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## DEFRA WT1505 - DEFRA COST EVIDENCE

Addendum to the Foul Cost Report

12/07/2013

Confidentiality: Public

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# Quality Management

Issue/revision	Issue 1	Revision 1	Revision 2	Revision 3
Remarks	Addendum			
Date	12 July 2013			
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Authorised by	Alastair Atkinson			
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Project number	50600471			
Report number	2			
File reference	n:\50600471 - defra - wt1505 evidence costs\c documents\reports\addendum to foul cost report.docx			

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# DEFRA WT1505 - Defra Cost Evidence

## Addendum to the Foul Cost Report

12/07/2013

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# 1 Background

- 1.1.1 This report forms an addendum to the original Foul Drainage Report issued in April 2013. The addendum provides additional information on the construction cost, and provides clarification on the approaches used in the design and costing process.

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## 2 Approach to the Study

- 2.1.1 The aim of the study was to compare the cost for a foul drainage layout which complies with the Building Regulations and the New National Standards. There are a range of factors which affect costs associated with delivering foul drainage. The surface water drainage layout, the approach designer, the housing layout, the landscape requirement to name but a few. However, as part of the works we tried to reduce the influence of these elements on the study so that a clearer cost comparison can be derived associated with Automatic Adoption and the National Standards.
- 2.1.2 The foul drainage networks were based upon real housing layouts and associated drainage layouts which have been approved and constructed. The selected sites were designed and constructed at different times and therefore they are not supported by similar design philosophies and construction techniques for the surface water drainage (some had source control SuDS and others had positive drainage).
- 2.1.3 The foul layouts used the same horizontal alignment position as the constructed layout but the levels are slightly altered. This allows a direct comparison between the scheme designed to the new standards therefore the comparison of the schemes was undertaken on a fair and equal basis.
- 2.1.4 The schemes have been designed to be compliant with both the National Standards and Sewers for Adoption 7<sup>th</sup> Edition so that the scheme is adoptable.
- 2.1.5 The costs have been assessed for comparative purposes rather than definitive costs. The costs have been split into two sections firstly; for the National Standards including the cost of Automatic Adoption, and secondly with the costs of the National Standards in isolation without the demonstration chambers required for Automatic Adoption.

### 3 The Revised Cost Analysis

3.1.1 As part of the design process the designs undertook minor alteration and the costs have now been re-assessed looking at the final designs. We have detailed the cost for each scheme in the table below.

Table 3.1: Scheme Costs

	Small	Medium	Large
Current Interpretation of Building Regulations	£28,630	£83,494	£324,029
Secretary of State Standards (SOS) inc demarcation chambers required for Automatic Adoption	£28,383	£76,331	£364,431
Difference	-£247 or -£30.88 / property	-£7163 or -£223.84 / property	£40,402 or £192.39 / property
Cost of demarcation Chambers required for Automatic Adoption	£1074	£3313	£34,791
No of properties	8	32	210
Costs per property associated with the delivery of the Draft National Standard	-£134. / property	-£327 / property	£26/ property

## 4 The Alternative Scheme for the Large Site

4.1.1 The original report identified two options for the larger site - the main options considered in the report followed the original design. However, an alternative design was produced to demonstrate that there was a possible alternative approach. To the drainage which in a direct comparison was cheaper than the original design. However, there were a number of elements in the report which was not costed.

- The phasing of the extra connections,
- The additional earthworks if the work was undertaken out of sequence,
- The likely additional conflicts between utilities, landscaping etc.,
- The conflicts between the current layout and the proposed drainage and the other costs to the developer or this impact.

4.1.2 Therefore, the report stated that not all the saving identified would be realised in reality. The purpose of including the design in the report was to demonstrate that the layout has a major impact on the cost and that alternative approaches were possible.

4.1.3 The costs have been defined below for comparison purposes only and are not part of the formal findings of the report.

*Table 2: Comparisons*

	Tested Large Scheme	Alternative Approach
Current Interpretation of Building Regulations	£324,029	£324,029
Secretary of State Standards (SOS) inc demarcation chambers required by SFA 7	£364,431	£284,730
Difference	£40,402 or £192.39 / property	-£39,299 or -£187.13/ property



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## 5 Summary

- 5.1.1 The study shows that the costs associated with the implementation of the National Standards and Automatic Adoption vary with sites tested. This is likely to be a function of the original design layout and the approach to the foul drainage rather than a function of scale.
- 5.1.2 The study shows that the costs range from a cost per property of -£30, -£220 and +£190 for the small, medium and large sites respectively for the introduction of National Standards and Automatic Adoption.
- 5.1.3 The study shows that the costs range from a cost per property of -£134, -£327 and +£26 for the small, medium and large sites respectively for the introduction of National Standards without the demarcation chamber for Automatic Adoption.
- 5.1.4 However, the work undertaken to develop the designs for the study has shown that even the smallest changes to the design can make a difference to the comparative costs, i.e. the removal or addition of one chamber for the small design will alter the headline figure from a saving to cost.
- 5.1.5 The costs associated with the new standards including are likely to be within a range of +£200 to -£200 per property.

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# Appendices

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APPENDIX A  
Cost Summary

Small site - Building Regulations

Item No	Assumed item from SPONS Price Book	SPONS Reference	Unit	Quantity	Rate (£)	Total (£)
	Manholes					
Main sewer manholes in highway	Foul manhole in public highway - Assume this has to meet SFA 7 requirements <i>Precast concrete construction with Circular shafts 150mm plain concrete C15/20 surround 225mm plain concrete C20/20 base slab Precast reducing slab Precast top slab Maximum ht of working chamber 2m above benching 750mm diameter access shaft Plain concrete C15/20 benching, 150mm clay main channel longitudinally and two 100mm branch channels  Step irons at 300mm centre, doubled if depth to invert exceeds 3m  Heavy duty manhole cover and frame In manholes over 6m deep, landings at maximum intervals Includes excavation, support, backfilling and disposal</i>					
	1200mm diameter x 1500 depth to invert	Civil Engineering and Highway Works Page229	No	1	£1,351.15	£1,351.15
	1200mm diameter x 2000 depth to invert	Civil Engineering and Highway Works Page229	No	4	£1,434.15	£5,736.60
	Extra over for concrete surround to meet SFA 7 requirement to GEN3 aggressive ground conditions	None - this is a typical foundation mix.				
	Extra over for 1200mm min dia access shaft to meet SFA 7 requirements	No difference as depths are too shallow to require access shaft				
	Extra over for 300mm concrete surround 1500 depth	1 x 1.17m <sup>3</sup> Rate for mass concrete PC for concrete stool and thrust blocks Page 241. Only materials allowed for - extra cost of placing wider concrete surround is marginal.	m <sup>3</sup>	1.17	£62.15	£72.72
	Extra over for 300mm concrete surround 2000 depth	4 x 1.56m <sup>3</sup> Rate for mass concrete PC for concrete stool and thrust blocks Page 241. Only materials allowed for - extra cost of placing wider concrete surround is marginal.	m <sup>3</sup>	6.24	£62.15	£387.82
	Part H inspection chamber - Does not meet SFA 7 standard					

*Inspection chambers polypropylene (Hepworth plc)  
Up to 1.2m deep including polymer chamber and cover and frame  
with screw down lid  
Excavation  
Backfilling  
Disposal*

Type 4 Access chamber in garden - Private	Inspection chamber 300mm diameter, 600mm deep	Landscaping and external works Page 365	No	1	£211.63	£211.63
Type 4 Inspection chamber in garden or shared access - Private	Inspection chamber 450mm diameter, 1200mm deep	Landscaping and external works Page 365, 475mm dia chamber	No	8	£375.60	£3,004.80
Type 3 Inspection chambers in shared access	Inspection chamber 450mm diameter, 1200mm deep	Landscaping and external works Page 365, 475mm dia chamber	No	3	£375.60	£1,126.80
	Extra over for granular base	Page 279 Type 1 use material cost only as cost of laying is marginal.	m <sup>3</sup>	10.09	£24.35	£245.69
	Extra over for 300mm Type 1 surround 600mm deep		m <sup>3</sup>	0.34	£24.35	£8.28
	Extra over for 300mm Type 1 surround 1200mm deep	Assume average depth of ICs is 1m.	m <sup>3</sup>	7.81	£24.35	£190.17
Type 3 Inspection chambers in shared access	Extra over for inspection chamber located in area subject to vehicle loading. Iron frame and cover	Those in shared access driveway and parking use rate for access cover and frame for concrete manholes (£350). Note a few ICs exceed 1200mm deep but this will not significantly affect costs	No	3	£350.00	£1,050.00
	Pipes					
Main sewers in road	Vitrified clay pipes to BSEN295 plain ends with push fit polypropylene couplings 150mm pipes in trenches ne 1.5m deep	Civil Engineering and Highway Works Page206	m	74	£46.52	£3,442.48
	Extra over for backfill with Type 1	Use material cost only as compaction, etc remains the same.	m <sup>3</sup>	50	£24.35	£1,217.50
Sewers under shared access 100mm	Unplasticized PVC pipes ring seal sockets excavation and supports backfilling 6m ppe lengths 110mm pipes in trenches ne 1.5m deep	Civil Engineering and Highway Works Page218	m	37	£26.36	£975.32

	Extra over for backfill with Type 1		m <sup>3</sup>	25	£24.35	£608.75
Private connections predominantly in gardens or under slabs 100mm	Unplasticized PVC pipes ring seal sockets excavation and supports backfilling 6m ppe lengths 110mm pipes in trenches ne 1.5m deep	Civil Engineering and Highway Works Page218	m	172	£26.36	£4,533.92
Pipe bedding	Imported granular material - 100mm deep bed for 100mm dia pipe	Civil Engineering and Highway Works Page238	m	209	£3.20	£668.80
	Imported granular material - 150mm deep bed for 150mm dia pipe	Civil Engineering and Highway Works Page238	m	74	£7.36	£544.64
Pipe surround	Imported granular material - 100mm deep surround for 100mm dia pipe	Civil Engineering and Highway Works Page238	m	209	£10.49	£2,192.41
	Imported granular material - 150mm deep surround for 150mm dia pipe	Civil Engineering and Highway Works Page238	m	74	£14.33	£1,060.42
					Total Cost for comparison purposes - Small site Building Regs	
					£28,629.90	

### Assumptions

Note these comments relate to foul systems in accordance with Part H and as such the pipes are no greater than 150mm and thus all manholes to be 1200 diameter PCC Ring chambers, with 300mm of concrete surround. This is based on the common practise of over excavating the void for the manhole, and allows proper compaction of the concrete in compliance with the specification. The cost of correct materials and methods for larger voids is likely to be similar to the notional 300 of concrete.

ICs are to be 450 plastic chambers with 300mm surround of type 1 material. Again, this thickness of surround is specified to allow proper compaction of the granular material.

All backfill to pipe runs beneath carriageways to be compacted Type 1 material.

Backfill to pipes within landscaped areas may be as-dug material

All pipe bedding assumed to be class S (full granular bed and surround)

Pipework may be clay or plastic, as long as it is compliant with the standards set out in SFA 7<sup>th</sup> - assume plastic off highway and clay in highway

Cover sizes to be in accordance with the relevant guidance document – SFA 7<sup>th</sup> or Building Regs Doc H. Note the access restriction to 450 plastic chambers in SFA 7<sup>th</sup>.

Surplus material is able to be disposed within the site

Connections to existing manhole not included - same for both options

Small site - SFA 7

Item No	Assumed item from SPONS Price Book	SPONS Reference	Unit	Quantity	Rate (£)	Total (£)
Main sewer manholes in highway	Manholes					
	Foul manhole in public highway - Assume this has to meet SFA 7 requirements					
	<i>Precast concrete construction with</i>					
	<i>Circular shafts</i>					
	<i>150mm plain concrete C15/20 surround</i>					
	<i>225mm plain concrete C20/20 base slab</i>					
	<i>Precast reducing slab</i>					
	<i>Precast top slab</i>					
	<i>Maximum ht of working chamber 2m above benching</i>					
	<i>750mm diameter access shaft</i>					
<i>Plain concrete C15/20 benching, 150mm clay main channel longitudinally and two 100mm branch channels</i>						
<i>Step irons at 300mm centre, doubled if depth to invert exceeds 3m</i>						
<i>Heavy duty manhole cover and frame</i>						
<i>In manholes over 6m deep, landings at maximum intervals</i>						
<i>Includes excavation, support, backfilling and disposal</i>						
	1200mm diameter x 1500 depth to invert	Civil Engineering and Highway Works Page229	No	1	£1,351.15	£1,351.15
	1200mm diameter x 2000 depth to invert	Civil Engineering and Highway Works Page229	No	4	£1,434.15	£5,736.60
	Extra over for concrete surround to meet SFA 7 requirement to GEN3 aggressive ground conditions	None - this is a typical foundation mix.				
	Extra over for 1200mm min dia access shaft to meet SFA 7 requirements	No difference as depths are too shallow to require access shaft				
	Extra over for 300mm concrete surround 1500 depth	1 x 1.17m <sup>3</sup> Rate for mass concrete PC for concrete stool and thrust blocks Page 241. Only materials allowed for - extra cost of placing wider concrete surround is marginal.	m <sup>3</sup>	1.17	£62.15	£72.72
	Extra over for 300mm concrete surround 2000 depth	4 x 1.56m <sup>3</sup> Rate for mass concrete PC for concrete stool and thrust blocks Page 241. Only materials allowed for - extra cost of placing wider concrete surround is marginal.	m <sup>3</sup>	6.24	£62.15	£387.82
	Part H inspection chamber - Does not meet SFA 7 standard					



*Inspection chambers polypropylene (Hepworth plc)*  
*Up to 1.2m deep including polymer chamber and cover and frame*  
*with screw down lid*  
*Excavation*  
*Backfilling*  
*Disposal*

Type 4 Access chamber in garden	Inspection chamber 300mm diameter, 600mm deep	Landscaping and external works Page 365	No	1	£211.63	£211.63
Type 4 Inspection chamber in garden - Private	Inspection chamber 450mm diameter, 1200mm deep	Landscaping and external works Page 365, 475mm dia chamber	No	7	£375.60	£2,629.20
Type 4 Inspection chamber in garden - Sewer	Inspection chamber 450mm diameter, 1200mm deep	Landscaping and external works Page 365, 475mm dia chamber	No	3	£375.60	£1,126.80
Type 3 Inspection chambers in garden	Inspection chamber 450mm diameter, 1200mm deep	Landscaping and external works Page 365, 475mm dia chamber	No	1	£375.60	£375.60
Type 3 Inspection chambers in shared access	Inspection chamber 450mm diameter, 1200mm deep	Landscaping and external works Page 365, 475mm dia chamber	No	1	£375.60	£375.60
	Extra over for granular base	Page 279 Type 1 use material cost only as cost of laying is marginal.	m <sup>3</sup>	11.8	£24.35	£287.33
	Extra over for 300mm Type 1 surround 600mm deep		m <sup>3</sup>	0.34	£24.35	£8.28
	Extra over for 300mm Type 1 surround 1200mm deep	Assume average depth of ICs is 1m.	m <sup>3</sup>	9.2	£24.35	£224.02
Type 3 Inspection chambers in shared access	Extra over for inspection chamber located in area subject to vehicle loading. Iron frame and cover	Those in shared access driveway and parking use rate for access cover and frame for concrete manholes (£350). Note a few ICs exceed 1200mm deep but this will not significantly affect costs	No	1	£350.00	£350.00
	Pipes					
Main sewers in road	Vitrified clay pipes to BSEN295 plain ends with push fit polypropylene couplings 150mm pipes in trenches ne 1.5m deep	Civil Engineering and Highway Works Page206	m	74	£46.52	£3,442.48
	Extra over for backfill with Type 1	Use material cost only as compaction, etc remains the same.	m <sup>3</sup>	50	£24.35	£1,217.50

Sewers under shared access 100mm	Unplasticized PVC pipes ring seal sockets excavation and supports backfilling 6m ppe lengths 110mm pipes in trenches ne 1.5m deep	Civil Engineering and Highway Works Page218	m	40	£26.36	£1,054.40
	Extra over for backfill with Type 1		m <sup>3</sup>	22	£24.35	£535.70
Laterals under shared access 100mm	Unplasticized PVC pipes ring seal sockets excavation and supports backfilling 6m ppe lengths 110mm pipes in trenches ne 1.5m deep	Civil Engineering and Highway Works Page218	m	18	£26.36	£474.48
	Extra over for backfill with Type 1		m <sup>3</sup>	8	£24.35	£194.80
Private connections predominantly in gardens or under slabs 100mm	Unplasticized PVC pipes ring seal sockets excavation and supports backfilling 6m ppe lengths 110mm pipes in trenches ne 1.5m deep	Civil Engineering and Highway Works Page218	m	148	£26.36	£3,901.28
Pipe bedding	Imported granular material - 100mm deep bed for 100mm dia pipe	Civil Engineering and Highway Works Page238	m	206	£3.20	£659.20
	Imported granular material - 150mm deep bed for 150mm dia pipe	Civil Engineering and Highway Works Page238	m	74	£7.36	£544.64
Pipe surround	Imported granular material - 100mm deep surround for 100mm dia pipe	Civil Engineering and Highway Works Page238	m	206	£10.49	£2,160.94
	Imported granular material - 150mm deep surround for 150mm dia pipe	Civil Engineering and Highway Works Page238	m	74	£14.33	£1,060.42
Total Cost for comparison purposes - Small site SFA						£28,382.58
7						

Assumptions

Note these comments relate to foul systems in accordance with Part H and as such the pipes are no greater than 150mm and thus all manholes to be 1200 diameter PCC Ring chambers, with 300mm of concrete surround. This is based on the common practise of over excavating the void for the manhole, and allows proper compaction of the concrete in compliance with the specification. The cost of correct materials and methods for larger voids is likely to be similar to the notional 300 of concrete.

ICs are to be 450 plastic chambers with 300mm surround of type 1 material. Again, this thickness of surround is specified to allow proper compaction of the granular material.

All backfill to pipe runs beneath carriageways to be compacted Type 1 material.

Backfill to pipes within landscaped areas may be as-dug material

All pipe bedding assumed to be class S (full granular bed and surround)

Pipework may be clay or plastic, as long as it is compliant with the standards set out in SFA 7<sup>th</sup> - assume plastic off highway and clay in highway

Cover sizes to be in accordance with the relevant guidance document – SFA 7<sup>th</sup> or Building Regs Doc H. Note the access restriction to 450 plastic chambers in SFA 7<sup>th</sup>.

Surplus material is able to be disposed within the site

Connections to existing manhole not included - same for both options

Medium site - Building Regs

Item No	Assumed item from SPONS Price Book	SPONS Reference	Unit	Quantity	Rate (£)	Total (£)
Main sewer manholes in highway	Manholes					
	Foul manhole in public highway - Assume this has to meet SFA 7 requirements					
	<i>Precast concrete construction with</i>					
	<i>Circular shafts</i>					
	<i>150mm plain concrete C15/20 surround</i>					
	<i>225mm plain concrete C20/20 base slab</i>					
	<i>Precast reducing slab</i>					
	<i>Precast top slab</i>					
	<i>Maximum ht of working chamber 2m above benching</i>					
	<i>750mm diameter access shaft</i>					
<i>Plain concrete C15/20 benching, 150mm clay main channel longitudinally and two 100mm branch channels</i>						
<i>Step irons at 300mm centre, doubled if depth to invert exceeds 3m</i>						
<i>Heavy duty manhole cover and frame</i>						
<i>In manholes over 6m deep, landings at maximum intervals</i>						
<i>Includes excavation, support, backfilling and disposal</i>						
	1200mm diameter x 1500 depth to invert	Civil Engineering and Highway Works Page229	No	2	£1,351.15	£2,702.30
	1200mm diameter x 2000 depth to invert	Civil Engineering and Highway Works Page229	No	3	£1,434.15	£4,302.45
	1200mm diameter x 2500 depth to invert	Civil Engineering and Highway Works Page229	No	3	£1,816.15	£5,448.45
	1200mm diameter x 3000 depth to invert	Civil Engineering and Highway Works Page229	No	0	£2,061.65	£0.00
	Extra over for concrete surround to meet Sfa 7 requirement to GEN3 aggressive ground conditions	None - this is a typical foundation mix.				
	Extra over for 1200mm min dia access shaft to meet Sfa 7 requirements	No difference as depths are too shallow to require access shaft				
	Extra over for 300mm concrete surround 1500 depth	2 x 1.17m <sup>3</sup> Rate for mass concrete PC for concrete stool and thrust blocks Page 241. Only materials allowed for - extra cost of placing wider concrete surround is marginal.	m <sup>3</sup>	2.34	£62.15	£145.43
	Extra over for 300mm concrete surround 2000 depth	Rate for mass concrete PC for concrete stool and thrust blocks Page 241. Only materials allowed for - extra cost of placing wider concrete surround is marginal.	m <sup>3</sup>	4.68	£62.15	£290.86

	Extra over for 300mm concrete surround 2500 depth	Rate for mass concrete PC for concrete stool and thrust blocks Page 241. Only materials allowed for - extra cost of placing wider concrete surround is marginal.	m <sup>3</sup>	5.82	£62.15	£361.71
	Extra over for 300mm concrete surround 3000 depth	Rate for mass concrete PC for concrete stool and thrust blocks Page 241. Only materials allowed for - extra cost of placing wider concrete surround is marginal.	m <sup>3</sup>	0	£62.15	£0.00
Sewer manholes in shared access	1200mm diameter x 1500 depth to invert	Civil Engineering and Highway Works Page229	No	3	£1,351.15	£4,053.45
	1200mm diameter x 2000 depth to invert	Civil Engineering and Highway Works Page229	No	4	£1,434.15	£5,736.60
	1200mm diameter x 2500 depth to invert	Civil Engineering and Highway Works Page229	No	0	£1,816.15	£0.00
	1200mm diameter x 3000 depth to invert	Civil Engineering and Highway Works Page229	No	0	£2,061.65	£0.00
	Extra over for concrete surround to meet Sfa 7 requirement to GEN3 aggressive ground conditions	None - this is a typical foundation mix.				
	Extra over for 1200mm min dia access shaft to meet Sfa 7 requirements	No difference as depths are too shallow to require access shaft				
	Extra over for 300mm concrete surround 1500 depth	3 x 1.17m <sup>3</sup> Rate for mass concrete PC for concrete stool and thrust blocks Page 241. Only materials allowed for - extra cost of placing wider concrete surround is marginal.	m <sup>3</sup>	3.51	£62.15	£218.15
	Extra over for 300mm concrete surround 2000 depth	Rate for mass concrete PC for concrete stool and thrust blocks Page 241. Only materials allowed for - extra cost of placing wider concrete surround is marginal.	m <sup>3</sup>	6.24	£62.15	£387.82
	Extra over for 300mm concrete surround 2500 depth	Rate for mass concrete PC for concrete stool and thrust blocks Page 241. Only materials allowed for - extra cost of placing wider concrete surround is marginal.	m <sup>3</sup>	0	£62.15	£0.00
	Extra over for 300mm concrete surround 3000 depth	Rate for mass concrete PC for concrete stool and thrust blocks Page 241. Only materials allowed for - extra cost of placing wider concrete surround is marginal.	m <sup>3</sup>	0	£62.15	£0.00
	Part H inspection chamber - Does not meet Sfa 7 standard <i>Inspection chambers polypropylene (Hepworth plc)</i> <i>Up to 1.2m deep including polymer chamber and cover and frame with screw down lid</i> <i>Excavation</i> <i>Backfilling</i>					

*Disposal*

Type 4 Access chamber in garden - Private	Inspection chamber 300mm diameter, 600mm deep	Landscaping and external works Page 365	No	0	£211.63	£0.00
Type 4 Inspection chamber in garden/footway/footpath - Private	Inspection chamber 450mm diameter, 1200mm deep	Landscaping and external works Page 365, 475mm dia chamber	No	30	£375.60	£11,268.00
Type 4 Inspection chamber in private parking - Sewer	Inspection chamber 450mm diameter, 1200mm deep	Landscaping and external works Page 365, 475mm dia chamber	No	9	£375.60	£3,380.40
Type 4 Inspection chamber in garden/footway/footpath - Sewer	Inspection chamber 450mm diameter, 1200mm deep	Landscaping and external works Page 365, 475mm dia chamber	No	0	£375.60	£0.00
Type 3 Inspection chambers in garden	Inspection chamber 450mm diameter, 1200mm deep	Landscaping and external works Page 365, 475mm dia chamber	No	0	£375.60	£0.00
Type 3 Inspection chambers in shared access	Inspection chamber 450mm diameter, 1200mm deep	Landscaping and external works Page 365, 475mm dia chamber	No	0	£375.60	£0.00
Type 3 Inspection chambers in shared access	Inspection chamber 450mm diameter, 1500mm deep	See separate cost breakdown	No	0	£431.94	£0.00
	Extra over for granular base	Page 279 Type 1 use material cost only as cost of laying is marginal.	m <sup>3</sup>	32	£24.35	£779.20
	Extra over for 300mm Type 1 surround 600mm deep		m <sup>3</sup>	0	£24.35	£0.00
	Extra over for 300mm Type 1 surround 1200mm deep	Assume average depth of ICs is 1m.	m <sup>3</sup>	26	£24.35	£633.10
	Extra over for 300mm Type 1 surround 1500mm deep	Assume average depth of ICs is 1.5m.	m <sup>4</sup>	0	£25.35	£0.00
Type 3/4 Inspection chambers in shared access or private parking	Extra over for inspection chamber located in area subject to vehicle loading. Iron frame and cover	Those in shared access driveway and parking use rate for access cover and frame for concrete manholes (£350)	No	9	£350.00	£3,150.00
	Pipes					
Main sewers in road/shared access	Vitrified clay pipes to BSEN295 plain ends with push fit polypropylene couplings 100mm pipes in trenches ne 1.5m deep	Civil Engineering and Highway Works Page205	m	34	£32.30	£1,098.20

	ne 2.0m deep	Civil Engineering and Highway Works Page206	m	0	£37.78	£0.00
	Vitrified clay pipes to BSEN295 plain ends with push fit polypropylene couplings 150mm pipes in trenches ne 1.5m deep	Civil Engineering and Highway Works Page206	m	91	£46.52	£4,233.32
	ne 2.0m deep	Civil Engineering and Highway Works Page206	m	134	£50.53	£6,771.02
	ne 2.5m deep	Civil Engineering and Highway Works Page206	m	0	£55.83	£0.00
	Extra over for backfill with Type 1	Use material cost only as compaction, etc remains the same.	m <sup>3</sup>	174	£24.35	£4,236.90
Private under shared access, highway or private parking 100mm	Unplasticized PVC pipes ring seal sockets excavation and supports backfilling 6m ppe lengths 110mm pipes in trenches ne 1.5m deep	Civil Engineering and Highway Works Page218	m	113	£26.36	£2,978.68
	ne 2.0m	Civil Engineering and Highway Works Page218	m	11	£30.35	£333.85
	ne 2.5m	Civil Engineering and Highway Works Page218	m	0	£34.32	£0.00
	Extra over for backfill with Type 1	Use material cost only as compaction, etc remains the same.	m <sup>3</sup>	67	£24.35	£1,631.45
Sewer under path 100mm	Unplasticized PVC pipes ring seal sockets excavation and supports backfilling 6m ppe lengths 110mm pipes in trenches ne 1.5m deep	Civil Engineering and Highway Works Page218	m	0	£26.36	£0.00
Private under shared access, highway or private parking 150mm	Unplasticized PVC pipes ring seal sockets excavation and supports backfilling 6m ppe lengths 160mm pipes in trenches ne 1.5m deep	Civil Engineering and Highway Works Page218	m	26	£51.48	£1,338.48
	Extra over for backfill with Type 1	Use material cost only as compaction, etc remains the same.	m <sup>3</sup>	17	£24.35	£413.95
Laterals under shared access or highway 100mm	Unplasticized PVC pipes ring seal sockets excavation and supports backfilling 6m ppe lengths 110mm pipes in trenches ne 1.5m deep	Civil Engineering and Highway Works Page206	m	0	£26.36	£0.00
	ne 2.0m	Civil Engineering and Highway Works Page218	m	0	£30.35	£0.00
	ne 2.5m	Civil Engineering and Highway Works Page218	m	0	£34.32	£0.00
	Extra over for backfill with Type 1	Use material cost only as compaction, etc remains the same.	m <sup>3</sup>	0	£24.35	£0.00

Private connections in gardens 100mm	Unplasticized PVC pipes ring seal sockets excavation and supports backfilling 6m ppe lengths 110mm pipes in trenches ne 1.5m deep	Civil Engineering and Highway Works Page206	m	161	£26.36	£4,243.96
	ne 2.0m	Civil Engineering and Highway Works Page218	m	29	£30.35	£880.15
	ne 2.5m	Civil Engineering and Highway Works Page218	m	0	£34.32	£0.00
Private connections in gardens 150mm	Unplasticized PVC pipes ring seal sockets excavation and supports backfilling 6m ppe lengths 160mm pipes in trenches ne 1.5m deep	Civil Engineering and Highway Works Page218	m	31	£51.48	£1,595.88
Pipe bedding	Imported granular material - 100mm deep bed for 100mm dia pipe	Civil Engineering and Highway Works Page238	m	348	£3.20	£1,113.60
	Imported granular material - 150mm deep bed for 150mm dia pipe	Civil Engineering and Highway Works Page238	m	282	£7.36	£2,075.52
Pipe surround	Imported granular material - 100mm deep surround for 100mm dia pipe	Civil Engineering and Highway Works Page238	m	348	£10.49	£3,650.52
	Imported granular material - 150mm deep surround for 150mm dia pipe	Civil Engineering and Highway Works Page238	m	282	£14.33	£4,041.06
Total Cost for comparison purposes - Medium site Building Regs						£83,494.46
Plus need to take into account variations in underslab drainage not included in above						

#### Assumptions

Note these comments relate to foul systems in accordance with Part H and as such the pipes are no greater than 150mm and thus all manholes to be 1200 diameter PCC Ring chambers, with 300mm of concrete surround. This is based on the common practise of over excavating the void for the manhole, and allows proper compaction of the concrete in compliance with the specification. The cost of correct materials and methods for larger voids is likely to be similar to the notional 300 of concrete.



ICs are to be 450 plastic chambers with 300mm surround of type 1 material. Again, this thickness of surround is specified to allow proper compaction of the granular material.

All backfill to pipe runs beneath carriageways to be compacted Type 1 material.

Backfill to pipes within landscaped areas may be as-dug material

All pipe bedding assumed to be class S (full granular bed and surround)

Pipework may be clay or plastic, as long as it is compliant with the standards set out in SFA 7<sup>th</sup> - assume plastic off highway and clay in highway

Cover sizes to be in accordance with the relevant guidance document – SFA 7<sup>th</sup> or Building Regs Doc H. Note the access restriction to 450 plastic chambers in SFA 7<sup>th</sup>.

Surplus material is able to be disposed within the site

Connections to existing manhole not included - same for both options

Medium site - SFA 7

Item No	Assumed item from SPONs Price Book	SPONS Reference	Unit	Quantity	Rate (£)	Total (£)
Main sewer manholes in highway	Manholes					
	Foul manhole in public highway - Assume this has to meet Sfa 7 requirements					
	<i>Precast concrete construction with</i>					
	<i>Circular shafts</i>					
	<i>150mm plain concrete C15/20 surround</i>					
	<i>225mm plain concrete C20/20 base slab</i>					
	<i>Precast reducing slab</i>					
	<i>Precast top slab</i>					
	<i>Maximum ht of working chamber 2m above benching</i>					
	<i>750mm diameter access shaft</i>					
<i>Plain concrete C15/20 benching, 150mm clay main channel longitudinally and two 100mm branch channels</i>						
<i>Step irons at 300mm centre, doubled if depth to invert exceeds 3m</i>						
<i>Heavy duty manhole cover and frame</i>						
<i>In manholes over 6m deep, landings at maximum intervals</i>						
<i>Includes excavation, support, backfilling and disposal</i>						
	1200mm diameter x 1500 depth to invert	Civil Engineering and Highway Works Page229	No	1	£1,351.15	£1,351.15
	1200mm diameter x 2000 depth to invert	Civil Engineering and Highway Works Page229	No	0	£1,434.15	£0.00
	1200mm diameter x 2500 depth to invert	Civil Engineering and Highway Works Page229	No	4	£1,816.15	£7,264.60
	1200mm diameter x 3000 depth to invert	Civil Engineering and Highway Works Page229	No	2	£2,061.65	£4,123.30
	Extra over for concrete surround to meet Sfa 7 requirement to GEN3 aggressive ground conditions	None - this is a typical foundation mix.				
	Extra over for 1200mm min dia access shaft to meet Sfa 7 requirements	No difference as depths are too shallow to require access shaft				
	Extra over for 300mm concrete surround 1500 depth	1 x 1.17m <sup>3</sup> Rate for mass concrete PC for concrete stool and thrust blocks Page 241. Only materials allowed for - extra cost of placing wider concrete surround is marginal.	m <sup>3</sup>	1.17	£62.15	£72.72
	Extra over for 300mm concrete surround 2000 depth	Rate for mass concrete PC for concrete stool and thrust blocks Page 241. Only materials allowed for - extra cost of placing wider concrete surround is marginal.	m <sup>3</sup>	0	£62.15	£0.00
	Extra over for 300mm concrete surround 2500 depth	Rate for mass concrete PC for concrete stool and thrust blocks Page 241. Only materials allowed for - extra cost of placing wider concrete surround is marginal.	m <sup>3</sup>	7.76	£62.15	£482.28
	Extra over for 300mm concrete surround 3000 depth	Rate for mass concrete PC for concrete stool and thrust blocks Page 241. Only materials allowed for - extra cost of placing wider concrete surround is marginal.	m <sup>3</sup>	4.66	£62.15	£289.62

Part H inspection chamber - Does not meet SfA 7 standard  
*Inspection chambers polypropylene (Hepworth plc)*  
*Up to 1.2m deep including polymer chamber and cover and frame with screw down lid*  
*Excavation*  
*Backfilling*  
*Disposal*

Type 4 Access chamber in garden	Inspection chamber 300mm diameter, 600mm deep	Landscaping and external works Page 365	No	0	£211.63	£0.00
Type 4 Inspection chamber in garden/footway/footpath - Private	Inspection chamber 450mm diameter, 1200mm deep	Landscaping and external works Page 365, 475mm dia chamber	No	20	£375.60	£7,512.00
Type 4 Inspection chamber in private parking - Sewer	Inspection chamber 450mm diameter, 1200mm deep	Landscaping and external works Page 365, 475mm dia chamber	No	7	£375.60	£2,629.20
Type 4 Inspection chamber in garden/footway/footpath - Sewer	Inspection chamber 450mm diameter, 1200mm deep	Landscaping and external works Page 365, 475mm dia chamber	No	3	£375.60	£1,126.80
Type 3 Inspection chambers in garden	Inspection chamber 450mm diameter, 1200mm deep	Landscaping and external works Page 365, 475mm dia chamber	No	3	£375.60	£1,126.80
Type 3 Inspection chambers in shared access	Inspection chamber 450mm diameter, 1200mm deep	Landscaping and external works Page 365, 475mm dia chamber	No	9	£375.60	£3,380.40
Type 3 Inspection chambers in shared access	Inspection chamber 450mm diameter, 1500mm deep	See separate cost breakdown	No	2	£431.94	£863.88
	Extra over for granular base	Page 279 Type 1 use material cost only as cost of laying is marginal.	m <sup>3</sup>	38	£24.35	£925.30
	Extra over for 300mm Type 1 surround 600mm deep		m <sup>3</sup>	0	£24.35	£0.00
	Extra over for 300mm Type 1 surround 1200mm deep	Assume average depth of ICs is 1m.	m <sup>3</sup>	30	£24.35	£730.50
	Extra over for 300mm Type 1 surround 1500mm deep	Assume average depth of ICs is 1.5m.	m <sup>4</sup>	2.1	£25.35	£53.24
Type 3/4 Inspection chambers in shared access or private parking	Extra over for inspection chamber located in area subject to vehicle loading. Iron frame and cover	Those in shared access driveway and parking use rate for access cover and frame for concrete manholes (£350)	No	18	£350.00	£6,300.00
	Pipes					
Main sewers in road	Vitrified clay pipes to BSEN295 plain neds with push fit polypropylene couplings 100mm pipes in trenches ne 1.5m deep	Civil Engineering and Highway Works Page205	m	34	£32.30	£1,098.20

	ne 2.0m deep	Civil Engineering and Highway Works Page206	m	26	37.78	982.28
	Vitrified clay pipes to BSEN295 plain neds with push fit polypropylene couplings 150mm pipes in trenches ne 1.5m deep	Civil Engineering and Highway Works Page206	m	0	£46.52	£0.00
	ne 2.0m deep	Civil Engineering and Highway Works Page206	m	7	£50.53	£353.71
	ne 2.5m deep	Civil Engineering and Highway Works Page206	m	82	£55.83	£4,578.06
	Extra over for backfill with Type 1	Use material cost only as compaction, etc remains the same.	m <sup>3</sup>	158	24.35	3847.3
Sewers under shared access 100mm	Unplasticized PVC pipes ring seal sockets excavation and supports backfilling 6m ppe lengths 110mm pipes in trenches ne 1.5m deep	Civil Engineering and Highway Works Page218	m	132	£26.36	£3,479.52
	ne 2.0m	Civil Engineering and Highway Works Page218	m	20	£30.35	£607.00
	ne 2.5m	Civil Engineering and Highway Works Page218	m	8	£34.32	£274.56
	Extra over for backfill with Type 1	Use material cost only as compaction, etc remains the same.	m <sup>3</sup>	91	£24.35	£2,215.85
Sewer under path 100mm	Unplasticized PVC pipes ring seal sockets excavation and supports backfilling 6m ppe lengths 110mm pipes in trenches ne 1.5m deep	Civil Engineering and Highway Works Page218	m	5	£26.36	£131.80
Sewers under shared access 150mm	Unplasticized PVC pipes ring seal sockets excavation and supports backfilling 6m ppe lengths 160mm pipes in trenches ne 1.5m deep	Civil Engineering and Highway Works Page218	m	41	£51.48	£2,110.68
Laterals under shared access or highway 100mm	Unplasticized PVC pipes ring seal sockets excavation and supports backfilling 6m ppe lengths 110mm pipes in trenches ne 1.5m deep	Civil Engineering and Highway Works Page206	m	102	£26.36	£2,688.72
	ne 2.0m	Civil Engineering and Highway Works Page218	m	4	£30.35	£121.40
	ne 2.5m	Civil Engineering and Highway Works Page218	m	5	£34.32	£171.60
	Extra over for backfill with Type 1	Use material cost only as compaction, etc remains the same.	m <sup>3</sup>	57	£24.35	£1,387.95
Laterals or private connections in gardens	Unplasticized PVC pipes ring seal sockets excavation and supports backfilling 6m ppe lengths 110mm pipes in trenches ne 1.5m deep	Civil Engineering and Highway Works Page206	m	159	£26.36	£4,191.24
Pipe bedding	Imported granular material - 100mm deep bed for 100mm dia pipe	Civil Engineering and Highway Works Page238	m	495	3.2	1584
	Imported granular material - 150mm deep bed for 150mm dia pipe	Civil Engineering and Highway Works Page238	m	130	£7.36	£956.80
Pipe surround	Imported granular material - 100mm deep surround for 100mm dia pipe	Civil Engineering and Highway Works Page238	m	495	10.49	5192.55
	Imported granular material - 150mm deep surround for 150mm dia pipe	Civil Engineering and Highway Works Page238	m	130	£14.33	£1,862.90

Plus need to take into account variations in underslab drainage not included in above

Extra length of pipe is	m	10	£26.36	£263.60
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Total Cost for comparison purposes - Medium site SFA 7				£76,331.50
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#### Assumptions

Note these comments relate to foul systems in accordance with Part H and as such the pipes are no greater than 150mm and thus all manholes to be 1200 diameter PCC Ring chambers, with 300mm of concrete surround. This is based on the common practise of over excavating the void for the manhole, and allows proper compaction of the concrete in compliance with the specification. The cost of correct materials and methods for larger voids is likely to be similar to the notional 300 of concrete.

ICs are to be 450 plastic chambers with 300mm surround of type 1 material. Again, this thickness of surround is specified to allow proper compaction of the granular material.

All backfill to pipe runs beneath carriageways to be compacted Type 1 material.

Backfill to pipes within landscaped areas may be as-dug material

All pipe bedding assumed to be class S (full granular bed and surround)

Pipework may be clay or plastic, as long as it is compliant with the standards set out in SFA 7<sup>th</sup> - assume plastic off highway and clay in highway

Cover sizes to be in accordance with the relevant guidance document – SFA 7<sup>th</sup> or Building Regs Doc H. Note the access restriction to 450 plastic chambers in SFA 7<sup>th</sup>.

Surplus material is able to be disposed within the site

Connections to existing manhole not included - same for both options

Large site - Building Regs

Item No	Assumed item from SPONs Price Book	SPONS Reference	Unit	Quantity	Rate (£)	Total (£)
Main sewer manholes in highway	Manholes					
	Foul manhole in public highway - Assume this has to meet SFA 7 requirements					
	<i>Precast concrete construction with</i>					
	<i>Circular shafts</i>					
	<i>150mm plain concrete C15/20 surround</i>					
	<i>225mm plain concrete C20/20 base slab</i>					
	<i>Precast reducing slab</i>					
	<i>Precast top slab</i>					
	<i>Maximum ht of working chamber 2m above benching</i>					
	<i>750mm diameter access shaft</i>					
<i>Plain concrete C15/20 benching, 150mm clay main channel longitudinally and two 100mm branch channels</i>						
<i>Step irons at 300mm centre, doubled if depth to invert exceeds 3m</i>						
<i>Heavy duty manhole cover and frame</i>						
<i>In manholes over 6m deep, landings at maximum intervals</i>						
<i>Includes excavation, support, backfilling and disposal</i>						
	1200mm diameter x 1500 depth to invert	Civil Engineering and Highway Works Page229	No	14	£1,351.15	£18,916.10
	1200mm diameter x 2000 depth to invert	Civil Engineering and Highway Works Page229	No	4	£1,434.15	£5,736.60
	1200mm diameter x 2500 depth to invert	Civil Engineering and Highway Works Page229	No	7	£1,816.15	£12,713.05
	1200mm diameter x 3000 depth to invert	Civil Engineering and Highway Works Page229	No	5	£2,061.65	£10,308.25
	Extra over for concrete surround to meet Sfa 7 requirement to GEN3 aggressive ground conditions	None - this is a typical foundation mix.				
	Extra over for 1200mm min dia access shaft to meet Sfa 7 requirements	No difference as depths are too shallow to require access shaft				
	Extra over for 300mm concrete surround 1500 depth	14 x 1.17m <sup>3</sup> Rate for mass concrete PC for concrete stool and thrust blocks Page 241. Only materials allowed for - extra cost of placing wider concrete surround is marginal.	m <sup>3</sup>	16.4	£62.15	£1,019.26
	Extra over for 300mm concrete surround 2000 depth	Rate for mass concrete PC for concrete stool and thrust blocks Page 241. Only materials allowed for - extra cost of placing wider concrete surround is marginal.	m <sup>3</sup>	6.2	£62.15	£385.33

	Extra over for 300mm concrete surround 2500 depth	Rate for mass concrete PC for concrete stool and thrust blocks Page 241. Only materials allowed for - extra cost of placing wider concrete surround is marginal.	m <sup>3</sup>	13.6	£62.15	£845.24
	Extra over for 300mm concrete surround 3000 depth	Rate for mass concrete PC for concrete stool and thrust blocks Page 241. Only materials allowed for - extra cost of placing wider concrete surround is marginal.	m <sup>3</sup>	11.7	£62.15	£727.16
Sewer manholes in shared access	1200mm diameter x 1500 depth to invert	Civil Engineering and Highway Works Page229	No	10	£1,351.15	£13,511.50
	1200mm diameter x 2000 depth to invert	Civil Engineering and Highway Works Page229	No	1	£1,434.15	£1,434.15
	1200mm diameter x 2500 depth to invert	Civil Engineering and Highway Works Page229	No	0	£1,816.15	£0.00
	1200mm diameter x 3000 depth to invert	Civil Engineering and Highway Works Page229	No	0	£2,061.65	£0.00
	Extra over for concrete surround to meet Sfa 7 requirement to GEN3 aggressive ground conditions	None - this is a typical foundation mix.				
	Extra over for 1200mm min dia access shaft to meet Sfa 7 requirements	No difference as depths are too shallow to require access shaft				
	Extra over for 300mm concrete surround 1500 depth	10 x 1.17m <sup>3</sup> Rate for mass concrete PC for concrete stool and thrust blocks Page 241. Only materials allowed for - extra cost of placing wider concrete surround is marginal.	m <sup>3</sup>	11.7	£62.15	£727.16
	Extra over for 300mm concrete surround 2000 depth	Rate for mass concrete PC for concrete stool and thrust blocks Page 241. Only materials allowed for - extra cost of placing wider concrete surround is marginal.	m <sup>3</sup>	1.6	£62.15	£99.44
	Extra over for 300mm concrete surround 2500 depth	Rate for mass concrete PC for concrete stool and thrust blocks Page 241. Only materials allowed for - extra cost of placing wider concrete surround is marginal.	m <sup>3</sup>	0	£62.15	£0.00
	Extra over for 300mm concrete surround 3000 depth	Rate for mass concrete PC for concrete stool and thrust blocks Page 241. Only materials allowed for - extra cost of placing wider concrete surround is marginal.	m <sup>3</sup>	0	£62.15	£0.00
<p>Part H inspection chamber - Does not meet Sfa 7 standard  <i>Inspection chambers polypropylene (Hepworth plc)</i>  <i>Up to 1.2m deep including polymer chamber and cover and frame with screw down lid</i>  <i>Excavation</i>  <i>Backfilling</i></p>						

*Disposal*

Type 4 Access chamber in garden	Inspection chamber 300mm diameter, 600mm deep	Landscaping and external works Page 365	No	0	£211.63	£0.00
Type 4 Inspection chamber in garden/footway/footpath - Private	Inspection chamber 450mm diameter, 1200mm deep	Landscaping and external works Page 365, 475mm dia chamber	No	186	£375.60	£69,861.60
	Inspection chamber 450mm diameter, 1500mm deep	See separate cost breakdown	No	2	£431.94	£863.88
Type 4 Inspection chamber in private parking or shared access - Sewer	Inspection chamber 450mm diameter, 1200mm deep	Landscaping and external works Page 365, 475mm dia chamber	No	8	£375.60	£3,004.80
	Inspection chamber 450mm diameter, 1500mm deep	See separate cost breakdown	No	8	£431.94	£3,455.52
Type 4 Inspection chamber in garden/footway/footpath - Sewer	Inspection chamber 450mm diameter, 1200mm deep	Landscaping and external works Page 365, 475mm dia chamber	No	0	£375.60	£0.00
Type 3 Inspection chambers in garden	Inspection chamber 450mm diameter, 1200mm deep	Landscaping and external works Page 365, 475mm dia chamber	No	0	£375.60	£0.00
Type 3 Inspection chambers in shared access	Inspection chamber 450mm diameter, 1200mm deep	Landscaping and external works Page 365, 475mm dia chamber	No	0	£375.60	£0.00
Type 3 Inspection chambers in shared access	Inspection chamber 450mm diameter, 1500mm deep	See separate cost breakdown	No	0	£431.94	£0.00
	Extra over for granular base	Page 279 Type 1 use material cost only as cost of laying is marginal.	m <sup>3</sup>	175	£24.35	£4,261.25
	Extra over for 300mm Type 1 surround 600mm deep		m <sup>3</sup>	0	£24.35	£0.00
	Extra over for 300mm Type 1 surround 1200mm deep	Assume average depth of ICs is 1m.	m <sup>3</sup>	206	£24.35	£5,016.10
	Extra over for 300mm Type 1 surround 1500mm deep	Assume average depth of ICs is 1.5m.	m <sup>4</sup>	14	£25.35	£354.90
Type 3/4 Inspection chambers in shared access or private parking	Extra over for inspection chamber located in area subject to vehicle loading. Iron frame and cover	Those in shared access driveway and parking use rate for access cover and frame for concrete manholes (£350)	No	10	£350.00	£3,500.00

Pipes



Main sewers in road/shared access	Vitrified clay pipes to BSEN295 plain ends with push fit polypropylene couplings 100mm pipes in trenches ne 1.5m deep	Civil Engineering and Highway Works Page205	m	0	£32.30	£0.00
	ne 2.0m deep	Civil Engineering and Highway Works Page206	m	0	£37.78	£0.00
	Vitrified clay pipes to BSEN295 plain ends with push fit polypropylene couplings 150mm pipes in trenches ne 1.5m deep	Civil Engineering and Highway Works Page206	m	370	£46.52	£17,212.40
	ne 2.0m deep	Civil Engineering and Highway Works Page206	m	242	£50.53	£12,228.26
	ne 2.5m deep	Civil Engineering and Highway Works Page206	m	138	£55.83	£7,704.54
	ne 3.0m deep	Civil Engineering and Highway Works Page206	m	203	£62.49	£12,685.47
	Extra over for backfill with Type 1	Use material cost only as compaction, etc remains the same.	m <sup>3</sup>	643	£24.35	£15,657.05
Sewer under shared access or private parking 100mm	Unplasticized PVC pipes ring seal sockets excavation and supports backfilling 6m ppe lengths 110mm pipes in trenches ne 1.5m deep	Civil Engineering and Highway Works Page218	m	55	£26.36	£1,449.80
	ne 2.0m	Civil Engineering and Highway Works Page218	m	0	£30.35	£0.00
	ne 2.5m	Civil Engineering and Highway Works Page218	m	0	£34.32	£0.00
	Unplasticized PVC pipes ring seal sockets excavation and supports backfilling 6m ppe lengths 160mm pipes in trenches ne 1.5m deep	Civil Engineering and Highway Works Page218	m	107	£51.48	£5,508.36
	Extra over for backfill with Type 1	Use material cost only as compaction, etc remains the same.	m <sup>3</sup>	73	£24.35	£1,777.55
Sewer under garden/path 100mm	Unplasticized PVC pipes ring seal sockets excavation and supports backfilling 6m ppe lengths 110mm pipes in trenches ne 1.5m deep	Civil Engineering and Highway Works Page218	m	448	£26.36	£11,809.28
	ne 2.0m	Civil Engineering and Highway Works Page218	m	0	£30.35	£0.00
	ne 2.5m	Civil Engineering and Highway Works Page218	m	15	£34.32	£514.80
Sewer under garden/path 150mm	Unplasticized PVC pipes ring seal sockets excavation and supports backfilling 6m ppe lengths 160mm pipes in trenches ne 1.5m deep	Civil Engineering and Highway Works Page218	m	224	£51.48	£11,531.52
Private under shared access, highway or private parking 150mm	Unplasticized PVC pipes ring seal sockets excavation and supports backfilling 6m ppe lengths 160mm pipes in trenches ne 1.5m deep	Civil Engineering and Highway Works Page218	m	0	£51.48	£0.00
	Extra over for backfill with Type 1	Use material cost only as compaction, etc remains the same.	m <sup>3</sup>	0	£24.35	£0.00

Laterals under shared access or highway 100mm	Unplasticized PVC pipes ring seal sockets excavation and supports backfilling 6m ppe lengths 110mm pipes in trenches ne 1.5m deep	Civil Engineering and Highway Works Page206	m	0	£26.36	£0.00
	ne 2.0m	Civil Engineering and Highway Works Page218	m	0	£30.35	£0.00
	ne 2.5m	Civil Engineering and Highway Works Page218	m	0	£34.32	£0.00
	Extra over for backfill with Type 1	Use material cost only as compaction, etc remains the same.	m <sup>3</sup>	0	£24.35	£0.00
Private connections in gardens 100mm	Unplasticized PVC pipes ring seal sockets excavation and supports backfilling 6m ppe lengths 110mm pipes in trenches ne 1.5m deep	Civil Engineering and Highway Works Page206	m	734	£26.36	£19,348.24
	ne 2.0m	Civil Engineering and Highway Works Page218	m	0	£30.35	£0.00
	ne 2.5m	Civil Engineering and Highway Works Page218	m	0	£34.32	£0.00
Private connections in gardens 150mm	Unplasticized PVC pipes ring seal sockets excavation and supports backfilling 6m ppe lengths 160mm pipes in trenches ne 1.5m deep	Civil Engineering and Highway Works Page218	m	50	£51.48	£2,574.00
	ne 2.0m	Civil Engineering and Highway Works Page218	m	27	£55.51	£1,498.77
Pipe bedding	Imported granular material - 100mm deep bed for 100mm dia pipe	Civil Engineering and Highway Works Page238	m	1361	£3.20	£4,355.20
	Imported granular material - 150mm deep bed for 150mm dia pipe	Civil Engineering and Highway Works Page238	m	1252	£7.36	£9,214.72
Pipe surround	Imported granular material - 100mm deep surround for 100mm dia pipe	Civil Engineering and Highway Works Page238	m	1361	£10.49	£14,276.89
	Imported granular material - 150mm deep surround for 150mm dia pipe	Civil Engineering and Highway Works Page238	m	1252	£14.33	£17,941.16
Total Cost for comparison purposes - Large site Building Regs						£324,029.29
There are no variations in underslab drainage Underslab drainage is not included in above						

Assumptions

Note these comments relate to foul systems in accordance with Part H and as such the pipes are no greater than 150mm and thus all manholes to be 1200 diameter PCC Ring chambers, with 300mm of concrete surround. This is based on the common practise of over excavating the void for the manhole, and allows proper compaction of the concrete in compliance with the specification. The cost of correct materials and methods for larger voids is likely to be similar to the notional 300 of concrete.

ICs are to be 450 plastic chambers with 300mm surround of type 1 material. Again, this thickness of surround is specified to allow proper compaction of the granular material.

All backfill to pipe runs beneath carriageways to be compacted Type 1 material.

Backfill to pipes within landscaped areas may be as-dug material

All pipe bedding assumed to be class S (full granular bed and surround)

Pipework may be clay or plastic, as long as it is compliant with the standards set out in SFA 7<sup>th</sup> - assume plastic off highway and clay in highway

Cover sizes to be in accordance with the relevant guidance document – SFA 7<sup>th</sup> or Building Regs Doc H. Note the access restriction to 450 plastic chambers in SFA 7<sup>th</sup>.

Surplus material is able to be disposed within the site

Connections to existing manhole not included - same for both options

Large site - SFA 7

Item No	Assumed item from SPONs Price Book	SPONS Reference	Unit	Quantity	Rate (£)	Total (£)
Main sewer manholes in highway	Manholes					
	Foul manhole in public highway - Assume this has to meet Sfa 7 requirements					
	<i>Precast concrete construction with</i>					
	<i>Circular shafts</i>					
	<i>150mm plain concrete C15/20 surround</i>					
	<i>225mm plain concrete C20/20 base slab</i>					
	<i>Precast reducing slab</i>					
	<i>Precast top slab</i>					
	<i>Maximum ht of working chamber 2m above benching</i>					
	<i>750mm diameter access shaft</i>					
	<i>Plain concrete C15/20 benching, 150mm clay main channel longitudinally and two 100mm branch channels</i>					
	<i>Step irons at 300mm centre, doubled if depth to invert exceeds 3m</i>					
	<i>Heavy duty manhole cover and frame</i>					
	<i>In manholes over 6m deep, landings at maximum intervals</i>					
	<i>Includes excavation, support, backfilling and disposal</i>					
	1200mm diameter x 1500 depth to invert	Civil Engineering and Highway Works Page229	No	14	£1,351.15	£18,916.10
	1200mm diameter x 2000 depth to invert	Civil Engineering and Highway Works Page229	No	7	£1,434.15	£10,039.05
	1200mm diameter x 2500 depth to invert	Civil Engineering and Highway Works Page229	No	1	£1,816.15	£1,816.15
	1200mm diameter x 3000 depth to invert	Civil Engineering and Highway Works Page229	No	4	£2,061.65	£8,246.60
	1200mm diameter x 3500 depth to invert	Civil Engineering and Highway Works Page231 use rate for 1800mm dia by 3500 depth	No	1	£4,446.85	£4,446.85
	Extra over for concrete surround to meet Sfa 7 requirement to GEN3 aggressive ground conditions	None - this is a typical foundation mix.				
	Extra over for 1200mm min dia access shaft to meet Sfa 7 requirements	No difference as depths are too shallow to require access shaft				
	Extra over for 300mm concrete surround 1500 depth	Rate for mass concrete PC for concrete stool and thrust blocks Page 241. Only materials allowed for - extra cost of placing wider concrete surround is marginal.	m <sup>3</sup>	16.4	£62.15	£1,019.26
	Extra over for 300mm concrete surround 2000 depth	Rate for mass concrete PC for concrete stool and thrust blocks Page 241. Only materials allowed for - extra cost of placing wider concrete surround is marginal.	m <sup>3</sup>	11	£62.15	£683.65
	Extra over for 300mm concrete surround 2500 depth	Rate for mass concrete PC for concrete stool and thrust blocks Page 241. Only materials allowed for - extra cost of placing wider concrete surround is marginal.	m <sup>3</sup>	2	£62.15	£124.30
	Extra over for 300mm concrete surround 3000 depth	Rate for mass concrete PC for concrete stool and thrust blocks Page 241. Only materials allowed for - extra cost of placing wider concrete surround is marginal.	m <sup>3</sup>	9	£62.15	£559.35

	Extra over for 300mm concrete surround 3500 depth	Rate for mass concrete PC for concrete stool and thrust blocks Page 241. Only materials allowed for - extra cost of placing wider concrete surround is marginal.	m <sup>3</sup>	2.7	£62.15	£167.81
Sewer manholes in shared access	1200mm diameter x 1500 depth to invert	Civil Engineering and Highway Works Page229	No	3	£1,351.15	£4,053.45
	1200mm diameter x 2000 depth to invert	Civil Engineering and Highway Works Page229	No	0	£1,434.15	£0.00
	1200mm diameter x 2500 depth to invert	Civil Engineering and Highway Works Page229	No	0	£1,816.15	£0.00
	1200mm diameter x 3000 depth to invert	Civil Engineering and Highway Works Page229	No	0	£2,061.65	£0.00
	Extra over for concrete surround to meet SFA 7 requirement to GEN3 aggressive ground conditions	None - this is a typical foundation mix.				
	Extra over for 1200mm min dia access shaft to meet SFA 7 requirements	No difference as depths are too shallow to require access shaft				
	Extra over for 300mm concrete surround 1500 depth	Rate for mass concrete PC for concrete stool and thrust blocks Page 241. Only materials allowed for - extra cost of placing wider concrete surround is marginal.	m <sup>3</sup>	4	£62.15	£248.60
	Extra over for 300mm concrete surround 2000 depth	Rate for mass concrete PC for concrete stool and thrust blocks Page 241. Only materials allowed for - extra cost of placing wider concrete surround is marginal.	m <sup>3</sup>	0	£62.15	£0.00
	Extra over for 300mm concrete surround 2500 depth	Rate for mass concrete PC for concrete stool and thrust blocks Page 241. Only materials allowed for - extra cost of placing wider concrete surround is marginal.	m <sup>3</sup>	0	£62.15	£0.00
	Extra over for 300mm concrete surround 3000 depth	Rate for mass concrete PC for concrete stool and thrust blocks Page 241. Only materials allowed for - extra cost of placing wider concrete surround is marginal.	m <sup>3</sup>	0	£62.15	£0.00
	Part H inspection chamber - Does not meet SFA 7 standard <i>Inspection chambers polypropylene (Hepworth plc)</i> <i>Up to 1.2m deep including polymer chamber and cover and frame with screw down lid</i> <i>Excavation</i> <i>Backfilling</i> <i>Disposal</i>					
Type 4 Access chamber in garden	Inspection chamber 300mm diameter, 600mm deep	Landscaping and external works Page 365	No	0	£211.63	£0.00
Type 4 Inspection chamber in garden/footway/footpath - Private	Inspection chamber 450mm diameter, 1200mm deep	Landscaping and external works Page 365, 475mm dia chamber	No	32	£375.60	£12,019.20
	Inspection chamber 450mm diameter, 1500mm deep	See separate cost breakdown	No	0	£431.94	£0.00
Type 4 Inspection chamber in private parking or shared access - Sewer	Inspection chamber 450mm diameter, 1200mm deep	Landscaping and external works Page 365, 475mm dia chamber	No	0	£375.60	£0.00

Type 4 Inspection chamber in garden/footway/footpath - Sewer	Inspection chamber 450mm diameter, 1500mm deep	See separate cost breakdown	No	0	£431.94	£0.00
Type 3 Inspection chambers in garden	Inspection chamber 450mm diameter, 1200mm deep	Landscaping and external works Page 365, 475mm dia chamber	No	115	£375.60	£43,194.00
Type 3 Inspection chambers in shared access	Inspection chamber 450mm diameter, 1200mm deep	Landscaping and external works Page 365, 475mm dia chamber	No	0	£375.60	£0.00
Type 3 Inspection chambers in shared access	Inspection chamber 450mm diameter, 1200mm deep	Landscaping and external works Page 365, 475mm dia chamber	No	14	£375.60	£5,258.40
Type 3 Inspection chambers in shared access	Inspection chamber 450mm diameter, 1500mm deep	See separate cost breakdown	No	7	£431.94	£3,023.58
	Extra over for granular base	Page 279 Type 1 use material cost only as cost of laying is marginal.	m <sup>3</sup>	144.5	£24.35	£3,518.58
	Extra over for 300mm Type 1 surround 600mm deep		m <sup>3</sup>	0	£24.35	£0.00
	Extra over for 300mm Type 1 surround 1200mm deep	Assume average depth of ICs is 1m.	m <sup>3</sup>	114	£24.35	£2,775.90
	Extra over for 300mm Type 1 surround 1500mm deep	Assume average depth of ICs is 1.5m.	m <sup>4</sup>	8	£25.35	£202.80
Type 3/4 Inspection chambers in shared access or private parking	Extra over for inspection chamber located in area subject to vehicle loading. Iron frame and cover	Those in shared access driveway and parking use rate for access cover and frame for concrete manholes (£350)	No	20	£350.00	£7,000.00
Main sewers in road/shared access	Pipes					
	Vitrified clay pipes to BSEN295 plain ends with push fit polypropylene couplings 100mm pipes in trenches ne 1.5m deep	Civil Engineering and Highway Works Page205	m	30	£32.30	£969.00
	ne 2.0m deep	Civil Engineering and Highway Works Page206	m	0	£37.78	£0.00
	Vitrified clay pipes to BSEN295 plain ends with push fit polypropylene couplings 150mm pipes in trenches ne 1.5m deep	Civil Engineering and Highway Works Page206	m	536	£46.52	£24,934.72
	ne 2.0m deep	Civil Engineering and Highway Works Page206	m	197	£50.53	£9,954.41
	ne 2.5m deep	Civil Engineering and Highway Works Page206	m	66	£55.83	£3,684.78
	ne 3.0m deep	Civil Engineering and Highway Works Page206	m	84	£62.49	£5,249.16
	ne 3.5m deep	Civil Engineering and Highway Works Page207	m	25	£75.76	£1,894.00
	Extra over for backfill with Type 1	Use material cost only as compaction, etc remains the same.	m <sup>3</sup>	507	£24.35	£12,345.45
Sewer under shared access or private parking 100mm	Unplasticized PVC pipes ring seal sockets excavation and supports backfilling 6m ppe lengths 110mm pipes in trenches ne 1.5m deep	Civil Engineering and Highway Works Page218	m	900	£26.36	£23,724.00
	ne 2.0m	Civil Engineering and Highway Works Page218	m	161	£30.35	£4,886.35
	ne 2.5m	Civil Engineering and Highway Works Page218	m	7	£34.32	£240.24
	Extra over for backfill with Type 1	Use material cost only as compaction, etc remains the same.	m <sup>3</sup>	480	£24.35	£11,688.00

Sewer under shared access or private parking 150mm	Unplasticized PVC pipes ring seal sockets excavation and supports backfilling 6m ppe lengths 160mm pipes in trenches ne 1.5m deep	Civil Engineering and Highway Works Page218	m	50	£51.48	£2,574.00	
	ne 2.0m	Civil Engineering and Highway Works Page218	m	16	£55.51	£888.16	
	Extra over for backfill with Type 1	Use material cost only as compaction, etc remains the same.	m <sup>3</sup>	57	£24.35	£1,387.95	
Sewer/private under garden/path 100mm	Unplasticized PVC pipes ring seal sockets excavation and supports backfilling 6m ppe lengths 110mm pipes in trenches ne 1.5m deep	Civil Engineering and Highway Works Page218	m	332	£26.36	£8,751.52	
	ne 2.0m	Civil Engineering and Highway Works Page218	m	9	£30.35	£273.15	
	ne 2.5m	Civil Engineering and Highway Works Page218	m		£34.32	£0.00	
Sewer/private under garden/path 150mm	Unplasticized PVC pipes ring seal sockets excavation and supports backfilling 6m ppe lengths 160mm pipes in trenches ne 1.5m deep	Civil Engineering and Highway Works Page218	m	43	£51.48	£2,213.64	
	ne 2.0m	Civil Engineering and Highway Works Page218	m	0	£55.51	£0.00	
Pipe bedding	Imported granular material - 100mm deep bed for 100mm dia pipe	Civil Engineering and Highway Works Page238	m	1439	£3.20	£4,604.80	
	Imported granular material - 150mm deep bed for 150mm dia pipe	Civil Engineering and Highway Works Page238	m	1017	£7.36	£7,485.12	
Pipe surround	Imported granular material - 100mm deep surround for 100mm dia pipe	Civil Engineering and Highway Works Page238	m	1439	£10.49	£15,095.11	
	Imported granular material - 150mm deep surround for 150mm dia pipe	Civil Engineering and Highway Works Page238	m	1017	£14.33	£14,573.61	
Total Cost for comparison purposes - Large site SFA7						£284,730.79	
Plus need to take into account variations in underslab drainage not included in above							
Extra costs if have to dig through existing road and reinstate	Excavate tarmacadam surface exposed at commencing surface ne 0.25m maximum depth	Civil Engineering and Highway Works Page 162 assume width is 450mm and 522m length	m <sup>3</sup>	59	£24.81	£1,463.79	
	Reinstate asphalt surface					£0.00	
	100mm DBM Base	Civil Engineering and Highway Works Page 280 assume width is 450mm and 522m length (note this is for large highways schemes so there will be an uplift for small works and hand laying - say 30%)	m <sup>3</sup>	24	£18.10	£434.40	Base rate without uplift £18.91
	100mm DBM Binder	Civil Engineering and Highway Works Page 280 assume width is 450mm and 522m length	m <sup>3</sup>	24	£16.78	£402.72	Base rate without uplift £12.91
	30mm DBM Surface	Civil Engineering and Highway Works Page 280 assume width is 450mm and 522m length	m <sup>3</sup>	7	£7.86	£55.02	Base rate without uplift £6.05
Total extra over						£2,355.93	
Assumptions							

Note these comments relate to foul systems in accordance with Part H and as such the pipes are no greater than 150mm and thus all manholes to be 1200 diameter PCC Ring chambers, with 300mm of concrete surround. This is based on the common practise of over excavating the void for the manhole, and allows proper compaction of the concrete in compliance with the specification. The cost of correct materials and methods for larger voids is likely to be similar to the notional 300 of concrete.

ICs are to be 450 plastic chambers with 300mm surround of type 1 material. Again, this thickness of surround is specified to allow proper compaction of the granular material.

All backfill to pipe runs beneath carriageways to be compacted Type 1 material.

Backfill to pipes within landscaped areas may be as-dug material

All pipe bedding assumed to be class S (full granular bed and surround)

Pipework may be clay or plastic, as long as it is compliant with the standards set out in SFA 7<sup>th</sup> - assume plastic off highway and clay in highway

Cover sizes to be in accordance with the relevant guidance document – SFA 7<sup>th</sup> or Building Regs Doc H. Note the access restriction to 450 plastic chambers in SFA 7<sup>th</sup>.

Surplus material is able to be disposed within the site

Connections to existing manhole not included - same for both options



Large site - SFA 7

Item No	Assumed item from SPONs Price Book	SPONS Reference	Unit	Quantity	Rate (£)	Total (£)
Main sewer manholes in highway	Manholes					
	Foul manhole in public highway - Assume this has to meet Sfa 7 requirements					
	<i>Precast concrete construction with</i>					
	<i>Circular shafts</i>					
	<i>150mm plain concrete C15/20 surround</i>					
	<i>225mm plain concrete C20/20 base slab</i>					
	<i>Precast reducing slab</i>					
	<i>Precast top slab</i>					
	<i>Maximum ht of working chamber 2m above benching</i>					
	<i>750mm diameter access shaft</i>					
<i>Plain concrete C15/20 benching, 150mm clay main channel longitudinally and two 100mm branch channels</i>						
<i>Step irons at 300mm centre, doubled if depth to invert exceeds 3m</i>						
<i>Heavy duty manhole cover and frame</i>						
<i>In manholes over 6m deep, landings at maximum intervals</i>						
<i>Includes excavation, support, backfilling and disposal</i>						
	1200mm diameter x 1500 depth to invert	Civil Engineering and Highway Works Page229	No	14	£1,351.15	£18,916.10
	1200mm diameter x 2000 depth to invert	Civil Engineering and Highway Works Page229	No	7	£1,434.15	£10,039.05
	1200mm diameter x 2500 depth to invert	Civil Engineering and Highway Works Page229	No	4	£1,816.15	£7,264.60
	1200mm diameter x 3000 depth to invert	Civil Engineering and Highway Works Page229	No	2	£2,061.65	£4,123.30
	1200mm diameter x 3500 depth to invert	Civil Engineering and Highway Works Page231 use rate for 1800mm dia by 3500 depth	No	1	£4,446.85	£4,446.85
	Extra over for concrete surround to meet Sfa 7 requirement to GEN3 aggressive ground conditions	None - this is a typical foundation mix.				
	Extra over for 1200mm min dia access shaft to meet Sfa 7 requirements	No difference as depths are too shallow to require access shaft				
	Extra over for 300mm concrete surround 1500 depth	14 x 1.17m <sup>3</sup> Rate for mass concrete PC for concrete stool and thrust blocks Page 241. Only materials allowed for - extra cost of placing wider concrete surround is marginal.	m <sup>3</sup>	16.4	£62.15	£1,019.26
	Extra over for 300mm concrete surround 2000 depth	Rate for mass concrete PC for concrete stool and thrust blocks Page 241. Only materials allowed for - extra cost of placing wider concrete surround is marginal.	m <sup>3</sup>	11	£62.15	£683.65

	Extra over for 300mm concrete surround 2500 depth	Rate for mass concrete PC for concrete stool and thrust blocks Page 241. Only materials allowed for - extra cost of placing wider concrete surround is marginal.	m <sup>3</sup>	7.8	£62.15	£484.77
	Extra over for 300mm concrete surround 3000 depth	Rate for mass concrete PC for concrete stool and thrust blocks Page 241. Only materials allowed for - extra cost of placing wider concrete surround is marginal.	m <sup>3</sup>	4.7	£62.15	£292.11
	Extra over for 300mm concrete surround 3500 depth	Rate for mass concrete PC for concrete stool and thrust blocks Page 241. Only materials allowed for - extra cost of placing wider concrete surround is marginal.	m <sup>3</sup>	2.7	£62.15	£167.81
	<p>Part H inspection chamber - Does not meet SfA 7 standard  <i>Inspection chambers polypropylene (Hepworth plc)</i>  <i>Up to 1.2m deep including polymer chamber and cover and frame with screw down lid</i>  <i>Excavation</i>  <i>Backfilling</i>  <i>Disposal</i></p>					
Type 4 Access chamber in garden	Inspection chamber 300mm diameter, 600mm deep	Landscaping and external works Page 365	No	0	£211.63	£0.00
Type 4 Inspection chamber in garden/footway/footpath - Private	Inspection chamber 450mm diameter, 1200mm deep	Landscaping and external works Page 365, 475mm dia chamber	No	111	£375.60	£41,691.60
	Inspection chamber 450mm diameter, 1500mm deep	See separate cost breakdown	No	0	£431.94	£0.00
Type 4 Inspection chamber in private parking or shared access - Sewer	Inspection chamber 450mm diameter, 1200mm deep	Landscaping and external works Page 365, 475mm dia chamber	No	0	£375.60	£0.00
	Inspection chamber 450mm diameter, 1500mm deep	See separate cost breakdown	No	0	£431.94	£0.00
Type 4 Inspection chamber in garden/footway/footpath - Sewer	Inspection chamber 450mm diameter, 1200mm deep	Landscaping and external works Page 365, 475mm dia chamber	No	134	£375.60	£50,330.40
Type 3 Inspection chambers in garden	Inspection chamber 450mm diameter, 1200mm deep	Landscaping and external works Page 365, 475mm dia chamber	No	0	£375.60	£0.00
Type 3 Inspection chambers in shared access	Inspection chamber 450mm diameter, 1200mm deep	Landscaping and external works Page 365, 475mm dia chamber	No	43	£375.60	£16,150.80

Type 3 Inspection chambers in shared access	Inspection chamber 450mm diameter, 1500mm deep	See separate cost breakdown	No	4	£431.94	£1,727.76
	Extra over for granular base	Page 279 Type 1 use material cost only as cost of laying is marginal.	m <sup>3</sup>	251	£24.35	£6,111.85
	Extra over for 300mm Type 1 surround 600mm deep		m <sup>3</sup>	0	£24.35	£0.00
	Extra over for 300mm Type 1 surround 1200mm deep	Assume average depth of ICs is 1m.	m <sup>3</sup>	204	£24.35	£4,967.40
	Extra over for 300mm Type 1 surround 1500mm deep	Assume average depth of ICs is 1.5m.	m <sup>4</sup>	4.2	£25.35	£106.47
Type 3/4 Inspection chambers in shared access or private parking	Extra over for inspection chamber located in area subject to vehicle loading. Iron frame and cover	Those in shared access driveway and parking use rate for access cover and frame for concrete manholes (£350)	No	47	£350.00	£16,450.00
	Pipes					
Main sewers in road/shared access	Vitrified clay pipes to BSEN295 plain neds with push fit polypropylene couplings 100mm pipes in trenches ne 1.5m deep	Civil Engineering and Highway Works Page205	m	184	£32.30	£5,943.20
	ne 2.0m deep	Civil Engineering and Highway Works Page206	m	90	£37.78	£3,400.20
	Vitrified clay pipes to BSEN295 plain neds with push fit polypropylene couplings 150mm pipes in trenches ne 1.5m deep	Civil Engineering and Highway Works Page206	m	241	£46.52	£11,211.32
	ne 2.0m deep	Civil Engineering and Highway Works Page206	m	128	£50.53	£6,467.84
	ne 2.5m deep	Civil Engineering and Highway Works Page206	m	85	£55.83	£4,745.55
	ne 3.0m deep	Civil Engineering and Highway Works Page206	m	133	£62.49	£8,311.17
	Extra over for backfill with Type 1	Use material cost only as compaction, etc remains the same.	m <sup>3</sup>	774	£24.35	£18,846.90
Sewer under shared access or private parking 100mm	Unplasticized PVC pipes ring seal sockets excavation and supports backfilling 6m ppe lengths 110mm pipes in trenches ne 1.5m deep	Civil Engineering and Highway Works Page218	m	200	£26.36	£5,272.00
	ne 2.0m	Civil Engineering and Highway Works Page218	m	10	£30.35	£303.50
	ne 2.5m	Civil Engineering and Highway Works Page218	m	0	£34.32	£0.00
	Extra over for backfill with Type 1	Use material cost only as compaction, etc remains the same.	m <sup>3</sup>	94	£24.35	£2,288.90
Sewer under shared access or private parking 150mm	Unplasticized PVC pipes ring seal sockets excavation and supports backfilling 6m ppe lengths 160mm pipes in trenches ne 1.5m deep	Civil Engineering and Highway Works Page218	m	245	£51.48	£12,612.60

	ne 2.0m	Civil Engineering and Highway Works Page218	m	22	£55.51	£1,221.22
	Extra over for backfill with Type 1	Use material cost only as compaction, etc remains the same.	m <sup>3</sup>	120	£24.35	£2,922.00
Sewer under garden/path 100mm	Unplasticized PVC pipes ring seal sockets excavation and supports backfilling 6m ppe lengths 110mm pipes in trenches ne 1.5m deep	Civil Engineering and Highway Works Page218	m	986	£26.36	£25,990.96
	ne 2.0m	Civil Engineering and Highway Works Page218	m		£30.35	£0.00
	ne 2.5m	Civil Engineering and Highway Works Page218	m		£34.32	£0.00
Private under garden/path 100mm	Unplasticized PVC pipes ring seal sockets excavation and supports backfilling 6m ppe lengths 110mm pipes in trenches ne 1.5m deep	Civil Engineering and Highway Works Page218	m	521	£26.36	£13,733.56
Sewer under garden/path 150mm	Unplasticized PVC pipes ring seal sockets excavation and supports backfilling 6m ppe lengths 160mm pipes in trenches ne 1.5m deep	Civil Engineering and Highway Works Page218	m	138	£51.48	£7,104.24
	ne 2.0m	Civil Engineering and Highway Works Page218	m	4	£55.51	£222.04
Pipe bedding	Imported granular material - 100mm deep bed for 100mm dia pipe	Civil Engineering and Highway Works Page238	m	1991	£3.20	£6,371.20
	Imported granular material - 150mm deep bed for 150mm dia pipe	Civil Engineering and Highway Works Page238	m	996	£7.36	£7,330.56
Pipe surround	Imported granular material - 100mm deep surround for 100mm dia pipe	Civil Engineering and Highway Works Page238	m	1991	£10.49	£20,885.59
	Imported granular material - 150mm deep surround for 150mm dia pipe	Civil Engineering and Highway Works Page238	m	996	£14.33	£14,272.68
Total Cost for comparison purposes - Large site SFA7						£364,431.00
Plus need to take into account variations in underslab drainage not included in above						

Assumptions

Note these comments relate to foul systems in accordance with Part H and as such the pipes are no greater than 150mm and thus all manholes to be 1200 diameter PCC Ring chambers, with 300mm of concrete surround. This is based on the common practise of over excavating the void for the manhole, and allows proper compaction of the concrete in compliance with the specification. The cost of correct materials and methods for larger voids is likely to be similar to the notional 300 of concrete.

ICs are to be 450 plastic chambers with 300mm surround of type 1 material. Again, this thickness of surround is specified to allow proper compaction of the granular material.

All backfill to pipe runs beneath carriageways to be compacted Type 1 material.

Backfill to pipes within landscaped areas may be as-dug material

All pipe bedding assumed to be class S (full granular bed and surround)

Pipework may be clay or plastic, as long as it is compliant with the standards set out in SFA 7<sup>th</sup> - assume plastic off highway and clay in highway

Cover sizes to be in accordance with the relevant guidance document – SFA 7<sup>th</sup> or Building Regs Doc H. Note the access restriction to 450 plastic chambers in SFA 7<sup>th</sup>.

Surplus material is able to be disposed within the site

Connections to existing manhole not included - same for both options

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