28			346.079.28			545,473.33			530.667.73			643,128,45			620.920.05
Sories 600: Earthworks																								
Drainage to embankments and roundabout (ALL OPTIONS)																								
A Excavate class 5a (topsoli) and denosit on site.	3120	3 800	24 958 15	2.841 m ²	800	22 726 15	3 120 m3	8.00	24 958 15	2.841 m3	8.00	22 726 15	3 120 m ²	8.00	24 958 15	2.841 m	3 800	22 726 15	3 120	m3 800	24 958 15	2 841	3 800	22 726 15
B Excavate Class 5a (topsoil) and dispose off-site.	3.120 m	n3 25.00	77.994.23	2.841 m	25.00	71.019.23	3.120 m3	25.00	77.994.23	2.841 m3	25.00	71.019.23	3.120 m3	25.00	77.994.23	2.841 m	3 25.00	71.019.23	3.120 n	n3 25.00	77.994.23	2.841 m	3 25.00	71.019.23
C Excavate acceptable material and deposit on site	'n	n3 8.00	0.00	mi	8.00	0.00	m3	8.00	0.00	0 m3	8.00	0.00	mā	8.00	0.00	0 m	3 8.00	0.00	0 n	n3 8.00	0.00	0 m	3 8.00	0.00
D Excavate acceptable material and remove from site	13,502 m	n3 24.00	324,036.00	12,107 m	24.00	290,556.00	13,502 m3	24.00	324,036.00	12,107 m3	24.00	290,556.00	13,502 m3	24.00	324,036.00	12,107 m	3 24.00	290,556.00	13,502 n	n3 24.00	324,036.00	12,107 m	3 24.00	290,556.00
E Allowance for dealing with contaminated material.	1,000 m	n3 69.00	69,000.00	1,000 m	69.00	69,000.00	1,000 m3	69.00	69,000.00	1,000 m3	69.00	69,000.00	1,000 m3	69.00	69,000.00	1,000 m	3 69.00	69,000.00	1,000 n	n3 69.00	69,000.00	1,000 m	3 69.00	69,000.00
F Imported acceptable material	34,100 m	n3 37.00	1,261,700.00	34,000 mi	37.00	1,258,000.00	34,100 m3	37.00	1,261,700.00	34,000 m3	37.00	1,258,000.00	34,100 m3	37.00	1,261,700.00	34,000 m	3 37.00	1,258,000.00	34,100 n	n3 37.00	1,261,700.00	34,000 m	3 37.00	1,258,000.00
G Excavate material in areas of soft fill, remove from site and backfill will acceptable material 50% reclaimed and 50% imported.	1.000 m	n3 65.00	65 000 00	1.000 m ³	65.00	65,000,00	1.000 m3	65.00	65,000,00	1.000 m3	65.00	65,000,00	1.000 m ³	65.00	65,000,00	1.000 m	3 65.00	65 000 00	1.000 m	n3 65.00	65,000,00	1.000 m	3 65.00	65,000,00
H Extra over for hard dig	1,325 n	n3 34.00	45,050.00	1,325 mi	34.00	45,050.00	1,325 m3	34.00	45,050.00	1,325 m3	34.00	45,050.00	1,325 m3	34.00	45,050.00	1,325 m	3 34.00	45,050.00	1,325 n	n3 34.00	45,050.00	1,325 m	3 34.00	45,050.00
I Lightweight Fill	4,000 m	n3 72.00	288,000.00	3,900 mi	72.00	280,800.00	4,000 m3	72.00	288,000.00	3,900 m3	72.00	280,800.00	4,000 m3	72.00	288,000.00	3,900 m	3 72.00	280,800.00	4,000 n	n3 72.00	288,000.00	3,900 m	3 72.00	280,800.00
J General Fill	0 1	n3 27.00	0.00	0 m:	27.00	0.00	0 m3	27.00	0.00	0 m3	27.00	0.00	0 m3	27.00	0.00	0 m	3 27.00	0.00	0 n	n3 27.00	0.00	0 m	3 27.00	0.00
K Allowance for Geotextiles	23,400 m	n2 5.00	117,000.00	23,400 m	5.00	117,000.00	23,400 m2	5.00	117,000.00	23,400 m2	5.00	117,000.00	23,400 m2	5.00	117,000.00	23,400 m	2 5.00	117,000.00	23,400 m	n2 5.00	117,000.00	23,400 m	2 5.00	117,000.00
L Construction Environmental Management Plan - construction routes, temporary bridge, etc.	300	т 461.00	138,300.00	300 m	461.00	138,300.00	300 m	461.00	138,300.00	300 m	461.00	138,300.00	300 m	461.00	138,300.00	300 m	461.00	138,300.00	300	m 461.00	138,300.00	300 r	461.00	138,300.00
M Capping 6F2	287 m	n3 44.00	12,628.00	254 m:	44.00	11,195.80	287 m3	44.00	12,628.00	254 m3	44.00	11,195.80	287 m3	44.00	12,628.00	254 m	3 44.00	11,195.80	287 m	n3 44.00	12,628.00	254 m	3 44.00	11,195.80
N Band Drains	6,062	m 1.50	9,093.12	5,783 m	1.50	8,674.62	6,062 m	1.50	9,093.12	5,783 m	1.50	8,674.62	6,062 m	1.50	9,093.12	5,783 m	1.50	8,674.62	6,062	m 1.50	9,093.12	5,783 r	1.50	8,674.62
Additional Earthworks																								
To additional embankments:																								
A Excavate class 5a (topsoil) and deposit on site.	0 1	n3 8.00	0.00	0 m:	8.00	0.00	1,466 m3	8.00	11,728.80	1,382 m3	8.00	11,059.20	1,835 m3	8.00	14,681.28	1,787 m	8.00	14,294.40	2,932 m	m3 8.00	23,457.60	2,765 m	3 8.00	22,118.40
B Excavate Class 5a (topsoil) and dispose off-site.	0 1	n3 25.00	0.00	0 m:	25.00	0.00	1,466 m3	25.00	36,652.50	1,382 m3	25.00	34,560.00	1,835 m3	25.00	45,879.00	1,787 m	3 25.00	44,670.00	2,932 n	n3 25.00	73,305.00	2,765 m	3 25.00	69,120.00
C Excavate acceptable material and deposit on site	0 1	n3 8.00	0.00	0 m:	8.00	0.00	m3	8.00	0.00	0 m3	8.00	0.00	0 m3	8.00	0.00	0 m	3 8.00	0.00	0 n	n3 8.00	0.00	0 m	3 8.00	0.00
D Excavate acceptable material and remove from site	0 1	n3 24.00	0.00	0 m:	24.00	0.00	2,363 m3	24.00	56,700.00	1,944 m3	24.00	46,656.00	3,714 m3	24.00	89,145.00	3,056 m	3 24.00	73,353.60	4,725 n	n3 24.00	113,400.00	3,888 m	3 24.00	93,312.00
E Allowance for dealing with contaminated material.	0 1	n3 69.00	D.00	0 m.	69.00	0.00	500 m3	69.00	34,500.00	500 m3	69.00	34,500.00	500 m3	69.00	34,500.00	500 m	3 69.00	34,500.00	500 n	n3 69.00	34,500.00	500 m	3 69.00	34,500.00
F Imported acceptable material	0 1	n3 37.00	0.00	0 m:	37.00	0.00	23,000 m3	37.00	851,000.00	22,000 m3	37.00	814,000.00	54,000 m3	37.00	1,998,000.00	52,400 m	3 37.00	1,938,800.00	47,000 m	n3 37.00	1,739,000.00	43,900 m	3 37.00	1,624,300.00
			1		1			1						1						1			1	4 I

KCC

Item Description	Quantity 1	Option 1A	6	Quantity Un	Option 1B	f	Quantity Unit	Option 2A Rate	f	Quantity Unit	Option 2B Rate	e	Quantity Unit	Option 3A Rate	f	Quantity Uni	Option 3B	e	Quantity II	Option 4A	e	Quantity Un	Option 4B	6
G Excavate material in areas of soft fill, remove from site and backfill	Quarterty	And Note		country on	ie rute	-	country on	1000		Quartery one	Note	-	Quantity one	. Nuto	-	Quality	e navo	-	Quantity C	THE THE	-	quantity on	i nuco	
will acceptable material 50% reclaimed and 50% imported.	0	m3 65.00	0.00	0 m	65.00	0.00	500 m3	65.00	32,500.00	500 m3	65.00	32,500.00	500 m3	65.00	32,500.00	500 m3	65.00	32,500.00	500 r	m3 65.00	32,500.00	500 m3	65.00	32,500.0
H Extra over for band dir						0.00		24.00	0.00		24.00	0.00	0 2	24.00	0.00		24.00	0.00		-2 -24.00	0.00		24.00	
	ľ	ms 34.00	0.00		5 54.00	0.00	0 ms	54.00	0.00	U ms	54.00	0.00	U ms	54.00	0.00	0 112	54.00	0.00		115 54.00	0.00	0 m.	54.00	
I Lightweight Fill	0	m3 72.00	0.00	0 m	3 72.00	0.00	4,000 m3	72.00	288,000.00	3,000 m3	72.00	216,000.00	4,000 m3	70.00	280,000.00	3,600 m3	72.00	259,200.00	4,000 r	n3 72.00	288,000.00	3,900 m3	72.00	280,800.0
J General Fill	0	m3 27.00	0.00	0 m	3 27.00	0.00	0 m3	27.00	0.00	0 m3	27.00	0.00	0 m3	27.00	0.00	0 m3	27.00	0.00	o r	n3 27.00	0.00	0 m3	27.00	o.o د
K Allowance for Geotextiles	0	m2 5.00	0.00	0 m	2 5.00	0.00	15,210 m2	5.00	76,050.00	15,210 m2	5.00	76,050.00	19,858 m2	5.00	99,287.50	19,858 m2	5.00	99,287.50	30,477 r	m2 5.00	152,385.00	30,477 m	5.00	152,385.0
L Construction Environmental Management Plan - construction																								
routes. wheelwash etc.	•	m 461.00	0.00	0 п	461.00	0.00	150 m	461.00	69,150.00	150 m	461.00	69,150.00	150 m	461.00	69,150.00	150 m	461.00	69,150.00	150	m 461.00	69,150.00	150 m	461.00	69,150.0
M Capping 6F2	0	m3 44.00	0.00	0 m	3 44.00	0.00	551 m3	44.00	24,255.00	454 m3	44.00	19,958.40	867 m3	44.00	38,134.25	713 m3	44.00	31,379.04	1,103 r	m3 44.00	48,510.00	0 m3	44.00	٥.0 v
N Band Drains	0	m 1.50	0.00	0 m	1.50	0.00	5,864 m	1.50	8,796.60	5,530 m	1.50	8,294.40	9,220 m	1.50	13,830.21	8,694 m	1.50	13,040.64	11,729	m 1.50	17,593.20	11,059 m	1.50	16,588.8
River Diversion Works		tem 400.000.00	0.00	0 ite	n 400.000.00	0.00	0 item	400.000.00	0.00	0 item	400.000.00	0.00	0 item	400,000.00	0.00	0 iter	400.000.00	0.00	1 11	em 400.000.00	400.000.00	1 iter	400.000.00	400.000.0
Carlos COD. Partherent						0.077.024.00			2 022 022 02									4 007 405 00			F 434 FC0 30			E 470.000
Series 600: Earthworks		1	Z,43Z,759.50			2,377,321.80			3,922,092.40			3,740,049.80			5,147,866.74			4,987,496.98			5,424,560.30			5,172,096.0
Series 700: Highways																								
Drainage to embankments and roundabout (ALL OPTIONS)																								
A Category A Sub-Base; 250mm	2,050	m3 41.00	84,050	1,818 m	3 41.00	74,518	2,050 m3	41.00	84,050	1,818 m3	41.00	74,518	2,050 m3	41.00	84,050	1,818 m3	41.00	74,518	2,050 r	m3 41.00	84,050	1,818 m	41.00	74,51
B DBM Base Course: 200mm	8200	m2 50.00	410.000	7 270 m	50.00	363.500	8 200 m2	50.00	410.000	7 270 m2	50.00	363 500	8.200 m2	50.00	410.000	7.270 m2	50.00	363,500	8200 7	n2 50.00	410.000	7.270 m	50.00	363.50
C UDA Distance Courses FOrmer										7,070														
C Inter binder Course; Summ	8,200	m2 15.00	123,000	7,2/0 m	15.00	109,050	8,200 m2	15.00	123,000	7,270 m2	15.00	109,050	8,200 m2	15.00	123,000	7,270 m2	15.00	109,050	8,200 r	nz 15.00	123,000	7,270 m2	15.00	109,05
D HRA Surfacing; 30mm	8,200	m2 12.00	98,400	7,270 m	2 12.00	87,240	8,200 m2	12.00	98,400	7,270 m2	12.00	87,240	8,200 m2	12.00	98,400	7,270 m2	12.00	87,240	8,200 r	m2 12.00	98,400	7,270 m2	12.00	87,24
E Planing	2,500	m2 8.00	20,000	2,500 m	2 8.00	20,000	2,500 m2	8.00	20,000	2,500 m2	8.00	20,000	2,500 m2	8.00	20,000	2,500 m2	8.00	20,000	2,500 r	m2 8.00	20,000	2,500 m2	8.00	J 20,00
Additional Works																								
A Category A Sub-Base: 250mm		m3 41.00			41.00	0	394 m3	41.00	16.144	324 m3	41.00	13.284	619 m3	41.00	16.144	509 m ³	41.00	13,284	788 7	n3 41.00	16.144	648 m ³	41.00	13.28
						-					50.00			50.00			50.00	,						
B DBM Base Course; 200mm		m2 50.00		0 m	2 50.00	U	1,575 m2	50.00	/8,/50	1,296 m2	50.00	64,800	2,476 m2	50.00	78,750	2,038 m2	50.00	64,800	3,150 r	n2 50.00	/8,/50	2,592 m.	50.00	. 64,80
C HRA Binder Course; 50mm	0	m2 15.00	0	0 m	2 15.00	0	1,575 m2	15.00	23,625	1,296 m2	15.00	19,440	2,476 m2	15.00	23,625	2,038 m2	15.00	19,440	3,150 r	m2 15.00	23,625	2,592 mi	15.00	19,44
D HRA Surfacing; 30mm	0	m2 12.00	0	0 m	2 12.00	0	1,575 m2	12.00	18,900	1,296 m2	12.00	15,552	2,476 m2	12.00	18,900	2,038 m2	12.00	15,552	3,150 r	m2 12.00	18,900	2,592 m2	12.00	J 15,55
E Planing	0	m2 8.00	0	0 m	2 8.00	0	0 m2	8.00	0	0 m2	8.00	0	0 m2	8.00	0	0 m2	8.00	0	0 1	m2 8.00	0	0 m2	8.00	c
F Bridge Deck Carriageway: including approx, 185mm thick binder																								
and approx. 40mm surface course	1,518	m2 63.00	95,634	1,518 m	2 63.00	95,634	540 m2	63.00	34,020	540 m2	63.00	34,020	668 m2	63.00	42,084	668 m2	63.00	42,084	438 r	m2 63.00	27,594	438 m.	63.00	27,59
G Bridge Deck Bus Lane; including approx. 185mm thick binder and	886	m2 63.00	55.787	0	63.00	0	315 m2	63.00	19.845	0 m2	63.00	0	390 m2	63.00	24.570	0 m2	63.00	0	256	T2 63.00	16.128	0 m	63.00	
Series 700: Highways			886,870.50			749,941.50			926,733.75			801,403.50			939,522.75			809,467.50			916,590.75			/94,977.5
Series 1100: Kerbs, Footways & Paved Areas																								
Drainage to embankments and roundabout (ALL OPTIONS)																								
A 125 x 255 HB Kerb	880	m 32.00	28,160.00	880 m	32.00	28,160.00	506 m	32.00	16,192.00	506 m	32.00	16,192.00	506 m	32.00	16,192.00	506 m	32.00	16,192.00	506	m 32.00	16,192.00	506 m	32.00	16,192.0
B 50 x 150 Edging	440	m 21.00	9,240.00	440 m	21.00	9,240.00	440 m	21.00	9,240.00	440 m	21.00	9,240.00	440 m	21.00	9,240.00	440 m	21.00	9,240.00	440	m 21.00	9,240.00	440 m	21.00	9,240.0
C Tactile Baulag			1 450 00	1.		1 450 00	10 -7		1.450.00	10	91.00	1 450 00	107	81.00	1 450 00	10	01.00	1 450 00			1 450 00	10		1.000
C racine raving	10	81.00	1,458.00	m	51.00	1,458.00	18 m2	\$1.00	1,458.00	10 m2	81.00	1,458.00	18 M2	81.00	1,458.00	10 102	81.00	1,458.00	10	51.00	1,458.00	10 m.	81.00	1,458.0
D Multi-User Path	1,701	m2 48.00	81,648	1,701 m	48.00	81,648	1,701 m2	48.00	81,648.00	1,701 m2	48.00	81,648.00	1,701 m2	48.00	81,648.00	1,701 m2	48.00	81,648.00	1,701 r	n2 48.00	81,648.00	1,701 m	48.00	81,648.0
E Hard Verge, including approx. 150mm regulating and approx. 30mm surface course	0	m2 52.00	0		2 52.00	0	0 ^{m2}	52.00	0.00	0 m2	52.00	0.00	0 m2	52.00	0.00	0 m2	52.00	0.00	0 r	m2 52.00	0.00	0 m2	52.00	0.0
Additional Works																								
																								1
F 125 x 255 HB Kerb	0	m 32.00	0.00	0 7	32.00	0.00	506 m	32.00	16,192.00	506 m	32.00	16,192.00	506 m	32.00	16,192.00	506 m	32.00	16,192.00	506	m 32.00	16,192.00	506 m	32.00	16,192.0
G Beaney Block type kerb	506	m 132.00	66,792.00	506 m	132.00	66,792.00	0 m	132.00	0.00	0 m	132.00	0.00	0 m	132.00	0.00	0 m	132.00	0.00	0	m 132.00	0.00	0 m	132.00	0.0
H 50 x 150 Edging	0	m 21.00	0.00	0 11	21.00	0.00	90 m	21.00	1,890.00	90 m	21.00	1,890.00	142 m	21.00	2,982.00	142 m	21.00	2,982.00	180	m 21.00	3,780.00	180 m	21.00	3,780.0
I Tactile Paving	0	m2 81.00	0.00	0 m	2 81.00	0.00	0 m2	81.00	0.00	0 m2	81.00	0.00	0 m2	81.00	0.00	0 m2	81.00	0.00	0,	n2 81.00	0.00	0 m2	81.00	J 0.0
L Multi-Licor Path	011	m7 49.00	42 710	011 -		42 710	957	49.00	41 120 40	957	49.00	41 130 40	721 7	48.00	24 610 27	721 -	49.00	24 610 27	903		20 524 40	902	48.00	20 524
	·**	46.UL	45,/18	^{***} ^m	40.00	45,/18	a, mz	*****	41,120.40		46.00	+1,120.40	741 102	46.00	34,018.3/	1	46.00	34,018.37		******	38,534.40	m.	40.00	36,534.4
K Hard Verge, including approx. 150mm regulating and approx. 30mm surface course	152	m2 52.00	7,894	152 m	2 52.00	7,894	98 m2	52.00	5,085.60	98 m2	52.00	5,085.60	67 m2	52.00	3,484.00	67 m2	52.00	3,484.00	44 r	m2 52.00	2,288.00	44 ^{m2}	52.00	2,288.0
Series 1100: Kerbs, Footways & Paved Areas			238,910.00		1	238,910.00		I	172,832.00			172,832.00		L	165,814.37			165,814.37			169,332.40		I	169,332.4
Sarias 1200: Tesffis Signs & Boad Markings																								
Series LEVV. Harric agns & ROdd Markings	I																							

Itom	Description	Quantity	Unit	Option 1A	6	Quantity	1168	Option 1B		Quantity	O	ption 2A	6	Quantity Hr	0 ait	Pote	6	Ouantitu	Op	ption 3A	6	Quantity	Option	38	<i>E</i> (luantitu	Option 4A	6	Quantity	Linit	Option 4B	6
	Drainage to embankments and roundabout (ALL OPTIONS)	quantity	Unix	Nuto		quarter	Unite	nute		Quantity	onic	Turco		Quartery		Kutto		Quantity	Onic	Nuto		Quantity	onn nate			countery	onne ikuko		Quantity	Unit	Nuto	
A	Allowance for signs		item		50,000.00		item		50,000.00	0	item	0.00	50,000.00	0 ite	em	0.00	50,000.00	0	item	0.00	50,000.00	0	item	0.00	50,000.00	0	tem 0.0	50,000.00	0	item	0.00	50,000.00
В	Allowance for road markings	880	m	7.00	6,160.00	880	m	7.00	6,160.00	880	m	7.00	6,160.00	880 n	n	7.00	6,160.00	880	m	7.00	6,160.00	880	m	.00	6,160.00	880	m 7.0	6,160.00	880	m	7.00	6,160.00
	Additional Works																															
A	Allowance for signs		item		10,000.00		item		10,000.00		item		10,000.00	ite	:m		10,000.00		item		10,000.00		item		10,000.00		tem	10,000.00		item		10,000.00
в	Allowance for road markings	506	m	7.00	3,542.00	506	m	7.00	3,542.00	506	m	7.00	3,542.00	506 n	n	7.00	3,542.00	506	m	7.00	3,542.00	506	m	.00	3,542.00	506	m 7.0	3,542.00	506	m	7.00	3,542.00
	Series 1200: Traffic Signs & Road Markings				69,702,00				69,702,00				69,702,00				69.702.00				69,702.00			_	59.702.00			69,702,00			0.00	69,702,00
					,				,-						Т						,				,							,
	Series 1300 & 1400: Lighting Columns & Electrical Work																															
	Drainage to embankments and roundabout (ALL OPTIONS)																															
۵	Lighting columns	33	nr	2 250 00	75 000 00	33	nr	2 250 00	75 000 00	33	or	2 250 00	75 000 00	33		2 250 00	75.000.00	33	pr.	2 250 00	75.000.00	33	pr 2.25		75 000 00	33	pr 2 250.0	75.000.00	33	or	2 250 00	75.000.00
	agreed commis	55		2,250.00	, 5,000.00		1	2,250.00	, 5,000.00	3.5		2,230.00	, 5,000.00			2,250.00	15,000.00			2,250.00	15,000.00	55			3,000.00	55		, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	33		2,250.00	15,000.00
В	Illuminated bollards	10	nr	600.00	6,000.00	10	nr	600.00	6,000.00	10	nr	600.00	6,000.00	10 n	r	600.00	6,000.00	10	nr	600.00	6,000.00	10	nr 60	0.00	6,000.00	10	nr 600.01	6,000.00	10	nr	600.00	6,000.00
с	Feeder pillar	2	nr	800.00	1,600.00	2	nr	800.00	1,600.00	2	nr	800.00	1,600.00	2 n	r	800.00	1,600.00	2	nr	800.00	1,600.00	2	nr 80	0.00	1,600.00	2	nr 800.0	1,600.00	2	nr	800.00	1,600.00
	Additional Works																															
A	Lighting columns	17	nr	2,250.00	37,950.00	17	nr	2,100.00	35,420.00	17	nr	2,250.00	37,950.00	17 n	r	2,100.00	35,420.00	17	nr	2,250.00	37,950.00	17	nr 2,10	0.00	35,420.00	17	nr 2,250.00	37,950.00	17	nr	2,100.00	35,420.00
в	Illuminated bollards	2	nr	530.00	1,060.00	2	nr	530.00	1,060.00	2	nr	530.00	1,060.00	2 n	ır	530.00	1,060.00	2	nr	530.00	1,060.00	2	nr 53	.00	1,060.00	2	nr 530.0	1,060.00	2	nr	530.00	1,060.00
c	Fooderniller			800.00	2 200 00			800.00	2 200 00			800.00	3 200 00			800.00	3 200 00			800.00	2 200 00				3 300 00		800.0				800.00	0.00
	reeder pinar	4	10	800.00	5,200.00	-		800.00	5,200.00	-		800.00	3,200.00	4 1	"	800.00	3,200.00	-		800.00	3,200.00	4			3,200.00	0	11 000.01	0.00	0		800.00	0.00
	Series 1300 & 1400: Lighting Columns & Electrical Work				124,810.00				122,280.00				124,810.00		-		122,280.00				124,810.00		-	13	22,280.00		1	121,610.00				119,080.00
	Series 1600: Piling and Embedded Retaining Walls																															
А	Piling rig and associated works, including: - Mobilize plant, labour and equipment and set up on site - Clear away on completion - Install and test working pile - Set up at each pile position - Attendance on piling																															
	- Integrity testing of piles - Test cubes				40.000.00				40.000.00												10.000.00	.						20.000.00				20.000.00
	e that also a fill second	2	item	20,000.00	40,000.00	Z	item	20,000.00	40,000.00	2	item	20,000.00 4	0,000.00	2 ite	im i	20,000.00	40,000.00	2	item 2	20,000.00	40,000.00	2	item 20,00	0.00 40,0	00.00	1	tem 20,000.00	20,000.00	1	item	20,000.00	20,000.00
В	Standing time	5.60	day	285.00	1,596.00	5.60	day	285.00	1,596.00	4.00	day	285.00 1	1,140.00	4.00 da	ay	285.00	1,140.00	4.80	day	285.00	1,368.00	4.80	day 28	.00 1,3	58.00	3.20	day 285.0	912.00	3.20	day	285.00	912.00
с	Piling	56	nr	4,150.00	232,400.00	56	nr	4,150.00	232,400.00	40	nr	4,150.00 16	56,000.00	40 n	ır	4,150.00	166,000.00	48	nr	4,150.00	199,200.00	48	nr 4,15	0.00 199,3	200.00	32	nr 4,150.0	132,800.00	32	nr	4,150.00	132,800.00
	-																															
D	Pile Caps	14	nr	16,150.00	226,100.00	14	nr	16,150.00	226,100.00	12	nr	16,150.00 19	93,800.00	12 n	ir i	16,150.00 1	93,800.00	12	nr 1	16,150.00	193,800.00	12	nr 16,15	0.00 193,	800.00	8	nr 16,150.0	129,200.00	8	nr	16,150.00	129,200.00
Е	Piling mat	7	item	7,350.00	51,450.00	7	item	7,350.00	51,450.00	6	item	7,350.00 4	4,100.00	6 ite	m	7,350.00	44,100.00	6	item	7,350.00	44,100.00	6	item 7,350	.00 44,1	.00.00	4	tem 7,350.00	29,400.00	4	item	7,350.00	29,400.00
	Series 1600: Piling and Embedded Retaining Walls				551,546.00				551,546.00				445,040.00				445,040.00				478,468.00			4	78,468.00			312,312.00				312,312.00
	Series 1700: Concrete Structures																															
A	concrete deck for viaduct; 250mm thick	3,719	m2	235.00	873,965.00	2,859	mz	235.00	ь/1,865.00	2,396	m2	235.00 56	53,083.50	1,842 m	12	235.00 4	132,846.50	1,636	m2	235.00	384,460.00	1,258	m2 23	295,1	530.00	1,073	mz 235.0	252,178.50	825	m2	235.00	193,851.50
В	Additional concrete beneath parapets; 400mm thick	506	m	850.00	430,100.00	506	m	850.00	430,100.00	326	m	850.00 27	77,100.00	326 n	n	850.00 2	277,100.00	223	m	850.00	189,227.00	223	m 85	0.00 189,	227.00	146	m 850.0	124,100.00	146	m	850.00	124,100.00
с	Concrete encasement of piers	100	m	2,770.00	277,000.00	100	_ m _	2,770.00	277,000.00	40	m	2,770.00 11	10,800.00	40 n	n	2,770.00 1	10,800.00	0	m	2,770.00	0.00	0	m 2,77	0.00	.00	0	m 2,770.0	0.00	0	_ m	2,770.00	0.00
	Companying inits			F 000 0	50.000.00			E 000 00	50.000.00		_	F 000 C2 -				5 000 00	10.000.00		_	E 000 00	0.00					10		F0.000.00	10		E 0000 000	FA 000 00
D	Expansion joints	10	nr	5,000.00	50,000.00	10	nr	5,000.00	50,000.00	6	nr	5,000.00 3	0,000.00	6 7	ir	5,000.00	30,000.00	0	nr	5,000.00	0.00	0	nr 5,00	0.00 0	.00	10	nr 5,000.00	50,000.00	10	nr	5,000.00	50,000.00
	Additional Works																															
Е	RC Bank Seat	53	m3	296.00	15,688.00	41	m3	300.00	12,300.00	106	m3	300.00 3	1,800.00	81 m	13	300.00	24,300.00	159	m3	300.00	47,700.00	122	m3 30	.00 36,6	00.00	106	m3 300.0	31,800.00	81	m3	300.00	24,300.00
				200 00				200.00								200.00				200.00							200.0				100.00	
F	KC columns beneath bank seat	40	ms	296.00	11,840.00	40	m3	300.00	12,000.00	80	ma	300.00 2	4,000.00	80 m	13	300.00	24,000.00	120	ms	300.00	36,000.00	120	m3 30	36,0	00.00	80	m3 300.01	24,000.00	80	ms	300.00	24,000.00
G	Ballast retaining wall	235	m2	1,113.00	261,555.00	209	m2	1,113.00	232,617.00	721	m2	1,113.00 80	02,473.00	644 m	12	1,113.00 7	716,772.00	987	m2	1,113.00	1,098,531.00	881	m2 1,11	1.00 980,	553.00	654	m2 1,113.0	727,902.00	584	m2	1,113.00	649,992.00
н	Earth reinforcement behind the above	2,473	m2	51.00	126,123.00	2,207	m2	51.00	112,557.00	7,830	m2	51.00 39	99,330.00	6,990 m	12	51.00 3	356,490.00	10,715	m2	51.00	546,465.00	9,565	m2 5	.00 487,	815.00	7,006	m2 51.0	357,306.00	6,254	m2	51.00	318,954.00
	5 - / - 1720 C Ch				2 045 274 00				4 700 400 00				220 505 50				4 070 000 50				2 202 202 00							4 553 305 50				4 225 407 50
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А	Steel girder beneath concrete deck; spec as Amey Girder elements -																															
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Structures Options Report Sturry Link

CO04300392/002 Revision 00

March 2017





Document Control Sheet

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Executive Summary

Amey have been commissioned by Kent County Council (KCC) to develop the concept design of a new link road in the Borough of Canterbury, Kent, to link the A28 Sturry Road to the A291 Herne Bay Road. The scheme involves constructing a new link road spanning two arms of the Stour River and a railway line (see Figure 1) in order to serve the intended development scheme to the west of Sturry.

The scheme is also intended to improve the operational safety of the existing level crossings, Sturry level crossing and the Broad Oaks level crossing, by reducing traffic using the crossings through diverting and encouraging use of the new link road and the new crossing over the railway lines and Great Stour River.

This report discusses options for the design and construction of the structures included in the proposed scheme. A multi-span viaduct option has been chosen to span the River Stour and the railway lines in order to reduce the impact on the flood plain. Over the viaduct the new link road will provide a single lane carriageway, multi-user foot/cycleway and addition bus lane.

This structures option report will discuss two bridge deck options and two bridge abutment options with a recommendation for a preferred option. The mitigating factors that affect the choice of a preferred option have included highway alignment, impact on existing watercourse, impact on Network Rail (NR) infrastructure, buildability, future maintenance, capital and whole life cost of the work, environment and the needs of other stakeholders such as the statutory undertakers and road users.

Six multi-span bridge options have been considered, with various permutations of the deck and abutment options. Each of the options has been evaluated based on the criteria stated above and priced accordingly. Recommendations for all structures have been made following discussion of all influencing factors.



Location Plan



Figure 1 Location Plan (viaduct circled in red)

Not to scale. Reproduced from the Ordnance Survey Map with the permission of the Controller of H.M. Stationery Office. Crown Copyright reserved.

Network Rail (NR) chainage: Mile 72+350yrds



Contents

1	Intr	oduction1
	1.1	Client brief1
	1.2	Aims of the study1
	1.3	Background1
	1.4	Proposed Sturry Link Viaduct
	1.5	Photographs of the location
2	Exis	ting information4
	2.1	Details of existing information4
	2.2	Network Rail restrictions
	2.3	Statutory undertakers' equipment5
	2.4	Surrounding land use and ownership5
	2.5	Site access
3	Brid	ge Design Considerations
	3.1	General Requirements8
	3.2	Piling10
4	Brid	ge Design Options11
	4.1	Other Options Considered
	4.2	Option 1: Precast Concrete Beam14
	4.3	Option 2: 4 No. Steel Beam Composite, Flat Soffit
	4.4	Option 3: 4 No. Steel Beam Composite, Curved Soffit
	4.5	Option 4: 6 No. Steel Beam Composite, Curved Soffit
	4.6	Option 5: Ladder Beam Composite, Curved Soffit
	4.7	Option 6: 5 Span Cable Stayed
5	Abu	tment Options
	5.1	Abutment 1: Wing Walls Perpendicular to Abutment Face
	5.2	Abutment 2: Splayed Wing Walls with Inspection Gallery
	5.3	Abutment 3: Splayed Wing Walls
	5.4	Abutment 4: Bank Seat on Reinforced Soil 29
6	Disc	cussion
	6.1	Construction
	6.2	Maintenance requirements



	6.3	Environmental considerations	32
	6.4	Combined Budget Works Estimates and Whole Life Costs	34
	6.5	Option Scoring	35
7	Conc	lusions	37
Арре	endix	A Structures Options Drawings	
Арре	endix	B Estimated Costs	
Арре	endix	C Options Scoring	
Арре	endix	D Network Rail Front End Pack	



1 Introduction

1.1 Client brief

Amey has been tasked by Kent County Council (KCC) to investigate and propose structure options to span the two arms of the Stour River and railway lines of the A28 to A291 Link Road in Sturry, Kent. This structures options report examines the possible options for new structures. The structures are discussed and illustrated, outlining various options considered. The favoured option in each case is identified and the reasons for that choice summarised.

The options report will identify, describe, and discuss impacts on the local community, environment and whole life costs.

1.2 Aims of the study

The aim of this study is to identify feasible options for a highway bridge crossing the Stour River and railway.

1.3 Background

The new link road, approximately 1.5km in length, comprises single carriageway construction connecting the A291 Sturry Hill Road in the east to the A28 Sturry Road in the south. From the A291 the route follows a westerly route north of the railway line before heading southwards to span over the railway and across the Great Stour and its floodplain and connect to the A28 (see Figure 1).

The proposal is for a viaduct to over sail the railway and both arms of the great Stour and its floodplain. A multi-span viaduct was decided upon by the client in order to reduce the impact on the floodplain (see Photograph 1).

KCC are in negotiation with three developers including the developers of the Sturry site. The developers and Local Enterprise Partnership (LEP) will provide the funding for the cost of the link road.

The development sites are included in the Canterbury District Draft Local Plan (2015) and the developers are expected to submit outline planning applications for these sites in Spring of 2017. KCC are progressing the highway alignment design with a view to submitting a detailed planning application early 2017.



The project is to be funded by developer contributions secured through S106 agreements and 5.9 million of LEP funding.

The current construction budget estimate for the link road is £29.6m

1.4 Proposed Sturry Link Viaduct

The proposed bridge is centred on grid reference E616942 N160042, to the west of Sturry in Kent.

The proposed bridge will be a multi-span structure with bearings and expansion joints to accommodate movement and thermal expansion effects. The benefits gained with regard to future maintenance cost savings and health and safety aspects have been considered.

The bridge will have six spans and a total length of 248.6 m with no skew angle. The proposed option will carry a 6.75 m wide single lane carriageway, 3.5 m wide bus lane, with a 3.6 m wide cycleway/footway on the east side of the bridge and a 0.6 m wide hard verge on the west side with a total width of 15.45 m. The design life of the structure is 120 years and the proposed speed limit over the structure is 40 mph.



1.5 Photographs of the location



Photograph 1 Ariel view of approximate proposed structure location



2 Existing information

2.1 Details of existing information

The site contains Network Rail's high speed St Pancras - Ashford - Canterbury West - Ramsgate route.

2.1.1 Ground summary

0 - 0.5 mbgl

Topsoil was recorded in a number of boreholes to a maximum depth of 0.5m and comprises a soft to firm dark brown sandy silty clay with some sub-rounded gravel of flint.

0.5 - 1.5 mbgl

Made ground was recorded in a number of the existing boreholes in the vicinity of the route to a depth of up to 1m and this was generally described as a firm brown grey slightly sandy clayey silt with occasional sub-angular fine to medium gravel of flints and chalk. No significant laboratory data is available for this material.

1.5 - 3.5 mbgl

The top 1-1.5m of the Alluvium is generally characterised by a soft to firm grey and brown very silty clay to clayey silt with many sub-rounded flint gravels. Plasticity results vary however and are typically found to fall within the CI or CH category, indicating clays of intermediate or high plasticity.

3.5 - 20.0 mbgl

The Thanet Formation is expected to be encountered beneath the majority of the scheme and most prominently between the existing A28 and the Canterbury to Ramsgate railway line. All historic borehole logs within this area identify this strata, which is typically found lying between 3.5mbgl and 20mbgl, with an average thickness of 16.5m.

It was described as primarily comprising medium dense blue grey clayey sandy silt interspersed with thin layers of harder siltstone. The base of this deposit is typically signified by the occurrence of the Bullhead Beds.

20.0 - 21.0 mbgl



Beneath the Thanet Formation, several historic boreholes log the occurrence of thin strata of the Bullhead Beds. This is a common stratum of well-worn rounded green flint cobbles often found at the base of the Thanet Formation. It is described as medium dense dark grey blue silt with sub-angular rounded fine to coarse flint gravels and cobbles.

2.2 Network Rail restrictions

The line speed at this location is 90 mph in each direction. The line is twin track with 3rd rail DC electricity power supply and the proposed viaduct crosses is on a straight section of track with no foreseeable adverse effects on sighting distances.

The Network Rail Front End Pack report is included in Appendix D of this report. The significant issues discussed in the report are:

- Vertical and horizontal clearances between proposed structure and railway track, taking account of all defections
- Existing service troughs
- Working on the railway in a safeguarded zone or possession
- Potential impact on existing infrastructure
- Requirement for Very High Containment parapets (H4a)

2.3 Statutory undertakers' equipment

No statutory undertakers' plant has been identified in the area of the proposed bridge except a 33kV cable running along the north edge of the Network Rail land.

The 33kV cable running along the railway shall not be disturbed during the construction of the viaduct.

2.4 Surrounding land use and ownership

The abutments and piers for the new bridge are located on private property that shall be purchased by KCC. The span of the structure and the location of the abutments have been selected to avoid significant impact on the operation of the railway during construction of the bridge and to meet Environmental Agency clearances.



Construction of the new link road will allow clear access for the construction of the bridge from either end, however developers are constructing infrastructure to the north of the railway and KCC to the south. Therefore there is potential for disruptions due to different timescales. The location for the contractor to set up a site compound for the bridge is to be confirmed in due course. Initial discussions have commenced between KCC and land owners for the necessary licences to enter onto the land to undertake the works.

The proposed bridge and approach embankments will require the acquisition of a strip of land to the north of the A28 currently owned by 3 separate owners. The current ownership of the land is shown in Figure 1 below.



Figure 2 Land ownership

2.5 Site access

Visual inspection of the existing site is accessible with permission from land owners as shown in Figure 3.