

North Essex Authorities

Infrastructure Order of Cost Estimate [41,000 Homes]

North Essex Authorities
Gleeds Cost Management
Project LNCM 0931

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Contributors	David Hutt, Colin Field, Willem Viljoen, Ria Carr, Della Hughes, David Nicholl, Gleeds Insight and Analytics		
Approved by	Colin Field	Grade	Director
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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

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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

Garden Community	NEA	ONS	Gleeds
	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 Borders	Colchester Braintree 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

Infrastructure		Demand Arising From Development	Unit of demand	Rate	Notes	Commentary / Assumptions	Total
1							
Education							
1.1	Primary Schools: 2 Form Entry (including 56 place EY+C facility)	14	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.	52,290,000
1.2	Secondary Schools	12	FE	3,690,000	Requirement as advised by the NEA.	Assuming 150 places per FE. Excludes temporary accommodation.	44,280,000
1.3	Standalone Early Year Facilities (56 place, above those co-located with Primary)	8	Facilities	1,170,000	Requirement as advised by the NEA.	Assuming 56 places per facility. 7 EY facilities within primary schools, 15 in total required by development. Excludes temporary accommodation.	9,360,000
2							
Healthcare & Community							
2.1	General Practitioners	2805	m2	3000	Based on West of Braintree Social Infrastructure Standards EXD/013E Braintree Council Website	Demand arising 17 GPs. Assuming 1800 population per GP. Assuming a population of 30,000 (2.4/unit). Assuming 165 m2 / GP.	8,415,000
2.2	Dentists	900	m2	3,000	Based on West of Braintree Social Infrastructure Standards EXD/013E Braintree Council Website	Demand arising 18 Dentists. Assuming 1760 population per dentist. Assuming a population of 30,000 (2.4/unit). Assuming 50 m2 / Dentist.	2,700,000
2.3	Community Space and Libraries	3600	m2	2,500	Library Space based on ECC Social Infrastructure Standards, Arts Council. Community Space provisions as advised by the NEA and their advisers.	Demand arising 900 m2 of Library Space. Assuming 30 m2 per 1000 persons. 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 by the NEA, the cost for Community Space and Library Facilities has been phased in accordance with unit delivery.	9,000,000
2.4	4 Court Sports Centre	1428	m2	1,450	Based on ECC Social Infrastructure Standards, Colchester SPG Provision of Open Space, Sport and Recreational facilities 2006.	Demand arising 3 nr facilities. Assuming 0.072 facilities per 1000 persons. Assuming 476m2 per facility. Assuming a population of 30,000 (2.4/unit).	2,070,600
2.5	4 Lane Swimming Pool	490	m2	2,200	Based on ECC Social Infrastructure Standards, Colchester SPG Provision of Open Space, Sport and Recreational facilities 2006.	Demand arising 2 nr facilities. Assuming 0.048 facilities per 1000 persons. Assuming 245m2 per facility.. Assuming a population of 30,000 (2.4/unit).	1,078,000
3							
Open Space							
3.1	Open space	240	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 30,000 (2.4/unit). Including: 8ha total open space per 1000 population.	33,600,000

Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8	Phase 9	Phase 10
Cumulative Development									
1351	2853	4108	5156	6665	8223	9224	10658	11866	12500
Phased Development									
1351	1502	1255	1048	1509	1558	1001	1434	1208	634
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		2FE + EY 7,470,000
1 1,170,000	1 1,170,000		1 1,170,000	1 1,170,000	1 1,170,000	1 1,170,000		1 1,170,000	1 1,170,000
2 990,000	2 990,000	1 495,000	2 990,000	2 990,000	1 495,000	2 990,000	2 990,000	1 495,000	2 990,000
2 300,000	2 300,000	2 300,000	2 300,000	2 300,000	2 300,000	1 150,000	2 300,000	2 300,000	1 150,000
11% 972,720	12% 1,081,440	10% 903,600	8% 754,560	12% 1,086,480	12% 1,121,760	8% 720,720	11% 1,032,480	10% 869,760	5% 456,480
1 690,200				1 690,200				1 690,200	
1 539,000					1 539,000				
24.00 3,360,000	52.80 7,392,000	19.20 2,688,000	28.80 4,032,000	52.80 7,392,000	12.00 1,680,000	12.00 1,680,000	12.00 1,680,000	26.40 3,696,000	0.00 -

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**Total Infrastructure Requirements by
Phase – Tendring Colchester Borders**

Site 2: Tendring Colchester Borders

Infrastructure	
1	Education
1.1	Primary Schools: 2 Form Entry (including 56 place EY+C facility)
1.2	Secondary Schools
1.3	Standalone Early Year Facilities (56 place, above those co-located with Primary)
2	Healthcare & Community
2.1	General Practitioners
2.2	Dentists
2.3	Community Space and Libraries
2.4	4 Court Sports Centre
2.5	4 Lane Swimming Pool

Demand arising from development and total cost	Unit of demand	Rate	Notes	Commentary/assumptions	Total
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.	
					29,880,000
8	FE	3,690,000	Requirement as advised by the NEA.	Assuming 150 places per FE. Excludes temporary accommodation.	
					29,520,000
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.	
					5,850,000
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.	
					4,950,000
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
1800	m2	2500	Library Space based on Tendring Colchester Borders Social Infrastructure Standards EXD/013B Braintree Council Website. Community Space Provisions as advised by the NEA and their advisers.	Demand arising 540 m2 of Library Space. Assuming 30 m2 per 1000 persons. Demand arising 1080m2 of Community Space. Assuming 60 m2 per 1000 persons. Demand arising 1nr 1800 m2 facilities. Assuming a population of 18,000 (2.4/unit). As advised by the NEA, the cost for Community Space and Library Facilities has been phased in accordance with unit delivery.	
					4,500,000
952	m2	1450	Based on ECC Social Infrastructure 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).	
					1,380,400
245	m2	2200	Based on ECC Social Infrastructure 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).	
					539,000

Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Cumulative Development					
1442	3004	4556	5783	6848	7500
Phased Development					
1442	1562	1552	1227	1065	652
2FE + EY	2FE + EY	2FE + EY		2FE + EY	
7,470,000	7,470,000	7,470,000		7,470,000	
	8FE				
	29,520,000				
1	1		2		1
1,170,000	1,170,000		2,340,000		1,170,000
2	2	2	1	2	1
990,000	990,000	990,000	495,000	990,000	495,000
3	2	1	2	2	1
450,000	300,000	150,000	300,000	300,000	150,000
23%	17%	17%	12%	21%	10%
1,035,000	765,000	765,000	540,000	945,000	450,000
1			1		
690,200			690,200		
1					
539,000					

4.18	Low Pressure Residential Connections																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														</
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6.2	Secondary signalised access onto A133 (TCB2b)		% of total provision		Based on AECOM IPPD background work, amendments to these costs as advised by the NEA.		2,500,000									
							2,500,000	100%	2,500,000							
6.3	Interim highways improvements measures (including improvements to Greenstead roundabout and A133 Hare Green roundabout) (TCB3)		% of total provision		Based on AECOM IPPD background work, amendments to these costs as advised by the NEA.											
							3,000,000	100%	3,000,000							
6.4	A120-A133 Link Road (TCB1)		% of total provision		Based on Jacobs HIF review & funding bid											
							41,000,000	100%	41,000,000							
6.5	On site RTS route and related improvements/facilities (TCB4)		% of total provision		Based on Jacobs RTS 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.										
							16,600,000	20%	3,320,000	20%	3320000	20%	3320000	20%	3320000	0%
6.6	Contribution to provisions of off site RTS network (TCB5)		% of total provision		Based on Jacobs RTS 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.										
							38,100,000	27%	10,287,000	30%	11,430,000	14%	5,334,000	14%	5,715,000	0%
6.7	Park & Ride facilities and interchange with RTS (TCB6)		% of total provision		Based on Jacobs RTS Study 2019	To provide for interchange between modes, including provision of park & ride (as appropriate)										
						Advised included in on-site RTS (item 6.5)		50%	-		50%	-	-	-	-	
6.8	Upgrade existing walking / cycling infrastructure (TCB7a)		% of total provision		Based on AECOM IPPD background work, amendments to these costs as advised by the NEA.											
							3,150,000	50%	1,575,000	50%	1,575,000					
6.9	Various combined segregated pedestrian / cycle "Greenways" through site (TCB7b)		% of total provision		Based on AECOM IPPD background work, amendments to these costs as advised by the NEA.											
							1,890,000	23%	434,700	17%	321,300	17%	321,300	12%	226,800	21%
6.10	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										
7	Per Unit Contributions															
7.1	Investment in early phase bus/transit services (TCB9)	7,500	% of total provision		Based on AECOM IPPD background work, amendments to these costs as advised by the NEA.	3,710,280 allocated by percentage of units per phase										
							3,710,280	23%	853,364	17%	630,748	17%	630,748	12%	445,234	21%
7.2	Travel plan measures (smarter choices, car clubs, charging points, etc) - Straight Line Cost Over Time	7,500	% of total provision	500	Allowance as advised by the NEA.	Aligned to Modal Shift analysis (ITP). Delivered from day one with funding annually - based on £500 cost per unit.										
							3,750,000	23%	862,500	17%	637,500	17%	637,500	12%	450,000	21%
7.3	Open Space Endowment	7,500	% of total provision	2,100	Allowance as advised by the NEA.	£/unit										
							15,750,000	23%	3,622,500	17%	2,677,500	17%	2,677,500	12%	1,890,000	21%
7.4	Employment Space	7,500	% of total provision	1,000	Allowance as advised by the NEA.	£/unit										
							7,500,000	23%	1,725,000	17%	1,275,000	17%	1,275,000	12%	900,000	21%
	Subtotal Total Cost Per Phase						407,513,680		92,822,926		147,972,130		52,658,070		43,349,456	
	Plus Professional fees at 10%			10%					9,282,293		14,797,213		5,265,807		4,334,946	
	Plus Contingency at 10%			10%					10,210,522		16,276,934		5,792,388		4,768,440	
	Total Scheme Cost Per Phase								112,315,741		179,046,277		63,716,264		52,452,841	
	Total costs at 4Q2018 (excluding VAT)								112,315,741		179,046,277		63,716,264		52,452,841	
	Accumulative number of units								1442		1562		1552		1227	
	Total % of units								19%		21%		21%		16%	
	Total Cost per Unit								77,889		114,626		41,054		42,749	

4

Total Infrastructure Requirements by
Phase – Colchester Braintree
Borders

Site 3: Colchester Braintree Borders

Infrastructure	Demand Arising From Development	Unit of Demand	Rate	Notes	Commentary/assumptions	Total	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
							Cumulative Development							
							2550	4608	7314	9812	12582	15531	18560	21000
							Phased Development							
							2550	2058	2706	2498	2770	2949	3029	2440
Education														
Primary Schools: 2 Form Entry (including 56 place EY+C facility)	22	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.		2nr 2FE +EY 14,940,000	2FE + EY 7,470,000	2nr 2FE +EY 14,940,000	2FE + EY 7,470,000	2nr 2FE +EY 14,940,000	2nr 2FE +EY 14,940,000	2FE + EY 7,470,000	
Secondary Schools	20	FE	3,690,000	Requirement as advised by the NEA.	Assuming 150 places per FE. Excludes temporary accommodation.		8FE 29,520,000		6FE 22,140,000			6FE 22,140,000		
Standalone Early Year Facilities (56 place, above those co-located with 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.		2 2,340,000	2 2,340,000	1 1,170,000	3 3,510,000	1 1,170,000	3 3,510,000	2 2,340,000	
						16,380,000								
Healthcare & Community														
General 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 1,980,000	4 1,980,000	4 1,980,000	4 1,980,000	4 1,980,000	4 1,980,000	3 1,485,000	1 495,000
Dentists	1450	Dentists	3,000	Based on Colchester Braintree Borders Social Infrastructure Standards EXD/013C Braintree Council Website	Demand arising 29 Dentists. Assuming 1760 population per dentist. Assuming a population of 50,400 (2.4/unit). Assuming 50 m2 / Dentist.		4 600,000	4 600,000	4 600,000	4 600,000	4 600,000	4 600,000	3 450,000	2 300,000
Community Space and Libraries	5400	m2	2,500	Library space based on Colchester Braintree Borders Social Infrastructure Standards EXD/013C Braintree Council Website. Community Space Provisions as advised by the NEA and their advisers.	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 delivery.		12% 1,639,286	10% 1,323,000	13% 1,739,571	12% 1,605,857	13% 1,780,714	14% 1,895,786	14% 1,947,214	12% 1,568,571
4 Court Sports Centre	1904	m2	1,450	Based on ECC Social Infrastructure Standards, Colchester SPG Provision of Open Space, Sport and Recreational facilities 2006.	Demand arising 4 nr facilities. Assuming 0.072 facilities per 1000 persons. Assuming 476m2 per facility. Assuming a population of 50,400 (2.4/unit).		1 690,200		1 690,200		1 690,200	1 690,200		
4 Lane Swimming Pool	735	m2	2,200	Based on ECC Social Infrastructure 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).		1 539,000		1 539,000		1 539,000			
						1,617,000								
Open Space														
Open space	403	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.		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	0.00 -
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.		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	2440 1,220,000
						10,500,000								
Utilities - Scheme-Wide Enabling Works														
			18,570	See Breakdown Below	Assuming Site Area as defined in the AECOM IPPD background work of 1,169ha 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.	389,975,250	47,354,138	38,217,575	50,251,097	46,388,485	51,439,593	54,763,667	56,249,287	45,311,410
	Substations					Includes the below items								

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.

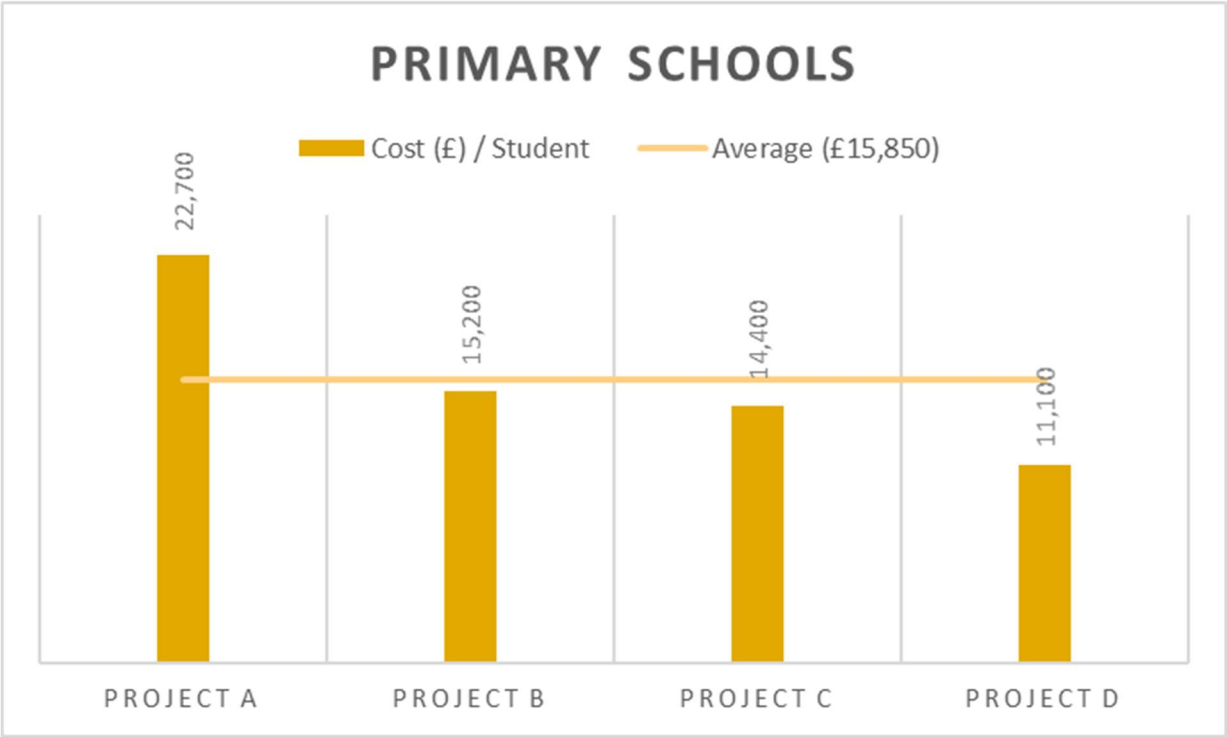
Transport

- 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.

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Appendix A

Benchmark Data Primary School



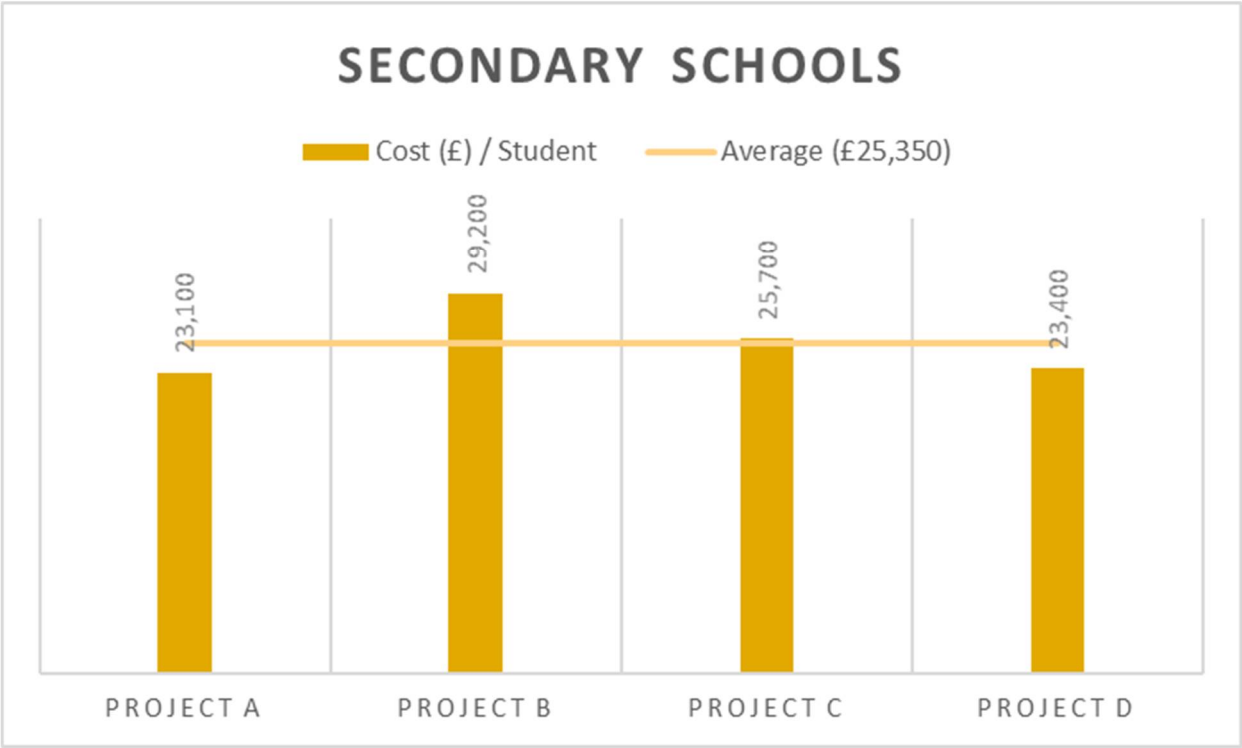
Project A	The construction of a new two storey primary school to accommodate 315 pupils
Project B	New modular build 2FE primary school
Project C	New build single storey primary school to accommodate 420 pupils
Project D	New modular build primary free school to accommodate 420 pupils

Please note: Costs exclude risk and professional fees.

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Appendix B

Benchmark Data Secondary Schools



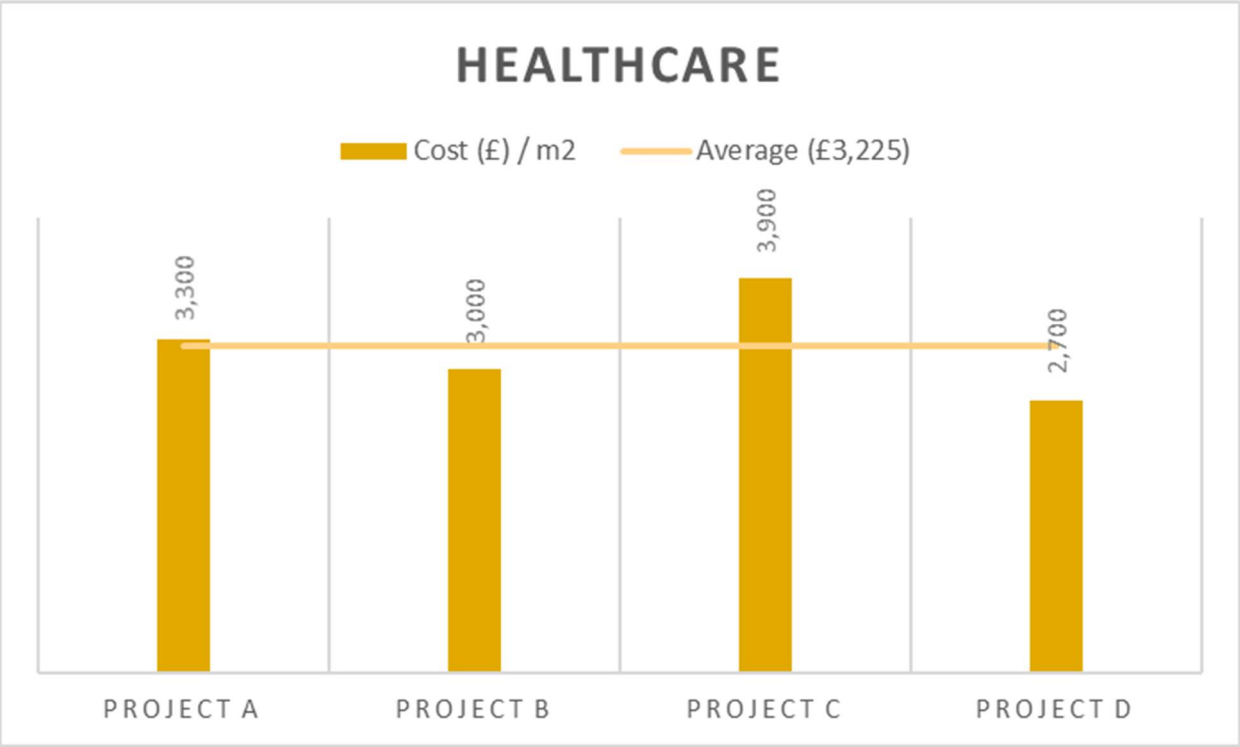
Project A	New build secondary school to accommodate up to 1300 pupils
Project B	New build secondary school to accommodate up to 1150 pupils
Project C	New build secondary school to accommodate up to 1229 pupils
Project D	A new build medium sized skill Academy for up to 1,232 pupils

Please note: Costs exclude risk and professional fees.

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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

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Appendix D

Schedule of Information Used

Document	Author	Date	35	Gleeds
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		

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Appendix E

Social Infrastructure Requirements

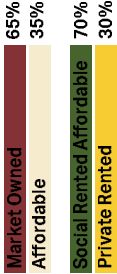
Social Infrastructure Requirements

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

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.



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.

	Flats (no. of bedrooms)				Houses (no. of bedrooms)			
	1	2	3	4+	1	2	3	4+
Market Owned	7%	6%	5%	2%	28%	24%	20%	8%
Social Rented Affordable	7%	6%	6%	1%	29%	23%	24%	4%
Private Rented	7%	8%	4%	2%	28%	32%	14%	6%
All Units	7%	6%	5%	2%	28%	24%	20%	8%

Average Household Size by Unit Type

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

Market Housing		Social Rented Housing		Intermediate 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

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

Topic	Standard	Ref.
Early Years	early year demand per 2 bed+ Flat	Essex County Council - Developers' Guide to Infrastructure Contributions 2016
	early year demand per 2 bed+ House	
	places per nursery	56
	Sq.m per 56 place nursery	337
Primary Schools**	Pupil Demand per 2 bed+ Flat	Essex County Council - Developers' Guide to Infrastructure Contributions 2016
	Pupil Demand per 2 bed+ House	
	Primary School Pupils in 1 Form Entry	210
	Pupil Demand per 2 bed+ Flat	0.100
Secondary Schools**	Pupil Demand per 2 bed+ House	0.200
	Secondary School Pupils in 1 Form Entry	150
	Proportion of 16-17 year olds in Sixth Form	32%
		AECOM Calculation of Sixth form roll 2016 against 16-17 population

Topic	Standard	Ref.
Primary Health Centre	People per GP	NHS 1,800
Dental Practice	People per Dentist	Existing ratio of Dentists to Population across England 2015 1,760
Acute Hospital	People per Bed	Existing ratio of Hospital Beds to population across England 2015 510
Library Space; based on branch	Sq.m per 1,000 person	Arts Council 30
Police Station	Population per Station	Previous AECOM Experience 25
Fire Station	Population per Station	Previous AECOM Experience 1,180
Ambulance Station	Population per Station	Previous AECOM Experience 65
Indoor Sports Facility (4 court hall)	facility per 1,000 person	Colchester SPG Provision of Open Space, Sport and Recreational Facilities 2006 0.072
Swimming Pool (4 lanes)	facility per 1,000 person	0.048
Natural Green Space	ha per 1,000 person	Recommend adoption of Braintree and Tendring standard - Colchester was 51ha 2,000
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
Allotments	ha. per 1,000 people	0.227
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	Tendring Open Space Strategy (2009) 0.750

** Bespoke Essex County Council Standards Applied