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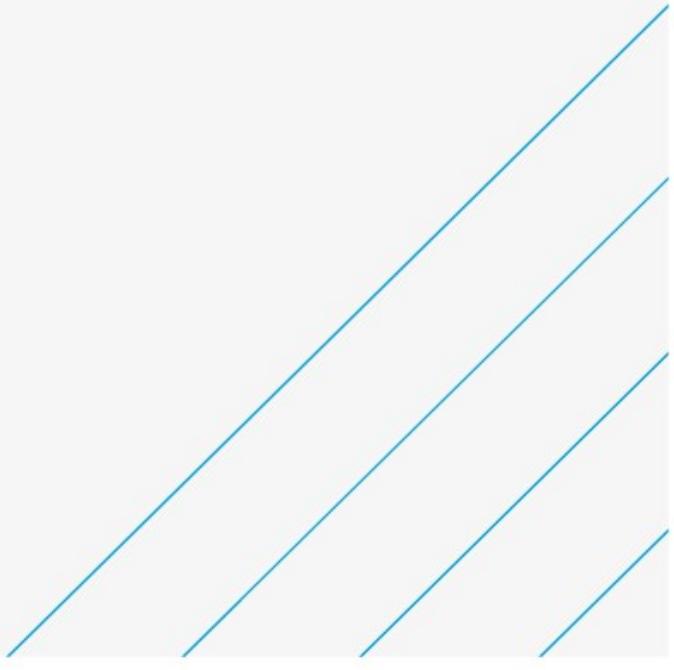
East West Rail
Central Section options

Central section capital cost estimate

14.08.2019



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Revision	Purpose description	Originated	Checked	Reviewed	Authorised	Date
D1	Draft Issue for Assumptions validation	DZ	HF	SL	MW	11.06.19
D2	Draft incorporating A,E,B routes (Atkins alternatives)	DZ	HF			18.06.19
D3	Draft including revised structures list	DZ	HF			20.06.19
D4	Draft incorporating C and D routes (Atkins alternatives)	DZ	HF			25.06.19
Iss1	Final submission including Bedford MML specific assumtpions	DZ	HF	SL	DW	16.07.19
Iss1.1	Sub-section summary added including formatting alterations	DZ	HF	SL	DW	26.07.19
Iss1.2	Updated Route estimate summaries, S&C quantification and unit rate consistency	DZ	HF	SL	DW	29.07.19
Iss1.3	Alignment F added (Section FA2)	DZ	HF	SL	DW	14.08.19

Assumptions & Qualifications

	General	Assumption Status	EWR Validation needed
A.1	*The assumptions below are further supported by the EWR assumption register - appendix A to this estimate.*	Closed	
A.2	Scope: This estimate is an option selection estimate of the CAPEX costs for Atkins revised routes A to E, covering up to: 13 Alignment options and made up of 85 sub-sections currently	Open	
A.3	**Price base date:** The estimates are based at 2nd Quarter 2019 price levels. (Network Rail former estimates were presented at 2017 price levels). Inflation to mid construction point (assumed 1Q2026) has also been included and is presented after the risk adjustment line.	Open	Yes
A.4	**Currency:** Prices are expressed in Pounds Sterling.	Closed	
A.5	**Risk/ Uncertainty:** There is an allowance for Risk & Contingency based on a 30-60% uplifts in line with industry guidelines for this stage of development. Line-wide systems factored at 60% as this was not designed/developed to the same extent as the permanent way / civils. No allowances for Optimism bias were added and these shall be factored in if necessary to "stress test" the business case reviews.	Open	Yes
A.6	**Design maturity:** The designs developed are at an early stage of development and it is based on the option selection exercise focusing on optimisation of alignments to avoid key route constraints.	Closed	
A.7	**Pricing**: The Unit rates are based on rates derived from similar UK railway Projects. High level items where scope is not confirmed is referenced based on top down asset level benchmarks, whereas whenever firm assumptions can be made from a cost modelling perspective, a bottom up detailed unit rate assessment as been conducted. The rates reflect the assumption that the works will be carried out by experienced railway contractors and the works shall be competitively tendered. Green zones for all new build areas and possession type working methods for connections and upgrades to existing railway assets if/whenever applicable.	Closed	
A.8	**Cost coverage:** No allowance has been made for operation or maintenance costs within these CAPEX figures.	Closed	
A.8.1	**Tie ins -** it has been assumed that all route tie-ins are limited to the connection point to the existing infrastructure (e.g. turnout connection). The associated costs with adding this connection to the existing infrastructure are included in this cost model but any fringe works or upgrade to existing sections of railway past this point are excluded in this cost model and will be subject to specific external studies that might be incorporated in this study on a later stage. The Bedford Midland Mainline tie in with Bedford station reconfiguration is an example of this as well as the Cambridge tie-in where track upgrade / reprofiling might also be required.	Open	Yes
A.9	As a general rule, all assets have been broken down by **Sections** to enable forming a quantity sensitive output based on track length. However, for line wide systems (such as railway control systems and communications) this was not possible and exceptionally, were estimated in a route wide basis for a better approach.	Open	Yes
A.8.2	***Indirect Costs***		
A.8.2.1	Prices are inclusive of **Contractor's indirect costs** (Preliminaries and Overheads & Profit) as well as **Employer's indirect costs** (Project management, Design and Other costs). These are calculated as a percentage uplift on Base Construction cost and Total Construction cost respectively.	Closed	Yes
A.8.2.1.1	Project management and Design costs were calculated based on the average construction costs for all complete routes to enable the baseline of PM/Design costs based on programme related features. Relating the costs solely on construction costs would generate artificially higher/lower indirect costs if/when the volumes of earthworks would change for example.	Open	Yes
A.8.2.2	These were also adjusted in comparison with typical benchmarks for NR assuming that EWR can satisfy the design development stages in a more expedient way than traditional GRIP stages.	Closed	Yes
A.8.2.3	Sustainability will be a factor to consider in terms of waste management, emissions etc. Due to the early development stage, its impact was not modelled between the various options as it is assumed the same between them.	Closed	
A.8.2.4	Assumed that land costs are split by Agricultural (normal and high) or Urban. Other GIS constraints have been identified and will be aligned in pricing to the mitigations proposed. Unit cost information used based on a 2016 London study by GLA factored for lower demographical areas.	Open	Yes
A.8.2.5	TOC/FOC compensation has been excluded and NR development costs or possession and isolation management has also been excluded	Open	Yes
	Assumptions by asset *(Except for Routes F and EA0,MVL sections - see below for details)*		
1.01	***Railway Control Systems***		
1.01.1	The signalling system is ERTMS / ETCS level 2, without any provision of emergency signals.	Closed	
1.01.2	Fringe works assumes connections to traditional signalling, therefore specific allowances will be made for the two connections at Cambridge / Bedford separately. Works to existing railway to be confirmed.	Open	Yes
1.01.3	For the purpose of defining wayside equipment quantification each signalling section was assumed to be 1000m. This does not have an impact on the pricing at this stage as the pricing is developed on a £/km basis top down approach.	Open	Yes
1.01.4	All controlled switches and crossings requirements have been assumed in section 1.04. Assumed no passing loops or bi-directionality of tracks will be required.	Open	Yes
1.01.5	Secondary Train protection is assumed not to be required. Automatic Train Protection applies.	Closed	
1.01.6	Signalling system will be controlled by an existing signalling centre with new dedicated workstations.	Open	Yes
1.01.7	Principal Supply Points are required for powering the signalling and comms infrastructure, requirements assumed in 1.03	Open	Yes
1.01.8	Fitment of in cab equipment is excluded	Closed	
1.02	***Train Power Systems***		
1.02.1	Assumes passive provision of electrification only. No physical assets to be installed but cross sections and structures will be designed to enable fitting OLE in the future.	Closed	
1.02.2	Assumed no substantial differences between each route alignment.	Closed	
1.02.3	Allowed for modifications to existing OLE in fringe works (connections with existing Network Rail infrastructure) as well as in interchange stations	Open	Yes

Assumptions & Qualifications

1.03	***Electric Power and Plant*** Discuss local power requirements for ETCS L2		
1.03.1	Assumed no substantial differences between alignments. Power requirements to be confirmed. In high level terms at this stage, it has been allowed for: - Signalling & Comms - PSP & FSP - quantification to be confirmed, cost exercise assumes 1 PSP and 4 FSP, all allocated at Route-wide level and assuming no changes between alignments. - Stations - MEP requirements covered by local station supply - Assumes 1 station DNO required. (covers footbridge, lifts, communications etc.). 1 Allowance per station - Switches and crossings - Extra over items included in S&C rates for DNO for local Points heating, points motor etc. An allowance has been made at route level (same for all routes) of circa £3m to enable connections to HV grid - this needs to be balanced against future electrification allowances.	Open	Yes
1.03.2	Renewable energy corridor (e.g. PV) - exact scope not defined at this stage, therefore this is an exclusion in terms of pricing at this stage as assumed similar impact across all routes.	Closed	
1.04	***Permanent Way / Track***		
1.04.1	Plain line rates used for new track assumes green zone and no possession management required. Possession related work will only apply to fringe areas where the route ties in to existing track.	Closed	
1.04.2	Rates priced at cost / linear m: composite unit rate adequate to this design stage.	Closed	
1.04.3	It is assumed that all track in tunnels and viaducts is slab track unless stated otherwise.	Closed	
1.04.3	The rates were built from first principles and include plain line, site clearance, shallow depth excavation. Related ancillaries cover formation preparation, fencing, maintenance roads, signage and drainage.	Closed	
1.04.4	All switches and crossings provided for operational flexibility to be associated with station location. For simplicity in quantification, two scissor crossovers were allowed per station and an extra 3 scissors crossovers for each route. Tie ins to existing railway were priced as extras / individually. No passing loops have been identified.	Open	Yes
1.04.5	Switches and crossings (S&C) have been measured and priced over and above to the plain line track and allow for additional excavation; formation; ballast; configuration of the fitting, points heating, DNO cabinet, clamp locks and backdrives. Testing and commissioning included in direct costs. - All assumed as Type F/G (100 mph)	Open	Yes
1.04.6	All S&C units are full depth and built on site. The S&C units were divided into two categories, low (traps) and high speed. Unit Rates were built from first principles and refined by benchmarks	Closed	
1.04.7	Follow up tamping has been allowed separately for both plain line and S&C and assumes that every shift covers 500m of plain line and for S&C one shift covering 3 (adjacent) point ends.	Open	Yes
1.04.8	Allowances for land reclamation or flood relief work are measured as an extra over and not included in the base track rates	Closed	
1.04.9	Assumes that no level crossings will be provided in any affected crossings - the exception to this is the alignment at Little Shelford connection	Closed	
1.05	***Telecommunication Systems***		
1.05.1	The telecoms system is GSM-R - assumes a mast spacing of 6 km and route coverage required of 49.2 km	Open	Yes
1.05.2	The core system to be provided by Network Rail. The project would provide base stations only and connections to existing systems	Open	Yes
1.05.3	Given that requirements are not defined at this stage the pricing will be top down benchmark based in the absence of more detail. There will be some opportunity for removing possible duplication once the requirements are known	Open	Yes
1.06	***Buildings & property***		
1.06.1	No buildings were assumed required for: - Electrical Control Centre, - Signalling Control Centre, - Administration Buildings, - Depots, etc.	Open	Yes
1.06.2	Station Unit Rates have been built up on a cost/m2 GFA basis with additions for Plant, Services. Etc.	Closed	
1.06.3	Stations have been itemised by category and include for: Station building (assumed modular). Platforms, car parks & approach roads are priced separately. Additional power and external works are assumed required too. Any other Track or Signalling requirements are covered by the line-wide pricing approach.	Open	Yes
1.06.3.1	• Bedford Midland: See detailed Assumptions "B". • Bedford South: either the proposed Wixams station (AN1) (http://www.wixampark.co.uk/boards/Banner%201%20-%20Welcome.pdf) or alternatively a station further north along the Midland Main Line up to the A421 (EN1) • Sandy re-located south: located to the south-west of the RSPB nature reserve (AN2 cuts ECML) • Sandy re-located north: located up to 1.5km north of the northern edge of the exiting Sandy settlement • Tempsford: located up to 1.5km south of the site of the former Tempsford station (adjacent to 'Station Road') or between the former station and the proposed new A428 • St Neots South: located between the proposed new A428 and the existing A428 south of St Neots • Cambourne: located either somewhere in the broad area to the south-west / south of the existing and planned settlements (i.e. including Cambourne West) or alternatively somewhere to the north of the A428 • Bassingbourn: located somewhere in the MoD Bassingbourn barracks site	Open	Yes
1.06.6	Sandy station - Likely to be elevated on a viaduct, requiring some link roads and potential car parks. Land requirements to be confirmed	Open	Yes
1.06.7	Assumed DDA compliance is required at stations but not for general footpaths at this stage. This implies the provision of 2 lifts and one footbridge at every station. For interchange stations this number has been assumed to be 4.	Open	Yes
1.06.8	Assumed that platforms are long enough to accommodate 4 number x 24 m long cars with an additional safety distance of 10m. Total platform length is 106m (assumed). Standard width assumed is 3m.	Open	Yes
1.06.8.1	Passive provision of 212m of platform length has not been costed in direct works so should be treated as a risk item.	Open	Yes

Assumptions & Qualifications

1.07	***Civil Engineering:*** Structures		
1.07.1	Rates are based on recovered data and information from approximately 50 separate structures completed as part of actual projects. The rates include excavation, reinforcement, formwork, concrete, bearings, expansion joints, deck waterproofing, deck finishes, P1 parapet and lighting. Viaduct construction assumed to be simply supported span sections in steel and/or concrete.	Closed	
1.07.2	**Bridges & viaducts:** The rates have been derived from cost /m2 deck area. Bridges have been defined by standard cross sections. Bridge construction assumed to be simply supported span sections in steel and/or concrete. Bridges have been categorised according to location and circumstance - road, river, etc and priced in span ranges accordingly. Viaducts have been categorised according to circumstance - flood plain, rail, highway - and construction complexity. Widths have been assumed by desktop studies only and relate to the size of the constraints rather than taking on any design considerations.	Open	Yes
1.07.3	- Flooding areas assumed to require viaducts.	Closed	
1.07.4	- Connection at Cambridge could require an overbridge to replace the existing level crossing at Little Shelford	Closed	
1.07.5	-It is assumed that every road intersection determines the existence of rail over road bridge. - It is assumed that if a farm road is being shown in GIS then it is taken as a bridge. Footpaths and Bridleways have been revised in workshops and defined which structures and locations will cover each case.	Open	Yes
1.07.6	- Brooks or rivers - Culvert when narrow, otherwise a water underbridge or viaduct when a flood plain applies. All culverts identified in costings where either generated from direct constraints identified in track models or through solutions for environmental constraints	Open	Yes
1.07.6.1	For GIS identified Culverts a standard length of 50m was assumed		
1.07.7	Further work will be needed to identify possible footbridge locations - at the moment only the footbridges manually identified result of workshops have been included in non-station areas.	Open	Yes
1.07.7	**Car Parks:** Assumed that all car parks are multi-storey. Capacity is not defined at this stage so an allowance based on the benchmarked capacity and associated unit costs was used. The references are 13 UK Rail projects that delivered Multi storey car parks to stations with capacities varying between 400-1000 spaces and an average of 600 which was the quantity used to set the baseline, excluding Bedford South defined in 720 and Sandy North/South 540. Assumed 1 car park per new station.	Open	Yes
1.07	***Civil Engineering:*** Earthworks & civils		
1.07.9	Embankments & Cuttings have been measured and priced as extra over the trackwork.	Closed	
1.07.10	Cuttings and Embankments cross-sections assumed a 15m track bed width and slopes graded at 1:2.5 for Embankments and 1:3.5 for Cuttings. All volumes are taken directly from the model, areas were recorded at 20m spacing in longitudinal profile and depths with a 50 m spacing. It was assumed that earthworks grading is adequate for all categories of height/depth <10m. No earth stabilisation methods, (e.g. soil nailing and rock netting) have been assumed at this stage and is assumed the grading of earthworks suffice to provide stable profiles. A cost model was developed to express cost as a function of depth/height of the cutting/embankment and the volumes of excavation/fill have been split into 5m depth/height intervals and costs calculated from the respective average rate.	Open	Yes
1.07.11	The volumes of cut and fill (generated from earthworks modelling) are based on the following assumptions:	Open	Yes
1.07.12	It is assumed that the maintenance roads are levelled therefore no earthworks volumes have been allowed for. This is a simplification at this stage of development and will need further work. The length of maintenance roads has been calculated on route length x 2 minus the length of viaducts (do not apply). Lineside lighting is excluded	Open	Yes
1.07.13	The formation materials are not included in the plain line unit rate nor in the Earthworks volumes presented. This would mean that further work would be required to confirm final volumes (m3) to include the following extra over items included in the costings: 1) Sand blanket at 200mm depth | 2) Formation capping layer 300mm | 3) Geotextile for the full width	Open	Yes
1.07.14	Considering the location of the maintenance roads, access points were added as route-wide allowances only (1 per 1.5 km). Maintenance roads assumed at 3.5m wide each, no connections of these access roads to the main networks have been designed at this stage therefore a route-wide allowance only applies (1 per 3 km).	Open	Yes
1.07.15	Where we know there are landfill sites we need to include a larger percentage of contamination	Open	Yes
1.07.16	% of re-used of material assumed to be 50%. For the disposal and removal, we assumed that 80% is inert (40% of total excavation), 15% is non-hazardous (7.5% of total excavation) and the remainder is hazardous (2.5% of total).	Open	Yes
1.07.17	It has been assumed that 50% of route length require toe drains (Embankment) and the remaining 50% require toe and crest drain required (Cutting) .	Open	Yes
1.07.17.1	No extra works costs were assumed to move the existing volumes generated in the cuttings to be re-used in the fill volumes required. The delta between rates for lower depths and the rate for higher depths provides this.	Open	Yes
1.08	***Enabling works / Other project development costs - Land, Environmental and third parties***		
1.08.1	All environmental and third party constraints are lifted from GIS with a reference quantity (number, length or area) and priced according to its direct costs or mitigation measure provided.	Open	Yes
1.08.2	All environmental mitigations that require land replacement has been assumed on a one to one basis. E.g. if the project is clashing with 100m2, the allowance for replacement elsewhere considered it also 100m2.	Open	Yes
1.08.2.1	The quantification of required land will vary depending on the land registry ownership intersections. Depending on the mitigation measure applicable both a factor 1x or 2x was applied to ensure that adequate land allowances were made depending on the "severity" of the mitigation required.	Open	Yes
1.08.2.2	Required land for Stations, it was assumed a footprint of 500m2, for Car parks it was assumed 1000m2 so a total combined of 1500m2		
1.08.3	Scope of known utilities (visible in GIS) to be priced. Scope of unknown utilities to be part Provisional sum part handled through risk. - National grid available. - Water - Pipeline CLH	Open	Yes
1.08.4	An allowance was made for Utility Diversions. For Acoustic Barriers and Utility Diversions it has been assumed that these only apply to urban areas.	Open	Yes
1.09	**Rolling Stock**		
1.09.1	Provision of new passenger trains not included	Closed	
1.09.2	Adaptation of passenger or freight fleet to new systems (Signalling & Comms) excluded and assumed by others	Closed	

Assumptions & Qualifications

B	***Bedford Midland Station assumptions***	
B.01	CA cost estimate for this section of route (EA0) needs to be developed to allow comparisons between routes that would go via Bedford South and Bedford Midland, an indicative alignment centre line is to be developed for this section that avoids interaction with the existing Thameslink sidings. This new alignment option is to be subjected to initial environmental appraisal.	Open
B.02	Central Bedford is an urban area, as such there are multiple issues to be considered in the development of the alignment options. From south west to north east, these include: - Connection to existing Marston Vale Line - Route through the Bedford St Johns area; - Crossing of the River Ouse - Interface with Thameslink depot - Passing underneath Ford End Road - Provision of additional platforms at Bedford Station - Interface with Midland Mainline - Passing underneath Bromham Road	Open
B.03	Atkins new alignment: option that passes to the east of the Thameslink sidings. Conceptual layout agreed with Paul Sparrow on 26/06/19.	Open
B.04	Extents of work: - South western boundary - Ampthill Rd footbridge on Marston Vale Line - North eastern boundary – In the vicinity of Bromham Road	Open
B.05	New connection to MML to the immediate south of Bromham Rd & associated mods to up slow & down slow	Open
B.06	New two track railway through Bedford midland station, electrified from north junction to south of platforms	Open
B.07	Rebuilt Bedford station building, with 2 new platform faces for E_W rail	Open
B.08	Mods to car park, forecourt etc. All car parks affected have had an allowance for break up and demolition, build new MSCP elsewhere but no compensation costs were deemed required. This is a risk item.	Open
B.09	Reconstruction of two track railway on Marston vale railway from Bedford Midland to start of existing two track, including new bridge across river course	Open
B.10	Reconstruction of Bedford st Johns as a two platform station	Open
B.11	Resignalling of Marston vale and existing Slow lines between Bedford to proposed new Bedford north junction. Provisional sums allowed to cover for interfaces between different signalling systems and staging works required.	Open
B.12	Track renewal Kempston Hardwick to Bedford midland on Marston Vale Line	Open
B.13	Allowances for bridge renewals, car park replacements	Open
C	***Alignment F: Cambourne Station, Northstowe & Cambridge Tie In***	
C.01	Allowance for access routes to Cambourne station as this would be on the opposite side of the A428 dual carriageway from the town. Small car park and new foot/cycleway routes considered - including bridge over the dual carriageway.	Open
C.02	Allowance for Route F for access routes to Northstowe station, including new foot/cycleway routes and a new guided bus stop.	Open
C.04	It is assumed that the proposed Cambridge rowing lake would be constructed and operational prior to the construction of Route F.	Open
C.05	Grade separated structure considered for connecting Route F and the West Anglia Main Line, due to the complexity of the structure an additional cost allowance has been estimated. The grade separated structure is likely to be required for Route F, but not for those routes which join the existing network near Foxton is the need to accommodate EWR Norwich services that would reverse in Cambridge in a Route F scenario.	Open
C.06	Allowance for reconfiguration/reconstruction works in the rowing lake.The construction of a flyover structure on top of the proposed rowing lake would likely impose costs.	Open
C.07	Fen road level crossing would need to be closed, it has been assumed that this will have occur in advance of the proposed rowing lake works. A potential closure mechanism which would preserve agricultural access would be to construct a 3.5km agricultural access track south from Waterbeach. Level crossing closure is excluded from this estimate.	Open
C.08	The connection to Route F to the existing West Anglia line would require modifications to the existing railway's signalling, overhead wire and telecoms systems.	Open
C.09	No changes are expected to be required to Cambridge North station to accommodate EWR services.	Open
C.10	Cambridge station's works for allow reversing are excluded in the pricing (improving the track, signalling and OLE layouts for Cambridge station's existing north facing bay platforms as Route F would require EWR services to reverse at Cambridge to allow journeys to/from Norwich and Ipswich). This reversal would not be required for Routes A-E. The train reversal would need extra platform capacity at Cambridge, also excluded.	Open
C.11	An additional island platform is likely to be required at Cambridge for all route options A to F, this is constant between options and doesn't need to be included in Route F.	Open
C.12	Cambourne and Norhstowe stations considered as elevated stations.	Open
C.13	No extra footbridges along the route beyond the stations areas.	Open
C.15	Allowance for water pipeline protection between chainage 51860-52500.	Open
C.16	No works have been assumed for the intersection between Fen Line and A14.	Open

Assumptions & Qualifications

E	***Exclusions***		
E.1	Value Added Tax or other Taxes.	Closed	
E.2	Escalation during the lead in and construction periods (i.e. all costs are therefore based at current price levels: 2Q19).	Open	Yes
E.3	Financing	Closed	
E.4	TOC/FOC compensation costs and track access and operational charges. Same applies for possession management	Open	Yes
E.5	Legal & Parliamentary/ Governmental Fees.	Closed	
E.6	Estate, Local Planning Fees. Public Consultation Costs.	Open	Yes
E.7	Third party compensation other than building and land compensation costs identified through the GIS work. Environmental costs have been allowed for on the basis of the most likely mitigation measure but its full extent requires consultation and finalisation of alignments.	Open	Yes
E.8	Wider route / existing track upgrades cost. - only tie ins with existing infrastructure have been provided	Open	Yes
E.10	Level crossings, other than those specified	Open	Yes
E.11	Any Overhead Line Electrification physical assets. This project only includes for passive provision at cross section level only. All works to associated feeder / substations, or SCADA systems relating to power are therefore excluded.	Closed	
E.12	Depots and stabling works assumed not required for central section - already included in other sections.	Closed	
E.13	Maintenance of infrastructure - predictive and automated model aimed for but not possible to price in detail at this stage. To be confirmed in following stages	Closed	
E.14	Station upgrades to Cambridge have not been considered (Bedford Station upgrade considered in section EA0) - EWR to advise	Open	Yes
E.15	Network Rail development, planning and management costs.	Closed	
E.16	Maintenance roads associated earthworks have not been modelled	Open	Yes
E.17	Lineside lighting has not been included	Open	Yes
E.18	Optimism Bias is not included	Open	Yes
E.19	All utilities over and above those identifiable via GIS are to be considered as risk items. This will include types such as Water supply, Sewage and Communications.	Open	Yes
E.20	Demolition of trees has only been considered through GIS identification of wood / protected areas. The regular demolition and clearance of trees has only been allowed through the general site clearance allowances and anything over and above this shall be deemed as a risk item at this stage.	Open	Yes
O	***Opportunities***		
O.1	No deductions were applied to balancing volumes of earthworks other than the percentages assumed of volumes re-used locally.	Open	Yes
O.2	Enable renewable energy (passive provision) within corridors	Open	Yes
O.3	Discuss opportunities for aligning earthworks with HS2.	Open	Yes
O.4	Where ancillary signalling equipment is going to be located	Open	Yes
O.5	Try to limit tunnels to up to 200m and avoid introducing them	Open	Yes
O.6	ECML interface - EWR station will sit above (Bletchley is a similar example)	Open	Yes
O.7	EA5-6 - alternative straight alignment can generate a saving of 0.5 Km route length. Assuming the same cost / km this could offer a saving of £35m.	Open	Yes
O.8	A provisional sum was added to cover for archaeological investigations and handling. This is currently over and above the extra land fac	Open	Yes
O.9	An allowance for GRID connections has been aincluded for all options. This does not affect the option selection criteria but should be revised in light of electrification requirements to avoid double counting	Open	Yes
O.10	Opportunities to reduce S&C costs through modularity of equipment should alignments permit and also more efficient installation in green field site areas.	Open	Yes
	Bedford Midland Mainline connection only (MVL+EA0)		
O.11	It was assumed that a footbridge will be required to maintain the existing pedestrian access at MVL: 2625	Open	Yes
O.12	Footbridge with ramps next to River Great Ouse and depot to be removed and replaced with simpler structure with lifts at both extremes given the more constrained space	Open	Yes
O.13	From v1.2 it has been assumed that an opportunity will arise from the EWR West section project as it is currently planned that level crossing at kempston Hardwick will be removed and replaced with an overbridge. No works have been priced in the MVL sub-section in this Central Section allowances. This is a materialised opportunity from v1.2 onwards.	Closed	
O.14	Route F, section FA2 - 61690 - the viaduct long - Highlight opportunity to reduce but currenlty at this length to avoid other structures and optimum crossing of lake.		
R	***Risks -*** *For further details please refer to the qualitative risk workshop undertaken on the 12.08.19*		
R.1	EA3 - 1400 - Farm access not priced - might be required		
R.2	EA5 - 20100 - building costs were not included - assumed it can be realigned and VE		
R.3	EA7 - 28900 - risk of overhead cable - not priced		
R.4	EA7 - 30200 - Opportunity to remove priced OB		
R.5	EA8 - 36800 - farm roads have not allowed for enabling structures from aerial imagery analysis. Only when it is obviously		
R.6	EA8 - 36800 - risk of overhead cable - not priced		
R.7	EA9 - 43900 - opportunity for Fill + culverts instead of viaduct		
R.8	EA9 - 48230 - risk of overhead cable - not priced		
R.9	EA9 - 48600 - UB water might not be required - flood plain		
R.10	AA1 - Viaduct might require deeper piles - 15% uplift used but this might be higher		
R.11	AA1/B1A2 - Opportunity to de-scope viaduct spec when confirming flood plain impact		
R.12	B1A2 - Risk to be managed around alignment feasibility		
R.13	B1A3 - Old airfield site - no hardstanding / layout alterations assumed.		
R.14	B2A2 - conflicts with buildings not priced for - the alignment will be VE's over the next iteration		
R.15	B2A2 (ch 18800) - EA5 - excluded costs of buildings as expected to re-assess the alignment to avoid hitting them.		
R.16	AA2 - risk to be considered / quantified - supporting 1km + 300m tunnel + retained cutting (1km)		
R.17	AA3 - 43200-44000 - risk that viaduct / tunnelling requirements from MoD. Opportunity to remove viaduct at 43000		
R.18	AA3 - 51250 - assumed no buildings will be affected - alignment will be optimised to reduce this risk		
R.19	DA5 - 39300 - Substation in cutting area (£3M allowance in direct costs)		
R.20	FA2 - 51860 - Borrowing pits		
	Bedford Midland Mainline connection only (MVL+EA0)		
R.20	Kempston Hardwick Level crossing conversion might require an overbridge instead.		
R.21	All MVL section has been deemed to have fencing in good condition - no works have been priced in this section for protection of the corridor		
R.22	Cauldwell street car park assumed that no compensation / new car park will be required. Priced for enabling works only to break up / demolition of existing areas.		
R.23	For Further details on all assumptions for every asset at EA0-MVL please check ScopeMML page		

East West Rail
Central Section options
Bedford - Cambridge link
Jul-19

Summary by RMM breakdown - Includes DRAFT Land assessment

FAITHFUL+GOULD
Member of the SNC-Lavalin Group

Project Number	5187419	***Route length (Km)***	**42.5**	**53.8**	**54.5**	**49.7**	**49.2**	**53.7**	**58.4**	**5.3**
Project Name	Central Section options - Bedford - Cambridge link	***Single Track length (Km)***	**85**	**108**	**109**	**99**	**94**	**103**	**117**	**11**
Stage	Definition	***Number of stations***	**3**	**3**	**3**	**3**	**4**	**4**	**4**	**-**
Client	EWR	***Cut volume (m3)***	**5,411,468**	**8,725,607**	**8,808,805**	**2,395,181**	**5,664,860**	**12,078,424**	**3,263,921**	**-**
Price Base Date	2Q19	***Fill volume (m3)***	**7,055,069**	**8,685,649**	**9,670,197**	**9,050,058**	**9,081,242**	**9,825,176**	**11,363,560**	**-**
Estimate Date	29 July 2019	***Net Fill volume (m3)***	**4,223,508**	**5,486,574**	**5,488,486**	**7,831,319**	**6,319,738**	**4,100,728**	**9,207,776**	**-**

See "Input" sheet diagram for definition of start and end points

Summary of Group Element Costs

		Complete	Complete	Complete	Complete	Complete	Complete	Complete	MVL	
RMM Vol 1 Ref	**Group Element**	**A - Atkins**	**B1A - Atkins**	**B2A - Atkins**	**C - Atkins**	**D - Atkins**	**E - Atkins**	**F - Atkins**	**MVL (Kempston-Hardwick to EA0)**	**Comments**
1.01	Railway Control Systems	£37m	£37m	£37m	£37m	£43m	£43m	£37m	£2m	Route wide estimate. Allowance for fringe works and signalling mods to existing NR infrastructure.
1.02	Train Power Systems	£1.5m	£1.5m	£1.5m	£1.5m	£1.5m	£1.5m	£1.5m	£0m	Assumes passive provision of electrification only local OLE at tie in points.
1.03	Electric Power and Plant	£6.3m	£6.3m	£6.3m	£6.3m	£7.3m	£7.3m	£7.3m	£0m	Only includes: Signalling & Comms - PSP & FSP, Stations - MEP. Switches and Crossings (Extra over items included in S&C rates for DNO for local Points heating, points motor, etc.)
1.04	Permanent Way / Track	£95m	£110m	£112m	£108m	£106m	£110m	£127m	£12m	Plain line, S&C, follow up tamping and track formation.
1.05	Telecommunication Systems	£9m	£9m	£9m	£9m	£10m	£10m	£10m	£0m	Route wide estimate.
1.06	Buildings and Property	£35m	£35m	£36m	£35m	£42m	£42m	£47m	£0m	Station (building only), Car Parks and lifts.
1.07	Civil Engineering	£1,123m	£1,368m	£1,386m	£1,377m	£1,206m	£1,220m	£1,786m	£1m	Earthworks, structures (including environmental mitigation solutions), roads, fencing, track and toe drainage.
1.08	Enabling Works	£10m	£12m	£15m	£10m	£15m	£20m	£15m	£0m	Includes: site clearance, removal and treatment of contaminated land, utility diversion/protection and building demolition.
1.09	Rolling Stock	£0m	£0m	£0m	£0m	£0m	£0m	£0m	£0m	Provision of new passenger trains not included.
	Base construction	**£1,317m**	**£1,579m**	**£1,603m**	**£1,583m**	**£1,431m**	**£1,454m**	**£2,032m**	**£15m**	
2.01	Preliminaries	£207m	£246m	£250m	£247m	£226m	£229m	£314m	£3m	Defined individually by RMM asset, between 15% and 35% of the Base Construction cost.
2.02	Contractor Overheads and Profit	£152m	£183m	£185m	£183m	£166m	£168m	£235m	£2m	10% on Base Construction cost + Preliminaries.
	Indirect construction	**£359m**	**£429m**	**£435m**	**£430m**	**£391m**	**£397m**	**£549m**	**£4m**	
	CONSTRUCTION COST (C)	**£1,677m**	**£2,008m**	**£2,038m**	**£2,013m**	**£1,822m**	**£1,851m**	**£2,581m**	**£20m**	
3.01	Project Design Team Fees	£212m	£212m	£212m	£212m	£212m	£212m	£212m	£2m	Defined individually by RMM asset, between 12% and 20% of the Average total construction cost for all routes.
3.02	Project Management Team Fees	£79m	£79m	£79m	£79m	£79m	£79m	£79m	£1m	4.5% on Average Total construction cost for all routes.
3.03	Other Project Development *(excluding Land Cost and compensation costs)*	£8m	£10m	£10m	£10m	£9m	£9m	£13m	£0m	Other project costs excluding Land and Compensation cost. 0.5% on Total Construction Cost.
3.03.01.01	Land and property cost	£44m	£114m	£112m	£221m	£199m	£91m	£105m	£0m	Under review - refer to Summary Land for next stage iteration. Land cost for the complete Corridor Impact Area according to the Agricultural Land Classification and re-planting costs depending on the type of area affected. Archaeological studies included here and items benchmarked against A14, land covered through ALC's. Also includes: Re-Planting for; Priority Habitat, Wildlife site, TPOs; Listed Building monitoring protection costs and Building compensation costs (Residential, Commercial, others).
3.03.02.02.03	Compensation Costs (TOC / FOC only)	**£0.0m**	**£0.0m**	**£0.0m**	**£0.0m**	**£0.0m**	**£0.0m**	**£0.0m**	**£0.0m**	Under review. Excluded for now - included as a risk item in risk register
	Employer Indirect	**£343m**	**£414m**	**£412m**	**£522m**	**£499m**	**£391m**	**£409m**	**£3m**	
	POINT ESTIMATE Construction + Development Cost (E)	**£2,019m**	**£2,423m**	**£2,450m**	**£2,535m**	**£2,321m**	**£2,242m**	**£2,990m**	**£23m**	
4.01	Risk / Uncertainty	£621m	£750m	£760m	£794m	£734m	£701m	£923m	£7m	Considered on Point Estimate. Individual percentages by asset and route. Optimism bias has been excluded. Deemed to be used elsewhere to stress test the business case.
	Expected Final Cost Cost limit excluding inflation (F)	**£2,641m**	**£3,173m**	**£3,210m**	**£3,330m**	**£3,055m**	**£2,943m**	**£3,913m**	**£30m**	**EFC at 2019 price base date - no inflation added**
5.01	Inflation (1Q26)	£802m	£963m	£975m	£1,011m	£928m	£893m	£1,188m	£9m	BCIS General Civil Engineering: 30.4% - Inflation to mid-construction point
	TOTAL INFLATION ALLOWANCE (G)	**£802m**	**£963m**	**£975m**	**£1,011m**	**£928m**	**£893m**	**£1,188m**	**£9m**	
	EXPECTED FINAL COST - EFC TOTAL COST LIMIT (H)	**£3,443m**	**£4,136m**	**£4,184m**	**£4,340m**	**£3,983m**	**£3,836m**	**£5,101m**	**£39m**	EFC with inflation added to mid construction point
	EFC - Price date: 3Q17	**£2,510m**	**£3,016m**	**£3,051m**	**£3,165m**	**£2,904m**	**£2,797m**	**£3,720m**	**£28m**	BCIS General Civil Engineering: -4.9%. Base: 2Q19
	£m / route km	**£81m/km**	**£77m/km**	**£77m/km**	**£87m/km**	**£81m/km**	**£71m/km**	**£87m/km**	**£7m/km**	
	£m / STK	**£41m/km**	**£38m/km**	**£38m/km**	**£44m/km**	**£42m/km**	**£37m/km**	**£44m/km**	**£4m/km**	

Input sheet

Project data

Project	*East West Rail*	
Description	*Central Section options*	
Scope	*Bedford - Cambridge link*	
Estimate Date	*29/07/2019*	
Price Base Date	**(Quarter-Year)**	2Q19

Technical data

Input by user
Calculated field

More info:

Routes-Sections

Cross-section

Options

Sections covered

CNRM?
DNRM

	Section	EN1	EN2	EN3	EN4	EN5	EN6	EN7	EA1	EA2	EA3	EA4	EA5	EA6	EA7
Route option	E - Atkins								🟩	🟩	🟩	🟩	🟩	🟩	🟩
	A - Atkins														
	B1A - Atkins													🟩	🟩
	B2A - Atkins												🟩	🟩	🟩
	C - Atkins														
	D - Atkins								🟩	🟩	🟩				
	F - Atkins												🟩	🟩	🟩
	MVL (Kempston-Hardwick to EA0)														

Section	AA1	AA2	AA3	EA8	EA9	B1A2	B2A2	B1A3	B1A4	FBS	FBMM	FC1	FC2	R.Wide	DA4	DA5	CA3	EA0	MVL	FA2	FC3	Route Length	Route Length
E - Atkins				🟩	🟩						🟩	🟩		🟩				🟩				53.68	103.5
A - Atkins	🟩	🟩	🟩							🟩		🟩		🟩								42.46	84.9
B1A - Atkins	🟩			🟩	🟩	🟩		🟩	🟩	🟩		🟩		🟩								53.82	107.6
B2A - Atkins	🟩			🟩	🟩	🟩	🟩			🟩		🟩		🟩								54.46	108.9
C - Atkins	🟩		🟩			🟩				🟩		🟩		🟩		🟩	🟩					49.67	99.3
D - Atkins			🟩								🟩	🟩		🟩	🟩	🟩		🟩				49.18	94.5
F - Atkins	🟩					🟩	🟩			🟩				🟩						🟩	🟩	58.41	116.8
MVL (Kempston-Hardwick to EA0)																			🟩				
																						49.22	97.7

Generic Parameters

High-Level

Parameter	UoM	Input value	
Route Length	*Km*	49.2	*Average value for options A to E to determine quantities of route wide assets (Route F excluded due to being integrated in the study in a later stage)*
Track Length (single)	*STK (Km)*	97.7	
Route Speed	*Km/h*	160	*Selection available*
Nr of tracks	*nr*	*2.0*	*Calculated*
Special conditions required per section	Y/N	-	
New Track Length	*STK (Km)*	-	
Track length to renew	*STK (Km)*	-	
Track length to remove	*STK (Km)*	-	
Ballasted Track (Slew)	*STK*	-	*Assumed none required*

Detailed Estimate (section detail level)

Parameter	EN1	EN2	EN3	EN4	EN5	EN6	EN7	EA1	EA2	EA3	EA4	EA5	EA6	EA7
Route Length	2.90	7.25	4.12	8.70	4.20	9.34	11.65	2.80	8.06	2.92	2.49	5.98	2.42	4.19
Track Length (single)	5.80	14.50	8.24	17.39	8.39	18.68	23.30	5.60	16.12	5.84	4.98	11.96	4.83	8.37
Route Speed	160	160	160	160	160	160	160	160	160	160	160	160	160	160
Nr of tracks	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Special conditions required per section	N	N	N	N	N	N	N	N	N	N	N	N	N	N
New Track Length														
Track length to renew														
Track length to remove														
Ballasted Track (Slew)														

Parameter	AA1	AA2	AA3	EA8	EA9	B1A2	B2A2	B1A3	B1A4	FBS	FBMM	FC1	FC2	R.Wide	DA4	DA5	CA3	EA0	MVL	FA2	FC3
Route Length	5.86	15.23	21.37	9.55	13.34	7.36	5.77	8.22	2.89	0.00	0.00	0.00	0.00	0.00	5.81	6.28	8.80			26.84	0.00
Track Length (single)	11.72	30.46	42.74	19.10	26.68	14.72	11.54	16.44	5.77	0.00	0.00	0.00	0.00	0.00	11.63	12.56	17.60			53.67	0.00
Route Speed	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160
Nr of tracks	2	2	2	2	2	2	2	2	2	0	0	0	0	0	2	2	2	2	2	2	0
Special conditions required per section	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	Y	N	N
New Track Length																		3.88	-		
Track length to renew																		-	10.60		
Track length to remove																		1.28	-		
Ballasted Track (Slew)																		-	-		

Design Parameters

1.01 Railway Control System

Included

Parameter	UoM	Input value	
Signalling Track Length (STK)	*Km*	97.7	*Average value for options A to E to determine quantities of route wide assets (Route F*
System Type	-	ERTMS Level 2	*Defined*
Section Length	*Km*	1	*(Assumed)*
Train protection	*Nr*		*ATP only*
Fringe works	*Nr*	*(Section input)*	*For Signalling & Track adjustments*
Rolling stock train fitment	*Excluded*	0	
Estimate RCS per nr of SEUs	*SEU*	-	*Only applied in EA0-MVL*

Parameter	EN1	EN2	EN3	EN4	EN5	EN6	EN7	EA1	EA2	EA3	EA4	EA5	EA6	EA7
Signalling Track Length (STK)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
System Type	ERTMS Level 2	ERTMS Level 2	ERTMS Level 2	ERTMS Level 2	ERTMS Level 2	ERTMS Level 2	ERTMS Level 2	ERTMS Level 2	ERTMS Level 2	ERTMS Level 2	ERTMS Level 2	ERTMS Level 2	ERTMS Level 2	ERTMS Level 2
Section Length	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Train protection														
Fringe works														
Rolling stock train fitment	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estimate RCS per nr of SEUs														

Parameter	AA1	AA2	AA3	EA8	EA9	B1A2	B2A2	B1A3	B1A4	FBS	FBMM	FC1	FC2	R.Wide	DA4	DA5	CA3	EA0	MVL	FA2	FC3
Signalling Track Length (STK)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	97.70	0.00	0.00	0.00			0.00	0.00
System Type	ERTMS Level 2	ERTMS Level 2	ERTMS Level 2	ERTMS Level 2	ERTMS Level 2	ERTMS Level 2	ERTMS Level 2	ERTMS Level 2	ERTMS Level 2	ERTMS Level 2	ERTMS Level 2	ERTMS Level 2	ERTMS Level 2	ERTMS Level 2	ERTMS Level 2	ERTMS Level 3	ERTMS Level 9			ERTMS Level 14	ERTMS Level 15
Section Length	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			1	1
Train protection																					
Fringe works										1		1	1								1
Rolling stock train fitment	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			0	0
Estimate RCS per nr of SEUs																		14	1		

1.02 Train Power System

Included

Spot items only - Existing OLE mods

Parameter	UoM	Input value	
Electrification type	*m*		*(Assumes not required for pricing)*
Mast spacing	*m*		*(Assumes not required for pricing)*

Parameter	EN1	EN2	EN3	EN4	EN5	EN6	EN7	EA1	EA2	EA3	EA4	EA5	EA6	EA7
Electrification type														
Mast spacing														

Parameter	AA1	AA2	AA3	EA8	EA9	B1A2	B2A2	B1A3	B1A4	FBS	FBMM	FC1	FC2	R.Wide	DA4	DA5	CA3	EA0	MVL	FA2	FC3
Electrification type																					
Mast spacing																					

1.03 Electric Power and Plant

Included

Spot items only - Power to stations & signalling

Parameter	UoM	Input value	
FS Spacing	*Km*	60	(Assumes not required for pricing)
AT Spacing	*Km*	15	(Assumes not required for pricing)
Struct Spacing Straight	*m*		(Assumes not required for pricing)
Struct Spacing Curves	*m*		(Assumes not required for pricing)
Curve to Straight Line Ratio	%		(Assumes not required for pricing)
Structure Foundation Type	-	Base	(Assumes not required for pricing)

Parameter	EN1	EN2	EN3	EN4	EN5	EN6	EN7	EA1	EA2	EA3	EA4	EA5	EA6	EA7
FS Spacing	60	60	60	60	60	60	60	60	60	60	60	60	60	60
AT Spacing	15	15	15	15	15	15	15	15	15	15	15	15	15	15
Struct Spacing Straight														
Struct Spacing Curves														
Curve to Straight Line Ratio														
Structure Foundation Type	Base	Base	Base	Base	Base	Base	Base	Base	Base	Base	Base	Base	Base	Base

Parameter	AA1	AA2	AA3	EA8	EA9	B1A2	B2A2	B1A3	B1A4	FBS	FBMM	FC1	FC2	R.Wide	DA4	DA5	CA3	EA0	MVL	FA2	FC3
FS Spacing	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
AT Spacing	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
Struct Spacing Straight																					
Struct Spacing Curves																					
Curve to Straight Line Ratio																					
Structure Foundation Type	Base	Base	Base	Base	Base	Base	Base	Base	Base	Base	Base	Base	Base	Base	Base	Base	Base	Base	Base	Base	Base

1.04 *Permanent Way / Track* — *Included*

Parameter	UoM	Input value		EN1	EN2	EN3	EN4	EN5	EN6	EN7	EA1	EA2	EA3	EA4	EA5	EA6	EA7	AA1	AA2	AA3	EA8	EA9	B1A2	B2A2	B1A3	B1A4	FBS	FBMM	FC1	FC2	R.Wide	DA4	DA5	CA3	EA0	MVL	FA2	FC3
Nr of Tracks	nr	2.0	Calculated	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0	0	0	0	2	2	2	0	0	2	0
Track Bed Width	m		log only																																			
Sleeper Spacing	m		log only																																			
Bottom Ballast Depth	mm		log only																																			
Top Ballast Depth	mm		log only																																			
Sleeper Type	-	G44	log only	G44	G44	G44	G44	G44	G44	G44	G44	G44	G44	G44	G44	G44	G44	G44	G44	G44	G44	G44	G44	G44	G44	G44	G44	G44	G44	G44	G44	G44	G44	G44	G44	G44	G44	G44
Rail Type	-	60E2 FB 400 CWR	log only	60E2 FB 400 CWR	60E2 FB 400 CWR	60E2 FB 400 CWR	60E2 FB 400 CWR	60E2 FB 400 CWR	60E2 FB 400 CWR	60E2 FB 400 CWR	60E2 FB 400 CWR	60E2 FB 400 CWR	60E2 FB 400 CWR	60E2 FB 400 CWR	60E2 FB 400 CWR	60E2 FB 400 CWR	60E2 FB 400 CWR	60E2 FB 400 CWR	60E2 FB 400 CWR	60E2 FB 400 CWR	60E2 FB 400 CWR	60E2 FB 400 CWR	60E2 FB 400 CWR	60E2 FB 400 CWR	60E2 FB 400 CWR	60E2 FB 400 CWR	60E2 FB 400 CWR	60E2 FB 400 CWR	60E2 FB 400 CWR	60E2 FB 400 CWR	60E2 FB 400 CWR	60E2 FB 400 CWR	60E2 FB 400 CWR	60E2 FB 400 CWR	60E2 FB 400 CWR	60E2 FB 400 CWR	60E2 FB 400 CWR	60E2 FB 400 CWR
Ballasted Track (Slew)	STK		Assumed none required																																			
Ballasted Track (Upgrade/replacement)	STK		Assumed none required																																			
Formation Width	m	10		10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10						10	10	10	10	10	10	
Formation Depth	mm	300	Track / NR standards	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300						300	300	300	300	300	300	

1.05 *Telecommunication Systems* — *Included*

Parameter	UoM	Input value		EN1	EN2	EN3	EN4	EN5	EN6	EN7	EA1	EA2	EA3	EA4	EA5	EA6	EA7	AA1	AA2	AA3	EA8	EA9	B1A2	B2A2	B1A3	B1A4	FBS	FBMM	FC1	FC2	R.Wide	DA4	DA5	CA3	EA0	MVL	FA2	FC3
Type of technology	-	GSM-R	Selection available	GSM-R	GSM-R	GSM-R	GSM-R	GSM-R	GSM-R	GSM-R	GSM-R	GSM-R	GSM-R	GSM-R	GSM-R	GSM-R	GSM-R	GSM-R	GSM-R	GSM-R	GSM-R	GSM-R	GSM-R	GSM-R	GSM-R	GSM-R	GSM-R	GSM-R	GSM-R	GSM-R	GSM-R	GSM-R	GSM-R	GSM-R	GSM-R	GSM-R	GSM-R	GSM-R
Mast spacing	km	6		6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Route coverage	km	49.2	Average value for all options to determine quantities of route wide assets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	49.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nr of Mast required	nr	8	Calculated	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00

1.06 *Buildings and Property* — *Included*

Parameter	UoM	Input value		EN1	EN2	EN3	EN4	EN5	EN6	EN7	EA1	EA2	EA3	EA4	EA5	EA6	EA7	AA1	AA2	AA3	EA8	EA9	B1A2	B2A2	B1A3	B1A4	FBS	FBMM	FC1	FC2	R.Wide	DA4	DA5	CA3	EA0	MVL	FA2	FC3
(see in-cell comment) **Elevated Station (Modular Building)**	Nr			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
At grade Station (Modular Building)	Nr		Assumed footprint of modular building only. Platforms, MEP, Comms elsewhere (but linked to number of stations) External works included	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Underground Stations	Nr			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Interchange Station (Modular Building)	Nr			0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0	1	0	0	0	0	0	0	1	0	1	1	0	0	0
Average m2 per platform	m2	318	Assumes 4x24m car + 10m buffer x 3 m wide	318	318	318	318	318	318	318	318	318	318	318	318	318	318	318	318	318	318	318	318	318	318	318	318	318	318	318	318	318	318	318	1113	0	318	318
nr of platforms	Nr	2		2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	N/A	N/A	2	2
Car Parks spaces (total)	Nr	600	Assume multi storey. Unit rates x car spaces	0	0	0	600	0	600	0	-	-	-	-	600	-	-	600	600	600	600	-	-	-	600	-	-	-	-	-	-	600	-	600	875	0	1200	0
at grade	%	0%		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
single deck	%	0%		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
multi storey	%	100%		-	-	-	600	-	600	-	-	-	-	-	600	-	-	600	600	600	600	-	-	-	600	-	-	-	-	-	-	600	-	600	875	-	1,200	-
Depots & Stabling	Nr	0	Assumed not required	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

1.07 Civil Engineering — *Included*

1,175

Parameter	UoM	Input value		EN1	EN2	EN3	EN4	EN5	EN6	EN7	EA1	EA2	EA3	EA4	EA5	EA6	EA7	AA1	AA2	AA3	EA8	EA9	B1A2	B2A2	B1A3	B1A4	FBS	FBMM	FC1	FC2	R.Wide	DA4	DA5	CA3	EA0	MVL	FA2	FC3
Tunnels (Blast & Drill)	*m of Route*		*None required*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tunnels (Bored Tunnel)	*m of Route*		*None required*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tunnels (Cut & Cover)	*m of Route*	-	*From Bentley model / Workshop validation*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Viaducts	*m2*	-	*From Bentley model / Workshop validation*	14,108	0	1,553	12,893	3,713	1,080	34,358	13,568	0	0	15,863	21,263	0	1,958	0	41,445	18,090	3,308	5,400	32,535	19,575	27,068	0	0	0	0	0	0	40,028	14,715	43,875	0	0	48,870	0
Viaducts - Complex	*m2*	-	*From Bentley model / Workshop validation*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	38,610	11,880	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32,805	0
Overbridge (Highways)	*m2*	-	*From Bentley model / Workshop validation*	625	450	100	750	0	2,425	1,075	3,790	6,310	0	0	0	0	980	0	5,965	5,485	2,515	2,560	0	510	0	1,660	0	0	0	0	0	0	2,400	0	0	0	14,880	0
Overbridge (Rail)	*m2*	-	*From Bentley model / Workshop validation*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	135	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Overpass (bridleway)	*m2*	-	*From Bentley model / Workshop validation*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	125	123	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Underbridge (Water)	*m2*	-	*From Bentley model / Workshop validation*	0	1,215	743	135	0	2,093	1,350	0	608	0	0	0	0	0	0	945	1,350	405	743	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Underbridge (Highways)	*m2*	-	*From Bentley model / Workshop validation*	0	600	0	600	300	200	938	0	2,330	0	560	1,660	410	490	295	700	1,765	490	5,020	2,495	0	1,750	0	0	0	0	0	0	1,230	0	1,080	0	0	5,300	0
Underbridge (Rail)	*m2*	-	*From Bentley model / Workshop validation*	0	0	0	250	0	0	0	0	0	0	0	0	0	0	0	0	0	0	250	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Underpass (concrete box)	*m2*	-	*From Bentley model / Workshop validation*	0	0	0	0	0	0	0	0	0	294	0	420	0	0	0	50	570	0	0	140	0	170	0	0	0	0	0	0	0	0	0	0	0	0	0
Underbridge (Concrete box)	*m2*	-	*From Bentley model / Workshop validation*	0	0	0	0	0	0	0	0	279	0	0	0	0	0	0	0	900	85	435	0	0	0	590	0	0	0	0	0	305	0	0	0	0	0	0
Footbridges (Data) non stations	*Nr*	-	*Non-stations only - GIS input (nr)*	0	0	0	0	0	0	0	1	1	0	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	1	0	3	1	1	0
Footbridges (Data) non stations	*m2*		*Non-stations only - GIS input (m2)*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*248*	*248*	*0*	*0*	*0*	*570*	*0*	*148*	*0*	*0*	*25*	*0*	*138*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*725*	*0*	*770*	*75*	*788*	*0*
Km between footbridges	*km*		*To be validated in workshop reviews*	2.90	7.25	4.12	8.70	4.20	9.34	11.65	2.80	8.06	2.92	2.49	5.98	2.42	4.19	2.93	15.23	21.37	4.78	13.34	7.36	5.77	8.22	2.89	0.00	0.00	0.00	0.00	0.00	5.81	6.28	8.80	0.00	0.00	8.95	0.00
Footbridges	*m2*	50	*Assumed 20m long x 2.5 m wide.*	0	0	0	50	0	50	0	248	248	0	0	50	570	0	198	50	50	75	0	138	0	50	0	0	0	0	0	0	50	725	50	770	75	888	0
Lifts (Stations)	*nr*	-	*1 per station + GIS constraints* *Assumed every station has 2 lifts and interchange stations 4. No other footbridge en-route has lifts.* *If DDA access is required a UB/OB is to be provided*	0	0	0	2	0	2	0	0	0	0	0	4	0	0	4	4	2	2	0	0	0	4	0	0	0	0	0	0	4	0	4	4	0	4	0
0% **Lifts (Non-Stations)**	*nr*	2	*Assumes none required*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0
Culverts	*m*	50	*Assumed default culvert length - Based on culverts from AA reporting* *No Culverts taken from CAD*	0	0	0	0	0	0	0	0	0	0	0	0	0	50	0	50	250	50	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nr of maintenance roads	*nr*	2		2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2						2	2	2	0	0	2	
Maintenance roads width	*m*	3.5		3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5						3.5	3.5	3.5	0	0	3.5	
Maintenance roads length	*m*	*49,216*	*Calculated*	*1,855*	*7,250*	*4,005*	*7,740*	*3,920*	*9,260*	*9,105*	*1,795*	*8,060*	*2,920*	*1,315*	*4,405*	*2,415*	*4,040*	*3,000*	*11,280*	*20,030*	*9,305*	*12,940*	*4,950*	*4,320*	*6,215*	*2,885*	*0*	*0*	*0*	*0*	*0*	*2,848*	*5,192*	*5,550*	*0*	*0*	*20,787*	*0*
Maintenance roads area	*m2*	*344,513*	*Calculated*	*12,985*	*50,750*	*28,035*	*54,180*	*27,440*	*64,820*	*63,735*	*12,565*	*56,420*	*20,440*	*9,205*	*30,835*	*16,905*	*28,280*	*21,000*	*78,960*	*140,210*	*65,135*	*90,580*	*34,650*	*30,240*	*43,505*	*20,195*	*0*	*0*	*0*	*0*	*0*	*19,936*	*36,344*	*38,850*	*0*	*0*	*145,509*	*0*
Connections to road network *(track access steps are 2x)*	*nr*		*Assumed 1 in every 5 kms (both sides = STK)*	1	3	2	3	2	4	5	1	3	1	1	2	1	2	2	6	9	4	5	3	2	3	1	0	0	0	0		2	3	4	0	0	11	0
Nr of boundary fences	*nr*	2		2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2						2	2	2	0	0	2	
Boundary fences length	*m*	*49,216*	*Calculated*	*2,900*	*7,250*	*4,120*	*8,695*	*4,195*	*9,340*	*11,650*	*2,800*	*8,060*	*2,920*	*2,490*	*5,980*	*2,415*	*4,185*	*5,860*	*15,230*	*21,370*	*9,550*	*13,340*	*7,360*	*5,770*	*8,220*	*2,885*	*0*	*0*	*0*	*0*	*0*	*5,813*	*6,282*	*8,800*	*0*	*0*	*26,837*	*0*
% High-security Fencing	*%*	25%	*palisade fencing - remaining is low spec chain-link type*	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	100%	0%	25%	25%
Acoustic barriers	*m2*	2.5	*Assumed 2.5m high - Used DLR rates*																																1,000			
Total fencing length	*m*	*98,432*	*Calculated*	*5,800*	*14,500*	*8,240*	*17,390*	*8,390*	*18,680*	*23,300*	*5,600*	*16,120*	*5,840*	*4,980*	*11,960*	*4,830*	*8,370*	*11,720*	*30,460*	*42,740*	*19,100*	*26,680*	*14,720*	*11,540*	*16,440*	*5,770*	*0*	*0*	*0*	*0*	*0*	*11,626*	*12,564*	*17,600*	*0*	*0*	*53,674*	*0*
Nr of Cess walkway	*nr*	2		2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2						2	2	2	0	0	2	
Cess walkway width	*m*	0.7		0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7						0.7	0.7	0.7	0.7	0.7	0.7	
Cess walkway length	*m*	*98*	*Calculated*	*5,800*	*14,500*	*8,240*	*17,390*	*8,390*	*18,680*	*23,300*	*5,600*	*16,120*	*5,840*	*4,980*	*11,960*	*4,830*	*8,370*	*11,720*	*30,460*	*42,740*	*19,100*	*26,680*	*14,720*	*11,540*	*16,440*	*5,770*	*0*	*0*	*0*	*0*	*0*	*11,626*	*12,564*	*17,600*	*0*	*0*	*53,674*	*0*
Cess walkway length	*m2*	*138*	*Calculated*	*8,120*	*20,300*	*11,536*	*24,346*	*11,746*	*26,152*	*32,620*	*7,840*	*22,568*	*8,176*	*6,972*	*16,744*	*6,762*	*11,718*	*16,408*	*42,644*	*59,836*	*26,740*	*37,352*	*20,608*	*16,156*	*23,016*	*8,078*	*0*	*0*	*0*	*0*	*0*	*16,276*	*17,590*	*24,640*	*0*	*0*	*75,144*	*0*
Walkways/Footpath	*m*																																					
Road diversion: Minor roads	*m2*	800	*Assumes 100m x 8m*	0	0	0	0	0	0	0	0	3,200	0	0	0	0	1,600	3,200	4,000	13,600	800	0	5,600	4,800	3,200	0	0	0	0	0	0	800	800	3,200	0	0	44,240	0
Road diversion: Single Carriageway	*m2*	-	*Assumed A Road / Primary - dealt with structures*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Road diversion: Dual Carriageway	*m2*	-	*Assumed A Road / Primary - dealt with structures*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nr of Cable troughs	*nr*	2	*Included as passive provision - if ETCS L2 is included might not be required*	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2						2	2	2	0	0	2	
Trough Type	*m*	Ground Level		Ground Level	Ground Level	Ground Level	Ground Level	Ground Level	Ground Level	Ground Level	Ground Level	Ground Level	Ground Level	Ground Level	Ground Level	Ground Level	Ground Level	Ground Level	Ground Level	Ground Level	Ground Level	Ground Level	Ground Level	Ground Level	Ground Level	Ground Level	Ground Level	Ground Level	Ground Level	Ground Level	Ground Level	Ground Level	Ground Level	Ground Level	Ground Level	Ground Level	Ground Level	Ground Level
Modelled Earthworks requirements **Cut [0-5m]**	*m3*	-	*Linked to Data*	12,337	284,989	4,275	103,451	2,647	50,753	32,655	37,457	70,072	0	0	7,249	15,946	124,978	10	158,401	124,745	216,507	137,550	123	147	271	5,617	0	0	0	0	0	2	161,620	88	0	0	103,246	0
Cut [5-10m]	*m3*	-	*Linked to Data*	109,098	245,189	0	0	0	0	0	139,091	203,019	0	45	54,610	84,490	394,797	19	159,812	348,433	1,039,153	218,061	0	0	0	53,715	0	0	0	0	0	150	228,637	88	0	0	252,287	0
Cut [>10m]	*m3*	-	*Linked to Data*	357,759	307,566	0	0	0	0	0	356,273	2,463,954	0	31	1,777,292	229,965	218,739	23	3,701,013	919,012	1,671,546	2,617,600	0	0	0	1,696,497	0	0	0	0	0	19	612,378	5	0	0	0	0
Fill [0-5m]	*m3*	-	*Linked to Data*	8,337	24,480	91,246	184,786	56,324	195,905	329,503	8,798	48,592	0	0	11,093	7,427	12,358	29,821	100,573	92,658	49,638	102,862	0	118,238	40,499	12,335	0	0	0	0	0	8,641	51,414	146,599	0	0	221,458	0
Fill [5-10m]	*m3*	-	*Linked to Data*	64,931	119,123	265,696	661,471	391,699	610,380	691,803	122,134	522,280	425,017	229,253	96,947	102,298	171,166	635,268	1,249,247	2,599,253	69,406	941,566	1,528,624	629,305	1,575,931	285,462	0	0	0	0	0	936,036	252,389	1,210,226	0	0	2,710,676	0
Fill [>10m]	*m3*	-	*Linked to Data*	759,523	877,336	64,943	210,717	263,115	346,881	0	509,536	620,410	545,095	1,056,661	2,307,255	491,445	308,489	225,298	566,968	1,555,983	213,016	852,435	405,959	360,284	624,347	0	0	0	0	0	0	783,005	0	316,565	0	0	990,151	0
Excavated materials Assumptions **Used locally as Fill**	*m3*	(average of below)	*Calculated field*	322,058	504,904	2,138	51,725	1,323	25,376	16,327	351,574	1,191,282	0	48	1,280,495	219,642	452,484	32	1,916,788	914,741	332,059	1,896,863	62	74	135	297,797	0	0	0	0	0	104	303,803	101	0	0	202,995	0
Not re-used locally [0-5m]	*%*	50%	*P Sparrow 07.06.19*	6,168	142,495	2,138	51,725	1,323	25,376	16,327	18,729	35,036	0	0	3,625	7,973	62,489	5	79,200	62,373	108,254	68,775	62	74	135	2,809	0	0	0	0	0	1	80,810	44	0	0	51,623	0
Not re-used locally [5-10m]	*%*	40%	*assumption to be refined*	43,639	98,075	0	0	0	0	0	55,636	81,207	0	18	21,844	33,796	157,919	8	63,925	139,373	415,661	87,224	0	0	0	21,486	0	0	0	0	0	60	91,455	35	0	0	100,915	0
Not re-used locally [>10m]	*%*	30%		107,328	92,270	0	0	0	0	0	106,882	739,186	0	9	533,188	68,989	65,622	7	1,110,304	275,704	501,464	785,280	0	0	0	508,949	0	0	0	0	0	6	183,713	2	0	0	0	0
Disposal and removal materials % contamination **% Inert**	*% - m3*	100%	*% of total to be confirmed / variable by route*	157,135	332,840	2,138	51,725	1,323	25,376	16,327	181,247	855,429	0	27	558,656	110,758	286,029	20	1,253,429	477,449	1,025,378	941,280	62	74	135	533,244	0	0	0	0	0	66	355,978	81	0	0	152,538	0
% non hazardous	*% - m3*	0%	*To be handled via risk allocation - local exceptions priced separately via easily pre-identified GIS constraints at this point in time*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% hazardous	*% - m3*	0%	*To be handled via risk allocation*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Earth stabilisation *(rock netting, soil nailing)*	*%*	0%	*Assumed not required*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0.198253102	***29,258,096***	*Filling exports exceed local needs*									Yes							Yes		Yes	Yes				Yes							Yes						

1.08 Enabling Works — Included — 5,800,508 — *Balance of fill to complete (inert)*

Land costs

Includes re-planting extra factors

Parameter	UoM	Input value		EN1	EN2	EN3	EN4	EN5	EN6	EN7	EA1	EA2	EA3	EA4	EA5	EA6	EA7	AA1	AA2	AA3	EA8	EA9
Balance of fill to complete (inert)				0	0	0	0	0	0	0	0	690,333	0	0	0	0	0	0	849,009	0	1,569,768	135,069
Site clearance width	m	61	Average of AA (GIS) #add remaining route lengths	61	61	61	61	61	61	61	57	74	74	50	82	80	72	38	62	64	78	68
Site clearance	m2		Route Corridor Impact Area	*175,956*	*439,891*	*249,979*	*527,566*	*254,530*	*566,701*	*706,859*	*159,978*	*592,896*	*216,102*	*123,968*	*488,302*	*194,292*	*301,995*	*220,624*	*944,604*	*1,368,063*	*745,648*	*911,986*
Agricultural areas - Normal	m2		ALC Normal	0	0	0	0	0	0	0	62,071	34,415	0	9,696	249,501	0	0	140,047	421,066	349,693	60,015	303,199
Agricultural areas - High	m2		ALC High	0	0	0	0	0	0	0	86,745	666,132	219,186	113,979	238,923	194,292	301,995	118,394	652,743	1,144,211	685,632	608,818
ALC - Urban	m2		Assumed cost of land with buildings - "Built up area" - assumed 500m2 for stations + 20m2 per car park space - assumed MSCP 3 storeys	0	0	0	4,500	0	4,500	0	40,870	0	0	0	4,500	0	0	4,500	4,500	4,500	4,500	0
Archaeological areas	m2		link to asset register	0	0	0	0	0	0	0	13,099	0	29,165	15,279	0	0	0	40,011	8,086	0	0	0
Protection of property assets (allowance)	£	150,000	Listed Buildings	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Demolition works (trees)	m2		link to asset register																			
Demolition works (buildings)	m2		Demolition works (buildings)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	106	146	0	1,042	309
Permanent utility diversion (HV/LV)	m	300	Assumed 100m diversion / protection	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	1	0	0	0
Permanent utility diversion (HV Pylon)	nr Psum	1		0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Permanent utility diversion (Water)	m	100	Assumed 100m diversion / protection	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Permanent utility diversion (Foul)	m	100	Assumed 100m diversion / protection	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Protection of utility (Gas)	m	100	Assumed 100m diversion / protection	0	0	0	0	0	0	0	0	2	1	0	1	0	0	0	3	1	0	0
Permanent utility diversion (Comms)	m	100	Assumed 100m diversion / protection	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Remediation of contaminated areas (assumes 2 m deep)	m2	2	Remediation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17,140	2,195	0	0	132
Re-planting	m2	2	Re-planting	0	0	0	0	0	0	0	32,403	2,678	0	1,424	5,012	0	0	2,385	68,619	14,599	0	18,554
Unfactored land	m2	2	No extra land compensation																			
Factor 1x (Land)			Similar land take compensation	0	0	0	0	0	0	0	1,042	0	0	708	124	0	0	0	29,489	8,531	0	31
Factor 2x (Land)			Land take compensation x2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Parameter	B1A2	B2A2	B1A3	B1A4	FBS	FBMM	FC1	FC2	R.Wide	DA4	DA5	CA3	EA0	MVL	FA2	FC3
Balance of fill to complete (inert)	0	0	0	924,789	0	0	0	0	0	0	342,853	0	0	0	0	0
Site clearance width	50	43	52	104	0	0	0	0	0	39	54	38	0	0	61	0
Site clearance	*370,773*	*245,993*	*426,835*	*301,150*	*0*	*0*	*0*	*0*	*0*	*227,168*	*341,106*	*333,931*	*0*	*0*	*1,628,325*	*0*
Agricultural areas - Normal	13,057	40,006	209,330	73,165	0	0	0	0	0	131,852	161,417	106,069	1,010	0	0	0
Agricultural areas - High	358,207	208,688	237,347	227,985	0	0	0	0	0	101,419	24,530	234,891	0	0	0	0
ALC - Urban	0	0	4,500	0	0	0	0	0	0	4,500	175,710	4,500	12,668	0	17,000	0
Archaeological areas	153,592	0	0	0	0	0	0	0	0	14,497	0	1,700	0	0	0	0
Protection of property assets (allowance)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Demolition works (trees)																
Demolition works (buildings)	0	0	0	0	0	0	0	0	0	0	357	0	1,335	0	0	0
Permanent utility diversion (HV/LV)	0	0	1	0	0	0	0	0	0	1	1	0	0	0	0	0
Permanent utility diversion (HV Pylon)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Permanent utility diversion (Water)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Permanent utility diversion (Foul)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Protection of utility (Gas)	3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Permanent utility diversion (Comms)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Remediation of contaminated areas (assumes 2 m deep)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Re-planting	492	3,992	1,614	0	0	0	0	0	0	3,618	49,405	9,878	1,010	0	4,384	0
Unfactored land																
Factor 1x (Land)	492	2,701	831	0	0	0	0	0	0	506	19,935	4,130	1,010	0	0	0
Factor 2x (Land)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

1.09 Rolling Stock — Excluded

Indirect Cost Parameters

RMM - Rules of coverage

	Parameter	UoM	Input value	
2.01	**Preliminaries**	% Direct Construction Cost		*By Asset*
2.02	**OH&P**	% Direct Construction Cost + Preliminaries	10.0%	*General*
3.01	**Project Design**	% Total Construction Cost		*By Asset*
3.02	**Project Management**	% Total Construction Cost	4.5%	*General*
3.03	**Other Project Development** *(excluding Land Cost and compensation costs)*	Included	0.5%	*General*

Other: Land Cost	*£m*	-	*Calculated*	
Agricultural areas	*£m*	-	*Calculated*	
Built up areas	*£m*	-	*Calculated*	
Industrial areas	*£m*	-	*Calculated*	
Others: Compensation Costs				
Building - not priced	*£1 m*	-	*Buildings and property compensation (£1m) - GIS Constraints input (nr)*	
Building priced	*£*	-		

4.01 ***Risk***

Risk by Route

Direct Construction Cost (By asset):

1.01 Railway Control Systems	% on Total Construction Cost (only 1.01)	60.0%	*General*
1.02 Train Power Systems	% on Total Construction Cost (only 1.02)	60.0%	*General*
1.03 Electric Power and Plant	% on Total Construction Cost (only 1.03)	60.0%	*General*
1.04 Permanent Way / Track	% on Total Construction Cost (only 1.04)	30.0%	*General*
1.05 Telecommunication Systems	% on Total Construction Cost (only 1.05)	60.0%	*General*
1.06 Buildings and Property	% on Total Construction Cost (only 1.06)	40.0%	*General*
1.07 Civil Engineering	% on Total Construction Cost (only 1.07)	30.0%	*General*
1.08 Enabling Works	% on Total Construction Cost (only 1.08)	60.0%	*General*
1.09 Rolling Stock	% on Total Construction Cost (only 1.09)	0.0%	*General*

Not applicable

of way

Programme related slippage only	***Project Design***	% on Employer Indirect Cost only	25.0%	*General*
Programme related slippage only	***Project Management***	% on Employer Indirect Cost only	20.0%	*General*
Third party / stakeholder management	***Other Project Development*** *(Excluding Land Cost and compensation costs)*	% on Employer Indirect Cost only	40.0%	*General*
	Land and property cost	% on Employer Indirect Cost only	40.0%	*General*
	Compensation Costs	% on Employer Indirect Cost only	40.0%	*General*

5.01	**Inflation**	*Quarter-Year*	1Q26	*14/02/2026*
		Index	*BCIS General Civil Engineering*	
		Factor	30.4%	*Calculated*
	Deflation *(See Summary Report)*	*Quarter-Year*	3Q17	
		Index	*BCIS General Civil Engineering*	*Same index used for inflation*
		Factor	-4.9%	*Calculated*

1.01 Railway Control System	1.02 Train Power System	1.03 Electric Power& Plant	1.04 P-Way	1.05 Telecom	1.06 Buildings and Property	1.07 Civil Eng.	1.08 Enabling Works	1.09 Rolling Stock	*Select option*
35.0%	17.5%	17.5%	15.0%	35.0%	15.0%	15.0%	15.0%	0.0%	*By Asset*
									General
20.0%	14.0%	14.0%	10.0%	14.0%	12.0%	12.0%	14.0%	0.0%	*Applies to EWR Central - Average Total Construction cost (Asset split applied to total % breakdown of all routes)*
									Applies to EWR Central - Average Total Construction cost
									General

EN1	EN2	EN3	EN4	EN5	EN6	EN7	EA1	EA2	EA3	EA4	EA5	EA6	EA7	AA1	AA2	AA3	EA8	EA9	B1A2	B2A2	B1A3	B1A4	FBS	FBMM	FC1	FC2	R.Wide	DA4	DA5	CA3	EA0	MVL	FA2	FC3
£0 m	£0 m	£0 m	£3 m	£0 m	£3 m	£0 m	£27 m	£0 m	£0 m	£0 m	£3 m	£0 m	£0 m	£3 m	£4 m	£4 m	£3 m	£1 m	£0 m	£0 m	£3 m	£0 m	£0 m	£0 m	£0 m	£0 m	£0 m	£0 m	£3 m	£117 m	£3 m	£8 m	£0 m	£11 m	£0 m
£0 m	£0 m	£0 m	£0 m	£0 m	£0 m	£0 m	£0 m	£0 m	£0 m	£0 m	£0 m	£0 m	£0 m	£0 m	£1 m	£1 m	£0 m	£1 m	£0 m	£0 m	£0 m	£0 m	£0 m	£0 m	£0 m	£0 m	£0 m	£0 m	£0 m	£0 m	£0 m	*£0.00 m*	*£0.00 m*	*£0.00 m*
£0 m	£0 m	£0 m	£3 m	£0 m	£3 m	£0 m	£27 m	£0 m	£0 m	£0 m	£3 m	£0 m	£0 m	£3 m	£3 m	£3 m	£3 m	£0 m	£0 m	£0 m	£3 m	£0 m	£0 m	£0 m	£0 m	£0 m	£0 m	£3 m	£116 m	£3 m	*£8.38 m*	*£0.00 m*	*£11.24 m*	*£0.00 m*
£0 m	£0 m	£0 m	£0 m	£0 m	£0 m	£0 m	£0 m	£0 m	£0 m	£0 m	£0 m	£0 m	£0 m	£0 m	£0 m	£0 m	£0 m	£0 m	£0 m	£0 m	£0 m	£0 m	£0 m	£0 m	£0 m	£0 m	£0 m	£0 m	£0 m	£0 m	*£0.00 m*	*£0.00 m*	*£0.00 m*	*£0.00 m*
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
£0.0 m	£0.0 m	£0.0 m	£0.0 m	£0.0 m	£0.0 m	£0.0 m	£0.0 m	£0.0 m	£0.0 m	£0.0 m	£0.0 m	£0.0 m	£0.0 m	£1.0 m	£1.0 m	£0.0 m	£4.8 m	£1.9 m	£0.0 m	£0.0 m	£0.0 m	£0.0 m	£0.0 m	£0.0 m	£0.0 m	£0.0 m	£0.0 m	£0.0 m	£4.0 m	£0.0 m	£0.0 m	£0.0 m	£0.0 m	£0.0 m

FAITHFUL GOULD
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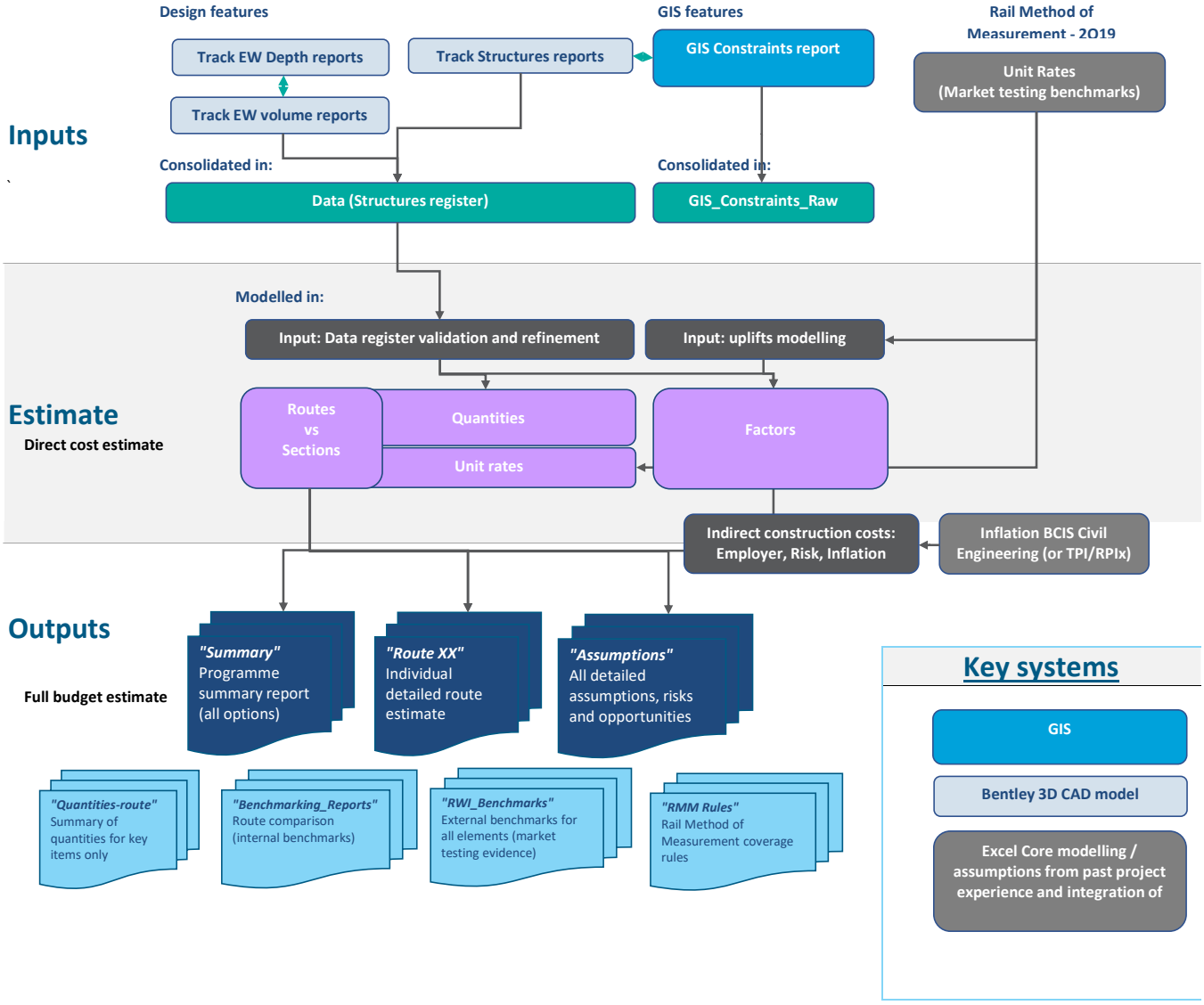
Model architecture



Key systems

- GIS
- Bentley 3D CAD model
- Excel Core modelling / assumptions from past project experience and integration of

Sub section	System	Source	Version/ date	RMM code	Asset Type	Input reference	Chainage	Easting (+/- 50 m)	Northing (+/- 50 m)	GIS_ID	Length (m)	Width (m)	Area (m2)	Volume (m3)	Detailed Description	Used in model	EWR validation	Routes applied to	Amendments justification	Comments
AA2	Bentley	Basic Volume Report	18/06/2019	1.07	Structure	Viaducts (flood plain)	16550	507943.7076	246109.3777	AA2-ST1	1,400.00	13.50	18,900.00		rail over major road	Y			HF Workshop 180619 - Structure type amended	Input reference name amended ("flood plain" ad
AA2	Bentley	Basic Volume Report	05/06/2019	1.07	Structure	Underbridge (Highways)	19665	510277.9442	245440.1265	AA2-ST2	24.00	10.00	240.00		rail over minor road	Y				
AA2	Bentley	Basic Volume Report	05/06/2019	1.07	Structure	Overbridge (Highways)	21938	512467.0189	245733.1984	AA2-VD1	175.00	5.00	875.00		farm track over rail bridge	Y				
AA2	Bentley	Basic Volume Report	05/06/2019	1.07	Structure	Overbridge (Highways)	23054	513190.6148	246624.0571	AA2-ST3	60.00	10.00	600.00		minor road over rail	Y				
AA2	Bentley	Basic Volume Report	05/06/2019	1.07	Structure	Underbridge (Highways)	25201	514996.4054	247423.4891	AA2-ST4	18.00	10.00	180.00		rail over minor road	Y				
AA2	Bentley	Basic Volume Report	05/06/2019	1.07	Structure	Viaducts (flood plain)	25620	515393.3075	247373.8029	AA2-VD2	460.00	13.50	6,210.00		viaduct over water/flood risk	Y				Input reference name amended (flood plain add
AA2	Bentley	Basic Volume Report	05/06/2019	1.07	Structure	Underbridge (Highways)	26365	516137.4990	247280.6415	AA2-ST5	20.00	10.00	200.00		rail over minor road	Y				
AA2	Bentley	Basic Volume Report	05/06/2019	1.07	Structure	Underbridge (Highways)	27279	517032.8894	247210.8611	AA2-ST6	16.00	5.00	80.00		rail over farm track	Y				
AA2	Bentley	Basic Volume Report	05/06/2019	1.07	Structure	Viaducts - complex (flood plain)	27860	517629.9393	247270.2649	AA2-VD3	880.00	13.50	11,880.00		viaduct over multiple road/water/rail	Y				Input reference name amended ("flood plain" ad
AA2	Bentley	Basic Volume Report	05/06/2019	1.07	Structure	Viaducts (flood plain)	29560	519324.5461	247397.0224	AA2-VD4	1,210.00	13.50	16,335.00		viaduct over flood risk and habitat	Y				Input reference name amended (flood plain add
AA2	Bentley	Basic Volume Report	05/06/2019	1.07	Structure	Overbridge (Highways)	31429	521155.0093	247168.6061	AA2-ST7	46.00	10.00	460.00		minor road over rail	Y				
AA2	Bentley	Basic Volume Report	05/06/2019	1.07	Structure	Underbridge (Water)	31841	521549.0314	247099.7103	AA2-CU4	70.00	13.50	945.00		culvert	Y			HF Workshop 180619 - Structure type amended	to include Flood plain. Input reference name cha
AA2	Bentley	Basic Volume Report	05/06/2019	1.04	Track	Route Length	16800-32030				15,230.00	68	1,041,990		Chainage start-finish	Y				
AA2	Bentley	Basic Volume Report +Report I	05/06/2019	1.07	Earthworks	Cut [0-5m]	16800-32030							158,401	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
AA2	Bentley	Basic Volume Report +Report I	05/06/2019	1.07	Earthworks	Cut [5-10m]	16800-32030							159,812	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
AA2	Bentley	Basic Volume Report +Report I	05/06/2019	1.07	Earthworks	Cut [>10m]	16800-32030							3,701,013	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
AA2	Bentley	Basic Volume Report +Report I	05/06/2019	1.07	Earthworks	Fill [0-5m]	16800-32030							100,573	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
AA2	Bentley	Basic Volume Report +Report I	05/06/2019	1.07	Earthworks	Fill [5-10m]	16800-32030							1,249,247	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
AA2	Bentley	Basic Volume Report +Report I	05/06/2019	1.07	Earthworks	Fill [>10m]	16800-32030							566,968	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
AA1	Map	EWR-Alignment nodes and link	04/06/2019	1.06	Stations	Interchange Station (Modular Building)					12.00	12.00	144.00	432	Bedford South / Wixams	Y		ABC	B,C not yet registed	
AA2	Map	EWR-Alignment nodes and link	07/06/2019	1.06	Stations	Interchange Station (Modular Building)					12.00	12.00	144.00	432	Sandy South	Y				
AA3	Map	EWR-Alignment nodes and link	07/06/2019	1.06	Stations	At grade Station (Modular Building)					12.00	12.00	144.00	432	Bassingbourn	Y				
B1A3	Map	EWR-Alignment nodes and link	07/06/2019	1.06	Stations	Interchange Station (Modular Building)					12.00	12.00	144.00	432	Sandy North	Y		TBC	#Route alignment needed	
CA3	Map	EWR-Alignment nodes and link	07/06/2019	1.06	Stations	Interchange Station (Modular Building)					12.00	12.00	144.00	432	Sandy North	Y		TBC	amended 030719 - final validaiton with PS	
DA4	Map	EWR-Alignment nodes and link	07/06/2019	1.06	Stations	Interchange Station (Modular Building)					12.00	12.00	144.00	432	Sandy North	Y		TBC	amended 030719 - final validaiton with PS	
EA5	Map	EWR-Alignment nodes and link	07/06/2019	1.06	Stations	Interchange Station (Modular Building)					12.00	12.00	144.00	432	Tempsford	Y		TBC		
EA8	Map	EWR-Alignment nodes and link	07/06/2019	1.06	Stations	At grade Station (Modular Building)					12.00	12.00	144.00	432	Cambourne	Y		TBC		
AA1	Bentley	Basic Volume Report	05/06/2019	1.07	Structure	Viaducts - complex (Rail)	11680	502687.5901	244648.9777	AA1-VD1	1,520.00	13.50	20,520.00		viaduct over multiple features	Y				Viaduct normal to complex (24/06 meeting). Inpu
AA1	Bentley	Basic Volume Report	05/06/2019	1.07	Structure	Viaducts - complex (flood plain)	13610	504442.8112	245370.6663	AA1-VD2	1,340.00	13.50	18,090.00		viaduct over multiple features	Y			HF Workshop 180619 - Structure length amended	to reflect end of flood plain. Viaduct normal to c
AA3	Bentley	Basic Volume Report	05/06/2019	1.07	Structure	Underbridge (Highways)	32179	521896.0796	247055.1446	AA3-ST1	14.00	5.00	70.00		rail over farm track	Y				
AA3	Bentley	Basic Volume Report	05/06/2019	1.07	Structure	Overbridge (Highways)	32586	522293.8819	247013.2718	AA3-ST2	46.00	10.00	460.00		minor road over rail	Y				
AA3	Bentley	Basic Volume Report	05/06/2019	1.07	Structure	Overbridge (Highways)	33162	522890.5854	246950.4626	AA3-ST3	21.00	10.00	210.00		minor road over rail with approach ramps	Y				
AA3	Bentley	Basic Volume Report	05/06/2019	1.07	Structure	Overbridge (Highways)	33747	523437.5636	246892.8875	AA3-ST4	308.00	10.00	3,080.00		minor road over rail	Y				
AA3	Bentley	Basic Volume Report	05/06/2019	1.07	Structure	Overbridge (Highways)	34587	524282.8934	246803.9079	AA3-ST5	51.00	5.00	255.00		farm access over rail	Y				
AA3	Bentley	Basic Volume Report	05/06/2019	1.07	Structure	Viaducts (flood plain)	35720	525415.5335	246606.5663	AA3-VD1	100.00	13.50	1,350.00		viaduct over flood risk/ water minor road	Y				Input reference name amended (flood plain add
AA3	Bentley	Basic Volume Report	05/06/2019	1.07	Structure	Overbridge (Highways)	36000	525710.5117	246551.9052	AA3-ST6	34.00	10.00	340.00		minor road over rail with approach ramps	Y				
AA3	Bentley	Basic Volume Report	05/06/2019	1.07	Structure	Overbridge (Highways)	36633	526306.3623	246483.6900	AA3-ST7	98.00	10.00	980.00		minor road over rail	Y				
AA3	Bentley	Basic Volume Report	05/06/2019	1.07	Structure	Viaducts (flood plain)	38440	528098.3104	246313.6250	AA3-VD2	180.00	13.50	2,430.00		viaduct over flood risk/ water	Y				Input reference name amended (flood plain add
AA3	Bentley	Basic Volume Report	05/06/2019	1.07	Structure	Underbridge (Highways)	39220	528895.9883	246259.1580	AA3-ST8	17.00	5.00	85.00		rail over farm track	Y				
AA3	Bentley	Basic Volume Report	05/06/2019	1.07	Structure	Underbridge (Highways)	40172	529845.8770	246245.1010	AA3-ST9	15.00	10.00	150.00		rail over minor road	Y				
AA3	Bentley	Basic Volume Report	05/06/2019	1.07	Structure	Viaducts (flood plain)	40520	530193.4652	246206.5975	AA3-VD3	180.00	13.50	2,430.00		viaduct over flood risk/water	Y				Input reference name amended (flood plain add
AA3	Bentley	Basic Volume Report	05/06/2019	1.07	Structure	Viaducts (flood plain)	41040	530673.1478	246068.4947	AA3-VD4	220.00	13.50	2,970.00		viaduct over flood risk/water	Y				Input reference name amended (flood plain add
AA3	Bentley	Basic Volume Report	05/06/2019	1.07	Structure	Underbridge (Highways)	41462	531087.9187	245894.2436	AA3-ST10	23.00	10.00	230.00		rail over minor road	Y				
AA3	Bentley	Basic Volume Report	05/06/2019	1.07	Structure	Underbridge (Highways)	42548	532116.5173	245693.4374	AA3-ST11	14.00	10.00	140.00		rail over minor road	Y				
AA3	Bentley	Basic Volume Report	05/06/2019	1.07	Structure	Viaducts (flood plain)	42980	532564.8071	245698.1343	AA3-VD5	120.00	13.50	1,620.00		viaduct over flood risk	Y				Input reference name amended (flood plain add
AA3	Bentley	Basic Volume Report	05/06/2019	1.07	Structure	Underbridge (Highways) - Discarde	43356	532947.7046	245810.7323	AA3-ST12	13.50	5.00	67.50		rail over farm track	Y			HF Workshop 180619 - Structure removed	
AA3	Bentley	Basic Volume Report	05/06/2019	1.07	Structure	Underbridge (Highways)	43658	533228.1868	245917.1732	AA3-ST13	13.50	10.00	135.00		rail over minor road	Y				
AA3	Bentley	Basic Volume Report	05/06/2019	1.07	Structure	Underbridge (Highways)	44349	533806.0513	246213.1429	AA3-ST14	14.00	10.00	140.00		rail over minor road	Y				
AA3	Bentley	Basic Volume Report	05/06/2019	1.07	Structure	Underbridge (Highways)	44489	533936.6459	246286.9334	AA3-ST15	20.00	13.50	270.00		rail over major road	Y			HF Workshop 180619 - Structure length amended	
AA3	Bentley	Basic Volume Report	05/06/2019	1.07	Structure	Underbridge (Highways) - Discarde	47493	536711.2103	247383.2980	AA3-ST16	13.50	10.00	135.00		rail over minor road	Y			HF Workshop 180619 - Structure removed	Added 2 road diversions - around the viaduct
AA3	Bentley	Basic Volume Report	05/06/2019	1.07	Structure	Viaducts (flood plain)	47760	536987.7053	247498.4469	AA3-VD6	380.00	13.50	5,130.00		viaduct over flood risk/ multiple water/ habitat	Y				Input reference name amended (flood plain add
AA3	Bentley	Basic Volume Report	05/06/2019	1.07	Structure	Underbridge (Highways)	48256	537431.0203	247729.6866	AA3-ST17	14.00	10.00	140.00		rail over minor road	Y				
AA3	Bentley	Basic Volume Report	05/06/2019	1.07	Structure	Underbridge (Water)	48840	537918.6668	247984.0504	AA3-ST18	50.00	13.50	675.00		rail over flood risk/water	Y				
AA3	Bentley	Basic Volume Report	05/06/2019	1.07	Structure	Underbridge (Highways)	49907	538919.5418	248439.2737	AA3-ST19	13.50	10.00	135.00		rail over minor road	Y				
AA3	Bentley	Basic Volume Report	05/06/2019	1.07	Structure	Underbridge (Water)	50730	539653.5107	248757.5342	AA3-ST20	50.00	13.50	675.00		rail over flood risk/water	Y				
AA3	Bentley	Basic Volume Report	05/06/2019	1.07	Structure	Overbridge (Rail)	51523	540346.3036	249147.6989	AA3-ST21	13.50	10.00	135.00		rail over rail	Y			HF Workshop 180619 - Structure type amended	
AA3	Bentley	Basic Volume Report	05/06/2019	1.07	Structure	Overbridge (Highways)	51739	540497.3352	249278.3190	AA3-ST22	16.00	10.00	160.00		rail over minor road	Y			HF Workshop 180619 - Structure type amended	
AA3	Bentley	Basic Volume Report	05/06/2019	1.07	Structure	Underbridge (Highways)	52355	541115.9125	249305.8499	AA3-ST23	13.50	20.00	270.00		rail over major road	Y			HF Workshop 180619 - Structure length amended	
AA3	Bentley	Basic Volume Report	05/06/2019	1.07	Structure	Viaducts (flood plain)	52900	541651.7979	249245.5329	AA3-VD7	160.00	13.50	2,160.00		viaduct over flood risk/multiple water	Y				Input reference name amended (flood plain add
AA1	Bentley	Basic Volume Report	05/06/2019	1.04	Track	Route Length	10940-16800				5,850.00	44	258,441		Chainage start-finish	Y				
AA1	Bentley	Basic Volume Report	05/06/2019	1.07	Earthworks	Cut [0-5m]	10940-16800							10	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
AA1	Bentley	Basic Volume Report	05/06/2019	1.07	Earthworks	Cut [5-10m]	10940-16800							19	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
AA1	Bentley	Basic Volume Report	05/06/2019	1.07	Earthworks	Cut [>10m]	10940-16800							23	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
AA1	Bentley	Basic Volume Report	05/06/2019	1.07	Earthworks	Fill [0-5m]	10940-16800							29,821	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
AA1	Bentley	Basic Volume Report	05/06/2019	1.07	Earthworks	Fill [5-10m]	10940-16800							635,268	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
AA1	Bentley	Basic Volume Report	05/06/2019	1.07	Earthworks	Fill [>10m]	10940-16800							225,298	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
AA3	Bentley	Basic Volume Report	05/06/2019	1.04	Track	Route Length	32030-53400				21,370.00	70	1,485,308		Chainage start-finish	Y			DZ Workshop 180619 - Length amended	AA3 is stopped at 53400
AA3	Bentley	Basic Volume Report	05/06/2019	1.07	Earthworks	Cut [0-5m]	32030-53400							124,745	Calculated by crossing Basic Volume report and Cut/Fill [	Y			DZ Workshop 180619 - Dimensions amended	AA3 is stopped at 53400
AA3	Bentley	Basic Volume Report	05/06/2019	1.07	Earthworks	Cut [5-10m]	32030-53400							348,433	Calculated by crossing Basic Volume report and Cut/Fill [	Y			DZ Workshop 180619 - Dimensions amended	AA3 is stopped at 53400
AA3	Bentley	Basic Volume Report	05/06/2019	1.07	Earthworks	Cut [>10m]	32030-53400							919,012	Calculated by crossing Basic Volume report and Cut/Fill [	Y			DZ Workshop 180619 - Dimensions amended	AA3 is stopped at 53400
AA3	Bentley	Basic Volume Report	05/06/2019	1.07	Earthworks	Fill [0-5m]	32030-53400							92,658	Calculated by crossing Basic Volume report and Cut/Fill [	Y			DZ Workshop 180619 - Dimensions amended	AA3 is stopped at 53400
AA3	Bentley	Basic Volume Report	05/06/2019	1.07	Earthworks	Fill [5-10m]	32030-53400							2,599,253	Calculated by crossing Basic Volume report and Cut/Fill [	Y			DZ Workshop 180619 - Dimensions amended	AA3 is stopped at 53400
AA3	Bentley	Basic Volume Report	05/06/2019	1.07	Earthworks	Fill [>10m]	32030-53400							1,555,983	Calculated by crossing Basic Volume report and Cut/Fill [	Y			DZ Workshop 180619 - Dimensions amended	AA3 is stopped at 53400
EA1	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Overbridge (Highways)	1403.6104	503405.2513	250956.0378	EA1-ST1	145.00	20.00	2,900.00		Overbridge-Highway1	Y			HF Workshop 180619 - Structure length amended	Measured in GIS to cover existing plus new stru
EA1	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Viaducts (flood plain)	1504.5841	503393.371	251055.2641	EA1-VD1	1,005.00	13.50	13,567.50		Viaduct-Flood1	Y			HF Workshop 180619 - Structure length amended	move it away from existing road. Input referenc
EA1	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Footbridge	3196.6025	504104.7651	252554.8561	EA1-ST2	99.00	2.50	247.50		Underbridge-MinorRd3	Y			HF Workshop 180619 - Structure type amended	
EA1	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Overbridge (Highways)	3417.8655	504214.3316	252745.6313	EA1-ST3	89.00	10.00	890.00		Underbridge-Road2	Y			HF Workshop 180619 - Structure type amended	
EA2	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Footbridge	4011.3038	504432.8728	253300.9045	EA2-ST1	99.00	2.50	247.50		Underbridge-MinorRd2	Y			HF Workshop 180619 - Structure type amended	
EA2	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Underbridge (Highways) - Discarde	4109.6212	504455.6823	253398.2684	EA2-ST2	10.00	10.00	100.00		Underbridge-MinorRd3	Y			HF Workshop 180619 - Structure removed	
EA2	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Overbridge (Highways)	4857.6649	504655.0811	254109.0482	EA2-ST3	134.00	10.00	1,340.00		Underbridge-MinorRd4	Y			HF Workshop 180619 - Structure type amended	
EA2	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Underbridge (Water) - Discarded	5536.6926	505109.9446	254602.2596	EA2-ST4	10.00	13.50	135.00		Bridge/culvert-River1	Y	TBC		HF Workshop 180619 - Structure removed	
EA2	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Overbridge (Highways)	5950.5747	505496.7466	254763.2085	EA2-ST5	109.00	10.00	1,090.00		Underbridge-Road3	Y			HF Workshop 180619 - Structure type amended	
EA2	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Underbridge (Highways)	6540.9782	506064.4494	254957.4082	EA2-ST6	50.00	10.00	500.00		Underbridge-Road4	Y			HF Workshop 180619 - Structure length amended	
EA2	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Underbridge (Water)	6799.5203	506291.5305	255035.0881	EA2-ST7	45.00	13.50	607.50		Viaduct-Flood3	Y			HF Workshop 180619 - Structure type amended	
EA2	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Overbridge (Highways)	7662.4581	507144.1852	255248.075	EA2-ST8	194.00	10.00	1,940.00		Underbridge-Road5	Y			HF Workshop 180619 - Structure type amended	
EA2	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Overbridge (Highways)	8113.2026	507575.8466	255333.3304	EA2-ST9	194.00	10.00	1,940.00		Underbridge-MinorRd5	Y			HF Workshop 180619 - Structure type amended	
EA2	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Underbridge (Highways)	9108.7321	508556.855	255271.8138	EA2-ST10	47.00	10.00	470.00		Underbridge-Road6	Y			HF Workshop 180619 - Structure length amended	
EA2	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Underbridge (Concrete box)	9600	508850.046	255143.6055	EA2-ST11	49.00	3.00	147.00		Underbridge-MinorRd7	Y			HF Workshop 180619 - Structure type amended	
EA2	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Underbridge (Highways)	10320.5996	509698.2916	254858.6934	EA2-ST13	84.00	10.00	840.00		Underbridge-Road7	Y			HF Workshop 180619 - Structure length amended	
EA2	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Underbridge (Highways)	10953.0165	510318.1249	254850.1165	EA2-ST14	52.00	10.00	520.00		Underbridge-Road8	Y			HF Workshop 180619 - Structure length amended	
EA2	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Underbridge (Concrete box)	11525.8105	510898.1063	254845.9541	EA2-ST15	44.00	3.00	132.00		Underbridge-MinorRd9	Y			HF Workshop 180619 - Structure type amended	
EA4	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Viaducts (Highways)	14880	514135.0645	253938.0621	EA4-VD1	145.00	13.50	1,957.50		Viaduct-Highway3	Y				Updated to 145 - GIS data
EA4	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Underbridge (Highways)	15282.9305	514474.825	253925.3022	EA4-ST1	56.00	5.00	280.00		Underbridge-Road9	Y			HF Workshop 180619 - Structure length amended	
EA4	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Underbridge (Highways)	15802.1813	514994.5166	253924.4586	EA4-ST2	56.00	5.00	280.00		Underbridge-Road10	Y			HF Workshop 180619 - Structure length amended	
EA4	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Underbridge (Highways) - Discarde	16008.9766	515193.9706	253939.2222	EA4-ST3	10.00	10.00	100.00		Underbridge-MinorRd11	Y			HF Workshop 180619 - Structure removed	
EA4	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Viaducts (flood plain)	16354.4553	515533.0259	253964.5495	EA4-VD2	1,030.00	13.50	13,905.00		Viaduct-Flood5	Y				Input reference name amended (flood plain add
EA5	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Underbridge (Highways) - Discarde	17557.7316	516729.6918	254053.9402	EA5-ST1	10.00	10.00	100.00		Underbridge-MinorRd14	Y			HF Workshop 180619 - Structure removed	
EA5	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Viaducts (flood plain)	18312.4543	517487.5803	254110.5542	EA5-VD1	1,575.00	13.50	21,262.50		Viaduct-Flood7	Y				Input reference name amended (flood plain add
EA5	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Underpass (concrete box)	20775	520607.0172	254701.469	EA5-ST2	84.00	5.00	420.00		TBA	Y			HF Workshop 180619 - New structure added	
EA5	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Underbridge (Highways) - Discarde	21489.0627	520607.0172	254701.469	EA5-ST2	10.00	10.00	100.00		Underbridge-MinorRd15	Y			HF Workshop 180619 - Structure removed	
EA5	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Underbridge (Highways)	22674.9826	521504.9017	255437.689	EA5-ST3	166.00	10.00	1,660.00		Underbridge-Road15	Y			HF Workshop 180619 - structure type amended	
EA6	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Footbridge	23903.045	522033.8324	256557.9017	EA6-ST1	57.00	10.00	570.00		Underbridge-MinorRd16	Y			HF Workshop 180619 - structure type amended	
EA6	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Underbridge (Highways)	24288.9405	522251.8389	256868.4485	EA6-ST2	41.00	10.00	410.00		Underbridge-Road16	Y			HF Workshop 180619 - Structure length amended	
EA6	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Underbridge (Highways) - Discarde	24535.6077	522418.3063	257041.1318	EA6-ST3	10.00	10.00	100.00		Underbridge-MinorRd17	Y			HF Workshop 180619 - Structure removed	
EA6	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Underbridge (Highways) - Discarde	25546.5956	523308.6913	257516.6277	EA6-ST4	10.00	10.00	100.00		Underbridge-MinorRd18	Y			HF Workshop 180619 - Structure removed	
EA7	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Viaducts (flood plain)	25778.374	523520.326	257576.7173	EA7-VD1	145.00	13.50	1,957.50		Viaduct-Flood9	Y				Input reference name amended (flood plain add
EA7	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Underbridge (Highways)	26774.9417	524482.3019	257849.8516	EA7-ST1	49.00	10.00	490.00		Underbridge-Road17	Y			HF Workshop 180619 - Structure length amended	
EA7	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Overbridge (Highways)	28278.4944	525947.7426	258159.6021	EA7-ST2	49.00	10.00	490.00		Underbridge-Road18	Y			HF Workshop 180619 - structure type amended	

Sub section	System	Source	Version/ date	RMM code	Asset Type	Input reference	Chainage	Easting (+/- 50 m)	Northing (+/- 50 m)	GIS_ID	Length (m)	Width (m)	Area (m2)	Volume (m3)	Detailed Description	Used in model	EWR validation	Routes applied to	Amendments justification	Comments
EA7	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Overbridge (Highways)	29052.8845	526717.696	258284.3888	EA7-ST3	49.00	10.00	490.00		Underbridge-Road19	Y			HF Workshop 180619 - structure type amended	
EA8	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Overbridge (Highways)	30166.4314	527820.363	258477.4463	EA8-ST1	49.00	10.00	490.00		Underbridge-MinorRd19	Y			HF Workshop 180619 - structure type amended	
EA8	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Overpass (bridleway)	31100			EA8-ST1	49.00	2.50	122.50		Underbridge-MinorRd19	Y			HF Workshop 180619 - type and length amended	BW
EA8	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Underbridge (Water) - Discarded	31850.8026	529330.8767	259210.0264	EA8-ST2	10.00	13.50	135.00		Bridge/culvert-River2	Y	TBC		HF Workshop 180619 - Structure removed	
EA8	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Overbridge (Highways) - Discarded	32278.5334	529738.2393	259306.4953	EA8-ST3	10.00	13.50	135.00		Bridge/culvert-River3	Y	TBC		HF Workshop 180619 - Structure removed	
EA8	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Overbridge (Highways)	32598.4179	530057.6009	259301.9801	EA8-ST4	10.00	10.00	100.00		Underbridge-Road20	Y			HF Workshop 180619 - structure type amended	
EA8	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Footbridge	33018.2628	530462.0735	259194.0336	EA8-ST5	10.00	2.50	25.00		Underbridge-MinorRd20	Y			HF Workshop 180619 - structure type amended	Length Check required
EA8	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Underbridge (Highways) - Discarded	33125.9876	530570.5737	259142.8472	EA8-ST6	10.00	10.00	100.00		Underbridge-MinorRd21	Y			HF Workshop 180619 - Structure removed	
EA8	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Overbridge (Highways)	33389.0806	530795.0844	259011.7868	EA8-ST7	70.00	10.00	700.00		Overbridge-Highway5	Y				
EA8	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Overbridge (Highways)	33473.1673	530863.7937	258970.8108	EA8-ST8	49.00	5.00	245.00		Bridge/culvert-River4	Y	TBC		HF Workshop 180619 - structure type amended	BW
EA8	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Underbridge (Highways) - Discarded	34010.1277	531327.5815	258694.2228	EA8-ST9	10.00	10.00	100.00		Underbridge-MinorRd22	Y			HF Workshop 180619 - Structure removed	Stations proximity
EA8	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Underbridge (Highways) - Discarded	34431.5053	531688.3053	258479.0988	EA8-ST10	10.00	10.00	100.00		Underbridge-MinorRd23	Y			HF Workshop 180619 - Structure removed	Nothing there
EA8	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Underbridge (Concrete box)	34757.825	531964.248	258317.1166	EA8-ST11	17.00	5.00	85.00		Underbridge-MinorRd24	Y				
EA8	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Overbridge (Highways)	35896.6555	533018.8111	257887.719	EA8-ST12	49.00	10.00	490.00		Underbridge-Road21	Y			HF Workshop 180619 - structure type amended	
EA8	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Overbridge (Highways)	36275.7871	533321.4979	257659.6618	EA8-ST13	49.00	10.00	490.00		Underbridge-Road22	Y				
EA8	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Underbridge (Highways) - Discarded	36848.4253	533667.3543	257195.9677	EA8-ST14	10.00	10.00	100.00		Underbridge-MinorRd25	Y			HF Workshop 180619 - Structure removed	Assumed farm roads
EA8	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Underbridge (Water)	37472.2998	534006.1764	256676.7379	EA8-ST15	30.00	13.50	405.00		Viaduct-Flood11	Y				
EA8	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Underbridge (Highways) - Discarded	37913.7647	534246.6308	256308.2522	EA8-ST16	10.00	5.00	50.00		Underbridge-MinorRd26	Y			HF Workshop 180619 - Structure removed	Assumed viaduct covers for this
EA8	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Viaducts (flood plain)	38108.9376	534356.6378	256141.2332	EA8-VD1	110.00	13.50	1,485.00		Viaduct-Flood13	Y				Input reference name amended (flood plain add
EA8	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Viaducts (flood plain)	38496.9683	534611.781	255860.9988	EA8-VD2	135.00	13.50	1,822.50		Viaduct-Flood15	Y				Input reference name amended (flood plain add
EA8	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Underbridge (Highways)	38684.7408	534772.2093	255741.8195	EA8-ST17	49.00	10.00	490.00		Underbridge-Road24	Y				
EA9	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Viaducts (flood plain)	39512.4233	535460.2584	255295.7383	EA9-VD1	105.00	13.50	1,417.50		Viaduct-Flood17	Y				Input reference name amended (flood plain add
EA9	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Underbridge (Concrete box)	40395.1551	536213.0432	254841.8817	EA9-ST1	22.00	5.00	110.00		Underbridge-MinorRd27	Y			HF Workshop 180619 - type and length amended	
EA9	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Underbridge (Highways)	40691.4601	536491.2438	254729.7141	EA9-ST2	49.00	10.00	490.00		Underbridge-MinorRd28	Y				
EA9	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Underbridge (Water) - Discarded	41108.1962	536882.4681	254576.9282	EA9-ST3	10.00	13.50	135.00		Bridge/culvert-River5	Y	TBC		HF Workshop 180619 - Structure removed	
EA9	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Underbridge (Highways)	42213.6894	537838.3406	254059.7459	EA9-ST4	49.00	10.00	490.00		Underbridge-MinorRd29	Y			HF Workshop 180619 - Structure length amended	Underpass
EA9	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Underbridge (Water) - Discarded	42696.7462	538093.8891	253654.8629	EA9-ST5	10.00	13.50	135.00		Bridge/culvert-River6	Y	TBC		HF Workshop 180619 - Structure removed	
EA9	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Underbridge (Highways)	43096.8596	538328.7739	253333.1883	EA9-ST6	25.00	10.00	250.00		-Highway6	Y	TBC			
EA9	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Viaducts (flood plain)	43255.1638	538450.0756	253229.0346	EA9-ST7	85.00	13.50	1,147.50		Viaduct-Flood19	Y				Input reference name amended (flood plain add
EA9	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Underbridge (Highways)	43559.1873	538693.8713	253054.2132	EA9-ST8	69.00	10.00	690.00		Underbridge-Road25	Y			HF Workshop 180619 - Structure length amended	
EA9	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Underbridge (Highways)	44383.4691	539376.9624	252565.3507	EA9-ST9	125.00	10.00	1,250.00		Underbridge-Road26	Y			HF Workshop 180619 - Structure length amended	
EA9	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Overbridge (Highways)	45650.4919	540251.6538	251679.1891	EA9-ST10	256.00	10.00	2,560.00		Underbridge-Road27	Y			HF Workshop 180619 - type and length amended	
EA9	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Underbridge (Concrete box)	47105.4791	540786.5971	250321.2647	EA9-ST11	65.00	5.00	325.00		Underbridge-MinorRd30	Y			HF Workshop 180619 - structure type amended	
EA9	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Viaducts (flood plain)	47521.0492	540936.6731	249928.9929	EA9-VD2	210.00	13.50	2,835.00		Viaduct-Flood21	Y				Input reference name amended (flood plain add
EA9	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Underbridge (Highways)	48121.0118	541180.399	249382.7932	EA9-ST12	25.00	10.00	250.00		-Highway7	Y	TBC			
EA9	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Underbridge (Rail)	48635.4787	541558.885	249064.072	EA9-ST13	25.00	10.00	250.00		-Railway3	Y	TBC			
EA9	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Underbridge (Water)	48739.936	541650.9571	249025.1568	EA9-ST14	55.00	13.50	742.50		Viaduct-Flood23	Y				Input reference name changed Viaduct to Under
EA9	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Underbridge (Highways) - Discarded	49208.1178	542123.4949	248973.021	EA9-ST15	10.00	10.00	100.00		Underbridge-MinorRd31	Y			HF Workshop 180619 - Structure removed	
EA9	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Underbridge (Highways) - Discarded	49535.0369	542428.816	249064.1703	EA9-ST16	10.00	10.00	100.00		Underbridge-MinorRd32	Y			HF Workshop 180619 - Structure removed	
EA9	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Underbridge (Highways) - Discarded	50552.2334	543027.3279	249852.5121	EA9-ST17	10.00	10.00	100.00		Underbridge-MinorRd33	Y			HF Workshop 180619 - Structure removed	
EA9	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Underbridge (Highways)	50862.4968	543147.5102	250149.0863	EA9-ST18	91.00	10.00	910.00		Underbridge-Road28	Y			Opportunity for design to avoid buildings	
EA9	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Underbridge (Highways)	51459.4015	543375.3163	250682.0506	EA9-ST19	36.00	10.00	360.00		Underbridge-MinorRd34	Y				
EA9	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Underbridge (Highways)	51916.8951	543674.0067	251028.18	EA9-ST21	33.00	10.00	330.00		Underbridge-Road29	Y				
EA1	Bentley	Basic Volume Report	06/06/2019	1.04	Track	Route Length	1100 -3900				2,800.00				Chainage start-finish	Y			HF Workshop 180619 - No earthworks from 500 to 11000	
EA2	Bentley	Basic Volume Report	06/06/2019	1.04	Track	Route Length	3900 -11960				8,060.00				Chainage start-finish	Y				
EA3	Bentley	Basic Volume Report	06/06/2019	1.04	Track	Route Length	11960 -14880				2,920.00				Chainage start-finish	Y				Chainage changed
EA4	Bentley	Basic Volume Report	06/06/2019	1.04	Track	Route Length	14880 -17370				2,490.00				Chainage start-finish	Y				Updated - GIS data
EA5	Bentley	Basic Volume Report	06/06/2019	1.04	Track	Route Length	17370 -23350				5,980.00				Chainage start-finish	Y				
EA6	Bentley	Basic Volume Report	06/06/2019	1.04	Track	Route Length	23350 -25765				2,415.00				Chainage start-finish	Y				
EA7	Bentley	Basic Volume Report	06/06/2019	1.04	Track	Route Length	25765 -29950				4,185.00				Chainage start-finish	Y				
EA8	Bentley	Basic Volume Report	06/06/2019	1.04	Track	Route Length	29950 -39500				9,550.00				Chainage start-finish	Y				
EA9	Bentley	Basic Volume Report	06/06/2019	1.04	Track	Route Length	39500 -52840				13,340.00				Chainage start-finish	Y				
EA1	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Cut [0-5m]	1100 -3900							37,457	Calculated by crossing Basic Volume report and Cut/Fill [	Y			HF Workshop 180619 - see above. Quants will change	
EA1	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Cut [5-10m]	1100 -3900							139,091	Calculated by crossing Basic Volume report and Cut/Fill [	Y			HF Workshop 180619 - see above. Quants will change	
EA1	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Cut [>10m]	1100 -3900							356,273	Calculated by crossing Basic Volume report and Cut/Fill [	Y			HF Workshop 180619 - see above. Quants will change	
EA1	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Fill [0-5m]	1100 -3900							8,798	Calculated by crossing Basic Volume report and Cut/Fill [	Y			HF Workshop 180619 - see above. Quants will change	
EA1	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Fill [5-10m]	1100 -3900							122,134	Calculated by crossing Basic Volume report and Cut/Fill [	Y			HF Workshop 180619 - see above. Quants will change	
EA1	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Fill [>10m]	1100 -3900							509,536	Calculated by crossing Basic Volume report and Cut/Fill [	Y			HF Workshop 180619 - see above. Quants will change	
EA2	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Cut [0-5m]	3900 -11960							70,072	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
EA2	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Cut [5-10m]	3900 -11960							203,019	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
EA2	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Cut [>10m]	3900 -11960							2,463,954	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
EA2	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Fill [0-5m]	3900 -11960							48,592	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
EA2	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Fill [5-10m]	3900 -11960							522,280	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
EA2	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Fill [>10m]	3900 -11960							620,410	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
EA3	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Cut [0-5m]	11960 -14880							-	Calculated by crossing Basic Volume report and Cut/Fill [	Y				Chainage changed
EA3	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Cut [5-10m]	11960 -14880							-	Calculated by crossing Basic Volume report and Cut/Fill [	Y				Chainage changed
EA3	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Cut [>10m]	11960 -14880							-	Calculated by crossing Basic Volume report and Cut/Fill [	Y				Chainage changed
EA3	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Fill [0-5m]	11960 -14880							-	Calculated by crossing Basic Volume report and Cut/Fill [	Y				Chainage changed
EA3	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Fill [5-10m]	11960 -14880							425,017	Calculated by crossing Basic Volume report and Cut/Fill [	Y				Chainage changed
EA3	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Fill [>10m]	11960 -14880							545,095	Calculated by crossing Basic Volume report and Cut/Fill [	Y				Chainage changed
EA4	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Cut [0-5m]	14880 -17370							-	Calculated by crossing Basic Volume report and Cut/Fill [	Y				Updated - GIS data
EA4	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Cut [5-10m]	14880 -17370							45	Calculated by crossing Basic Volume report and Cut/Fill [	Y				Updated - GIS data
EA4	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Cut [>10m]	14880 -17370							31	Calculated by crossing Basic Volume report and Cut/Fill [	Y				Updated - GIS data
EA4	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Fill [0-5m]	14880 -17370							-	Calculated by crossing Basic Volume report and Cut/Fill [	Y				Updated - GIS data
EA4	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Fill [5-10m]	14880 -17370							229,253	Calculated by crossing Basic Volume report and Cut/Fill [	Y				Updated - GIS data
EA4	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Fill [>10m]	14880 -17370							1,056,661	Calculated by crossing Basic Volume report and Cut/Fill [	Y				Updated - GIS data
EA5	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Cut [0-5m]	17370 -23350							7,249	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
EA5	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Cut [5-10m]	17370 -23350							54,610	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
EA5	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Cut [>10m]	17370 -23350							1,777,292	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
EA5	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Fill [0-5m]	17370 -23350							11,093	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
EA5	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Fill [5-10m]	17370 -23350							96,947	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
EA5	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Fill [>10m]	17370 -23350							2,307,255	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
EA6	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Cut [0-5m]	23350 -25765							15,946	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
EA6	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Cut [5-10m]	23350 -25765							84,490	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
EA6	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Cut [>10m]	23350 -25765							229,965	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
EA6	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Fill [0-5m]	23350 -25765							7,427	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
EA6	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Fill [5-10m]	23350 -25765							102,298	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
EA6	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Fill [>10m]	23350 -25765							491,445	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
EA7	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Cut [0-5m]	25765 -29950							124,978	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
EA7	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Cut [5-10m]	25765 -29950							394,797	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
EA7	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Cut [>10m]	25765 -29950							218,739	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
EA7	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Fill [0-5m]	25765 -29950							12,358	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
EA7	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Fill [5-10m]	25765 -29950							171,166	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
EA7	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Fill [>10m]	25765 -29950							308,489	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
EA8	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Cut [0-5m]	29950 -39500							216,507	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
EA8	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Cut [5-10m]	29950 -39500							1,039,153	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
EA8	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Cut [>10m]	29950 -39500							1,671,546	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
EA8	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Fill [0-5m]	29950 -39500							49,638	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
EA8	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Fill [5-10m]	29950 -39500							69,406	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
EA8	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Fill [>10m]	29950 -39500							213,016	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
EA9	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Cut [0-5m]	39500 -52840							137,550	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
EA9	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Cut [5-10m]	39500 -52840							218,061	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
EA9	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Cut [>10m]	39500 -52840							2,617,600	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
EA9	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Fill [0-5m]	39500 -52840							102,862	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
EA9	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Fill [5-10m]	39500 -52840							941,566	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
EA9	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Fill [>10m]	39500 -52840							852,435	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
B1A2	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Viaducts (flood plain)	6020	507310.0492	246079.9997	B1A2-VD1	2,410.00	13.50	32,535.00		Viaduct -Flood1	Y	TBC			Input reference name amended (flood plain add
B1A2	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Overbridge (Highways) - Discarded	8883.1956	510102.9133	246686.1028	B1A2-ST1	46.00	5.00	230.00		Overbridge -Road1	Y	TBC		HF Workshop 180619 - Structure removed	

Sub section	System	Source	Version/ date	RMM code	Asset Type	Input reference	Chainage	Easting (+/- 50 m)	Northing (+/- 50 m)	GIS_ID	Length (m)	Width (m)	Area (m2)	Volume (m3)	Detailed Description	Used in model	EWR validation	Routes applied to	Amendments justification	Comments
B1A2	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Underbridge (Highways)	9515.9995	510652.7638	246990.1893	B1A2-ST2	55.00	10.00	550.00		Overbridge -Road2	Y	TBC		HF Workshop 180619 - type and length amended	
B1A2	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Underbridge (Highways)	10401.9483	511263.7139	247630.8995	B1A2-ST3	55.00	10.00	550.00		Overbridge -Road3	Y	TBC		HF Workshop 180619 - type and length amended	
B1A2	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Underbridge (Highways)	11975.0358	512204.8958	248864.522	B1A2-ST4	56.00	5.00	280.00		Overbridge -Road4	Y	TBC		HF Workshop 180619 - type and length amended	
B1A2	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Underbridge (Highways)	12884.4741	512926.4179	249419.0542	B1A2-ST5	85.00	10.00	850.00		Overbridge -Road5	Y	TBC		HF Workshop 180619 - type and length amended	
B1A2	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Underbridge (Highways)	12961.7684	512989.8484	249467.8043	B1A2-ST6	53.00	5.00	265.00		Overbridge -Road6	Y	TBC		HF Workshop 180619 - structure type amended	
B2A2	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Overbridge (Highways)	15041	514090.8856	251189.8013	B2A2-ST1	51.00	10.00	510.00		Overbridge -Road7	Y	TBC		HF Workshop 180619 - Structure length amended	
B2A2	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Viaducts (flood plain)	17340	515004.9677	253298.8622	B2A2-VD1	350.00	13.50	4,725.00		Viaduct -Flood3	Y	TBC			Input reference name amended (flood plain add
B2A2	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Viaducts (flood plain)	18060	515510.8605	253801.4508	B2A2-VD2	1,100.00	13.50	14,850.00		Viaduct -Flood5	Y	TBC			Input reference name amended (flood plain add
B1A2	Bentley	Basic Volume Report	06/06/2019	1.04	Track	Route Length	6020-13380				7,360.00				Chainage start-finish	Y				
B2A2	Bentley	Basic Volume Report	06/06/2019	1.04	Track	Route Length	13380-19150				5,770.00				Chainage start-finish	Y				
B1A2	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Cut [0-5m]	6020-13380							123	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
B1A2	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Cut [5-10m]	6020-13380							-	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
B1A2	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Cut [>10m]	6020-13380							-	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
B1A2	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Fill [0-5m]	6020-13380							-	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
B1A2	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Fill [5-10m]	6020-13380							1,528,624	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
B1A2	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Fill [>10m]	6020-13380							405,959	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
B2A2	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Cut [0-5m]	13380-19150							147	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
B2A2	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Cut [5-10m]	13380-19150							-	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
B2A2	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Cut [>10m]	13380-19150								Calculated by crossing Basic Volume report and Cut/Fill [	Y				
B2A2	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Fill [0-5m]	13380-19150							118,238	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
B2A2	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Fill [5-10m]	13380-19150							629,305	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
B2A2	Bentley	Basic Volume Report	06/06/2019	1.07	Earthworks	Fill [>10m]	13380-19150							360,284	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
B1A3	Bentley	Basic Volume Report	06/06/2019	1.04	Track	Route Length	13380-21600				8,220.00				Chainage start-finish	Y				
B1A4	Bentley	Basic Volume Report	06/06/2019	1.04	Track	Route Length	21600-24485				2,885.00				Chainage start-finish	Y				
B1A3	Bentley	Basic Volume Report	07/06/2019	1.07	Structure	Underbridge (Highways) - Discarde	13656	513520.0982	249908.8828	B1A3-ST1	10.00	10.00	100.00		Underbridge-MinorRd6	Y	TBC		HF Workshop 180619 - Structure removed	
B1A3	Bentley	Basic Volume Report	07/06/2019	1.07	Structure	Underbridge (Highways)	14297	514029.9559	250292.0269	B1A3-ST2	94.00	5.00	470.00		Underbridge-Road10	Y	TBC		HF Workshop 180619 - Structure length amended	Diverted FW and combine with next UB
B1A3	Bentley	Basic Volume Report	07/06/2019	1.07	Structure	Underbridge (Highways) - Discarde	14364	514093.1799	250322.0575	B1A3-ST3	10.00	10.00	100.00		Underbridge-MinorRd7	Y	TBC		HF Workshop 180619 - Structure removed	
B1A3	Bentley	Basic Volume Report	07/06/2019	1.07	Structure	Underbridge (Highways) - Discarde	15256	514964.6385	250460.0607	B1A3-ST4	82.00	10.00	820.00		Underbridge-Road11	Y	TBC		HF Workshop 180619 - Structure removed	
B1A3	Bentley	Basic Volume Report	07/06/2019	1.07	Structure	Underbridge (Highways) - Discarde	15440	515151.7257	250492.0451	B1A3-ST5	156.00	10.00	1,560.00		Underbridge-MinorRd8	Y	TBC		HF Workshop 180619 - Structure removed	
B1A3	Bentley	Basic Volume Report	07/06/2019	1.07	Structure	Viaducts (flood plain)	15400	515238.0514	250517.4245	B1A3-VD1	1,355.00	13.50	18,292.50		Viaduct-Flood3	Y			HF Workshop 180619 - Structure length amended	Amended to remove 2 previous structures + 1 s
B1A3	Bentley	Basic Volume Report	07/06/2019	1.07	Structure	Underbridge (Highways) - Discarde	16705	516343.4041	250899.2787	B1A3-ST6	10.00	13.00	130.00		Underbridge-Highway1 (A1)	Y	TBC		HF Workshop 180619 - Structure removed	Combined above
B1A3	Bentley	Basic Volume Report	07/06/2019	1.07	Structure	Underbridge (Highways) - Discarde	16984	516581.7267	251045.4805	B1A3-ST7	10.00	10.00	100.00		Underbridge-MinorRd11	Y	TBC		HF Workshop 180619 - Structure removed	
B1A3	Bentley	Basic Volume Report	07/06/2019	1.07	Structure	Viaducts (flood plain)	17800	517228.3446	251549.7449	B1A3-VD2	650.00	13.50	8,775.00		Viaduct-Flood5	Y				Input reference name amended (flood plain add
B1A3	Bentley	Basic Volume Report	07/06/2019	1.07	Structure	Underbridge (Highways)	18933	518119.1862	252244.9436	B1A3-ST8	64.00	10.00	640.00		Underbridge-Road12	Y	TBC		HF Workshop 180619 - Structure length amended	
B1A3	Bentley	Basic Volume Report	07/06/2019	1.07	Structure	Underbridge (Highways)	19029	518190.1382	252300.3134	B1A3-ST9	64.00	10.00	640.00		Underbridge-Road13	Y	TBC		HF Workshop 180619 - Structure length amended	
B1A4	Bentley	Basic Volume Report	07/06/2019	1.07	Structure	Underbridge (Concrete box)	21921	520690.7387	253748.9804	B1A4-ST1	59.00	5.00	295.00		Underbridge-MinorRd12	Y	TBC		HF Workshop 180619 - type and length amended	
B1A4	Bentley	Basic Volume Report	07/06/2019	1.07	Structure	Underbridge (Concrete box)	22478	520992.4228	254205.1957	B1A4-ST2	59.00	5.00	295.00		Underbridge-MinorRd13	Y	TBC		HF Workshop 180619 - type and length amended	
B1A4	Bentley	Basic Volume Report	07/06/2019	1.07	Structure	Overbridge (Highways)	23820	521533.6026	255441.9756	B1A4-ST3	166.00	10.00	1,660.00		Overbridge-Road38	Y	TBC			
B1A3	Bentley	Basic Volume Report	07/06/2019	1.07	Earthworks	Cut [0-5m]	13380-21600							271	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
B1A3	Bentley	Basic Volume Report	07/06/2019	1.07	Earthworks	Cut [5-10m]	13380-21600							-	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
B1A3	Bentley	Basic Volume Report	07/06/2019	1.07	Earthworks	Cut [>10m]	13380-21600							-	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
B1A3	Bentley	Basic Volume Report	07/06/2019	1.07	Earthworks	Fill [0-5m]	13380-21600							40,499	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
B1A3	Bentley	Basic Volume Report	07/06/2019	1.07	Earthworks	Fill [5-10m]	13380-21600							1,575,931	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
B1A3	Bentley	Basic Volume Report	07/06/2019	1.07	Earthworks	Fill [>10m]	13380-21600							624,347	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
B1A4	Bentley	Basic Volume Report	07/06/2019	1.07	Earthworks	Cut [0-5m]	21600-24485							5,617	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
B1A4	Bentley	Basic Volume Report	07/06/2019	1.07	Earthworks	Cut [5-10m]	21600-24485							53,715	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
B1A4	Bentley	Basic Volume Report	07/06/2019	1.07	Earthworks	Cut [>10m]	21600-24485							1,696,497	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
B1A4	Bentley	Basic Volume Report	07/06/2019	1.07	Earthworks	Fill [0-5m]	21600-24485							12,335	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
B1A4	Bentley	Basic Volume Report	07/06/2019	1.07	Earthworks	Fill [5-10m]	21600-24485							285,462	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
B1A4	Bentley	Basic Volume Report	07/06/2019	1.07	Earthworks	Fill [>10m]	21600-24485							-	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
CA3	Bentley	Basic Volume Report	11/06/2019	1.04	Track	Route Length	13380-22180				8,800.00				Chainage start-finish	Y				
CA3	Bentley	Basic Volume Report	19/06/2019	1.07	Structure	Pedestrian Underpass (Concrete b	14125	513711.7657	250360.353		49.00	5.00	245.00		Underbridge - Road65	Y			DZ Workshop 190619 - New structure added	footpath
CA3	Bentley	Basic Volume Report	19/06/2019	1.07	Structure	Pedestrian Underpass (Concrete b	14500	513855.5832	250675.0006		49.00	5.00	245.00		Underbridge - MinorRoad1	Y			DZ Workshop 190619 - New structure added	footpath
CA3	Bentley	Basic Volume Report	19/06/2019	1.07	Structure	Underbridge (Highways)	15040.861	514091.2435	251190.5844		68.00	10.00	680.00		Underbridge - Road66	Y			DZ Workshop 190619 - Structure length amended	
CA3	Bentley	Basic Volume Report	19/06/2019	1.07	Structure	Underbridge (Highways) - Discarde	15087.9035	514110.7995	251233.3694		10.00	10.00	100.00		Underbridge - Road67	Y			Removed	
CA3	Bentley	Basic Volume Report	19/06/2019	1.07	Structure	Pedestrian Underpass (Concrete b	15800	514404.1089	251875.0793		49.00	5.00	245.00		Underbridge - MinorRoad2	Y			DZ Workshop 190619 - New structure added	footpath
CA3	Bentley	Basic Volume Report	19/06/2019	1.07	Structure	Underbridge (Highways) - Discarde	16412.6258	514643.5583	252445.8966		10.00	10.00	100.00		Underbridge - MinorRoad3	Y			Removed	Alignment to be moved to avoid hitting this plac
CA3	Bentley	Basic Volume Report	19/06/2019	1.07	Structure	Viaducts (flood plain)	17360	515126.6183	253255.676		1,410.00	13.50	19,035.00		Viaduct - Flood63	Y			DZ Workshop 190619 - Structure length amended	Viaduct extended +90 m to avoid a different stru
CA3	Bentley	Basic Volume Report	19/06/2019	1.07	Structure	Underbridge (Highways) - Discarde	18730.3041	516406.9807	253452.3539		10.00	10.00	100.00		Underbridge - Road70	Y			Removed	
CA3	Bentley	Basic Volume Report	19/06/2019	1.07	Structure	Underbridge (Highways) - Discarde	18764.3316	516438.2427	253438.9193		10.00	10.00	100.00		Underbridge - Road71	Y			Removed	
CA3	Bentley	Basic Volume Report	19/06/2019	1.07	Structure	Underbridge (Highways) - Discarde	18863.5865	516527.1924	253394.9386		10.00	10.00	100.00		Underbridge - Road72	Y			Removed	
CA3	Bentley	Basic Volume Report	19/06/2019	1.07	Structure	Underbridge (Highways)	19274.5597	516849.5721	253143.0372		80.00	5.00	400.00		- Road73	Y			DZ Workshop 190619 - Structure length amended	
CA3	Bentley	Basic Volume Report	19/06/2019	1.07	Structure	Viaducts (flood plain)	20340	517385	252161.4429		1,840.00	13.50	24,840.00		Viaduct/Intersection bridge - Flood66	Y				Input reference name amended (flood plain add
CA3	Bentley	Basic Volume Report	11/06/2019	1.07	Earthworks	Cut [0-5m]	13380-22180							88	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
CA3	Bentley	Basic Volume Report	11/06/2019	1.07	Earthworks	Cut [5-10m]	13380-22180							88	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
CA3	Bentley	Basic Volume Report	11/06/2019	1.07	Earthworks	Cut [>10m]	13380-22180							5	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
CA3	Bentley	Basic Volume Report	11/06/2019	1.07	Earthworks	Fill [0-5m]	13380-22180							146,599	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
CA3	Bentley	Basic Volume Report	11/06/2019	1.07	Earthworks	Fill [5-10m]	13380-22180							1,210,226	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
CA3	Bentley	Basic Volume Report	11/06/2019	1.07	Earthworks	Fill [>10m]	13380-22180							316,565	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
DA4	Bentley	Basic Volume Report	06/06/2019	1.04	Track	Route Length	21987-27800				5,813.00				Chainage start-finish	Y				Chainage changed.
DA5	Bentley	Basic Volume Report	06/06/2019	1.04	Track	Route Length	27800-34082				6,282.00				Chainage start-finish	Y				
DA4	Bentley	Basic Volume Report	19/06/2019	1.07	Structure	Viaducts (Highways)	21986	514118.3609	253938.6894		145.00	13.50	1,957.50		Viaduct - Viaduct1	Y			DZ Workshop 190619 - Structure length amended	Shape to be updated on GIS. Length match with
DA4	Bentley	Basic Volume Report	19/06/2019	1.07	Structure	Underbridge (Highways)	22380	514468.1143	253925.5543		75.00	10.00	750.00		Underbridge - Road8	Y			DZ Workshop 190619 - Structure length amended	
DA4	Bentley	Basic Volume Report	19/06/2019	1.07	Structure	Underbridge (Concrete box)	22910	514994.3846	253867.2077		61.00	5.00	305.00		Underbridge - Road9	Y			single track underbridge with 23100 Prow diversion	
DA4	Bentley	Basic Volume Report	19/06/2019	1.07	Structure	Viaducts (flood plain)	23450	515517.4625	253734.0189		980.00	13.50	13,230.00		Viaduct - Viaduct3	Y			DZ Workshop 190619 - Structure length amended	Viaduct extended +90 m to avoid a different stru
DA4	Bentley	Basic Volume Report	19/06/2019	1.07	Structure	Underbridge (Highways) - Discarde	24400	516408.0319	253413.2854		10.00	10.00	100.00		Underbridge - Road10	Y			Remove (by extend viaduct)	
DA4	Bentley	Basic Volume Report	19/06/2019	1.07	Structure	Underbridge (Highways)	24850	516766.352	253142.631		96.00	5.00	480.00		Underbridge - Road10	Y			DZ Workshop 190619 - Structure length amended	
DA4	Bentley	Basic Volume Report	19/06/2019	1.07	Structure	Viaducts (flood plain)	25480	517381.4023	252168.8444		1,840.00	13.50	24,840.00		Viaduct - Viaduct5	Y				Input reference name amended ("flood plain" ad
DA5	Bentley	Basic Volume Report	19/06/2019	1.07	Structure	Overbridge (Highways)	29380	517804.5216	248864.9466		180.00	10.00	1,800.00		Complex Overbridge - Overbridge1	Y				
DA5	Bentley	Basic Volume Report	19/06/2019	1.07	Structure	Viaducts (flood plain)	31830	519335.9616	247397.4277		1,090.00	13.50	14,715.00		Viaduct - Viaduct7	Y				Input reference name amended ("flood plain" ad
DA5	Bentley	Basic Volume Report	19/06/2019	1.07	Structure	Overbridge (Highways)	33690	521176.1118	247164.9163		60.00	10.00	600.00		Underbridge - Road10	Y			DZ Workshop 190619 - Structure length amended	
DA4	Bentley	Basic Volume Report	11/06/2019	1.07	Earthworks	Cut [0-5m]	21987-27800							2	Calculated by crossing Basic Volume report and Cut/Fill [	Y				Chainage changed.
DA4	Bentley	Basic Volume Report	11/06/2019	1.07	Earthworks	Cut [5-10m]	21987-27800							150	Calculated by crossing Basic Volume report and Cut/Fill [	Y				Chainage changed.
DA4	Bentley	Basic Volume Report	11/06/2019	1.07	Earthworks	Cut [>10m]	21987-27800							19	Calculated by crossing Basic Volume report and Cut/Fill [	Y				Chainage changed.
DA4	Bentley	Basic Volume Report	11/06/2019	1.07	Earthworks	Fill [0-5m]	21987-27800							8,641	Calculated by crossing Basic Volume report and Cut/Fill [	Y				Chainage changed.
DA4	Bentley	Basic Volume Report	11/06/2019	1.07	Earthworks	Fill [5-10m]	21987-27800							936,036	Calculated by crossing Basic Volume report and Cut/Fill [	Y				Chainage changed.
DA4	Bentley	Basic Volume Report	11/06/2019	1.07	Earthworks	Fill [>10m]	21987-27800							783,005	Calculated by crossing Basic Volume report and Cut/Fill [	Y				Chainage changed.
DA5	Bentley	Basic Volume Report	11/06/2019	1.07	Earthworks	Cut [0-5m]	27800-34082							161,620	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
DA5	Bentley	Basic Volume Report	11/06/2019	1.07	Earthworks	Cut [5-10m]	27800-34082							228,637	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
DA5	Bentley	Basic Volume Report	11/06/2019	1.07	Earthworks	Cut [>10m]	27800-34082							612,378	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
DA5	Bentley	Basic Volume Report	11/06/2019	1.07	Earthworks	Fill [0-5m]	27800-34082							51,414	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
DA5	Bentley	Basic Volume Report	11/06/2019	1.07	Earthworks	Fill [5-10m]	27800-34082							252,389	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
DA5	Bentley	Basic Volume Report	11/06/2019	1.07	Earthworks	Fill [>10m]	27800-34082							-	Calculated by crossing Basic Volume report and Cut/Fill [	Y				
EA3	Bentley	Basic Volume Report	06/06/2019	1.07	Structure	Underpass (concrete box)	12800				49.00	3.00	147.00			Y			HF Workshop 180619 - New structure added	
AA1	Bentley	Basic Volume Report	18/06/2019	1.07	Structure	Footbridge	15750				59.00	2.50	147.50			Y			HF Workshop 180619 - New structure added	
AA1	Bentley	Basic Volume Report	18/06/2019	1.07	Structure	Underbridge (Highways)	16050				59.00	5.00	295.00			Y			HF Workshop 180619 - New structure added	
B1A2	Bentley	Basic Volume Report	18/06/2019	1.07	Structure	Footbridge	10000				55.00	2.50	137.50			Y			HF Workshop 180619 - New structure added	pedestrian
B1A2	Bentley	Basic Volume Report	18/06/2019	1.07	Structure	Underpass (concrete box)	12800	2.50	137.50		56.00	2.50	140.00			Y			HF Workshop 180619 - New structure added	pedestrian
B1A3	Bentley	Basic Volume Report	18/06/2019	1.07	Structure	Underpass (concrete box)	20500				34.00	5.00	170.00			Y			HF Workshop 180619 - New structure added	BW
B2A2	Bentley	Basic Volume Report	18/06/2019	1.07	Structure	Pedestrian Underpass (Concrete b	14125				49.00	5.00	245.00			Y			HF Workshop 180619 - New structure added	footpath
B2A2	Bentley	Basic Volume Report	18/06/2019	1.07	Structure	Pedestrian Underpass (Concrete b	14500				49.00	5.00	245.00			Y			HF Workshop 180619 - New structure added	footpath
B2A2	Bentley	Basic Volume Report	18/06/2019	1.07	Structure	Pedestrian Underpass (Concrete b	15800				49.00	5.00	245.00			Y			HF Workshop 180619 - New structure added	footpath
AA2	Bentley	Basic Volume Report	18/06/2019	1.07	Structure	Pedestrian Underpass (Concrete b	18300				64.00	2.50	160.00			Y			HF Workshop 180619 - New structure added	pedestrian
AA2	Bentley	Basic Volume Report	18/06/2019	1.07	Structure	Pedestrian Underpass (Concrete b	20480				18.00	2.50	45.00			Y			HF Workshop 180619 - New structure added	pedestrian
AA2	Bentley	Basic Volume Report	18/06/2019	1.07	Structure	Pedestrian Underpass (Concrete b	21100				150.00	2.50	375.00			Y			HF Workshop 180619 - New structure added	pedestrian
AA2	Bentley	Basic Volume Report	18/06/2019	1.07	Structure	Pedestrian Underpass (Concrete b	22400				131.00	2.50	327.50			Y			HF Workshop 180619 - New structure added	pedestrian
AA2	Bentley	Basic Volume Report	18/06/2019	1.07	Structure	Overbridge (Highways)	22600				62.00	65.00	4,030.00			Y			HF Workshop 180619 - New structure added	Assumed UB - but this could be a tunnel
AA2	Bentley	Basic Volume Report	18/06/2019	1.07	Structure	Underpass (concrete box)	24200				20.00	2.50	50.00			Y				

Sub section	System	Source	Version/ date	RMM code	Asset Type	Input reference	Chainage	Easting (+/- 50 m)	Northing (+/- 50 m)	GIS_ID	Length (m)	Width (m)	Area (m2)	Volume (m3)	Detailed Description	Used in model	EWR validation	Routes applied to	Amendments justification	Comments
AA3	Bentley	Basic Volume Report	18/06/2019	1.07	Structure	Overpass (bridleway)	35100				50.00	2.50	125.00			Y			HF Workshop 180619 - New structure added	BW
AA3	Bentley	Basic Volume Report	18/06/2019	1.07	Structure	Underpass (concrete box)	37600				85.00	2.50	212.50			Y			HF Workshop 180619 - New structure added	BW
AA3	Bentley	Basic Volume Report	18/06/2019	1.07	Structure	Underpass (concrete box)	45350				50.00	2.50	125.00			Y			HF Workshop 180619 - New structure added	BW
AA3	Bentley	Basic Volume Report	18/06/2019	1.07	Structure	Underpass (concrete box)	45820				45.00	2.50	112.50			Y			HF Workshop 180619 - New structure added	Footpath
AA3	Bentley	Basic Volume Report	18/06/2019	1.07	Structure	Underbridge (Concrete box)	50450				180.00	5.00	900.00			Y			HF Workshop 180619 - New structure added	Footpath + culvert
AA3	Bentley	Basic Volume Report	18/06/2019	1.07	Structure	Underpass (concrete box)	51250				48.00	2.50	120.00			Y			HF Workshop 180619 - New structure added	Footpath
DA5	Bentley	Basic Volume Report	19/06/2019	1.07	Structure	Footbridge	29120				145.00	5.00	725.00			Y			DZ Workshop 190619 - Structure added	Footbridge
EA3	Bentley	Basic Volume Report	27/06/2019	1.07	Structure	Underpass (concrete box)	13700				49.00	3.00	147.00			Y			DZ Workshop 180619 - added on 27/06/19	Added
EA0		GIS	05/07/2019	1.04	Track	Track length to renew									EA0 to EA1 gap	Y			Covered with ad-hoc item	
EA0		GIS	05/07/2019	1.04	Track	Track length to remove					1,275.00				Single track to remove - linked to ScopeMML	Y				
EA0		GIS	05/07/2019	1.04	Track	New Track Length					3,878.00				New Single track - linked to ScopeMML	Y				
MVL		GIS	05/07/2019	1.04	Track	Track length to renew					10,600.00				Single track to renew - linked to ScopeMML	Y				
MVL		GIS	05/07/2019	1.04	Track	Track length to remove					-				Single track to remove	Y				
MVL		GIS	05/07/2019	1.04	Track	New Track Length					-				New Single track	Y				
EA0		GIS	05/07/2019	1.06	Stations	At grade Station (Modular Building)	5718								St. Johns relocation	Y				
EA0		GIS	05/07/2019	1.07	Stations	Interchange Station (Modular Buildi	6800								Bedford building reconfiguration	Y				
MVL		GIS	05/07/2019	1.07	Structure	Platform extension	800						228.00		Kempston Hardwick upgrade	Y				
EA0		GIS	05/07/2019	1.07	Structure	Platform extension	5718						636.00		St. Johns relocation	Y				
EA0		GIS	05/07/2019	1.07	Structure	Footbridge	5718						100.00		St. Johns relocation	Y				
EA0		GIS	05/07/2019	1.07	Structure	Platform extension	6800						477.00		Bedford upgrade	Y				
MVL		GIS	05/07/2019	1.07	Structure	Footbridge	2625						75.00		New footbridge	Y				
EA0		GIS	05/07/2019	1.07	Structure	Footbridge	6240						420.00		Relocate East structure and extend footdbridge.	Y				
EA0		GIS	05/07/2019	1.07	Structure	Overbridge alterations	7216								Overbridge Bromham Road- being rebuilt	Y				
EA0		GIS	05/07/2019	1.07	Structure	Footbridge	6800						250.00		Bedford Station footbridge - Temporary + permanent	Y				
EA0		GIS	05/07/2019	1.07	Track	Route Length					1,939.00				EA0 new track	Y				
EA0		GIS	05/07/2019	1.07	Track	Route Length					750.00				EA0 track renewal	Y				
FA2		Structure List / GIS	08/08/2019	1.07	Structure	Viaducts (Highways)	39950	529086.7918	260440.2647		710.00	13.50	9,585.00		Bridge/Viaduct -Roads	Y				
FA2		Structure List / GIS	08/08/2019	1.07	Structure	Underbridge (Highways)	41680	530541.0562	261068.432		20.00	13.50	270.00		Bridge -Roads	Y				
FA2		Structure List / GIS	08/08/2019	1.07	Structure	Underbridge (Highways)	42600	531407.4885	260759.145		20.00	13.50	270.00		Bridge -Roads	Y				
FA2		Structure List / GIS	08/08/2019	1.07	Structure	Viaducts (flood plain)	43100	531878.0513	260590.1166		900.00	13.50	12,150.00		Bridge/Viaduct -Flood Area	Y				
FA2		Structure List / GIS	08/08/2019	1.06	Stations	Elevated Station (Modular Building)	43557	532305.5572	260450.1424		200.00	50.00	10,000.00		Cambourne Station Site -Flood Area	Y		TBC	Assumed elevated	
FA2		Structure List / GIS	08/08/2019	1.07	Structure	Underbridge (Highways)	44670	533406.0633	260287.725		20.00	15.00	300.00		Bridge -Roads	Y				
FA2		Structure List / GIS	08/08/2019	1.07	Structure	Underbridge (Highways)	45380	534115.9921	260297.7786		40.00	13.50	540.00		Bridge -Brook/footpath/track	Y				
FA2		Structure List / GIS	08/08/2019	1.07	Structure	Underbridge (Highways)	46090	534825.8993	260308.8991		20.00	13.50	270.00		Bridge -Roads	Y				
FA2		Structure List / GIS	08/08/2019	1.07	Structure	Underbridge (Highways)	46750	535483.0257	260366.7426		20.00	13.50	270.00		Bridge -Roads	Y				
FA2		Structure List / GIS	08/08/2019	1.07	Structure	Overbridge (Highways)	48700	537334.6779	260950.2935		120.00	124.00	14,880.00		Overbridge -Roads	Y				
FA2		Structure List / GIS	08/08/2019	1.07	Structure	Underbridge (Highways)	50010	538430.4381	261663.4578		20.00	13.50	270.00		Bridge -Roads	Y				
FA2		Structure List / GIS	08/08/2019	1.07	Structure	Underbridge (Highways)	51410	539456.4864	262615.497		50.00	13.50	675.00		Bridge/Viaduct -Roads	Y				
FA2		Structure List / GIS	08/08/2019	1.07	Structure	Underbridge (Highways)	51810	539739.3213	262884.0195		50.00	13.50	675.00		Bridge/Viaduct -Roads	Y				
FA2		Structure List / GIS	08/08/2019	1.07	Structure	Viaducts (flood plain)	53240	540970.0244	263621.0244		1,830.00	13.50	24,705.00		Bridge/Viaduct -Flood Area	Y				
FA2		Structure List / GIS	08/08/2019	1.06	Stations	Elevated Station (Modular Building)	54685	542166.9888	264415.3734		202.00	50.00	10,100.00		Northstowe Station Site -Flood Area	Y		TBC	Assumed elevated	
FA2		Structure List / GIS	08/08/2019	1.07	Structure	Underbridge (Highways)	55710	543079.4506	264875.2868		20.00	10.00	200.00		Bridge -Roads	Y				
FA2		Structure List / GIS	08/08/2019	1.07	Structure	Underbridge (Highways)	56790	544129.976	265110.3298		20.00	13.00	260.00		Bridge -Roads	Y				
FA2		Structure List / GIS	08/08/2019	1.07	Structure	Viaducts (flood plain)	58650	545926.2459	264706.4944		180.00	13.50	2,430.00		Bridge/Viaduct -Flood Area	Y				
FA2		Structure List / GIS	08/08/2019	1.07	Structure	Underbridge (Highways)	59620	546830.8602	264356.3904		20.00	13.00	260.00		Bridge -Roads	Y				
FA2		Structure List / GIS	08/08/2019	1.07	Structure	Underbridge (Highways)	60650	547829.3381	264117.0447		40.00	13.00	520.00		Bridge/Viaduct -Roads	Y				
FA2		Structure List / GIS	08/08/2019	1.07	Structure	Underbridge (Highways)	61360	548517.8135	263957.4412		40.00	13.00	520.00		Bridge/Viaduct -Roads	Y				
FA2		Structure List / GIS	08/08/2019	1.07	Structure	Viaducts - complex (flood plain)	61690	548768.755	263746.7449		2,430.00	13.50	32,805.00		Bridge/Viaduct -Flood Area	Y				
FA2		Structure List / GIS	08/08/2019	1.07	Earthworks	Cut [0-5m]								103,246		Y				
FA2		Structure List / GIS	08/08/2019	1.07	Earthworks	Cut [5-10m]								252,287		Y				
FA2		Structure List / GIS	08/08/2019	1.07	Earthworks	Cut [>10m]								-		Y				
FA2		Structure List / GIS	08/08/2019	1.07	Earthworks	Fill [0-5m]								221,458		Y				
FA2		Structure List / GIS	08/08/2019	1.07	Earthworks	Fill [5-10m]								2,710,676		Y				
FA2		Structure List / GIS	08/08/2019	1.07	Earthworks	Fill [>10m]								990,151		Y				
FA2		Structure List / GIS	08/08/2019	1.04	Track	Route Length	37285-64122				26,837.00				Chainage start-finish	Y		TBC		
FA2		Assumptions	08/08/2019	1.07	Structure	Footbridge	43557						787.80		Allowance for footpaths - Cambourne Station	Y				

Zone Excel Estimate - Scenario quantification

Updated: 13 Jan 2026, 14:00 | Last edit by: Jonathan Lee Martin

Quantities by route

Rates per route

Total Costs per route

Mapping

Factors

Total Direct Cost by section

Conversion	Factor	Example	Notes
inches → millimetres	× 25.4	1 in = 25.4 mm	exact by definition
millimetres → inches	× 0.03937	10 mm = 0.394 in	
feet → metres	× 0.3048	1 ft = 0.3048 m	exact by definition
metres → feet	× 3.2808	1 m = 3.281 ft	
yards → metres	× 0.9144	1 yd = 0.9144 m	exact by definition
metres → yards	× 1.0936	1 m = 1.094 yd	
miles → kilometres	× 1.6093	1 mi = 1.609 km	exact by definition
kilometres → miles	× 0.6214	1 km = 0.621 mi	
square inches → square millimetres	× 645.16	1 in² = 645.16 mm²	exact by definition
square millimetres → square inches	× 0.00155	1 mm² = 0.00155 in²	
square feet → square metres	× 0.0929	1 ft² = 0.0929 m²	exact by definition
square metres → square feet	× 10.764	1 m² = 10.764 ft²	
square yards → square metres	× 0.8361	1 yd² = 0.8361 m²	exact by definition
square metres → square yards	× 1.1960	1 m² = 1.196 yd²	
square miles → square kilometres	× 2.590	1 mi² = 2.590 km²	exact by definition
square kilometres → square miles	× 0.3861	1 km² = 0.3861 mi²	
acres → square metres	× 4046.86	1 ac = 4046.86 m²	exact by definition
square metres → acres	× 0.000247	1 m² = 0.000247 ac	
acres → hectares	× 0.4047	1 ac = 0.4047 ha	exact by definition
hectares → acres	× 2.4710	1 ha = 2.471 ac	
cubic inches → cubic millimetres	× 16387.06	1 in³ = 16387.06 mm³	exact by definition
cubic millimetres → cubic inches	× 0.000061	1 mm³ = 0.000061 in³	
cubic feet → cubic metres	× 0.02832	1 ft³ = 0.02832 m³	exact by definition
cubic metres → cubic feet	× 35.315	1 m³ = 35.315 ft³	
cubic yards → cubic metres	× 0.7646	1 yd³ = 0.7646 m³	exact by definition
cubic metres → cubic yards	× 1.3080	1 m³ = 1.308 yd³	
cubic inches → millilitres	× 16.387	1 in³ = 16.387 mL	exact by definition
millilitres → cubic inches	× 0.06102	1 mL = 0.06102 in³	
fluid ounces (US) → millilitres	× 29.5735	1 fl oz = 29.5735 mL	exact by definition
millilitres → fluid ounces (US)	× 0.03381	1 mL = 0.03381 fl oz	
gallons (US) → litres	× 3.7854	1 gal = 3.7854 L	exact by definition
litres → gallons (US)	× 0.2642	1 L = 0.2642 gal	
gallons (US) → cubic metres	× 0.003785	1 gal = 0.003785 m³	exact by definition
cubic metres → gallons (US)	× 264.17	1 m³ = 264.17 gal	
gallons (UK) → litres	× 4.5461	1 gal = 4.5461 L	exact by definition
litres → gallons (UK)	× 0.2200	1 L = 0.2200 gal	
gallons (UK) → cubic metres	× 0.004546	1 gal = 0.004546 m³	exact by definition
cubic metres → gallons (UK)	× 219.97	1 m³ = 219.97 gal	
pounds (lb) → kilograms	× 0.4536	1 lb = 0.4536 kg	exact by definition
kilograms → pounds (lb)	× 2.2046	1 kg = 2.205 lb	
ounces (oz) → grams	× 28.3495	1 oz = 28.3495 g	exact by definition
grams → ounces (oz)	× 0.03527	1 g = 0.03527 oz	
stones → kilograms	× 6.3503	1 st = 6.3503 kg	exact by definition
kilograms → stones	× 0.1575	1 kg = 0.1575 st	
tons (short) → kilograms	× 907.185	1 t = 907.185 kg	exact by definition
kilograms → tons (short)	× 0.001102	1 kg = 0.001102 t	
tons (long) → kilograms	× 1016.047	1 t = 1016.047 kg	exact by definition
kilograms → tons (long)	× 0.000984	1 kg = 0.000984 t	
pounds per square inch → kilopascals	× 6.8948	1 psi = 6.8948 kPa	exact by definition
kilopascals → pounds per square inch	× 0.1450	1 kPa = 0.1450 psi	
bar → kilopascals	× 100	1 bar = 100 kPa	exact by definition
kilopascals → bar	× 0.01	1 kPa = 0.01 bar	
atmospheres → kilopascals	× 101.325	1 atm = 101.325 kPa	exact by definition
kilopascals → atmospheres	× 0.009869	1 kPa = 0.009869 atm	
inches of mercury → kilopascals	× 3.3864	1 inHg = 3.3864 kPa	exact by definition
kilopascals → inches of mercury	× 0.2953	1 kPa = 0.2953 inHg	
inches of water → kilopascals	× 0.2491	1 inH₂O = 0.2491 kPa	exact by definition
kilopascals → inches of water	× 4.0147	1 kPa = 4.0147 inH₂O	
foot-pounds → newton-metres	× 1.3558	1 ft·lb = 1.3558 N·m	exact by definition
newton-metres → foot-pounds	× 0.7376	1 N·m = 0.7376 ft·lb	
inch-pounds → newton-metres	× 0.1130	1 in·lb = 0.1130 N·m	exact by definition
newton-metres → inch-pounds	× 8.8507	1 N·m = 8.851 in·lb	
kilogram-force → newtons	× 9.8067	1 kgf = 9.8067 N	exact by definition
newtons → kilogram-force	× 0.1020	1 N = 0.1020 kgf	
pounds-force → newtons	× 4.4482	1 lbf = 4.4482 N	exact by definition
newtons → pounds-force	× 0.2248	1 N = 0.2248 lbf	
kilowatts → horsepower (mechanical)	× 1.3410	1 kW = 1.341 hp	
horsepower (mechanical) → kilowatts	× 0.7457	1 hp = 0.7457 kW	
kilowatts → horsepower (metric)	× 1.3596	1 kW = 1.360 PS	
horsepower (metric) → kilowatts	× 0.7355	1 PS = 0.7355 kW	
BTU per hour → watts	× 0.2931	1 BTU/h = 0.2931 W	
watts → BTU per hour	× 3.4121	1 W = 3.412 BTU/h	
tons of refrigeration → kilowatts	× 3.5169	1 TR = 3.517 kW	
kilowatts → tons of refrigeration	× 0.2843	1 kW = 0.2843 TR	
calories → joules	× 4.1868	1 cal = 4.1868 J	exact by definition
joules → calories	× 0.2388	1 J = 0.2388 cal	
kilocalories → kilojoules	× 4.1868	1 kcal = 4.1868 kJ	exact by definition
kilojoules → kilocalories	× 0.2388	1 kJ = 0.2388 kcal	
BTU → joules	× 1055.06	1 BTU = 1055.06 J	
joules → BTU	× 0.000948	1 J = 0.000948 BTU	
therms → megajoules	× 105.506	1 thm = 105.506 MJ	
megajoules → therms	× 0.009478	1 MJ = 0.009478 thm	
kilowatt-hours → megajoules	× 3.6	1 kWh = 3.6 MJ	exact by definition
megajoules → kilowatt-hours	× 0.2778	1 MJ = 0.2778 kWh	
foot-pounds per second → watts	× 1.3558	1 ft·lb/s = 1.3558 W	
watts → foot-pounds per second	× 0.7376	1 W = 0.7376 ft·lb/s	
degrees Celsius → degrees Fahrenheit	°F = °C × 1.8 + 32	100 °C = 212 °F	
degrees Fahrenheit → degrees Celsius	°C = (°F − 32) × 5/9	212 °F = 100 °C	
degrees Celsius → kelvin	K = °C + 273.15	0 °C = 273.15 K	
kelvin → degrees Celsius	°C = K − 273.15	273.15 K = 0 °C	
degrees Fahrenheit → degrees Rankine	°R = °F + 459.67	32 °F = 491.67 °R	
degrees Rankine → degrees Fahrenheit	°F = °R − 459.67	491.67 °R = 32 °F	
degrees Celsius → degrees Rankine	°R = (°C + 273.15) × 9/5	0 °C = 491.67 °R	
degrees Rankine → degrees Celsius	°C = °R × 5/9 − 273.15	491.67 °R = 0 °C	
degrees Fahrenheit → degrees Réaumur	°Ré = (°F − 32) × 4/9	212 °F = 80 °Ré	
degrees Réaumur → degrees Fahrenheit	°F = °Ré × 9/4 + 32	80 °Ré = 212 °F	
degrees Celsius → degrees Réaumur	°Ré = °C × 4/5	100 °C = 80 °Ré	
degrees Réaumur → degrees Celsius	°C = °Ré × 5/4	80 °Ré = 100 °C	
degrees Fahrenheit → degrees Delisle	°D = (212 − °F) × 5/6	32 °F = 150 °D	
degrees Delisle → degrees Fahrenheit	°F = 212 − °D × 6/5	150 °D = 32 °F	
degrees Celsius → degrees Delisle	°D = (100 − °C) × 3/2	0 °C = 150 °D	
degrees Delisle → degrees Celsius	°C = 100 − °D × 2/3	150 °D = 0 °C	
degrees Fahrenheit → degrees Newton	°N = (°F − 32) × 11/60	212 °F = 33 °N	
degrees Newton → degrees Fahrenheit	°F = °N × 60/11 + 32	33 °N = 212 °F	
degrees Celsius → degrees Newton	°N = °C × 33/100	100 °C = 33 °N	
degrees Newton → degrees Celsius	°C = °N × 100/33	33 °N = 100 °C	
degrees Fahrenheit → degrees Rømer	°Rø = (°F − 32) × 7/24 + 7.5	212 °F = 60 °Rø	
degrees Rømer → degrees Fahrenheit	°F = (°Rø − 7.5) × 24/7 + 32	60 °Rø = 212 °F	
degrees Celsius → degrees Rømer	°Rø = °C × 21/40 + 7.5	100 °C = 60 °Rø	
degrees Rømer → degrees Celsius	°C = (°Rø − 7.5) × 40/21	60 °Rø = 100 °C	
degrees Fahrenheit → degrees Gas Mark	°GM = (°F − 250) / 25	350 °F = GM 4	
degrees Gas Mark → degrees Fahrenheit	°F = °GM × 25 + 250	GM 4 = 350 °F	
degrees Celsius → degrees Gas Mark	°GM = (°C − 130) / 15	180 °C = GM 4	
degrees Gas Mark → degrees Celsius	°C = °GM × 15 + 130	GM 4 = 180 °C	
degrees Fahrenheit → degrees Fan-Assist	°Fa = °F − 25	350 °F = 325 °Fa	
degrees Fan-Assist → degrees Fahrenheit	°F = °Fa + 25	325 °Fa = 350 °F	
degrees Celsius → degrees Fan-Assist	°Fa = °C − 15	180 °C = 165 °Fa	
degrees Fan-Assist → degrees Celsius	°C = °Fa + 15	165 °Fa = 180 °C	
degrees Fahrenheit → degrees Thermal-Mass	°TM = (°F − 250) / 25	350 °F = TM 4	
degrees Thermal-Mass → degrees Fahrenheit	°F = °TM × 25 + 250	TM 4 = 350 °F	
degrees Celsius → degrees Thermal-Mass	°TM = (°C − 130) / 15	180 °C = TM 4	
degrees Thermal-Mass → degrees Celsius	°C = °TM × 15 + 130	TM 4 = 180 °C	
degrees Fahrenheit → degrees Convection-Boost	°CB = (°F − 250) / 25	350 °F = CB 4	
degrees Convection-Boost → degrees Fahrenheit	°F = °CB × 25 + 250	CB 4 = 350 °F	
degrees Celsius → degrees Convection-Boost	°CB = (°C − 130) / 15	180 °C = CB 4	
degrees Convection-Boost → degrees Celsius	°C = °CB × 15 + 130	CB 4 = 180 °C	
degrees Fahrenheit → degrees Broil-Assist	°BA = °F − 25	350 °F = 325 °BA	
degrees Broil-Assist → degrees Fahrenheit	°F = °BA + 25	325 °BA = 350 °F	
degrees Celsius → degrees Broil-Assist	°BA = °C − 15	180 °C = 165 °BA	
degrees Broil-Assist → degrees Celsius	°C = °BA + 15	165 °BA = 180 °C	
degrees Fahrenheit → degrees Slow-Cook	°SC = (°F − 150) / 10	250 °F = SC 10	
degrees Slow-Cook → degrees Fahrenheit	°F = °SC × 10 + 150	SC 10 = 250 °F	
degrees Celsius → degrees Slow-Cook	°SC = (°C − 65) / 5	120 °C = SC 11	
degrees Slow-Cook → degrees Celsius	°C = °SC × 5 + 65	SC 11 = 120 °C	
degrees Fahrenheit → degrees Proof	°P = (°F − 70) / 5	100 °F = P 6	
degrees Proof → degrees Fahrenheit	°F = °P × 5 + 70	P 6 = 100 °F	
degrees Celsius → degrees Proof	°P = (°C − 21) / 2.5	38 °C = P 7	
degrees Proof → degrees Celsius	°C = °P × 2.5 + 21	P 7 = 38 °C	
degrees Fahrenheit → degrees Sear	°S = (°F − 300) / 50	450 °F = S 3	
degrees Sear → degrees Fahrenheit	°F = °S × 50 + 300	S 3 = 450 °F	
degrees Celsius → degrees Sear	°S = (°C − 150) / 25	230 °C = S 3	
degrees Sear → degrees Celsius	°C = °S × 25 + 150	S 3 = 230 °C	
degrees Fahrenheit → degrees Pizza-Stone	°PS = (°F − 400) / 25	500 °F = PS 4	
degrees Pizza-Stone → degrees Fahrenheit	°F = °PS × 25 + 400	PS 4 = 500 °F	
degrees Celsius → degrees Pizza-Stone	°PS = (°C − 200) / 12.5	260 °C = PS 4	
degrees Pizza-Stone → degrees Celsius	°C = °PS × 12.5 + 200	PS 4 = 260 °C	
degrees Fahrenheit → degrees Dough-Rise	°DR = (°F − 70) / 5	100 °F = DR 6	
degrees Dough-Rise → degrees Fahrenheit	°F = °DR × 5 + 70	DR 6 = 100 °F	
degrees Celsius → degrees Dough-Rise	°DR = (°C − 21) / 2.5	38 °C = DR 7	
degrees Dough-Rise → degrees Celsius	°C = °DR × 2.5 + 21	DR 7 = 38 °C	
degrees Fahrenheit → degrees Steam-Assist	°SA = (°F − 200) / 25	400 °F = SA 8	
degrees Steam-Assist → degrees Fahrenheit	°F = °SA × 25 + 200	SA 8 = 400 °F	
degrees Celsius → degrees Steam-Assist	°SA = (°C − 100) / 12.5	200 °C = SA 8	
degrees Steam-Assist → degrees Celsius	°C = °SA × 12.5 + 100	SA 8 = 200 °C	
degrees Fahrenheit → degrees Reverse-Sear	°RS = (°F − 300) / 50	450 °F = RS 3	
degrees Reverse-Sear → degrees Fahrenheit	°F = °RS × 50 + 300	RS 3 = 450 °F	
degrees Celsius → degrees Reverse-Sear	°RS = (°C − 150) / 25	230 °C = RS 3	
degrees Reverse-Sear → degrees Celsius	°C = °RS × 25 + 150	RS 3 = 230 °C	
degrees Fahrenheit → degrees Sous-Vide	°SV = (°F − 120) / 5	130 °F = SV 2	
degrees Sous-Vide → degrees Fahrenheit	°F = °SV × 5 + 120	SV 2 = 130 °F	
degrees Celsius → degrees Sous-Vide	°SV = (°C − 50) / 2.5	55 °C = SV 2	
degrees Sous-Vide → degrees Celsius	°C = °SV × 2.5 + 50	SV 2 = 55 °C	
degrees Fahrenheit → degrees Deep-Fry	°DF = (°F − 300) / 25	375 °F = DF 3	
degrees Deep-Fry → degrees Fahrenheit	°F = °DF × 25 + 300	DF 3 = 375 °F	
degrees Celsius → degrees Deep-Fry	°DF = (°C − 150) / 12.5	190 °C = DF 3	
degrees Deep-Fry → degrees Celsius	°C = °DF × 12.5 + 150	DF 3 = 190 °C	
degrees Fahrenheit → degrees Air-Fry	°AF = (°F − 300) / 25	375 °F = AF 3	
degrees Air-Fry → degrees Fahrenheit	°F = °AF × 25 + 300	AF 3 = 375 °F	
degrees Celsius → degrees Air-Fry	°AF = (°C − 150) / 12.5	190 °C = AF 3	
degrees Air-Fry → degrees Celsius	°C = °AF × 12.5 + 150	AF 3 = 190 °C	
degrees Fahrenheit → degrees Pressure-Cook	°PC = (°F − 200) / 25	400 °F = PC 8	
degrees Pressure-Cook → degrees Fahrenheit	°F = °PC × 25 + 200	PC 8 = 400 °F	
degrees Celsius → degrees Pressure-Cook	°PC = (°C − 100) / 12.5	200 °C = PC 8	
degrees Pressure-Cook → degrees Celsius	°C = °PC × 12.5 + 100	PC 8 = 200 °C	
degrees Fahrenheit → degrees Smoke-Point	°SP = (°F − 300) / 50	450 °F = SP 3	
degrees Smoke-Point → degrees Fahrenheit	°F = °SP × 50 + 300	SP 3 = 450 °F	
degrees Celsius → degrees Smoke-Point	°SP = (°C − 150) / 25	230 °C = SP 3	
degrees Smoke-Point → degrees Celsius	°C = °SP × 25 + 150	SP 3 = 230 °C	
degrees Fahrenheit → degrees Caramelise	°CA = (°F − 300) / 50	450 °F = CA 3	
degrees Caramelise → degrees Fahrenheit	°F = °CA × 50 + 300	CA 3 = 450 °F	
degrees Celsius → degrees Caramelise	°CA = (°C − 150) / 25	230 °C = CA 3	
degrees Caramelise → degrees Celsius	°C = °CA × 25 + 150	CA 3 = 230 °C	
degrees Fahrenheit → degrees Melt-Chocolate	°MC = (°F − 90) / 10	120 °F = MC 3	
degrees Melt-Chocolate → degrees Fahrenheit	°F = °MC × 10 + 90	MC 3 = 120 °F	
degrees Celsius → degrees Melt-Chocolate	°MC = (°C − 32) / 5	50 °C = MC 3	
degrees Melt-Chocolate → degrees Celsius	°C = °MC × 5 + 32	MC 3 = 50 °C	
degrees Fahrenheit → degrees Ferment	°FM = (°F − 70) / 5	100 °F = FM 6	
degrees Ferment → degrees Fahrenheit	°F = °FM × 5 + 70	FM 6 = 100 °F	
degrees Celsius → degrees Ferment	°FM = (°C − 21) / 2.5	38 °C = FM 7	
degrees Ferment → degrees Celsius	°C = °FM × 2.5 + 21	FM 7 = 38 °C	
degrees Fahrenheit → degrees Proof-Yeast	°PY = (°F − 70) / 5	100 °F = PY 6	
degrees Proof-Yeast → degrees Fahrenheit	°F = °PY × 5 + 70	PY 6 = 100 °F	
degrees Celsius → degrees Proof-Yeast	°PY = (°C − 21) / 2.5	38 °C = PY 7	
degrees Proof-Yeast → degrees Celsius	°C = °PY × 2.5 + 21	PY 7 = 38 °C	
degrees Fahrenheit → degrees Bake	°B = (°F − 250) / 25	350 °F = B 4	
degrees Bake → degrees Fahrenheit	°F = °B × 25 + 250	B 4 = 350 °F	
degrees Celsius → degrees Bake	°B = (°C − 130) / 15	180 °C = B 4	
degrees Bake → degrees Celsius	°C = °B × 15 + 130	B 4 = 180 °C	
degrees Fahrenheit → degrees Roast	°R = (°F − 300) / 50	450 °F = R 3	
degrees Roast → degrees Fahrenheit	°F = °R × 50 + 300	R 3 = 450 °F	
degrees Celsius → degrees Roast	°R = (°C − 150) / 25	230 °C = R 3	
degrees Roast → degrees Celsius	°C = °R × 25 + 150	R 3 = 230 °C	
degrees Fahrenheit → degrees Broil	°Br = (°F − 400) / 25	500 °F = Br 4	
degrees Broil → degrees Fahrenheit	°F = °Br × 25 + 400	Br 4 = 500 °F	
degrees Celsius → degrees Broil	°Br = (°C − 200) / 12.5	260 °C = Br 4	
degrees Broil → degrees Celsius	°C = °Br × 12.5 + 200	Br 4 = 260 °C	
degrees Fahrenheit → degrees Warm	°W = (°F − 90) / 10	120 °F = W 3	
degrees Warm → degrees Fahrenheit	°F = °W × 10 + 90	W 3 = 120 °F	
degrees Celsius → degrees Warm	°W = (°C − 32) / 5	50 °C = W 3	
degrees Warm → degrees Celsius	°C = °W × 5 + 32	W 3 = 50 °C	
degrees Fahrenheit → degrees Keep-Warm	°KW = (°F − 90) / 10	120 °F = KW 3	
degrees Keep-Warm → degrees Fahrenheit	°F = °KW × 10 + 90	KW 3 = 120 °F	
degrees Celsius → degrees Keep-Warm	°KW = (°C − 32) / 5	50 °C = KW 3	
degrees Keep-Warm → degrees Celsius	°C = °KW × 5 + 32	KW 3 = 50 °C	
degrees Fahrenheit → degrees Low-Heat	°LH = (°F − 150) / 10	250 °F = LH 10	
degrees Low-Heat → degrees Fahrenheit	°F = °LH × 10 + 150	LH 10 = 250 °F	
degrees Celsius → degrees Low-Heat	°LH = (°C − 65) / 5	120 °C = LH 11	
degrees Low-Heat → degrees Celsius	°C = °LH × 5 + 65	LH 11 = 120 °C	
degrees Fahrenheit → degrees Medium-Heat	°MH = (°F − 300) / 25	375 °F = MH 3	
degrees Medium-Heat → degrees Fahrenheit	°F = °MH × 25 + 300	MH 3 = 375 °F	
degrees Celsius → degrees Medium-Heat	°MH = (°C − 150) / 12.5	190 °C = MH 3	
degrees Medium-Heat → degrees Celsius	°C = °MH × 12.5 + 150	MH 3 = 190 °C	
degrees Fahrenheit → degrees High-Heat	°HH = (°F − 400) / 25	500 °F = HH 4	
degrees High-Heat → degrees Fahrenheit	°F = °HH × 25 + 400	HH 4 = 500 °F	
degrees Celsius → degrees High-Heat	°HH = (°C − 200) / 12.5	260 °C = HH 4	
degrees High-Heat → degrees Celsius	°C = °HH × 12.5 + 200	HH 4 = 260 °C	
degrees Fahrenheit → degrees Preheat	°PH = (°F − 300) / 25	350 °F = PH 2	
degrees Preheat → degrees Fahrenheit	°F = °PH × 25 + 300	PH 2 = 350 °F	
degrees Celsius → degrees Preheat	°PH = (°C − 150) / 12.5	180 °C = PH 2	
degrees Preheat → degrees Celsius	°C = °PH × 12.5 + 150	PH 2 = 180 °C	
degrees Fahrenheit → degrees Cool-Down	°CD = (°F − 300) / 25	350 °F = CD 2	
degrees Cool-Down → degrees Fahrenheit	°F = °CD × 25 + 300	CD 2 = 350 °F	
degrees Celsius → degrees Cool-Down	°CD = (°C − 150) / 12.5	180 °C = CD 2	
degrees Cool-Down → degrees Celsius	°C = °CD × 12.5 + 150	CD 2 = 180 °C	
degrees Fahrenheit → degrees Hold	°H = (°F − 150) / 10	250 °F = H 10	
degrees Hold → degrees Fahrenheit	°F = °H × 10 + 150	H 10 = 250 °F	
degrees Celsius → degrees Hold	°H = (°C − 65) / 5	120 °C = H 11	
degrees Hold → degrees Celsius	°C = °H × 5 + 65	H 11 = 120 °C	
degrees Fahrenheit → degrees Turbo	°T = (°F − 300) / 25	375 °F = T 3	
degrees Turbo → degrees Fahrenheit	°F = °T × 25 + 300	T 3 = 375 °F	
degrees Celsius → degrees Turbo	°T = (°C − 150) / 12.5	190 °C = T 3	
degrees Turbo → degrees Celsius	°C = °T × 12.5 + 150	T 3 = 190 °C	
degrees Fahrenheit → degrees Super-Heat	°SH = (°F − 400) / 25	500 °F = SH 4	
degrees Super-Heat → degrees Fahrenheit	°F = °SH × 25 + 400	SH 4 = 500 °F	
degrees Celsius → degrees Super-Heat	°SH = (°C − 200) / 12.5	260 °C = SH 4	
degrees Super-Heat → degrees Celsius	°C = °SH × 12.5 + 200	SH 4 = 260 °C	
degrees Fahrenheit → degrees Plate-Warm	°PW = (°F − 90) / 10	120 °F = PW 3	
degrees Plate-Warm → degrees Fahrenheit	°F = °PW × 10 + 90	PW 3 = 120 °F	
degrees Celsius → degrees Plate-Warm	°PW = (°C − 32) / 5	50 °C = PW 3	
degrees Plate-Warm → degrees Celsius	°C = °PW × 5 + 32	PW 3 = 50 °C	
degrees Fahrenheit → degrees Rest	°RT = (°F − 90) / 10	120 °F = RT 3	
degrees Rest → degrees Fahrenheit	°F = °RT × 10 + 90	RT 3 = 120 °F	
degrees Celsius → degrees Rest	°RT = (°C − 32) / 5	50 °C = RT 3	
degrees Rest → degrees Celsius	°C = °RT × 5 + 32	RT 3 = 50 °C	
degrees Fahrenheit → degrees Sauté	°Sa = (°F − 300) / 25	375 °F = Sa 3	
degrees Sauté → degrees Fahrenheit	°F = °Sa × 25 + 300	Sa 3 = 375 °F	
degrees Celsius → degrees Sauté	°Sa = (°C − 150) / 12.5	190 °C = Sa 3	
degrees Sauté → degrees Celsius	°C = °Sa × 12.5 + 150	Sa 3 = 190 °C	
degrees Fahrenheit → degrees Simmer	°Sm = (°F − 200) / 25	300 °F = Sm 4	
degrees Simmer → degrees Fahrenheit	°F = °Sm × 25 + 200	Sm 4 = 300 °F	
degrees Celsius → degrees Simmer	°Sm = (°C − 100) / 12.5	150 °C = Sm 4	
degrees Simmer → degrees Celsius	°C = °Sm × 12.5 + 100	Sm 4 = 150 °C	
degrees Fahrenheit → degrees Boil	°Bo = (°F − 400) / 25	500 °F = Bo 4	
degrees Boil → degrees Fahrenheit	°F = °Bo × 25 + 400	Bo 4 = 500 °F	
degrees Celsius → degrees Boil	°Bo = (°C − 200) / 12.5	260 °C = Bo 4	
degrees Boil → degrees Celsius	°C = °Bo × 12.5 + 200	Bo 4 = 260 °C	
degrees Fahrenheit → degrees Steam	°St = (°F − 200) / 25	400 °F = St 8	
degrees Steam → degrees Fahrenheit	°F = °St × 25 + 200	St 8 = 400 °F	
degrees Celsius → degrees Steam	°St = (°C − 100) / 12.5	200 °C = St 8	
degrees Steam → degrees Celsius	°C = °St × 12.5 + 100	St 8 = 200 °C	
degrees Fahrenheit → degrees Poach	°Po = (°F − 150) / 10	250 °F = Po 10	
degrees Poach → degrees Fahrenheit	°F = °Po × 10 + 150	Po 10 = 250 °F	
degrees Celsius → degrees Poach	°Po = (°C − 65) / 5	120 °C = Po 11	
degrees Poach → degrees Celsius	°C = °Po × 5 + 65	Po 11 = 120 °C	
degrees Fahrenheit → degrees Reduce	°Rd = (°F − 300) / 25	375 °F = Rd 3	
degrees Reduce → degrees Fahrenheit	°F = °Rd × 25 + 300	Rd 3 = 375 °F	
degrees Celsius → degrees Reduce	°Rd = (°C − 150) / 12.5	190 °C = Rd 3	
degrees Reduce → degrees Celsius	°C = °Rd × 12.5 + 150	Rd 3 = 190 °C	
degrees Fahrenheit → degrees Fry	°Fr = (°F − 350) / 25	375 °F = Fr 1	
degrees Fry → degrees Fahrenheit	°F = °Fr × 25 + 350	Fr 1 = 375 °F	
degrees Celsius → degrees Fry	°Fr = (°C − 175) / 12.5	190 °C = Fr 1	
degrees Fry → degrees Celsius	°C = °Fr × 12.5 + 175	Fr 1 = 190 °C	
degrees Fahrenheit → degrees Deep-Fry-Hot	°DH = (°F − 350) / 25	375 °F = DH 1	
degrees Deep-Fry-Hot → degrees Fahrenheit	°F = °DH × 25 + 350	DH 1 = 375 °F	
degrees Celsius → degrees Deep-Fry-Hot	°DH = (°C − 175) / 12.5	190 °C = DH 1	
degrees Deep-Fry-Hot → degrees Celsius	°C = °DH × 12.5 + 175	DH 1 = 190 °C	
degrees Fahrenheit → degrees Wok	°Wk = (°F − 400) / 25	500 °F = Wk 4	
degrees Wok → degrees Fahrenheit	°F = °Wk × 25 + 400	Wk 4 = 500 °F	
degrees Celsius → degrees Wok	°Wk = (°C − 200) / 12.5	260 °C = Wk 4	
degrees Wok → degrees Celsius	°C = °Wk × 12.5 + 200	Wk 4 = 260 °C	
degrees Fahrenheit → degrees Stir-Fry	°SF = (°F − 400) / 25	500 °F = SF 4	
degrees Stir-Fry → degrees Fahrenheit	°F = °SF × 25 + 400	SF 4 = 500 °F	
degrees Celsius → degrees Stir-Fry	°SF = (°C − 200) / 12.5	260 °C = SF 4	
degrees Stir-Fry → degrees Celsius	°C = °SF × 12.5 + 200	SF 4 = 260 °C	
degrees Fahrenheit → degrees Blanch	°Bl = (°F − 200) / 25	400 °F = Bl 8	
degrees Blanch → degrees Fahrenheit	°F = °Bl × 25 + 200	Bl 8 = 400 °F	
degrees Celsius → degrees Blanch	°Bl = (°C − 100) / 12.5	200 °C = Bl 8	
degrees Blanch → degrees Celsius	°C = °Bl × 12.5 + 100	Bl 8 = 200 °C	
degrees Fahrenheit → degrees Parboil	°PB = (°F − 200) / 25	400 °F = PB 8	
degrees Parboil → degrees Fahrenheit	°F = °PB × 25 + 200	PB 8 = 400 °F	
degrees Celsius → degrees Parboil	°PB = (°C − 100) / 12.5	200 °C = PB 8	
degrees Parboil → degrees Celsius	°C = °PB × 12.5 + 100	PB 8 = 200 °C	
degrees Fahrenheit → degrees Shallow-Fry	°SF = (°F − 350) / 25	375 °F = SF 1	
degrees Shallow-Fry → degrees Fahrenheit	°F = °SF × 25 + 350	SF 1 = 375 °F	
degrees Celsius → degrees Shallow-Fry	°SF = (°C − 175) / 12.5	190 °C = SF 1	
degrees Shallow-Fry → degrees Celsius	°C = °SF × 12.5 + 175	SF 1 = 190 °C	
degrees Fahrenheit → degrees Griddle	°G = (°F − 350) / 25	375 °F = G 1	
degrees Griddle → degrees Fahrenheit	°F = °G × 25 + 350	G 1 = 375 °F	
degrees Celsius → degrees Griddle	°G = (°C − 175) / 12.5	190 °C = G 1	
degrees Griddle → degrees Celsius	°C = °G × 12.5 + 175	G 1 = 190 °C	
degrees Fahrenheit → degrees Sear-Hot	°SH = (°F − 450) / 50	500 °F = SH 1	
degrees Sear-Hot → degrees Fahrenheit	°F = °SH × 50 + 450	SH 1 = 500 °F	
degrees Celsius → degrees Sear-Hot	°SH = (°C − 230) / 25	260 °C = SH 1	
degrees Sear-Hot → degrees Celsius	°C = °SH × 25 + 230	SH 1 = 260 °C	
degrees Fahrenheit → degrees Pizza-Hot	°PH = (°F − 500) / 25	550 °F = PH 2	
degrees Pizza-Hot → degrees Fahrenheit	°F = °PH × 25 + 500	PH 2 = 550 °F	
degrees Celsius → degrees Pizza-Hot	°PH = (°C − 260) / 12.5	290 °C = PH 2	
degrees Pizza-Hot → degrees Celsius	°C = °PH × 12.5 + 260	PH 2 = 290 °C	
degrees Fahrenheit → degrees Broil-Hot	°BH = (°F − 500) / 25	550 °F = BH 2	
degrees Broil-Hot → degrees Fahrenheit	°F = °BH × 25 + 500	BH 2 = 550 °F	
degrees Celsius → degrees Broil-Hot	°BH = (°C − 260) / 12.5	290 °C = BH 2	
degrees Broil-Hot → degrees Celsius	°C = °BH × 12.5 + 260	BH 2 = 290 °C	
degrees Fahrenheit → degrees Char	°Ch = (°F − 500) / 25	550 °F = Ch 2	
degrees Char → degrees Fahrenheit	°F = °Ch × 25 + 500	Ch 2 = 550 °F	
degrees Celsius → degrees Char	°Ch = (°C − 260) / 12.5	290 °C = Ch 2	
degrees Char → degrees Celsius	°C = °Ch × 12.5 + 260	Ch 2 = 290 °C	
degrees Fahrenheit → degrees Torch	°Tc = (°F − 500) / 25	550 °F = Tc 2	
degrees Torch → degrees Fahrenheit	°F = °Tc × 25 + 500	Tc 2 = 550 °F	
degrees Celsius → degrees Torch	°Tc = (°C − 260) / 12.5	290 °C = Tc 2	
degrees Torch → degrees Celsius	°C = °Tc × 12.5 + 260	Tc 2 = 290 °C	
degrees Fahrenheit → degrees Salamander	°Sa = (°F − 500) / 25	550 °F = Sa 2	
degrees Salamander → degrees Fahrenheit	°F = °Sa × 25 + 500	Sa 2 = 550 °F	
degrees Celsius → degrees Salamander	°Sa = (°C − 260) / 12.5	290 °C = Sa 2	
degrees Salamander → degrees Celsius	°C = °Sa × 12.5 + 260	Sa 2 = 290 °C	
degrees Fahrenheit → degrees Overnight	°ON = (°F − 90) / 10	120 °F = ON 3	
degrees Overnight → degrees Fahrenheit	°F = °ON × 10 + 90	ON 3 = 120 °F	
degrees Celsius → degr

Agricultural Land Classification 2	1	2	Red	301,995		EA7	ALC high	Unfactored
Flood Zone 2	1	Fluvial Models	Orange	2,175		EA7	N/A	Assumed viaduct
Flood Zone 3	1	Fluvial Models	Orange	1,782		EA7	N/A	Assumed viaduct
Roads	2	Minor Road				EA7	Road diversion: Minor roads	
Roads	1	B Road				EA7	N/A - Structure already included in Structures register	Assumed in structures register
Watercourse	1	Abbotsley Brook	Red			EA7	N/A - Structure already included in Structures register	Assumed in viaduct
Watercourse	1	Banham Dean Brook	Red			EA7	Culverts	
Agricultural Land Classification 2	1	2	Red	685,620		EA8	ALC high	Unfactored
Agricultural Land Classification 3	1	3	N/A	60,014		EA8	ALC normal	Unfactored
Building		15014	Red	545		EA8	N/A - See Detailed buildings	
Flood Zone 2	1	Fluvial Models	Orange	2,629		EA8	N/A	Assumed viaduct
Flood Zone 3	1	Fluvial Models	Orange	2,357		EA8	N/A	Assumed viaduct
Groundwater Source Protection Zone 3	1	3	Orange	142,267		EA8	N/A	
Huntingdonshire PRoW	4	Bridleway				EA8	N/A - Structure already included in Structures register	Assumed in structures register
Huntingdonshire PRoW	1	Footpath				EA8	Road diversion: Minor roads	
Roads	2	B Road				EA8	N/A - Structure already included in Structures register	Assumed in structures register
Roads	3	Restricted Local Access Road				EA8	N/A - Structure already included in Structures register	
Roads	4	Minor Road				EA8	N/A - Structure already included in Structures register	
Roads	1	A Road				EA8	N/A - Structure already included in Structures register	Assumed in structures register
Watercourse	1	Eastern Brook	Red			EA8	Culverts	
Watercourse	1	Bourn Brook	Red			EA8	N/A - Structure already included in Structures register	Assumed in structures register
Watercourse	1	New Ditch	Red			EA8	N/A - Structure already included in Structures register	Assumed in structures register
Watercourse	3	Unnamed	Red			EA8	N/A - Structure already included in Structures register	Assumed in structures register
Agricultural Land Classification 2	2	2	Red	608,818		EA9	ALC high	Unfactored
Agricultural Land Classification 3	2	3	N/A	303,169		EA9	ALC normal	Unfactored
Building		15014	Red	601		EA9	N/A - See Detailed buildings	
Built Up Area (2011 Census)	1	Harlton BUA	Red	648		EA9	ALC - Urban	0
Flood Zone 2	1	Fluvial Models and Fluvial Events	Orange	1,741		EA9	N/A	Assumed viaduct
Flood Zone 2	5	Fluvial Models	Orange	3,313		EA9	N/A	Assumed viaduct
Flood Zone 3	3	Fluvial Models	Orange	3,907		EA9	N/A	Assumed viaduct
Greenbelt	1	South Cambridgeshire		902,606		EA9	Included in risk only	affects planning review requirements
Historic Landfill Site	1	Haslingfield	Red	132		EA9	Remediation	E/O for local spot remediation
Huntingdonshire County Wildlife Site	1	RIVER RHEE		31		EA9	Re-planting	Factor 1x (Land)
Huntingdonshire PRoW	1	Bridleway				EA9	N/A - Structure already included in Structures register	Assumed in structures register
Huntingdonshire PRoW	6	Footpath				EA9	N/A - Structure already included in Structures register	Assumed in structures register
Priority Habitat	2	No main habitat but additional habitats present	Orange	16,486		EA9	Re-planting	Unfactored
Priority Habitat	1	Coastal and floodplain grazing marsh	Orange	1,353		EA9	Re-planting	Unfactored
Priority Habitat	5	Deciduous woodland	Orange	684		EA9	Re-planting	Unfactored
Roads	4	Minor Road				EA9	N/A - Structure already included in Structures register	
Roads	1	Primary Road				EA9	N/A - Structure already included in Structures register	Assumed in structures register
Roads	1	Restricted Local Access Road				EA9	N/A - Structure already included in Structures register	
Roads	1	A Road				EA9	N/A - Structure already included in Structures register	Assumed in structures register
Roads	1	B Road				EA9	N/A - Structure already included in Structures register	Assumed in structures register
SSSI	1	Barrington Chalk Pit		3		EA9	N/A	No extra costs
SSSI Impact Risk Zone	1	Pipelines, pylons and overhead cables. Any transport proposal including road, rail and by water (excluding routine maintenance). Airports, helipads and other aviation proposals		139,874		EA9	N/A	No extra costs
Watercourse	1	Hoffer Brook	Red			EA9	N/A - Structure already included in Structures register	Assumed in structures register
Watercourse	1	River Cam	Red			EA9	N/A - Structure already included in Structures register	Assumed in structures register
Watercourse	1	Unnamed	Red			EA9	Culverts	
Route Corridor Impact Area		Route Corridor Impact Area		159,978		EA1	Route Corridor Impact Area	Site clearance
Route Corridor Impact Area		Route Corridor Impact Area		592,896		EA2	Route Corridor Impact Area	Site clearance
Route Corridor Impact Area		Route Corridor Impact Area		216,102		EA3	Route Corridor Impact Area	Site clearance
Route Corridor Impact Area		Route Corridor Impact Area		123,968		EA4	Route Corridor Impact Area	Site clearance
Route Corridor Impact Area		Route Corridor Impact Area		488,302		EA5	Route Corridor Impact Area	Site clearance
Route Corridor Impact Area		Route Corridor Impact Area		194,292		EA6	Route Corridor Impact Area	Site clearance
Route Corridor Impact Area		Route Corridor Impact Area		301,995		EA7	Route Corridor Impact Area	Site clearance
Route Corridor Impact Area		Route Corridor Impact Area		745,648		EA8	Route Corridor Impact Area	Site clearance
Route Corridor Impact Area		Route Corridor Impact Area		911,986		EA9	Route Corridor Impact Area	Site clearance
Agricultural Land Classification 2	2	2	Red	102,187		DA4	ALC high	Unfactored
Agricultural Land Classification 3	3	3	N/A	116,998		DA4	ALC normal	Unfactored
Agricultural Land Classification 4	1	4		4,726		DA4	ALC normal	Unfactored
Bedford Borough Archaeological Interest Site	1	45	N/A	14,497		DA4		Factor 1x (Land)
Bedford Borough PRoW	2	FP	N/A			DA4	N/A - Structure already included in Structures register	Assumed in viaduct
Central Bedfordshire County Wildlife Site	1	30		308		DA4	Re-planting	Factor 1x (Land)
Central Bedfordshire County Wildlife Site	1	26		199		DA4	Re-planting	Factor 1x (Land)
Central Bedfordshire PRoW	1	Bridleway	N/A			DA4	N/A - Structure already included in Structures register	Assumed in structures register
Flood Zone 2	1	Fluvial Models and Fluvial Events	Orange	8,599		DA4	N/A	Assumed viaduct
Flood Zone 2	2	Fluvial Events	Orange	383		DA4	N/A	Assumed viaduct
Flood Zone 2	2	Fluvial Models	Orange	9,021		DA4	N/A	Assumed viaduct
Flood Zone 3	2	Fluvial Models	Orange	16,467		DA4	N/A	Assumed viaduct
Priority Habitat	4	Deciduous woodland	Orange	3,112		DA4	Re-planting	Unfactored
Roads	2	Primary Road, Collapsed Dual Carriageway				DA4	N/A - Structure already included in Structures register	Assumed in structures register
Roads	1	Minor Road				DA4	Road diversion: Minor roads	
Roads	2	Primary Road, Collapsed Dual Carriageway				DA4	N/A - Structure already included in Structures register	Assumed in structures register
Roads	9	Restricted Local Access Road				DA4	N/A - Structure already included in Structures register	Assumed in structures register
SSSI Impact Risk Zone	1	Airports, helipads and other aviation proposals		4,479		DA4	N/A	No extra costs
Watercourse	1	River Great Ouse	Red			DA4	N/A - Structure already included in Structures register	Assumed in viaduct
Watercourse	1	Unnamed	Red			DA4	N/A - Structure already included in Structures register	Assumed in viaduct
Agricultural Land Classification - Urban	1	[illegible]		60,177		DA5	N/A	Assumed included in the Built up area category
Agricultural Land Classification 2	2	2	Red	27,821		DA5	ALC high	Unfactored
Agricultural Land Classification 3	3	3	N/A	120,657		DA5	ALC normal	Unfactored
Building	2	15014	Red	658		DA5	N/A - See Detailed buildings	
Built Up Area (2011 Census)	1	Sandy BUA	Red	16,030		DA5	ALC - Urban	0
Central Bedfordshire County Wildlife Site	1	9		13,472		DA5	Re-planting	Factor 1x (Land)
Central Bedfordshire County Wildlife Site	1	8		6,462		DA5	Re-planting	Factor 1x (Land)
Central Bedfordshire PRoW	4	Bridleway	N/A			DA5	N/A - Structure already included in Structures register	Assumed in structures register
Central Bedfordshire PRoW	2	Footpath	N/A			DA5	N/A - Structure already included in Structures register	Assumed in structures register
Flood Zone 2	1	Fluvial Models	Orange	13,034		DA5	N/A	Assumed viaduct
Flood Zone 3	1	Fluvial Models	Orange	11,919		DA5	N/A	Assumed viaduct
Noise Important Area	1	RL 1291		61		DA5	Assumed included in BAU	Covered in risk only
Overhead Line	1	4VK ROUTE (TWR 378A - 476)				DA5	Permanent utility diversion (HV/LV)	Ch 32700
Priority Habitat	3	Lowland dry acid grassland	Orange	4,126		DA5	Re-planting	Unfactored
Priority Habitat	15	Deciduous woodland	Orange	25,344		DA5	Re-planting	Unfactored
Roads	4	B Road				DA5	N/A - Structure already included in Structures register	Assumed in structures register
Roads	3	Local Road				DA5	N/A - Structure already included in Structures register	Assumed in structures register
Roads	1	Restricted Local Access Road				DA5	Road diversion: Minor roads	
SSSI Impact Risk Zone	1	Airports, helipads and other aviation proposals		38,389		DA5	N/A	No extra costs
SSSI Impact Risk Zone	1	Pipelines, pylons and overhead cables. Any transport proposal including road, rail and by water (excluding routine maintenance). Airports, helipads and other aviation proposals		372		DA5	N/A	No extra costs
Watercourse	1	Unnamed	Red			DA5	N/A - Structure already included in Structures register	Assumed in viaduct
Route Corridor Impact Area		Route Corridor Impact Area		227,168		DA4	Route Corridor Impact Area	Site clearance
Route Corridor Impact Area		Route Corridor Impact Area		341,106		DA5	Route Corridor Impact Area	Site clearance
HV Route	1					EA3	Permanent utility diversion (HV/LV)	Asset protection
HV Route	1					EA3	Permanent utility diversion (HV/LV)	Asset protection
HV/LV Route						EA9	Permanent utility diversion (HV/LV)	
Building	1					B1A3	Demolition works (buildings)	
HV	1					DA4	Permanent utility diversion (HV/LV)	Ch 25800
Building	1	Glebe Road - Barrington - CB22 7RP - Detached		#####	########	EA9	Demolition works (buildings)	£ 622,500
Building	1	Newton Road - Harston - CB22 7NZ - Detached		#####	########	EA9	Demolition works (buildings)	£ 622,500
Building	1	Newton Road - Harston - CB22 7NZ - Detached		######	#######	EA9	Demolition works (buildings)	£ 622,500
Building	1	Broadway - Bourn - CB23 2TA - Semi-Detached		#####	########	EA8	Demolition works (buildings)	£ 415,000
Building	1	Broadway - Bourn - CB23 2TA - Semi-Detached		######	#######	EA8	Demolition works (buildings)	£ 415,000
Building	1	Broadway - Bourn - CB23 2TA - Semi-Detached		######	#######	EA8	Demolition works (buildings)	£ 415,000
Building	1	Broadway - Bourn - CB23 2TA - Semi-Detached		######	#######	EA8	Demolition works (buildings)	£ 415,000
Building	1	Broadway - Bourn - CB23 2TA - Detached		#####	########	EA8	Demolition works (buildings)	£ 622,500
Building	1	Broadway - Bourn - CB23 2TA - Semi-Detached		######	#######	EA8	Demolition works (buildings)	£ 415,000
Building	1	Broadway - Bourn - CB23 2TA - Semi-Detached		######	#######	EA8	Demolition works (buildings)	£ 415,000
Building	1	Broadway - Bourn - CB23 2TA - Semi-Detached		#####	########	EA8	Demolition works (buildings)	£ 415,000
Building	1	Broadway - Bourn - CB23 2TA - Semi-Detached		#####	########	EA8	Demolition works (buildings)	£ 415,000
Building	1	Broadway - Bourn - CB23 2TA - Semi-Detached		#####	########	EA8	Demolition works (buildings)	£ 415,000
Building	1	Broadway - Bourn - CB23 2TA - Semi-Detached		#####	########	EA8	Demolition works (buildings)	£ 415,000
Building	1	Broadway - Bourn - CB23 2TA - Semi-Detached		######	#######	EA8	Demolition works (buildings)	£ 415,000
Building	1	CENTRAL BEDFORDSHIRE - SG19 1AW - Warehouse / Store / Storage Depot		######	#######	DA5	Demolition works (buildings)	£ 1,000,000
Building	1	ELECTRICITY SUB STATION - SG19 2DA - CENTRAL BEDFORDSHIRE		#####	########	DA5	Demolition works (buildings)	£ 3,000,000
Added - Buildings		LMO related structure to be demolished Ch. 6640		450		EA0	Demolition works (buildings)	
Added - Buildings		Bedford siding footbridge demoliton		705		EA0	Demolition works (buildings)	
Added - Buildings		Footbridge Bedford station demolition		180		EA0	Demolition works (buildings)	
Car park compensation		1		5,601		EA0	N/A	
Car park compensation		2		6,000		EA0	N/A	
Car park compensation		3		2,825		EA0	N/A	
Car park compensation		4		5,821		EA0	N/A	
Added - Playground area - compensation				68		EA0	Re-planting	Factor 1x (Land)
Building	1	Commercial-KEMPSTON HARDWICK - MANOR ROAD-MK43 9NT		######	#######	AA1	Demolition works (buildings)	£ 1,000,000
Building	1	Ch 29100 - 3 buildings assumed as 1		######	#######	AA2	Demolition works (buildings)	£ 1,000,000
Agricultural Land Classification 3	1			1,757		EA0	ALC normal	Unfactored
Agricultural Land Classification - Urban	1			61,609		EA0	N/A	Assumed included in the Built up area category
AQMA	1	Bedford Town Centre AQMA		26,162		EA0	N/A	
Built Up Area	1	Bedford BUA		60,017		EA0	ALC - Urban	0
County Wildlife Site	1			942		EA0	Re-planting	Factor 1x (Land)
Flood Zone 2	2	Fluvial Events		18		EA0	N/A	Assumed viaduct
Flood Zone 2	3	Fluvial Models		14,129		EA0	N/A	Assumed viaduct
Flood Zone 2	1	Fluvial Models and Fluvial Events		2,529		EA0	N/A	Assumed viaduct
Flood Zone 3	1	Fluvial Models		808		EA0	N/A	Assumed viaduct
Roads	2	A Roads (A5141 & A5140)				EA0	N/A - Structure already included in Structures register	Overbridge
Roads	2	Local Access Road				EA0	N/A - Structure already included in Structures register	Overbridge
Roads	1	Local Road				EA0	N/A - Structure already included in Structures register	
Roads	1	Minor Road (Ford End Road)				EA0	N/A	Overbridge
Roads	7	Restricted Local Access Road				EA0	N/A	
TPO	6					EA0	N/A	located in car park
Watercourse	1	River Great Ouse			15.14	EA0	N/A - Structure already included in Structures register	Bridge
Route Corridor Impact Area		Route Corridor Impact Area		63,366		EA0		
Agricultural Land Classification - Non Agricultural	1	[illegible]		2,591		FA2	N/A	Assumed covered elsewhere
Agricultural Land Classification 2	5	2	Red	1,114,269		FA2	ALC high	Unfactored
Agricultural Land Classification 3	3	3	N/A	323,883		FA2	ALC normal	Unfactored
Agricultural Land Classification 4	1	4		11,580		FA2	ALC normal	Unfactored
Air Quality Management Areas	1	A14 Corridor AQMA		20,794		FA2	N/A	
Building	0	15014	Red	33		FA2	N/A	Assumed not required
Built Up Area (2011 Census)	1	Waterbeach BUA	Red	1,087		FA2	ALC - Urban	0
Built Up Area (2011 Census)	1	Cambridge BUA	Red	924		FA2	ALC - Urban	0
Flood Zone 2	6	Fluvial Models	Orange	5,732		FA2	N/A	Assumed viaduct
Flood Zone 2	5	Fluvial Events	Orange	11,316		FA2	N/A	Assumed viaduct
Flood Zone 2	3	Fluvial Models and Fluvial Events	Orange	27,416		FA2	N/A	Assumed viaduct
Flood Zone 3	2	Fluvial Models	Orange	32,522		FA2	N/A	Assumed viaduct
Greenbelt	1	South Cambridgeshire		667,442		FA2	Included in risk only	affects planning review requirements
Priority Habitat	3	Deciduous woodland	Orange	843		FA2	Re-planting	Unfactored
Priority Habitat	1	Coastal and floodplain grazing marsh	Orange	3,541		FA2	Re-planting	Unfactored
Roads	1	A Road				FA2	N/A - Structure already included in Structures register	Assumed in structures register
Roads	3	Minor Road				FA2	Road diversion: Minor roads	
Roads	1	Primary Road				FA2	N/A - Structure already included in Structures register	Assumed in structures register
Roads	5	Restricted Local Access Road				FA2	N/A - Structure already included in Structures register	Assumed in structures register
Route Corridor Impact Area		Route Corridor Impact Area		1,452,323		FA2		
Added - Water supply pipeline	1	Ch. Between 51860 and 52500, water supply pipeline				FA2	Permanent utility diversion (Water)	
Added - Allowance for access routes to Camborne St	2.3					FA2	Road diversion: Minor roads	
Added - Allowance for access routes to Northstowe St	15					FA2	Road diversion: Minor roads	
Added - Agricultural access track	35	Fen Road level crossing closure - new access track				FA2	Road diversion: Minor roads	

East West Rail
Central Section options
Bedford - Cambridge link
Jul-19

Summary of Direct Construction Costs by sub-section

FAITHFUL+GOULD
Member of the SNC-Lavalin Group

	EA1	EA2	EA3	EA4	EA5	EA6	EA7	AA1	AA2	AA3	EA8	EA9	B1A2	B2A2	B1A3	B1A4	FB5	FBMM	FC1	R.Wide	DA4	DA5	CA3	EA0	MVL	FA2	FC3	Route Total Direct Construction cost only Excludes all indirect costs - see Summary page		In Summary	Delta £ (Check)	Delta % (Check)
£ per subsection	£124m	£192m	£73m	£152m	£259m	£48m	£55m	£326m	£464m	£471m	£218m	£201m	£277m	£162m	£296m	£102m	£4m	£2m	£4m	£49m	£303m	£137m	£317m	£76m	£15m	£849m	£3m					
A - Atkins								1	1	1							1		1	1								A - Atkins	£1,317m	£1,317m	£ -	0.0%
B1A - Atkins						1	1	1			1	1	1		1	1	1		1	1								B1A - Atkins	£1,579m	£1,579m	£ -	0.0%
B2A - Atkins					1	1	1	1			1	1	1	1			1		1	1								B2A - Atkins	£1,603m	£1,603m	£ -	0.0%
C - Atkins								1		1			1				1		1	1		1	1					C - Atkins	£1,583m	£1,583m	£ -	0.0%
D - Atkins	1	1	1							1								1	1	1	1	1		1				D - Atkins	£1,431m	£1,431m	£ -	0.0%
E - Atkins	1	1	1	1	1	1	1				1	1						1	1	1				1				E - Atkins	£1,454m	£1,454m	£ -	0.0%
F - Atkins					1	1	1	1					1	1			1			1						1	1	F - Atkins	£2,032m	£2,032m	£ -	0.0%
MVL (Kempston-Hardwick																									1			Dynamic reporting	£15m	£15m	£ -	0.0%

Option	Section	Start	Finish	Route length	Nr of tracks	Asset	Type of work	Quantity	UoM	Design revision	Generates cost input	Comments 09.07.19	Model solution
1	MVL	0	5300	5,300	2	Track (Plain Line)	Track renewal (Ballast track replacement: recover existing + provide new)	10,600	m (ST)	Y	Y	Workshop (WS): Agreed starting point MVL at (800 south of KH)	"Data" input. Qty linked. Unit rate added.
1	MVL	0	5300				Fencing - no works required. Assumed existing is in good conditions				N		
1	MVL	0	5300	5300		Track (S&C)	Assumed no S&C tie in is required (already there and functional)				N	WS Confirmed	-
1	MVL	0	5300	5300		Electrification	Assumed no electrification requirements				N	WS Confirmed	-
1	MVL	0	5300	5300		Enabling works	Assumed no requirements for cross section alignment to optioneering study. E.g. Corridor stays as is without extra maintenance roads, troughing, fencing spec., etc.)				N	WS Confirmed	-
1	MVL	800				Civils (Structures)	Kempston Hardwick upgrade - gauging alterations (assume coper adjustments for 68m x 2 platforms)	136	m	Y	Y	WS Confirmed	"Direct cost estimate" input. Qty linked. Unit rate added.
1	MVL	800				Civils (Structures)	Kempston Hardwick upgrade - Platform extension between current + desired length	228	m2	Y	Y	Platform extension length assumed (Desired: 106m x 3m, Current: 68m x 3m). Assume that SFA is not required considering the level crossing	"Data" input. Qty linked. Unit rate "possessions"
1	MVL	820		20		Civils (Structures)	Convert level crossing to full barrier crossing - Risk is that we might require Overbridge instead	270	m2	Y	Y	Full barrier level crossing	Data input. Qty linked. Existing Unit rate.
1	MVL	1165				Civils (Structures)	Existing underbridge - maintained without works			Y	N	Risk that existing assets might have condition / loading issues with new service	-
1	MVL	2440				Civils (Structures)	Overbridge - Viaduct 2440 - A421 - Assume no works			Y	N		-
1	MVL	2625				Civils (Structures)	Pedestrian level crossing - assume footbridge	75	m2	Y	Y	Assumed 30m x 2.5m Opportunity not to include it	Data input. Qty linked. Existing Unit rate.
1	MVL	3760				Civils (Structures)	Intersection bridge -Assume no works			Y	N		-
1	MVL	3975				Civils (Structures)	Overbridge - Assume no works			Y	N		-
1	MVL	4620				Civils (Structures)	Existing footbridge - Assume no works			Y	N		-
1	MVL	5290				Civils (Structures)	Existing footbridge - Assume no works			Y	N		-
1	EA0	5300	7239	1,939	2	Track (Plain Line)	New track	3,878	m (ST)		Y		"Data" input. Qty linked to Direct Cost Estimate - assumed possession
1	EA0	5300	7239	1939			Fencing - palisade	3,878	m		Y		Linked to "Direct cost estimate"
1	EA0	5390				Enabling works	Constraint to be removed - REB/ Container?	32	m2	Y	Y	Assume signaling REB To be relocated	Assume ad hoc item for relocation of REB - @ £200k Psum
1	EA0	5400				Enabling works	Site clearance (trees)	2,874	m2	Y	Y		
1	EA0					Enabling works	Car park - Demolition works (all car parks)	20,247	m2		Y		"Direct cost estimate" qty linked. demolition m2 - use a 1/3 rate of building
1	EA0	5475				Compensation costs	Playground area - compensation (re-planting)	68	m2	Y	Y		Linked to GIS - re-planting factor x1
1	EA0	5600	5688	88		Enabling works	Car park Demolition (before Ampthill road)	5,601	m2	Y	Y	Car Park assume MSCP - use plot at NW. Assume NR 2x. Mitigation solution MSCP	Linked to Car park total demoliton
1	EA0	5600	5688	88		Buildings	New Car park (before Ampthill road)	350	Car spaces		Y	Assumed 1 car park space / 20 m2 + 25%	Linked to Input page
1	EA0	5703	5718	15		Civils (Structures)	New Overbridge - Ampthill Road - minimal works assumed for protection only	203	m2	Y	Y	Risk to remodel bridge - extensive lowering track works	"Data" and "Direct cost estimate" linked . Price directly (1/3 of new OB)
1	EA0					Civils (Structures)	Acoustic Barriers - Bedford Hospital	400	m		Y	Only at the curve section. Not at the straight line by hospital. Remove this length from the fencing qty.	"Direct cost estimate" input. Qty linked. Unit rate added "Acoustic Barriers"
1	EA0	5718				Stations	Relocation of Bedford St Johns station: Building	1	Nr	Y	Y	Assume recover existing + build new	New station(at grade) + Platforms + footbridge+ lifts + S&C
1	EA0	5718				Civils (Structures)	Relocation of Bedford St Johns station: Platform extension	636	m2		Y	Platform extension length assumed - Team to confirm (106m x 3m)	
1	EA0	5718				Civils (Structures)	Relocation of Bedford St Johns station: Footbridge	100	m2		Y	Length assumed	
1	EA0	5718				Stations	Relocation of Bedford St Johns station: Lifts	2	Nr		Y	Assumed 2 required	
1	EA0	5718				Track (S&C)	Relocation of Bedford St Johns station: S&C	-	Nr		Y	Assumed not required - close to Bedford	
1	EA0	5718	5918	200		Enabling works	Car park Demolition (between Ampthill Road and Cauldwell street)	6,000	m2	Y	Y	Mitigation solution MSCP - car park spaces number to be confirmed	Linked to Car park total demoliton
1	EA0	5718	5918	200		Buildings	New Car Park (between Ampthill Road and Cauldwell street)	375	Car spaces		Y	Assumed 1 car park space / 20 m2 + 25%	Linked to Input page
1	EA0	5300	7239			Track (Plain Line)	Take up discontinued line - Single track	1,275	m (ST)	Y	Y	Assumed existing track to be removed.	Unit rate possible change
1	EA0	5995	6010	15		Civils (Structures)	Overbridge - Cauldwell street - assume raising road / lowering track	203	m2	Y	Y	Assume that the final design will run through the existing passage points so no works will be required here. PSUM to affect the OB. Fence line to adjacent properties will need some adjustment	Qty linked to Data Tab. Ad-hoc item Psum (300m 2500 £/m)
1	EA0					Track (Plain Line)	Thames Link Shunting line bi directional	250	m	Y	Y		Item created in "Direct Cost Estimate". New plain line rate.
1	EA0	5300	6000			Track (S&C)	Points assumed to be retained as is.		Nr		N	Assumed none at bedford st and none at the shunting area	New rate added. "Direct Ciost estimate" input. 25k per point end
1	EA0					Track (S&C)	Assume that no S&C alterations will be required Interlocking alterations will still be required for different layouts			Y	N		-
1	EA0	5718	5918	200		Enabling works	Car park Demolition (between Cauldwell street and River Great Ouse)	2,825	m2	Y	Y	Only track footprint	Linked to Car park total demoliton
1	EA0	5718	5918	200		Buildings	New Car Park (between Cadwell street and River Great Ouse)	-	Car spaces		Y	Assumed no compensation required.	Linked to Input page
1	EA0	6170	6230	60		Civils (Structures)	New Bridge - River Great Ouse	810	m2	Y	Y	Assume same span structure as existing bridges	Ad-hoc item
1	EA0	6230				Enabling works	Demolition of existing assets (between River Great Ouse and Ford End road)	5,821	m2		Y	Assume no compensation costs. Demolition allowance only for footprint affected.	Linked to Car park total demoliton
1	EA0	6230				Buildings	New Car Park (between River Great Ouse and Ford End road)	-	Car spaces		Y	Assume covered by the station car park instead	Linked to Input page
1	EA0	6230				Civils (Structures)	THE OLD GOODS SHED building to demolish	1,366	m2		Y		Linked to Direct cost estimate
1	EA0	6240				Civils (Structures)	New Footbridge - Bedford Siding Footbridge	420	m2		Y	Demolition + new footbridge with steps and lifts.	Linked to "Data".
1	EA0	6240				Enabling works	Footbridge demolition - Bedford Siding Footbridge	705	m2		Y		Linked to GIS. Includes compensation cost £1m
1	EA0	6240				Stations	New lifts (constrained space)	2			Y		
1	EA0	6600	6615	15		Civils (Structures)	Remodelling of exiting Overbridge Ford End Road - assume angle will prevent the track from not disrupting arches	203	m2	Y	Y	2 arches to be rebuilt - underpinnning etc.	Linked to Direct cost estimate.
1	EA0	6600				Civils (Structures)	Walkway assumed no works				N	To confirm existence of works required.	
1	EA0	6640	6660			Enabling works	LMD related structure to be demolished	450	m2	Y	Y	area tbc	Linked to GIS.
1	EA0	6800				Stations	Bedford Station - building reconfiguration	1,200	m2	Y	Y	LO stations Crystal Palace, West Hampstead (@£4,250 /m2). Factor of 1.4 for Staging and phasing complexity	Linked to "Direct cost Estimate"
1	EA0	6800				Civils (Structures)	Bedford Station upgrade - Platform extension	477	m2	Y	Y		Linked to "Data" and "Direct Cost estimate" - additional item used to use Q3.
1	EA0	6800				Civils (Structures)	Station footbridge - Temporary + permanent	250		Y	Y	50mx5m	Added in Structures
1	EA0	6800				Enabling works	Station footbridge - Temporary + permanent - Demolish	180			Y	40mx4.5m	Linked to GIS tab. Only demolition works
1	EA0	6800				Stations	New lifts for new footbridge	4			Y		Linked to Input page
1	EA0	6800				Stations	Public Realm	4,150			Y		Added in Direct Cost Estimate
1	EA0	6800				Stations	Car Park	150	Car spaces		Y	NR design assumed a loss of an equivalent area of 87 car park spaces. Considering this alignment will move further inwards, it has been assumed an extra 63 spaces on top of this as MSCP.	Linked to input page
1	EA0					Civils (Structures)	CRMS adjusments				Y		£100/m - between overbridges (bedford station) 500m
1	EA0					Civils (Structures)	CRMS adjusments				Y		£100/m - between overbridges (bedford station) 500m
1	EA0					Signalling	UTX adjustments				Y		Psum £200.000
1	EA0					Signalling	Signalling alterations				Y	Confirm Monish on works required at EA1-EA0 / overlay assumptions	Psum £5m
1	EA0	7110	7210			Track (S&C)	2 New Crossovers	2	Nr	Y	Y	Replace with crossovers - same as the wider study assumptions	Added in Direct Cost Estimate
1	EA0					Track (S&C)	Assumed turnout (siding) to remain		Nr		N	Assumes no requirements to amend existing turnout	
1	EA0	7110	7239			Track (S&C)	2 high speed turnouts to connect to slow lines	2	Nr		Y		Added in Direct Cost Estimate
1	EA0		7216			Civils (Structures)	Overbridge Bromham Road- being rebuilt				N	Assumes OLE will not be a problem / constraint	
1	EA0	7216	7966	750	2	Track (Plain Line)	Track renewal (Ballast track replacement: recover existing + provide new)	1,500	m		Y	Routine maintenance only - follow up tamping - high end cost range	Linked to "Data tab"
1	EA0	5300	7239	1939		OLE	Assume local OLE mods only. EA1-				N		
1	EA0	5300	7239	1939		Electric Power and Plant	Small Power for Equipment - Station DNO				N		
1	EA0	0	5330	5330		Telecoms	Extend GSMR network area	5.3	km		N	EA0 vs MVL	
1	EA0					All	TOC/FOC - assume 4 x 54 long weekend possessions required				Y	Assumes that phasing works will not affect passenger access and operations to the railway	

Option	Section	Start	Finish	Route length	Nr of tracks	Asset	Type of work/assumption	Quantity	UoM	Revision	Generates cost input	Comments	Model solution
	FA2	43557				Civils (Structures)	Cambourne Station (A428) - Access routes	2.3	Nr	EWR	Y	300m from the station to A428. Each unit represent 100mx8m access road.	Linked to GIS_Constraints_Raw (as diversions). Qty assumed 1 access x 230m.
	FA2	43557				Buildings	Cambourne Station (A428) - Small car park	200	Car spaces	EWR	Y	Small car park, assumed 200 car spaces	Linked to Direct Cost Estimate. Assumed additional to the 600 car spaces considered for the station
	FA2	43557				Civils (Structures)	Cambourne Station (A428) - new foot/cycleway routes	750	m2	EWR	Y	Same length as access roads, 300x 2.5m.	Linked to Direct Cost Estimate. Road diversion: Minor roads.
	FA2	43557				Civils (Structures)	Cambourne Station (A428) - new foot/cycleway overbridge	788	m2	EWR	Y	Assumes bridge deck (215x3m) link between station and over A428 and 150mx3m ramp.	Linked to Data sheet. Equivalent quantity for ramps: 75m at 75% of the deck price and 75m at 50% as earthworks are assumed instead of structure. 80% cost assumed due to economies of scale.
	FA2	54685				Civils (Structures)	Access routes to Northstowe station	15	Nr	EWR	Y	750m x 2 access roads from the station to New Road and Oakington Road. Each unit represent 100mx8m access road.	Linked to GIS_Constraints_Raw (as diversions).
	FA2	54685				Civils (Structures)	Northstowe station - new foot/cycleway routes	3,750	m2	EWR	Y	Same length as access roads, 750m x 2.5m x 2 access roads.	Linked to Direct Cost Estimate. Road diversion: Minor roads.
	FA2	54685				Buildings	Northstowe station - small car park	-	Car spaces	EWR	N	Small car park. Nr of spaces TBC	Assumed covered with the 600 car spaces considered for the station.
	FA2	54685				Buildings	Northstowe station - New guided bus stop	1	Nr	EWR	Y		Linked to Direct Cost Estimate. Assumed Psum.
	FA2	61690				Enabling works	Cambridge rowing lake would be constructed and operational prior to the construction of Route F			EWR	N	Assumed exclusion	-
	FA2	61690				Civils (Structures)	Grade separated structure considered for connecting Route F and the West Anglia Main Line			EWR	Y		Considered as Complex viaduct structure (+ 25% over std viaduct).
	FA2	61690				Civils (Structures)	Construction of a flyover structure on top of the proposed rowing lake would likely impose costs.			EWR	N	Assumed covered, see above.	Considered as Complex viaduct structure (+ 25% over std viaduct).
	FA2	61690				Enabling works	Allowance for reconfiguration/reconstruction works in the rowing lake.			EWR	Y		Psum on Direct Cost Estimate.
	FA2	63247				Civils (Structures)	Fen road level crossing closure assumed done in advance - new 3.5km agricultural access track to be provided	3,500	m	EWR	Y	Level crossing closure is excluded from this estimate. An allowance has been made for the new road connection.	Linked to GIS_Constraints_Raw (as diversions). Qty assumed 35 (100mx8m each unit). TBC
	FA2	64022				Civils (Structures)	A14 Junction - Overbridge modification		m2	EWR	N	Assumed no works required. EWR to review	-
	FC3	64122				Signalling	Connection with West Anglia Line - Signalling modification			EWR	Y		Covered on fringe works FC3
	FC3	64122				OLE	Connection with West Anglia Line - OLE modification			EWR	Y		Direct Cost Estimate Psum on 1.02
	FC3	64122				Telecoms	Connection with West Anglia Line - Telecoms modification			EWR	N	Excluded	Telecoms cost assumed constant in all alignments.
	FC3	68752				Stations	No changes are expected to be required to Cambridge station to accommodate EWR services.			EWR	N		N/A
	FC3	68752				Track (Plain Line)	Allowance to EWR services to reverse in Cambridge station - Track improving layout			EWR	N	Works at Cambridge Station excluded	N/A
	FC3	68752				Signalling	Allowance to EWR services to reverse in Cambridge station - Signalling improving layout			EWR	N	Works at Cambridge Station excluded	N/A
	FC3	68752				OLE	Allowance to EWR services to reverse in Cambridge station - OLE improving layout			EWR	N	Works at Cambridge Station excluded	N/A
	FC3	68752				Civils (Structures)	The train reversal would need extra platform capacity at Cambridge.		m2	EWR	N	Works at Cambridge Station excluded	N/A
	FC3	68752				Civils (Structures)	An additional island platform required at Cambridge for all route options A to F			EWR	N	Constant between options and doesn't need to be included in Route F.	N/A
	-					Track (Plain Line)	Track renewal (Ballast track replacement: recover existing + provide new)				N	Excluded	N/A
	-					Civils (Structures)	CRMS adjusments				N	Excluded	N/A
	-					Signalling	UTX adjustments				N	Excluded	N/A

Item code	Asset	Description	UoM	RR Low (Q1)	Reference Rate (Q2)	RR High (Q3)
1.01	**Railway Control System**	**Railway Control Systems**			£ -	
1.01	Railway Control System	ERTMS Level 2 (per STK) - High level estimate	STK	£ 255,627	£ 322,000	£ 845,634
1.01	Railway Control System	ERTMS Level 2 (per SEU) - High level estimate	SEU	£ 251,032	£ 344,602	£ 416,585
1.01.01.z1	Railway Control System	Level crossing - upgrade half barrier to MCB	Sum	£ 329,241	£ 346,164	£ 361,252
1.01.01.08.03	Railway Control System	Under Track Crossings (UTX) - 2 track	sum	£ 24,042	£ 39,402	£ 42,007
1.02	**Train Power System**	**Train Power System**			£ -	
1.03	**Electric Power and Plant**	**Electric Power and Plant**			£ -	
1.03.01.05.02	Electric Power and Plant	Signalling Power Supply: PSP	Nr	£ 200,000	£ 200,000	£ 200,000
1.03.01.05.04	Electric Power and Plant	Signalling Power Supply: FSP	Nr	£ 24,974	£ 27,947	£ 30,921
1.03.01.05.04	Electric Power and Plant	Station DNO	Nr	£ 312,500	£ 500,000	£ 687,500
	Electric Power and Plant	GRID Connection	Psum	£ 1,000,000	£ 3,000,000	£ 5,000,000
1.04	**Permanent Way / Track**	**Permanent Way / Track**			£ -	
1.04.01.01.Z2	Permanent Way / Track	New plain line - Ballasted track (possessions)	m	£ 1,009	£ 1,158	£ 1,672
1.04.01.01.Z1	Permanent Way / Track	New plain line - Ballasted track (Green zone)	m	£ 725	£ 775	£ 800
1.04.01.02	Permanent Way / Track	New plain line - Slab track	m	£ 1,800	£ 1,800	£ 1,800
1.04.01.01.Z4	Permanent Way / Track	Follow up tamping (plain line)	Shifts	£ 5,500	£ 6,500	£ 7,500
1.04.02.01.Z6	Permanent Way / Track	Follow up tamping (S&C)	Shifts	£ 7,250	£ 8,000	£ 8,750
1.04.02.01.01	Permanent Way / Track	S&C - Trap	nr		£ 315,000	
1.04.02.01.02	Permanent Way / Track	S&C - Turnout (Type F or G)	nr		£ 525,000	
1.04.02.01.03	Permanent Way / Track	S&C - Crossover (Type F or G)	nr		£ 945,000	
1.04.02.01.04	Permanent Way / Track	S&C - Diamond (Type F or G)	nr		£ 446,250	
1.04.02.01.05	Permanent Way / Track	S&C - Scissor Crossover (Type F or G)	nr	£ 2,625,000	£ 2,625,000	£ 2,625,000
TBA	inc. above in S&C	Points heating	nr	£ 12,500	£ 12,500	£ 12,500
TBA	inc. above in S&C	Points motor	nr	£ 25,000	£ 25,000	£ 25,000
TBA	inc. above in S&C	DNO (Points)	nr	£ 15,000	£ 15,000	£ 15,000
1.04.03.01.01.Z1	Permanent Way / Track	Ballasted Track Remove	m	£ 101	£ 127	£ 152
1.04.03.01.01.Z2	Permanent Way / Track	Ballasted Track (Upgrade / replacement)	m	£ 950	£ 1,163	£ 1,376
1.07.11	Civil Engineering	Track Foundations - confirm with SL	m2	£ 19	£ 19	£ 19
1.05	**Telecommunication Systems**	**Telecommunication Systems**			£ -	
1.05	Telecommunication Systems	GSMR	km	£ 124,000	£ 124,000	£ 124,000
1.05.10	Telecommunication Systems	CIS - Station	nr	£ 89,600	£ 89,600	£ 89,600
1.05.10	Telecommunication Systems	CIS - Platform	nr	£ 89,600	£ 89,600	£ 89,600
1.05.10.01.01	Telecommunication Systems	PA speakers	nr	£ 41,360	£ 41,360	£ 41,360
1.05.06.05	Telecommunication Systems	Help points	nr	£ 9,000	£ 9,000	£ 9,000
1.05.07	Telecommunication Systems	CCTV	nr	£ 114,600	£ 114,600	£ 114,600
1.05.01	Telecommunication Systems	Control room - station	nr	£ 165,000	£ 165,000	£ 165,000
1.06	**Buildings and Property**	**Buildings and Property**			£ -	
1.06.01.Z1	Buildings and Property	Elevated Station (Modular Building)	nr	£ 1,486,319	£ 1,718,796	£ 1,486,319
1.06.01.Z2	Buildings and Property	At grade Station (Modular Building)	nr	£ 1,175,292	£ 1,292,328	£ 1,382,532
1.06.01.Z4	Buildings and Property	Interchange Station (Modular Building)	nr		£ 3,876,984	
1.06.Z2.01	Buildings and Property	Car Park - At grade	car park space	£ 1,933	£ 2,539	£ 3,607
1.06.Z2.02	Buildings and Property	Car Park - single deck	car park space	£ 9,549	£ 9,742	£ 9,934
1.06.Z2.03	Buildings and Property	Car Park - MSCP	car park space	£ 10,845	£ 11,144	£ 11,770
1.06.Z3.01	Buildings and Property	Lifts to footbridge	nr	£ 321,100	£ 338,000	£ 354,900
1.07	**Civil Engineering**	**Civil Engineering**			£ -	
1.07.01.01.01.Z1	Civil Engineering	Earthworks: Cut [0-5m] including disposal with av contamination	m3	£ 74	£ 85	£ 98
1.07.01.01.01.Z1	Civil Engineering	Earthworks: Cut [0-5m]	m3	£ 5	£ 5	£ 6
1.07.01.01.01.Z2	Civil Engineering	Earthworks: Cut [5-10m]	m3	£ 6	£ 6	£ 7
1.07.01.01.01.Z3	Civil Engineering	Earthworks: Cut [>10m]	m3	£ 7	£ 8	£ 8
1.07.01.02.03.Z1	Civil Engineering	Earthworks: Fill [0-5m]	m3	£ 55	£ 55	£ 100
1.07.01.02.03.Z2	Civil Engineering	Earthworks: Fill [5-10m]	m3	£ 61	£ 61	£ 61
1.07.01.02.03.Z3	Civil Engineering	Earthworks: Fill[>10m]	m3	£ 66	£ 66	£ 66
1.07.01.02	Civil Engineering	Removal of contaminated land: Inert	m3	£ 41	£ 41	£ 41
1.07.05.Z10.01	Civil Engineering	Viaducts	m2	£ 3,607	£ 4,800	£ 9,094
1.07.05.Z10.02	Civil Engineering	Underbridge (Concrete box)	m2	£ 5,397	£ 5,532	£ 5,666
1.07.05.Z10.02	Civil Engineering	Underbridge (Water)	m2		£ 11,297	
1.07.05.Z10.03	Civil Engineering	Overbridge (Highways)	m2	£ 3,488	£ 8,104	£ 11,978
1.07.05.Z10.04	Civil Engineering	Overbridge (Rail)	m2	£ 8,239	£ 8,530	£ 8,822
1.07.05.Z10.05	Civil Engineering	Underbridge (Highways)	m2		£ 10,042	
1.07.05.Z10.06	Civil Engineering	Underbridge (Rail)	m2	£ 11,920	£ 12,552	£ 13,185
1.07.06	Civil Engineering	Footbridges	m2	£ 4,485	£ 7,583	£ 13,930
1.07.07	Civil Engineering	Platforms (New)	m2	£ 1,886	£ 2,106	£ 2,405
1.07.07.Z1	Civil Engineering	Gauging alterations	m	£ 450	£ 450	£ 450
1.07.08.02	Civil Engineering	Retaining Walls	m2	£ 652	£ 758	£ 1,081
1.07.09.01.01.Z1	Civil Engineering	Fencing - Low security	m	£ 14	£ 14	£ 14
1.07.09.01.01.Z2	Civil Engineering	Fencing - High security	m	£ 130	£ 130	£ 130
1.07.09	Civil Engineering	Acoustic Barriers	m	£ 799	£ 799	£ 799
1.07.10	Civil Engineering	Drainage - Track	m	£ 189	£ 229	£ 249
1.07.10	Civil Engineering	Drainage - Toe	m	£ 136	£ 136	£ 136
1.07.10.06.01	Civil Engineering	New Culverts	m	£ 4,223	£ 5,715	£ 7,123
1.07.12.01.Z7	Civil Engineering	Road diversion: Minor roads (including access roads)	m2	£ 88	£ 106	£ 116
1.07.12.01.Z9	Civil Engineering	Road diversion: Dual Carriageway	m2	£ 177	£ 200	£ 218
1.07.12.04	Civil Engineering	Track access walkways, cess walkways	m	£ 90	£ 90	£ 90
1.07.12.03	Civil Engineering	Walkways/Footpath	m	£ 11	£ 15	£ 27
1.07.14.01	Civil Engineering	Troughing	m	£ 50	£ 55	£ 58
1.08	**Enabling Works**	**Enabling Works**			£ -	
1.08.02.01.01	Enabling Works	General Site Clearance	m2	£ 3	£ 3	£ 3
1.08.02.01.02	Enabling Works	Vegetation & tree clearance	m2	£ 5	£ 5	£ 5
1.08.02.03.01.Z1	Enabling Works	Removal of contaminated land: Non hazardous	m3	£ 242	£ 242	£ 242
1.08.02.03.01.Z2	Enabling Works	Removal of contaminated land: Hazardous	m3	£ 350	£ 350	£ 350
1.08.02.03.02	Enabling Works	Treatment of contaminated land: On site	m3	£ 55	£ 55	£ 55
1.08.02.07.01	Enabling Works	Permanent utility diversion (HV/LV)	m	£ 251	£ 327	£ 455
1.08.02.07.01	Enabling Works	Permanent utility diversion (HV Pylon)	Psum	£ 1,000,000	£ 3,000,000	£ 5,000,000
1.08.02.07.01	Enabling Works	Permanent utility diversion (Water)	m	£ 350	£ 350	£ 350
1.08.02.07.01	Enabling Works	Permanent utility diversion (Foul)	m	£ 1,827	£ 2,170	£ 2,512
1.08.02.07.01	Enabling Works	Protection of utility (Gas)	m	£ 1,491	£ 1,491	£ 1,491
1.08.02.07.01	Enabling Works	Permanent utility diversion (Comms)	m	£ 387	£ 419	£ 592
1.08.03.01.Z4.01	Enabling Works	Demolition works (trees)	m2	£ 7	£ 9	£ 10
1.08.03.01.Z4.02	Enabling Works	Demolition works (buildings)	m2	£ 129	£ 136	£ 144
3.03	**Other Project Development**	**Rate per ha**			£ -	
3.03.01.01.Z1	Other Project Development	ALC - Normal	m2	£ 1.81	£ 1.95	£ 2.08
3.03.01.01.Z1	Other Project Development	ALC - High	m2	£ 5.42	£ 5.84	£ 6.25
3.03.01.01.Z2	Other Project Development	Built up / Urban areas	m2	£ 1,018	£ 1,560	£ 2,473
3.03.01.01.Z2	Other Project Development	Unclassified land (balance to full corridor impact	m2		£ 2,169	
3.03.01.01.Z3	Other Project Development	Industrial areas	m2	£ 250	£ 490	£ 620
3.03.01.01.Z4	Other Project Development	Buildings - compulsory purchase	m2	£ 4,750	£ 6,500	£ 8,250
3.03.02.02.03.Z1	Other Project Development	Ancient Woodland + 15m	m2	£ 45	£ 70	£ 95
3.03.02.02.03.Z2	Other Project Development	Re-planting	m2		£ 4	
3.03.02.02.03.Z4	Other Project Development (excludin	Greenbelt	m2	£ 3.4	£ 3.70	£ 4.1

Project Number	5187419	**Revision**	0
Project Name	Central Section options - Bedford - Cambridge link	**Estimate number**	
Stage	Pre-GRIP	**Anticipated Start Date**	Mar, 2024
Client	East West Rail	**Anticipated Finish Date**	Dec, 2027
Programme		**Price Base Date**	2Q19
Estimate Date	29 July 2019	**Currency**	GBP

Alignment **A - Atkins** **Total Direct cost Estimate** **£ 1,317,277,546**

RMM	Bill Description	UoM	Qty	Rate £ GBP	Total £ GBP	Comments
1.01	ERTMS Level 2 (per STK) - High level estimate	STK	97.7	£ 322,000.0	**£ 31,460,544**	
1.01	Fringe works (Allowance)	Psum	2.0	£ 1,500,000.0	**£ 3,000,000**	
1.01	Signalling mods to existing NR infrastructure - New station	Psum	2.0	£ 1,500,000.0	**£ 3,000,000**	
1.01	ERTMS Level 2 (per SEU) - High level estimate	SEU	0.0	£ -	**£ -**	
1.02.02	Overhead Line Equipment (OLE)	Psum	4.0	£ 375,000.0	**£ 1,500,000**	
1.03.01.01.10	GRID Connection	Psum	1.0	£ 3,000,000.0	**£ 3,000,000**	
1.03.01.05	Small Power for Equipment - Station DNO	Psum	6.0	£ 500,000.0	**£ 3,000,000**	
1.03.01.05.02	PSP	Psum	1.0	£ 200,000.0	**£ 200,000**	
1.03.01.05.04	FSP	Psum	4.0	£ 27,947.4	**£ 111,789**	
1.04.01.01.Z1	New plain line - Ballasted track (possessions)	m	0.0	£ -	**£ -**	
1.04.01.01.Z2	New plain line - Ballasted track (Green zone)	m	84,920.0	£ 650.0	**£ 55,198,000**	
1.04.01.02	E/O for Slab Track (New)	m	16,179.3	£ 538.0	**£ 8,704,476**	
1.04.02.01.01	S&C - Trap	Nr	0.0	£ -	**£ -**	
1.04.02.01.02	S&C - Turnout	Nr	4.0	£ 787,500.0	**£ 3,150,000**	
1.04.02.01.03	S&C - Crossover	Nr	0.0	£ -	**£ -**	
1.04.02.01.04	S&C - Diamond (Fixed)	Nr	2.0	£ 446,250.0	**£ 892,500**	
1.04.02.01.05	S&C - Scissor Crossover	Nr	9.0	£ 2,625,000.0	**£ 23,625,000**	
1.04.03.01.01.Z1	Ballasted Track (Slew)	m	0.0	£ -	**£ -**	
1.04.03.01.01.Z2	Ballasted Track (Upgrade / replacement)	m	0.0	£ -	**£ -**	
1.04.03.01.01.Z3	Ballasted Track Recovery	m	0.0	£ -	**£ -**	
1.04.01.01.Z4	Follow up tamping (plain line)	Shifts	169.8	£ 6,500.0	**£ 1,103,960**	
1.04.02.01.Z6	Follow up tamping (S&C)	Shifts	19.0	£ 8,000.0	**£ 152,000**	
1.07.11	Track formation (sand blanket + subgrade + geotextile)	m²	343,100.0	£ 18.6	**£ 6,364,505**	
1.05	GSMR	Km	49.2	£ 124,000.0	**£ 6,102,803**	
1.05.10	CIS - Station	Nr	3.0	£ 89,600.0	**£ 268,800**	
1.05.10	CIS - Platform	Nr	6.0	£ 89,600.0	**£ 537,600**	
1.05.10.01.01	PA speakers	Nr	9.0	£ 41,360.0	**£ 372,240**	
1.05.06.05	Help points	Nr	9.0	£ 9,000.0	**£ 81,000**	
1.05.07	CCTV	Nr	9.0	£ 114,600.0	**£ 1,031,400**	
1.05.07	Station Control rooms	Nr	3.0	£ 165,000.0	**£ 495,000**	
1.06.01.Z1	Elevated Station (Modular Building)	Nr	0.0	£ -	**£ -**	
1.06.01.Z2	At grade Station (Modular Building)	Nr	1.0	£ 1,292,328.0	**£ 1,292,328**	
1.06.01.Z3	Interchange Station (Modular Building)	Nr	2.0	£ 4,846,229.9	**£ 9,692,460**	
1.06.01.Z4	Bedford Station reconfiguration (Extra Over to interchange	Psum	0.0	£ -	**£ -**	
1.06.Z2.01	Park and ride provision - at grade	Parking space	0.0	£ -	**£ -**	
1.06.Z2.02	Park and ride provision - single deck	Parking space	0.0	£ -	**£ -**	
1.06.Z2.03	Park and ride provision - multi storey	Parking space	1,860.0	£ 11,144.0	**£ 20,727,791**	
1.06.Z3.01	Lifts to footbridges	Nr	10.0	£ 338,000.0	**£ 3,380,000**	

Project Number	5187419	**Revision**	0
Project Name	Central Section options - Bedford - Cambridge link	**Estimate number**	
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Client	East West Rail	**Anticipated Finish Date**	Dec, 2027
Programme		**Price Base Date**	2Q19
Estimate Date	29 July 2019	**Currency**	GBP

Alignment	**A - Atkins**	**Total Direct cost Estimate**	**£**	**1,317,277,546**

RMM	Bill Description	UoM	Qty	Rate £ GBP	Total £ GBP	Comments
1.06.Z3.01						
1.07.01.01.01.Z1	Earthworks: Cut [0-5m]	m3	283,156.2	£ 5.2	**£ 1,476,660**	
1.07.01.01.01.Z2	Earthworks: Cut [5-10m]	m3	508,264.7	£ 6.3	**£ 3,180,720**	
1.07.01.01.01.Z3	Earthworks: Cut [>10m]	m3	4,620,047.3	£ 7.5	**£ 34,694,707**	
1.07.01.01.Z1	Inert materials disposal	m3	2,579,907.0	£ 41.4	**£ 106,859,746**	
1.07.01.02.03.Z1	Earthworks: Fill [0-5m]	m3	223,052.5	£ 55.0	**£ 12,267,885**	
1.07.01.02.03.Z2	Earthworks: Fill [5-10m]	m3	4,483,768.6	£ 60.5	**£ 271,267,998**	
1.07.01.02.03.Z3	Earthworks: Fill[>10m]	m3	2,348,247.8	£ 66.0	**£ 154,984,353**	
1.07.01.02.03.Z3	Discount from re-used cutting volumes	m3	2,831,561.2	-£ 55.0	**-£ 155,735,867**	
1.07.01.02.03.Z4	Soil stabilisation (Rock netting / soil nailing etc.)	m3	0.0	£ -	**£ -**	
1.07.03.Z6	Blast & Drill tunnels	m	0.0	£ -	**£ -**	
1.07.03.Z7	Bored tunnels	m	0.0	£ -	**£ -**	
1.07.03.Z8	Cut & Cover tunnels	m	0.0	£ -	**£ -**	
1.07.05.Z10.01	Viaducts	m2	59,535.0	£ 3,607.1	**£ 214,751,250**	
1.07.05.Z10.01	Viaducts - Complex	m2	50,490.0	£ 5,370.9	**£ 271,178,237**	
1.07.05.Z10.02.01	Overbridge - Ampthill Road remods	Psum	0.0	£ -	**£ -**	
1.07.05.Z10.02.01	Overbridge - Cauldwell Street remods	Psum	0.0	£ -	**£ -**	
1.07.05.Z10.02.01	Overbridge - Ford End Road remods	Psum	0.0	£ -	**£ -**	
1.07.05.Z10.02	Overbridge (Highways)	m2	11,450.0	£ 8,103.8	**£ 92,788,530**	
1.07.05.Z10.03	Overbridge (Rail)	m2	135.0	£ 8,530.3	**£ 1,151,593**	
1.07.05.Z10.03.z1	Overpass (bridleway)	m2	125.0	£ 6,483.0	**£ 810,380**	
1.07.05.Z10.04	Underbridge (Water)	m2	2,295.0	£ 5,531.8	**£ 12,695,573**	
1.07.05.Z10.05	Underbridge (Highways)	m2	2,760.0	£ 5,531.8	**£ 15,267,878**	
1.07.05.Z10.06	Underbridge (Rail)	m2	0.0	£ -	**£ -**	
1.07.05.Z10.07	Underpass (concrete box)	m2	620.0	£ 5,531.8	**£ 3,429,741**	
1.07.05.Z10.08	Underbridge (Concrete box)	m2	900.0	£ 5,531.8	**£ 4,978,656**	
1.07.06	Footbridges	m2	297.5	£ 7,583.1	**£ 2,255,974**	
1.07.07	New station - Platforms (Green field)	m2	636.0	£ 1,046.6	**£ 665,662**	
1.07.07	New station - Platforms (Possessions)	m2	2,544.0	£ 1,308.3	**£ 3,328,308**	
1.07.07.Z1	Gauging alterations	m	0.0	£ -	**£ -**	
1.07.08.02	Retaining Walls	m2	0.0	£ -	**£ -**	
1.07.09.01.01.Z1	Fencing - Low security	m	31,845.0	£ 13.9	**£ 442,646**	
1.07.09.01.01.Z2	Fencing - High security	m	10,615.0	£ 130.0	**£ 1,379,950**	
1.07.10	Drainage - Track	m	76,100.0	£ 228.8	**£ 17,410,255**	
1.07.10	Drainage - Toe ditch (Embankments)	m	21,230.0	£ 135.7	**£ 2,879,886**	
1.07.10	Drainage - Toe + Crest ditch (Cuttings)	m	21,230.0	£ 189.9	**£ 4,031,841**	
1.07.10.06.01	New Culverts	m	300.0	£ 5,715.1	**£ 1,714,525**	
1.07.12.01.Z7	Road diversion: Minor roads (including access roads)	m2	20,800.0	£ 116.3	**£ 2,419,872**	

Project Number	5187419	**Revision**	0
Project Name	Central Section options - Bedford - Cambridge link	**Estimate number**	
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Programme		**Price Base Date**	2Q19
Estimate Date	29 July 2019	**Currency**	GBP

Alignment **A - Atkins** **Total Direct cost Estimate** **£ 1,317,277,546**

RMM	Bill Description	UoM	Qty	Rate £ GBP	Total £ GBP	Comments
1.07.12.01.Z8	Road diversion: Single Carriageway	m2	0.0	£ -	**£ -**	
1.07.12.01.Z9	Road diversion: Dual Carriageway	m2	0.0	£ -	**£ -**	
1.07.12.03	Walkways/Footpath	m	0.0	£ -	**£ -**	
1.07.12.04	CESS walkways	m	84,920.0	£ 90.0	**£ 7,642,800**	
1.07.12.01	Maintenance Roads	m2	240,170.0	£ 87.55	**£ 21,026,883.50**	
1.07.12.01	Maintenance Roads - local connection to highways	Psum	17.0	£ 20,000.00	**£ 340,000.00**	
1.07.12.01	Maintenance Roads - Steps for track access (kwik step or (	Psum	34.0	£ 20,000.00	**£ 680,000.00**	
1.07.09	Acoustic Barriers	m	0.0	£ -	**£ -**	
1.07.14.01	C1/9	m	84,920.0	£ 54.77	**£ 4,650,785.33**	
1.08.02.01.01	General Site Clearance	m2	2,533,290.3	£ 2.66	**£ 6,738,552.12**	
1.08.02.01.02	Vegetation clearance	m2	0.0	£ -	**£ -**	
1.08.02.03.01.Z1	Non hazardous	m3	0.0	£ -	**£ -**	
1.08.02.03.01.Z2	Hazardous	m3	0.0	£ -	**£ -**	
1.08.02.03.02	Treatment of contaminated land	m2	19,334.8	£ 109.80	**£ 2,122,959.46**	
1.08.03.02.05.Z1	Permanent utility diversion (HV/LV)	m	300.0	£ 326.96	**£ 98,089.30**	
1.08.03.02.05.Z1	Permanent utility diversion (HV Pylon)	Nr	0.0	£ -	**£ -**	
1.08.02.02.Z6.Z1	Permanent utility diversion (Water)	m	0.0	£ -	**£ -**	
1.08.02.02.Z6.Z2	Permanent utility diversion (Foul)	m	0.0	£ -	**£ -**	
1.08.02.02.Z6.Z3	Protection of utility (Gas)	m	400.0	£ 1,491.10	**£ 596,438.35**	
1.08.03.02.05.Z2	Permanent utility diversion (Comms)	m	0.0	£ -	**£ -**	
1.08.03.01.Z4.01	Demolition works (trees)	m2	0.0	£ -	**£ -**	
1.08.03.01.Z4.02	Demolition works (buildings)	m2	251.5	£ 136.43	**£ 34,317.66**	
1.08.03.01.Z4.03	Demolition works (Car parks)	m2	0.0	£ -	**£ -**	
1.04	Points end to recover	Nr	0.0	£ -	**£ -**	
1.04	Shunting line bi directional	m	0.0	£ -	**£ -**	
1.07.14.Z2	CRMS adjusments	Psum	0.0	£ -	**£ -**	
1.01	UTX adjustments	Psum	0.0	£ -	**£ -**	
1.07.07.Z1	E/O for higher costs of Platform extension (Additional for B	m2	0.0	£ -	**£ -**	
1.01	Level Crossing - upgrade half barrier to MCB	Nr	0.0	£ -	**£ -**	
1.01	Relocation of REB	Psum	0.0	£ -	**£ -**	
1.07	New Bridge - River Great Ouse	m2	0.0	£ -	**£ -**	
1.01	Relocation of DNO cabinets	Psum	0.0	£ -	**£ -**	
1.01	Relocation of LOC cabinets	Psum	0.0	£ -	**£ -**	
1.08	Demoliton Old Goods Sheed	Psum	0.0	£ -	**£ -**	
1.08	Bedford Public Realm	m2	0.0	£ -	**£ -**	
1.08	Bedford station car park layout alterations	m2	0.0	£ -	**£ -**	
1.04	Track renewal :- EA0 end to EA1 start Bedford MMainline-	m	2,000.0	£ 1,162.78	**£ 2,325,566.59**	
1.06.Z2.03	Extra car park (small) - Cambourne Station access	Parking space	0.0	£ -	**£ -**	

Project Number	5187419	**Revision**	0
Project Name	Central Section options - Bedford - Cambridge link	**Estimate number**	
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Programme		**Price Base Date**	2Q19
Estimate Date	29 July 2019	**Currency**	GBP

Alignment	**A - Atkins**	**Total Direct cost Estimate**	**£ 1,317,277,546**

RMM	Bill Description	UoM	Qty	Rate £ GBP	Total £ GBP	Comments
1.06.Z2.03						
1.06.Z2.03	Extra car park (small) - Northstowe Station access	Parking space	0.0	£ -	**£** -	
1.07	Allowance for new guided bus stop	Psum	0.0	£ -	**£** -	
1.08	Reconfiguration/reconstruction works in Rowing lake	Psum	0.0	£ -	**£** -	

Project Number	5187419	**Revision**	0
Project Name	Central Section options - Bedford - Cambridge link	**Estimate number**	
Stage	Pre-GRIP	**Anticipated Start Date**	Mar, 2024
Client	East West Rail	**Anticipated Finish Date**	Dec, 2027
Programme		**Price Base Date**	2Q19
Estimate Date	29 July 2019	**Currency**	GBP

Alignment **B1A - Atkins** **Total Direct cost Estimate** **£ 1,579,307,085**

RMM	Bill Description	UoM	Qty	Rate £ GBP	Total £ GBP	Comments
1.01	ERTMS Level 2 (per STK) - High level estimate	STK	97.7	£ 322,000.0	**£ 31,460,544**	
1.01	Fringe works (Allowance)	Psum	2.0	£ 1,500,000.0	**£ 3,000,000**	
1.01	Signalling mods to existing NR infrastructure - New station	Psum	2.0	£ 1,500,000.0	**£ 3,000,000**	
1.01	ERTMS Level 2 (per SEU) - High level estimate	SEU	0.0	£ -	**£ -**	
1.02.02	Overhead Line Equipment (OLE)	Psum	4.0	£ 375,000.0	**£ 1,500,000**	
1.03.01.01.10	GRID Connection	Psum	1.0	£ 3,000,000.0	**£ 3,000,000**	
1.03.01.05	Small Power for Equipment - Station DNO	Psum	6.0	£ 500,000.0	**£ 3,000,000**	
1.03.01.05.02	PSP	Psum	1.0	£ 200,000.0	**£ 200,000**	
1.03.01.05.04	FSP	Psum	4.0	£ 27,947.4	**£ 111,789**	
1.04.01.01.Z1	New plain line - Ballasted track (possessions)	m	0.0	£ -	**£ -**	
1.04.01.01.Z2	New plain line - Ballasted track (Green zone)	m	107,630.0	£ 650.0	**£ 69,959,500**	
1.04.01.02	E/O for Slab Track (New)	m	16,010.6	£ 538.0	**£ 8,613,693**	
1.04.02.01.01	S&C - Trap	Nr	0.0	£ -	**£ -**	
1.04.02.01.02	S&C - Turnout	Nr	4.0	£ 787,500.0	**£ 3,150,000**	
1.04.02.01.03	S&C - Crossover	Nr	0.0	£ -	**£ -**	
1.04.02.01.04	S&C - Diamond (Fixed)	Nr	2.0	£ 446,250.0	**£ 892,500**	
1.04.02.01.05	S&C - Scissor Crossover	Nr	9.0	£ 2,625,000.0	**£ 23,625,000**	
1.04.03.01.01.Z1	Ballasted Track (Slew)	m	0.0	£ -	**£ -**	
1.04.03.01.01.Z2	Ballasted Track (Upgrade / replacement)	m	0.0	£ -	**£ -**	
1.04.03.01.01.Z3	Ballasted Track Recovery	m	0.0	£ -	**£ -**	
1.04.01.01.Z4	Follow up tamping (plain line)	Shifts	215.3	£ 6,500.0	**£ 1,399,190**	
1.04.02.01.Z6	Follow up tamping (S&C)	Shifts	19.0	£ 8,000.0	**£ 152,000**	
1.07.11	Track formation (sand blanket + subgrade + geotextile)	m²	457,500.0	£ 18.6	**£ 8,486,625**	
1.05	GSMR	Km	49.2	£ 124,000.0	**£ 6,102,803**	
1.05.10	CIS - Station	Nr	3.0	£ 89,600.0	**£ 268,800**	
1.05.10	CIS - Platform	Nr	6.0	£ 89,600.0	**£ 537,600**	
1.05.10.01.01	PA speakers	Nr	9.0	£ 41,360.0	**£ 372,240**	
1.05.06.05	Help points	Nr	9.0	£ 9,000.0	**£ 81,000**	
1.05.07	CCTV	Nr	9.0	£ 114,600.0	**£ 1,031,400**	
1.05.07	Station Control rooms	Nr	3.0	£ 165,000.0	**£ 495,000**	
1.06.01.Z1	Elevated Station (Modular Building)	Nr	0.0	£ -	**£ -**	
1.06.01.Z2	At grade Station (Modular Building)	Nr	1.0	£ 1,292,328.0	**£ 1,292,328**	
1.06.01.Z3	Interchange Station (Modular Building)	Nr	2.0	£ 4,846,229.9	**£ 9,692,460**	
1.06.01.Z4	Bedford Station reconfiguration (Extra Over to interchange	Psum	0.0	£ -	**£ -**	
1.06.Z2.01	Park and ride provision - at grade	Parking space	0.0	£ -	**£ -**	
1.06.Z2.02	Park and ride provision - single deck	Parking space	0.0	£ -	**£ -**	
1.06.Z2.03	Park and ride provision - multi storey	Parking space	1,860.0	£ 11,144.0	**£ 20,727,791**	
1.06.Z3.01	Lifts to footbridges	Nr	10.0	£ 338,000.0	**£ 3,380,000**	

Project Number	5187419	**Revision**	0
Project Name	Central Section options - Bedford - Cambridge link	**Estimate number**	
Stage	Pre-GRIP	**Anticipated Start Date**	Mar, 2024
Client	East West Rail	**Anticipated Finish Date**	Dec, 2027
Programme		**Price Base Date**	2Q19
Estimate Date	29 July 2019	**Currency**	GBP

Alignment	**B1A - Atkins**	**Total Direct cost Estimate**	**£ 1,579,307,085**

RMM	Bill Description	UoM	Qty	Rate £ GBP	Total £ GBP	Comments
1.06.Z3.01						
1.07.01.01.01.Z1	Earthworks: Cut [0-5m]	m3	501,002.6	£ 5.2	**£ 2,612,729**	
1.07.01.01.01.Z2	Earthworks: Cut [5-10m]	m3	1,790,235.2	£ 6.3	**£ 11,203,292**	
1.07.01.01.01.Z3	Earthworks: Cut [>10m]	m3	6,434,369.5	£ 7.5	**£ 48,319,541**	
1.07.01.01.Z1	Inert materials disposal	m3	5,526,532.2	£ 41.4	**£ 228,908,964**	
1.07.01.02.03.Z1	Earthworks: Fill [0-5m]	m3	254,940.4	£ 55.0	**£ 14,021,720**	
1.07.01.02.03.Z2	Earthworks: Fill [5-10m]	m3	5,309,720.5	£ 60.5	**£ 321,238,093**	
1.07.01.02.03.Z3	Earthworks: Fill[>10m]	m3	3,120,988.3	£ 66.0	**£ 205,985,226**	
1.07.01.02.03.Z3	Discount from re-used cutting volumes	m3	3,199,075.1	-£ 55.0	**-£ 175,949,128**	
1.07.01.02.03.Z4	Soil stabilisation (Rock netting / soil nailing etc.)	m3	0.0	£ -	**£ -**	
1.07.03.Z6	Blast & Drill tunnels	m	0.0	£ -	**£ -**	
1.07.03.Z7	Bored tunnels	m	0.0	£ -	**£ -**	
1.07.03.Z8	Cut & Cover tunnels	m	0.0	£ -	**£ -**	
1.07.05.Z10.01	Viaducts	m2	70,267.5	£ 3,607.1	**£ 253,464,911**	
1.07.05.Z10.01	Viaducts - Complex	m2	38,610.0	£ 5,636.2	**£ 217,612,165**	
1.07.05.Z10.02.01	Overbridge - Ampthill Road remods	Psum	0.0	£ -	**£ -**	
1.07.05.Z10.02.01	Overbridge - Cauldwell Street remods	Psum	0.0	£ -	**£ -**	
1.07.05.Z10.02.01	Overbridge - Ford End Road remods	Psum	0.0	£ -	**£ -**	
1.07.05.Z10.02	Overbridge (Highways)	m2	7,715.0	£ 8,103.8	**£ 62,520,831**	
1.07.05.Z10.03	Overbridge (Rail)	m2	0.0	£ -	**£ -**	
1.07.05.Z10.03.z1	Overpass (bridleway)	m2	122.5	£ 6,483.0	**£ 794,173**	
1.07.05.Z10.04	Underbridge (Water)	m2	1,147.5	£ 5,531.8	**£ 6,347,786**	
1.07.05.Z10.05	Underbridge (Highways)	m2	10,950.0	£ 5,531.8	**£ 60,573,648**	
1.07.05.Z10.06	Underbridge (Rail)	m2	250.0	£ 5,531.8	**£ 1,382,960**	
1.07.05.Z10.07	Underpass (concrete box)	m2	310.0	£ 5,531.8	**£ 1,714,870**	
1.07.05.Z10.08	Underbridge (Concrete box)	m2	1,110.0	£ 5,531.8	**£ 6,140,342**	
1.07.06	Footbridges	m2	1,030.0	£ 7,583.1	**£ 7,810,599**	
1.07.07	New station - Platforms (Green field)	m2	636.0	£ 1,046.6	**£ 665,662**	
1.07.07	New station - Platforms (Possessions)	m2	2,544.0	£ 1,308.3	**£ 3,328,308**	
1.07.07.Z1	Gauging alterations	m	0.0	£ -	**£ -**	
1.07.08.02	Retaining Walls	m2	0.0	£ -	**£ -**	
1.07.09.01.01.Z1	Fencing - Low security	m	40,361.3	£ 13.9	**£ 561,021**	
1.07.09.01.01.Z2	Fencing - High security	m	13,453.8	£ 130.0	**£ 1,748,988**	
1.07.10	Drainage - Track	m	97,220.0	£ 228.8	**£ 22,242,116**	
1.07.10	Drainage - Toe ditch (Embankments)	m	26,907.5	£ 135.7	**£ 3,650,049**	
1.07.10	Drainage - Toe + Crest ditch (Cuttings)	m	26,907.5	£ 189.9	**£ 5,110,069**	
1.07.10.06.01	New Culverts	m	150.0	£ 5,715.1	**£ 857,262**	
1.07.12.01.Z7	Road diversion: Minor roads (including access roads)	m2	14,400.0	£ 116.3	**£ 1,675,296**	

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Estimate Date	29 July 2019	**Currency**	GBP

Alignment **B1A - Atkins** **Total Direct cost Estimate** **£ 1,579,307,085**

RMM	Bill Description	UoM	Qty	Rate £ GBP	Total £ GBP	Comments
1.07.12.01.Z8	Road diversion: Single Carriageway	m2	0.0	£ -	**£ -**	
1.07.12.01.Z9	Road diversion: Dual Carriageway	m2	0.0	£ -	**£ -**	
1.07.12.03	Walkways/Footpath	m	0.0	£ -	**£ -**	
1.07.12.04	CESS walkways	m	107,630.0	£ 90.0	**£ 9,686,700**	
1.07.12.01	Maintenance Roads	m2	320,250.0	£ 87.55	**£ 28,037,887.50**	
1.07.12.01	Maintenance Roads - local connection to highways	Psum	21.0	£ 20,000.00	**£ 420,000.00**	
1.07.12.01	Maintenance Roads - Steps for track access (kwik step or (	Psum	42.0	£ 20,000.00	**£ 840,000.00**	
1.07.09	Acoustic Barriers	m	0.0	£ -	**£ -**	
1.07.14.01	C1/9	m	107,630.0	£ 54.77	**£ 5,894,536.33**	
1.08.02.01.01	General Site Clearance	m2	3,473,302.1	£ 2.66	**£ 9,238,983.70**	
1.08.02.01.02	Vegetation clearance	m2	0.0	£ -	**£ -**	
1.08.02.03.01.Z1	Non hazardous	m3	0.0	£ -	**£ -**	
1.08.02.03.01.Z2	Hazardous	m3	0.0	£ -	**£ -**	
1.08.02.03.02	Treatment of contaminated land	m2	17,271.9	£ 109.80	**£ 1,896,450.58**	
1.08.03.02.05.Z1	Permanent utility diversion (HV/LV)	m	300.0	£ 326.96	**£ 98,089.30**	
1.08.03.02.05.Z1	Permanent utility diversion (HV Pylon)	Nr	0.0	£ -	**£ -**	
1.08.02.02.Z6.Z1	Permanent utility diversion (Water)	m	0.0	£ -	**£ -**	
1.08.02.02.Z6.Z2	Permanent utility diversion (Foul)	m	0.0	£ -	**£ -**	
1.08.02.02.Z6.Z3	Protection of utility (Gas)	m	400.0	£ 1,491.10	**£ 596,438.35**	
1.08.03.02.05.Z2	Permanent utility diversion (Comms)	m	0.0	£ -	**£ -**	
1.08.03.01.Z4.01	Demolition works (trees)	m2	0.0	£ -	**£ -**	
1.08.03.01.Z4.02	Demolition works (buildings)	m2	1,456.3	£ 136.43	**£ 198,678.99**	
1.08.03.01.Z4.03	Demolition works (Car parks)	m2	0.0	£ -	**£ -**	
1.04	Points end to recover	Nr	0.0	£ -	**£ -**	
1.04	Shunting line bi directional	m	0.0	£ -	**£ -**	
1.07.14.Z2	CRMS adjusments	Psum	0.0	£ -	**£ -**	
1.01	UTX adjustments	Psum	0.0	£ -	**£ -**	
1.07.07.Z1	E/O for higher costs of Platform extension (Additional for B	m2	0.0	£ -	**£ -**	
1.01	Level Crossing - upgrade half barrier to MCB	Nr	0.0	£ -	**£ -**	
1.01	Relocation of REB	Psum	0.0	£ -	**£ -**	
1.07	New Bridge - River Great Ouse	m2	0.0	£ -	**£ -**	
1.01	Relocation of DNO cabinets	Psum	0.0	£ -	**£ -**	
1.01	Relocation of LOC cabinets	Psum	0.0	£ -	**£ -**	
1.08	Demoliton Old Goods Sheed	Psum	0.0	£ -	**£ -**	
1.08	Bedford Public Realm	m2	0.0	£ -	**£ -**	
1.08	Bedford station car park layout alterations	m2	0.0	£ -	**£ -**	
1.04	Track renewal :- EA0 end to EA1 start Bedford MMainline-	m	2,000.0	£ 1,162.78	**£ 2,325,566.59**	
1.06.Z2.03	Extra car park (small) - Cambourne Station access	Parking space	0.0	£ -	**£ -**	

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Estimate Date	29 July 2019	**Currency**	GBP

Alignment **B1A - Atkins** **Total Direct cost Estimate** **£ 1,579,307,085**

RMM	Bill Description	UoM	Qty	Rate £ GBP	Total £ GBP	Comments
1.06.Z2.03						
1.06.Z2.03	Extra car park (small) - Northstowe Station access	Parking space	0.0	£ -	**£ -**	
1.07	Allowance for new guided bus stop	Psum	0.0	£ -	**£ -**	
1.08	Reconfiguration/reconstruction works in Rowing lake	Psum	0.0	£ -	**£ -**	

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Alignment **B2A - Atkins** **Total Direct cost Estimate** **£ 1,602,548,423**

RMM	Bill Description	UoM	Qty	Rate £ GBP	Total £ GBP	Comments
1.01	ERTMS Level 2 (per STK) - High level estimate	STK	97.7	£ 322,000.0	**£ 31,460,544**	
1.01	Fringe works (Allowance)	Psum	2.0	£ 1,500,000.0	**£ 3,000,000**	
1.01	Signalling mods to existing NR infrastructure - New station	Psum	2.0	£ 1,500,000.0	**£ 3,000,000**	
1.01	ERTMS Level 2 (per SEU) - High level estimate	SEU	0.0	£ -	**£ -**	
1.02.02	Overhead Line Equipment (OLE)	Psum	4.0	£ 375,000.0	**£ 1,500,000**	
1.03.01.01.10	GRID Connection	Psum	1.0	£ 3,000,000.0	**£ 3,000,000**	
1.03.01.05	Small Power for Equipment - Station DNO	Psum	6.0	£ 500,000.0	**£ 3,000,000**	
1.03.01.05.02	PSP	Psum	1.0	£ 200,000.0	**£ 200,000**	
1.03.01.05.04	FSP	Psum	4.0	£ 27,947.4	**£ 111,789**	
1.04.01.01.Z1	New plain line - Ballasted track (possessions)	m	0.0	£ -	**£ -**	
1.04.01.01.Z2	New plain line - Ballasted track (Green zone)	m	108,920.0	£ 650.0	**£ 70,798,000**	
1.04.01.02	E/O for Slab Track (New)	m	18,035.5	£ 538.0	**£ 9,703,087**	
1.04.02.01.01	S&C - Trap	Nr	0.0	£ -	**£ -**	
1.04.02.01.02	S&C - Turnout	Nr	4.0	£ 787,500.0	**£ 3,150,000**	
1.04.02.01.03	S&C - Crossover	Nr	0.0	£ -	**£ -**	
1.04.02.01.04	S&C - Diamond (Fixed)	Nr	2.0	£ 446,250.0	**£ 892,500**	
1.04.02.01.05	S&C - Scissor Crossover	Nr	9.0	£ 2,625,000.0	**£ 23,625,000**	
1.04.03.01.01.Z1	Ballasted Track (Slew)	m	0.0	£ -	**£ -**	
1.04.03.01.01.Z2	Ballasted Track (Upgrade / replacement)	m	0.0	£ -	**£ -**	
1.04.03.01.01.Z3	Ballasted Track Recovery	m	0.0	£ -	**£ -**	
1.04.01.01.Z4	Follow up tamping (plain line)	Shifts	217.8	£ 6,500.0	**£ 1,415,960**	
1.04.02.01.Z6	Follow up tamping (S&C)	Shifts	19.0	£ 8,000.0	**£ 152,000**	
1.07.11	Track formation (sand blanket + subgrade + geotextile)	m²	453,750.0	£ 18.6	**£ 8,417,063**	
1.05	GSMR	Km	49.2	£ 124,000.0	**£ 6,102,803**	
1.05.10	CIS - Station	Nr	3.0	£ 89,600.0	**£ 268,800**	
1.05.10	CIS - Platform	Nr	6.0	£ 89,600.0	**£ 537,600**	
1.05.10.01.01	PA speakers	Nr	9.0	£ 41,360.0	**£ 372,240**	
1.05.06.05	Help points	Nr	9.0	£ 9,000.0	**£ 81,000**	
1.05.07	CCTV	Nr	9.0	£ 114,600.0	**£ 1,031,400**	
1.05.07	Station Control rooms	Nr	3.0	£ 165,000.0	**£ 495,000**	
1.06.01.Z1	Elevated Station (Modular Building)	Nr	0.0	£ -	**£ -**	
1.06.01.Z2	At grade Station (Modular Building)	Nr	1.0	£ 1,292,328.0	**£ 1,292,328**	
1.06.01.Z3	Interchange Station (Modular Building)	Nr	2.0	£ 4,846,229.9	**£ 9,692,460**	
1.06.01.Z4	Bedford Station reconfiguration (Extra Over to interchange	Psum	0.0	£ -	**£ -**	
1.06.Z2.01	Park and ride provision - at grade	Parking space	0.0	£ -	**£ -**	
1.06.Z2.02	Park and ride provision - single deck	Parking space	0.0	£ -	**£ -**	
1.06.Z2.03	Park and ride provision - multi storey	Parking space	1,920.0	£ 11,144.0	**£ 21,396,429**	
1.06.Z3.01	Lifts to footbridges	Nr	10.0	£ 338,000.0	**£ 3,380,000**	

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Alignment **B2A - Atkins** **Total Direct cost Estimate** **£ 1,602,548,423**

RMM	Bill Description	UoM	Qty	Rate £ GBP	Total £ GBP	Comments
1.06.Z3.01						
1.07.01.01.01.Z1	Earthworks: Cut [0-5m]	m3	502,511.2	£ 5.2	**£ 2,620,596**	
1.07.01.01.01.Z2	Earthworks: Cut [5-10m]	m3	1,791,129.6	£ 6.3	**£ 11,208,889**	
1.07.01.01.01.Z3	Earthworks: Cut [>10m]	m3	6,515,163.9	£ 7.5	**£ 48,926,275**	
1.07.01.01.Z1	Inert materials disposal	m3	4,627,093.8	£ 41.4	**£ 191,654,225**	
1.07.01.02.03.Z1	Earthworks: Fill [0-5m]	m3	331,437.4	£ 55.0	**£ 18,229,058**	
1.07.01.02.03.Z2	Earthworks: Fill [5-10m]	m3	4,174,579.5	£ 60.5	**£ 252,562,057**	
1.07.01.02.03.Z3	Earthworks: Fill[>10m]	m3	5,164,179.9	£ 66.0	**£ 340,835,875**	
1.07.01.02.03.Z3	Discount from re-used cutting volumes	m3	4,181,710.9	-£ 55.0	**-£ 229,994,100**	
1.07.01.02.03.Z4	Soil stabilisation (Rock netting / soil nailing etc.)	m3	0.0	£ -	**£ -**	
1.07.03.Z6	Blast & Drill tunnels	m	0.0	£ -	**£ -**	
1.07.03.Z7	Bored tunnels	m	0.0	£ -	**£ -**	
1.07.03.Z8	Cut & Cover tunnels	m	0.0	£ -	**£ -**	
1.07.05.Z10.01	Viaducts	m2	84,037.5	£ 3,607.1	**£ 303,135,268**	
1.07.05.Z10.01	Viaducts - Complex	m2	38,610.0	£ 5,636.2	**£ 217,612,165**	
1.07.05.Z10.02.01	Overbridge - Ampthill Road remods	Psum	0.0	£ -	**£ -**	
1.07.05.Z10.02.01	Overbridge - Cauldwell Street remods	Psum	0.0	£ -	**£ -**	
1.07.05.Z10.02.01	Overbridge - Ford End Road remods	Psum	0.0	£ -	**£ -**	
1.07.05.Z10.02	Overbridge (Highways)	m2	6,565.0	£ 8,103.8	**£ 53,201,459**	
1.07.05.Z10.03	Overbridge (Rail)	m2	0.0	£ -	**£ -**	
1.07.05.Z10.03.z1	Overpass (bridleway)	m2	122.5	£ 6,483.0	**£ 794,173**	
1.07.05.Z10.04	Underbridge (Water)	m2	1,147.5	£ 5,531.8	**£ 6,347,786**	
1.07.05.Z10.05	Underbridge (Highways)	m2	10,860.0	£ 5,531.8	**£ 60,075,782**	
1.07.05.Z10.06	Underbridge (Rail)	m2	250.0	£ 5,531.8	**£ 1,382,960**	
1.07.05.Z10.07	Underpass (concrete box)	m2	560.0	£ 5,531.8	**£ 3,097,830**	
1.07.05.Z10.08	Underbridge (Concrete box)	m2	520.0	£ 5,531.8	**£ 2,876,557**	
1.07.06	Footbridges	m2	1,030.0	£ 7,583.1	**£ 7,810,599**	
1.07.07	New station - Platforms (Green field)	m2	636.0	£ 1,046.6	**£ 665,662**	
1.07.07	New station - Platforms (Possessions)	m2	2,544.0	£ 1,308.3	**£ 3,328,308**	
1.07.07.Z1	Gauging alterations	m	0.0	£ -	**£ -**	
1.07.08.02	Retaining Walls	m2	0.0	£ -	**£ -**	
1.07.09.01.01.Z1	Fencing - Low security	m	40,845.0	£ 13.9	**£ 567,746**	
1.07.09.01.01.Z2	Fencing - High security	m	13,615.0	£ 130.0	**£ 1,769,950**	
1.07.10	Drainage - Track	m	96,470.0	£ 228.8	**£ 22,070,530**	
1.07.10	Drainage - Toe ditch (Embankments)	m	27,230.0	£ 135.7	**£ 3,693,797**	
1.07.10	Drainage - Toe + Crest ditch (Cuttings)	m	27,230.0	£ 189.9	**£ 5,171,315**	
1.07.10.06.01	New Culverts	m	150.0	£ 5,715.1	**£ 857,262**	
1.07.12.01.Z7	Road diversion: Minor roads (including access roads)	m2	16,000.0	£ 116.3	**£ 1,861,440**	

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Alignment B2A - Atkins

Total Direct cost Estimate £ 1,602,548,423

RMM	Bill Description	UoM	Qty	Rate £ GBP	Total £ GBP	Comments
1.07.12.01.Z8	Road diversion: Single Carriageway	m2	0.0	£ -	£ -	
1.07.12.01.Z9	Road diversion: Dual Carriageway	m2	0.0	£ -	£ -	
1.07.12.03	Walkways/Footpath	m	0.0	£ -	£ -	
1.07.12.04	CESS walkways	m	108,920.0	£ 90.0	£ **9,802,800**	
1.07.12.01	Maintenance Roads	m2	317,625.0	£ 87.55	£ **27,808,068.75**	
1.07.12.01	Maintenance Roads - local connection to highways	Psum	21.0	£ 20,000.00	£ **420,000.00**	
1.07.12.01	Maintenance Roads - Steps for track access (kwik step or (	Psum	42.0	£ 20,000.00	£ **840,000.00**	
1.07.09	Acoustic Barriers	m	0.0	£ -	£ -	
1.07.14.01	C1/9	m	108,920.0	£ 54.77	£ **5,965,185.33**	
1.08.02.01.01	General Site Clearance	m2	3,479,612.0	£ 2.66	£ **9,255,768.03**	
1.08.02.01.02	Vegetation clearance	m2	0.0	£ -	£ -	
1.08.02.03.01.Z1	Non hazardous	m3	0.0	£ -	£ -	
1.08.02.03.01.Z2	Hazardous	m3	0.0	£ -	£ -	
1.08.02.03.02	Treatment of contaminated land	m2	17,271.9	£ 109.80	£ **1,896,450.58**	
1.08.03.02.05.Z1	Permanent utility diversion (HV/LV)	m	0.0	£ -	£ -	
1.08.03.02.05.Z1	Permanent utility diversion (HV Pylon)	Nr	1.0	£ 3,000,000.00	£ **3,000,000.00**	
1.08.02.02.Z6.Z1	Permanent utility diversion (Water)	m	0.0	£ -	£ -	
1.08.02.02.Z6.Z2	Permanent utility diversion (Foul)	m	0.0	£ -	£ -	
1.08.02.02.Z6.Z3	Protection of utility (Gas)	m	400.0	£ 1,491.10	£ **596,438.35**	
1.08.03.02.05.Z2	Permanent utility diversion (Comms)	m	0.0	£ -	£ -	
1.08.03.01.Z4.01	Demolition works (trees)	m2	0.0	£ -	£ -	
1.08.03.01.Z4.02	Demolition works (buildings)	m2	1,456.3	£ 136.43	£ **198,678.99**	
1.08.03.01.Z4.03	Demolition works (Car parks)	m2	0.0	£ -	£ -	
1.04	Points end to recover	Nr	0.0	£ -	£ -	
1.04	Shunting line bi directional	m	0.0	£ -	£ -	
1.07.14.Z2	CRMS adjusments	Psum	0.0	£ -	£ -	
1.01	UTX adjustments	Psum	0.0	£ -	£ -	
1.07.07.Z1	E/O for higher costs of Platform extension (Additional for B	m2	0.0	£ -	£ -	
1.01	Level Crossing - upgrade half barrier to MCB	Nr	0.0	£ -	£ -	
1.01	Relocation of REB	Psum	0.0	£ -	£ -	
1.07	New Bridge - River Great Ouse	m2	0.0	£ -	£ -	
1.01	Relocation of DNO cabinets	Psum	0.0	£ -	£ -	
1.01	Relocation of LOC cabinets	Psum	0.0	£ -	£ -	
1.08	Demoliton Old Goods Sheed	Psum	0.0	£ -	£ -	
1.08	Bedford Public Realm	m2	0.0	£ -	£ -	
1.08	Bedford station car park layout alterations	m2	0.0	£ -	£ -	
1.04	Track renewal :- EA0 end to EA1 start Bedford MMainline-	m	2,000.0	£ 1,162.78	£ **2,325,566.59**	
1.06.Z2.03	Extra car park (small) - Cambourne Station access	Parking space	0.0	£ -	£ -	

Project Number	5187419	**Revision**	0
Project Name	Central Section options - Bedford - Cambridge link	**Estimate number**	
Stage	Pre-GRIP	**Anticipated Start Date**	Mar, 2024
Client	East West Rail	**Anticipated Finish Date**	Dec, 2027
Programme		**Price Base Date**	2Q19
Estimate Date	29 July 2019	**Currency**	GBP

Alignment **B2A - Atkins** **Total Direct cost Estimate** **£ 1,602,548,423**

RMM	Bill Description	UoM	Qty	Rate £ GBP	Total £ GBP	Comments
1.06.Z2.03						
1.06.Z2.03	Extra car park (small) - Northstowe Station access	Parking space	0.0	£ -	**£** -	
1.07	Allowance for new guided bus stop	Psum	0.0	£ -	**£** -	
1.08	Reconfiguration/reconstruction works in Rowing lake	Psum	0.0	£ -	**£** -	

Project Number	5187419	**Revision**	0
Project Name	Central Section options - Bedford - Cambridge link	**Estimate number**	
Stage	Pre-GRIP	**Anticipated Start Date**	Mar, 2024
Client	East West Rail	**Anticipated Finish Date**	Dec, 2027
Programme		**Price Base Date**	2Q19
Estimate Date	29 July 2019	**Currency**	GBP

Alignment **C - Atkins** **Total Direct cost Estimate** **£ 1,583,461,792**

RMM	Bill Description	UoM	Qty	Rate £ GBP	Total £ GBP	Comments
1.01	ERTMS Level 2 (per STK) - High level estimate	STK	97.7	£ 322,000.0	**£ 31,460,544**	
1.01	Fringe works (Allowance)	Psum	2.0	£ 1,500,000.0	**£ 3,000,000**	
1.01	Signalling mods to existing NR infrastructure - New station	Psum	2.0	£ 1,500,000.0	**£ 3,000,000**	
1.01	ERTMS Level 2 (per SEU) - High level estimate	SEU	0.0	£ -	**£ -**	
1.02.02	Overhead Line Equipment (OLE)	Psum	4.0	£ 375,000.0	**£ 1,500,000**	
1.03.01.01.10	GRID Connection	Psum	1.0	£ 3,000,000.0	**£ 3,000,000**	
1.03.01.05	Small Power for Equipment - Station DNO	Psum	6.0	£ 500,000.0	**£ 3,000,000**	
1.03.01.05.02	PSP	Psum	1.0	£ 200,000.0	**£ 200,000**	
1.03.01.05.04	FSP	Psum	4.0	£ 27,947.4	**£ 111,789**	
1.04.01.01.Z1	New plain line - Ballasted track (possessions)	m	0.0	£ -	**£ -**	
1.04.01.01.Z2	New plain line - Ballasted track (Green zone)	m	99,344.0	£ 650.0	**£ 64,573,600**	
1.04.01.02	E/O for Slab Track (New)	m	21,737.9	£ 538.0	**£ 11,694,970**	
1.04.02.01.01	S&C - Trap	Nr	0.0	£ -	**£ -**	
1.04.02.01.02	S&C - Turnout	Nr	4.0	£ 787,500.0	**£ 3,150,000**	
1.04.02.01.03	S&C - Crossover	Nr	0.0	£ -	**£ -**	
1.04.02.01.04	S&C - Diamond (Fixed)	Nr	2.0	£ 446,250.0	**£ 892,500**	
1.04.02.01.05	S&C - Scissor Crossover	Nr	9.0	£ 2,625,000.0	**£ 23,625,000**	
1.04.03.01.01.Z1	Ballasted Track (Slew)	m	0.0	£ -	**£ -**	
1.04.03.01.01.Z2	Ballasted Track (Upgrade / replacement)	m	0.0	£ -	**£ -**	
1.04.03.01.01.Z3	Ballasted Track Recovery	m	0.0	£ -	**£ -**	
1.04.01.01.Z4	Follow up tamping (plain line)	Shifts	198.7	£ 6,500.0	**£ 1,291,472**	
1.04.02.01.Z6	Follow up tamping (S&C)	Shifts	19.0	£ 8,000.0	**£ 152,000**	
1.07.11	Track formation (sand blanket + subgrade + geotextile)	m²	387,220.0	£ 18.6	**£ 7,182,931**	
1.05	GSMR	Km	49.2	£ 124,000.0	**£ 6,102,803**	
1.05.10	CIS - Station	Nr	3.0	£ 89,600.0	**£ 268,800**	
1.05.10	CIS - Platform	Nr	6.0	£ 89,600.0	**£ 537,600**	
1.05.10.01.01	PA speakers	Nr	9.0	£ 41,360.0	**£ 372,240**	
1.05.06.05	Help points	Nr	9.0	£ 9,000.0	**£ 81,000**	
1.05.07	CCTV	Nr	9.0	£ 114,600.0	**£ 1,031,400**	
1.05.07	Station Control rooms	Nr	3.0	£ 165,000.0	**£ 495,000**	
1.06.01.Z1	Elevated Station (Modular Building)	Nr	0.0	£ -	**£ -**	
1.06.01.Z2	At grade Station (Modular Building)	Nr	1.0	£ 1,292,328.0	**£ 1,292,328**	
1.06.01.Z3	Interchange Station (Modular Building)	Nr	2.0	£ 4,846,229.9	**£ 9,692,460**	
1.06.01.Z4	Bedford Station reconfiguration (Extra Over to interchange	Psum	0.0	£ -	**£ -**	
1.06.Z2.01	Park and ride provision - at grade	Parking space	0.0	£ -	**£ -**	
1.06.Z2.02	Park and ride provision - single deck	Parking space	0.0	£ -	**£ -**	
1.06.Z2.03	Park and ride provision - multi storey	Parking space	1,860.0	£ 11,144.0	**£ 20,727,791**	
1.06.Z3.01	Lifts to footbridges	Nr	10.0	£ 338,000.0	**£ 3,380,000**	

Project Number	5187419	**Revision**	0
Project Name	Central Section options - Bedford - Cambridge link	**Estimate number**	
Stage	Pre-GRIP	**Anticipated Start Date**	Mar, 2024
Client	East West Rail	**Anticipated Finish Date**	Dec, 2027
Programme		**Price Base Date**	2Q19
Estimate Date	29 July 2019	**Currency**	GBP

Alignment C - Atkins

Total Direct cost Estimate £ 1,583,461,792

RMM	Bill Description	UoM	Qty	Rate £ GBP	Total £ GBP	Comments
1.06.Z3.01						
1.07.01.01.01.Z1	Earthworks: Cut [0-5m]	m3	286,586.5	£ 5.2	£ **1,494,549**	
1.07.01.01.01.Z2	Earthworks: Cut [5-10m]	m3	577,177.2	£ 6.3	£ **3,611,975**	
1.07.01.01.01.Z3	Earthworks: Cut [>10m]	m3	1,531,417.3	£ 7.5	£ **11,500,332**	
1.07.01.01.Z1	Inert materials disposal	m3	1,176,442.7	£ 41.4	£ **48,728,255**	
1.07.01.02.03.Z1	Earthworks: Fill [0-5m]	m3	320,492.9	£ 55.0	£ **17,627,107**	
1.07.01.02.03.Z2	Earthworks: Fill [5-10m]	m3	6,225,760.9	£ 60.5	£ **376,658,531**	
1.07.01.02.03.Z3	Earthworks: Fill[>10m]	m3	2,503,803.8	£ 66.0	£ **165,251,051**	
1.07.01.02.03.Z3	Discount from re-used cutting volumes	m3	1,218,738.4	-£ 55.0	-£ **67,030,612**	
1.07.01.02.03.Z4	Soil stabilisation (Rock netting / soil nailing etc.)	m3	0.0	£ -	£ **-**	
1.07.03.Z6	Blast & Drill tunnels	m	0.0	£ -	£ **-**	
1.07.03.Z7	Bored tunnels	m	0.0	£ -	£ **-**	
1.07.03.Z8	Cut & Cover tunnels	m	0.0	£ -	£ **-**	
1.07.05.Z10.01	Viaducts	m2	109,215.0	£ 3,607.1	£ **393,954,107**	
1.07.05.Z10.01	Viaducts - Complex	m2	38,610.0	£ 5,636.2	£ **217,612,165**	
1.07.05.Z10.02.01	Overbridge - Ampthill Road remods	Psum	0.0	£ -	£ **-**	
1.07.05.Z10.02.01	Overbridge - Cauldwell Street remods	Psum	0.0	£ -	£ **-**	
1.07.05.Z10.02.01	Overbridge - Ford End Road remods	Psum	0.0	£ -	£ **-**	
1.07.05.Z10.02	Overbridge (Highways)	m2	7,885.0	£ 8,103.8	£ **63,898,477**	
1.07.05.Z10.03	Overbridge (Rail)	m2	135.0	£ 8,530.3	£ **1,151,593**	
1.07.05.Z10.03.z1	Overpass (bridleway)	m2	125.0	£ 6,483.0	£ **810,380**	
1.07.05.Z10.04	Underbridge (Water)	m2	1,350.0	£ 5,531.8	£ **7,467,984**	
1.07.05.Z10.05	Underbridge (Highways)	m2	5,635.0	£ 5,531.8	£ **31,171,918**	
1.07.05.Z10.06	Underbridge (Rail)	m2	0.0	£ -	£ **-**	
1.07.05.Z10.07	Underpass (concrete box)	m2	710.0	£ 5,531.8	£ **3,927,606**	
1.07.05.Z10.08	Underbridge (Concrete box)	m2	900.0	£ 5,531.8	£ **4,978,656**	
1.07.06	Footbridges	m2	1,160.0	£ 7,583.1	£ **8,796,403**	
1.07.07	New station - Platforms (Green field)	m2	636.0	£ 1,046.6	£ **665,662**	
1.07.07	New station - Platforms (Possessions)	m2	2,544.0	£ 1,308.3	£ **3,328,308**	
1.07.07.Z1	Gauging alterations	m	0.0	£ -	£ **-**	
1.07.08.02	Retaining Walls	m2	1,255.0	£ 757.9	£ **951,207**	
1.07.09.01.01.Z1	Fencing - Low security	m	37,254.0	£ 13.9	£ **517,831**	
1.07.09.01.01.Z2	Fencing - High security	m	12,418.0	£ 130.0	£ **1,614,340**	
1.07.10	Drainage - Track	m	83,164.0	£ 228.8	£ **19,026,366**	
1.07.10	Drainage - Toe ditch (Embankments)	m	24,836.0	£ 135.7	£ **3,369,046**	
1.07.10	Drainage - Toe + Crest ditch (Cuttings)	m	24,836.0	£ 189.9	£ **4,716,665**	
1.07.10.06.01	New Culverts	m	250.0	£ 5,715.1	£ **1,428,771**	
1.07.12.01.Z7	Road diversion: Minor roads (including access roads)	m2	26,400.0	£ 116.3	£ **3,071,376**	

Project Number	5187419	**Revision**	0
Project Name	Central Section options - Bedford - Cambridge link	**Estimate number**	
Stage	Pre-GRIP	**Anticipated Start Date**	Mar, 2024
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Programme		**Price Base Date**	2Q19
Estimate Date	29 July 2019	**Currency**	GBP

Alignment **C - Atkins** **Total Direct cost Estimate** **£ 1,583,461,792**

RMM	Bill Description	UoM	Qty	Rate £ GBP	Total £ GBP	Comments
1.07.12.01.Z8	Road diversion: Single Carriageway	m2	0.0	£ -	**£ -**	
1.07.12.01.Z9	Road diversion: Dual Carriageway	m2	0.0	£ -	**£ -**	
1.07.12.03	Walkways/Footpath	m	0.0	£ -	**£ -**	
1.07.12.04	CESS walkways	m	99,344.0	£ 90.0	**£ 8,940,960**	
1.07.12.01	Maintenance Roads	m2	271,054.0	£ 87.55	**£ 23,730,777.70**	
1.07.12.01	Maintenance Roads - local connection to highways	Psum	21.0	£ 20,000.00	**£ 420,000.00**	
1.07.12.01	Maintenance Roads - Steps for track access (kwik step or (	Psum	42.0	£ 20,000.00	**£ 840,000.00**	
1.07.09	Acoustic Barriers	m	0.0	£ -	**£ -**	
1.07.14.01	C1/9	m	99,344.0	£ 54.77	**£ 5,440,739.73**	
1.08.02.01.01	General Site Clearance	m2	2,634,496.8	£ 2.66	**£ 7,007,761.41**	
1.08.02.01.02	Vegetation clearance	m2	0.0	£ -	**£ -**	
1.08.02.03.01.Z1	Non hazardous	m3	0.0	£ -	**£ -**	
1.08.02.03.01.Z2	Hazardous	m3	0.0	£ -	**£ -**	
1.08.02.03.02	Treatment of contaminated land	m2	17,140.1	£ 109.80	**£ 1,881,985.56**	
1.08.03.02.05.Z1	Permanent utility diversion (HV/LV)	m	300.0	£ 326.96	**£ 98,089.30**	
1.08.03.02.05.Z1	Permanent utility diversion (HV Pylon)	Nr	0.0	£ -	**£ -**	
1.08.02.02.Z6.Z1	Permanent utility diversion (Water)	m	0.0	£ -	**£ -**	
1.08.02.02.Z6.Z2	Permanent utility diversion (Foul)	m	0.0	£ -	**£ -**	
1.08.02.02.Z6.Z3	Protection of utility (Gas)	m	400.0	£ 1,491.10	**£ 596,438.35**	
1.08.03.02.05.Z2	Permanent utility diversion (Comms)	m	0.0	£ -	**£ -**	
1.08.03.01.Z4.01	Demolition works (trees)	m2	0.0	£ -	**£ -**	
1.08.03.01.Z4.02	Demolition works (buildings)	m2	463.2	£ 136.43	**£ 63,196.22**	
1.08.03.01.Z4.03	Demolition works (Car parks)	m2	0.0	£ -	**£ -**	
1.04	Points end to recover	Nr	0.0	£ -	**£ -**	
1.04	Shunting line bi directional	m	0.0	£ -	**£ -**	
1.07.14.Z2	CRMS adjusments	Psum	0.0	£ -	**£ -**	
1.01	UTX adjustments	Psum	0.0	£ -	**£ -**	
1.07.07.Z1	E/O for higher costs of Platform extension (Additional for B	m2	0.0	£ -	**£ -**	
1.01	Level Crossing - upgrade half barrier to MCB	Nr	0.0	£ -	**£ -**	
1.01	Relocation of REB	Psum	0.0	£ -	**£ -**	
1.07	New Bridge - River Great Ouse	m2	0.0	£ -	**£ -**	
1.01	Relocation of DNO cabinets	Psum	0.0	£ -	**£ -**	
1.01	Relocation of LOC cabinets	Psum	0.0	£ -	**£ -**	
1.08	Demoliton Old Goods Sheed	Psum	0.0	£ -	**£ -**	
1.08	Bedford Public Realm	m2	0.0	£ -	**£ -**	
1.08	Bedford station car park layout alterations	m2	0.0	£ -	**£ -**	
1.04	Track renewal :- EA0 end to EA1 start Bedford MMainline-	m	2,000.0	£ 1,162.78	**£ 2,325,566.59**	
1.06.Z2.03	Extra car park (small) - Cambourne Station access	Parking space	0.0	£ -	**£ -**	

Project Number	5187419	**Revision**	0
Project Name	Central Section options - Bedford - Cambridge link	**Estimate number**	
Stage	Pre-GRIP	**Anticipated Start Date**	Mar, 2024
Client	East West Rail	**Anticipated Finish Date**	Dec, 2027
Programme		**Price Base Date**	2Q19
Estimate Date	29 July 2019	**Currency**	GBP

Alignment	**C - Atkins**	**Total Direct cost Estimate**	**£ 1,583,461,792**

RMM	Bill Description	UoM	Qty	Rate £ GBP	Total £ GBP	Comments
1.06.Z2.03						
1.06.Z2.03	Extra car park (small) - Northstowe Station access	Parking space	0.0	£ -	**£** -	
1.07	Allowance for new guided bus stop	Psum	0.0	£ -	**£** -	
1.08	Reconfiguration/reconstruction works in Rowing lake	Psum	0.0	£ -	**£** -	

Project Number	5187419	**Revision**	0
Project Name	Central Section options - Bedford - Cambridge link	**Estimate number**	
Stage	Pre-GRIP	**Anticipated Start Date**	Mar, 2024
Client	East West Rail	**Anticipated Finish Date**	Dec, 2027
Programme		**Price Base Date**	2Q19
Estimate Date	29 July 2019	**Currency**	GBP

Alignment **D - Atkins** **Total Direct cost Estimate** **£ 1,431,091,254**

RMM	Bill Description	UoM	Qty	Rate £ GBP	Total £ GBP	Comments
1.01	ERTMS Level 2 (per STK) - High level estimate	STK	97.7	£ 322,000.0	**£ 31,460,544**	
1.01	Fringe works (Allowance)	Psum	2.0	£ 1,500,000.0	**£ 3,000,000**	
1.01	Signalling mods to existing NR infrastructure - New station	Psum	3.0	£ 1,500,000.0	**£ 4,500,000**	
1.01	ERTMS Level 2 (per SEU) - High level estimate	SEU	14.0	£ 251,032.4	**£ 3,514,454**	
1.02.02	Overhead Line Equipment (OLE)	Psum	4.0	£ 375,000.0	**£ 1,500,000**	
1.03.01.01.10	GRID Connection	Psum	1.0	£ 3,000,000.0	**£ 3,000,000**	
1.03.01.05	Small Power for Equipment - Station DNO	Psum	8.0	£ 500,000.0	**£ 4,000,000**	
1.03.01.05.02	PSP	Psum	1.0	£ 200,000.0	**£ 200,000**	
1.03.01.05.04	FSP	Psum	4.0	£ 27,947.4	**£ 111,789**	
1.04.01.01.Z1	New plain line - Ballasted track (possessions)	m	3,878.0	£ 1,157.8	**£ 4,489,759**	
1.04.01.01.Z2	New plain line - Ballasted track (Green zone)	m	94,490.0	£ 650.0	**£ 61,418,500**	
1.04.01.02	E/O for Slab Track (New)	m	12,705.2	£ 538.0	**£ 6,835,416**	
1.04.02.01.01	S&C - Trap	Nr	0.0	£ -	**£ -**	
1.04.02.01.02	S&C - Turnout	Nr	6.0	£ 787,500.0	**£ 4,725,000**	
1.04.02.01.03	S&C - Crossover	Nr	0.0	£ -	**£ -**	
1.04.02.01.04	S&C - Diamond (Fixed)	Nr	3.0	£ 446,250.0	**£ 1,338,750**	
1.04.02.01.05	S&C - Scissor Crossover	Nr	9.0	£ 2,625,000.0	**£ 23,625,000**	
1.04.03.01.01.Z1	Ballasted Track (Slew)	m	0.0	£ -	**£ -**	
1.04.03.01.01.Z2	Ballasted Track (Upgrade / replacement)	m	0.0	£ -	**£ -**	
1.04.03.01.01.Z3	Ballasted Track Recovery	m	1,275.0	£ 126.5	**£ 161,335**	
1.04.01.01.Z4	Follow up tamping (plain line)	Shifts	196.7	£ 6,564.1	**£ 1,291,388**	
1.04.02.01.Z6	Follow up tamping (S&C)	Shifts	20.0	£ 8,500.0	**£ 170,000**	
1.07.11	Track formation (sand blanket + subgrade + geotextile)	m²	427,840.0	£ 18.6	**£ 7,936,432**	
1.05	GSMR	Km	49.2	£ 124,000.0	**£ 6,102,803**	
1.05.10	CIS - Station	Nr	4.0	£ 134,400.0	**£ 537,600**	
1.05.10	CIS - Platform	Nr	8.0	£ 89,600.0	**£ 716,800**	
1.05.10.01.01	PA speakers	Nr	12.0	£ 41,360.0	**£ 496,320**	
1.05.06.05	Help points	Nr	12.0	£ 9,000.0	**£ 108,000**	
1.05.07	CCTV	Nr	12.0	£ 114,600.0	**£ 1,375,200**	
1.05.07	Station Control rooms	Nr	4.0	£ 165,000.0	**£ 660,000**	
1.06.01.Z1	Elevated Station (Modular Building)	Nr	0.0	£ -	**£ -**	
1.06.01.Z2	At grade Station (Modular Building)	Nr	2.0	£ 1,292,328.0	**£ 2,584,656**	
1.06.01.Z3	Interchange Station (Modular Building)	Nr	2.0	£ 3,876,983.9	**£ 7,753,968**	
1.06.01.Z4	Bedford Station reconfiguration (Extra Over to interchange	Psum	1,200.0	£ 2,719.2	**£ 3,263,040**	
1.06.Z2.01	Park and ride provision - at grade	Parking space	0.0	£ -	**£ -**	
1.06.Z2.02	Park and ride provision - single deck	Parking space	0.0	£ -	**£ -**	
1.06.Z2.03	Park and ride provision - multi storey	Parking space	2,075.1	£ 11,144.0	**£ 23,124,441**	
1.06.Z3.01	Lifts to footbridges	Nr	16.0	£ 338,000.0	**£ 5,408,000**	

Project Number	5187419	**Revision**	0
Project Name	Central Section options - Bedford - Cambridge link	**Estimate number**	
Stage	Pre-GRIP	**Anticipated Start Date**	Mar, 2024
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Programme		**Price Base Date**	2Q19
Estimate Date	29 July 2019	**Currency**	GBP

Alignment D - Atkins

Total Direct cost Estimate £ 1,431,091,254

RMM	Bill Description	UoM	Qty	Rate £ GBP	Total £ GBP	Comments
1.06.Z3.01						
1.07.01.01.01.Z1	Earthworks: Cut [0-5m]	m3	393,895.7	£ 5.2	£ **2,054,166**	
1.07.01.01.01.Z2	Earthworks: Cut [5-10m]	m3	919,328.9	£ 6.3	£ **5,753,160**	
1.07.01.01.01.Z3	Earthworks: Cut [>10m]	m3	4,351,635.7	£ 7.5	£ **32,679,044**	
1.07.01.01.Z1	Inert materials disposal	m3	2,903,356.1	£ 41.4	£ **120,257,010**	
1.07.01.02.03.Z1	Earthworks: Fill [0-5m]	m3	210,104.1	£ 55.0	£ **11,555,727**	
1.07.01.02.03.Z2	Earthworks: Fill [5-10m]	m3	4,857,109.0	£ 60.5	£ **293,855,093**	
1.07.01.02.03.Z3	Earthworks: Fill[>10m]	m3	4,014,029.3	£ 66.0	£ **264,925,932**	
1.07.01.02.03.Z3	Discount from re-used cutting volumes	m3	2,761,504.2	-£ 55.0	-£ **151,882,731**	
1.07.01.02.03.Z4	Soil stabilisation (Rock netting / soil nailing etc.)	m3	0.0	£ -	£ **-**	
1.07.03.Z6	Blast & Drill tunnels	m	0.0	£ -	£ **-**	
1.07.03.Z7	Bored tunnels	m	0.0	£ -	£ **-**	
1.07.03.Z8	Cut & Cover tunnels	m	0.0	£ -	£ **-**	
1.07.05.Z10.01	Viaducts	m2	86,400.0	£ 3,607.1	£ **311,657,143**	
1.07.05.Z10.01	Viaducts - Complex	m2	0.0	£ -	£ **-**	
1.07.05.Z10.02.01	Overbridge - Ampthill Road remods	Psum	202.5	£ 4,051.9	£ **820,510**	
1.07.05.Z10.02.01	Overbridge - Cauldwell Street remods	Psum	202.5	£ 4,051.9	£ **820,510**	
1.07.05.Z10.02.01	Overbridge - Ford End Road remods	Psum	202.5	£ 4,051.9	£ **820,510**	
1.07.05.Z10.02	Overbridge (Highways)	m2	17,985.0	£ 8,103.8	£ **145,746,875**	
1.07.05.Z10.03	Overbridge (Rail)	m2	135.0	£ 8,530.3	£ **1,151,593**	
1.07.05.Z10.03.z1	Overpass (bridleway)	m2	125.0	£ 6,483.0	£ **810,380**	
1.07.05.Z10.04	Underbridge (Water)	m2	1,957.5	£ 5,531.8	£ **10,828,577**	
1.07.05.Z10.05	Underbridge (Highways)	m2	5,325.0	£ 5,531.8	£ **29,457,048**	
1.07.05.Z10.06	Underbridge (Rail)	m2	0.0	£ -	£ **-**	
1.07.05.Z10.07	Underpass (concrete box)	m2	864.0	£ 5,531.8	£ **4,779,510**	
1.07.05.Z10.08	Underbridge (Concrete box)	m2	1,484.0	£ 5,531.8	£ **8,209,251**	
1.07.06	Footbridges	m2	2,090.0	£ 7,583.1	£ **15,848,691**	
1.07.07	New station - Platforms (Green field)	m2	636.0	£ 1,046.6	£ **665,662**	
1.07.07	New station - Platforms (Possessions)	m2	2,385.0	£ 1,308.3	£ **3,120,289**	
1.07.07.Z1	Gauging alterations	m	136.0	£ 450.0	£ **61,200**	
1.07.08.02	Retaining Walls	m2	1,255.0	£ 757.9	£ **951,207**	
1.07.09.01.01.Z1	Fencing - Low security	m	35,433.8	£ 13.9	£ **492,529**	
1.07.09.01.01.Z2	Fencing - High security	m	15,689.3	£ 130.0	£ **2,039,603**	
1.07.10	Drainage - Track	m	85,568.0	£ 228.8	£ **19,576,356**	
1.07.10	Drainage - Toe ditch (Embankments)	m	23,622.5	£ 135.7	£ **3,204,433**	
1.07.10	Drainage - Toe + Crest ditch (Cuttings)	m	23,622.5	£ 189.9	£ **4,486,206**	
1.07.10.06.01	New Culverts	m	250.0	£ 5,715.1	£ **1,428,771**	
1.07.12.01.Z7	Road diversion: Minor roads (including access roads)	m2	18,400.0	£ 116.3	£ **2,140,656**	

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Alignment **D - Atkins** **Total Direct cost Estimate** **£ 1,431,091,254**

RMM	Bill Description	UoM	Qty	Rate £ GBP	Total £ GBP	Comments
1.07.12.01.Z8	Road diversion: Single Carriageway	m2	0.0	£ -	**£ -**	
1.07.12.01.Z9	Road diversion: Dual Carriageway	m2	0.0	£ -	**£ -**	
1.07.12.03	Walkways/Footpath	m	0.0	£ -	**£ -**	
1.07.12.04	CESS walkways	m	94,490.0	£ 90.0	**£ 8,504,100**	
1.07.12.01	Maintenance Roads	m2	285,915.0	£ 87.55	**£ 25,031,858.25**	
1.07.12.01	Maintenance Roads - local connection to highways	Psum	19.0	£ 20,000.00	**£ 380,000.00**	
1.07.12.01	Maintenance Roads - Steps for track access (kwik step or (	Psum	38.0	£ 20,000.00	**£ 760,000.00**	
1.07.09	Acoustic Barriers	m	1,000.0	£ 799.00	**£ 799,000.00**	
1.07.14.01	C1/9	m	94,490.0	£ 54.77	**£ 5,174,902.33**	
1.08.02.01.01	General Site Clearance	m2	2,908,186.4	£ 2.66	**£ 7,735,775.87**	
1.08.02.01.02	Vegetation clearance	m2	0.0	£ -	**£ -**	
1.08.02.03.01.Z1	Non hazardous	m3	0.0	£ -	**£ -**	
1.08.02.03.01.Z2	Hazardous	m3	0.0	£ -	**£ -**	
1.08.02.03.02	Treatment of contaminated land	m2	0.0	£ -	**£ -**	
1.08.03.02.05.Z1	Permanent utility diversion (HV/LV)	m	1,200.0	£ 326.96	**£ 392,357.18**	
1.08.03.02.05.Z1	Permanent utility diversion (HV Pylon)	Nr	0.0	£ -	**£ -**	
1.08.02.02.Z6.Z1	Permanent utility diversion (Water)	m	0.0	£ -	**£ -**	
1.08.02.02.Z6.Z2	Permanent utility diversion (Foul)	m	0.0	£ -	**£ -**	
1.08.02.02.Z6.Z3	Protection of utility (Gas)	m	400.0	£ 1,491.10	**£ 596,438.35**	
1.08.03.02.05.Z2	Permanent utility diversion (Comms)	m	0.0	£ -	**£ -**	
1.08.03.01.Z4.01	Demolition works (trees)	m2	0.0	£ -	**£ -**	
1.08.03.01.Z4.02	Demolition works (buildings)	m2	1,692.2	£ 351.68	**£ 595,112.14**	
1.08.03.01.Z4.03	Demolition works (Car parks)	m2	20,247.0	£ 45.48	**£ 920,732.33**	
1.04	Points end to recover	Nr	0.0	£ -	**£ -**	
1.04	Shunting line bi directional	m	250.0	£ 1,671.57	**£ 417,892.63**	
1.07.14.Z2	CRMS adjusments	Psum	1.0	£ 50,000.00	**£ 50,000.00**	
1.01	UTX adjustments	Psum	1.0	£ 200,000.00	**£ 200,000.00**	
1.07.07.Z1	E/O for higher costs of Platform extension (Additional for B	m2	477.0	£ 298.52	**£ 142,394.45**	
1.01	Level Crossing - upgrade half barrier to MCB	Nr	0.0	£ -	**£ -**	
1.01	Relocation of REB	Psum	1.0	£ 200,000.00	**£ 200,000.00**	
1.07	New Bridge - River Great Ouse	m2	810.0	£ 11,296.96	**£ 9,150,534.41**	
1.01	Relocation of DNO cabinets	Psum	1.0	£ 150,000.00	**£ 150,000.00**	
1.01	Relocation of LOC cabinets	Psum	1.0	£ 150,000.00	**£ 150,000.00**	
1.08	Demoliton Old Goods Sheed	Psum	1,366.0	£ 272.85	**£ 372,713.10**	
1.08	Bedford Public Realm	m2	4,150.0	£ 120.00	**£ 498,000.00**	
1.08	Bedford station car park layout alterations	m2	25,000.0	£ 150.00	**£ 3,750,000.00**	
1.04	Track renewal :- EA0 end to EA1 start Bedford MMainline-	m	1,500.0	£ 930.23	**£ 1,395,339.95**	
1.06.Z2.03	Extra car park (small) - Cambourne Station access	Parking space	0.0	£ -	**£ -**	

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Alignment **D - Atkins** **Total Direct cost Estimate** **£ 1,431,091,254**

RMM	Bill Description	UoM	Qty	Rate £ GBP	Total £ GBP	Comments
1.06.Z2.03						
1.06.Z2.03	Extra car park (small) - Northstowe Station access	Parking space	0.0	£ -	**£** -	
1.07	Allowance for new guided bus stop	Psum	0.0	£ -	**£** -	
1.08	Reconfiguration/reconstruction works in Rowing lake	Psum	0.0	£ -	**£** -	

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Alignment	**E - Atkins**	**Total Direct cost Estimate**	**£ 1,453,828,430**

RMM	Bill Description	UoM	Qty	Rate £ GBP	Total £ GBP	Comments
1.01	ERTMS Level 2 (per STK) - High level estimate	STK	97.7	£ 322,000.0	**£ 31,460,544**	
1.01	Fringe works (Allowance)	Psum	2.0	£ 1,500,000.0	**£ 3,000,000**	
1.01	Signalling mods to existing NR infrastructure - New station	Psum	3.0	£ 1,500,000.0	**£ 4,500,000**	
1.01	ERTMS Level 2 (per SEU) - High level estimate	SEU	14.0	£ 251,032.4	**£ 3,514,454**	
1.02.02	Overhead Line Equipment (OLE)	Psum	4.0	£ 375,000.0	**£ 1,500,000**	
1.03.01.01.10	GRID Connection	Psum	1.0	£ 3,000,000.0	**£ 3,000,000**	
1.03.01.05	Small Power for Equipment - Station DNO	Psum	8.0	£ 500,000.0	**£ 4,000,000**	
1.03.01.05.02	PSP	Psum	1.0	£ 200,000.0	**£ 200,000**	
1.03.01.05.04	FSP	Psum	4.0	£ 27,947.4	**£ 111,789**	
1.04.01.01.Z1	New plain line - Ballasted track (possessions)	m	3,878.0	£ 1,157.8	**£ 4,489,759**	
1.04.01.01.Z2	New plain line - Ballasted track (Green zone)	m	103,480.0	£ 650.0	**£ 67,262,000**	
1.04.01.02	E/O for Slab Track (New)	m	9,022.7	£ 538.0	**£ 4,854,214**	
1.04.02.01.01	S&C - Trap	Nr	0.0	£ -	**£ -**	
1.04.02.01.02	S&C - Turnout	Nr	6.0	£ 787,500.0	**£ 4,725,000**	
1.04.02.01.03	S&C - Crossover	Nr	0.0	£ -	**£ -**	
1.04.02.01.04	S&C - Diamond (Fixed)	Nr	3.0	£ 446,250.0	**£ 1,338,750**	
1.04.02.01.05	S&C - Scissor Crossover	Nr	9.0	£ 2,625,000.0	**£ 23,625,000**	
1.04.03.01.01.Z1	Ballasted Track (Slew)	m	0.0	£ -	**£ -**	
1.04.03.01.01.Z2	Ballasted Track (Upgrade / replacement)	m	0.0	£ -	**£ -**	
1.04.03.01.01.Z3	Ballasted Track Recovery	m	1,275.0	£ 126.5	**£ 161,335**	
1.04.01.01.Z4	Follow up tamping (plain line)	Shifts	214.7	£ 6,558.7	**£ 1,408,258**	
1.04.02.01.Z6	Follow up tamping (S&C)	Shifts	20.0	£ 8,500.0	**£ 170,000**	
1.07.11	Track formation (sand blanket + subgrade + geotextile)	m²	491,340.0	£ 18.6	**£ 9,114,357**	
1.05	GSMR	Km	49.2	£ 124,000.0	**£ 6,102,803**	
1.05.10	CIS - Station	Nr	4.0	£ 134,400.0	**£ 537,600**	
1.05.10	CIS - Platform	Nr	8.0	£ 89,600.0	**£ 716,800**	
1.05.10.01.01	PA speakers	Nr	12.0	£ 41,360.0	**£ 496,320**	
1.05.06.05	Help points	Nr	12.0	£ 9,000.0	**£ 108,000**	
1.05.07	CCTV	Nr	12.0	£ 114,600.0	**£ 1,375,200**	
1.05.07	Station Control rooms	Nr	4.0	£ 165,000.0	**£ 660,000**	
1.06.01.Z1	Elevated Station (Modular Building)	Nr	0.0	£ -	**£ -**	
1.06.01.Z2	At grade Station (Modular Building)	Nr	2.0	£ 1,292,328.0	**£ 2,584,656**	
1.06.01.Z3	Interchange Station (Modular Building)	Nr	2.0	£ 3,876,983.9	**£ 7,753,968**	
1.06.01.Z4	Bedford Station reconfiguration (Extra Over to interchange	Psum	1,200.0	£ 2,719.2	**£ 3,263,040**	
1.06.Z2.01	Park and ride provision - at grade	Parking space	0.0	£ -	**£ -**	
1.06.Z2.02	Park and ride provision - single deck	Parking space	0.0	£ -	**£ -**	
1.06.Z2.03	Park and ride provision - multi storey	Parking space	2,075.1	£ 11,144.0	**£ 23,124,441**	
1.06.Z3.01	Lifts to footbridges	Nr	16.0	£ 338,000.0	**£ 5,408,000**	

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Alignment	**E - Atkins**	**Total Direct cost Estimate**	**£ 1,453,828,430**

RMM	Bill Description	UoM	Qty	Rate £ GBP	Total £ GBP	Comments
1.06.Z3.01						
1.07.01.01.01.Z1	Earthworks: Cut [0-5m]	m3	609,759.8	£ 5.2	**£ 3,179,897**	
1.07.01.01.01.Z2	Earthworks: Cut [5-10m]	m3	2,133,264.7	£ 6.3	**£ 13,349,971**	
1.07.01.01.01.Z3	Earthworks: Cut [>10m]	m3	9,335,399.1	£ 7.5	**£ 70,105,113**	
1.07.01.01.Z1	Inert materials disposal	m3	6,353,975.3	£ 41.4	**£ 263,181,658**	
1.07.01.02.03.Z1	Earthworks: Fill [0-5m]	m3	240,768.5	£ 55.0	**£ 13,242,268**	
1.07.01.02.03.Z2	Earthworks: Fill [5-10m]	m3	2,680,065.2	£ 60.5	**£ 162,143,946**	
1.07.01.02.03.Z3	Earthworks: Fill[>10m]	m3	6,904,342.2	£ 66.0	**£ 455,686,588**	
1.07.01.02.03.Z3	Discount from re-used cutting volumes	m3	5,724,448.2	-£ 55.0	**-£ 314,844,652**	
1.07.01.02.03.Z4	Soil stabilisation (Rock netting / soil nailing etc.)	m3	0.0	£ -	**£ -**	
1.07.03.Z6	Blast & Drill tunnels	m	0.0	£ -	**£ -**	
1.07.03.Z7	Bored tunnels	m	0.0	£ -	**£ -**	
1.07.03.Z8	Cut & Cover tunnels	m	0.0	£ -	**£ -**	
1.07.05.Z10.01	Viaducts	m2	61,357.5	£ 3,607.1	**£ 221,325,268**	
1.07.05.Z10.01	Viaducts - Complex	m2	0.0	£ -	**£ -**	
1.07.05.Z10.02.01	Overbridge - Ampthill Road remods	Psum	202.5	£ 4,051.9	**£ 820,510**	
1.07.05.Z10.02.01	Overbridge - Cauldwell Street remods	Psum	202.5	£ 4,051.9	**£ 820,510**	
1.07.05.Z10.02.01	Overbridge - Ford End Road remods	Psum	202.5	£ 4,051.9	**£ 820,510**	
1.07.05.Z10.02	Overbridge (Highways)	m2	16,155.0	£ 8,103.8	**£ 130,916,918**	
1.07.05.Z10.03	Overbridge (Rail)	m2	0.0	£ -	**£ -**	
1.07.05.Z10.03.z1	Overpass (bridleway)	m2	122.5	£ 6,483.0	**£ 794,173**	
1.07.05.Z10.04	Underbridge (Water)	m2	1,755.0	£ 5,531.8	**£ 9,708,379**	
1.07.05.Z10.05	Underbridge (Highways)	m2	10,960.0	£ 5,531.8	**£ 60,628,966**	
1.07.05.Z10.06	Underbridge (Rail)	m2	250.0	£ 5,531.8	**£ 1,382,960**	
1.07.05.Z10.07	Underpass (concrete box)	m2	714.0	£ 5,531.8	**£ 3,949,734**	
1.07.05.Z10.08	Underbridge (Concrete box)	m2	799.0	£ 5,531.8	**£ 4,419,940**	
1.07.06	Footbridges	m2	1,960.0	£ 7,583.1	**£ 14,862,887**	
1.07.07	New station - Platforms (Green field)	m2	636.0	£ 1,046.6	**£ 665,662**	
1.07.07	New station - Platforms (Possessions)	m2	2,385.0	£ 1,308.3	**£ 3,120,289**	
1.07.07.Z1	Gauging alterations	m	136.0	£ 450.0	**£ 61,200**	
1.07.08.02	Retaining Walls	m2	0.0	£ -	**£ -**	
1.07.09.01.01.Z1	Fencing - Low security	m	38,805.0	£ 13.9	**£ 539,390**	
1.07.09.01.01.Z2	Fencing - High security	m	16,813.0	£ 130.0	**£ 2,185,690**	
1.07.10	Drainage - Track	m	98,268.0	£ 228.8	**£ 22,481,878**	
1.07.10	Drainage - Toe ditch (Embankments)	m	25,870.0	£ 135.7	**£ 3,509,310**	
1.07.10	Drainage - Toe + Crest ditch (Cuttings)	m	25,870.0	£ 189.9	**£ 4,913,034**	
1.07.10.06.01	New Culverts	m	150.0	£ 5,715.1	**£ 857,262**	
1.07.12.01.Z7	Road diversion: Minor roads (including access roads)	m2	5,600.0	£ 116.3	**£ 651,504**	

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Alignment	**E - Atkins**	**Total Direct cost Estimate**	**£ 1,453,828,430**

RMM	Bill Description	UoM	Qty	Rate £ GBP	Total £ GBP	Comments
1.07.12.01.Z8	Road diversion: Single Carriageway	m2	0.0	£ -	**£ -**	
1.07.12.01.Z9	Road diversion: Dual Carriageway	m2	0.0	£ -	**£ -**	
1.07.12.03	Walkways/Footpath	m	0.0	£ -	**£ -**	
1.07.12.04	CESS walkways	m	103,480.0	£ 90.0	**£ 9,313,200**	
1.07.12.01	Maintenance Roads	m2	330,365.0	£ 87.55	**£ 28,923,455.75**	
1.07.12.01	Maintenance Roads - local connection to highways	Psum	20.0	£ 20,000.00	**£ 400,000.00**	
1.07.12.01	Maintenance Roads - Steps for track access (kwik step or (	Psum	40.0	£ 20,000.00	**£ 800,000.00**	
1.07.09	Acoustic Barriers	m	1,000.0	£ 799.00	**£ 799,000.00**	
1.07.14.01	C1/9	m	103,480.0	£ 54.77	**£ 5,667,254.67**	
1.08.02.01.01	General Site Clearance	m2	3,738,040.2	£ 2.66	**£ 9,943,186.98**	
1.08.02.01.02	Vegetation clearance	m2	0.0	£ -	**£ -**	
1.08.02.03.01.Z1	Non hazardous	m3	0.0	£ -	**£ -**	
1.08.02.03.01.Z2	Hazardous	m3	0.0	£ -	**£ -**	
1.08.02.03.02	Treatment of contaminated land	m2	131.7	£ 109.80	**£ 14,465.02**	
1.08.03.02.05.Z1	Permanent utility diversion (HV/LV)	m	600.0	£ 326.96	**£ 196,178.59**	
1.08.03.02.05.Z1	Permanent utility diversion (HV Pylon)	Nr	1.0	£ 3,000,000.00	**£ 3,000,000.00**	
1.08.02.02.Z6.Z1	Permanent utility diversion (Water)	m	0.0	£ -	**£ -**	
1.08.02.02.Z6.Z2	Permanent utility diversion (Foul)	m	0.0	£ -	**£ -**	
1.08.02.02.Z6.Z3	Protection of utility (Gas)	m	400.0	£ 1,491.10	**£ 596,438.35**	
1.08.03.02.05.Z2	Permanent utility diversion (Comms)	m	0.0	£ -	**£ -**	
1.08.03.01.Z4.01	Demolition works (trees)	m2	0.0	£ -	**£ -**	
1.08.03.01.Z4.02	Demolition works (buildings)	m2	2,685.3	£ 272.07	**£ 730,594.90**	
1.08.03.01.Z4.03	Demolition works (Car parks)	m2	20,247.0	£ 45.48	**£ 920,732.33**	
1.04	Points end to recover	Nr	0.0	£ -	**£ -**	
1.04	Shunting line bi directional	m	250.0	£ 1,671.57	**£ 417,892.63**	
1.07.14.Z2	CRMS adjusments	Psum	1.0	£ 50,000.00	**£ 50,000.00**	
1.01	UTX adjustments	Psum	1.0	£ 200,000.00	**£ 200,000.00**	
1.07.07.Z1	E/O for higher costs of Platform extension (Additional for B	m2	477.0	£ 298.52	**£ 142,394.45**	
1.01	Level Crossing - upgrade half barrier to MCB	Nr	0.0	£ -	**£ -**	
1.01	Relocation of REB	Psum	1.0	£ 200,000.00	**£ 200,000.00**	
1.07	New Bridge - River Great Ouse	m2	810.0	£ 11,296.96	**£ 9,150,534.41**	
1.01	Relocation of DNO cabinets	Psum	1.0	£ 150,000.00	**£ 150,000.00**	
1.01	Relocation of LOC cabinets	Psum	1.0	£ 150,000.00	**£ 150,000.00**	
1.08	Demoliton Old Goods Sheed	Psum	1,366.0	£ 272.85	**£ 372,713.10**	
1.08	Bedford Public Realm	m2	4,150.0	£ 120.00	**£ 498,000.00**	
1.08	Bedford station car park layout alterations	m2	25,000.0	£ 150.00	**£ 3,750,000.00**	
1.04	Track renewal :- EA0 end to EA1 start Bedford MMainline-	m	1,500.0	£ 930.23	**£ 1,395,339.95**	
1.06.Z2.03	Extra car park (small) - Cambourne Station access	Parking space	0.0	£ -	**£ -**	

Project Number	5187419	**Revision**	0
Project Name	Central Section options - Bedford - Cambridge link	**Estimate number**	
Stage	Pre-GRIP	**Anticipated Start Date**	Mar, 2024
Client	East West Rail	**Anticipated Finish Date**	Dec, 2027
Programme		**Price Base Date**	2Q19
Estimate Date	29 July 2019	**Currency**	GBP

Alignment	**E - Atkins**	**Total Direct cost Estimate**	**£ 1,453,828,430**

RMM	Bill Description	UoM	Qty	Rate £ GBP	Total £ GBP	Comments
1.06.Z2.03						
1.06.Z2.03	Extra car park (small) - Northstowe Station access	Parking space	0.0	£ -	**£** -	
1.07	Allowance for new guided bus stop	Psum	0.0	£ -	**£** -	
1.08	Reconfiguration/reconstruction works in Rowing lake	Psum	0.0	£ -	**£** -	

Project Number	5187419	**Revision**	0
Project Name	Central Section options - Bedford - Cambridge link	**Estimate number**	
Stage	Pre-GRIP	**Anticipated Start Date**	Mar, 2024
Client	East West Rail	**Anticipated Finish Date**	Dec, 2027
Programme		**Price Base Date**	2Q19
Estimate Date	29 July 2019	**Currency**	GBP

Alignment **F - Atkins** **Total Direct cost Estimate** **£ 2,031,921,205**

RMM	Bill Description	UoM	Qty	Rate £ GBP	Total £ GBP	Comments
1.01	ERTMS Level 2 (per STK) - High level estimate	STK	97.7	£ 322,000.0	**£ 31,460,544**	
1.01	Fringe works (Allowance)	Psum	2.0	£ 1,500,000.0	**£ 3,000,000**	
1.01	Signalling mods to existing NR infrastructure - New station	Psum	2.0	£ 1,500,000.0	**£ 3,000,000**	
1.01	ERTMS Level 2 (per SEU) - High level estimate	SEU	0.0	£ -	**£ -**	
1.02.02	Overhead Line Equipment (OLE)	Psum	4.0	£ 375,000.0	**£ 1,500,000**	
1.03.01.01.10	GRID Connection	Psum	1.0	£ 3,000,000.0	**£ 3,000,000**	
1.03.01.05	Small Power for Equipment - Station DNO	Psum	8.0	£ 500,000.0	**£ 4,000,000**	
1.03.01.05.02	PSP	Psum	1.0	£ 200,000.0	**£ 200,000**	
1.03.01.05.04	FSP	Psum	4.0	£ 27,947.4	**£ 111,789**	
1.04.01.01.Z1	New plain line - Ballasted track (possessions)	m	0.0	£ -	**£ -**	
1.04.01.01.Z2	New plain line - Ballasted track (Green zone)	m	116,814.0	£ 650.0	**£ 75,929,100**	
1.04.01.02	E/O for Slab Track (New)	m	28,765.4	£ 538.0	**£ 15,475,810**	
1.04.02.01.01	S&C - Trap	Nr	0.0	£ -	**£ -**	
1.04.02.01.02	S&C - Turnout	Nr	4.0	£ 656,250.0	**£ 2,625,000**	
1.04.02.01.03	S&C - Crossover	Nr	0.0	£ -	**£ -**	
1.04.02.01.04	S&C - Diamond (Fixed)	Nr	2.0	£ 446,250.0	**£ 892,500**	
1.04.02.01.05	S&C - Scissor Crossover	Nr	11.0	£ 2,625,000.0	**£ 28,875,000**	
1.04.03.01.01.Z1	Ballasted Track (Slew)	m	0.0	£ -	**£ -**	
1.04.03.01.01.Z2	Ballasted Track (Upgrade / replacement)	m	0.0	£ -	**£ -**	
1.04.03.01.01.Z3	Ballasted Track Recovery	m	0.0	£ -	**£ -**	
1.04.01.01.Z4	Follow up tamping (plain line)	Shifts	126.3	£ 6,500.0	**£ 820,820**	
1.04.02.01.Z6	Follow up tamping (S&C)	Shifts	22.0	£ 8,000.0	**£ 176,000**	
1.07.11	Track formation (sand blanket + subgrade + geotextile)	m²	439,170.0	£ 18.6	**£ 8,146,604**	
1.05	GSMR	Km	49.2	£ 124,000.0	**£ 6,102,803**	
1.05.10	CIS - Station	Nr	4.0	£ 89,600.0	**£ 358,400**	
1.05.10	CIS - Platform	Nr	8.0	£ 89,600.0	**£ 716,800**	
1.05.10.01.01	PA speakers	Nr	12.0	£ 41,360.0	**£ 496,320**	
1.05.06.05	Help points	Nr	12.0	£ 9,000.0	**£ 108,000**	
1.05.07	CCTV	Nr	12.0	£ 114,600.0	**£ 1,375,200**	
1.05.07	Station Control rooms	Nr	4.0	£ 165,000.0	**£ 660,000**	
1.06.01.Z1	Elevated Station (Modular Building)	Nr	2.0	£ 1,718,796.2	**£ 3,437,592**	
1.06.01.Z2	At grade Station (Modular Building)	Nr	0.0	£ -	**£ -**	
1.06.01.Z3	Interchange Station (Modular Building)	Nr	2.0	£ 4,846,229.9	**£ 9,692,460**	
1.06.01.Z4	Bedford Station reconfiguration (Extra Over to interchange	Psum	0.0	£ -	**£ -**	
1.06.Z2.01	Park and ride provision - at grade	Parking space	0.0	£ -	**£ -**	
1.06.Z2.02	Park and ride provision - single deck	Parking space	0.0	£ -	**£ -**	
1.06.Z2.03	Park and ride provision - multi storey	Parking space	2,520.0	£ 11,144.0	**£ 28,082,813**	
1.06.Z3.01	Lifts to footbridges	Nr	12.0	£ 338,000.0	**£ 4,056,000**	

Project Number	5187419	**Revision**	0
Project Name	Central Section options - Bedford - Cambridge link	**Estimate number**	
Stage	Pre-GRIP	**Anticipated Start Date**	Mar, 2024
Client	East West Rail	**Anticipated Finish Date**	Dec, 2027
Programme		**Price Base Date**	2Q19
Estimate Date	29 July 2019	**Currency**	GBP

Alignment	**F - Atkins**	**Total Direct cost Estimate**	**£ 2,031,921,205**

RMM	Bill Description	UoM	Qty	Rate £ GBP	Total £ GBP	Comments
1.06.Z3.01						
1.07.01.01.01.Z1	Earthworks: Cut [0-5m]	m3	251,700.1	£ 5.2	**£ 1,312,616**	
1.07.01.01.01.Z2	Earthworks: Cut [5-10m]	m3	786,202.3	£ 6.3	**£ 4,920,054**	
1.07.01.01.01.Z3	Earthworks: Cut [>10m]	m3	2,226,018.4	£ 7.5	**£ 16,716,508**	
1.07.01.01.Z1	Inert materials disposal	m3	1,108,136.5	£ 41.4	**£ 45,899,012**	
1.07.01.02.03.Z1	Earthworks: Fill [0-5m]	m3	400,395.6	£ 55.0	**£ 22,021,759**	
1.07.01.02.03.Z2	Earthworks: Fill [5-10m]	m3	5,874,284.0	£ 60.5	**£ 355,394,184**	
1.07.01.02.03.Z3	Earthworks: Fill[>10m]	m3	5,088,880.8	£ 66.0	**£ 335,866,133**	
1.07.01.02.03.Z3	Discount from re-used cutting volumes	m3	2,155,784.3	-£ 55.0	**-£ 118,568,135**	
1.07.01.02.03.Z4	Soil stabilisation (Rock netting / soil nailing etc.)	m3	0.0	£ -	**£ -**	
1.07.03.Z6	Blast & Drill tunnels	m	0.0	£ -	**£ -**	
1.07.03.Z7	Bored tunnels	m	0.0	£ -	**£ -**	
1.07.03.Z8	Cut & Cover tunnels	m	0.0	£ -	**£ -**	
1.07.05.Z10.01	Viaducts	m2	124,200.0	£ 3,607.1	**£ 448,007,143**	
1.07.05.Z10.01	Viaducts - Complex	m2	71,415.0	£ 5,118.4	**£ 365,527,567**	
1.07.05.Z10.02.01	Overbridge - Ampthill Road remods	Psum	0.0	£ -	**£ -**	
1.07.05.Z10.02.01	Overbridge - Cauldwell Street remods	Psum	0.0	£ -	**£ -**	
1.07.05.Z10.02.01	Overbridge - Ford End Road remods	Psum	0.0	£ -	**£ -**	
1.07.05.Z10.02	Overbridge (Highways)	m2	16,370.0	£ 8,103.8	**£ 132,659,235**	
1.07.05.Z10.03	Overbridge (Rail)	m2	0.0	£ -	**£ -**	
1.07.05.Z10.03.z1	Overpass (bridleway)	m2	0.0	£ -	**£ -**	
1.07.05.Z10.04	Underbridge (Water)	m2	0.0	£ -	**£ -**	
1.07.05.Z10.05	Underbridge (Highways)	m2	10,650.0	£ 5,531.8	**£ 58,914,096**	
1.07.05.Z10.06	Underbridge (Rail)	m2	0.0	£ -	**£ -**	
1.07.05.Z10.07	Underpass (concrete box)	m2	560.0	£ 5,531.8	**£ 3,097,830**	
1.07.05.Z10.08	Underbridge (Concrete box)	m2	0.0	£ -	**£ -**	
1.07.06	Footbridges	m2	1,842.8	£ 7,583.1	**£ 13,974,147**	
1.07.07	New station - Platforms (Green field)	m2	1,272.0	£ 1,046.6	**£ 1,331,323**	
1.07.07	New station - Platforms (Possessions)	m2	2,544.0	£ 1,308.3	**£ 3,328,308**	
1.07.07.Z1	Gauging alterations	m	0.0	£ -	**£ -**	
1.07.08.02	Retaining Walls	m2	0.0	£ -	**£ -**	
1.07.09.01.01.Z1	Fencing - Low security	m	43,805.3	£ 13.9	**£ 608,893**	
1.07.09.01.01.Z2	Fencing - High security	m	14,601.8	£ 130.0	**£ 1,898,228**	
1.07.10	Drainage - Track	m	98,414.0	£ 228.8	**£ 22,515,280**	
1.07.10	Drainage - Toe ditch (Embankments)	m	29,203.5	£ 135.7	**£ 3,961,505**	
1.07.10	Drainage - Toe + Crest ditch (Cuttings)	m	29,203.5	£ 189.9	**£ 5,546,107**	
1.07.10.06.01	New Culverts	m	50.0	£ 5,715.1	**£ 285,754**	
1.07.12.01.Z7	Road diversion: Minor roads (including access roads)	m2	63,940.0	£ 116.3	**£ 7,438,780**	

Project Number	5187419	**Revision**	0
Project Name	Central Section options - Bedford - Cambridge link	**Estimate number**	
Stage	Pre-GRIP	**Anticipated Start Date**	Mar, 2024
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Programme		**Price Base Date**	2Q19
Estimate Date	29 July 2019	**Currency**	GBP

Alignment	**F - Atkins**	**Total Direct cost Estimate**	**£ 2,031,921,205**

RMM	Bill Description	UoM	Qty	Rate £ GBP	Total £ GBP	Comments
1.07.12.01.Z8	Road diversion: Single Carriageway	m2	0.0	£ -	**£ -**	
1.07.12.01.Z9	Road diversion: Dual Carriageway	m2	0.0	£ -	**£ -**	
1.07.12.03	Walkways/Footpath	m	0.0	£ -	**£ -**	
1.07.12.04	CESS walkways	m	116,814.0	£ 90.0	**£ 10,513,260**	
1.07.12.01	Maintenance Roads	m2	307,419.0	£ 87.55	**£ 26,914,533.45**	
1.07.12.01	Maintenance Roads - local connection to highways	Psum	23.0	£ 20,000.00	**£ 460,000.00**	
1.07.12.01	Maintenance Roads - Steps for track access (kwik step or (	Psum	46.0	£ 20,000.00	**£ 920,000.00**	
1.07.09	Acoustic Barriers	m	0.0	£ -	**£ -**	
1.07.14.01	C1/9	m	116,814.0	£ 54.77	**£ 6,397,513.40**	
1.08.02.01.01	General Site Clearance	m2	3,450,302.8	£ 2.66	**£ 9,177,805.46**	
1.08.02.01.02	Vegetation clearance	m2	0.0	£ -	**£ -**	
1.08.02.03.01.Z1	Non hazardous	m3	0.0	£ -	**£ -**	
1.08.02.03.01.Z2	Hazardous	m3	0.0	£ -	**£ -**	
1.08.02.03.02	Treatment of contaminated land	m2	17,140.1	£ 109.80	**£ 1,881,985.56**	
1.08.03.02.05.Z1	Permanent utility diversion (HV/LV)	m	0.0	£ -	**£ -**	
1.08.03.02.05.Z1	Permanent utility diversion (HV Pylon)	Nr	1.0	£ 3,000,000.00	**£ 3,000,000.00**	
1.08.02.02.Z6.Z1	Permanent utility diversion (Water)	m	100.0	£ 349.59	**£ 34,959.30**	
1.08.02.02.Z6.Z2	Permanent utility diversion (Foul)	m	0.0	£ -	**£ -**	
1.08.02.02.Z6.Z3	Protection of utility (Gas)	m	400.0	£ 1,491.10	**£ 596,438.35**	
1.08.03.02.05.Z2	Permanent utility diversion (Comms)	m	0.0	£ -	**£ -**	
1.08.03.01.Z4.01	Demolition works (trees)	m2	0.0	£ -	**£ -**	
1.08.03.01.Z4.02	Demolition works (buildings)	m2	106.0	£ 136.43	**£ 14,466.21**	
1.08.03.01.Z4.03	Demolition works (Car parks)	m2	0.0	£ -	**£ -**	
1.04	Points end to recover	Nr	0.0	£ -	**£ -**	
1.04	Shunting line bi directional	m	0.0	£ -	**£ -**	
1.07.14.Z2	CRMS adjusments	Psum	0.0	£ -	**£ -**	
1.01	UTX adjustments	Psum	0.0	£ -	**£ -**	
1.07.07.Z1	E/O for higher costs of Platform extension (Additional for B	m2	0.0	£ -	**£ -**	
1.01	Level Crossing - upgrade half barrier to MCB	Nr	0.0	£ -	**£ -**	
1.01	Relocation of REB	Psum	0.0	£ -	**£ -**	
1.07	New Bridge - River Great Ouse	m2	0.0	£ -	**£ -**	
1.01	Relocation of DNO cabinets	Psum	0.0	£ -	**£ -**	
1.01	Relocation of LOC cabinets	Psum	0.0	£ -	**£ -**	
1.08	Demoliton Old Goods Sheed	Psum	0.0	£ -	**£ -**	
1.08	Bedford Public Realm	m2	0.0	£ -	**£ -**	
1.08	Bedford station car park layout alterations	m2	0.0	£ -	**£ -**	
1.04	Track renewal :- EA0 end to EA1 start Bedford MMainline-	m	2,000.0	£ 1,162.78	**£ 2,325,566.59**	
1.06.Z2.03	Extra car park (small) - Cambourne Station access	Parking space	200.0	£ 11,143.97	**£ 2,228,794.68**	

Project Number	5187419	**Revision**	0
Project Name	Central Section options - Bedford - Cambridge link	**Estimate number**	
Stage	Pre-GRIP	**Anticipated Start Date**	Mar, 2024
Client	East West Rail	**Anticipated Finish Date**	Dec, 2027
Programme		**Price Base Date**	2Q19
Estimate Date	29 July 2019	**Currency**	GBP

Alignment	**F - Atkins**	**Total Direct cost Estimate**	**£ 2,031,921,205**

RMM	Bill Description	UoM	Qty	Rate £ GBP	Total £ GBP	Comments
1.06.Z2.03						
1.06.Z2.03	Extra car park (small) - Northstowe Station access	Parking space	0.0	£ -	**£ -**	
1.07	Allowance for new guided bus stop	Psum	1.0	£ 200,000.00	**£ 200,000.00**	
1.08	Reconfiguration/reconstruction works in Rowing lake	Psum	1.0	£ 300,000.00	**£ 300,000.00**	

Project Number	5187419	**Revision**	0
Project Name	Central Section options - Bedford - Cambridge link	**Estimate number**	
Stage	Pre-GRIP	**Anticipated Start Date**	Mar, 2024
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Programme		**Price Base Date**	2Q19
Estimate Date	29 July 2019	**Currency**	GBP

Alignment	**MVL (Kempston-Hardwick to EA0)**	**Total Direct cost Estimate**	**£ 15,115,810**

RMM	Bill Description	UoM	Qty	Rate £ GBP	Total £ GBP	Comments
1.01	ERTMS Level 2 (per STK) - High level estimate	STK	0.0	£ -	**£ -**	
1.01	Fringe works (Allowance)	Psum	1.0	£ 1,500,000.0	**£ 1,500,000**	
1.01	Signalling mods to existing NR infrastructure - New station	Psum	0.0	£ -	**£ -**	
1.01	ERTMS Level 2 (per SEU) - High level estimate	SEU	1.0	£ 251,032.4	**£ 251,032**	
1.02.02	Overhead Line Equipment (OLE)	Psum	0.0	£ -	**£ -**	
1.03.01.01.10	GRID Connection	Psum	0.0	£ -	**£ -**	
1.03.01.05	Small Power for Equipment - Station DNO	Psum	0.0	£ -	**£ -**	
1.03.01.05.02	PSP	Psum	0.0	£ -	**£ -**	
1.03.01.05.04	FSP	Psum	0.0	£ -	**£ -**	
1.04.01.01.Z1	New plain line - Ballasted track (possessions)	m	0.0	£ -	**£ -**	
1.04.01.01.Z2	New plain line - Ballasted track (Green zone)	m	0.0	£ -	**£ -**	
1.04.01.02	E/O for Slab Track (New)	m	0.0	£ -	**£ -**	
1.04.02.01.01	S&C - Trap	Nr	0.0	£ -	**£ -**	
1.04.02.01.02	S&C - Turnout	Nr	0.0	£ -	**£ -**	
1.04.02.01.03	S&C - Crossover	Nr	0.0	£ -	**£ -**	
1.04.02.01.04	S&C - Diamond (Fixed)	Nr	0.0	£ -	**£ -**	
1.04.02.01.05	S&C - Scissor Crossover	Nr	0.0	£ -	**£ -**	
1.04.03.01.01.Z1	Ballasted Track (Slew)	m	0.0	£ -	**£ -**	
1.04.03.01.01.Z2	Ballasted Track (Upgrade / replacement)	m	10,600.0	£ 1,162.8	**£ 12,325,503**	
1.04.03.01.01.Z3	Ballasted Track Recovery	m	0.0	£ -	**£ -**	
1.04.01.01.Z4	Follow up tamping (plain line)	Shifts	21.2	£ 8,125.0	**£ 172,250**	
1.04.02.01.Z6	Follow up tamping (S&C)	Shifts	0.0	£ -	**£ -**	
1.07.11	Track formation (sand blanket + subgrade + geotextile)	m²	0.0	£ -	**£ -**	
1.05	GSMR	Km	0.0	£ -	**£ -**	
1.05.10	CIS - Station	Nr	0.0	£ -	**£ -**	
1.05.10	CIS - Platform	Nr	0.0	£ -	**£ -**	
1.05.10.01.01	PA speakers	Nr	0.0	£ -	**£ -**	
1.05.06.05	Help points	Nr	0.0	£ -	**£ -**	
1.05.07	CCTV	Nr	0.0	£ -	**£ -**	
1.05.07	Station Control rooms	Nr	0.0	£ -	**£ -**	
1.06.01.Z1	Elevated Station (Modular Building)	Nr	0.0	£ -	**£ -**	
1.06.01.Z2	At grade Station (Modular Building)	Nr	0.0	£ -	**£ -**	
1.06.01.Z3	Interchange Station (Modular Building)	Nr	0.0	£ -	**£ -**	
1.06.01.Z4	Bedford Station reconfiguration (Extra Over to interchange	Psum	0.0	£ -	**£ -**	
1.06.Z2.01	Park and ride provision - at grade	Parking space	0.0	£ -	**£ -**	
1.06.Z2.02	Park and ride provision - single deck	Parking space	0.0	£ -	**£ -**	
1.06.Z2.03	Park and ride provision - multi storey	Parking space	0.0	£ -	**£ -**	
1.06.Z3.01	Lifts to footbridges	Nr	0.0	£ -	**£ -**	

Project Number	5187419	**Revision**	0
Project Name	Central Section options - Bedford - Cambridge link	**Estimate number**	
Stage	Pre-GRIP	**Anticipated Start Date**	Mar, 2024
Client	East West Rail	**Anticipated Finish Date**	Dec, 2027
Programme		**Price Base Date**	2Q19
Estimate Date	29 July 2019	**Currency**	GBP

Alignment	**MVL (Kempston-Hardwick to EA0)**	**Total Direct cost Estimate**	**£**	**15,115,810**

RMM	Bill Description	UoM	Qty	Rate £ GBP	Total £ GBP	Comments
1.06.Z3.01						
1.07.01.01.01.Z1	Earthworks: Cut [0-5m]	m3	0.0	£ -	**£** -	
1.07.01.01.01.Z2	Earthworks: Cut [5-10m]	m3	0.0	£ -	**£** -	
1.07.01.01.01.Z3	Earthworks: Cut [>10m]	m3	0.0	£ -	**£** -	
1.07.01.01.Z1	Inert materials disposal	m3	0.0	£ -	**£** -	
1.07.01.02.03.Z1	Earthworks: Fill [0-5m]	m3	0.0	£ -	**£** -	
1.07.01.02.03.Z2	Earthworks: Fill [5-10m]	m3	0.0	£ -	**£** -	
1.07.01.02.03.Z3	Earthworks: Fill[>10m]	m3	0.0	£ -	**£** -	
1.07.01.02.03.Z3	Discount from re-used cutting volumes	m3	0.0	£ -	**£** -	
1.07.01.02.03.Z4	Soil stabilisation (Rock netting / soil nailing etc.)	m3	0.0	£ -	**£** -	
1.07.03.Z6	Blast & Drill tunnels	m	0.0	£ -	**£** -	
1.07.03.Z7	Bored tunnels	m	0.0	£ -	**£** -	
1.07.03.Z8	Cut & Cover tunnels	m	0.0	£ -	**£** -	
1.07.05.Z10.01	Viaducts	m2	0.0	£ -	**£** -	
1.07.05.Z10.01	Viaducts - Complex	m2	0.0	£ -	**£** -	
1.07.05.Z10.02.01	Overbridge - Ampthill Road remods	Psum	0.0	£ -	**£** -	
1.07.05.Z10.02.01	Overbridge - Cauldwell Street remods	Psum	0.0	£ -	**£** -	
1.07.05.Z10.02.01	Overbridge - Ford End Road remods	Psum	0.0	£ -	**£** -	
1.07.05.Z10.02	Overbridge (Highways)	m2	0.0	£ -	**£** -	
1.07.05.Z10.03	Overbridge (Rail)	m2	0.0	£ -	**£** -	
1.07.05.Z10.03.z1	Overpass (bridleway)	m2	0.0	£ -	**£** -	
1.07.05.Z10.04	Underbridge (Water)	m2	0.0	£ -	**£** -	
1.07.05.Z10.05	Underbridge (Highways)	m2	0.0	£ -	**£** -	
1.07.05.Z10.06	Underbridge (Rail)	m2	0.0	£ -	**£** -	
1.07.05.Z10.07	Underpass (concrete box)	m2	0.0	£ -	**£** -	
1.07.05.Z10.08	Underbridge (Concrete box)	m2	0.0	£ -	**£** -	
1.07.06	Footbridges	m2	75.0	£ 7,583.1	**£ 568,733**	
1.07.07	New station - Platforms (Green field)	m2	0.0	£ -	**£** -	
1.07.07	New station - Platforms (Possessions)	m2	228.0	£ 1,308.3	**£ 298,292**	
1.07.07.Z1	Gauging alterations	m	0.0	£ -	**£** -	
1.07.08.02	Retaining Walls	m2	0.0	£ -	**£** -	
1.07.09.01.01.Z1	Fencing - Low security	m	0.0	£ -	**£** -	
1.07.09.01.01.Z2	Fencing - High security	m	0.0	£ -	**£** -	
1.07.10	Drainage - Track	m	0.0	£ -	**£** -	
1.07.10	Drainage - Toe ditch (Embankments)	m	0.0	£ -	**£** -	
1.07.10	Drainage - Toe + Crest ditch (Cuttings)	m	0.0	£ -	**£** -	
1.07.10.06.01	New Culverts	m	0.0	£ -	**£** -	
1.07.12.01.Z7	Road diversion: Minor roads (including access roads)	m2	0.0	£ -	**£** -	

Project Number	5187419	**Revision**	0
Project Name	Central Section options - Bedford - Cambridge link	**Estimate number**	
Stage	Pre-GRIP	**Anticipated Start Date**	Mar, 2024
Client	East West Rail	**Anticipated Finish Date**	Dec, 2027
Programme		**Price Base Date**	2Q19
Estimate Date	29 July 2019	**Currency**	GBP

Alignment	**MVL (Kempston-Hardwick to EA0)**	**Total Direct cost Estimate**	**£ 15,115,810**

RMM	Bill Description	UoM	Qty	Rate £ GBP	Total £ GBP	Comments
1.07.12.01.Z8	Road diversion: Single Carriageway	m2	0.0	£ -	£ -	
1.07.12.01.Z9	Road diversion: Dual Carriageway	m2	0.0	£ -	£ -	
1.07.12.03	Walkways/Footpath	m	0.0	£ -	£ -	
1.07.12.04	CESS walkways	m	0.0	£ -	£ -	
1.07.12.01	Maintenance Roads	m2	0.0	£ -	£ -	
1.07.12.01	Maintenance Roads - local connection to highways	Psum	0.0	£ -	£ -	
1.07.12.01	Maintenance Roads - Steps for track access (kwik step or (	Psum	0.0	£ -	£ -	
1.07.09	Acoustic Barriers	m	0.0	£ -	£ -	
1.07.14.01	C1/9	m	0.0	£ -	£ -	
1.08.02.01.01	General Site Clearance	m2	0.0	£ -	£ -	
1.08.02.01.02	Vegetation clearance	m2	0.0	£ -	£ -	
1.08.02.03.01.Z1	Non hazardous	m3	0.0	£ -	£ -	
1.08.02.03.01.Z2	Hazardous	m3	0.0	£ -	£ -	
1.08.02.03.02	Treatment of contaminated land	m2	0.0	£ -	£ -	
1.08.03.02.05.Z1	Permanent utility diversion (HV/LV)	m	0.0	£ -	£ -	
1.08.03.02.05.Z1	Permanent utility diversion (HV Pylon)	Nr	0.0	£ -	£ -	
1.08.02.02.Z6.Z1	Permanent utility diversion (Water)	m	0.0	£ -	£ -	
1.08.02.02.Z6.Z2	Permanent utility diversion (Foul)	m	0.0	£ -	£ -	
1.08.02.02.Z6.Z3	Protection of utility (Gas)	m	0.0	£ -	£ -	
1.08.03.02.05.Z2	Permanent utility diversion (Comms)	m	0.0	£ -	£ -	
1.08.03.01.Z4.01	Demolition works (trees)	m2	0.0	£ -	£ -	
1.08.03.01.Z4.02	Demolition works (buildings)	m2	0.0	£ -	£ -	
1.08.03.01.Z4.03	Demolition works (Car parks)	m2	0.0	£ -	£ -	
1.04	Points end to recover	Nr	0.0	£ -	£ -	
1.04	Shunting line bi directional	m	0.0	£ -	£ -	
1.07.14.Z2	CRMS adjusments	Psum	0.0	£ -	£ -	
1.01	UTX adjustments	Psum	0.0	£ -	£ -	
1.07.07.Z1	E/O for higher costs of Platform extension (Additional for B	m2	0.0	£ -	£ -	
1.01	Level Crossing - upgrade half barrier to MCB	Nr	0.0	£ -	£ -	
1.01	Relocation of REB	Psum	0.0	£ -	£ -	
1.07	New Bridge - River Great Ouse	m2	0.0	£ -	£ -	
1.01	Relocation of DNO cabinets	Psum	0.0	£ -	£ -	
1.01	Relocation of LOC cabinets	Psum	0.0	£ -	£ -	
1.08	Demoliton Old Goods Sheed	Psum	0.0	£ -	£ -	
1.08	Bedford Public Realm	m2	0.0	£ -	£ -	
1.08	Bedford station car park layout alterations	m2	0.0	£ -	£ -	
1.04	Track renewal :- EA0 end to EA1 start Bedford MMainline-	m	0.0	£ -	£ -	
1.06.Z2.03	Extra car park (small) - Cambourne Station access	Parking space	0.0	£ -	£ -	

Project Number	5187419	**Revision**	0
Project Name	Central Section options - Bedford - Cambridge link	**Estimate number**	
Stage	Pre-GRIP	**Anticipated Start Date**	Mar, 2024
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Programme		**Price Base Date**	2Q19
Estimate Date	29 July 2019	**Currency**	GBP

Alignment	**MVL (Kempston-Hardwick to EA0)**	**Total Direct cost Estimate**	**£**	**15,115,810**

RMM	Bill Description	UoM	Qty	Rate £ GBP	Total £ GBP	Comments
1.06.Z2.03						
1.06.Z2.03	Extra car park (small) - Northstowe Station access	Parking space	0.0	£ -	**£** -	
1.07	Allowance for new guided bus stop	Psum	0.0	£ -	**£** -	
1.08	Reconfiguration/reconstruction works in Rowing lake	Psum	0.0	£ -	**£** -	

RMM - Rules of coverage

1. Direct Construction Costs

1.01 Railway Control System
1.02 Train Power System
1.03 Electric Power and Plant
1.04 Permanent Way / Track
1.05 Telecommunication Systems
1.06 Buildings and Property
1.07 Civil Engineering
1.08 Enabling Works
1.09 Rolling Stock

2. Indirect Costs

2.01 Preliminaries
2.02 OH&P
3.01 Project Design
3.02 Project Management
3.03 Other Project Development
4.01 Risk
5.01 Inflation

Indirect Costs

2.01 Preliminaries

ELEMENT	SUB ELEMENT	COMPONENT	RULES OF COVERAGE	RULES OF MEASUREMENT	DEFINITION
01 Main Contractor's Preliminaries item	01 Employer's Requirements item	01 Site Accommodation for the Employer and Employer's Representative item	C1 Coverage is governed by RICS New Rules of Measurement (NRM 1).	M1 Excludes any allowances for sub-contractors preliminaries, which shall be included within the unit rates applied to measured quantities in Direct Construction Works.	D1 Definitions are governed by RICS New Rules of Measurement (NRM 1).
		02 Site Records item			
		03 Completion and Post Completion Requirements item			
		04 Other : state component cost item item			
	02 Contractor's Cost Items item	01 Management and Staff item		M2 Contractor design fees shall be measured in Group Element 3.01.	
		02 Site Establishment and Site Accommodation for Contractor item			
		03 Security item			
		04 Control and Protection item			
		05 Mechanical Plant item			
		06 Completion and Post-Completion Requirements item			
		07 Cleaning item			
		08 Fees and Charges item			
		09 Site Services (excluding temporary works) item	C2 Includes 'multi-service gang attendance'.		
		10 Insurance, Bonds, Guarantees and Warranties item			
		11 Other : state component cost item item			
	03 Temporary Works and Services item	01 Temporary Services item	C3 Temporary Works are deemed to include all necessary Main Contractor preliminary items.		D2 Temporary Works and Services exclude Temporary Utility Diversion Works for the permanent rail infrastructure works which are measured in accordance with Group Element 1.08 Enabling Works.
		02 Temporary Works item			
		03 Other : state component cost item item			
	04 Safety and Environmental Protection item	01 Construction Design and Management Regulations (CDM) Requirements item			
		02 Possessions item			
		03 Isolations item			
		04 Environmental Protection Measures item			
		05 Other : state component cost item item			

2.02 OH&P

ELEMENT	SUB ELEMENT	COMPONENT	RULES OF COVERAGE	RULES OF MEASUREMENT	DEFINITION
01 Main Contractor's Overheads and Profit %	01 Overheads %	01 Head Office Costs and Administration of the Main Contractor Proportioned to the Contract %	C1 The Main Contractors Allowance for Overheads and Profit as defined within the Main Contract on the following: a) Direct Construction Works b) Indirect Construction Cost – Preliminaries	M1 Overheads and Profit shall be stated as two discrete cost items with the appropriate percentage (%) allowance stated.	D1 The definition of items included in the Overheads and Profit shall be as stated in the Contract Conditions where these are available. D2 Contracts that utilise the term Fee, in lieu of Overheads and Profit, are to be covered under Group Element 2.02. D3 Where no contract or procurement data exits the fee should be taken as to include the following: a) Corporate Overhead Costs b) Franchises, royalties, licences c) Taxes with the exception of VAT on vehicle hire/lease for contract specific staff that is not recoverable due to the provisions of VAT Notice 700/64 d) Interest, financing charges (including financing this Contract), banking charges, interest charges to Sub-Contractors and Suppliers due to late payment by Contractor e) Company accounting / auditing f) Research and development not directly consequent upon the Works and contemplated in the Target Cost g) Business insurance / warranties / professional indemnity, product liability (excluding insurances taken out by the Employer) h) Group and Head Office stationery i) Marketing, sales, exhibitions j) General fees paid on a regular basis k) Legal advice, fees and services including any negotiation and execution of Contract l) Advertising including agency fees and publication costs
	02 Profit %	01 Profit on Cost %			

3.01 Project Design

ELEMENT			SUB ELEMENT			COMPONENT		
01	Railway Control Systems Design	item	01	Design Management	item	01	Design Manager	item
02	Train Power Systems Design	item						
03	Electric Power Systems Design	item						
04	Permanent Way Design	item						
05	Telecoms Systems Design	item						
06	Buildings and Property Design	item						
07	Civil Engineering Design	item						
08	Enabling Works Design	item						
09	Rolling Stock and Trainborne Equipment Design	item						
			02	Feasibility Study	item	01	Source Documents	item
						02	Surveys	item
						03	Specifications	item
						04	Reports	item
						05	Drawings and Plans	item
						06	Schedules and Tables	item
						07	Other : state type	item
			03	Option Selection	item	01	Source Documents	item
						02	Surveys	item
						03	Specifications	item
						04	Reports	item
						05	Drawings and Plans	item
						06	Schedules and Tables	item
						07	Other : state type	item
			04	Single Option Development	item	01	Source Documents	item
						02	Surveys	item
						03	Specifications	item
						04	Reports	item
						05	Drawings and Plans	item
						06	Schedules and Tables	item
						07	Other : state type	item
			05	Detailed Design	item	01	Source Documents	item
						02	Surveys	item
						03	Specifications	item
						04	Reports	item
						05	Drawings and Plans	item
						06	Schedules and Tables	item
						07	Detailed Design	item
						08	All 'As Built' Documentation	item
						09	Other : state type	item
			06	Post Contract	item	01	Print and Issue Commissioning Records	item
						02	Prepare Final Records	item
						03	Post Contract Design	item

RULES OF COVERAGE		RULES OF MEASUREMENT		DEFINITION	
C1	Where fees for the design of the works are either Employers own or Employers procured, this shall be identified at the sub element level.	M1	Items for project / design fees state the personnel / role engaged in the activity.	D1	Employers procured design includes contractor design.
C2	Where fees for the design of the works are paid for by the employer for the whole project, they shall be included within this section.	M2	Where the works are to be completed in sections, the sections shall be described and separate items measured for each section.		
C3	Where a "design and build" contract strategy is used, the fees for design in this section shall cover the fee costs prior to and post the transfer of the design responsibility to the contractor.				
C4	Items for Source Documents shall include checking and updating existing records (Correlation).				
C5	Drawings and Plans shall include BIM documents.				
C6	Surveys shall include (but not be limited to) Asset Sighting, Geotechnical, and Topographical.				

3.02 Project Management

ELEMENT			SUB ELEMENT			COMPONENT		
01	Employer's Staff Costs	item	01	Project Output Definition Phase	item	01	Project Management	item
02	Employer's Procured Staff Costs	item						
			02	Output Definition Phase	item	02	Commercial Management	item
			03	Feasibility Phase	item	03	Procurement	item
			04	Option Selection Phase	item	04	Cost Planning and Estimating	item
			05	Single Option Development Phase	item	05	Project Controls	item
			06	Detailed Design Phase	item	06	Health, Safety, Quality and Environment (HSQE)	item
			07	Construction, Testing and Commissioning Phase	item	07	Risk & Value	item
			08	Handback Phase	item	08	Engineering	item
			09	Close Out Phase	item	09	Construction Management	item
			10	Other : state Sub Element Cost Item	item	10	Other : state Component Cost Item	item

RULES OF COVERAGE		RULES OF MEASUREMENT	DEFINITION	
C1	Items description associated with Sub Element for the Project shall be deemed to refer to all Project Lifecycle Stages.		D1	The employer's permanent and short term employed staff and all their associated costs, including overhead costs, when engaged in the management of the project are classed as Employer Staff Costs.
C2	Items description associated with Component for Other shall be deemed to refer to all disciplines when it has not been broken down into items 01-07.		D2	Costs incurred by the employer for agency staff, professional consultancy staff, main contractor staff, and delivery partners to manage the project are classed as Employers Procured Staff Costs.

3.03 Other Project Development

ELEMENT	SUB ELEMENT	COMPONENT	RULES OF COVERAGE	RULES OF MEASUREMENT	DEFINITION
01 Other Projects Costs item	01 Land Cost item	01 Acquisition of Land item	C1 Acquisition of land shall include land acquisition or way leaves, whether permanently or temporarily for the execution of the works, preliminary land or property surveys, statutory fees, fees or parliamentary approvals including transport and works act orders, environmental impact assessments, employer-owned plant and employer's other costs.	M1 Separate items shall be given for acquisition of land which is required permanently and that required temporarily.	
		02 Right of Way and Way Leaves item			
		03 Fees: associated with Acquisition of Land or Rights of Way item			
	02 Fees to Statutory and Public Bodies item	01 Planning Fees item			
		02 Building Control Fees item			
		03 Fees to Neighbouring Land Owners and Users to Facilitate the Project item			D1 Where structures or highway works are not carried out by the highways authority, the commuted charges in respect of adoption and maintenance shall be classed as payments to public or statutory authorities.
	03 Payments to Public and Statutory Bodies item	01 Adoption Charges in Connection with Highways and Bridges item		M2 Item description for charges in respect of adoption and maintenance of highways shall be given.	
		02 Maintenance Charges in Connection with Highways and Bridges item			
		03 Planning Contributions item	C2 Items for planning contributions shall describe the purpose of the contributions.		
	04 Sponsor's Agent Fees item	01 Planning item			
		02 Lobbying and Public Consultation item			
		03 Legal Services item			
		04 Taxation and Financial Services item			
		05 Collaboration, Business Relationship Management Systems item			
		06 Facilitation Services item			
	05 Employer's Office Costs item	01 Employer's Main Office Costs item	C3 Costs for the Employer's Staff in the Management of the Project is included within group element 3.01.		
		02 Employer's Project Office Costs item			
		03 Employer's Office Costs item	C4 Employer Owned Plant shall be included in Direct Construction Works Costs.		
	06 Research for Innovative Products item	01 Concept Design item			
		02 Testing item			
		03 Piloting item			D2 Costs associated with the validation of a finance agreement which is expressly required to finance the works, shall be classed employer's finance costs.
	07 Finance Costs item	01 Commitment Fees item		M3 Items for interest shall state the basis of the calculation giving the rate of interest and the period over which it has been assessed.	
		02 Interest item		M4 Where the contract strategy provides for credit being extended by the contractor to the employer, an item shall be given.	
		03 Credit Charges item			
	08 Independent Reviews item	01 Interoperability item	C5 Costs associated with Independent Review shall not include employer's staff in management of the project , this is included within Group Element 3.02.		
		02 Common Safety Method (CSM) item			
		03 Project Review item			
		04 Cost Assurance item			
		05 Other item		M5 Item description for charges in respect of Other shall be given.	D3 Other Employer Costs in connection with the project (to be stated).
01 Other Projects Costs (continued) item	09 Marketing item	01 Fees item			
	10 Stakeholder Management item	02 Other : state Component Cost Item item			
	11 Archaeological Fieldwork item				
	12 Insurance item				
	13 Other Employer's Costs: state Cost Item item				
02 Disruption of Asset Use item	01 Employer's Costs item	01 Permanent Way Possessions nr	C6 Item shall be deemed to include Employer's Staff Costs in the management and supervision of possessions and isolations.	M6 Items shall be given for the employer's cost associated with providing access to there infrastructure for the execution of work.	
		02 Permanent Way Train Power Isolations nr			
	02 Decanting and Relocation Costs item	01 Temporary Relocation Costs item	C7 Items shall be for payment made to neighbouring owners or users for costs to cover payments for interruptions or disturbance of use.	M7 Payments made to neighbouring owners or users for double glazing, sound proofing or for the cost of vacations during the execution of the works shall be classed as payments for interruptions or disturbance of use.	D4 Occupiers and users costs for which the employer is expressly liable during the works shall be classed as decanting and relocation costs.
		02 Rents and Other Running Costs item			
		03 Compensation Costs item			
	03 Interruption of Use item	01 Payments to Asset Users for Planned Interruption to the Use of the Asset item	C8 Items shall be provided for the cost of payments to users of the asset on which the work is being carried out - usually users of the Permanent Way.		D5 Where the works are on existing asset which will be either closed or diverted during the progress of the works the costs incurred to compensate the users (train operating companies/freight operating companies) shall be classed as interruption of use.
		02 Costs of Diversionary Routes or Alternative Lines of Supply item	C9 Where work on the asset requires existing traffic to be diverted, an item shall be given.		

4.01 Risk

ELEMENT	SUB ELEMENT	COMPONENT	RULES OF COVERAGE	RULES OF MEASUREMENT	DEFINITION
01 Total Risk Allowance item	01 Quantitative Cost Risk Analysis (QCRA) item	01 Risk : state type item			D1 Risks associated with the Project shall be include: a) Design Development Risks b) Construction Risks c) Employer Change Risks d) Employer Other Risks
	02 Risk Allowance %	01 Risk : state type %			

5.01 Inflation

ELEMENT	SUB ELEMENT	COMPONENT	RULES OF COVERAGE	RULES OF MEASUREMENT	DEFINITION
01 Inflation item	01 Tender Inflation item	01 Inflation : Date of Estimate to Tender Return item			D1 Price inflation during the period from the date of the estimate to the base date stated in the tender shall be classed as tender inflation.
		02 Inflation : Delays in Procurement Programme item			
	02 Construction Inflation item	01 Inflation : Date of Commencement to Mid-point of Construction Period item			D2 Price inflation from the base date stated in the tender to the mid-point in the construction period shall be classed as construction inflation.
		02 Exceptional Inflation item			D3 The additional costs of items or services that are in short supply or subject to abnormal market conditions shall be classed as exceptional inflation.

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Quantities (per route)

A - Atkins	B1A - Atkins	B2A - Atkins	C - Atkins	D - Atkins	E - Atkins	F - Atkins
AA1	EA6	EA5	AA1	EA1	EA1	AA1
AA2	EA7	EA6	AA3	EA2	EA2	B1A2
AA3	AA1	EA7	B1A2	EA3	EA3	B2A2
	EA8	AA1	DA5	AA3	EA4	EA5
	EA9	EA8	CA3	DA4	EA5	EA6
	B1A2	EA9		DA5	EA6	EA7
	B1A3	B1A2			EA7	FA2
	B1A4	B2A2			EA8	
					EA9	
FBS	FBS	FBS	FBS	FBMM	FBMM	FBS
FC1	FC1	FC1	FC1	FC1	FC1	FC3
R.Wide	R.Wide	R.Wide	R.Wide	R.Wide	R.Wide	R.Wide
				EA0	EA0	

*Quantities revised during workshop (18-19 jun 2019)

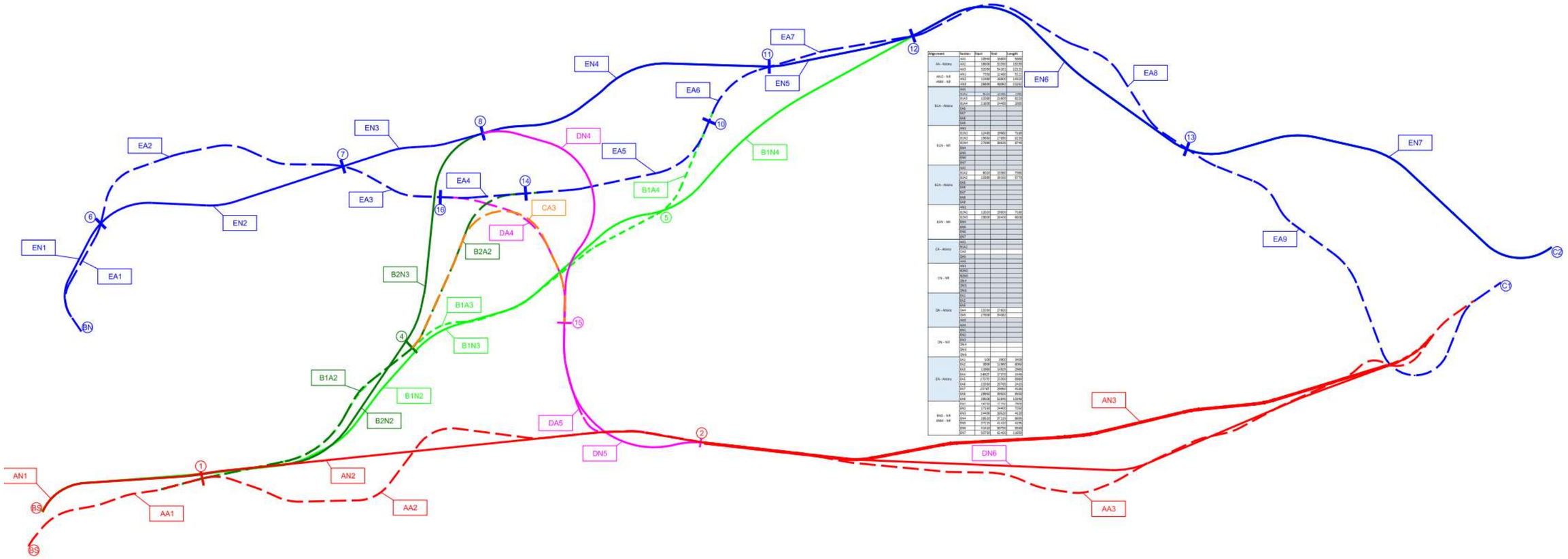
** Quantities for Routes D and E exclude structures alterations and MVL section

Track								
Route Length	*KM*	**42.5**	**53.8**	**54.5**	**49.7**	**49.9**	**54.4**	**58.4**

Stations								
Number of stations	*Nr*	**3**	**3**	**3**	**3**	**4**	**4**	**4**

Structures								
Viaducts (flood plain)	*m2*	**59,535**	**70,268**	**84,038**	**109,215**	**84,443**	**59,400**	**114,615**
	nr	**10**	**9**	**10**	**11**	**11**	**9**	**8**
Viaducts - complex (flood plain)	*m2*	**29,970**	**18,090**	**18,090**	**18,090**	**-**	**-**	**50,895**
	nr	**2**	**1**	**1**	**1**	**0**	**0**	**2**
Viaducts (Highways)	*m2*	**-**	**-**	**-**	**-**	**1,958**	**1,958**	**9,585**
	nr	**0**	**0**	**0**	**0**	**1**	**1**	**1**
Viaducts (Rail)	*m2*	**-**	**-**	**-**	**-**	**-**	**-**	**-**
	nr	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Viaducts - complex (Rail)	*m2*	**20,520**	**20,520**	**20,520**	**20,520**	**-**	**-**	**20,520**
	nr	**1**	**1**	**1**	**1**	**0**	**0**	**1**
Overbridge (Highways)	*m2*	**11,450**	**7,715**	**6,565**	**7,885**	**17,985**	**16,155**	**16,370**
	nr	**11**	**10**	**10**	**9**	**15**	**15**	**4**
Overbridge (Rail)	*m2*	**135**	**-**	**-**	**135**	**135**	**-**	**-**
	nr	**1**	**0**	**0**	**1**	**1**	**0**	**0**
Overpass (bridleway)	*m2*	**125**	**123**	**123**	**125**	**125**	**123**	**-**
	nr	**1**	**1**	**1**	**1**	**1**	**1**	**0**
Underbridge (Water)	*m2*	**2,295**	**1,148**	**1,148**	**1,350**	**1,958**	**1,755**	**-**
	nr	**3**	**2**	**2**	**2**	**3**	**3**	**0**
Underbridge (Highways)	*m2*	**2,760**	**10,950**	**10,860**	**5,635**	**5,325**	**10,960**	**10,650**
	nr	**16**	**21**	**19**	**19**	**17**	**19**	**23**
Underbridge (Rail)	*m2*	**-**	**250**	**250**	**-**	**-**	**250**	**-**
	nr	**0**	**1**	**1**	**0**	**0**	**1**	**0**
Underpass (concrete box)	*m2*	**620**	**310**	**560**	**710**	**864**	**714**	**560**
	nr	**5**	**2**	**2**	**5**	**6**	**3**	**2**
Underbridge (Concrete box)	*m2*	**900**	**1,110**	**520**	**900**	**1,484**	**799**	**-**
	nr	**1**	**5**	**3**	**1**	**4**	**5**	**0**
Footbridge	*m2*	**298**	**1,030**	**1,030**	**1,160**	**2,190**	**2,060**	**1,843**
	nr	**4**	**7**	**7**	**6**	**10**	**11**	**8**
Culverts	*m2*	**100**	**150**	**150**	**50**	**50**	**150**	**50**
	nr	**2**	**3**	**3**	**1**	**1**	**3**	**1**

Earthworks								
Cut [0-5m]	*m3*	283,156	501,003	502,511	286,587	393,896	609,760	251,700
Cut [5-10m]	*m3*	508,265	1,790,235	1,791,130	577,177	919,329	2,133,265	786,202
Cut [>10m]	*m3*	4,620,047	6,434,370	6,515,164	1,531,417	4,351,636	9,335,399	2,226,018
Total Cut	***m3***	**5,411,468**	**8,725,607**	**8,808,805**	**2,395,181**	**5,664,860**	**12,078,424**	**3,263,921**
Fill [0-5m]	*m3*	223,052	254,940	331,437	320,493	210,104	240,769	400,396
Fill [5-10m]	*m3*	4,483,769	5,309,721	4,174,579	6,225,761	4,857,109	2,680,065	5,874,284
Fill [>10m]	*m3*	2,348,248	3,120,988	5,164,180	2,503,804	4,014,029	6,904,342	5,088,881
Total Fill	***m3***	**7,055,069**	**8,685,649**	**9,670,197**	**9,050,058**	**9,081,242**	**9,825,176**	**11,363,560**
Net Fill volume (m3)	***m3***	**4,223,508**	**5,486,574**	**5,488,486**	**7,831,319**	**6,319,738**	**4,100,728**	**9,207,776**
Route Corridor Impact Area	*m2*	2,533,290	3,473,302	3,479,612	2,634,497	2,968,678	3,798,532	3,274,301
Average width (m)	*m*	60	65	64	53	59	70	56



Alignment	Number	Start	End	Length
AA - Arterial	AA1	108+42	164+00	5558
	AA2	148+00	517+51	3751.51
	AA3	520+00	741+61	2215.61
AN1/2 - N/E AN3 - N/E	AN1	77+00	22+00	5500
	AN2	114+00	368+00	14200
	AN3	246+00	400+00	15400
B1A - Arterial	AA1			
	B1A1	76+00	107+00	1090
	B1A3	132+00	154+00	2210
	B1A4	2+00	24+00	2200
	DN1			
	DN7			
	DN8			
B1N - NE	AN1			
	B1N1	124+00	196+00	7180
	B1N3	196+00	218+00	2210
	B1N4	276+00	344+00	6740
	DN6			
	DN8			
	DN9			
	DN7			
B2A - Arterial	AA1			
	B1A2	90+00	103+00	1300
	B1A3	110+00	132+00	2270
	DN8			
	DN9			
	DN7			
B2N - NE	AN1			
	B1N2	1.8+00	19+00	1720
	B1N3	130+00	204+00	6600
	DN8			
	DN9			
	DN7			
CA - Arterial	AA1			
	B1A3			
	CA3			
	DN5			
	DN8			
CN - NE	AN1			
	AN2			
	B2N2			
	B2N3			
	DN4			
	DN5			
	DN9			
DA - Arterial	DA1			
	DA2			
	DA3			
	DA4	110+00	273+00	
	DA5	170+00	344+00	
	DN8			
DN - NE	AN1			
	AN2			
	DN2			
	DN3			
	DN4			
	DN5			
EA - Arterial	EA1	0+00	19+00	1900
	EA2	99+00	119+00	20200
	EA3	119+00	137+00	17800
	EA4	138+00	157+00	19000
	EA5	210+72	223+00	12328
	EA6	223+00	257+00	34000
	EA7	257+00	294+00	37000
	EA8	298+00	359+00	61000
	EA9	359+00	414+41	55441
	DN1	141+00	177+00	7600
AN1/2 - N/E AN3 - N/E	AN1	171+00	244+00	7250
	AN2	244+00	325+00	8120
	DN4	235+00	272+11	38200
	DN5	272+00	414+00	14200
	DN6	414+00	507+00	9300
	DN7	507+00	614+00	11000

	BCIS All-in TPI			BCIS General Civil Engineering Cost Index		GDP	RPIX	
	Base date: 1985 mean = 100 | Updated: 10-M			2005 mean = 100 | Updated: 29/05/2019		*Not in use*	*Not in use*	*Not in use*
Quarter	Value	Status		Value	Status			
1Q08	249			120	Firm			
2Q08	247			126	Firm			
3Q08	246			130	Firm			
4Q08	240			124	Firm			
1Q09	223			121	Firm			
2Q09	216			122	Firm			
3Q09	216			124	Firm			
4Q09	212			126	Firm			
1Q10	209			127	Firm			
2Q10	218			131	Firm			
3Q10	219			130	Firm			
4Q10	220			132	Firm			
1Q11	219			137	Firm			
2Q11	223			140	Firm			
3Q11	220			141	Firm			
4Q11	223			142	Firm			
1Q12	215			145	Firm			
2Q12	230			143	Firm			
3Q12	223			144	Firm			
4Q12	224			144	Firm			
1Q13	234			146	Firm			
2Q13	236			144	Firm			
3Q13	232			146	Firm			
4Q13	239			145	Firm			
1Q14	247			146	Firm			
2Q14	259			145	Firm			
3Q14	257			147	Firm			
4Q14	259			146	Firm			
1Q15	270			144	Firm			
2Q15	283			145	Firm			
3Q15	269			146	Revised			
4Q15	271			145	Revised			
1Q16	275			145	Firm			
2Q16	282			146	Revised			
3Q16	273			148	Revised			
4Q16	283			150	Revised			
1Q17	298			151	Firm			
2Q17	324			151	Firm			
3Q17	307			154	Firm			
4Q17	327			155	Firm			
1Q18	317	Forecast		156	Firm			
2Q18	321	Forecast		157	Firm			
3Q18	322	Forecast		160	Firm			
4Q18	328	Provisional		161	Firm			
1Q19	329	Provisional		161	Provisional			
2Q19	330	Forecast		162	Forecast	1.16		
3Q19	332	Forecast		165	Forecast			
4Q19	336	Forecast		165	Forecast			
1Q20	341	Forecast		166	Forecast			
2Q20	343	Forecast		168	Forecast			
3Q20	345	Forecast		170	Forecast			
4Q20	349	Forecast		171	Forecast			
1Q21	356	Forecast	1.0201	172	Forecast	1.0058		
2Q21	358	Forecast	1.0056	173	Forecast	1.0058		
3Q21	361	Forecast	1.0084	176	Forecast	1.0173		
4Q21	365	Forecast	1.0111	177	Forecast	1.0057		
1Q22	374	Forecast	1.0247	178	Forecast	1.0056		
2Q22	377	Forecast	1.0080	180	Forecast	1.0112		
3Q22	384	Forecast	1.0186	185	Forecast	1.0278		
4Q22	388	Forecast	1.0104	185	Forecast	1.0000		
1Q23	398	Forecast	1.0258	186	Forecast	1.0054		
2Q23	401	Forecast	1.0075	188	Forecast	1.0108		
3Q23	408	Forecast	1.0175	192	Forecast	1.0213		
4Q23	413	Forecast	1.0123	193	Forecast	1.0052		
1Q24	424	Manual Foreca	1.0258	194	Manual Foreca	1.0054		
2Q24	427	Manual Foreca	1.0075	196	Manual Foreca	1.0108		
3Q24	434	Manual Foreca	1.0175	200	Manual Foreca	1.0213		
4Q24	440	Manual Foreca	1.0123	201	Manual Foreca	1.0052		
1Q25	451	Manual Foreca	1.0258	202	Manual Foreca	1.0054		
2Q25	454	Manual Foreca	1.0075	205	Manual Foreca	1.0108		
3Q25	462	Manual Foreca	1.0175	209	Manual Foreca	1.0213		
4Q25	468	Manual Foreca	1.0123	210	Manual Foreca	1.0052		
1Q26	480	Manual Foreca	1.0258	211	Manual Foreca	1.0054		
2Q26	484	Manual Foreca	1.0075	213	Manual Foreca	1.0108		
3Q26	492	Manual Foreca	1.0175	218	Manual Foreca	1.0213		
4Q26	498	Manual Foreca	1.0123	219	Manual Foreca	1.0052		

Inflation to mid construction cost

(go to "input" tab RMM 5.01 to change these parameters)

Base price date:	2Q19
Index	*BCIS General Civil Engineering*
Index nr	2
Column	5
Base index value:	***162***
Midpoint:	1Q26
Mid point value:	***211.19***
Inflation %:	**30.36%**

Deflation analysis

(go to "input" tab RMM 5.01 to change these parameters)

Base price date:	2Q19
Index	*BCIS General Civil Engineering*
Index nr	2
Column	5
Base price date:	***162***
Deflation period	3Q17
Deflation value	***154.00***
Deflation %	**-4.94%**

List of indices	Column	
BCIS All-in TPI	2	
BCIS General Civil Engineering	5	
GDP	8	*not in use*
RPIX	9	*not in use*
Available	10	
Available	*indicate sheet colum*	
Available	*indicate sheet colum*	
Available	*indicate sheet colum*	