

St Austell to A30 Link Road

Cost Report

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Mace

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Cost Report

Issue & Revision Record						
Revision	Date	Originator	Checked	Authorised	Purpose of Issue	Nature of Change
O	21/10/19	MP	RV	RV	First Issue	Original
A	29/11/19	MP	RV	RV	Updated cost table	
B	03/08/20	NP			Updated cost table 1.1.8 & 3.9b	For FBC
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- A Tender Drawings Register**
- B Programme**
- C Costing Summary BoQ**

1 INTRODUCTION

1.1 Background and Approach

1.1.1 The original costing of the preferred option for the link road was based upon a review of the feasibility study carried out as part of the Options Appraisal Report (OAR) done by CORMAC in 2015. The Scheme budget in that report was used as part of the comparison process between the options considered. The Roche route is the preferred route and anticipated costs have been updated through the collation of relevant pricing information to apply in the next stage of the estimating process in March 2017. This report updates the projected cost forecast for the scheme following confirmation of planning approval and the conclusion of a successful tendering process that has identified a successful tenderer to undertake the design and build for the construction stage of the project. The total project budget is £84,461,000. £6 million of this is to be funded by Cornwall Council during the pre-construction phase the remaining £78,461,000 will be released by the Department for Transport (DfT), in annual contributions each March for the forecast spend for the financial year to come

1.1.2 At this stage the design of the scheme planning permission has been granted a successful contractor has been appointed to proceed with design and build contract commencing Dec 2019 and complete in June 2022. The design was developed by CORMAC to comply with the design guidance provided by the DMRB, and following consultation with local stakeholders to reduce the impact upon the local residents and the environment.

- Cornwall and Isles of Scilly Local Enterprise Partnership (CIoS LEP)
- Cornwall Council
- The Eden project
- Department for Transport
- St Austell Business Improvement District
- Roche Parish Council
- Luxulyan Parish Council
- Treverbyn Parish Council
- St. Blaise Parish Council
- Carlyon Parish Council
- The Cornwall College Group
- St Austell Town Council
- St Austell Bay Economic Forum (SABEF)
- Cornwall Countryside Access Forum (CCAF)
- Natural England (NE)

1.1.3 The resulting design represented the best value for the route. The planning approved drawings are the drawings that the contractor will develop into the construction drawings but line and level of the road will not change.

- 1.1.4 The set of design drawings used during the tender process are included in Appendix A. The initial quantities used in the pre tender estimate highlighted that an area of cutting required in land currently used to store waste from clay mineral extraction that generated a significant surplus of granular material. The amount of cut material has been identified and Cornwall will be placing an order with the land owner, Imerys, who are the quarry owner, to relocate their storage area to the required level for the highway construction to continue off site prior to the arrival of the Contractor.
- 1.1.5 The contract sum has inflation fixed into the price, although, under the form of contract used, the contractor will be paid his actual costs thus the risk of inflation still remains, however the target would not be adjusted.
- 1.1.6 Other aspects of the scheme outturn costs have been included in this report such as Land costs, legal costs, consultants, complimentary measures, part 1 claims. Environmental mitigation is built into the contractor's target.
- 1.1.7 The programme for the project is included in Appendix B. The scope of the tendered target cost is to design and build a new single carriageway road connecting St Austell with the A30. This will be in the form of a new 6.3km long single carriageway road 10m wide, with all associated structures, side roads, roundabouts and junction improvements required to a total length of 8.1km. A separated mixed Non-Motorised Users pathway is included throughout the scheme. This scope is also inclusive of a landscaping design that has been developed with the experts at Eden Project to provide an exemplar scheme. To encourage use of the new road and to reduce traffic through the villages of Roche, Stenalees and Bugle, the cost of measures on the A30 (new signage) and restrictions within the villages and on their approaches (complementary measures) has also been included.
- 1.1.8 The current assessment of the works cost is £84,461,000 with a total base construction cost of £55,389,490.

Table 1.1.8 Cost profile

	Cost Profile							
Financial Year	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024 - 2029
Annual Cost (£)	£396,231	£3,545,813	£3,495,613	£4,929,856	£36,358,832	£29,159,051	£5,211,097	£1,364,507
Running Total (£)	£396,231	£3,942,044	£7,437,657	£12,367,513	£48,726,345	£77,885,396	£83,096,493	£84,461,000

1.2 Land Costs

- 1.2.1 The land costs have been calculated by Cornwall Council Estate Services and based upon their experience

1.3 Land Valuation

- 1.3.1 The land along the Roche route is formed of category 3 farmland, some common land, and areas of china clay mining some of which have been worked and others where there has as yet been no extraction. Some of the land has also had deep (and occasionally shallow) mining for metals including tin, tungsten, iron and silver. The large land owners in the area retain the mineral rights underneath all the properties, for example, Tregothnan and Edgcumbe estates over the metals and Imerys over the China Clay reserves. This situation is unlikely to change. Land Registry data shows there are 50 land title holders on 31 properties that are directly affected by the road footprint. Tregothnan and Imerys own the greatest number of titles and an analysis of the route gives the summary of land ownership as:

Owner	Land ownership	Comment
Imerys	37.8%	
Tregothnan	31.5%	
Cornwall Council	17.5%	Maintained highways
Small land owners	6.4%	Minear, Mead, Hocking, Keast, Bradbury, Williams, Gay, Davies, Rundle
Mr Morcom	4.6%	Trerank Farm
Cornwall Council	2.2%	old A30

- 1.3.2 The permanent land take is 63ha and existing highway 9.9ha. The majority of the route runs through land owned by either Tregothnan or Imerys, both of whom are supportive of the proposed scheme. The valuation of the land has been set at £12,000 per acre on average for the permanent land acquisition. And at £200 per acre per annum for renting the land used in the Temporary Works Area.
- 1.3.3 The cost of Special Purchase takes into account two farm loss payments to be made for Hillside Farm and Holly Farm. An allowance has been made for twenty five claimants for Severance and Injurious Affection and also for Disturbance. An estimate of the legal and surveyor fees have also been included for these twenty five claimants.

1.3.4 The estimated cost of the above is £6.2m at Q4 2019 prices. This includes the freehold purchase of Holly and Hillside farms which is round terms amounts to £1.1m. The current cost schedule also includes the £2.2m for injurious affection to Imerys for impact on their quarrying activities. This equates to an additional £3.3m to add to the original estimate of £2.9m which comes to £6.2m.

1.4 **Common Land Measures**

- 1.4.1 A high level allowance has been made for Common Land at Hensbarrow Down. The land is owned by Imerys with one local resident claiming common rights over the land. The commons register maintained by Cornwall Council has been investigated and as yet no record has been found that corroborates the claim. The last registered commoner (back in the 1970s) had right of grazing for 20 cattle along with the right to extract peat and rock from the common. Compensation may be due to any existing commoners for disturbance etc. If common land is taken for the scheme then it will need to be replaced elsewhere with equivalent quality land for the use of the commoners. To that end replacement land has been identified and agreed with Imerys, who are also the owners of the required replacement land. The Common land exchange process is being prepared as a joint application with Imerys and due to be actioned once funding has been approved. Imerys currently run a Stewardship scheme with Natural England on the existing Common, this will require changing to the new Common and any compensation paid to Natural England, in line with Stewardship practises.

1.5 **Acquisition**

- 1.5.1 The owner of any land taken under CPO powers is to be paid at the market value. This will need to include a value for the effects of value on land which can include for the loss of trade or disturbance, injurious affection and severance. In the next stage of the work a Land Agent will be retained to act upon the behalf of the council in negotiating with land owners. The intention is to try and secure all the land without the use of the CPO to avoid the potential delay and added cost caused by an inquiry. Negotiations are ongoing and proceeding well for Heads of Terms for all the land required for the construction of the project along with lease agreements for Temporary Land for use by the Principal Contractor during the construction phase. All Heads of Terms are currently being prepared by the end of the year for issue to Solicitors allowing them time to complete before the CPO objection period/process is completed February/March 2020. The CPO will run in parallel to the heads of terms to provide a backup in case the landowners pull-out of the HoT agreements.

1.6 **Compensation claims *Part 1 claims Land Compensation Act 1953***

1.6.1 The Cornwall Council Estate Services reviewed the design drawings and have estimated the number of residents likely to be able to make a Part 1 claim. This runs to 217 properties with a potential cost up to £0.92m at Q4 2019 prices. This includes an allowance for legal costs, administration costs and the costs of compensation for successful Part 1 claims.

1.7 **Risk on land costs and Part 1 claims**

1.7.1 The costs and likelihood of occurrence have been included in the Risk assessment and this provides a float should the prices for land increase or there be more Part 1 claims than originally envisaged.

2 WORKS COST PROCESS

2.1.1 The proposed road has been designed, to the requirements of the DMRB, as a wide single carriageway with 3.75m wide running lanes with a 1m hard margin. Climbing lanes have been provided on various sections throughout the length and suitable tie-ins to the side roads have been provided. The design allows for four roundabouts. A three metre wide mixed use cycleway / bridleway runs the full length along one side with a landscaped margin between path and carriageway. The layout of the road is shown on the General Arrangement drawing EDG0717-CSL-GEN-SX198613-DR-D-0001.pdf. The cost breakdown is shown in Appendix C.

2.1.2 Two tenders were evaluated, both below the pre-tender estimate carried out in April 2019 within the budget of £53.096m comparable on tender scope. This total budget was approved by the Department of Transport within the outline business case and also by Cornwall Council at Transport Infrastructure Project Board (TIPB). There was a third submission that was reviewed by the Council's legal team and was deemed to be noncompliant. The evaluation of the tender was split on cost and quality with a higher emphasis on the quality submission, with a 35% price and 65% quality split the technical answers given through the submission by the successful tenderer demonstrated they had given thought to a clear strategy for the project and had a strong track record of similar projects. They scored overall the highest score and were the most economically advantageous tender (MEAT). Alun Griffiths Contract sum was £49,776,748.86

2.2 Series 100 - Preliminaries

2.2.1 The prelims were split into two areas as the project has two stages to enable a clean break clause without further liability to the employer if funding is not forthcoming there is a preconstruction phase and a construction phase. The totals for prelims received by the successful tender and form part of the current scheme costs are for the preconstruction phase £3,234,940.00 and for the Construction phase £ 10,898,289.

- 2.2.2 The preconstruction services for staff and design are the two largest component of the preconstruction services both were allocating circa £2.6m: £2.2m to design and only £0.4m to staff. Other areas where Griffiths were lower was in, site offices and insurances, but they allocated more monies to further investigation work. This demonstrates a clear understanding of the requirements to advance the design and to further site investigation works prior to design because there were some areas of the Site where investigation works were not concluded prior to tender due to access, and this is a contractor's risk. The list of items that form the preconstruction services are as follows: design, all staff costs for period of Pre-construction, temporary site set up, temporary offices, further investigation works, CDM duties, quality assurance, insurances for Pre-Construction period only, Parent Company Guarantee and Performance Bond.
- 2.2.3 The construction phase prelims total £ 10,898,289 and contains the above listed items for the duration of the onsite construction phase, plus the following items: insurances for construction period, health and safety measures, as built records, operation and maintenance manuals, mobilisation and demobilisation, traffic management, Employer's preliminaries and Testing.
- 2.2.4 The preliminaries are greater than the allowances quoted in the previous report in March 2017, but the scope for the contractor includes design and some plant and labour has been allocated to this item for earthworks and drainage. As a percentage of the total price the prelims are 23 % this is higher than expected, but for a project of this duration some elements of the labour and plant are allocated to preliminaries and are based on the programme durations. Also Alun Griffiths, the successful tender, are a company who own most of their plant, and will self-deliver as opposed to package out the works to other sub-contractors. Therefore the higher than expected prelim percentage can be explained if direct labour, plant both large and small can be assumed to be allocated to the prelims and the more specific task related plant is assumed to be allocated to the individual areas of work.
- 2.2.5 Further allowance may be needed for material processing and storage areas, access tracks and the subsequent landscaping or making good thereof. The construction phase may see the need to build an access track parallel to the proposed road to allow for the movement of soil from cuttings to processing areas and then onto the road sections where fill material is required. It is difficult to estimate the cost of such a measure until negotiations have been concluded with the land owners.

2.3 **Series 100 – Traffic Management**

2.3.1 Since the previous report the requirement to close the southern section of existing highway for several months has been removed. As part of the quality submission a question was raised specifically on how to minimise the impact of any closures on the public and the successful tenderer came up with an option to build a temporary road beside the proposed new road to allow traffic to run normally or under traffic light control. A Traffic Management specialist will need to be retained to determine the exact nature and extent of the TM works required. Vehicle recovery has not been included because the majority of scheme is being built off line.

2.4 **Series 100 – Supervision**

2.4.1 Supervision in the revised numbers give a total of staff costs of £6,776,120 which is 14%. The CV's that Alun Griffiths put forward with the organogram showed a good understanding of the level of resource and experience required the previous estimate assumed 10% which was lower, but 14% suggests a well-managed scheme and consideration needs to be given for accommodation costs for senior site managers.

2.5 **Series 200 – Site Clearance**

2.5.1 Allowances used are the proposals received from the successful tenderer and have been reviewed and are satisfactory. The total sum for the work as detailed in the scope and drawings is £185,563-96 this compares slightly favourably with the allowances quoted in 2017.

2.6 **Series 300 – Fencing**

2.6.1 Allowances used are the proposals received from the successful tenderer and have been reviewed and are satisfactory. The total sum for the work as detailed in the scope and drawings is £2,428,230.56. There is considerable fencing requirements to maintain boundaries and create new boundaries as required, post and four rail, there are gates as required to fields and bridleways. Post and four rail fence to provide protection from farm animals until the Cornish hedge is established. The Cornish hedge would be in keeping with the style apparent in the medieval field boundary areas locally. This compares favourably with the allowances quoted in 2017.

2.7 **Series 400 – Vehicle Restraint**

2.7.1 Allowances used are from the proposals received from the successful tenderer. They have been reviewed and are satisfactory. The total sum for the work as detailed in the scope and drawings is £156,899-44. This covers the tender stage safety barrier needs for the proposed road. This compares favourably with the allowances quoted in 2017, in that it is approximately 80% lower. A full Road Restraint Risk Assessment Process (RRRAP) will need to be carried out as part of detailed design development.

2.8 **Series 500 – Drainage**

2.8.1 A detailed drainage design has been completed for the proposed road alignment. This includes design of the pipe network, gullies, filter drains, attenuation basins, storage capacity, swales and rate of release of water. The drainage system is designed to cope with a 100 year return period with uplift to allow for the effect of climate change. The sum used in the update is the estimate from the tender and this totals £4,025,465.66 this compares to the price quoted on the previous report in 2017 of £8,003,955. This is considerably lower as the design is mature and strategy set for drainage, the risk of rock is accounted for and the reduced level excavation close to formation further reduces the impact on this item.

2.9 **Series 600 – Earthworks**

2.9.1 In the original report in March 2017 the Design assumptions used in had a large effect on the earthworks cost. These included: the amount of cut material that could have been processed into acceptable material for use as fill, the effect of poor materials necessitating removal and replacement; and the amount of hard excavation to be encountered. The allowance in that report was £15.4m the current number will be the tendered offer which is £6.3m, plus a package of reduced dig works carried out by Imerys which adds £4.5m and makes the total package value £10.8m.

2.9.2 This is lower than the previous estimate and in comparison it is noted that labour and plant for earthworks from Alun Griffiths is allocated within the prelims package which explains the difference. Within this package is also a reasonable sized area of Japanese knotweed, the area was known but the true quantity was not. Within the estimate it was assumed this would be moved somewhere within the site. The current thinking is that this may not be the case, the contractors being more experienced may have a differing view on pricing the risk and this could be part of a lower cost that is reflected in the target.

- 2.9.3 As the ground investigations and more detailed topographical surveys are largely completed there has been more certainty in the volumes. Initially in the 2017 estimate there was an assumption that in the cut quantities 35% could be processed into fill. The assumption on the hard excavation was it would comprise 20% of the cut volume. Excavation in hard material is considerably more expensive than in loose material.
- 2.9.4 The assumed value of 35% of cut material processed into acceptable material for fill is acceptable in the northern section of the road and in the south the unusable material will be relocated by Imerys from one area to another within their tips.
- 2.9.5 The area left by Imerys after they have relocated their tip material will contain rockhead which will require blasting by the contractor. This material is also owned by Imerys so the arisings after blasting will not be the property of the contractor to use in their cut and fill balance calculation. Imerys will receive the arisings at a free tip. The tenderers received a late amendment in the process to advise them that Imerys would be doing a reduced "dig" prior to site mobilisation. This will de-risk the programme and reduce the uncertain risk (which was to be taken by the tenderer). The reduced dig will be to a level just above formation.

2.10 **Series 700 – Pavements**

- 2.10.1 Allowances used are the proposals received from the successful tenderer and have been reviewed and are satisfactory. The total sum for the work is as detailed in the scope and drawings is £8.12m by comparison the previous reported sum for pavements in 2017 was £5.4m not allowing for any inflation requirement. The surfacing work is likely to be undertaken mostly in 2021, and that is 4 years from the bases price in 2017. The assumption on inflation in the 2017 report was a single line item that equated to 10% from 2017 to 2021. The contractor's price is fixed until completion. However in the 2017 report there were allowances for side roads and improvements in tie in and in the villages along the route. These allowances total £1.5m and some of these items are within the current scope however the downgrading and improvements in the villages along the route will form part of the complimentary measures. The allowance in the 2017 report are low compared to the current commitments which are to be developed over the coming year.

2.11 **Series 1100 – Kerbs, Footways and Paved Areas**

2.11.1 Allowances used are the proposals received from the successful tenderer and have been reviewed and are satisfactory. The total sum for the work is as detailed in the scope and drawings is £1.29m by comparison the previous reported sum for pavements in 2017 was £1.88m not allowing for any inflation requirement.

2.12 **Series 1200 – Traffic Signs and Road Markings**

2.12.1 Allowances used are the proposals received from the successful tenderer and have been reviewed and are satisfactory. The total sum for the work is £1.39m as detailed in the scope and drawings. By comparison the previous reported sum for signage in 2017 was £159k not allowing for any inflation requirement. It was noted that Alun Griffiths was greater than other tenders as well as the pre tender estimate but there was a large sum from Alun Griffiths for the alterations to signs on existing roads further down and up the A30. This is a contractor's risk on design so the assumption is they have assumed there would be a requirement for all new signs and new plates, and these would be large signs. This price is based on a completed design and the figure of £159k did not include the considerable alterations that will be required on the approaches to the new road.

2.13 **Series 1300 – Road Lighting Columns and Brackets, CCTV Masts and Cantilever Masts**

2.13.1 The area around the proposed road is rural and there is minimal lighting in the scheme and what little has been committed to around interchanges is contained within the allowances from the tender.

2.14 **Series 1400 – Electrical Work for Road Lighting and Traffic Signs**

2.14.1 Cabling, feeder pillars and electrical connection works have been allowed for to connect streetlights and signage. This will be refined depending upon the lighting and signage design.

2.15 **Series 2500 – Structures .**

2.15.1 The structures are fairly straight forward; several large precast concrete retaining walls and two small single span bridges are required. We are confident the price reflects a competitive market rate from an experienced contractor and is line with the requirements of the design. Reported in March 2017 a sum of £960k prior to inflation. The sum now is £3.78m it is noted that two precast concrete retaining walls have been added the scope and the detail of the road over farm tracks are wider to accommodate livestock and pedestrians.

2.16 **Series 2700: Accommodation Works, Works for Statutory Undertakers.**

- 2.16.1 C3s have been obtained from statutory undertakers for the Roche Route. Some 84 separate companies or bodies were contacted with 10 returns from utility providers with services affected. There are a number of major impacts on utilities to be taken into account.
- 2.16.2 A high pressure gas main runs across the fields to the south of the C0120 (old A30) and ducted fibre optic cables run along the northern side of the C0120. At this stage it is assumed that a structural slab will allow the proposed road to pass over the gas main and that the fibre-optic cables will not need to be disturbed in their current location – these assumptions need to be confirmed when the C3s are refreshed by the contractor.
- 2.16.3 High Voltage cables cross the proposed road at a number of locations but are sufficiently high not to affect the in-service operation. Restrictions on operations below them during construction will apply. The road passes close to the transmission towers at a number of locations. The current alignment shows that the road including earthworks and supporting structures pass at a sufficient distance that no significant measures will need to be undertaken to protect the towers and their foundations.
- 2.16.4 Mains water supplies are to be crossed or diverted close to the covered water reservoirs at Trezaise and Stenalees.
- 2.16.5 One of the main unknowns are the costs of dealing with the pipework, powerlines and water supply or drainage for the Imerys operations. Many of their utilities are obvious, for example, overhead powerlines that will need raising or realigning. However, there are also many disused or passive utilities likely to be found along the route between Stenalees and Trezaise. A close relationship with Imerys will need to be developed to determine which can be removed and which need to be accommodated for current and future operations. Any pipe or facility that has been carrying liquid clay will need careful assessment as there may well be residual low level naturally occurring radioactive materials (NORMs) contamination. Imerys have the facility to deal with this type of contamination within their local business.
- 2.16.6 An allowance in the Tendered sum has been made to deal with the works for statutory undertakers and the utilities necessary for the Imerys operation. Allowance has also been included for the smaller utilities on the minor roads that are crossed by the proposed road.

2.17 **Series 3000: Landscaping and Ecology**

- 2.17.1 The costings included in the submitted report in March 2017 had a differing approach in the assumptions made included an allowance for replacement of topsoil, seeding and turfing. No allowance was made for planting or environmental mitigation measures although these are included in the quantified risk register. The costs for new Cornish hedges that will form one of the main components the mitigation are included in the Series 300.
- 2.17.2 The current scope for the landscaping has seen considerable development on types of plants, shrubs and trees through consultation with The Eden Project. There is now no requirement for topsoiling over large areas of the scheme and this has been changed as part of the requirement to encourage "wild" nature to develop in a low nutrient environment. The details of the wild plants and their requirements formed part of the submission for planning and have been priced for in the Tender. The target cost provided by Alun Griffiths to the sum of £1.985m.
- 2.17.3 The extent of the required environmental mitigation are detailed further in the Environmental Impact Assessment (EIA).

3 WORKS COST

3.1 Activity Schedule

3.1.1 The Tendered construction cost is £49,776,749 as per the Activity Schedule below. Other construction packages that make up the entire project are included below to give a Total Base Construction Cost

Construction costs – including overheads and profit.		
Main Line Works		
Series		Cost (£)
100	Preliminaries (including design, TM)	£17,580,273
200	Site Clearance	£185,563
300	Fencing	£2,428,230
400	Safety Fences, Safety Barrier and Pedestrian Guardrails	£156,899
500	Drainage & Service Ducts	£4,025,465
600	Earthworks	£6,332,791
700	Pavements	£8,126,850
1100	Kerbs, Footways & Paved Areas	£1,289,547
1200	Traffic Signs & Road Markings	£1,390,901
1300	Road Lighting Columns and Brackets, CCTV Masts	£53,100
1400	Electrical Work for Road Lighting and Traffic Signs	£105,120
1700	Structural Concrete	£3,785,509
2700	Accommodation Works	£2,489,128
3000	Environmental	£1,985,588
	Subtotal	£49,776,749
Side Roads Improvements and Complementary Measures in Villages		
C0120/C0070	Roche to Trekenning	£600,000
C0120/B3274	Works in Bugle and Roche	£4,000,372
B3274	Works in White river Valley	£500,000
A390	Assessments of Holmbush Bridge	£498,901
Post tender		
Compensation Events	Mining survey at Coldreath	£13,468
	Subtotal	£5,612,741
	Total	£55,389,490

3.2 Environmental Costs

3.2.1 A full environmental investigation appraisal (EIA) has been undertaken as part of the design development to take the project to planning. This detailed the environmental mitigation measures required and the associated costs.

3.2.2 The following environmental costs and items have be considered:

- Translocation of existing highway verge vegetation
- Management of existing vegetation.
- Reuse of Cornish hedge removed prior to the road construction.
- Grading of embankment slopes and cuttings to meet particular mitigation requirements
- Potential land needed for mitigation measures and remedial treatment thereof
- Topsoiling to increased depths (i.e. over and above normal batter topsoiling) for pasture land or woodland
- Native tree and shrub planting
- Maintenance of planted areas
- Seeding with wild flowers in a low nutrient environment
- Bat and otter culverts
- Specialist drainage measures (i.e. swales)
- Control of invasive species
- Preparation of china clay waste areas for to encourage and maintain populations of 'red' species found in the clay area

3.3 **Maintenance Costs**

3.3.1 The Cornwall Highways Network Manager has provided an approximate value for the current maintenance costs (from the capital budget and revenue figures for the Financial Year 2016/17) for this class of road as approximately £5000 per km per annum. For the Roche Route this works out as £41,500 per annum.

3.4 **Recoverable VAT**

3.4.1 Discussions between Cornwall Council and the HMRC indicate that the VAT on this scheme, if it were to be built and adopted by the Council, would be recoverable by the Council in arrears on a monthly basis. As such no VAT has been applied to the costs shown in this report.

3.5 **Inflation**

3.5.1 Inflation is now included in the tendered sum from the Contractor. Inflation due to factors that delay the start date such as lack of funding or delays to statutory processes will constitute a compensation event under the NEC contract. The risk element associated with this is included in the risk sum described below.

3.6 Risk

3.6.1 The St Austell Link Road Scheme in Cornwall has been developed to tender stage by Cormac with a number of parties including WSP and AECOM, who supported the development of the initial risk register Mace and AECOM have reviewed the risk register and updated the report to accompany the Final Business Case submitted to the DfT to apply for funding. The risk register produced by Mace is detailed in the Report - QUANTITATIVE COST RISK ASSESSMENT. (QCRA)

3.6.2 QCRA is a method of analysing an organised collection of risk data in order to understand the effects of uncertainty. Data is collected through a series of activities which form part of the risk management process, such as; workshops and interviews, as well as inputs from estimators in order to create the required inputs. The data is then put through a statistical modelling algorithm (known as Monte Carlo) in order to simulate the project and understand the impact of the variables.

3.7 Results

3.7.1 The pre and post-mitigation table shows that based on the data provided there is a wide spread of likely outcomes, with the P20 to P90 range shown in the table below.

3.7.2 The risk register indicates the mitigation strategies implemented to reduce the risk exposure from impacts and probability, The post mitigation P90 value of £8,197,462 represents the 90% confidence levels of not exceeding this value

Table 3.7.2a: Summary of Model Outputs

	Model Pre-mitigated (£)	Model Post-mitigated (£)
Base Cost	76,263,538	76,263,538
20% Confidence Level	19,336,902	5,510,297
50% Confidence Level	22,380,412	6,473,680
80% Confidence Level	25,201,648	7,110,204
90% Confidence Level	26,453,618	7,727,462

Table 3.7.2b: Base Cost plus Risk

Base Cost	Base Cost + P20 risk	Base Cost + P90 risk
£76,733,538	£81,308,595	£84,461,000

Note: the base cost here is the total job cost including inflation.

3.8 **Recommendation**

- 3.8.1 For the purpose of supporting the Outline Business Case it is recommended that the P90 value is used £7,727,462. These figures can be used to provide the contingency estimate (risk allowance) it reflects a 9.1% of the total scheme value.
- 3.8.2 Following the completion of the next stage of the project a review should take place to assess the effectiveness of the risk management strategies post mitigation to determine revised probabilities and impacts, the risk model should then be re-run to see the effect with these updated inputs.
- 3.8.3 It is recommended that the Risk Register produced from this workshop is maintained moving forward in to the pre-construction and construction stages of the project i.e. implement key risk management strategies.
- 3.8.4 The sensitivity analysis shows the key risks which are driving the risk analysis, and implementation of the defined mitigation's against these key risks could significantly reduce the project risk exposure.
- 3.8.5 Regular risk reviews of the implementation of these risk management strategies have been taking place on a monthly basis to help to build the 'Risk Management' culture and therefore the chance of delivering the Project successfully.
- 3.8.6 Following award of tender to the Contractor Alun Griffiths and their involvement in subsequent workshops as outlined in items 3.8.2 to 3.8.5 the Risk Register was recalculated prior to submission of the Full Business Case with a revised figure of £9,100,994, representing both some increased risk but also identifying a reduction in construction costs.

3.9 Estimate Summary Report

3.9.1 The Total Base Construction cost is £55,389,490 as shown in 3.1 above. To produce a Total Capital Cost Estimate the development costs, risk and inflation must be taken into account.

Table 3.9a Total Capital Cost Estimate

Total Base Construction cost	65.6%	£55,389,490
Project/Design team fees & other development costs (actuals)		
Design team fees	3.5%	2,933,000
Project Team Fees	1.5%	1,301,150
Project Controls Fees	3.3%	2,794,744
Additional Surveys	1.2%	989,000
Land purchases	14.1%	11,952,621
Total Employer Indirect Costs		£ 75,360,005
Risk	10.8%	£ 9,100,994
Inflation		Inc in above
Total Capital cost estimate	100%	£ 84,461,000

Table 3.9b – Spend Profile from DfT funding

	Funding request and profiling (CC contribution removed)				
Financial Year	2020/21	2021/22	2022/23	2023/24	2024 -2029
Annual Cost (£)	£6,367,513	£36,358,832	£29,159,051	£5,211,097	£1,364,507
Running Total (£)	£6,367,513	£42,726,345	£71,885,396	£77,096,493	£78,461,000

3.10 **General Notes/Assumptions**

- The estimate base date is 4Q 2019.
- All costs are based on pounds sterling.
- The estimate is based on capital construction costs only.
- The estimate is based on quantities provided by the Contractor.
- The units of measure are based on the Method of Measurement for Highway Works.
- A percentage wastage allowance has been included in the rates and/or quantities where appropriate.
- The budget cost is based on a 2 year construction programme
- Risk contingency has been allowed for as detailed in section 4.6 and 4.7 above
- The cost estimate is highly sensitive to the amount of cut material that can be processed into engineering fill. And to the amount of hard excavation encountered. Initial geotechnical investigation has reduced uncertainty over likely ground conditions and the effect upon construction. Significant reductions to the total cost are likely if there is less hard excavation than allowed for and greater reuse of cut material as fill.
- An allowance for poor ground condition been made based on the percentage of the route with High and Medium geotechnical risk
- We have assumed that 35% of all excavated material will be suitable for re-use and any excess will deposited on site or close by in the clay area. We have also assumed that suitable fill will need to be imported to make up where insufficient suitable processed cut material is available this is included in the overall construction costs.
- An allowance has been made for excavation of hard material at 20% of all cut material
- An allowance has been made for environmental or ecological protection measures
- We have assumed that contaminated/hazardous material will be encountered during the works
- Maintenance costs are subject to potential change with time.

Appendices

Appendix B

Programme

Appendix C Costing Summary BoQ