Kingsway Tunnels - Totals Tunnel strip out

Item	No.	Sum	Unit	Notes / Assumptions
General				
Floor space area (GIA)		6263.4	m2	Total Floor area - approximate based on Matterport surevy. .
Total internal surface area of tunnel minus floor space area		17670.8	m2	2x πr2 Plus 2πr2xL
Concrete				
Area of Dividing Blockwork walls		779.6	m2	50% of the south street west tunnel x height
Total concrete floor (in situ quantities pre-processing)		2456.8	m3	Approximate concrete within base of tunnel bore, not accounting for drainage and or service ducting - assumed removal of 50%
Total volume of concrete & brick work partition walls	0.15	**116.9**	**m3**	Wall thickness measured from Matteport survey 0.15
Total concrete (in situ quantities pre processing)		***2573.7***	***m3***	Based on the above assumptions and calculations - Tonnes conversion factors based on referenced websites and standard guidance (Bulk density of 2300kg/m3)
Processed concrete volume (inc bulking factor)		***4375.3***	***m3***	
Concrete tonnes conversation		***10063.2***	***Tonnes***	
Miscallaneous Office Equipment & Hard furnishings (soft strip malterial)				
Desks / Chairs / Furnitures all occupied floors		***9.6***	***Tonnes***	Estimated value based on Matterport survey
Showers and toilets		***1.2***	***Tonnes***	
Floor Tiles (Assumed ceramic tile) (Patterned)				
Total floor tiles		3548.8	m2	Assumption Based on Matterport survey
Total Volume of floor Tiles	0.05	***177.4***	***m3***	Thickness assumption based on average thickness of commercial tiles (0.05m)
Tile tonnes	2.4	***425.9***	***Tonnes***	weight conversion based on referenced websites
Floor Tiles (Vinyl)				
Tiled floor space per floor		1099.5	m2	Assumption Based on Matterport survey (2.6kg per m2)
Total Volume of floor Tiles	0.003	***3.3***	***m3***	Thickness assumption based on average thickness of commercial tiles (0.003m)
Tile tonnes	0.0026	***2.9***	***Tonnes***	weight conversion based on referenced websites (2.6kg per m2)
Floor Tiles (Glazed Ceramic)				
Tiled floor space per floor		548.0	m2	Assumption Based on Matterport survey
Total Volume of floor Tiles	0.05	***27.4***	***m3***	Thickness assumption based on average thickness of commercial tiles (0.05m)
Tile tonnes	2.4	***65.8***	***Tonnes***	weight conversion based on referenced websites
Carpets				
Total area of carpet		999.3	m2	Assumption Based on Matterport survey
Carpet thickness	0.01	***10.0***	***m3***	
Carpet Tonnes	0.0055	***5.5***	***Tonnes***	Online sources show 550g per m2
Ceiling Tiles (Mineral Fibre acoustic boards)				
Mineral Fibre Ceiling tiles		724.1	m2	Assumption Based on Matterport survey
Total Volume of Ceiling Tiles	0.0015	***1.1***	***m3***	Thickness assumption based on average thickness of ceiling tiles (0.0015m)

Tile tonnes	0.0034	***2.5***	***Tonnes***	Weight conversion based on referenced websites (1m2=3.47kg)	
Ceiling Tiles (Metal Slat Roof) (Potentially Aluminum) (in North Street West Canteen area)					
Metal Slat roof (western Half)		276.2	m2	Assumption that metal slat roof (western Portion)	
Total ceiling tiles all occupied floors	1	276.2	m2	Assume that consistent on all occupied floors	
Total Volume of Ceiling Tiles	0.0015	***0.4***	***m3***	Thickness assumption based on average thickness of ceiling tiles (0.0015m)	
Tile tonnes	0.34	***0.1***	***Tonnes***	Weight conversion based on referenced websites	
Water pipework (Ferrous metal)					
Water pipework		***1346.1***	***m***	Length of tunnel plus width in m. based on assumptions.	
Steel Pipework	0.015	***20.2***	***Tonnes***	1m steel pipe = 0.0015 tonnes (25mm dia pipe with 2.5mm thick walls)	
Electrical (Non-Ferrous Metals)					
LV Electrical cables		5018.8	m	Based on Matterport survey assumptions	
Volume in m3 for LV Electrical cables	0.04	200.8	m3	Assumption based on referenced websites	
Volume in tonnes for LV electrical cables	0.015	**3.0**	**Tonnes**	15kg per m3	
Flourescent Lighting		505.0	Units	Assume that consistent throughout tunnel	
Total Florescent Lighting		***0.5***	***Tonnes***	95g each flourescent tube aprox	
Electrical switchgear and circuit breakers	25	**7.5**	**Tonnes**	25 switchgear cabinets - Assumption of 300kg per unit	
Transformers	10	**28.0**	**Tonnes**	2 transformers, winding weight unknown from Matterport survey. assume 2,860kg from modern units	
Generator equipment and AC/DC inverter	1	**8.0**	**Tonnes**	8 tonnes per unit assumption	
HV electical transformers	4	**11.4**	**Tonnes**	Assumption taken from matterport survey of 2,860kg per unit	
Bakerlite pannels (Identified in asbestos management survey)					
Total Bakerlite panneling		11867.2	m2	Assumptions from Matterport survey Bakerlite pannel weight = 1250kg / m3	
Bakerlite panneling m3	0.002	***23.7***	***m3***	Bakerlite pannel thickness 2mm	
Bakerlite panneling tonnes	1.25	***29.7***	***tonnes***		
Doors					
Doors		164.0	No.	Assumptions from matterport surevy	11480
Weight of doors tonnes	0.04	***6.6***	***Tonnes***	Weight based on referenced website average 40kg per door - 1m3 = 1000kg	
Ventilation ducting (Ferrous metal)					
Ductwork for Air handling units		***15.4***	***Tonnes***	Approximately 1 length of the tunnels assumption from Matterport survey(15kg/m)	
Total		***15.4***	***Tonnes***		
Additional Plant (Mixed Ferrous and Non-Ferrous Metals)					
Air Handling Unit	1	2.1	Tonnes	Assumption weight taken from a modern modular packaged air handling unit (NuAire - NA17-220/130 - 2.13 tonnes per unit)	
2 x Large 6 cylinder Diesel generators		16.0	Tonnes	Assumption from matter port survey as a 6-cylinder Ruston 6APC engine - 8 tonnes	
DC lead batteries 23 cells within 1 rack		0.72		Assumptions from Matterport survey DC battery rack weight aprox 720kg	
Air Handling Unit	1	2.1	Tonnes	Assumption weight taken from a modern modular packaged air handling unit (NuAire - NA17-220/130 - 2.13 tonnes per unit)	

2 x Large 6 cylinder Diesel generators		16.0	Tonnes	Assumption from Matterport survey as a 6-cylinder Ruston 6APC engine - 8 tonnes
Asbestos 3 stage Decontamination Unit		0.9	Tonnes	930 kg average unit
Water chiller unit		0.2	Tonnes	Assumption of 192kg taken from modern equivalent and observation from Matterport survey
Air Handling Unit	1	2.1	Tonnes	weight taken from a modern modular packaged air handling unit (NuAire - NA17-220/130 - 2.13 tonnes per unit)
Telecoms exchange racking		1.2	Tonnes	Assumption based on Matterport survey
Total		***41.4***	***Tonnes***	

Second Avenue

Usage: Fitted-out Offices

1st half furnishings; Bakelite panels on walls and roof, Room dividers Bakelite, Carpet throughout

Item	No.	Sum	Unit	Notes / Assumptions
General				
Floor space area (GIA)		539.0	m2	Total Floor area - approximate based on Matterport surevy. .
Tunnel bore height (including concrete floor)		5.7	m	Measurement from floor to roof of tunnel bore
Length of Tunnel		77.0	m	Length of tunnel
Diameter of Tunnel		7.2	m	Average width assumed constant throughout tunnel
Radius of tunnel		3.6	m	Width halved
Floor width		7.0	m	floor width within bottom 10th of tunnel bore
Total internal surface area of tunnel minus floor space area		1,284.1	m2	2x πr2 Plus 2πr2xL
Concrete				
Total volume concrete floor		**229.9**	***m3***	Approximate concrete within base of tunnel bore, not accounting for drainage and or service ducting - assumed removal of 50%
Total concrete (in situ quantities pre processing)		**229.9**	***m3***	Based on the above assumptions and calculations - Tonnes conversion factors based on referenced websites and standard guidance (Bulk density of 2300kg/m3)
Processed concrete volume (inc bulking factor)		**390.8**	***m3***	
Concrete tonnes conversation		**528.7**	***Tonnes***	
Miscallaneous Office Equipment & Hard furnishings (soft strip malterial)				
Desks / Chairs /Msc fixtures and fittings /Furnitures		***2.8***	***Tonnes***	Estimated value based on Matterport survey
Ceiling Tiles (Mineral Fibre acoustic boards)				
Mineral Fibre Ceiling tiles		539.0	m2	The assumption that the ceiling is office tiling
Total Volume of Ceiling Tiles	0.0015	***0.8***	***m3***	Thickness assumption based on average thickness of ceiling tiles (0.0015m)
Tile tonnes	0.0034	***1.8***	***Tonnes***	Weight conversion based on referenced websites (1m2=3.47kg)
Carpets				
Total area of carpet		539.0	m2	Assumption that carpet covers all of the floor space within office fit out
Carpet thickness	0.01	***5.4***	***m3***	
Carpet Tonnes	0.0055	***3.0***	***Tonnes***	Online sources show 550g per m2
Water pipework				
Water pipework	0.015	***84.2***	***m***	Length of tunnel plus width in m. based on assumptions. 0.015m based on referenced websites.
Steel Pipework	0.96	***1.3***	***Tonnes***	1m steel pipe = 0.0015 tonnes (25mm dia pipe with 2.5mm thick walls)
Electrical				
LV Electrical cables		308.0	m	Assumed 4 lengths off tunnel for distribution
Volume in m3 for LV Electrical cables	0.04	12.3	m3	Assumption based on referenced websites
Volume in tonnes for LV electrical cables	0.015	**0.2**	**Tonnes**	
Fluorescent Lighting per floor		***40.0***	***No.***	Based on assumptions
Total volume Florescent Lighting		***0.0***	***Tonnes***	95g each flourescent tube aprox
Bakerlite pannels (Identified in asbestos management survey)				

Total Bakerlite panneling		1,541.0	m2	Assumptions from Matterport survey Bakerlite panel weight = 1250kg / m3 (fitted out office, 20% added for partition walls)
Bakerlite panneling m3	0.002	3.1	m3	Bakerlite pannel thickness 2mm
Bakerlite panneling tonnes	1.25	***3.9***	***Tonnes***	
Doors				
Doors		35.0	No.	Assumption from matterport survey
Weight of doors tonnes	0.04	***1.4***	***Tonnes***	Weight based on referenced website average 40kg per door - 1m3 = 1000kg
Ventilation ducting				
Ductwork for Air handling units		***1.2***	***Tonnes***	Approximately 1 lengths of the tunnel (15kg/m)

First Avenue

Usage: Fitted-out Offices & Decom Asbestos unit

1st half furnishings; Bakelite panels on walls and roof, Room dividers Bakelite, carpet throughout

2nd half furnishings: Asbestos decom unit, Bakelite walls and ceramic tiles floor

Item	No.	Sum	Unit	Notes / Assumptions
General				
Floor space area (GIA)		525.0	m2	Total Floor area - approximate based on Matterport surevy. .
Tunnel bore height (including concrete floor)		5.7	m	Measurement from floor to roof of tunnel bore
Length of Tunnel		75.0	m	Length of tunnel
Diameter of Tunnel		7.2	m	Average width assumed constant throughout tunnel
Radius of tunnel		3.6	m	Width halved
Floor width		7.0	m	floor width within bottom 10th of tunnel bore
Total internal surface area of tunnel minus floor space area		1252.9	m2	2x πr2 Plus 2πr2xL
Concrete				
Total volume concrete floor		**223.9**	***m3***	Approximate concrete within base of tunnel bore, not accounting for drainage and or service ducting - assumed removal of 50%
Total concrete (in situ quantities pre processing)		**223.9**	***m3***	Based on the above assumptions and calculations - Tonnes conversion factors based on referenced websites and standard guidance (Bulk density of 2300kg/m3)
Processed concrete volume (inc bulking factor)		**380.6**	***m3***	
Concrete tonnes conversation		**514.9**	***Tonnes***	
Miscallaneous Office Equipment & Hard furnishings (soft strip malterial)				
Desks / Chairs /Msc fixtures and fittings /Furnitures		***1.4***	***Tonnes***	Estimated based on matteprort survey, Half tunnel fitted out as office space
Desks / Chairs / Msc fixtures and fittings/ Furnitures all occupied floors		***0.0***	***Tonnes***	
Floor Tiles (Assumed ceramic tile)				
Tiled floor space per floor		183.8	m2	The assumption that 1/3 the floor space is ceramic tiling (14kg per m2)
Total Volume of floor Tiles	0.003	***0.6***	***m3***	Thickness assumption based on average thickness of commercial tiles (0.003m)
Tile tonnes	0.0026	***0.5***	***Tonnes***	Weight conversion based on referenced websites (2.6kg per m2)
Floor Tiles (Vinyl)				
Tiled floor space per floor		183.8	m2	Vinyl flooring (Office portion) (2.6kg per m2) 3rd of floor space
Total Volume of floor Tiles	0.003	***0.6***	***m3***	Thickness assumption based on average thickness of commercial tiles (0.003m)
Tile tonnes	0.0026	***0.5***	***Tonnes***	weight conversion based on referenced websites (2.6kg per m2)
Ceiling Tiles (Mineral Fibre acoustic boards)				
Mineral Fibre Ceiling tiles		183.8	m2	The assumption that 1/3 the ceiling is office tiling
Total Volume of Ceiling Tiles	0.0015	***0.3***	***m3***	Thickness assumption based on average thickness of ceiling tiles (0.0015m)
Tile tonnes	0.0034	***0.6***	***Tonnes***	Weight conversion based on referenced websites (1m2=3.47kg)
Carpets				
Total area of carpet		157.5	m2	Assumption that carpet covers 1/3 of the floor space
Carpet thickness	0.01	***1.6***	***m3***	
Carpet Tonnes	0.55	***0.9***	***Tonnes***	Online sources show 550g per m2
Water pipework				

Water pipework	0.015	***82.2***	***m***	Length of tunnel plus width in m. based on assumptions. 0.015m based on referenced websites.
Steel Pipework	0.96	***1.2***	***Tonnes***	1m steel pipe = 0.0015 tonnes (25mm dia pipe with 2.5mm thick walls)
Electrical				
LV Electrical cables		300.0	m	Assumed 4 lengths off tunnel for distribution
Volume in m3 for LV Electrical cables	0.04	12.0	m3	Assumption based on referenced websites
Volume in tonnes for LV electrical cables	0.015	***0.2***	***Tonnes***	
Fluorescent Lighting per floor		***40.0***	***No.***	Based on assumptions
Total volume Florescent Lighting		***0.0***	***Tonnes***	95g each flourescent tube aprox
Bakerlite pannels (Identified in asbestos management survey)				
Total Bakerlite panneling		1503.5	m2	Assumptions from Matterport survey Bakerlite panel weight = 1250kg / m3 (fitted out office, 20% added for partition walls)
Bakerlite panneling m3	0.002	3.0	m3	Bakerlite pannel thickness 2mm
Bakerlite panneling tonnes	1.25	***3.8***	***Tonnes***	
Doors				
Doors		25.0	No.	Assumption from matterport survey
Weight of doors tonnes	0.04	***1.0***	***Tonnes***	Weight based on referenced website average 40kg per door - 1m3 = 1000kg
Ventilation ducting				
Ductwork for Air handling units		***1.1***	***Tonnes***	Approximately 1 lengths of the tunnel (15kg/m)
Additional Plant				
Asbestos 3 stage Decontamination Unit		0.9	Tonnes	930 kg average unit
Total		***0.9***	***Tonnes***	

Service Avenue

Usage: Housing Vent plant

1st half furnishings; Bare tunnel lining with Ventialtion plant present, ceramic tiles and concrete plinths

2nd half furnishings:

Item	No.	Sum	Unit	Notes / Assumptions
General				
Floor space area (GIA)		308.0	m2	Total Floor area - approximate based on Matterport surevy. .
Tunnel bore height (including concrete floor)		5.7	m	Measurement from floor to roof of tunnel bore
Length of Tunnel		44.0	m	Length of tunnel
Diameter of Tunnel		7.2	m	Average width assumed constant throughout tunnel
Radius of tunnel		3.6	m	Width halved
Floor width		7.0	m	floor width within bottom 10th of tunnel bore
Total internal surface area of tunnel minus floor space area		768.7	m2	2x πr2 Plus 2πr2xL
Concrete				
Total volume concrete floor		**223.9**	***m3***	Approximate concrete within base of tunnel bore, not accounting for drainage and or service ducting - assumed removal of 50%
Total concrete (in situ quantities pre processing)		**223.9**	***m3***	Based on the above assumptions and calculations - Tonnes conversion factors based on referenced websites and standard guidance (Bulk density of 2300kg/m3)
Processed concrete volume (inc bulking factor)		**380.6**	***m3***	
Concrete tonnes conversation		**514.9**	***Tonnes***	
Floor Tiles (Ceramic)				
Tiled floor space per floor		308.0	m2	The assumption that the floor space is ceramic tiling (14kg per m2)
Total Volume of floor Tiles	0.003	***0.9***	***m3***	Thickness assumption based on average thickness of commercial tiles (0.003m)
Tile tonnes	0.0026	***0.8***	***Tonnes***	Weight conversion based on referenced websites (2.6kg per m2)
Water pipework				
Water pipework	0.015	***51.2***	***m***	Length of tunnel plus width in m. based on assumptions. 0.015m based on referenced websites.
Steel Pipework	0.96	***0.8***	***Tonnes***	1m steel pipe = 0.0015 tonnes (25mm dia pipe with 2.5mm thick walls)
Electrical				
LV Electrical cables		176.0	m	Assumed 4 lengths off tunnel for distribution
Volume in m3 for LV Electrical cables	0.04	7.0	m3	Assumption based on referenced websites
Volume in tonnes for LV electrical cables	0.015	**0.1**	**Tonnes**	
Fluorescent Lighting per floor		***40.0***	***No.***	Based on assumptions
Total volume Florescent Lighting		***0.0***	***Tonnes***	95g each flourescent tube aprox
Bakerlite pannels (Identified in asbestos management survey)				
Total Bakerlite panneling		308.0	m2	Assumptions from Matterport survey Bakerlite panel weight = 1250kg / m3 (Roof coverage)
Bakerlite panneling m3	0.002	0.6	m3	Bakerlite pannel thickness 2mm
Bakerlite panneling tonnes	1.25	***0.8***	***Tonnes***	
Additional Plant				

Water chiller unit	1	0.2	Tonnes	Assumption of 192kg taken from modern equivalent and observation from matterport survey
Air Handling Unit	1	2.1	Tonnes	weight taken from a modern modular packaged air handling unit (NuAire - NA17-220/130 - 2.13 tonnes per unit)
Total		***2.3***	***Tonnes***	

Goods Avenue

Usage: Bare tunnel bore service tunnel between service avenue and goods avenue

1st half furnishings;

2nd half furnishings:

Item	No.	Sum	Unit	Notes / Assumptions
General				
Floor space area (GIA)		109.82	m2	Total Floor area - approximate based on Matterport surevy. .
Tunnel bore height (including concrete floor)		2.78	m	Measurement from floor to roof of tunnel bore
Length of Tunnel		38	m	Length of tunnel
Diameter of Tunnel		3.68	m	Average width assumed constant throughout tunnel
Radius of tunnel		1.84	m	Width halved
Floor width		2.89	m	floor width within bottom 10th of tunnel bore
Total internal surface area of tunnel minus floor space area		350.7726689	m2	2x πr2 Plus 2πr2xL
Concrete				
Total volume concrete floor		**38.3**	***m3***	Approximate concrete within base of tunnel bore, not accounting for drainage and or service ducting - assumed removal of 50%
Total concrete (in situ quantities pre processing)		**38.3**	***m3***	Based on the above assumptions and calculations - Tonnes conversion factors based on referenced websites and standard guidance (Bulk density of 2300kg/m3)
Processed concrete volume (inc bulking factor)		**65.11**	***m3***	
Concrete tonnes conversation		**88.09**	***Tonnes***	

Goods Alley

Usage: Bare tunnel bore service tunnel between goods avenue and telecoms switchroom

1st half furnishings; bare tunnel and concrete floors

2nd half furnishings:

Item	No.	Sum	Unit	Notes / Assumptions
General				
Floor space area (GIA)		132.9	m2	Total Floor area - approximate based on Matterport surevy. .
Tunnel bore height (including concrete floor)		3.7	m	Measurement from floor to roof of tunnel bore
Length of Tunnel		44.6	m	Length of tunnel
Diameter of Tunnel		4.6	m	Average width assumed constant throughout tunnel
Radius of tunnel		2.3	m	Width halved
Floor width		3.0	m	floor width within bottom 10th of tunnel bore
Total internal surface area of tunnel minus floor space area		541.7	m2	2x πr2 Plus 2πr2xL
Concrete				
Total volume concrete floor		**49.3**	***m3***	Approximate concrete within base of tunnel bore, not accounting for drainage and or service ducting - assumed removal of 50%
Total concrete (in situ quantities pre processing)		**49.3**	***m3***	Based on the above assumptions and calculations - Tonnes conversion factors based on referenced websites and standard guidance (Bulk density of 2300kg/m3)
Processed concrete volume (inc bulking factor)		**83.7**	***m3***	
Concrete tonnes conversation		**113.3**	***Tonnes***	

Telecoms room

Usage: Bare tunnel bore with telecoms switchroom

1st half furnishings; bare tunnel with telecoms switchgear and ceramic flooring

2nd half furnishings:

Item	No.	Sum	Unit	Notes / Assumptions
General				
Floor space area (GIA)		99.0	m2	Total Floor area - approximate based on Matterport surevy. .
Tunnel bore height (including concrete floor)		5.7	m	Measurement from floor to roof of tunnel bore
Length of Tunnel		16.5	m	Length of tunnel
Diameter of Tunnel		7.2	m	Average width assumed constant throughout tunnel
Radius of tunnel		3.6	m	Width halved
Floor width		6.0	m	floor width within bottom 10th of tunnel bore
Total internal surface area of tunnel minus floor space area		355.7	m2	2x πr2 Plus 2πr2xL
Concrete				
Total volume concrete floor		**49.3**	***m3***	Approximate concrete within base of tunnel bore, not accounting for drainage and or service ducting - assumed removal of 50%
Total concrete (in situ quantities pre processing)		**49.3**	***m3***	Based on the above assumptions and calculations - Tonnes conversion factors based on referenced websites and standard guidance (Bulk density of 2300kg/m3)
Processed concrete volume (inc bulking factor)		**83.7**	***m3***	
Concrete tonnes conversation		**113.3**	***Tonnes***	
Floor Tiles (Assumed ceramic tile)				
Tiled floor space per floor		99.0	m2	The assumption that the floor space is ceramic tiling (14kg per m2)
Total Volume of floor Tiles	0.003	***0.3***	***m3***	Thickness assumption based on average thickness of commercial tiles (0.003m)
Tile tonnes	0.0026	***0.3***	***Tonnes***	Weight conversion based on referenced websites (2.6kg per m2)
Water pipework				
Water pipework	0.015	***23.7***	***m***	Length of tunnel plus width in m. based on assumptions. 0.015m based on referenced websites.
Steel Pipework	0.96	***0.4***	***Tonnes***	1m steel pipe = 0.0015 tonnes (25mm dia pipe with 2.5mm thick walls)
Electrical				
LV Electrical cables		66.0	m	Assumed 4 lengths off tunnel for distribution
Volume in m3 for LV Electrical cables	0.04	2.6	m3	Assumption based on referenced websites
Volume in tonnes for LV electrical cables	0.015	**0.0**	**Tonnes**	
Fluorescent Lighting per floor		***20.0***	***No.***	Based on assumptions
Total volume Florescent Lighting		***0.0***	***Tonnes***	95g each flourescent tube aprox
Bakerlite pannels (Identified in asbestos management survey)				
Total Bakerlite panneling		99.0	m2	Assumptions from Matterport survey Bakerlite panel weight = 1250kg / m3 (Roof coverage)
Bakerlite panneling m3	0.002	0.2	m3	Bakerlite pannel thickness 2mm
Bakerlite panneling tonnes	1.25	***0.2***	***Tonnes***	
Additional Plant				
Telecoms exchange racking		1.2	Tonnes	Assumption based on Matterport survey

Total		***1.2***	***Tonnes***	

First Aid Bay

Usage: Bakelite roof and ceramic floor tiles

1st half furnishings; bare room

2nd half furnishings:

Item	No.	Sum	Unit	Notes / Assumptions
General				
Floor space area (GIA)		59.4	m2	Total Floor area - approximate based on Matterport surevy. .
Tunnel bore height (including concrete floor)		2.3	m	Measurement from floor to roof of tunnel bore
Length of Tunnel		19.8	m	Length of tunnel
Diameter of Tunnel		3.7	m	Average width assumed constant throughout tunnel
Radius of tunnel		1.8	m	Width halved
Floor width		3.0	m	floor width within bottom 10th of tunnel bore
Total internal surface area of tunnel minus floor space area		190.8	m2	2x πr2 Plus 2πr2xL
Concrete				
Total volume concrete floor		36.1	***m3***	Approximate concrete within base of tunnel bore, not accounting for drainage and or service ducting - assumed removal of 50%
Total concrete (in situ quantities pre processing)		**36.1**	***m3***	Based on the above assumptions and calculations - Tonnes conversion factors based on referenced websites and standard guidance (Bulk density of 2300kg/m3)
Processed concrete volume (inc bulking factor)		**61.3**	***m3***	
Concrete tonnes conversation		**82.9**	***Tonnes***	
Miscallaneous Office Equipment & Hard furnishings (soft strip malterial)				
Showers and toilets	1	**0.0**	***Tonnes***	Assumption from matterport survey of 1 toilet and wash facilities
Floor Tiles (Assumed ceramic tile)				
Tiled floor space per floor		59.4	m2	Assumption that all of the floor space is tiling
Total Volume of floor Tiles	0.003	***0.2***	***m3***	Thickness assumption based on average thickness of commercial tiles (0.003m)
Tile tonnes	0.0026	***0.2***	***Tonnes***	Weight conversion based on referenced websites (2.6kg per m2)
Water pipework				
Water pipework	0.015	***23.5***	***m***	Length of tunnel plus width in m. based on assumptions. 0.015m based on referenced websites.
Steel Pipework	0.96	***0.4***	***Tonnes***	1m steel pipe = 0.0015 tonnes (25mm dia pipe with 2.5mm thick walls)
Electrical				
LV Electrical cables		79.2	m	Assumed 4 lengths off tunnel for distribution
Volume in m3 for LV Electrical cables	0.04	3.2	m3	Assumption based on referenced websites
Volume in tonnes for LV electrical cables	0.015	**0.0**	**Tonnes**	
Fluorescent Lighting per floor		***20.0***	***No.***	Based on assumptions
Total volume Florescent Lighting		***0.0***	***Tonnes***	95g each flourescent tube aprox
Bakerlite pannels (Identified in asbestos management survey)				
Total Bakerlite panneling		59.4	m2	Assumptions from Matterport survey Bakerlite panel weight = 1250kg / m3 (Roof coverage)
Bakerlite panneling m3	0.002	0.1	m3	Bakerlite pannel thickness 2mm
Bakerlite panneling tonnes	1.25	***0.1***	***Tonnes***	
Doors				

Doors		4.0	No.	Assumption from matterport survey
Weight of doors tonnes	0.04	***0.2***	***Tonnes***	Weight based on referenced website average 40kg per door - 1m3 = 1000kg

Female toilets (east)

Usage: Female toilets

1st half furnishings; Toilet facilities 6 hand basins and 10 cubicles

2nd half furnishings:

Item	No.	Sum	Unit	Notes / Assumptions
General				
Floor space area (GIA)		75.2	m2	Total Floor area - approximate based on Matterport surevy. .
Tunnel bore height (including concrete floor)		2.5	m	Measurement from floor to roof of tunnel bore
Length of Tunnel		19.8	m	Length of tunnel
Diameter of Tunnel		3.7	m	Average width assumed constant throughout tunnel
Radius of tunnel		1.9	m	Width halved
Floor width		3.8	m	floor width within bottom 10th of tunnel bore
Total internal surface area of tunnel minus floor space area		178.6	m2	2x πr2 Plus 2πr2xL
Concrete				
Area of Dividing Blockwork walls		49.5	m2	tunnel length x height
Total volume concrete floor		31.1	***m3***	Approximate concrete within base of tunnel bore, not accounting for drainage and or service ducting - assumed removal of 50%
Total volume of concrete walls		**7.4**	**m3**	Wall thickness measured from matteport survey 0.15
Total concrete (in situ quantities pre processing)		**38.5**	***m3***	Based on the above assumptions and calculations - Tonnes conversion factors based on referenced websites and standard guidance (Bulk density of 2300kg/m3)
Processed concrete volume (inc bulking factor)		**65.5**	***m3***	
Concrete tonnes conversation		**88.6**	***Tonnes***	
Miscallaneous Hard furnishings (soft strip malterial)				
Toilets and hand basins	6	**0.2**	***Tonnes***	Matterport survey indicates 6 toilet and wash facilities
Floor Tiles (Ceramic)				
Tiled floor space per floor		75.2	m2	Assumption that the floor space is tiling
Total Volume of floor Tiles	0.05	***3.8***	***m3***	Thickness assumption based on average thickness of commercial tiles (0.05m)
Tile tonnes	2.4	***9.0***	***Tonnes***	weight conversion based on referenced websites
Water pipework				
Water pipework	0.015	***23.5***	***m***	Length of tunnel plus width in m. based on assumptions. 0.015m based on referenced websites.
Steel Pipework	0.96	***0.4***	***Tonnes***	1m steel pipe = 0.0015 tonnes (25mm dia pipe with 2.5mm thick walls)
Electrical				
LV Electrical cables		79.2	m	Assumed 4 lengths off tunnel for distribution
Volume in m3 for LV Electrical cables	0.04	3.2	m3	Assumption based on referenced websites
Volume in tonnes for LV electrical cables	0.015	**0.0**	**Tonnes**	
Fluorescent Lighting per floor		***20.0***	***No.***	Based on assumptions
Total volume Florescent Lighting		***0.0***	***Tonnes***	95g each flourescent tube aprox
Doors				
Doors		6.0	No.	Assumption from matterport survey
Weight of doors tonnes	0.04	***0.2***	***Tonnes***	Weight based on referenced website average 40kg per door - 1m3 = 1000kg

Male toilets (east)

Usage: Male toilets

1st half furnishings; Toilet facilities 8 hand basins and 10 cubicles

2nd half furnishings:

Item	No.	Sum	Unit	Notes / Assumptions
General				
Floor space area (GIA)		69.3	m2	Total Floor area - approximate based on Matterport surevy. .
Tunnel bore height (including concrete floor)		2.5	m	Measurement from floor to roof of tunnel bore
Length of Tunnel		19.8	m	Length of tunnel
Diameter of Tunnel		3.5	m	Average width assumed constant throughout tunnel
Radius of tunnel		1.8	m	Width halved
Floor width		3.5	m	floor width within bottom 10th of tunnel bore
Total internal surface area of tunnel minus floor space area		167.7	m2	2x πr2 Plus 2πr2xL
Concrete				
Area of Dividing Blockwork walls		49.5	m2	tunnel length x height
Total volume concrete floor		31.1	***m3***	Approximate concrete within base of tunnel bore, not accounting for drainage and or service ducting - assumed removal of 50%
Total volume of concrete walls		**7.4**	**m3**	Wall thickness measured from matteport survey 0.15
Total concrete (in situ quantities pre processing)		**38.5**	***m3***	Based on the above assumptions and calculations - Tonnes conversion factors based on referenced websites and standard guidance (Bulk density of 2300kg/m3)
Processed concrete volume (inc bulking factor)		**65.5**	***m3***	
Concrete tonnes conversation		**88.6**	***Tonnes***	
Miscallaneous Office Equipment & Hard furnishings (soft strip malterial)				
Toilets and hand basins	10	**0.4**	***Tonnes***	Matterport survey indicates 10 toilet and 8 wash facilities
Floor Tiles (Ceramic)				
Tiled floor space per floor		69.3	m2	Assumption that the floor space is tiling
Total Volume of floor Tiles	0.05	***3.5***	***m3***	Thickness assumption based on average thickness of commercial tiles (0.05m)
Tile tonnes	2.4	***8.3***	***Tonnes***	weight conversion based on referenced websites
Water pipework				
Water pipework	0.015	***23.3***	***m***	Length of tunnel plus width in m. based on assumptions. 0.015m based on referenced websites.
Steel Pipework	0.96	***0.3***	***Tonnes***	1m steel pipe = 0.0015 tonnes (25mm dia pipe with 2.5mm thick walls)
Electrical				
LV Electrical cables		79.2	m	Assumed 4 lengths off tunnel for distribution
Volume in m3 for LV Electrical cables	0.04	3.2	m3	Assumption based on referenced websites
Volume in tonnes for LV electrical cables	0.015	**0.0**	**Tonnes**	
Fluorescent Lighting per floor		***20.0***	***No.***	Based on assumptions
Total volume Florescent Lighting		***0.0***	***Tonnes***	95g each flourescent tube aprox
Doors				
Doors		10.0	No.	Assumption from matterport survey
Weight of doors tonnes	0.04	***0.4***	***Tonnes***	Weight based on referenced website average 40kg per door - 1m3 = 1000kg

Female toilets (West)

Usage: Female toilets

1st half furnishings; Toilet facilities 6 hand basins and 9 cubicles

2nd half furnishings:

Item	No.	Sum	Unit	Notes / Assumptions
General				
Floor space area (GIA)		38.5	m2	Total Floor area - approximate based on Matterport surevy. .
Tunnel bore height (including concrete floor)		2.5	m	Measurement from floor to roof of tunnel bore
Length of Tunnel		13.5	m	Length of tunnel
Diameter of Tunnel		3.5	m	Average width assumed constant throughout tunnel
Radius of tunnel		1.8	m	Width halved
Floor width		2.9	m	floor width within bottom 10th of tunnel bore
Total internal surface area of tunnel minus floor space area		129.2	m2	2x πr2 Plus 2πr2xL
Concrete				
Area of Dividing Blockwork walls		33.8	m2	tunnel length x height
Total volume concrete floor		21.2	***m3***	Approximate concrete within base of tunnel bore, not accounting for drainage and or service ducting - assumed removal of 50%
Total volume of concrete walls		**5.1**	**m3**	Wall thickness measured from matteport survey 0.15
Total concrete (in situ quantities pre processing)		**26.3**	***m3***	Based on the above assumptions and calculations - Tonnes conversion factors based on referenced websites and standard guidance (Bulk density of 2300kg/m3)
Processed concrete volume (inc bulking factor)		**44.7**	***m3***	
Concrete tonnes conversation		**60.4**	***Tonnes***	
Miscallaneous Office Equipment & Hard furnishings (soft strip malterial)				
Toilets and hand basins	9	**0.3**	***Tonnes***	Matterport survey indicates 9 toilet and 6 wash facilities
Floor Tiles (Ceramic)				
Tiled floor space per floor		38.5	m2	Assumption that the floor space is tiling
Total Volume of floor Tiles	0.05	***1.9***	***m3***	Thickness assumption based on average thickness of commercial tiles (0.05m)
Tile tonnes	2.4	***4.6***	***Tonnes***	weight conversion based on referenced websites
Water pipework				
Water pipework	0.015	***17.0***	***m***	Length of tunnel plus width in m. based on assumptions. 0.015m based on referenced websites.
Steel Pipework	0.96	***0.3***	***Tonnes***	1m steel pipe = 0.0015 tonnes (25mm dia pipe with 2.5mm thick walls)
Electrical				
LV Electrical cables		54.0	m	Assumed 4 lengths off tunnel for distribution
Volume in m3 for LV Electrical cables	0.04	2.2	m3	Assumption based on referenced websites
Volume in tonnes for LV electrical cables	0.015	**0.0**	**Tonnes**	
Fluorescent Lighting per floor		***20.0***	***No.***	Based on assumptions
Total volume Florescent Lighting		***0.0***	***Tonnes***	95g each flourescent tube aprox
Doors				
Doors		10.0	No.	Assumption from matterport survey
Weight of doors tonnes	0.04	***0.4***	***Tonnes***	Weight based on referenced website average 40kg per door - 1m3 = 1000kg

male toilets (West)

Usage: male toilets

1st half furnishings; Toilet facilities 8 hand basins and 9 cubicles

2nd half furnishings:

Item	No.	Sum	Unit	Notes / Assumptions
General				
Floor space area (GIA)		57.0	m2	Total Floor area - approximate based on Matterport surevy. .
Tunnel bore height (including concrete floor)		2.5	m	Measurement from floor to roof of tunnel bore
Length of Tunnel		20.0	m	Length of tunnel
Diameter of Tunnel		3.5	m	Average width assumed constant throughout tunnel
Radius of tunnel		1.8	m	Width halved
Floor width		2.9	m	floor width within bottom 10th of tunnel bore
Total internal surface area of tunnel minus floor space area		182.2	m2	2x πr2 Plus 2πr2xL
Concrete				
Area of Dividing Blockwork walls		50.0	m2	tunnel length x height
Total volume concrete floor		31.4	***m3***	Approximate concrete within base of tunnel bore, not accounting for drainage and or service ducting - assumed removal of 50%
Total volume of concrete walls		**7.5**	**m3**	Wall thickness measured from matteport survey 0.15
Total concrete (in situ quantities pre processing)		**38.9**	***m3***	Based on the above assumptions and calculations - Tonnes conversion factors based on referenced websites and standard guidance (Bulk density of 2300kg/m3)
Processed concrete volume (inc bulking factor)		**66.2**	***m3***	
Concrete tonnes conversation		**89.5**	***Tonnes***	
Miscallaneous Office Equipment & Hard furnishings (soft strip malterial)				
Toilets and hand basins	8	**0.3**	***Tonnes***	Matterport survey indicates 9 toilet and 6 wash facilities
Floor Tiles (Ceramic)				
Tiled floor space per floor		57.0	m2	Assumption that the floor space is tiling
Total Volume of floor Tiles	0.05	***2.9***	***m3***	Thickness assumption based on average thickness of commercial tiles (0.05m)
Tile tonnes	2.4	***6.8***	***Tonnes***	weight conversion based on referenced websites
Water pipework				
Water pipework	0.015	***23.5***	***m***	Length of tunnel plus width in m. based on assumptions. 0.015m based on referenced websites.
Steel Pipework	0.96	***0.4***	***Tonnes***	1m steel pipe = 0.0015 tonnes (25mm dia pipe with 2.5mm thick walls)
Electrical				
LV Electrical cables		80.0	m	Assumed 4 lengths off tunnel for distribution
Volume in m3 for LV Electrical cables	0.04	3.2	m3	Assumption based on referenced websites
Volume in tonnes for LV electrical cables	0.015	**0.0**	**Tonnes**	
Fluorescent Lighting per floor		***20.0***	***No.***	Based on assumptions
Total volume Florescent Lighting		***0.0***	***Tonnes***	95g each flourescent tube aprox
Doors				
Doors		10.0	No.	Assumption from matterport survey
Weight of doors tonnes	0.04	***0.4***	***Tonnes***	Weight based on referenced website average 40kg per door - 1m3 = 1000kg

Kingsway Tunnels - North Street West

Usage: Canteen/Mess hall and Kitchen 2 half Vent plant and Stores
Furnishings Canteen: Bakelite wall pannels, metal clad strips on roof, mirror and canteen hatch in the canteen, vinyl floor
Furnishings stores: Bakelite clad Nissen hut construction with brick partition walls within tunnel bore, Tiled ceramic floor
Furnishings vent plant: Bare tunnel bore, ducting & Cyclone fan Air moving Unit, Tiled ceramic floor

Item	No.	Sum	Unit	Notes / Assumptions
General				
Floor space area (GIA)		348.3	m2	Total Floor area - approximate based on Matterport surevy. .
Tunnel bore height (including concrete floor)		4.1	m	Measurement from floor to roof of tunnel bore
Length of Tunnel		81.0	m	Length of tunnel
Diameter of Tunnel		5.0	m	Average width assumed constant throughout tunnel
Radius of tunnel		2.5	m	Width halved
Floor width		4.3	m	floor width within bottom 10th of tunnel bore
Total internal surface area of tunnel minus floor space area		974.1	m2	2x πr2 Plus 2πr2xL
Concrete Floor				
Total concrete floor (in situ quantities pre-processing)		104.1	m3	Approximate concrete within base of tunnel bore, not accounting for drainage and or service ducting - assumed removal of 50%
Processed concrete volume (inc bulking factor)		***176.9***	***m3***	Based on the above assumptions and calculations - Tonnes conversion factors based on referenced websites and standard guidance (Bulk density of 2300kg/m3)
Concrete tonnes conversation		***239.4***	***Tonnes***	
Miscallaneous Furishings & Hard furnishings (soft strip malterial)				
Small Catering kitchen		***1.2***	***Tonnes***	Mixed appliance stainless steel kitchen
Floor Tiles (Vinyl)				
Tiled floor space per floor		348.3	m2	Vinyl flooring (Western portion) (2.6kg per m2)
Total Volume of floor Tiles	0.003	***1.0***	***m3***	Thickness assumption based on average thickness of commercial tiles (0.003m)
Tile tonnes	0.0026	***0.9***	***Tonnes***	weight conversion based on referenced websites (2.6kg per m2)
Floor Tiles (Assumed ceramic tile)				
Tiled floor space per floor		348.3	m2	Ceramic flooring (Eastern portion) (14kg per m2)
Total Volume of floor Tiles	0.006	***2.1***	***m3***	Thickness assumption based on average thickness of commercial tiles (0.006m)
Tile tonnes	0.014	***4.9***	***Tonnes***	weight conversion based on referenced websites (2.6kg per m2)
Ceiling Tiles				
Metal Slat roof (western Half)		276.2	m2	Assumption that metal slat roof (western Portion)
Total Volume of Ceiling Tiles	0.0015	***0.4***	***m3***	Thickness assumption based on average thickness of ceiling tiles (0.0015m)
Tile tonnes	0.34	***0.1***	***Tonnes***	Weight conversion based on referenced websites
Water pipework				
Water distribution pipework		***86.0***	***m***	length of tunnel plus width in m. based on assumptions. 0.015m based on referenced websites.
Steel pipework	0.0015	***0.1***	***Tonnes***	1m steel pipe = 0.0015 tonnes (25mm dia pipe with 2.5mm thick walls)
Electrical				
LV Electrical cables		324.0	m	Assumed 4 lengths off tunnel for distribution
Volume in m3 for LV Electrical cables	0.04	13.0	m3	Assumption based on referenced websites

Volume in tonnes for LV electrical cables	0.015	**0.2**	**Tonnes**		
Flourescent Lighting	100	***100.0***	***Units***	Assume that consistent throughout tunnel	
Total volume Florescent Lighting		***0.1***	***Tonnes***	95g each flourescent tube aprox	
Bakerlite pannels (Identified in asbestos management survey)					
Total Bakerlite panneling		487.1	m2	Assumptions from Matterport survey Bakerlite pannel weight = 1250kg / m3 (Western half of tunnel)	
Bakerlite panneling m3	0.002	***1.0***	***m3***	Bakerlite pannel thickness 2mm	
Bakerlite panneling tonnes	1.25	***1.2***	***tonnes***		
Doors					
Fire Doors		4.0	No.	Assumptions from matterport surevy	300
Weight of doors tonnes	0.04	***0.2***	***Tonnes***	Weight based on referenced website average 40kg per door - 1m3 = 1000kg	
Ventilation ducting					
Ductwork for Air handling units		***1.2***	***Tonnes***	Approximately 1 lengths of the tunnel (15kg/m)	
Additional Plant					
Air Handling Unit	1	2.1	Tonnes	weight taken from a modern modular packaged air handling unit (NuAire - NA17-220/130 - 2.13 tonnes per unit)	
Total		***2.1***	***Tonnes***		

South Street West

Usage: 1st half Recreational room with bar, 2nd half separate rooms and 2 diesel generators
1st half furnishings; clad (AIB) - Vynil floor,Bakelite cladding

2nd half furnishings: Offices on one side of tunnel, Brick partition walls with bakelite panelled walls , ceramic tiles, Engine room bare tunnel shield and ducting

Furnishings

Item	No.	Sum	Unit	Notes / Assumptions
General				
Floor space area (GIA)		401.8	m2	Total Floor area - approximate based on Matterport surevy. .
Tunnel bore height (including concrete floor)		4.1	m	Measurement from floor to roof of tunnel bore
Length of Tunnel		98.0	m	Length of tunnel
Diameter of Tunnel		5.0	m	Average width assumed constant throughout tunnel
Radius of tunnel		2.5	m	Width halved
Floor width		4.1	m	floor width within bottom 10th of tunnel bore
Total internal surface area of tunnel minus floor space area		1189.8	m2	2x πr2 Plus 2πr2xL
Concrete & blockwork tonnes conversation				
Area of Dividing Blockwork walls		200.9	m2	50% of the south street west tunnel x height
Total concrete floor (in situ quantities pre-processing)		125.9	m3	Approximate concrete within base of tunnel bore, not accounting for drainage and or service ducting - assumed removal of 50%
Total volume of concrete & brick work partition walls	0.15	**30.1**	**m3**	Wall thickness measured from matteport survey 0.15
Total concrete (in situ quantities pre processing)		**231.0**	***m3***	Based on the above assumptions and calculations - Tonnes conversion factors based on referenced websites and standard guidance (Bulk density of 2300kg/m3)
Processed concrete & blockwork volume (inc bulking factor)		**445.1**	***m3***	
Concrete & blockwork tonnes conversation		**520.7**	***Tonnes***	
Floor Tiles (Assumed ceramic tile)				
Tiled floor space per floor		100.5	m2	Ceramic flooring (Eastern portion) (14kg per m2)
Total Volume of floor Tiles	0.05	***5.0***	***m3***	Thickness assumption based on average thickness of commercial tiles (0.006m)
Tile tonnes	0.026	***2.6***	***Tonnes***	weight conversion based on referenced websites (2.6kg per m2)
Floor Tiles (Vinyl)				
Tiled floor space per floor		40.2	m2	Vinyl flooring 10% of tunnel floor space (Western portion) (2.6kg per m2)
Total Volume of floor Tiles	0.003	***0.1***	***m3***	Thickness assumption based on average thickness of commercial tiles (0.003m)
Tile tonnes	0.0026	***0.1***	***Tonnes***	weight conversion based on referenced websites (2.6kg per m2)
Carpets				
Total area of carpet		301.4	m2	Assumption that carpet covers 3/4 of the floor space within tunnels
Carpet Tonnes	0.0055	***0.0***	***Tonnes***	Online sources show 550g per m2
Water pipework				
Water pipework		***103.0***	***m***	length of tunnel plus width in m. based on assumptions.
Steel Pipework	0.015	***1.5***	***Tonnes***	1m steel pipe = 0.0015 tonnes (25mm dia pipe with 2.5mm thick walls)
Electrical				
LV Electrical cables		392.0	m	Assumed 4 lengths off tunnel for distribution

Total volume in m3 for Electrical cables	0.04	**15.7**	**m3**	Assumption based on referenced websites
Total volume in tonnes for electrical cables	0.015	**0.2**	**Tonnes**	
Flourescent Lighting	90			Assumptions from matterport surevy
Total volume Florescent Lighting		***1.0***	***Tonnes***	95g each flourescent tube aprox
Bakerlite pannels (Identified in asbestos management survey)				
Total Bakerlite panneling		892.3	m2	Assumptions from Matterport survey Bakerlite pannel weight = 1250kg / m3 (100% coverage Western half of tunnel/ 50% mid tunnel)
Bakerlite panneling m3	0.002	1.8	m2	Bakerlite pannel thickness 2mm
Bakerlite panneling tonnes	1.25	***2.2***	***tonnes***	
Doors				
Doors		12.0	No.	Assumptions from matterport surevy
Weight of doors tonnes	0.04	***0.5***	***Tonnes***	Weight based on referenced website average 40kg per door - 1m3 = 1000kg
Ventilation ducting				
Ductwork for Air handling units	0	***1.5***	***Tonnes***	Approximately 1 lengths of the tunnel (15kg/m)
Plant Room				
2 x Large 6 cylinder Diesel generators		16.0	Tonnes	Assumption from matter port survey as a 6-cylinder Ruston 6APC engine - 8 tonnes
Total		***16.0***	***Tonnes***	

0

North Street Centre

Usage: 1st half of tunnel utilised as power & air movement plant with battery storage rooms & transformer enclosures x 4.
2nd half formed of offices containing electical IT equipment
1st half furnishings; Generators and air movement units with associated ducting within bare tunnel lining, battery storage rooms formed of masonry, transformer enclosures x4 constructed of single course brick. Ceramic tiles throughout

2nd half furnishings: Bakelite panels and room divides with suspended roof tiles and wooden doors, fitted out with verticle walls to form conventional office space Vynil floor tiles and carpet 50/50

Item	No.	Sum	Unit	Notes / Assumptions
General				
Floor space area (GIA)		765.6	m2	Total Floor area - approximate based on Matterport surevy. .
Tunnel bore height (including concrete floor)		4.1	m	Measurement from floor to roof of tunnel bore
Length of Tunnel		196.3	m	Length of tunnel
Diameter of Tunnel		5.0	m	Average width assumed constant throughout tunnel
Radius of tunnel		2.5	m	Width halved
Floor width		3.9	m	floor width within bottom 10th of tunnel bore
Total internal surface area of tunnel minus floor space area		2382.5	m2	2x πr2 Plus 2πr2xL
Concrete				
Total concrete floor (in situ quantities pre-processing)		**251.8**	***m3***	Approximate concrete within base of tunnel bore, not accounting for drainage and or service ducting - assumed removal of 50%
Area of Dividing Blockwork walls		201.2	m2	25% of South street centre length X height
Total volume of concrete & brick work partition walls		**30.2**	**m3**	Wall thickness measured from matteport survey 0.15
Total concrete (in situ quantities pre processing)		***282.0***	***m3***	Based on the above assumptions and calculations - Tonnes conversion factors based on referenced websites and standard guidance (Bulk density of 2300kg/m3)
Processed concrete volume (inc bulking factor)		***479.4***	***m3***	
Concrete tonnes conversation		***648.7***	***Tonnes***	
Miscallaneous Office Equipment & Hard furnishings (soft strip malterial)				
Desks / Chairs /Msc fixtures and fittings /Furnitures		***2.8***	***Tonnes***	Estimated value based on 50% South Street Centre fitted out as office space
Floor Tiles (Assumed ceramic tile)				
Tiled floor space per floor		267.9	m2	The assumption that 1/3 of the floor space is ceramic tiling (14kg per m2)
Total Volume of floor Tiles	0.05	***13.4***	***m3***	Thickness assumption based on average thickness of commercial tiles (0.05m)
Tile tonnes	0.014	***3.8***	***Tonnes***	weight conversion based on referenced websites
Floor Tiles (Vinyl)				
Tiled floor space per floor		267.9	m2	Vinyl flooring (Western portion) (2.6kg per m2)
Total Volume of floor Tiles	0.003	***0.8***	***m3***	Thickness assumption based on average thickness of commercial tiles (0.003m)
Tile tonnes	0.0026	***0.7***	***Tonnes***	weight conversion based on referenced websites (2.6kg per m2)
Ceiling Tiles (Mineral Fibre acoustic boards)				
Mineral Fibre Ceiling tiles		1.4	m2	The assumption that 1/3 of the ceiling is office tiling
Total Volume of Ceiling Tiles	0.0015	***0.0***	***m3***	Thickness assumption based on average thickness of ceiling tiles (0.0015m)
Tile tonnes	0.0034	***0.0***	***Tonnes***	Weight conversion based on referenced websites (1m2=3.47kg)

Carpets				
Total area of carpet		1.4	m2	Assumption that carpet covers 1/3 of the floor space (Office fit out)
Carpet thickness	0.01	***0.0***	***m3***	
Carpet Tonnes	0.0055	***0.0***	***Tonnes***	Online sources show 550g per m2
Water pipework				
Water pipework	0.015	***201.3***	***m***	length of tunnel plus width in m. based on assumptions. 0.015m based on referenced websites.
Steel Pipework	0.96	***3.0***	***Tonnes***	1m steel pipe = 0.0015 tonnes (25mm dia pipe with 2.5mm thick walls)
Electrical				
LV Electrical cables		785.2	m	Assumed 4 lengths off tunnel for distribution
Volume in m3 for LV Electrical cables	0.04	31.4	m3	Assumption based on referenced websites
Volume in tonnes for LV electrical cables	0.015	**0.5**	**Tonnes**	
Fluorescent Lighting per floor		***15.0***	***No.***	Based on assumptions
Total volume Florescent Lighting		***0.0***	***Tonnes***	95g each flourescent tube aprox
Bakerlite pannels (Identified in asbestos management survey)				
Total Bakerlite panneling		1786.9	m2	Assumptions from Matterport survey Bakerlite pannel weight = 1250kg / m3 (100% coverage Western half of tunnel/ 50% mid tunnel)
Bakerlite panneling m3	0.002	3.6	m3	Bakerlite pannel thickness 2mm
Bakerlite panneling tonnes	1.25	***4.5***	***Tonnes***	
Doors				
Doors		20.0	No.	Assumptions from matterport surevy
Weight of doors tonnes	0.04	***0.8***	***Tonnes***	Weight based on referenced website average 40kg per door - 1m3 = 1000kg
Ventilation ducting				
Ductwork for Air handling units	0	***2.9***	***Tonnes***	Approximately 1 lengths of the tunnel (15kg/m)
Additional Plant				
Generator equipment and AC/DC inverter	1	8.0	Tonnes	8 tonnes for unit Assumption
HV electical transformers	4	11.4	Tonnes	Assumption taken from matterport survey of 2,860kg per unit
Total		***19.4***	***Tonnes***	

South Street Centre

Usage: 1st half Power plant (2 diesel engines)and switchgear with associated transformers and distribution equipment with occasional office room.
2nd half: Offcie rooms with access to 1-4th Avenue, Batteries and Air movement plant

1st half furnishings; diesel engines and bare tunnel lining,

2nd half furnishings: Rooms diveded with Masonry walls and bakelite wall panels on half tunnel

Item	No.	Sum	Unit	Notes / Assumptions
General				
Floor space area (GIA)		741.0	m2	Total Floor area - approximate based on Matterport surevy. .
Tunnel bore height (including concrete floor)		4.1	m	Measurement from floor to roof of tunnel bore
Length of Tunnel		190.0	m	Length of tunnel
Diameter of Tunnel		5.0	m	Average width assumed constant throughout tunnel
Radius of tunnel		2.5	m	Width halved
Floor width		3.9	m	floor width within bottom 10th of tunnel bore
Total internal surface area of tunnel minus floor space area		2307.3	m2	2x πr2 Plus 2πr2xL
Concrete & blockwork tonnes conversation				
Total concrete floor (in situ quantities pre-processing)		**244.1**	***m3***	Approximate concrete within base of tunnel bore, not accounting for drainage and or service ducting - assumed removal of 50%
Area of Dividing Blockwork walls		194.8	m2	25% of South street centre length X height
Total volume of concrete & brick work partition walls		**29.2**	**m3**	Wall thickness measured from matteport survey 0.15
Total concrete (in situ quantities pre processing)		***273.3***	***m3***	Based on the above assumptions and calculations - Tonnes conversion factors based on referenced websites and standard guidance (Bulk density of 2300kg/m3)
Processed concrete volume (inc bulking factor)		***464.7***	***m3***	
Concrete tonnes conversation		***628.7***	***Tonnes***	
Miscallaneous Office Equipment & Hard furnishings (soft strip malterial)				
Desks / Chairs /Msc fixtures and fittings /Furnitures		***2.8***	***Tonnes***	Estimated value based on 50% South Street Centre fitted out as office space
Floor Tiles (Assumed ceramic tile)				
Tiled floor space per floor		555.8	m2	The assumption that 2/3 of the floor space is ceramic tiling (14kg per m2)
Total Volume of floor Tiles	0.05	***27.8***	***m3***	Thickness assumption based on average thickness of commercial tiles (0.05m)
Tile tonnes	0.014	***7.8***	***Tonnes***	weight conversion based on referenced websites
Floor Tiles (Vinyl)				
Tiled floor space per floor		259.4	m2	Vinyl flooring (Western portion) (2.6kg per m2) 3rd of floor space
Total Volume of floor Tiles	0.003	***0.8***	***m3***	Thickness assumption based on average thickness of commercial tiles (0.003m)
Tile tonnes	0.0026	***0.7***	***Tonnes***	weight conversion based on referenced websites (2.6kg per m2)
Water pipework				
Water pipework	0.015	***195.0***	***m***	length of tunnel plus width in m. based on assumptions. 0.015m based on referenced websites.
Steel Pipework	0.96	***2.9***	***Tonnes***	1m steel pipe = 0.0015 tonnes (25mm dia pipe with 2.5mm thick walls)
Electrical				

LV Electrical cables		760.0	m	Assumed 4 lengths off tunnel for distribution
Volume in m3 for LV Electrical cables	0.04	30.4	m3	Assumption based on referenced websites
Volume in tonnes for LV electrical cables	0.015	**0.5**	**Tonnes**	
Electrical switchgear and circuit breakers	25	**7.5**	**Tonnes**	25 switchgear cabinets - Assumption of 300kg per unit
Transformers	10	**28.0**	**Tonnes**	2 transformers, winding weight unknown from Matterport survey. assume 2,860kg from modern units
Fluorescent Lighting per floor	50		***No.***	Based on assumptions
Total volume Florescent Lighting		***0.0***	***Tonnes***	95g each flourescent tube aprox
Bakerlite pannels (Identified in asbestos management survey)				
Total Bakerlite panneling		807.6	m2	Assumptions from Matterport survey Bakerlite pannel weight = 1250kg / m3 (50% coverage eastern portion of tunnel)
Bakerlite panneling m3	0.002	1.6	m3	Bakerlite pannel thickness 2mm
Bakerlite panneling tonnes	1.25	***2.0***	***Tonnes***	
Doors				
Doors		16.0	No.	Assumption from matterport survey
Weight of doors tonnes	0.07	***1.1***	***Tonnes***	
Ventilation ducting				
Ductwork for Air handling units		***2.9***	***Tonnes***	Approximately 1 lengths of the tunnel (15kg/m)
Additional Plant				
DC lead batteries 23 cells within 1 rack		0.7		Assumptions from Matterport survey DC battery rack weight aprox 720kg
Air Handling Unit	1	2.1	Tonnes	weight taken from a modern modular packaged air handling unit (NuAire - NA17-220/130 - 2.13 tonnes per unit)
2 x Large 6 cylinder Diesel generators		16.0	Tonnes	Assumption from matter port survey as a 6-cylinder Ruston 6APC engine - 8 tonnes
Total		***18.9***	***Tonnes***	