

North Essex Authorities

Infrastructure Order of Cost Estimate [41,000 Homes]

North Essex Authorities Gleeds Cost Management Project LNCM 0931

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Executive Summary

Gleeds have undertaken a review of the cost of infrastructure works associated with the development of 41,000 homes across 3 new garden communities in North Essex. This report is based on the design information contained within AECOM's Infrastructure Planning, Phasing and Delivery (NEGC IPPD) Draft Report dated July 2019..

We have identified clear assumptions within our report under Section 5.

This estimate reflects prices at Q4 2018 based on the details referenced therein. The pricing basis of this preliminary budget estimate is current market conditions and should be reviewed at regular intervals of no longer than 3 months.

Throughout the cost estimating process we have worked collaboratively with other consultants. The infrastructure requirements have been informed by review of the design information as set out in the AECOM IPPD Draft Report July 2019, and in some cases estimated using metrics outlined in ECC Developer's Guide to Infrastructure Contributions Document. We have also incorporated Essex County Councils' guidance on Education requirements, UCML guidance on utilities provisions, Essex Highways guidance on Rapid Transit System requirements and the North Essex Authorities guidance on Per Unit Contributions.

A number of benchmark data are identified within this report; however, the following are key priorities during the next stage of the feasibility design;

- Inflation Forecast to be reviewed
- Refined design information to determine accurate benchmark information
- Strategic review of associated risk

Introduction

Introduction

Overview

Gleeds have been asked to provide cost advice for the community infrastructure and enabling works required to support the delivery of 41,000 homes across three new garden communities over a number of phases in Essex to Garden Community Principles.

Whilst it is too early to provide detailed substantiation behind the Order of Cost Estimate contained within this report, this report aims to give the NEA the intended guidance of the likely cost associated with the infrastructure works.

This report presents the findings of a "high-level" design assessment based on AECOM's IPPD Draft Report dated July 2019. Identifying three broad locations at West of Braintree, Tendring Colchester Borders and Colchester Braintree Borders. It is noted that these analysis and options will continue to evolve, and the basis of our report is the assumed delivery of 41,000 homes as outlined within AECOM's IPPD Draft Report dated July 2019 and the number of homes proposed for each of the Garden Communities is as follows:

Site	Gleeds	AECOM
	Number of Residential Units	Number of Residential Units
1 - West of Braintree	12,500	12,500
2 - Tendring Colchester Borders	7,500	7,500
3 - Colchester Braintree Borders	21,000	21,000
	41,000	41,000

	NEA	ONS	Gleeds
Garden Community	Number of Residential Units	Anticipated Population	£ / Residential Unit
Site 1 – West of Braintree	12,500	30,000	£64,000
Site 2 – Tendring Colchester Borders	7,500	18,000	£66,000
Site 3 – Colchester Braintree Borders	21,000	50,400	£63,000

Please note: £ / Residential Unit rates reflect prices at 4Q2018 and include 10% Professional Fees and 10% Risk.

Infrastructure Costs per Site:

	Site 1	Site 2	Site 3	All Sites
	West of Braintree	Tendring	Colchester	
		Colchester	Braintree	
		Borders	Borders	
Number of Units	12,500	7,500	21,000	41,000
	(£ Total)	(£ Total)	(£ Total)	(£ Total)
Education	105,930,000	65,250,000	172,350,000	343,530,000
Healthcare & Community	23,260,000	13,020,000	36,090,000	72,370,000
Open Space	39,850,000	23,910,000	66,950,000	130,710,000
Utilities - Scheme-Wide Enabling Works	230,420,000	138,640,000	389,980,000	759,040,000
Additional Onsite Requirements	8,340,000			8,340,000
Utilities - Off-Site Requirements	34,910,000	27,250,000	70,360,000	132,520,000
Transport	140,830,000	108,740,000	248,850,000	498,020,000
Per Unit Contributions	81,690,000	30,710,000	117,600,000	230,000,000
Total Construction Cost (exc. Fees and Risk)	665,230,000	407,520,000	1,101,780,000	2,174,530,000
Cost per Unit (exc. Fees and Risk)	53,000	54,000	52,000	53,000
Professional Fees (10%)	66,520,000	40,750,000	110,180,000	217,450,000
Project Risk (10%)	73,180,000	44,830,000	121,200,000	239,200,000
Total Cost at 4Q2018 (exc. VAT)	804,930,000	493,100,000	1,333,160,000	2,631,180,000
Cost per Unit	64,000	66,000	63,000	64,000

Assumptions:

- Number of units as per the AECOM IPPD Draft Report dated July 2019.
- Anticipated population assumes a population per household rate in line with the Office for National Statistics (ONS, 2017) average of 2.4 persons per household.

Professional Fees and Risk Allowances:

- Professional fees assumed at 10%.
- Project risk assumed at 10%. Given the high-level nature of this estimate, we have assumed 10% Risk as a
 reasonable starting point. Risk allowance and allocation on an item by item basis should be strategically
 reviewed as a key priority.

This report provides the analysis and conclusions that derived from a select group of documents given the works that has gone into the Garden Communities Charter and the three Borough Councils Local Plan process. We also used the objectives as set out in the NEGC Concept Feasibility Study. A schedule of information used can be found in Appendix D.

Background

The NEA's preferred option is to deliver the Garden Communities through an infrastructure led approach.

This report outlines the conceptual masterplan work undertaken by AECOM to further support the NEA's infrastructure planning, phasing and delivery of the three garden communities. We have also accounted for several changes to the design which have been advised by the NEA and their advisers

The principal objective for this report is to:

Set the Cost Framework for the delivery of the Garden Communities Infrastructure as outlined in AECOM's IPPD Draft Report dated July 2019.

The report consists of 5 sections comprising:

- Total Infrastructure Requirements by Phase:
 - West of Braintree
 - Tendring Colchester Borders
 - Colchester Braintree Borders
- Assumptions
- Appendices

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Total Infrastructure Requirements by Phase – West of Braintree

Site 1: West of Braintree

	frastructure	Demand Arisin Development			Notes	Commentary / Assumptions	Total	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8	Phase 9	Phase 10
								1351	2853	4108	5156	6665	ve Development 8223	9224	10658	11866	12500
								1351	1502	1255	1048	Phase 1509	Development 1558	1001	1434	1208	634
1	ducation																
1.1	rimary Schools: 2 Form Entry (including 56 place EY+C	l ———	14 FE	3,150	000 Requirement as advised b	y 2FE facilities and EY	·										
	icility)				the NEA.	+ C Assuming 210 places per FE and 56											
						places per EY. Excludes temporary		055 57	055 54	055 5)		055 5	055 50		055 57		055 5)
						accommodation.	52,290,000	2FE + EY 7,470,000	2FE + EY 7,470,000			2FE + EY 7,470,000	2FE + EY 7,470,000		2FE + EY 7,470,000		2FE + EY 7,470,000
1.2	econdary Schools		12 FE	3,690	000 Requirement as advised b the NEA.	y Assuming 150 place per FE. Excludes temporary	es										
						accommodation.	44,280,000		6FE 22,140,000					6FE 22,140,000			
1.3	tandalone Early Year Facilities (56 place, above those co-located with rimary)		8 Facilit	es 1,17	0,000 Requirement as advised by the NEA.	y Assuming 56 places per facility. 7 EY											
	,					facilities within primar schools, 15 in total	iry										
						required by development.											
						Excludes temporary accommodation.		1	1		1	1	1	1		1	1
							9,360,000	1,170,000	1,170,000		1,170,000	1,170,000	1,170,000	1,170,000		1,170,000	1,170,000
2	ealthcare & Community																
2.1	eneral Practitioners	{ 	2805 m2		3000 Based on West of Braintre	e Demand arising 17											
					Social Infrastructure Standards EXD/013E	GPs. Assuming 1800 population per GP.											
					Braintree Council Website	population of 30,000											
						(2.4/unit). Assuming 165 m2 / GP.											
							8,415,000	990,000	990,000	1 495,000	990,000	990,000	1 495,000	990,000	990,000	1 495,000	990,000
2.2	entists		900 m2	3	000 Based on West of Braintre Social Infrastructure	Dentists. Assuming											
					Standards EXD/013E Braintree Council Website	1760 population per dentist. Assuming a											
						population of 30,000 (2.4/unit). Assuming 50 m2 / Dentist.											
						JO IIIZ / Delitist.		2	2	2	2	2	2	1	2	2	1
2.3	ommunity Space and Libraries	1	3600 m2	2	500 Library Space based on EC Social Infrastucture	CC Demand arising 900 m2 of Library Space.	2,700,000	300,000	300,000	300,000	300,000	300,000	300,000	150,000	300,000	300,000	150,000
					Standards, Arts Council. Community Space provision	Assuming 30 m2 per											
					as advised by the NEA and their advisers.	Demand arising 1800m2 of											
						Community Space. Assuming 60 m2 per											
						1000 persons. Demand arising 2nr											
						1800 m2 facilities. Assuming a											
						population of 30,000 (2.4/unit). As advised	i										
						by the NEA, the cost for Community Space and Library Facilities	e										
						has been phased in accordance with unit											
						delivery.											
							9,000,000	11% 972,720				12% 1,086,480	12% 1,121,760		11% 1,032,480	10% 869,760	
2.4	Court Sports Centre		1428 m2	1	450 Based on ECC Social Infrastucture Standards,	Demand arising 3 nr facilities. Assuming		, ==	,,,	,		, ,	, , ,	., =			
					Colchester SPG Provision Open Space, Sport and	of 0.072 facilities per 1000 persons.											
					Recreational facilities 2006	facility. Assuming a											
						population of 30,000 (2.4/unit).											
							2,070,600	1 690,200				1 690,200				1 690,200	
2.5	Lane Swimming Pool		490 m2	2	200 Based on ECC Social Infrastucture Standards,	Demand arising 2 nr facilities. Assuming		030,200				050,200				030,200	
					Colchester SPG Provision Open Space, Sport and	of 0.048 facilities per 1000 persons.											
					Recreational facilities 2006	 Assuming 245m2 per facility Assuming a population of 30,000 	r										
						population of 30,000 (2.4/unit).											
							1,078,000	539,000					539,000				
													223,200				
3	pen Space																
3.1	pen space	1	240 ha	140	000 Based on ECC Social Infrastructure Standards,	Assuming a population of 30,000	 										
					based on an average of Braintree, Colchester and	(2.4/unit). Including;											
					Tendring LPA. Uplifted to 8 per 1000 people as advise	tha per 1000 population.											
					by the NEA.		33,600,000	24.00 3,360,000					12.00 1,680,000			26.40 3,696,000	
			ı			1	55,555,500	0,000,000	.,002,000	_,000,000	.,002,000	. ,002,000	.,000,000	.,000,000	.,000,000	0,000,000	

Environment/waste - Allowance to include any noise attenuation and on site recycling points	12,500	units	500		Covers the provision of acoustic bunding /]										
					fencing to mitigate the impact of external sources of noise such as highways and											
					public transport and localised solid waste recycling area.		1351	1502	1255	1048	1509	1558	1001	1434	120	
4 Utilities - Scheme-Wide Enabling Works						6,250,000	675,500	751,000	627,500	524,000	754,500	779,000	500,500	717,000	604,00	317,000
			18,434	See Breakdown Belov	w. Assuming Site Area as defined in the AECOM IPPD	230,420,000										
					background work of 685ha plus an allowance for an additional 10% of this											
					area to allow for works outside of the core development area and within the											
					site boundary. Excludes any allowance for archaeological											
Site Preparations and Earthworks					findings.	Includes the below items										
4.1 General demolition and site clearance 754 ha = m² 4.2 Strategic Earthworks; cut and fill Highways	7,540,000 7,540,000) m²	1			7,540,000 7,540,000	814,923 814,923	906,006 906,006	757,016 757,016	632,154 632,154	910,229 910,229	939,786 939,786	603,803 603,803	864,989 864,989	728,66 728,66	382,429
4.3 Primary and secondary road network Drainage Foul and surface water network	7,540,000		2			75,400,000 15,080,000	8,149,232 1,629,846	9,060,064 1,812,013	7,570,160 1,514,032	6,321,536 1,264,307	9,102,288 1,820,458	9,397,856 1,879,571	6,038,032 1,207,606	8,649,888 1,729,978	7,286,65 1,457,33	
Landscaping 4.5 Cost captured in open-space Noise attenuation 4.6 Cost captured in open-space																
Waste Management 4.7 Provision for recycling on site, excluding new amenitys Energy	12,500) Nr	250			3,125,000	337,750	375,500	313,750	262,000	377,250	389,500	250,250	358,500	302,00	158,500
4.8 58 No. 11 kV to 400 V distribution substations 4.9 9 No. 11 kV ring circuits from primary substation to connect to distribution substations.		8 Substations Ring Circuits	315,000 315,000			18,270,000 2,840,000	1,974,622 306,947	2,195,323 341,254	1,834,308 285,136	1,531,757 238,106	2,205,554 342,845	2,277,173 353,978	1,463,062 227,427	2,095,934 325,805	1,765,61 274,45	3 144,045
4.10 400 V LV circuits from distribution substations to end users 4.11 Residential Electricity Connections	12,500) Circuits/Unit	1,300	Based on UCML's Utilities Review	Assuming 12,500 nr residential connections. Exclude	16,250,000 s	1,756,300	1,952,600	1,631,500	1,362,400	1,961,700	2,025,400	1,301,300	1,864,200	1,570,40	824,200
					off-site mains lay from the POC location and any upstream reinforcement.	n										
					Excludes connections to commercial.	5										
4.12 Budget cost per Low Voltage (LV) Service Disconnection		Unit	1,800	Based on UCML's Utilities	Number of existing	20,625,000	2,229,150	12% 2,478,300	10% 2,070,750	1,729,200	12% 2,489,850	12% 2,570,700	8% 1,651,650	11% 2,366,100	10 1,993,20	
				Review	properties within the core development area likely to be demolished is											
Potable water					unknown.	Excluded	-									
New network of distribution pipework Water mains, connections and infrastructure charges	12,500) Network	1,300	Based on UCML's Utilities Review	Assuming the supply of 12,500 nr dwellings. Excluding	16,250,000	1,756,300	1,952,600	1,631,500	1,362,400	1,961,700	2,025,400	1,301,300	1,864,200	1,570,40	824,200
					Infrastructure charge inflations. Excluding connections to											
Waste Water					commercial.	19,375,000	11% 2,094,050	12% 2,328,100	10% 1,945,250	8% 1,624,400	12% 2,338,950	12% 2,414,900	8% 1,551,550	11% 2,222,700	10 1,872,40	
4.15 New network of collection pipework 4.16 Plot connections for all properties to waste water distribution network	12,500 12,500	Connections	1,300 500			16,250,000 6,250,000	1,756,300 675,500	1,952,600 751,000	1,631,500 627,500	1,362,400 524,000	1,961,700 754,500	2,025,400 779,000	1,301,300 500,500	1,864,200 717,000	1,570,40 604,00	
Gas 4.17 Low Pressure Residential Connections				Based on UCML's Utilities Review	Assuming 12,500 nr low pressure residential											
					connections. Includes gas pressure reduction systems	s										
					and on-site medium pressure mains lay. Excludes off-site mains lay and											
					upstream reinforcements or connection enabling works. Excludes											
					connections to commercial.	5,625,000	11% 607,950	12% 675,900	10% 564,750	8% 471,600	12% 679,050	12% 701,100	8% 450,450	11% 645,300	10 543,60	
5 Additional onsite requirements																
5.1 New Plant to treat additional capacity onsite		Plant		Based on AECOM IPPD background work		7,700,000	100% 7,700,000									
	L	1	1	I.	<u> </u>	7,700,000	7,700,000									

1	1	Panad ca AECOM IPPO				1	1					
1 No. Medium to Low Pressure reducing station	Station 1	Based on AECOM IPPD 635,000 background work		100%								
			635,000	635,000								
Utilities - Off-Site Requirements												
Electricity	100	Decedes AFCOM IDDD										
1 Primary Substation 132/11 kV with 2 x 45 MVA transformers	MVA	Based on AECOM IPPD background work			100%					1		
2	Connection	Based on AECOM IPPD	11,250,000	1	1,250,000							
132 kV connection to Primary Substation from Braintree Grid	Connection	background work								1		
substation			9,200,000	100% 9,200,000								
EL LUX BU LA WAL		Based on UCML's Utilities										
Electricity Diversion Works		Review	2,000,000	100% 2,000,000								
Potable Water		Based on AECOM IPPD										
Connection to closest feasible supply source with capacity		background work								1		
(e.g. trunk main or reservoir)			4,100,000	100% 4,100,000								
Budget cost per lowering of a 100mm distribution water main to	5 Site Entrances		Assuming 5 nr Site	100%								
accommodate a site entrance.		Review	Entrances 75,000	75,000								
Waste Water / Foul Water	Unavadas	Based on AECOM IPPD										
Upgrades to water course discharges / Surface Water	Upgrades	background work		100%								
		Based on AECOM IPPD	1,600,000	1,600,000								
Effluent from on-site waste treatment plant pumped 3.5km to		background work								1		
River Brain			2,050,000	100% 2,050,000						1		
Gas			2,000,000	2,000,000								
Extension to Medium Pressure network	1km Pipeline	Based on AECOM IPPD background work		100%								
		Ţ. i. i.	1,025,000									
Telecommunications	% of total	Based on AECOM IPPD										
Development of access chambers for BT Telecoms network,		background work								1		
BT Openreach fibre optic network and private telecoms network throughout development	provision			11%	12% 10	% 8%	12%	12%	8%	11%	10%	,
			3,220,000	348,018	386,915 323,28		388,718	401,341	257,858	369,398	311,181	
0 Budget cost per fibre provider for the diversion of underground apparatus at a single location.	3 nr	130,000 Based on UCML's Utilities Review	Assuming 3nr Providers	100%						1		
3			390,000	390,000								
Transport												
·			the Controlled to bid									
On site RTS route and related improvements/facilities (WoB5)	% of total provision	Based on Jacobs RTS Stu- 2019	dy Cost relates to higher investment scenario.							1		
			Low end of the range (as allowances for							1		
			risk/contingency							1		
			added separately)							1		
			22,900,000	15% 3,435,000	12% 15° 2,748,000 3,435,000			18% 4,122,000	13% 2,977,000	0%	0%	0'
Contribution to provisions of off site RTS network (WoB6)	% of total	Based on Jacobs RTS Stu		3,435,000	2,748,000 3,435,000	2,977,000	3,206,000	4,122,000	2,977,000	-	•	-
	provision	2019								1		
			Cost relates to higher investment scenario.							1		
			Low end of the range (as allowances for							1		
			risk/contingency added separately).							1		
			Allowance as a							1		
			proportion of overall funding requirements.	27%	30% 14	% 14%	15%	0%	0%	0%	0%	
		D 4500M/DDD	64,200,000		9,260,000 8,988,000	8,988,000	9,630,000	-	-	-	-	-
3 Various combined segregated pedestrian / cycle "Greenways" through site (WoB8)	% of total provision	Based on AECOM IPPD background work,								1		
		amendments to these cost as advised by the NEA.	S							1		
1										1		
			2,940,000	11% 317,755	12% 10° 353,270 295,17°		12% 354,917	12% 366,442	8% 235,435	11% 337,277	10% 284,122	
Upgrade to existing pedestrian bridge over A120 to provide pedestrian /	% of total	Based on AECOM IPPD	2,940,000	317,733	293,170	240,490	554,917	300,442	230,435	331,211	204,122	149,11
cycle connection between site and Flitch Way. At-grade or elevated link to continue into the site (WoB12)	provision	background work, amendments to these cost	s							1		
		as advised by the NEA.								1		
				100%						1		
Name and a trian (a part height () 1 1 2 2 2 2 2 2 2		B	4,410,000	4,410,000								
New pedestrian / cycle bridge (combined with new junction arrangements) over A120 providing a connection between the site and	% of total provision	Based on AECOM IPPD background work,								1		
Flitch Way, including new route south of A120 (WoB11)		amendments to these cost as advised by the NEA.	s							1		
										1		
			6,510,000		100% 6,510,000							
A shared use footway/Cycleway between Rayne and Blake End	% of total	 	6,510,000		0,010,000							
alongside the B1256. (WoB10)	provision	Based on AECOM IPPD background work. ITP								1		
		reviewed & costs assumpti increased to achieve high	ions							1		
		qualiy connection.								1		
			8,600,000	50% 4,300,000	50° 4,300,000							
Flitch Way east of Pods Lane and Rayne to retain rural character and	% of total	Based on AECOM IPPD	8,600,000	4,500,000	4,300,000							
setting. A 2km all-weather surfaced section from River Brain to Pods Lane in Rayne with sensitive lighting is proposed to improve	provision	background work. ITP reviewed and consider sho	uld							1		
connectivity to Braintree town-centre B123; (WoB9)		be higher to get better qual connection.	liy							1		
1		connection.								1		
										1		
					100%					1		
			4,200,000		4,200,000							

7.8	Transit Hub & multi-modal interchange (with RTS) (WoB7)			% of total provision		Consistent approach to other GCs. As advised by the NEA.	To provide for interchange between modes, including provision of park & ride (as appropriate)	
								Included in on-site R
	Upgrades to improve safety and operation at the B1417 / B1256 and B1256 / Blake End junction to form a new roundabout or signal controlled junction (WoB1a)			% of total provision		Based on AECOM IPPD background work, amendments to these costs as advised by the NEA.		
7.10	Utilise existing access arrangements from the A120 junction with the			% of total		Based on AECOM IPPD		2,
	addition of a new on-slip (WoB1b)			provision		background work, amendments to these costs as advised by the NEA.		
7.11	All-vehicle off-slip and associated junction improvement at Stebbing Green (WoB2b)			% of total provision		Based on AECOM IPPD background work,		3,
	G ((1 (1)))			providen		amendments to these costs as advised by the NEA.		
7.40		<u> </u>		0/ // /		Based on AECOM IPPD		
7.12	Additional infrastructure to form an all-movement junction between the A120 and B1417 and associated widening of the bridge structure. (WoB2a)			% of total provision		background work, amendments to these costs as advised by the NEA.		
								7,
7.13	Bus only eastbound off-slip and eastbound on-slips to above junction (WoB15)			% of total provision		Based on AECOM IPPD background work, amendments to these costs as advised by the NEA.		
7.14	The addition of a full junction upgrade connecting the main site access	-		% of total		Based on AECOM IPPD		1,
	with the above upgrades to the A120/B1417 junction (WoB3)			provision		background work, amendments to these costs as advised by the NEA.		
7.15	The addition of a new signal control or roundabout junction providing	-		% of total		Based on AECOM IPPD		10,
	direct access from the B1256 junction through to the site (WoB1c)			provision		background work, amendments to these costs as advised by the NEA.		
7.16	Internal road network			% of total provision				1,
		<u> </u>		provision				Included in enabling
8	Per Unit Contributions							
8.1	Investment in early phase bus/transit services (WoB14)			% of total provision		Based on AECOM IPPD background work, amendments to these costs as advised by the NEA.	Delivered from day one with funding annually for the first three phases	
	0 17 5 1 0 1 1 1 1 5 1 1 1 1 5 1 1 1 1 1 1 1		10.500	0/ // /	0.500			5,
8.2	Contribution to Strategic highways (incl A120 improvement) (WoB5)		12,500	% of total provision	2,500	Allowance as advised by the NEA.		31,:
8.3	Travel plan measures (smarter choices, car clubs, charging points, etc) - Straight Line Cost Over Time		12,500	% of total provision	500	Allowance as advised by the NEA.	Aligned to Modal Shift analysis (ITP)	6,
8.4	Open Space Endowment		12,500	% of total provision	2,100	Allowance as advised by the NEA.		26,
8.5	Employment Space		12,500	% of total provision	1,000	Allowance as advised by the NEA.		12,
	Subtotal Total Cost Per Phase							665,
	Plus Professional fees at 10%				10%			303,
	Plus Contingency at 10%				10%			
	Total Scheme Cost Per Phase Total costs at 4Q2018 (excluding VAT)							
	Accumulative number of units							
	Total % of units							-
	Total Cost per Unit							

									1
_	_								
100%									
2,550,000									
100%									
3,026,000									
	100% 850,000								
	850,000								
100%									
7,000,000									
	100%								
	1,620,000								
	100%								
	10,200,000								
	100%								
	1,820,000								
	1,020,000								
33%	33%	34%							
1,794,731	1,794,731	1,849,117							
11%	12%	10%	8%	12%	12%	8%	11%	10% 3,020,000	5%
3,377,500	3,755,000	3,137,500	2,620,000	3,772,500	3,895,000	2,502,500	3,585,000	3,020,000	1,585,000
ı			l l			1	440/	10%	F0/
11%	12%	10%	8%	12%	12%	8%	11%		5%
11% 675,500	12% 751,000	10% 627,500	8% 524,000	12% 754,500	12% 779,000	500,500	717,000	604,000	317,000
675,500	751,000	627,500	524,000	754,500	779,000	500,500	717,000	604,000	317,000
675,500 11%	751,000 12%	627,500 10%	524,000 8%	754,500 12%	779,000 12%	500,500	717,000	604,000	317,000 5%
675,500	751,000	627,500	524,000	754,500	779,000	500,500	717,000	604,000	317,000
675,500 11% 2,837,100	751,000 12% 3,154,200	627,500 10% 2,635,500	524,000 8% 2,200,800	754,500 12% 3,168,900	779,000 12% 3,271,800	500,500 8% 2,102,100	717,000 11% 3,011,400	604,000 10% 2,536,800	317,000 5% 1,331,400
675,500 11% 2,837,100 11%	751,000 12% 3,154,200	627,500 10% 2,635,500	524,000 8% 2,200,800	754,500 12% 3,168,900	779,000 12% 3,271,800	500,500 8% 2,102,100	717,000 11% 3,011,400 11%	604,000 10% 2,536,800 10%	317,000 5% 1,331,400
675,500 11% 2,837,100	751,000 12% 3,154,200	627,500 10% 2,635,500	524,000 8% 2,200,800 8% 1,048,000	754,500 12% 3,168,900	779,000 12% 3,271,800	500,500 8% 2,102,100	717,000 11% 3,011,400 11% 1,434,000	604,000 10% 2,536,800	317,000 5% 1,331,400
675,500 11% 2,837,100 11%	751,000 12% 3,154,200 12% 1,502,000	627,500 10% 2,635,500 10% 1,255,000	524,000 8% 2,200,800 8% 1,048,000	754,500 12% 3,168,900 12% 1,509,000	779,000 12% 3,271,800 12% 1,558,000	500,500 8% 2,102,100	717,000 11% 3,011,400 11% 1,434,000	10% 2,536,800 10% 1,208,000	317,000 5% 1,331,400 5% 634,000
675,500 11% 2,837,100 11% 1,351,000 122,602,818 12,260,281	751,000 12% 3,154,200 1502,000 139,136,824 13,913,682	627,500 10% 2,635,500 10% 1,255,000 62,464,349 6,246,435	524,000 8% 2,200,800 8% 1,048,000 45,963,227 4,596,323	754,500 12% 3,168,900 1,509,000 70,454,018 7,045,402	779,000 12% 3,271,800 12% 1,558,000 56,667,891 5,666,789	500,500 8% 2,102,100 8% 1,001,000 55,379,646 5,537,965	717,000 11% 3,011,400 11% 1,434,000 48,077,338 4,807,734	604,000 10% 2,536,800 10% 1,208,000 38,056,851 3,805,885	317,000 5% 1,331,400 5% 634,000 26,420,218 2,642,022
675,500 11% 2,837,100 11% 1,351,000 122,602,818 12,260,282 13,486,310	751,000 12% 3,154,200 12% 1,502,000 139,136,824 13,913,682 15,305,051	627,500 10% 2,635,500 10% 1,255,000 62,464,349 6,246,435 6,871,078	524,000 8% 2,200,800 8% 1,048,000 45,963,227 4,596,323 5,055,955	754,500 12% 3,168,900 12% 1,509,000 70,454,018 7,045,402 7,749,942	779,000 12% 3,271,800 12% 1,558,000 56,667,891 5,666,789 6,233,468	500,500 8% 2,102,100 8% 1,001,000 55,379,646 5,537,965 6,091,761	717,000 11% 3,011,400 11% 1,434,000 48,077,338 4,807,734 5,288,507	10% 2,536,800 10% 1,208,000 38,056,851 3,805,685 4,186,254	317,000 5% 1,331,400 5% 634,000 26,420,218 2,642,022 2,906,224
675,500 11% 2,837,100 11% 1,351,000 122,602,818 12,260,282 13,486,310 148,349,410	751,000 12% 3,154,200 12% 1,502,000 139,136,824 13,913,682 15,305,051 168,355,557	627,500 10% 2,635,500 10% 1,255,000 62,464,349 6,246,435 6,871,078	524,000 8% 2,200,800 8% 1,048,000 45,963,227 4,5963,223 5,055,955 55,615,505	754,500 12% 3,168,900 1,509,000 70,454,018 7,045,402 7,749,942 85,249,361	779,000 12% 3,271,800 12% 1,558,000 56,667,891 5,666,7891 6,233,468 68,568,148	500,500 8% 2,102,100 8% 1,001,000 55,379,646 5,537,965 6,091,761 67,009,372	717,000 11% 3,011,400 1,434,000 48,077,338 4,807,734 5,288,507 58,173,578	10% 2,536,800 10% 1,208,000 38,056,851 3,805,685 4,186,254 46,048,790	317,000 5% 1,331,400 5% 634,000 26,420,218 2,642,022 2,906,224 31,968,463
11% 2,837,100 11% 2,837,100 11% 1,351,000 122,602,818 12,260,282 13,486,310 148,349,410 148,349,410	751,000 12% 3,154,200 12% 1,502,000 139,136,824 13,913,682 15,305,051 168,355,557 168,355,557	627,500 10% 2,635,500 10% 1,255,000 62,464,349 6,246,435 6,871,078 75,581,863 75,581,863	524,000 8% 2,200,800 8% 1,048,000 45,963,227 4,596,323 5,055,955 55,615,505 55,615,505	754,500 12% 3,168,900 12% 1,509,000 70,454,018 7,045,402 7,749,942 85,249,361 85,249,361	779,000 12% 3,271,800 12% 1,558,000 56,667,891 5,666,789 6,233,468 68,568,148 68,568,148	500,500 8% 2,102,100 8% 1,001,000 55,379,646 5,537,965 6,091,761 67,009,372 67,009,372	717,000 11% 3,011,400 11% 1,434,000 48,077,338 4,807,734 5,288,507 58,173,578 58,173,578	10% 2,536,800 10% 1,208,000 38,056,851 3,805,885 4,186,254 46,048,790	317,000 5% 1,331,400 5% 634,000 26,420,218 2,642,022 2,906,224 31,968,463 31,968,463
675,500 11% 2,837,100 11% 1,351,000 122,602,818 12,260,282 13,486,310 148,349,410 148,349,410 1351	751,000 12% 3,154,200 12% 1,502,000 139,136,824 13,913,682 15,305,051 168,355,557 168,355,557	627,500 10% 2,635,500 10% 1,255,000 62,464,349 6,246,435 6,871,078 75,581,863 75,581,863 1255	524,000 8% 2,200,800 8% 1,048,000 45,963,227 4,596,323 5,055,955 55,615,505 55,615,505	754,500 12% 3,168,900 12% 1,509,000 70,454,018 7,045,402 7,749,942 85,249,361 85,249,361 1509	779,000 12% 3,271,800 12% 1,558,000 56,667,891 5,666,789 6,233,468 68,568,148 68,568,148	500,500 8% 2,102,100 8% 1,001,000 55,379,646 5,537,965 6,091,761 67,009,372 67,009,372 1001	717,000 11% 3,011,400 11% 1,434,000 48,077,338 4,807,734 5,288,507 58,173,578 58,173,578	10% 2,536,800 10% 1,208,000 38,056,851 3,805,685 4,186,254 46,048,790 46,048,790	317,000 5% 1,331,400 5% 634,000 26,420,218 2,642,022 2,906,224 31,968,463 31,968,463 634
11% 2,837,100 11% 2,837,100 11% 1,351,000 122,602,818 12,260,282 13,486,310 148,349,410 148,349,410	751,000 12% 3,154,200 12% 1,502,000 139,136,824 13,913,682 15,305,051 168,355,557 168,355,557	627,500 10% 2,635,500 10% 1,255,000 62,464,349 6,246,435 6,871,078 75,581,863 75,581,863	524,000 8% 2,200,800 8% 1,048,000 45,963,227 4,596,323 5,055,955 55,615,505 55,615,505	754,500 12% 3,168,900 12% 1,509,000 70,454,018 7,045,402 7,749,942 85,249,361 85,249,361	779,000 12% 3,271,800 12% 1,558,000 56,667,891 5,666,789 6,233,468 68,568,148 68,568,148	500,500 8% 2,102,100 8% 1,001,000 55,379,646 5,537,965 6,091,761 67,009,372 67,009,372	717,000 11% 3,011,400 11% 1,434,000 48,077,338 4,807,734 5,288,507 58,173,578 58,173,578	10% 2,536,800 10% 1,208,000 38,056,851 3,805,885 4,186,254 46,048,790	317,000 5% 1,331,400 5% 634,000 26,420,218 2,642,022 2,906,224 31,968,463 31,968,463

3

Total Infrastructure Requirements by Phase – Tendring Colchester Borders

Site 2: Tendring Colchester Borders

	Infrastructure	Demand arising from development and total cost	Unit of demand R	tate Notes Commentary/assumptions	otal	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
						1442	3004	Cumulative Devel	opment 5783	6848	7500
						1442	3004	Phased Develop		0040	7300
						1442	1562	1552	1227	1065	652
1	Education										
1.1	Primary Schools: 2 Form Entry (including 56 place EY+C facility)	8	FE	3,150,000 Requirement as advised by the NEA. 2FE facilities and EY + C Assuming 210 places per FE and 56 places per EY. Excludes temporary accommodation.							
						2FE + EY	2FE + EY	2FE + EY		2FE + EY	
1.2	Secondary Schools	8	FE	3,690,000 Requirement as advised by the NEA. Excludes temporary accommodation.	29,880,000	7,470,000	7,470,000	7,470,000		7,470,000	
							8FE				
					29,520,000		29,520,000				
1.3	Standalone Early Year Facilities (56 place, above those co-located with Primary)	5	Facilities	1,170,000 Requirement as advised by the NEA. Assuming 56 places per facility. 4 EY facilities within primary schools, 9 in total required by development. Excludes temporary accommodation.							
						1	1		2		1
					5,850,000	1,170,000	1,170,000		2,340,000		1,170,000
2	Healthcare & Community										
0.4	Out and Departition and	4050	0	2000 December Tember December 1 of the 10 ODs Assessing							
2.1	General Practitioners	1650	m2	3000 Based on Tendring Colchester Borders Social Infrastructure Standards EXD/013B Braintree Council Website Demand arising 10 GPs. Assuming 1800 population per GP. Assuming a population of 18,000 (2.4/unit). Assuming 165 m2 / GP.			2	2	1	2	1
			+		4,950,000	990,000	990,000	990,000	495,000	990,000	495,000
2.2	Dentists	550	m2	3000 Based on Tendring Colchester Borders Social Infrastructure Standards EXD/013B Braintree Council Website Demand arising 11 Dentists. Assuming 1760 population per dentist. Assuming a population of 18,000 (2.4/unit). Assuming 50 m2 / Dentist.							
					1,650,000	450,000	300,000	150,000	300,000	300,000	150,000
2.3	Community Space and Libraries	1800	m2	2500 Library Space based on Tendring Colchester Borders Social Infrastructure Standards EXD/013B Braintree Council Website. Community Space Assuming 80 m2 per 1000 persons. Demand arising 100 m2 per 1000 persons. Demand arising 1nr 1800 m2 facilities. Assuming a population of 18,000 (2.4/unit). As advised by the NEA and their advisers.							
					4,500,000	23% 1,035,000	17% 765,000	17% 765,000	12% 540,000	21% 945,000	10% 450,000
2.4	4 Court Sports Centre	952	m2	1450 Based on ECC Social Infrastucture Standards, Colchester SPG Provision of Open Space, Sport and Recreational facilities 2006. Demand arising 2 nr facilities. Assuming 0.072 facilities per 1000 persons. Assuming 476m2 per facility. Assuming a population of 18,000 (2.4/unit).	4,300,000	1,000,000	733,000	7.00,000	340,000	343,000	+30,000
						1			1		
2.5	4 Lane Swimming Pool	245	m2	2200 Based on ECC Social Infrastucture Standards, Colchester SPG Provision of Open Space, Sport and Recreational facilities 2006. Demand arising 1 nr facility. Assuming 0.048 facilities per 1000 persons. Assuming 245m2 per facility Assuming a population of 18,000 (2.4/unit).	1,380,400	690,200			690,200		
			+		539,000	539,000					
			1	<u> </u>	300,000	333,000					

			1	T	ı				T			
3	Open Space											
3.1	Open Space	144	ha		Based on ECC Social Infrastructure Standards, based on an average of Braintree, Colchester and Tendring LPA. Uplifted to 8ha per 1000 people as advised by the NEA	Assuming a population of 18,000 (2.4/unit). Including; 8ha total open space per 1000 population.						
							20,400,000	38.88	47.52	1.44	28.80	20.16
3.2	Environment/waste - Allowance to include any noise attenuation and on-site recycling points	7,500	units	500		Covers the provision of acoustic bunding / fencing to mitigate the impact of external sources of noise such as highways and public transport and localised solid waste recycling area.	20,160,000	5,443,200	6,652,800	201,600	4,032,000	2,822,400
							3,750,000	721,000	781,000	776,000	613,500	532,500
4	Utilities - Scheme-Wide Enabling Works											
				18,485	See Breakdowr Below	Assuming Site Area as defined in the AECOM IPPD background work of 424ha less the University area of 15.4ha and the Park & Ride Area South of the A133 of 2.78ha totalling 403ha plus an allowance for an additional 10% of this area to allow for works outside of the core development area and within the site boundary. Excludes any allowance for archaeological findings.		26,654,889	28,873,049	28,688,203	22,680,686	19,686,170
	Site Preparations and Earthworks											
4.1	General demolition and site clearance 443 ha = m ²	4,430,000) m²	1			4,430,000	851,741	922,621	916,715	724,748	629,060
4.2	Strategic Earthworks; cut and fill	4,430,000) m²	1			4,430,000	851,741	922,621	916,715	724,748	629,060
4.3	Highways Primary and secondary road network Drainage	4,430,000) m²	10			44,300,000	8,517,413	9,226,213	9,167,147	7,247,480	6,290,600
4.4	Foul and surface water network	4,430,000) m²	2			8,860,000	1,703,483	1,845,243	1,833,429	1,449,496	1,258,120
4.5	Landscaping Cost captured in open-space											
4.5	Noise attenuation											
4.6	Cost captured in open-space											
4.7	Waste Management Provision for recycling on site, excluding new amenitys	7,500) Nr	250			1,880,000	361,461	391,541	389,035	307,568	266,960
	Energy											
4.8 4.9	33 No. 11 kV to 400 V distribution substations 7 No. 11 kV ring circuits from primary substation to connect to distribution substations.	33	Substations	315,000			10,400,000	1,999,573	2,165,973	2,152,107	1,701,440	1,476,800
		7	Ring Circuits	315,000			2,210,000	424,909	460,269	457,323	361,556	313,820
4.11	400 V LV circuits from distribution substations to end users Residential Electricity Connections	7,500) Circuits/Unit	1,300	Based on UCML's Utilities Review	Assuming 7,500 nr residential connections. Excludes off-site mains lay from the POC location and any upstream reinforcement. Excludes connections to commercial.	9,750,000	1,874,600 23% 3,220,000	2,030,600 17% 2380000	2,017,600 17% 2380000	1,595,100 12% 1680000	1,384,500 21% 2940000
4.12	Budget cost per Low Voltage (LV) Service Disconnection		Unit	1,800	Based on UCML's Utilities Review	Number of existing properties within the core development area likely to be demolished is unknown.	Excluded					
	Potable water		Matricals									
	New network of distribution pipework Water mains, connections and infrastructure charges	7,500	Network	1,300	Based on UCML's Utilities Review	Assuming the supply of 7,500 nr dwellings. Excluding Infrastructure charge inflations. Excluding connections to commercial.	9,750,000	1,874,600 23% 2,702,500	2,030,600 17% 1997500	2,017,600 17% 1997500	1,595,100 12% 1410000	1,384,500 21% 2467500
4.15	Budget cost per water service disconnection in the Affinity area.				Based on UCML's	Quantity Unknown	. 1,1 00,000	2,752,500	100.000			_ 10.000
	W W			650	Utilities Review		Excluded					
4.16	Waste Water New network of collection pipework	7 500) Network	1,300			9,750,000	1,874,600	2030600	2017600	1595100	1384500
	Plot connections for all properties to waste water distribution	7,500	,									
	network Gas	.,000	Connections	500			3,750,000	721,000	781000	776000	613500	532500
			•									

1,008,000

652 326,000

12,052,003

385,115 385,115

3,851,147

770,229

163,435

904,107

192,123 847,600

10% 1400000

847,600

1175000

847600

326000

Low Pressure Residential Connections			Assuming 7,500 nr low pressure residential connections. Includes gas pressure reduction systems and on-site medium pressure mains lay. Excludes off-site mains lay and upstream reinforcements or connection enabling works. Excludes connections to commercial.		23%	17%	17%	12%	21%	10%
Utilities - Off-Site Requirements				3,375,000	776,250	573750	573750	405000	708750	337500
Electricity			4	1						
132 kV connection to Primary Substation from Colchester Grid		Based on AECOM IPPD background work								
substation	1		I	9,200,000		100% 9,200,000				
Adoption of existing overhead electricity transmission infrastructure.		Based on UCML's Utilities Review	Diversion financially unfeasible	9,200,000 Excluded		9,200,000				
Electricity Diversion Works		Based on UCML's Utilities Review	T	1,500,000	100% 1,500,000					
Potable Water				1,000,000	1,000,000					
Connection to closest feasible supply source with capacity		Based on AECOM IPPD background work		1						
(e.g. trunk main or reservoir)		'		4,100,000	100% 4,100,000					
Budget cost per lowering of the Affinity Water 12" AC Distribution Water Main to accommodate a site entrance.	3 Site Entrances		Assuming lowering of the distribution water main to accommodate site entrances within Brightlingsea Road, Elmstead Road and Colchester Road.	3	100% 225,000					
Waste Water / Foul Water				225,000	220,000				4	
Upgrades to water course discharges			Allowance for environmental enhancement / EA regulations. Note: Does not account for university student population	1,050,000	100% 1,050,000					
Connection to existing waste water treatment works via new pumping station - primary and secondary collection networks			Pumped to Colchester WRC (5.2 km pipeline). Note: Does not account for university student population.	5,300,000	100% 5,300,000					
Gas Extension to Medium Pressure network		Based on AECOM								
Xtension to Medium Pressure Hetwork		IPPD background	2 km pipeline based on £1.022m/km	2,044,000	100% 2,044,000					
1 No. Medium to Low Pressure reducing station		Based on AECOM IPPD background work			1731	1874	1863	1472	1277	783
Re-routing of 12" Medium Pressure Gas Main through the new on-site road network	1 Station	635,000 Based on UCML's Utilities Review	+	635,000	122,089 100%	132,249	131,403	103,886	90,170	55,203
Telecommunications				750,000	750,000					
Development of access chambers for BT Telecoms network, BT Openreach fibre optic network and private telecoms network throughout development.		Based on AECOM IPPD background work		1						
Openreach diversion works associated with Mount Pleasant and Allen's Farm off Tye		Based on UCML's	<u> </u>	2,150,000	23% 494,500 100%	17% 365,500	17% 365,500	12% 258,000	21% 451,500	10% 215,000
Road. Openreach diversion works associated with highway works on the A133.		Utilities Review Based on UCML's	t	95,000	95,000					
penreach diversion works associated with highway works on the Artos.		Based on UCML's Utilities Review	<u> </u>	200,000	100% 200,000					
Transport										
New signalised access onto A133 (primary access to site) (TCB2a)	% of total provision	Based on AECOM IPPD background work, amendments to these costs as advised by the NEA.								

<u> </u>			<u> </u>		<u> </u>	2,500,000	2,500,000					
Secondary signalised access onto A133 (TCB2b)		% of total		ased on AECOM								
		provision		PD background ork, amendments]						
				these costs as								
				lvised by the NEA.			100%					
Interior highways in a superior and the state of the stat		0/ = 1 - 1 - 1		and or AECOM		2,500,000	2,500,000					
Interim highways improvements measures (including improvements to Greenstead roundabout and A133 Hare Green roundabout) (TCB3)		% of total provision	IP	ased on AECOM PD background								
		provident.	wo	ork, amendments								
				these costs as lvised by the NEA.								
			ac	IVISED BY THE INCA.								
							100%					
						3,000,000	3,000,000					
A120-A133 Link Road (TCB1)		% of total		ased on Jacobs								
		provision	bio	F review & funding				100%				
						41,000,000		41,000,000				
On site RTS route and related improvements/facilities (TCB4)		% of total		ased on Jacobs		,,,,,,		,,				
		provision	R ⁻	TS Study 2019	Cost relates to higher investment							
					scenario. Low end of the range (as allowances for risk/contingency							
					added separately). Allowance as a							
					proportion of overall funding							
					requirements.	40,000,000	20%	20%	20%	20%	20%	
Contribution to provisions of off site RTS network (TCB5)		% of total	D,	ased on Jacobs		16,600,000	3,320,000	3,320,000	3320000	3320000	3320000	
Commodulation to provide the one of the two transfer (1000)		provision	R ⁻	TS Study 2019	Cost relates to higher investment							
				-	scenario. Low end of the range (as							
					allowances for risk/contingency added separately). Allowance as a							
					proportion of overall funding							
					requirements.		27%	30%	14%	14%	15%	
						38,100,000	10,287,000	11,430,000	5,334,000	5,334,000	5,715,000	
Park & Ride facilities and interchange with RTS (TCB6)		% of total provision	Ba R	ased on Jacobs TS Study 2019	To provide for interchange between modes, including provision of park							
		provision	IX.	10 Olddy 2019	& ride (as appropriate)							
						A de de la discola de la colonia de la colon	50%		50%			
						Advised included in on-site RTS (item 6.5)	_	_	_		_	
Upgrade existing walking / cycling infrastructure (TCB7a)		% of total	Ba	ased on AECOM		1(10 (item 0.5)		-	-	•		
opgrade oxioting maining/ oyeming minderaction (1.00) ay		provision	IP	PD background								
				ork, amendments								
				these costs as lvised by the NEA.			50%	50%				
				,		3,150,000	1,575,000	1,575,000				
Various combined segregated pedestrian / cycle "Greenways" through site (TCB7b)		% of total		ased on AECOM		·		·				
		provision		PD background ork, amendments]						
			to	these costs as]						
				lvised by the NEA.]						
							23%	17%	17%	12%	21%	
Internal road nativerk		0/, of total				1,890,000	434,700	321,300	321,300	226,800	396,900	
Internal road network		% of total provision			Required to facilitate access to]						
					site (based on no.resi built per]						
					phase). Included in enabling costs							
						Included in enabling costs						
Beatlett Outstandard												
Per Unit Contributions												
Investment in early phase bus/transit services (TCB9)	7,500	% of total	Re	ased on AECOM								
	7,000	provision	IP	PD background								
				ork, amendments	2 710 200 olloantad burnanta]						
				these costs as lvised by the NEA.	3,710,280 allocated by percentage of units per phase]						
				.,	, ,]	23%	17%	17%	12%	21%	
<u> </u>					<u> </u>	3,710,280	853,364	630,748	630,748	445,234	779,159	
Travel plan measures (smarter choices, car clubs, charging points, etc) - Straight Line	7,500	% of total		lowance as	Aligned to Modal Shift analysis							
Cost Over Time		provision	ac	ivised by the NEA.	(ITP). Delivered from day one with funding annually - based on £500]						
					cost per unit.]						
					, ,		23%	17%	17%	12%	21%	
						3,750,000	862,500	637,500	637,500	450,000	787,500	
Open Space Endowment	7,500	% of total	2,100 AI	lowance as lvised by the NEA.	£/unit]						
		provision	ac	wised by the NEA.]	23%	17%	17%	12%	21%	
						15,750,000	3,622,500	2,677,500	2,677,500	1,890,000	3,307,500	
	7,500	% of total	1,000 AI	lowance as	0/ 1/				-			
Employment Space		provision	ac	lvised by the NEA.	£/unit			.=	.=0.		2.0.	
Employment Space	l					7,500,000	23% 1,725,000	17% 1,275,000	17% 1,275,000	12% 900,000	21% 1,575,000	
Employment Space		J				7,500,000 407,513,680	1,725,000 92,822,926	1,275,000 147,972,130	1,275,000 52,658,070	43,349,456	1,575,000 51,149,299	
									32,030,070	43,349,430	31,143,299	
Subtotal Total Cost Per Phase			10%			401,010,000				4.334 946	5.114 930	
			10% 10%			401,010,000	9,282,293 10,210,522	14,797,213 16,276,934	5,265,807 5,792,388	4,334,946 4,768,440	5,114,930 5,626,423	
Subtotal Total Cost Per Phase Plus Professional fees at 10%						407,010,000	9,282,293	14,797,213	5,265,807			
Subtotal Total Cost Per Phase Plus Professional fees at 10% Plus Contingency at 10% Total Scheme Cost Per Phase Total costs at 4Q2018 (excluding VAT)						401,010,000	9,282,293 10,210,522 112,315,741 112,315,741	14,797,213 16,276,934 179,046,277 179,046,277	5,265,807 5,792,388 63,716,264 63,716,264	4,768,440 52,452,841 52,452,841	5,626,423 61,890,652 61,890,652	
Subtotal Total Cost Per Phase Plus Professional fees at 10% Plus Contingency at 10% Total Scheme Cost Per Phase						40,010,000	9,282,293 10,210,522 112,315,741	14,797,213 16,276,934 179,046,277	5,265,807 5,792,388 63,716,264	4,768,440 52,452,841	5,626,423 61,890,652	

4

Total Infrastructure Requirements by Phase – Colchester Braintree Borders

Site 3: Colchester Braintree Borders

nfrastructure	Demand Arising From Developmen		Rate	Notes	Commentary/assumptions	Total	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
		-	•	-	•	-	2550	4608	7314	Cummulative 9812	Development 12582	15531	18560	21000
							2550	,	2700	Phased De		2040	2020	24
							2550	2058	2706	2498	2770	2949	3029	24
Education														
Primary Schools: 2 Form Entry (including 56 place EY+C	22	P FE	3,150,000	Requirement as	2FE facilities and EY + C Assuming 210									
acility)				advised by the NEA.	places per FE and 56 places per EY. Excludes temporary accommodation.		2nr 2FE +EY	2FE + EY	2nr 2FE +EY	2FE + EY	2nr 2FE +EY	2nr 2FE +EY	2FE + EY	
Secondary Schools	20) FE	3,690,000	Requirement as	Assuming 150 places per FE. Excludes	82,170,000	14,940,000	7,470,000	14,940,000	7,470,000	14,940,000	14,940,000	7,470,000	
·				advised by the NEA.	temporary accommodation.	73,800,000	8FE 29,520,000		6FE 22,140,000			6FE 22,140,000		
Standalone Early Year Facilities (56 place, above those co-located vith Primary)	14	Facility	1,170,000	Requirement as advised by the NEA.	Assuming 56 places per facility. 11 EY facilities within primary schools, 25 in total required by development. Excludes temporary accommodation.		20,020,000		22,110,000			22,110,000		
						16,380,000	2,340,000	2 2,340,000	1 1,170,000	3,510,000	1 1,170,000	3,510,000	2,340,000	
						10,380,000	2,340,000	2,340,000	1,170,000	3,310,000	1,170,000	3,310,000	2,040,000	
Healthcare & Community														
Seneral Practitioners	4620) GPs	3,000	Based on Colchester Braintree Borders Social Infrastructure Standards EXD/013C Braintree Council Website	Demand arising 28 GPs. Assuming 1800 population per GP. Assuming a population of 50,400 (2.4/unit). Assuming 165 m2 / GP.		4	4	4	4	4	4	33	
Dentists	1450	D. effets	0.000	Based on Colchester	Demand arising 29 Dentists. Assuming	13,860,000	1,980,000	1,980,000	1,980,000	1,980,000	1,980,000	1,980,000	1,485,000	495,00
retiusis	1450) Dentists	3,000	Braintree Borders Social Infrastructure Standards EXD/013C Braintree Council	1760 population per dentist. Assuming a population of 50,400 (2.4/unit). Assuming 50 m2 / Dentist.			4		4	4	4	2	
				Website		4,350,000	600,000	600,000	600,000	600,000	600,000	600,000	450,000	300,00
Community Space and Libraries	5400) m2	2,500	Colchester Braintree Borders Social Infrastructure Standards EXD/013C Braintree Council Website. Community Space Provisions as	Demand arising 1512 m2 of Library Space Assuming 30 m2 per 1000 persons. Demand arising 3024m2 of Community Space. Assuming 60 m2 per 1000 persons Demand arising 3nr 1800 m2 facilities. Assuming a population of 50,400 (2.4/unit) As advised by the NEA, the cost for Community Space and Library Facilities has been phased in accordance with unit	s.								
				their advisers.	delivery.		12%	10%	13%	12%	13%	14%	14%	12
Court Sports Centre	1904	m2	1.450	Paged on ECC Social	Demand arising 4 nr facilities. Assuming	13,500,000	1,639,286	1,323,000	1,739,571	1,605,857	1,780,714	1,895,786	1,947,214	1,568,57
Court Spots Centre	130-	, 1112	1,450	Infrastucture Standards Colchester SPG Provision of Open Space, Sport and Recreational facilities 2006.	O.072 facilities per 1000 persons. Assuming 476m2 per facility. Assuming a population of 50,400 (2.4/unit).		1		1		1	1		
U O. Stanio Parl	70,		0.000	Develop 500 Occid	Described to the Conference of	2,760,800	690,200		690,200		690,200	690,200		
Lane Swimming Pool	738	6 m2	2,200	Infrastucture Standards Colchester SPG Provision of Open Space, Sport and Recreational facilities 2006.	Demand arising 3 nr facilities. Assuming 0.048 facilities per 1000 persons. Assuming 245m2 per facility. Assuming a population of 50,400 (2.4/unit).									
						1,617,000	539,000		539,000			539,000		
Open Space														
Open space	403	B ha	140,000	Based on ECC Social Infrastructure Standards, based on an average of Braintree, Colchester and Tendring LPA. Uplifted to 8ha per 1000 people as advised by the NEA.	Assuming a population of 50,400 (2.4/unit Including; 8ha total open space per 1000 population.									
						56,448,000	60.48 8,467,200	60.48 8,467,200	56.45 7,902,720	100.80 14,112,000	52.42 7,338,240	32.26 4,515,840	40.32 5,644,800	0.
Environment/waste - Allowance to include any noise attenuation and on-site recycling points	21,000	units	500		Covers the provision of acoustic bunding / fencing to mitigate the impact of external sources of noise such as highways and public transport and localised solid waste recycling area.		5, 101, 100	3, 10, 120	1,000,120	,2,000	1,000,100	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	3,5 : 1,000	
					,,,	10 700 00	2550 1,275,000	2058 1,029,000	2706 1,353,000	2498 1,249,000	2770 1,385,000	2949 1,474,500	3029 1,514,500	24- 1,220,00
						10,500,000	1,275,000	1,029,000	1,353,000	1,249,000	1,385,000	1,474,500	1,514,500	1,220,00
Jtilities - Scheme-Wide Enabling Works														
			18,570	See Breakdown Below	Assuming Site Area as defined in the AECOM IPPD background work of 1,169h plus an allowance for an additional 10% of this area to allow for works outside of the core development area and within the site boundary. Excludes any allowance for archaeological findings.	f	47,354,138	38,217,575	50,251,097	46,388,485	51,439,593	54,763,667	56,249,287	45,311,4

Site Preparations and Earthworks													
General demolition and site clearance 1,286 ha = m² Strategic Earthworks; cut and fill	12,860,000 12,860,000		1		12,860,000 12,860,000	1,561,571 1,561,571	1,260,280 1,260,280	1,657,103 1,657,103	1,529,728 1,529,728	1,696,295 1,696,295	1,805,911 1,805,911	1,854,902 1,854,902	1, 1,
lighways frimary and secondary road network			10		128,600,000								14
rimary and secondary road network rainage	12,860,000	m²	10		128,600,000	15,615,714	12,602,800	16,571,029	15,297,276	16,962,952	18,059,114	18,549,019	14
oul and surface water network	12,860,000	m²	2		25,720,000	3,123,143	2,520,560	3,314,206	3,059,455	3,392,590	3,611,823	3,709,804	2
andscaping Cost captured in open-space													
Noise attenuation													
Cost captured in open-space Waste Management													
Provision for recycling on site, excluding new amenitys	21,000	Nr :	250		5,250,000	637,500	514,500	676,500	624,500	692,500	737,250	757,250	
104 No. 11 kV to 400 V distribution substations	104	Substations 315,0	00		32,760,000	3,978,000	3,210,480	4,221,360	3,896,880	4,321,200	4,600,440	4,725,240	3
12 No. 11 kV ring circuits from primary substation to connect to distribution substations.	12	Ring Circuits 315,0	00		3,780,000	459.000	370.440	487.080	449.640	498,600	530.820	545,220	
400 V LV circuits from distribution substations to end users		Circuits/Unit 1,3	00		27,300,000	3,315,000	2,675,400	3,517,800	3,247,400	3,601,000	3,833,700	3,937,700	
Residential Electricity Connections			Based on UCML's Utilities Review	Assuming 21,000 nr residential connections. Excludes off-site mains lay from the POC location and any upstream reinforcement. Excludes connections to commercial.		15%	12%	15%	13%	14%	18%	13%	
					34,125,000	5,118,750	4,095,000	5,118,750	4,436,250	4,777,500	6,142,500	4,436,250	
Budget cost per Low Voltage (LV) Service Disconnection		Unit 1,	Boo Based on UCML's Utilities Review	Number of existing properties within the core development area likely to be									
				demolished is unknown.	Excluded								
Potable water					Excluded								
New network of distribution pipework Water mains, connections and infrastructure charges	21,000	Network 1,3	00	Assuming the supply of 21,000 nr	27,300,000	3,315,000	2675400	3517800	3247400	3601000	3833700	3937700	
water mains, connections and intrastructure charges				Assuming the supply of 2,000 ml dwellings. Excluding Infrastructure charge inflations. Excluding connections to commercial.		15%	12%	15%	13%	14%	18%	13%	
Waste Water					32,900,000	4,935,000	3,948,000	4,935,000	4,277,000	4,606,000	5,922,000	4,277,000	
New network of collection pipework	21,000		00		27,300,000	3,315,000	2675400	3517800	3247400	3601000	3833700	3937700	
Plot connections for all properties to waste water distribution network	21,000	Connections	500		10,500,000	1,275,000	1029000	1353000	1249000	1385000	1474500	1514500	
- Sework Sas - Sas - Sas			Based on UCML's	Assuming 21,000 nr low pressure	.,,								
			Utilities Review	residential connections. Includes gas pressure reduction systems and on-site medium pressure mains lay. Excludes off- site mains lay and upstream reinforcements or connection enabling works. Excludes connections to commercial.	8,720,250	15% 1,308,038	12% 1,046,430	15% 1,308,038	13% 1,133,633	14% 1,220,835	18% 1,569,645	13% 1,133,633	
Utilities - Off-Site Requirements													
New 2 x 125 MVA Primary Substation			Based on AECOM										
New 2 X 120 WVA Fillilary Substation		MVA	IPPD background work	k	22,860,000			100% 22,860,000					
12km 132 kV Overhead Line connection to Colchester substation		% of total provision	Based on AECOM IPPD background work	ı.	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			,,,,,,,,					
		provision	Based on 12km line at £1.022m per Km		12,270,000	100% 12,270,000							
Electricity Diversion Works			Based on UCML's		12,270,000								
			Utilities Review		3,700,000	100% 3,700,000							
Potable Water Connection to closest feasible supply source with capacity (e.g. trunk			Based on AECOM										
Connection to closest reasible supply source with capacity (e.g. trunk main or reservoir)			IPPD background work	k		100%							
					4,100,000	4,100,000							
Budget cost per lowering of a 100mm distribution water main to accommodate a site entrance.		Site Entrance	Based on AECOM 000 IPPD background work	k									
		15,1			Excluded								
Waste Water / Foul Water Upgrades to water course discharges / Surface Water			Based on AECOM										
to mater source adminisper/ ourrance Water		upgrades	IPPD background work	k	6 1	100%							
13km connection to existing waste water treatment works			Based on AECOM	+	2,175,000	2,175,000							
-			IPPD background work	k		100%							
					13,300,000	100% 13,300,000							
Gas Jpgrade to low pressure gas mains			Based on AECOM										
ppgrado to tom producto gua maino			IPPD background work	k L		100%							
No. Medium to Low Pressure reducing station	1	Station	Based on AECOM	+	5,325,000	5,325,000							
5		635,0	00 IPPD background work	k	635,000	100%							
Budget cost per lowering of a 180mm Low Pressure Gas Main to	2	Site Entrance	Based on UCML's	Assuming 2nr site entrances	635,000	635,000							
accommodate a site entrance.		26,0	000 Utilities Review		52,000	100% 52,000							
Budget cost per lowering of a 225mm Medium Pressure Gas Main to	2	Site Entrance	Based on UCML's	Assuming 2nr site entrances	02,000								
accommodate a site entrance.		54,0	000 Utilities Review		108,000	100% 108,000							
			Based on AECOM										
Telecommunications			IPPD background work	k									
Development of access chambers for BT Telecoms network,		l l			I I				1				
Development of access chambers for BT Telecoms network, BT Openreach fibre optic network and private telecoms						129/	10%	120/.	120/	130/	1/10/-	1/10/	
Development of access chambers for BT Telecoms network, BT Openreach fibre optic network and private telecoms network throughout development					5,440,000	12% 660,571	10% 533,120	13% 700,983	12% 647,101	13% 717,562	14% 763,931	14% 784,655	
	3	nr 130,	000 Based on UCML's Utilities Review	Assuming 3nr providers	5,440,000								

6 Transport														
6.1 A3 - Active Modes link (Church Lane - Marks Tey station) (CBB10a)		% of total			Upfront costs/phase 1									
		provision		Based on AECOM IPPD background work.										
				Relates to aspects in										
				MAS (Jacobs 2017).		400,000	100% 400,000							
6.2 Park & Ride facilities & interchange with RTS (CBB9)		% of total			To provide for interchange between		100,000							
		provision		Study 2019	modes, including provision of park & ride (as appropriate)									
						Advised included in on-site	10%	90%						
						RTS (item 6.11)	-	-						
6.3 Internal Road Network					based on total scheme percentage									
6.4 Walking and Cycling connections (CBB10c)				Based on AECOM		Included in enabling costs								
or and optiming commodations (OSS 100)				IPPD background work,										
				amendments to these costs as advised by the										
				NEA.	based on total scheme percentage and at £0.5m per km		100%							
					at 20.3m per km	1,250,000	1,250,000							
6.5 Additional bridges overrailway line (2 vehicular & 3 pedestrian/cycle) (not explicit in MAS, now CBB2)					Previously included as separate line items for each bridge, total cost circa £60m.	3								
(Not explicit in MAS, Now CBB2)				Based on Colchester	lor each bridge, total cost circa 20011.									
				Braintree Borders Cost Analysis & Comparison.										
				Previously not included. Based on Jacobs HIF										
				review & funding bid.										
						30,200,000	40% 12,080,000	14% 4,228,000	0%	40% 12,080,000	6% 1,812,000	0%	0%	0%
6.6 A2 & A4 - Active Modes Connections to Rural Hinterland, Cycle Links	-	% of total		Based on AECOM		30,200,000	12,000,000	4,228,000	•	12,080,000	1,612,000	-		-
(CBB10b)		provision		IPPD background work, amendments to these										
				costs as advised by the										
				NEA.	A4 upfront (cycle links) with remainder hinterland in proportion of units		30%	10%	15%	10%	10%	15%	10%	0%
						1,500,000	450,000	150,000	225,000	150,000	150,000	225,000	150,000	-
6.7 Marks Tey Station and junction package & Stane St reduction (PR1 & PR 2- in MAS, now CBB1)				Based on Jacobs HIF review & funding bid.	Various work to station and environs									
,				a second										
						25,800,000	58% 14,964,000	42% 10,836,000						
6.8 R2 - A12 Southern junction with Garden Community. R2 in MAS, now				Based on AECOM		25,800,000	14,964,000	10,836,000						
CBB3				IPPD background work, amendments to these										
				costs as advised by the	D.F. and its Francish Add in an annual section									
				NEA.	Delivered in line with A12 improvements.		100%							
						41,300,000	41,300,000							
6.90 Widest realignment of A12 as part of improvements. (not explicit in MAS, now CBB4)				Based on Jacobs HIF	Delivered in line with A12 improvements.									
,,,				review & funding bid		********	100%							
6.10 A12 capacity improvements around Kelvedon (CBB5)				Based on Jacobs HIF	Delivered in line with A12 improvements.	62,100,000	62,100,000							
				review & funding bid		20,000,000	100% 20,900,000							
6.11 On site RTS route and related improvements/facilities (PT1a in MAS,				Based on Jacobs RTS	Cost relates to higher investment scenario	20,900,000	20,900,000							
now CCB7)				Study 2019	Low end of the range (as allowances for risk/contingency added separately).									
					Allowance as a proportion of overall									
					funding requirements.	32,600,000	60% 19,560,000	20% 6,520,000	20% 6,520,000	0	0	0	0	0
6.12 Contribution to provisions of off site RTS network (CBB8)					Cost relates to higher investment scenario		.,,		.,,					
				Study 2019	Low end of the range (as allowances for risk/contingency added separately).									
					Allowance as a proportion of overall funding requirements.		60%	20%	20%					
					J . J	32,400,000	19,440,000	6,480,000	6,480,000	0	0	0	0	0
													$\overline{}$	
7 Per Unit Contributions														
7.4 Investment in early phase hyphysical condition (CRRAC)		00 0/ -/ 1-/ 1		Poord on ACCOM										
7.1 Investment in early phase bus/transit services (CBB12)	21,00	00 % of total provision		Based on AECOM IPPD background work,	Based on an approximate average of the									
				amendments to these	per unit provision for Bus Service Subsidies on Site 1 - WOB and Site 2 -									
				NEA.	TCB (£500/unit).		75%	25%						
7.2 Contribution to A120 (CBB6)	21,00	00 % of total	1.50	Allowance as advised	Delivered from day one with funding	10,500,000	7,875,000	2,625,000						
	21,00	provision		by the NEA.	annually									
						31,500,000	12% 3,825,000	10% 3,087,000	13% 4.059.000	12% 3,747,000	13% 4,155,000	14% 4,423,500	14% 4,543,500	12% 3,660,000
7.3 Travel plan measures (smarter choices, car clubs, charging points,	21,00	00 % of total	50	00 Allowance as advised	Aligned to Modal Shift analysis (ITP)	31,500,000	3,020,000	3,087,000	4,059,000	3,747,000	4,155,000	4,423,500	4,543,500	3,000,000
etc) - Straight Line Cost Over Time		provision		by the NEA.	Delivered from day one with funding annually - based on £500 cost per unit.									
					zz, zzzza on zooo oost per unit.									
							12%	10%	13%	12%	13%	14%	14%	12%
						10,500,000	1,275,000	1,029,000	1,353,000	1,249,000	1,385,000	1,474,500	1,514,500	1,220,000
7.4 Open Space Endowment	21,00	00 % of total provision	2,10	 Allowance as advised by the NEA. 	Delivered from day one with funding annually									
•						•	•	·	•	•	•	•	•	

							44,100,000
7.5	Employment Space	21,000	% of total provision		by the NEA.	Allowance of £1,000 per unit. In practice, may be partially covered by other elements such as service charges	
							21,000,000
	Subtotal Total Cost Per Phase						1,101,766,050
	Plus Professional fees at 10%			10%			
	Plus Contingency at 10%			10%			
	Total Scheme Cost Per Phase						
	Total costs at June 2018 prices (excluding VAT)						
	Accumulative number of units						
	Total % of units						
	Total cost per unit						

12%	10%	13%	12%	13%	14%	14%	12%
5,355,000	4,321,800	5,682,600	5,245,800	5,817,000	6,192,900	6,360,900	5,124,000
12%	10%	13%	12%	13%	14%	14%	12%
2,550,000	2,058,000	2,706,000	2,498,000	2,770,000	2,949,000	3,029,000	2,440,000
367,548,545	104,961,090	155,493,642	103,369,047	98,743,485	126,075,172	92,404,889	53,170,181
36,754,854	10,496,109	15,549,364	10,336,905	9,874,348	12,607,517	9,240,489	5,317,018
40,430,340	11,545,720	17,104,301	11,370,595	10,861,783	13,868,269	10,164,538	5,848,720
444,733,739	127,002,919	188,147,307	125,076,547	119,479,616	152,550,958	111,809,915	64,335,919
444,733,739	127,002,919	188,147,307	125,076,547	119,479,616	152,550,958	111,809,915	64,335,919
2550	2058	2706	2498	2770	2949	3029	2440
12%	10%	13%	12%	13%	14%	14%	12%
174,405	61,712	69,530	50,071	43,133	51,730	36,913	26,367

5 Assumptions

Assumptions

Education;

Primary Schools, Secondary Schools and Early Years Facilities:

- Requirement based on the design information in AECOM's IPPD Draft Report dated July 2019.
- Assumes 210 places per FE for Primary Schools.
- Assumes 150 places per FE for Secondary Schools.
- Assumes a 20% uplift to Secondary School rates to account for 6th Form provisions.
- Assumes 56 places per facility for Early Years.
- A 2FE Primary School with 56 place Early Years facility (2FE + EY) assumes a cost of 2FE Primary plus the cost of a standalone 56 place Early Years facility.
- The phasing of the costs is based on the phasing as provided in AECOM's IPPD Draft Report dated July 2019.
- We have based our estimated cost per education facility on Gleeds benchmark information as appended to this report. See Appendix, A and B.
- Costs exclude risk and professional fees.

Health and Community:

GPs:

- Assumes a population per household rate in line with the Office for National Statistics (ONS, 2017) average of 2.4 persons per household, generating a population of 30,000 people in West of Braintree, 18,000 people in Tendring Colchester Borders and 50,400 people in Colchester Braintree Borders.
- Assumes 1800 people per GP, as defined by the NHS. Outlined in West of Braintree Social Infrastructure Standards EXD/013E, Tendring Colchester Borders Social Infrastructure Standards EXD/013B and Colchester Braintree Borders Social Infrastructure Standards EXD/013C on Braintree Council's Website.
- Assumes an allocation of 165m2 of healthcare space per GP as per AECOM's IPPD background work.
- The phasing of the costs is based on the phasing as provided in the AECOM's IPPD background work.
- We have based our estimated cost per healthcare facility on Gleeds benchmark information as appended to this report. See Appendix C.
- Costs exclude risk and professional fees.

Dentists:

- Assumes a population per household rate in line with the Office for National Statistics (ONS, 2017) average of 2.4 persons per household, generating a population of 30,000 people in West of Braintree, 18,000 people in Tendring Colchester Borders and 50,400 people in Colchester Braintree Borders.
- Assumes 1760 people per Dentist, as defined by the existing ratio of Dentists to population across England 2015. Outlined in West of Braintree Social Infrastructure Standards EXD/013E, Tendring Colchester Borders Social Infrastructure Standards EXD/013B and Colchester Braintree Borders Social Infrastructure Standards EXD/013C on Braintree Council's Website.
- Assumes an allocation of 50m2 of healthcare space per Dentist as per AECOM's IPPD Background Work.
- The phasing of the costs is based on the phasing as provided in the AECOM's IPPD Background Work.
- Costs exclude risk and professional fees.

Community Space and Libraries:

- Assumes a population per household rate in line with the Office for National Statistics (ONS, 2017) average of 2.4 persons per household, generating a population of 30,000 people in West of Braintree, 18,000 people in Tendring Colchester Borders and 50,400 people in Colchester Braintree Borders.
- Assumes 30m2 of Library Space per 1000 people as defined by Essex County Council Social Infrastructure Standards, Arts Council. Outlined in West of Braintree Social Infrastructure Standards EXD/013E, Tendring Colchester Borders Social Infrastructure Standards EXD/013B and Colchester Braintree Borders Social Infrastructure Standards EXD/013C on Braintree Council's Website.
- Assuming 60 m2 of Community Space per 1000 people as advised by the NEA.
- Assumes provision of 1800m2 facilities based on AECOM's IPPD Background Work for libraries at 600m2 facilities, proportionally increased to include community space.
- The phasing of the costs is based on the phasing as provided in AECOM's IPPD Background Work.
- As advised by the NEA, Community Space and Library costs have been phased in accordance with unit delivery.
- Costs exclude risk and professional fees.

4 Court Sport Centres:

- Assumes a population per household rate in line with the Office for National Statistics (ONS, 2017) average of 2.4 persons per household, generating a population of 30,000 people in West of Braintree, 18,000 people in Tendring Colchester Borders and 50,400 people in Colchester Braintree Borders.
- Assumes 0.072 facilities per 1000 people, as defined by Essex County Council Social Infrastructure Standards, Colchester SPG Provision of Open Space, Sport and Recreational facilities 2006. Outlined in West of Braintree Social Infrastructure Standards EXD/013E, Tendring Colchester Borders Social Infrastructure Standards EXD/013B and Colchester Braintree Borders Social Infrastructure Standards EXD/013C on Braintree Council's Website.
- Assumes provision of 476m2 facilities based on AECOM IPPD Background Work.
- The phasing of the costs is based on the phasing as provided on AECOM's IPPD Background Work.
- Costs exclude risk and professional fees.

4 Lane Swimming Pools:

- Assumes a population per household rate in line with the Office for National Statistics (ONS, 2017) average of 2.4 persons per household, generating a population of 30,000 people in West of Braintree, 18,000 people in Tendring Colchester Borders and 50,400 people in Colchester Braintree Borders.
- Assumes 0.048 facilities per 1000 people, as defined by ECC Social Infrastructure Standards, Colchester SPG Provision of Open Space, Sport and Recreational facilities 2006. Outlined in West of Braintree Social Infrastructure Standards EXD/013E, Tendring Colchester Borders Social Infrastructure Standards EXD/013B and Colchester Braintree Borders Social Infrastructure Standards EXD/013C on Braintree Council's Website.
- Assumes provision of 245m2 facilities based on AECOM's IPPD Background Work.
- The phasing of the costs is based on the phasing as provided in AECOM's IPPD Background Work.
- Costs exclude risk and professional fees.

Open Space:

- Assumes a population per household rate in line with the Office for National Statistics (ONS, 2017) average of 2.4 persons per household, generating a population of 30,000 people in West of Braintree, 18,000 people in Tendring Colchester Borders and 50,400 people in Colchester Braintree Borders.
- Based on ECC Social Infrastructure Standards outlined in West of Braintree Social Infrastructure
 Standards EXD/013E, Tendring Colchester Borders Social Infrastructure Standards EXD/013B and
 Colchester Braintree Borders Social Infrastructure Standards EXD/013C on Braintree Council's Website.
- Uplifted to 8ha per 1000 population as advised by the NEA.
- Assumes a blended rate across the open space.

- The phasing of the costs is based on the phasing as provided in AECOM's IPPD Background Work.
- Costs exclude risk and professional fees.

Environment/Waste:

- Allowance of £500/unit to include noise attenuation and on-site recycling points.
- Covers the provision of acoustic bunding / fencing to mitigate the impact of external sources of noise such as highways and public transport and localised solid waste recycling area.
- Costs exclude risk and professional fees.

Site-Wide Enabling Costs

- Based on the requirements outlined in AECOM's IPPD Background Work and UCML guidance on utilities provisions.
- Site-Wide Enabling Costs are based on the Core Developable areas as outlined in AECOM's IPPD Draft Report dated July 2019. We have included an additional 10% of the core developable area as an allowance for works outside of the core developable area and within the site boundary.
- In the case of Tendring Colchester Borders (TCB), the site area is less the University area of 15.4ha and the Park & Ride area South of the A133 of 2.78ha which will be brought forward separately to the core Garden Community as advised by the NEA.
- · Costs exclude risk and professional fees.

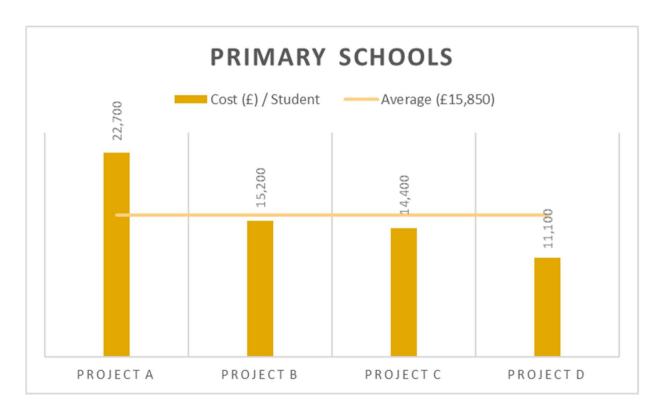
Utilities

- Based on the requirements outlined in AECOM's IPPD Background Work and UCML guidance on utilities provisions
- In the absence of phasing information associated with the UCML items, we have assumed that residential connection costs are phased by unit delivery and all other costs are attributed to Phase 1.
- We have assumed 5nr site entrances to West of Braintree (Site 1), 3nr site entrances to Tendring Colchester Borders (Site 2) and 4nr Site Entrances to Colchester Braintree Borders (Site 3).
- We have assumed 3nr fibre providers for each site.
- · Costs exclude risk and professional fees.

Transport

- Transport costs are based on AECOM's IPPD Background Work. Some amendments have been made to the design as advised by the NEA.
- Rapid Transit System Costs are as advised in the Essex Highways Rapid Transit System for North Essex: From vision to plan document dated July 2019.
- RTS Costs are based on the lower end of the range provided for the higher investment scenario. It is assumed that these costs exclude risk and professional fees.
- Per unit contributions are as advised by the NEA.
- Costs exclude risk and professional fees.

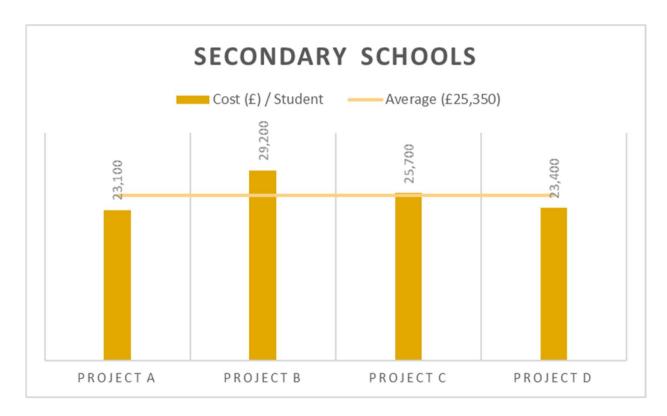
Appendix A Benchmark Data Primary School



Project A	The construction of a new two storey primary school to accommodate 315 pupils
Project B	New modular build 2FE primary school
Project C	New build single storey primary school to accommodate 420 pupils
Project D	New modular build primary free school to accommodate 420 pupils

Please note: Costs exclude risk and professional fees.

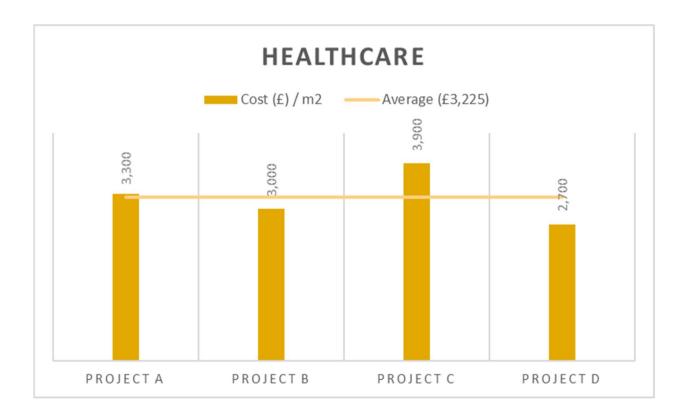
Appendix B Benchmark Data Secondary Schools



Project A	New build secondary school to accommodate up to 1300 pupils
Project B	New build secondary school to accommodate up to 1150 pupils
Project C	New build secondary school to accommodate up to 1229 pupils
Project D	A new build medium sized skill Academy for up to 1,232 pupils

Please note: Costs exclude risk and professional fees.

Appendix C Benchmark Data: Healthcare



Project A	New build 'Health Park' to accommodate a range of primary and community services
Project B	The construction of two single storey health centre with associated car parking, landscaping and servicing provisions
Project C	New Build GP Clinic
Project D	New Build Medical Centre

Appendix D Schedule of Information Used

Document	Author	Date	35
North Essex Garden Communities - Infrastructure Planning, Phasing and Delivery Draft Report (IPPD Background Work)	AECOM	Up to July 2019	
EXD/013E AECOM Benchmark Social Infrastructure Standards (Site 1 - West of Braintree)	AECOM		
EXD/013B AECOM Benchmark Social Infrastructure Standards (Site 2 - Tendring Colchester Borders)	AECOM		
EXD/013C AECOM Benchmark Social Infrastructure Standards (Site 3 - Colchester Braintree Borders)	AECOM		
The Essex County Council Developers' Guide to Infrastructure Contributions	Essex County Council	2016	
North Essex Garden Communities - Concept Feasibility Study. Volume 3 - Garden Communities Concept Options & Evaluation	AECOM	Jun-16	
EB/013/1/2North Essex Local Plans (Section 1) Viability Assessment Main Report	Hyas	Apr-17	
Essex Highways - Rapid Transit System for North Essex: From vision to plan	Essex County Council, Ringway Jacobs	2017	
UCML Utilities Review	UCML	2019	

Gleeds

Appendix E Social Infrastructure Requirements

Social Infrastructure Requirements

Community is important to determine with respect the exception of education calculations), with the viability assessment. For this exercise AECOM's of any future Garden Community. The provision Social Infrastructure Model (SIF) was used (with and accessible communities created. As such, an indicative understanding of the likely social ollowing assumptions and standards applied. Social infrastructure will form an integral part to generating a cost estimation for use in the well-being is enhanced and walkable, vibrant of recreation, culture, health, education and community facilities ensures that residents' infrastructure requirements of the Garden

The following household and tenure assumptions have been applied to assess the population impacts of the proposed housing growth across each site and option.

Housing Tenure Mix

Housing tenure mix was determined based on a review of the housing mix assumptions from policy or evidence base of each local authority

Market Owned Affordable	65% 35%
Social Rented Affordable	%0/
Private Rented	30%

Housing Size Mix

Assumption that 80% of future dwellings would be houses and 20% flats - reflecting current ratio in Essex County. To determine the housing size mix, a review of the SHMA for Colchester and Braintree allowed for the identification of a target tenure. The average between both local authorities was utilised to determine final housing mix.

Houses (no. of bedrooms)

Flats (no. of bedrooms)

	-	1 2 3 4+	3	4+	-	7	1 2 3 4+	4+
Market Owned	7%	%9 %/	2%	2%	%87	24%	28% 24% 20% 8%	%8
Social Rented Affordable	% /		%9	1%	73%	23%	29% 23% 24% 4%	4%
Private Rented	7%	%8	4%	7%	28%	32%	28% 32% 14% 6%	%9
All Units	7%	%9	2%	7%	28%	24%	28% 24% 20% 8%	%8
20								

** Bespoke Essex County Council Standards Applied

population

Average Household Size by Unit Type

collating all three local authorities, to ensure appropriate proportions of households The average household size was determined by utilising the 2011 Census data by and population are accounted for.

Market Housing		Social Rented Ho	using	Intermediate Ho	e Housing
Flat - 1 bed	1.27	Flat - 1 bed	1.27	Flat - 1 bed	1.18
Flat - 2 bed	1.59	Flat - 2 bed	1.59	Flat - 2 bed	2.18
Flat - 3 bed	2.03	Flat - 3 bed	2.03	Flat - 3 bed	2.78
Flat - 4 bed	2.83	Flat - 4 bed	2.83	Flat - 4 bed	2.39
House - 1 bed	1.49	House - 1 bed	1.49	House - 1 bed	1.32
House - 2 bed	1.75	House - 2 bed	1.75	House - 2 bed	2.04
House - 3 bed	2.39	House - 3 bed	2.39	House - 3 bed	3.14
House - 4 bed	2.97	House - 4 bed	2.97	House - 4 bed	4.24

Social Infrastructure Standards

against the following bespoke list of planning standards from a list of national and local resources. population profiles of each site and development option. These have been assessed The Household tenure, size and mix assumptions have been used to inform the

				hall)
Topic		Standard	Ref.	Owimming
	early year demand per 2 bed+ Flat	0.045	Essex County	lanes)
Early Years	early year demand per 2 bed+ House	0.090	Council - Developers' Guide	
	places per nursery	56	Contributions	Natural Gree
	Sq.mper 56 place nursery	337	2016	Space
	Pupil Demand per 2 bed+ Flat	0.150	Essex County	Outdoor Sp
Primary Schools **	Pupil Demand per 2 bed+ House	0.300	Council - Developers' Guide	Parks and G
	Primary School Pupils in 1 Form Entry	210	Contributions 2016	Amenity Gre Space
	Pupil Demand per 2 bed+ Flat	0.100	Essex County	Allotments
Secondary	Pupil Demand per 2 bed+ House	0.200	Council - Developers' Guide to Infrastructure	Children's Playspace
	Secondary School Pupils in 1 Form Entry	150	Contributions 2016	(Informal) Children's Playspace (f
Sixth Form	Proportion of 16-17 year olds in	32%	AECOM Calculation of Sixth form roll	Green Corri
	Sixth Form		2016 against 16-17	

Topic		Standard	Ref.
Primary Health Centre	People per GP	1,800	NHS
Dental Practice	People per Dentist	1,760	Existing ratio of Dentists to Population across England 2015
Acute Hospital	People per Bed	510	Existing ratio of Hospital Beds to population across England 2015
Library Space; based on branch	sq.m per 1,000 person	08	Arts Council
Police Station	Population per Station	25	Previous AECOM Experience
Fire Station	Population per Station	1,180	Previous AECOM Experience
Ambulance Station	Population per Station	99	Previous AECOM Experience
Indoor Sports Facility (4 court hall)	facility per 1,000 person	0.072	Colchester SPG Provision of Open Space, Sport
Swimming Pool (4 lanes)	facility per 1,000 person	0.048	and Recreational Facilities 2006 (0.072 facilities per 1,000 persons)
Natural Green Space	ha per 1,000 person	2.000	Recommend adoption of Braintree and Tendring standard - Colchester was 5ha
Outdoor Sports	ha per 1,000 person	1.530	
Parks and Gardens	ha per 1,000 person	1.320	
Amenity Green Space	ha. per 1,000 people	0.883	Average of Braintree
Allotments	ha. per 1,000 people	0.227	Colchester and Tendring I PA
Children's Playspace (Informal)	ha. per 1,000 people	0.208	
Children's Playspace (formal)	ha. per 1,000 people	0.142	
Green Corridor	ha per 1,000 person	0.750	Tendring Open Space Strategy (2009)