Heat Network Technical Assurance Scheme

New Build Heat Networks

Technical Specification

District Distribution Network

Phase 1: Feasibility

HNTAS-NB-TS-DD-P1

Version History

Revision	Notes	Date
V0.4	Draft issue	05/12/25

Disclaimer

The following HNTAS Code document is published in draft format. This document is intended to give the sector early sight of HNTAS requirements in their current stage of development for the purpose of facilitating sector understanding of the scheme.

Draft Code documents, including Technical Specifications and Assessment Procedures, have been reviewed and consulted on through a series of technical workshops with participation from a range of experts from across the heat network industry. The content of this document is still in development and subject to change. Requirements should not be considered as fixed at this stage.

Changes which may be made to this document in future include those to:

- reflect learnings from the New Build and Existing network pilot programmes;
- align with aspects of HNTAS which are subject to public policy consultation;
- align with new requirements in TS1 and MMS;
- align the terminology of this document with that used in other HNTAS documentation;
- rectify errors in this draft version; and
- improve clarity of contents.

The Key Failures set out in the draft Code documents have been identified as a specific area for review, to ensure that:

- all Key Failures enable a binary assessment;
- Key Failures are only included for genuine issues presenting major risks to KPIs, and that moderate or lower risks are considered via non-conformity processes; and
- Key Failures do not duplicate Technical Requirements unless there is a clear justification to do so.

DESNZ will be welcoming feedback on the information in this document via a change management process. This process will run in parallel to the HNTAS policy consultation and DESNZ invites stakeholders to engage with both, once they are open. You can sign up to receive updates on future detailed draft technical documents as they are published by contacting: heatnetworks@energysecurity.gov.uk.

Please be advised that this document references other HNTAS draft Code documents which have not yet been published. References to other documents will also be subject to change following the publication of updated standards. The final version of this document will be released before the launch of HNTAS.

Note on Phase 4: Operation (initial) and Phase 5: Operation (ongoing)

The New Build Technical Specification and Assessment Procedures Overview (Phase 0) documents indicate that there are separate New Build Code Documents for Phase 4: Operation (initial) and Phase 5: Operation (ongoing).

These documents have since been consolidated to reduce the number of Code Documents, so the Phase 4: Operation documents cover requirements for New Build networks during both initial and ongoing operation.

This change does not impact the assessment of New Build networks in operation, which still occurs:

- after 1 year of operation; and
- after 2 years of operation.

Contents

Foreword

This Technical Specification forms part of the UK Government's Heat Network Technical Assurance Scheme (HNTAS, The Scheme) delivered by the Department for Energy Security and Net Zero, in partnership with the Scottish Government and Ofgem. The Department for Energy Security and Net Zero appointed FairHeat as technical author for this document.

The Scheme has been designed and developed in consultation with a range of experts across the heat network industry in the form of Technical Sub-Working Groups, culminating in a series of Technical Specifications and Assessment Procedures to facilitate the validation and verification of performance outcomes of Elements within a Heat Network.

This document specifies HNTAS Requirements for a District Distribution Network Element within a New Build Heat Network in Phase 1: Feasibility.

This document sits within a series of Technical Specifications for a District Distribution Network, which features within a wider Code documentation structure, as outlined in Table 1.

This Technical Specification has been issued in draft format and will be updated prior to scheme launch.

For further information on the use of this document within the Heat Network Technical Assurance Scheme, please refer to the Heat Network Technical Assurance Scheme – New Build Heat Networks – Scheme Rules – Assessment Regime (HNTAS-NB-SR-XX-AS) document.

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Code Document Structure

Technical Specifications

Document Type	Element		Part/Phase				
			Overview	Phase 1: Feasibility	Phase 2: Design	Phase 3: Construction	Phase 4: Operation
			P0	P1	P2	P3	P4
Technical Specification	Energy Centre	EC	HNTAS-NB-TS-EC-P0	HNTAS-NB-TS-EC-P1	HNTAS-NB-TS-EC-P2	HNTAS-NB-TS-EC-P3	HNTAS-NB-TS-EC-P4
	District Distribution Network	DD	HNTAS-NB-TS-DD-P0	HNTAS-NB-TS-DD-P1	HNTAS-NB-TS-DD-P2	HNTAS-NB-TS-DD-P3	HNTAS-NB-TS-DD-P4
	Substation	SS	HNTAS-NB-TS-SS-P0	HNTAS-NB-TS-SS-P1	HNTAS-NB-TS-SS-P2	HNTAS-NB-TS-SS-P3	HNTAS-NB-TS-SS-P4
	Communal Distribution Network	CD	HNTAS-NB-TS-CD-P0	HNTAS-NB-TS-CD-P1	HNTAS-NB-TS-CD-P2	HNTAS-NB-TS-CD-P3	HNTAS-NB-TS-CD-P4
	Consumer Connection	CC	HNTAS-NB-TS-CC-P0	HNTAS-NB-TS-CC-P1	HNTAS-NB-TS-CC-P2	HNTAS-NB-TS-CC-P3	HNTAS-NB-TS-CC-P4
	Consumer Heat System	CH	HNTAS-NB-TS-CH-P0	HNTAS-NB-TS-CH-P1	HNTAS-NB-TS-CH-P2	HNTAS-NB-TS-CH-P3	N/A

Table 1: New Build Network Technical Specification structure

Scope

This document specifies the HNTAS Requirements for a District Distribution Network within a New Build Heat Network in Phase 1: Feasibility.

A District Distribution Network is defined as any pipework system that is not within a building and distributes thermal energy from one location within a Heat Network to another. For example, distributing thermal energy from an Energy Centre to a Building Connection underground.

A detailed definition of the District Distribution Network is contained within the Heat Network Technical Assurance Scheme – New Build Heat Networks – Technical Specification – District Distribution Network – Overview (HNTAS-NB-TS-DD-P0) document.

New Build Heat Networks

There is one stage within Phase 1: Feasibility, which is Stage 1: Concept Design. This is outlined in Figure 1.

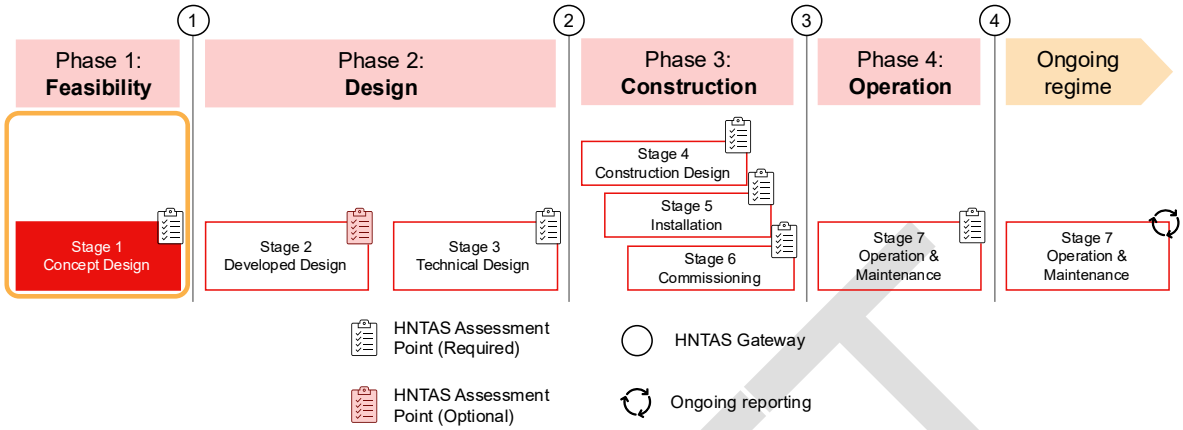

Figure 1: HNTAS New Build regime phases and stages

References

Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

- Heat Network Technical Standard (TS1) (HNTAS, 2025)
- Heat Network Metering and Monitoring Standard (MMS) (HNTAS, 2025)
- Heat Network Technical Assurance Scheme – New Build Heat Networks – Scheme Rules – Assessment Regime (HNTAS-NB-SR-XX-AS)
- Heat Network Technical Assurance Scheme – New Build Heat Networks – Technical Specification – District Distribution Network – Overview (HNTAS-NB-TS-DD-P0)

Informative references

The following informative references apply to this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

- RIBA Plan of Work (RIBA, 2020)

Terms and Definitions

For the purposes of this document, the terms and definitions given in the Heat Network Technical Assurance Scheme – Terms and Definitions (HNTAS-XX-TD) document apply.

1. Requirements for Stage 1: Concept Design

1.1. Technical Requirements

The applicable HNTAS Technical Requirements in Table 2 shall be fulfilled.

Technical Requirement		Applicable technical standard(s)	Evidence Requirement(s)
1.1.1.	Peak heat demands, heat demand profiles and annual heat consumption shall be estimated in accordance with the applicable technical standard(s).	TS1 1.1.1 TS1 1.1.2 TS1 1.1.3 TS1 1.1.4 TS1 1.1.5 TS1 1.1.6 TS1 1.1.7 TS1 1.1.8 TS1 1.1.9 TS1 1.1.10 TS1 1.1.11 TS1 1.4.10 TS1 1.5.1 TS1 1.7.4	DD-S1-E01
1.1.2.	A phasing plan shall be developed in accordance with the applicable technical standard(s).	TS1 1.1.12	DD-S1-E08
1.1.3.	Operating temperatures shall be determined in accordance with the applicable technical standard(s).	TS1 1.4.1 TS1 1.4.2 TS1 1.4.3 TS1 1.4.4 TS1 1.4.5 TS1 1.4.6 TS1 1.4.7 TS1 1.4.8 TS1 1.4.9 TS1 1.4.10 TS1 1.10.1 TS1 1.16.1	DD-S1-E02
1.1.4.	The routing of the District Distribution Network pipework shall be determined in accordance with the applicable technical standard(s).	TS1 1.3.5 TS1 1.3.6 TS1 1.3.7 TS1 1.3.8 TS1 1.3.9 TS1 1.3.10 TS1 1.3.11 TS1 1.3.12	DD-S1-E04 DD-S1-E05
1.1.5.	Pipe sizes shall be estimated in accordance with the applicable technical standard(s).	TS1 1.5.1 TS1 1.5.3 TS1 1.9.4	DD-S1-E06

Technical Requirement		Applicable technical standard(s)	Evidence Requirement(s)
1.1.6.	Working pressures shall be assessed in accordance with the applicable technical standard(s). *Note: it is expected that this assessment is undertaken with consideration for the other Elements present in the Heat Network.*	TS1 1.6.1 TS1 1.6.2 TS1 1.6.3 TS1 1.6.4 TS1 1.6.5 TS1 1.16.1	DD-S1-E03
1.1.7.	The lifecycle costs (CapEx, OpEx, RepEx) and revenues for all District Distribution Network components, including the Metering and Monitoring System, shall be assessed in accordance with the applicable technical standard(s) and used to inform design decisions.	TS1 1.7.2 TS1 1.12.2 TS1 1.15.1 TS1 1.15.2	DD-S1-E09
1.1.8.	A Resilience Strategy shall be developed in accordance with the applicable technical standard(s). *Note: it is expected that this assessment is undertaken with consideration for the other Elements present in the Heat Network.*	TS1 1.9.1 TS1 1.9.2 TS1 1.9.3	DD-S1-E12
1.1.9.	A repair and replacement strategy shall be developed in accordance with the applicable technical standard(s). The strategy shall include: • estimated timeframe for replacement of major plant and equipment within the District Distribution Network to support long-term planning; • consideration of long-term carbon-reduction implications of repair and replacement decisions.	TS1 1.3.7 TS1 1.15.2 TS1 1.15.3	DD-S1-E10
1.1.10.	A Water Quality Statement shall be produced in accordance with the applicable technical standard(s). *Note: it is expected that this is undertaken with consideration for the other Elements present in the Heat Network.*	TS1 1.11.1	DD-S1-E14
1.1.11.	An initial specification for the pipework insulation shall be determined in accordance with the applicable technical standard(s).	TS1 1.13.3 TS1 1.13.4	DD-S1-E07

Technical Requirement		Applicable technical standard(s)	Evidence Requirement(s)
1.1.12.	Network heat losses shall be estimated in accordance with the applicable technical standard(s).	TS1 1.13.3 TS1 1.13.4	DD-S1-E12
1.1.13.	The pipework system shall be determined with appropriate consideration for the design life at the determined operating temperatures and pressures in accordance with the applicable technical standard(s).	TS1 1.16.1	DD-S1-E02 DD-S1-E03
1.1.14.	The Technical Parameters Schedule shall be completed with accurate information and references to relevant documentation.		DD-S1-E14

Table 2: Technical Requirements for the District Distribution Network at Stage 1: Concept Design

1.2. Performance Monitoring Requirements

The applicable Performance Monitoring Requirements in Table 3 shall be fulfilled.

Performance Monitoring Requirement		Applicable technical standard(s)	Evidence Requirement(s)
1.2.1.	A Metering and Monitoring Strategy shall be developed in accordance with the applicable technical standard(s).	TS1 1.12.1	DD-S1-E15DD-S1-E1
1.2.2.	The KPIs to be measured and reported for the District Distribution Network shall be identified. A KPI Schedule shall be produced as part of the Metering and Monitoring Strategy. The KPI Schedule shall contain: 1. the identified applicable KPIs to be measured and reported by the Metering and Monitoring System; 2. the thresholds for each KPI in operation (based on the level of information available at this stage); 3. the Monitoring Points required to measure each KPI.	TS1 1.12.1 MMS 4.1.12	DD-S1-E16
1.2.3.	The Monitoring Points required for measuring the applicable District Distribution Network KPIs shall be identified and included in a Monitoring Points Schedule, as part of the Metering and Monitoring Strategy. The Monitoring Points Schedule shall contain: 1. the required Monitoring Points to measure KPIs; 2. the location of each Monitoring Point (which identifies the applicable Element); 3. a unique ID code, which follows a determined naming convention.	TS1 1.12.1 MMS 4.1.13	DD-S1-E16 DD-S1-E17 DD-S1-E18

Performance Monitoring Requirement		Applicable technical standard(s)	Evidence Requirement(s)
1.2.4.	Schematic(s) shall be produced which contain each Monitoring Point in the required location, each labelled with its unique ID code.	TS1 1.12.1 MMS 4.1.14	DD-S1-E04 DD-S1-E18

Table 3: Performance Monitoring Requirements for the District Distribution Network at Stage 1: Concept Design

1.3. Key Failures

The applicable Key Failures listed in Table 4 shall not be present.

Key Failure		Outcome to avoid	Evidence Requirement(s)
1.3.1.	District Distribution Network flow temperature inappropriately set given end consumer requirements and temperature of heat generation or delivery to the District Distribution Network.	Network temperatures being set higher than necessary to deliver heat to consumers, resulting in higher heat losses and increased energy consumption.	DD-S1-E02
1.3.2.	Inaccurate estimation of return temperatures.	Return temperature used to size network not accurately reflect expected operation based on building connections, impacting pipe sizing.	DD-S1-E02
1.3.3.	District Distribution Network pipework routing not optimised.	Increased network pipework length, increasing capital cost of pipework, installation cost of pipework and Distribution Network heat losses.	DD-S1-E04 DD-S1-E05
1.3.4.	Inadequate surveys or further investigation undertaken to inform optimal pipework route and mitigate risks when major barriers and congested service pinch points are identified on desired route.	Non-feasible route being taken forward to Developed Design stage.	DD-S1-E04
1.3.5.	Inappropriate and/or inaccurate methodology used to size pipework.	Oversized or undersized pipework, resulting in inaccurate cost model.	DD-S1-E06 DD-S1-E07
1.3.6.	Lack of consideration to operating pressures of network, specifically consideration to elevation (static height), in relation to pipework selection, lifespan of pipework and requirements for hydraulic breaks.	Inaccurate estimation of operating pressures could impact estimates of pipe sizing, future expansion ability, requirements for hydraulic breaks and lifespan of pipework.	DD-S1-E03 DD-S1-E07

Key Failure		Outcome to avoid	Evidence Requirement(s)
1.3.7.	Insulation material and type (thickness) assumed at this stage not sufficient to meet heat loss requirements	High network heat losses as a result of insufficient insulation specification.	DD-S1-E07 DD-S1-E11
1.3.8.	Insufficient service corridors provided for the District Distribution Network pipework, specifically applicable for new build developments.	Required pipework separation with other utilities not achieved due to lack of space within zones or service corridors.	DD-S1-E04 DD-S1-E05
1.3.9.	Insufficient outline replacement strategy and access/egress strategy considered for District Distribution Network pipework, including at entry points to buildings.	Inability to access District Distribution Network pipework in the need of future maintenance and replacement.	DD-S1-E05 DD-S1-E10
1.3.10.	Insufficient consideration given to Resilience Strategy (how to supply heat in the case of failure of the Heat Network).	Insufficient strategy and space allocated to enable connections to temporary plant at strategic points in the District Distribution Network in the case that it is required due to a failure of the District Distribution Network.	DD-S1-E05 DD-S1-E12
1.3.11.	Monitoring Points required to measure KPIs not identified at Concept Design stage.	Network routing and access requirements being developed which do not consider space and access requirements for any necessary Monitoring Points on the District Distribution Network.	DD-S1-E05 DD-S1-E16 DD-S1-E17

Table 4: Key Failures for the District Distribution Network at Stage 1: Concept Design

1.4. Evidence Requirements

The applicable Evidence Items listed in Table 5 shall be provided to demonstrate fulfilment with the Technical Requirements, Performance Monitoring Requirements, and avoidance of Key Failures.

Evidence Item		Detailed description and requirements
DD-S1-E01	Peak and annual heat demand calculations and schedule	Methodology, calculations, and assumptions used to estimate peak heat demands shall be provided. To include a schedule outlining the expected peak and annual heat demand for each end consumer and section of the Distribution Network. For annual heat demands, rationale for occupancy patterns shall be outlined. Sensitivity analysis shall be provided where applicable.
DD-S1-E02	System operating temperature assessment	Report highlighting the operating temperature design criteria. This shall include rationale for the temperatures specified.
DD-S1-E03	System pressure assessment	Assessment of working pressures in the system. Shall include: • calculation of the System Maximum Working Pressure; • calculation of the Local Maximum Working Pressure; • identification of the risks that arise as a result of calculated working pressures; • assessment of the likelihood and impact of the identified risk; • mitigation of the risks posed by working pressures (where appropriate).
DD-S1-E04	Route proving report	Evidence to justify route selection taken. Evidence of any surveys undertaken to determine route. Justification to be provided where shortest route possible not taken.
DD-S1-E05	Drawing(s)	District Distribution Network drawing(s) to the detail required by RIBA Stage 2 (RIBA, 2020) as a minimum. Drawings, through a combination of general arrangements and schematics, shall outline the network route and the peak demand, flow rate, velocity, and size for each section of the District Distribution Network. Shall also outline the hydraulic strategy and Resilience Strategy provision (e.g.

Evidence Item		Detailed description and requirements
		isolation valves, indicative temporary plant connections).
DD-S1-E06	Pipe sizing calculations	Shall outline calculations, methodology and assumptions used to estimate size of pipework.
DD-S1-E07	Pipework material and insulation selection assessment	Shall include evidence of assessment (calculations, methodology and assumptions where applicable) used to determine pipework material and insulation specification.
DD-S1-E08	Phasing Plan	Shall include which buildings will be connected, by when, and how the heat demand will build up over time. Shall also outline considerations for temporary plant and space requirements. The Phasing Plan shall include the following: • phase name and description including the number of connections; • notable areas describing significant aspects of each phase, such as the use of temporary equipment for heat production or the connection of air-source heat pumps (ASHP) once all phases are complete. Considerations for temporary plants and space requirements should be outlined; • proposed heat on date for all connections shall be specified to show how heat demand will be built up overtime; • annual demand and peak load of each phase.
DD-S1-E09	Cost Model	A cost model and assessment which contains lifecycle costings (CapEx, OpEx, RepEx etc.) used to inform design decisions. All inputs and assumptions shall be outlined. This may be in the form of a techno-economic model.
DD-S1-E10	Repair and Replacement Strategy	Shall include how repair and replacement is considered within the Heat Network to aid justification of routing, access, spatial requirements, and District Distribution Network location.
DD-S1-E11	Heat loss calculations	Shall include calculations, methodology and assumptions used to calculate District Distribution heat loss.
DD-S1-E12	Resilience Strategy	Shall outline the Resilience Strategy for the Heat Network, including: • the key threats to system and equipment failure;

Evidence Item		Detailed description and requirements
		• the risk score of each threat without resilience measures in place; • the redundancy and recovery measures implemented across the system; • the risk score of each threat with resilience measures in place; and • any residual risks associated with each threat. Shall demonstrate that suitable provision is made for the required spatial allowances and connection points necessary to successfully implement the Resilience Strategy.
DD-S1-E13	Water Quality Statement	Shall include: • the type of water quality system to be followed; • preliminary selection of fill water source; • preliminary selection of the material of plant, equipment, and distribution pipework; • initial performance specification for water treatment and conditioning; and • a spatial assessment of the plant room considering the spatial dimensions and maintenance requirements for water quality equipment, transportation and storage of chemicals and equipment and plant room accessibility requirements.
DD-S1-E14	Technical Parameters Schedule	Schedule which outlines all technical parameters in one location, with reference to applicable documents.
DD-S1-E15	Metering and Monitoring Strategy	The Metering and Monitoring Strategy shall contain a high-level description of how data required to calculate KPIs will be measured, extracted, recorded, and stored at the required read frequency, how the raw data will be transformed, and how KPIs will be calculated and reported. The strategy shall also include: 1. a KPI Schedule (item DD-S1-E1); 2. a Monitoring Points Schedule (item DD-S1-E1); 3. a Monitoring Points unique ID code naming methodology (item DD-S1-E1); 4. a Schematic with labelled Monitoring Points.
DD-S1-E16	KPI Schedule	A schedule of all KPIs required to be measured by the Metering and Monitoring System. The KPI Schedule shall contain:

Evidence Item		Detailed description and requirements
		1. the identified applicable KPIs to be measured and reported by the Metering and Monitoring System; 2. the thresholds for each KPI in operation (based on the level of information available at this stage); 3. the Monitoring Points required to measure each KPI.
DD-S1-E17	Monitoring Points Schedule	A schedule of all Monitoring Points required to measure KPIs. The Monitoring Points Schedule shall contain: 1. the required Monitoring Points to measure KPIs; 2. the location of each Monitoring Point (which identifies the applicable Element); 3. a unique ID code, which follows a determined naming convention.
DD-S1-E18	Unique ID code naming convention	Methodology used to label each Monitoring Point with a unique ID code.

Table 5: Evidence Requirements for the District Distribution Network at Stage 1: Concept Design