Mayford Estate

Architect: **London Borough of Camden**
Issue Status: **D2 Tender**

KPI TRACKER – DESIGN REVIEWS

KPI REF	DESCRIPTION	KPI/HOW ITS DEMONSTRATED	REFERENCE SPECIFICATION DOCUMENT	STAGE DEMONSTRATED AT
	Central plant			
KPI 1.1	Size to appropriate hot water loads	Swedish Diversity Factor within heat network calculations	Camden Heat Networks: Design and Delivery Supplement (Swedish DHA F:101 Technical Requirements)	Stage 3 – Design
KPI 1.2	Size to realistic space heating loads	Space heating central plant diversity factor	CIBSE CP1.2 2020 Metropolitan Decentralised Energy Key Design Parameters – Rev 002	Stage 3 – Design
KPI 1.3	Network losses to be calculated within heat network plantroom, primary and secondary distribution pipe work	Maximum of 15% network losses (13% distribution network and 2% heat network plantroom)	CIBSE CP1.2 2020 Metropolitan Decentralised Energy Key Design Parameters – Rev 002	Stage 3 – Design
KPI 1.4	Variable volume pumping	Variable volume pumps controlled via different pressure sensors across the network 100kPa to maintained at head of risers	Camden Heat Networks: Design and Delivery Supplement HIU manufacture guidance	Stage 3 – Design
KPI 1.5	Plant efficiencies and sizing	Plant to be able to operate of 5% of peak load	Camden Heat Networks: Design and Delivery Supplement	Stage 3 – Design
KPI 1.6	Operating temperatures	To welcome low carbon heating technologies and increase efficiency. Primary Estate Flow – 70°C Primary Return – 40°C Secondary Flow – 65°C (dwelling) Secondary Return – ≤40°C (dwelling) DHW set point – 50°C (dwelling) Primary Flow (summer) – ≥70°C Primary Return (summer) – ≥40°C	Camden Heat Networks: Design and Delivery Supplement CIBSE CP1.2 2020	Stage 3 – Design
	Distribution			
KPI 2.1	Pipe work losses to be minimised: 1. Losses 2. Insulation 3. Diversity on pipe sizing	1. Sized on velocity and pressure with regards to peak and part load 2. High performance enhanced insulation levels 3. Pipe work to be sized around the network with hot water and space heating diversity	1. Table 6 and 13 – Metropolitan Decentralised Energy Key Design Parameters – Rev 002 2. Table 7 – Metropolitan Decentralised Energy Key Design Parameters – Rev 002 3. CIBSE CP1.2 2020	Stage 3 – Design Stage 4 – Construction

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KPI REF	DESCRIPTION	KPI/HOW ITS DEMONSTRATED	REFERENCE SPECIFICATION DOCUMENT	STAGE DEMONSTRATED AT
KPI 2.2	Bypasses	<5% no HIU flow at heat network plantroom. HIU keep warm facility only on long leg single dwelling branch outs. Temperature controlled bypass at head of risers	Camden Heat Networks: Design and Delivery Supplement Metropolitan Decentralised Energy Key Design Parameters – Rev 002	Stage 3 – Design Stage 4 – Construction Stage 5 – Commissioning Stage 6 – Operation and Maintenance
KPI 2.3	HIU HW plate sizes	Maximum 37.5 kW hot water plate heat exchanger	Camden Heat Networks: Design and Delivery Supplement	Stage 3 – Design
KPI 2.4	HIU selection	1. HIU to be BESA tested 2. Electronic HIU to allow for remote commissioning, parameter configuration and analytics 3. HIU to have low VWARTs a. <23°C DHW b. <50°C space heating c. <48°C keep warm	Camden Heat Networks: Design and Delivery Supplement	Stage 3 – Design Stage 4 – Construction Stage 6 – Operation and Maintenance
KPI 2.5	Dwelling space heating circuits	Limit space heating return temperature back to the heating network through the use of pressure independent flow limiting TVRs and pre settable lock shield valves.	Metropolitan Decentralised Energy Key Design Parameters – Rev 002	Stage 3 – Design Stage 4 – Construction Stage 5 – Commissioning Stage 6 – Operation and Maintenance
KPI 2.6	Metering and monitoring strategy document including schematic	1. Heat network plantroom, block level and dwelling level heat metering 2. Dwelling level heat metering to have outputs available for space heating return temperature monitoring for commissioning 3. Front end infrastructure for heat network analytics	Camden Heat Metering Specification Version 3.0 (Marche 2019) Camden Appendix 2_ Camden Standards for Data Cabling Camden Appendix 3_Camden Connectivity Specification Camden Appendix 4_Camden Data Format Specification Heat Networks (Metering & Billing) 2014 Metropolitan Decentralised Energy Key Design Parameters – Rev 002	Stage 3 – Design Stage 4 – Construction Stage 5 – Commissioning Stage 6 – Operation and Maintenance

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KPI REF	DESCRIPTION	KPI/HOW ITS DEMONSTRATED	REFERENCE SPECIFICATION DOCUMENT	STAGE DEMONSTRATED AT
KPI 2.7	Cost of heat delivered	To be calculated against final design (p/kWh). 1. Heat network plantroom average variable cost 2. Block average variable cost 3. Dwelling average variable cost	CIBSE CP1.2 2020	Stage 3 – Design Stage 5 – Commissioning Stage 6 – Operation and Maintenance

KPI TRACKER – INSTALLATION INSPECTION

KPI REF	DESCRIPTION	KPI/HOW ITS DEMONSTRATED	REFERENCE SPECIFICATION DOCUMENT	STAGE DEMONSTRATED AT
KPI 3.1	Pipe work insulation with correct insulation type including supports and all valves	Visual inspection and photographic	CIBSE CP1.2 2020 Camden Heat Networks: Design and Delivery Supplement	Stage 3 – Design Stage 4 – Construction
KPI 3.2	Distribution bypasses	Documented installation of bypasses 1. Location 2. Product/model number 3. Specification and flow rate	Camden Heat Networks: Design and Delivery Supplement	Stage 3 – Design Stage 4 – Construction
KPI 3.3	Heat meter strategy	Visual inspection and photographic evidence to represent design strategy documents	Camden Heat Networks: Design and Delivery Supplement	Stage 3 – Design Stage 4 – Construction
KPI 3.4	HIU and controls installation report	Documented report of HIU installations including controls and networking	CIBSE CP1.2 2020	Stage 3 – Design Stage 4 – Construction
KPI 3.5	Flushing, leakage testing and water quality	Documented reports	CIBSE CP1.2 2020	Stage 4 – Construction

KPI TRACKER – TESTING AND COMMISSIONING

KPI REF	DESCRIPTION	KPI/HOW ITS DEMONSTRATED	REFERENCE SPECIFICATION DOCUMENT	STAGE DEMONSTRATED AT
KPI 4.1	Independent commissioning tests	Appoint suitably qualified commissioning team	CIBSE CP1 CP1.2 2020	Stage 3 – Design Stage 4 – Construction Stage 5 – Commissioning

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KPI REF	DESCRIPTION	KPI/HOW ITS DEMONSTRATED	REFERENCE SPECIFICATION DOCUMENT	STAGE DEMONSTRATED AT
KPI 4.2	Clear commissioning plan	Cover all aspects of the network 1. Heat network plantroom 2. Distribution 3. Internal distribution 4. HIUs and dwellings 5. System controls	Appendix B CIBSE CP1.2 2020	Stage 4 – Construction Stage 5 – Commissioning
KPI 4.3	HIU commissioning	All HIUs to be fully commissioned by specialist to agreed method set out in CP1	Appendix B CIBSE CP1.2 2020	Stage 5 – Commissioning
KPI 4.4	Broadband connections fully working prior to commissioning	To allow automatic meter reading before handover	CIBSE CP1.2 2020 Camden Heat Metering Specification_v3.0 Camden Appendix 3_Camden Connectivity Specification v1.0 Camden Appendix 4_Camden Data Format Specification v1.3	Stage 5 – Commissioning
KPI 4.5	Meter schedule and register	All meter series numbers associated dwelling number and block address to be scheduled and automatic meter reading operational before handover	CIBSE CP1.2 2020 Camden Heat Metering Specification_v3.0 Camden Appendix 3_Camden Connectivity Specification v1.0 Camden Appendix 4_Camden Data Format Specification v1.3	Stage 5 – Commissioning

KPI TRACKER – PROVING AND ACCEPTANCE

KPI REF	DESCRIPTION	KPI/HOW ITS DEMONSTRATED	REFERENCE SPECIFICATION DOCUMENT	STAGE DEMOSTRATED AT
KPI 5.1	Independent acceptance test	Complete acceptance testing in accordance with Camden specification including bypass flow rate and VWART calculations	Camden Heat Network Design Supplement Appendix 4	Stage 6 – Operation and Maintenance Stage 7 – Customer Expectations and Obligations
KPI 5.2	Cost of heat	Cost of heat to be as design and verified through annual monitoring	Appendix F CIBSE CP1.2 2020	Stage 6 – Operation and Maintenance Stage 7 – Customer Expectations and Obligations
KPI 5.3	Network performance	Network losses to be calculated through energy meter usage against heat generated at the heat network plantroom. Network temperatures to be as design. Annual monitoring to validate the above.	Appendix F CIBSE CP1.2 2020 Camden Heat Network Design Supplement Appendix 4	Stage 6 – Operation and Maintenance Stage 7 – Customer Expectations and Obligations
KPI 5.4	2 year operation, maintenance and training program	2 year operation and maintenance program with a training program for incumbent facility engineer	Camden requirement	Stage 6 – Operation and Maintenance Stage 7 – Customer Expectations and Obligations

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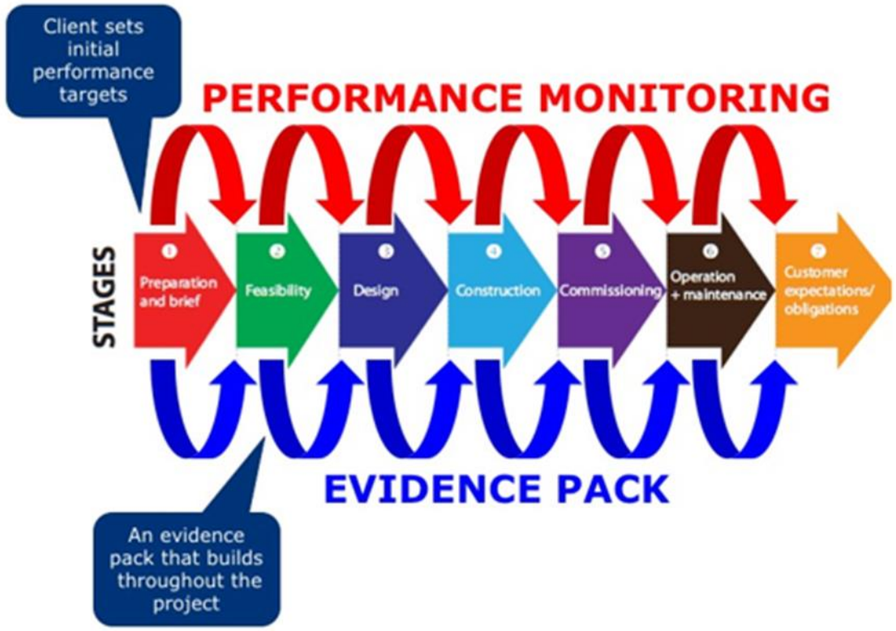
Notes

1. This KPI tracker has been produced to set-out as a minimum the main KPIs that will run through the delivery of the heating network project.
2. KPIs are to be proven at the various stages across the project with submission packages which will allow the project to pass through a gateway to the next stage.
3. This tracker is to be used a design tool.
4. This document shall be reading in conjunction with the following documents:
    i. Max Fordham specification documents (100, 200 & 300)
    II. CIBSE CP1.2 2020
    III. Metropolitan Decentralised Energy Key Design Parameters – Rev 002
    IV. Camden Heat Networks – Design and Delivery Supplement
    v. Camden's Heat Metering Specification Version 3, March 2019 including 4 appendices:
        a. Heat Network Design Supplement
        b. Standards for Data Cabling
        c. Connectivity Specification
        d. Data Format Specification

Rev	Date	Status	Description	Engineer	Project Leader
P01	26/08/22	D2	TENDER	EO	DL



This diagram identifies the stages throughout the heating network project and where evidence packs shall be provided to the Client for approval and sign off before continuing to the next stage in the project.

Failure to provide the relevant information at each stage will delay the project or be stopped until issues are addressed.

The required output of each stage is identified in the CIBSE CP1.2 Code of Practice for Heating Networks.

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