

A12 Chelmsford to A120 widening scheme

TR010060

9.39 Borrow Pits Cost Information

Rule 8(1)(k)

Planning Act 2008
Infrastructure Planning (Examination Procedure)
Regulations 2010

Volume 9

March 2023

Infrastructure Planning

Planning Act 2008

The Infrastructure Planning
(Examination Procedure) Rules 2010

A12 Chelmsford to A120 widening scheme
Development Consent Order 202[]

Borrow Pits Cost Information

Regulation Number	Rule 8(1)(k)
Planning Inspectorate Scheme Reference	TR010060
Application Document Reference	TR010060/EXAM/9.39
Author	A12 Project Team and National Highways

Version	Date	Status of Version
Rev 1	09 March 2023	Final for Deadline 3

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1 Borrow Pits Cost Information

1.1 Summary / Narrative

- 1.1.1 The borrow pits cost information contained in this note has been submitted to the Examination in response to a request in the Compulsory Acquisition Hearing (CAH) held on 1 March 2023, as noted in the Applicant's Response to CAH [EXAM-9.29] part 28. This note presents the output of the cost generation exercise that was undertaken to inform the assessment of sources for providing the earthworks volume deficit.
- 1.1.2 It has not been possible to present the complete cost generation spreadsheets prepared to inform the borrow pit assessment with this note. This is because they contain commercially sensitive information for the Applicant, its delivery partner and their supply chain, particularly in relation to the base product or resource rates as well as the approach to producing and presenting cost information, the systems and methods of working used and the approach to project management. The disclosure of such information would be detrimental to those parties' ability to enter into future commercial negotiations and would be potentially both anti-competitive and unfair. For these reasons, the cost generation work presented in Appendix A and Appendix B has been altered to provide the summary output (rather than complete information), with any commercially sensitive information removed.
- 1.1.3 The earthworks volume deficit figures are presented in The Borrow Pits Report [APP-278] and the Supplementary Borrow Pits Technical Note [REP1-011] as 600,000m³ for general earthworks fill material and 445,000m³ of granular engineering fill material.
- 1.1.4 The cost generation work has been split into two worksheets because of the operational differences involved in receiving and placing the materials. For example, the granular engineering fill material won from borrow pits on the proposed scheme will require processing to meet the material classes discussed in the reports mentioned in 1.1.3 above. Material processing carries setup and operating costs that are not applicable to winning unprocessed general fill material from borrow pits. Therefore, the worksheets have been split into 'general earthworks fill material' and 'granular engineering fill material' and are presented in Appendix A and Appendix B respectively.
- 1.1.5 The calculations in the worksheets are based on a bottom-up, order of magnitude exercise that uses market supplied rates to provide the basis of the calculations. This is to ensure that the current market situation is reflected, along with any potential benefits that could be derived from using local resources.

1.1.6 The worksheets in Appendix A and Appendix B are presented in a Bill of Quantities format listing the individual costed elements on the left-hand side under the subheadings of:

- Construction Costs – Indirect Works
- Construction Costs – Direct Works
- Construction Costs - Risk, Opportunity, Overheads & Fee
- Schedule of Other Costs
- Total Adjustment Costs

The different options assessed can be seen along the top of each sheet, which enables the presentation of grouped information in separate columns.

1.1.7 The options assessed are listed in the following order (from left to right):

- Use of Borrow Pits within the proposed scheme Order Limits
- Import from an external supplier
- Import from another local source or construction project (labelled as 'Other Project' in the worksheet in Appendix A).

The option of importing from another local source or construction project is not included in the Table 4.4 Engineering Fill Material Import Rates Worksheet (Appendix B) because any local projects with surplus granular engineering fill will effectively be classed as an external supplier, most likely selling recycled material. Therefore, this option will effectively be covered in the 'import from an external supplier' option.

As discussed in the Supplementary Borrow Pits Technical Note [REP1-011] paragraph 4.3.17, local sources of recycled material are wholly dependent on the demolition market at the time, so cannot be relied upon as a sole source of granular engineering fill for the proposed scheme.

For the 'Import from an external supplier' columns, the Table 4.3 General Fill Material Import Rates Worksheet (Appendix A) only shows input from three suppliers. This is because one of the four suppliers did not submit a cost to be assessed for this exercise.

Similarly for the Table 4.4 Engineering Fill Material Import Rates Worksheet (Appendix B), costs were submitted by three of the four suppliers only.

1.1.8 Subtotal figures have been provided for each of the subheadings discussed in paragraph 1.1.6 above to show the order of magnitude of costs for each element. Figures for individual items have been redacted for reasons of commercial sensitivity as explained above.

As can be seen from the worksheets in Appendix A and Appendix B, the Applicant has properly considered the different cost elements that constitute the different options in its assessment. For example, there are not any costs associated with borrow pit operating / lands costs in the scenarios in which material is imported from the market or other local sources. Similarly, it can be seen that some columns have no data for the individual cost elements. This is because the relevant cost would not be incurred for the option assessed.

- 1.1.9 A comments column has also been included on the right-hand side of the worksheets to assist the reader with further details on the costed element, such as what is included within the figure shown, or how the figure has been built up from the basic rate information.

For example, item 600.02 in both worksheets is titled 'Deposition of acceptable material in embankments and other areas of fill'.

The figures are redacted because they are built from commercially sensitive information, but the comments column confirms that the borrow pits option is built from an amalgamated onsite and offsite haulage rate from the borrow pits to the point of placement including deposition of material. Whereas the import from supplier or other local source columns are built from the deposition of material at the point of placement because the haulage is included within item 600.01.

- 1.1.10 In conclusion, the costs presented in the Supplementary Borrow Pits Technical Note [REP1-011] Table 4.3 and 4.4 are robust and fully justified having been calculated from first principles, using a standard Bill of Quantities approach, specific to the type of material being sourced and derived from current market rates specific to this proposed scheme to provide an accurate picture of any benefits that could be realised from using resources local to the proposed scheme.

Appendix A - Table 4.3 General Fill Material Import Rates Worksheet

Table 4.3 General Fill Material Import Rates Worksheet

WBS	Item	Bill of Materials		Borrow Pit Q1 2023		Supplier Q1 2023		Supplier Q1 2023		Supplier Q1 2023		Other Project Q1 2023		Comments		
		Bill Description	Unit	Quantity	Rate Q1 2023	Amount Q1 2023	Rate Q1 2023	Amount Q1 2023	Rate Q1 2023	Amount Q1 2023	Rate Q1 2023	Amount Q1 2023	Rate Q1 2023		Amount Q1 2023	
CONSTRUCTION COSTS - INDIRECT WORKS																
PRELIMINARY COSTS																
100.01	Preliminaries and Other Overhead Costs	sum	1.00		£ 2,845,000.00	£ 2,845,000.00	£	£	£	£	£	£	£ 6,630,757.55	£ 6,630,757.55	Cost developed by applying historical percentages of Indirect Works costs to the Direct Works total cost. Preliminary costs may include, but are not limited to Construction Management, Attendant Labour & Plant, Site Accommodation, Health, Safety and Environmental Management, IT & Systems, Site Security, Provision of Power, Water and Waste Management.	
TEMPORARY WORKS COSTS																
100.02	Temp Bridge - BP I	sum	1.00		£ 1,540,000.00	£ 1,540,000.00									Cost developed to install, hire, remove and reinstale for temporary bridge structure to Borrow Pit I	
100.03	Dewatering - BP E	sum	1.00		£ 165,000.00	£ 165,000.00									Cost developed to dewater Borrow Pit operation.	
100.04	Dewatering - BP F	sum	1.00		£ 220,000.00	£ 220,000.00									Cost developed to dewater Borrow Pit operation.	
100.05	Dewatering - BP I	sum	1.00		£ 770,000.00	£ 770,000.00									Cost developed to dewater Borrow Pit operation.	
100.06	Other Temporary Works	sum	1.00		£ 550,000.00	£ 550,000.00									Cost developed to account for other significant temporary works in order to facilitate Borrow Pit Operations. E.g. haul roads, fences, highway access/leaves	
					Sub-Total	£ 6,090,000.00	Sub-Total	£	Sub-Total	£	Sub-Total	£	Sub-Total	£ 6,630,757.55		
CONSTRUCTION COSTS - DIRECT WORKS																
ACCEPTABLE FILL MATERIAL																
600.01	Imported acceptable material in embankments and other areas of fill including environmental bunds	m3	600,000		£	£	£	£	£	£	£	£	£	£	Borrow Pit Rate - Excavation of Class 1/2 from BP Supplier Rate - Import of Class 1/2 from Off Site Other Project - Excavation of Class 1/2 from 'Other Project' Stock Pile & Haul 40km via 20T Tipper to Site	
600.02	Deposition of acceptable material in embankments and other areas of fill	m3	600,000		£	£	£	£	£	£	£	£	£	£	Borrow Pit Rate - Amalgamated onsite and offsite haulage rates from the Borrow Pits to the point of placement including deposition of material. Supplier Rate - Deposition of material at the point of placement. Other Project - Deposition of material at the point of placement.	
600.03	Double Handling	m3	300,000		£	£	£	£	£	£	£	£	£	£	Borrow Pit Rate - Sourcing of material directly from the Borrow Pit eliminates double handling. Supplier Rate - Excavation from stock pile and onsite haulage to permanent deposition. Other Project - Excavation from stock pile and onsite haulage to permanent deposition.	
600.04	Compaction of acceptable material in embankments and other areas of fill	m3	600,000		£	£	£	£	£	£	£	£	£	£	Borrow Pit Rate - Compaction of Class 1/2 as deposited. Supplier Rate - Compaction of Class 1/2 as deposited. Other Project - Compaction of Class 1/2 as deposited.	
METHOD RELATED DIRECT WORKS																
600.05	Topsoil strip - BP E	m3	43,194		£	£	£	£	£	£	£	£	£	£	Borrow Pit Rate - Excavation and haulage to temporary stockpile of Topsoil. Supplier Rate - Not required. Other Project - Not required.	
600.06	Topsoil strip - BP F	m3	39,122		£	£	£	£	£	£	£	£	£	£	Borrow Pit Rate - Excavation and haulage to temporary stockpile of Topsoil. Supplier Rate - Not required. Other Project - Not required.	
600.07	Topsoil strip - BP I	m3	42,496		£	£	£	£	£	£	£	£	£	£	Borrow Pit Rate - Excavation and haulage to temporary stockpile of Topsoil. Supplier Rate - Not required. Other Project - Not required.	
600.08	Re-soil Bps - BP E	m3	19,309		£	£	£	£	£	£	£	£	£	£	Borrow Pit Rate - Excavation and haulage from temporary stockpile of Topsoil. Supplier Rate - Not required. Other Project - Not required.	
600.09	Re-soil Bps - BP F	m3	20,133		£	£	£	£	£	£	£	£	£	£	Borrow Pit Rate - Excavation and haulage from temporary stockpile of Topsoil. Supplier Rate - Not required. Other Project - Not required.	
600.10	Re-soil Bps - BP I	m3	19,431		£	£	£	£	£	£	£	£	£	£	Borrow Pit Rate - Excavation and haulage from temporary stockpile of Topsoil. Supplier Rate - Not required. Other Project - Not required.	
600.11	Topsoil strip temp soil storage areas	m3	241,610		£	£	£	£	£	£	£	£	£	£	Borrow Pit Rate - Excavation and haulage to temporary stockpile of Topsoil. Supplier Rate - Not required. Other Project - Not required.	
600.12	Re-soil temp soil storage areas	m3	241,610		£	£	£	£	£	£	£	£	£	£	Borrow Pit Rate - Excavation and haulage from temporary stockpile of Topsoil. Supplier Rate - Not required. Other Project - Not required.	
EARTHWORKS SUBCONTRACTOR PRELIMINARY COSTS																
600.13	Earthworks Subcontractor Preliminary Costs	sum	1.00		£	£									Borrow Pit Rate - Cost developed by applying historical percentages of Indirect Works costs to the Direct Works total cost. Supplier Rate - Not required. Other Project - Not required.	
AGGREGATE LEVY																
600.14	Aggregate Levy	m3	120,000		£ 4.00	£ 480,000.00									Borrow Pit Rate - Applied the Aggregate Levy rate (E2 per ton) to estimated volume of Class 1 material only. Supplier Rate - Rates above include Aggregate Levy. Other Project - Rates above include Aggregate Levy.	
ARCHAEOLOGY																
3001.01	Archaeology Mitigation - BP E	sum	-		£ -	£ -									Borrow Pit Rate - Cost to complete the Archaeology Investigation and Mitigation. Supplier Rate - Not required. Other Project - Not required.	
3001.02	Archaeology Mitigation - BP F	sum	1.00		£ 490,000.00	£ 490,000.00									Borrow Pit Rate - Cost to complete the Archaeology Investigation and Mitigation. Supplier Rate - Not required. Other Project - Not required.	
3001.03	Archaeology Mitigation - BP I	sum	1.00		£ 320,000.00	£ 320,000.00									Borrow Pit Rate - Cost to complete the Archaeology Investigation and Mitigation. Supplier Rate - Not required. Other Project - Not required.	
LANDSCAPING & ECOLOGY																
3000.01	Landscaping and ecology	sum	1.00		£ 550,000.00	£ 550,000.00									Borrow Pit Rate - Cost to complete the Landscaping & Ecology Investigation and Mitigation. Supplier Rate - Not required. Other Project - Not required.	
					Sub-Total	£ 8,759,524.05	Sub-Total	£	Sub-Total	£	Sub-Total	£	Sub-Total	£ 20,413,000.53		
CONSTRUCTION COSTS - RISK, OPPORTUNITY, OVERHEADS & FEE																
R1.01	Risk Contractors Risk Allowance	%	10.00%		£ 14,849,524.05	£ 1,484,952.41	£	£	£	£	£	£	£ 27,043,758.08	£ 2,704,375.81	Cost developed by applying historical risk percentages to the Total Indirect & Direct Works cost.	
O1.01	Opportunity Contractors Opportunity Allowance	%	0.00%		£ 2,500,000.00	£ 2,500,000.00									Borrow Pit Rate - Opportunity to dispose of unsuitable material as backfill to Borrow Pits. Supplier Rate - Excluded. Other Project - Excluded.	
F1.01	Fee Contractors Fee	%				Forfeited									Excluded	
	TOTAL CONSTRUCTION COSTS					£ 13,834,476.46								£ 29,748,133.88		
Schedule of Other Costs																
SoOC.01	Schedule of Other Costs	sum	1.00		£ 2,948,000.00	£ 2,948,000.00									Borrow Pit Rate - Estimated Client costs. E.g. Lands, Statutory Undertakers Supplier Rate - Excluded. Other Project - Excluded.	
TOTAL ADJUSTMENT COSTS																
CON1.01	Contingency	%	5.00%		£ 16,782,476.46	£ 839,123.82	10.00%	£	10.00%	£	10.00%	£	15.00%	£ 29,748,133.88	£ 4,482,220.08	Borrow Pit Rate - Based on a mature earthworks strategy to meet the projects programme and cost requirements. Supplier Rate - Based on Market Engagement. Other Project - Based on the availability of material and potential to synchronise schedule with a local project.
	GRAND TOTAL COSTS					£ 17,621,600.28								£ 34,210,353.97		
	Total Cost per m3 of Class 1/2	m3				£ 29.37								£ 57.02		

Appendix B - Table 4.4 Engineering Fill Material Import Rates Worksheet

Table 4.4 Engineering Fill Material Import Rates Worksheet

WBS	Item	Bill of Quantities		Borrow Pit Q1 2023		Supplier Q1 2023		Supplier Q1 2023		Supplier Q1 2023		Comments
		Unit	Quantity	Rate Q1 2023	Amount Q1 2023	Rate Q1 2023	Amount Q1 2023	Rate Q1 2023	Amount Q1 2023	Rate Q1 2023	Amount Q1 2023	
CONSTRUCTION COSTS - INDIRECT WORKS												
PRELIMINARY COSTS												
	100.01	Preliminaries and Other Overhead Costs	sum	1.00	£ 5,103,000.00	£ 5,103,000.00						Cost developed by applying historical percentages of Indirect Works costs to the Direct Works total cost. Preliminary costs may include, but re not limited to Construction Management, Attendant Labour & Plant, Site Accommodation, Health, Safety and Environmental Management, IT & Systems, Site Security, Provision of Power, Water and Waste Management.
TEMPORARY WORKS												
	100.01	Dewatering - BP J	sum	1.00	£ 649,000.00	£ 649,000.00						Cost developed to dewater Borrow Pit operation.
	100.02	Other Temporary Works	sum	1.00	£ 110,000.00	£ 110,000.00						Cost developed to account for other significant temporary works in order to facilitate Borrow Pit Operations. E.g. haul roads, fencing, highway access/egress
		Sub-Total			£ 5,862,000.00			£		£		
CONSTRUCTION COSTS - DIRECT WORKS												
ACCEPTABLE FILL MATERIAL												
	600.01	Imported acceptable class 6 material	m3	300,000	£		£					Borrow Pit Rate - Excavation and haul to Stockpile of Class 6 from BP Supplier Rate - Import of Class 6 from Off Site
	600.01	Processing - Mobilisation	sum	1.00	£		£					Borrow Pit Rate - Cost to establish onsite processing facility. Supplier Rate - Not required
	600.01	Processing - OnCosts	m3	300,000	£		£					Borrow Pit Rate - Cost to operate onsite processing facility. Supplier Rate - Not required
	600.01	Processing - DeMobilisation	sum	1.00	£		£					Borrow Pit Rate - Cost to demobilise onsite processing facility. Supplier Rate - Not required
	600.02	Deposition of acceptable material in embankments and other areas of fill	m3	300,000	£		£					Borrow Pit Rate - Amalgamated onsite and offsite haulage rates from the Borrow Pits to the point of placement including deposition of material. Supplier Rate - Deposition of material at the point of placement.
	600.03	Double Handling	m3	60,000	£		£					Borrow Pit Rate - Excavation from stock pile and onsite haulage to permanent deposition. Supplier Rate - Excavation from stock pile and onsite haulage to permanent deposition.
	600.04	Compaction of acceptable material in embankments and other areas of fill	m3	300,000	£		£					Borrow Pit Rate - Compaction of Class 6 as deposited. Supplier Rate - Compaction of Class 6 as deposited.
METHOD RELATED DIRECT WORKS												
	600.05	Topsail strip - BP J	m3	68,400	£		£					Borrow Pit Rate - Excavation and haulage to temporary stockpile of Topsail. Supplier Rate - Not required.
	600.06	Re-soil Bps - BP J	m3	41,904	£		£					Borrow Pit Rate - Excavation and haulage from temporary stockpile of Topsail. Supplier Rate - Not required.
EARTHWORKS SUBCONTRACTOR PRELIMINARY COSTS												
	600.07	Earthworks Subcontractor Preliminary Costs	sum	1.00	£		£					Borrow Pit Rate - Cost developed by applying historical percentages of Indirect Works costs to the Direct Works total cost. Supplier Rate - Not required.
AGGREGATE LEVY												
	600.08	Aggregate Levy	m3	300,000	£ 4.40	£ 1,320,000.00						Borrow Pit Rate - Applied the Aggregate Levy rate (£2 per ton) to estimated volume of Class 6 material. Supplier Rate - Rates above include Aggregate Levy.
ARCHAEOLOGY												
	3001.01	Archaeology Mitigation - BP J	sum	1.00	£ 1,650,000.00	£ 1,650,000.00						Borrow Pit Rate - Cost to complete the Archaeology Investigation and Mitigation. Supplier Rate - Not required.
LANDSCAPING & ECOLOGY												
	3000.01	Landscaping and ecology	sum	1.00	£ 198,000.00	£ 198,000.00						Borrow Pit Rate - Cost to complete the Landscaping & Ecology Investigation and Mitigation. Supplier Rate - Not required.
		Sub-Total			£ 15,709,820.86		£		£			
CONSTRUCTION COSTS - RISK, OPPORTUNITY, OVERHEADS & FEE												
	R1.01	Risk Contractors Risk Allowance (10% of Construction Costs)	%	10.00%	£ 21,571,821	£ 2,157,182.09						Cost developed by applying historical risk percentages to the Total Indirect & Direct Works cost.
	O1.01	Opportunity Contractors Opportunity Allowance	%	0.00%		Excluded		Excluded		Excluded		Excluded
	F1.01	Fee Contractors Fee	%	0.00%		Excluded		Excluded		Excluded		Excluded
		TOTAL CONSTRUCTION COSTS (Direct + Indirect Costs + Risk)				£ 23,729,002.95		£		£		
Schedule of Other Costs												
	SoOC.01	Schedule of Other Costs	sum	1.00	£ 1,540,000.00	£ 1,540,000.00						Borrow Pit Rate - Estimated Client costs. E.g. Lands, Statutory Undertakers Supplier Rate - Excluded.
TOTAL ADJUSTMENT COSTS												
	CON1.01	Contingency Contingency	%		£ 25,269,002.95	£ 1,263,450.15	10.00%	£	10.00%	£	10.00%	Borrow Pit Rate - Based on a mature earthworks strategy to meet the projects programme and cost requirements. Supplier Rate - Based on Market Engagement.
		GRAND TOTAL COSTS				£ 26,532,453.09		£		£		
		Total Cost per m3 of Class 6	m3			£ 88.44		£		£		
Average Supplier Rate £113.83												