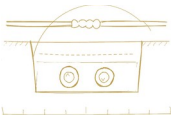
Sample Heat NETWORKS



SAMPLE · ILLUSTRATIVE TEMPLATE
FINAL DOC.
FW-D-001 · Template version 0.1
DISTRICT HEATING

FINAL DOCUMENTATION · DISTRICT HEATING

Final documentation / network route documentation

The final documentation records the executed pre-insulated pipe route NETZ-2, including as-built geometry, components, tests, deviations and GIS data. It serves technical acceptance, operator takeover, maintenance and audit-proof asset records.

1 Document type

Discipline / cluster	District heating
Document class	Final doc.
Standard reference	BS EN 13941-1; BS EN 13941-2; BS EN 253; BS EN 448; BS EN 489-1; BS EN 14419; CIBSE CP1

2 Document control (to be completed · • = mandatory)

• Project number	**• Project title**
e.g. FW-2431	*e.g. district heating expansion Sampleton North – heating plant & network section 2*
Plant / site / bay	**Component / designation (KKS / RDS-PP)**
e.g. district heating network Sampleton North, NETZ-2	*e.g. pre-insulated main route DN 250, North Road, km 0.0–1.4*
• Document number	**• Revision / version**
suggested automatically	*e.g. 00*
Document status (draft/…)	**• Date**
Draft / under review / approved	*DD.MM.YYYY*
• Client / operator	**• Contractor / author**
e.g. Sample Heat Networks	*e.g. Pipeworks South Ltd, lot 3, pipe construction*

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DMS RESOLVER
Link back from paper / PDF → digital DMS object
https://dms.sample.example/r/template/FW-D-001
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1 Key data

• Network section	*e.g. NETZ-2, North Road, km 0.0–1.4*
• Pipe system	*e.g. single pre-insulated pipe system, steel, DN 250*
• Route length	*e.g. 1,400 m, supply and return*
• Network connection	*e.g. HZ-NORD, heating plant 32 MW_th*
• Documentation status	*e.g. revision 1.0, 23.10.2026*

The chapter texts are fully worded sample versions for the consistent sample project; adapt contents, values and responsibilities to the project.

2 Project data, scope of documentation and delimitation

This final documentation describes the executed district heating network section NETZ-2 of project FW-2431 in Sampleton North. Client and future plant operator is Sample Heat Networks Ltd; the pipe construction work was carried out by Pipeworks South Ltd in lot 3. The pre-insulated main route DN 250 runs along North Road from station km 0.0 to km 1.4 and comprises supply, return, fittings, shut-off devices, joint casings and the integrated monitoring system. The route connects the heating plant HZ-NORD at 12 Industry Road with the northern supply area and forms the basis for connecting around 180 substations of cluster UST-N. The documentation of the heating plant with CHP-1, HP-1 and ST-1 and the individual documents of the substations are kept separately; their interfaces are recorded here.

- Documentation boundary: NETZ-2 including associated installations and route connections
- Interfaces HZ-NORD and UST-N according to interface and as-built plan
- Handover scope: PDF/A, CAD, GIS data, test records and component register

Identifier	Object	Scope	Responsible	Reference	Status
NETZ-2	*Pre-insulated main route*	*km 0.0–1.4*	*Pipeworks South Ltd*	*FW-2431-TR-001*	*Documented*
HZ-NORD	*Heating plant*	*32 MW_th*	*Plant Engineering North Ltd*	*FW-2431-SST-001*	*Interface*
UST-N	*Substations*	*approx. 180 planned*	*Operator*	*FW-2431-UST-001*	*Separate scope*

3 Route, survey and as-built plans

The executed route NETZ-2 runs from the connection to HZ-NORD via North Road to the northern end point at station km 1.4. The as-built survey was carried out after completion of pipe laying and before final backfilling; concealed installations were additionally surveyed. The digital as-built plan FW-2431-BP-001 contains the actual pipeline axes, bend points, branches, valves, crossings and height data. The position coordinates are kept in the reference system ETRS89/UTM zone 32N and the heights in the DHHN2016 system. The example coordinates are sample data and are replaced by verified survey data before GIS takeover.

- As-built plan with supply, return, pipe dimensions and flow direction
- Stationing, cover, bend points, branches and crossings
- Survey before backfilling with associated survey record

Point ID	Station	Easting m	Northing m	Height m	Description
TP-001	*0+000*	*500120.35*	*5400120.42*	*102.45*	*Connection HZ-NORD*
TP-014	*0+650*	*500418.20*	*5400696.18*	*101.82*	*Route bend*
TP-029	*1+400*	*500805.66*	*5401278.30*	*100.95*	*End point NETZ-2*

4 Pipe system, components and material traceability

In section NETZ-2, a directly buried single pre-insulated pipe system with steel service pipes DN 250 for supply and return was installed. The system consists of steel service pipe, PUR thermal insulation and PE casing as well as factory-made fittings and site-installed joint casings. Pipe dimensions, materials and permissible operating

parameters are defined in the approved pipe system specification FW-2431-RS-001. Pipes, bends, branches, valves and joint kits are assigned to installation locations and material certificates by unique component identifiers; traceability extends from the batch certificate to the position in the as-built plan.

- Component list with unique identifier and stationing
- Batch and delivery lot assignment with material certificates
- Link between component, weld seam and joint identifiers

Component ID	Component	Dimension	Station	Lot/batch	Evidence
R-025	*Pre-insulated pipe*	*DN 250*	*0+240*	*L-26017*	*MAT-025*
B-004	*Pre-insulated bend*	*DN 250 / 45°*	*0+650*	*L-26021*	*MAT-041*
A-002	*Shut-off valve*	*DN 250*	*1+120*	*L-26035*	*MAT-063*

5 Weld seam documentation and joint tests

All welded joints of the steel service pipes were documented with a unique weld number. The weld seam register FW-2431-SR-001 contains installation position, welding procedure, welder ID, procedure qualification and test results. Visual inspections and the specified non-destructive tests are traceable on the basis of the approved test planning FW-2431-QS-001. The pipe joints were released after assessment of the test results and before joint casing assembly.

- Weld map and weld seam register with unique references
- Welding procedure specifications, qualification and NDT records
- Repaired joints including repeat test

Weld ID	Station	Procedure	Test type	Result	Evidence
SN-041	*0+240*	*141/111*	*VT + RT*	*Passed*	*ZFP-041*
SN-087	*0+650*	*141/111*	*VT + RT*	*Passed*	*ZFP-087*
SN-132	*1+120*	*141/111*	*VT + UT*	*Passed*	*ZFP-132*

6 Joint assembly, insulation and trench completion

The joint casings installed after completion of the weld tests are recorded individually in the joint register FW-2431-MR-001: installation location, joint type, fitter, installation date, leak test and insulation work. Pipe bedding, lateral embedment, cover and compaction were checked section by section by site supervision. Approval for final backfilling was only granted after completion of the survey, joint and monitoring system records.

- Joint register with reference to the weld seams
- Assembly and leak test records, photo documentation
- Approval of concealed work before final backfilling

Joint ID	Station	Weld reference	Test	Result	Record
MU-041	*0+240*	*SN-041*	*Leak test*	*Passed*	*MP-041*
MU-087	*0+650*	*SN-087*	*Leak test*	*Passed*	*MP-087*
MU-132	*1+120*	*SN-132*	*Leak test*	*Passed*	*MP-132*

7 Pressure test, monitoring system and commissioning

The pressure test of the completed sections was carried out and recorded according to the approved test plan FW-2431-DP-001. Test pressure, test duration, temperature conditions and assessment criteria correspond to the project-specific test instruction; the test pressure of 25 bar is an example value. The pre-insulated pipe monitoring system was checked for conductor continuity, insulation behavior and connection assignment; initial measured values are available as a reference for network operation. Commissioning approval requires the assessment of all tests and confirmed operational readiness.

- Pressure test records with pressure and temperature curves, measuring equipment certificates
- Flushing, filling and venting documented
- Measurement records and assignment plan of the monitoring system

Test ID	Section	Test variable	Example value	Result	Evidence
DP-01	0+000–0+700	Test pressure	25 bar according to test plan	Passed	DP-P-001
DP-02	0+700–1+400	Test pressure	25 bar according to test plan	Passed	DP-P-002
UE-01	0+000–1+400	Conductor/insulation	according to test instruction	Passed	UE-P-001

8 Deviations, defects and as-built corrections

Deviations from the approved detailed design are recorded in the deviation register FW-2431-ABW-001. At station 0+650, the route was shifted laterally by 0.40 m because of a third-party line encountered on site, and the changed position was surveyed. Assessment and approval are documented under ABW-003; effects on pipe statics, cover and line crossing were checked and incorporated into the as-built plan and GIS data set. At the reference date, all deviations relevant to handover are closed or provided with an approved measure and responsibility.

- Deviation register with unique IDs, assessment and approval
- Correction of as-built plans and component assignments
- Open outstanding items with date and owner

Dev. ID	Station	Facts	Action	Evidence	Status
ABW-003	0+650	Third-party line	Axis +0.40 m	ABW-F-003	Completed
ABW-005	0+980	Bend position adjusted	Statics checked	ABW-F-005	Completed
ABW-008	1+120	Valve relocated	As-built corrected	ABW-F-008	Completed

9 GIS data handover and digital asset records

The surveyed as-built data are combined in the GIS handover data set FW-2431-GIS-001: line geometries for supply and return, pipe dimensions, station references, valves, branches and route objects with unique object identifiers. Coordinate reference system, height reference and attribute structure comply with the operator’s GIS interface specification. Productive takeover only takes place after successful geometry, attribute, topology and completeness checks and confirmed import by the GIS office.

- Georeferenced geometries (ETRS89/UTM 32N, DHHN2016)
- Attribute data with object ID, nominal size, component type and installation date
- Import log with error list and documented data takeover

GIS object	Object type	Station	Attribute	Source plan	Import status
GIS-R-001	Supply	0+000–0+650	DN 250	BP-001	Validated
GIS-R-002	Return	0+000–0+650	DN 250	BP-001	Validated
GIS-A-002	Valve	1+120	DN 250	BP-002	Validated

10 Document register, operator handover and approval

The complete final documentation NETZ-2 is handed over to the operator as handover package FW-2431-ED-001. All documents are recorded in the document register with identifier, revision, approval status and unique file name. Network operation additionally receives information on shut-off points, connection points of the monitoring system, accessibility and operational restrictions. Approval of the final documentation takes place after completeness and technical review and confirmed data takeover; it replaces neither construction acceptance nor commissioning approval.

- Document register with target/actual comparison of all mandatory documents
- List of outstanding items with assessment and handover responsibility

- Handover record with approval notes and acceptance confirmation

Document ID	Document	Revision	Format	Status	Handover
FW-2431-BP-001	*As-built plan*	*1.0*	*PDF/A + CAD*	*Approved*	*23.10.2026*
FW-2431-SR-001	*Weld seam register*	*1.0*	*PDF/A + XLSX*	*Approved*	*23.10.2026*
FW-2431-GIS-001	*GIS data set*	*1.0*	*GPKG*	*For takeover*	*23.10.2026*

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11 Approval criteria

No.	Test characteristic	Target / tolerance (source)	Evidence	Actual / finding	OK	In case of deviation
1	**Completeness of the documentation package**	All mandatory documents complete, uniquely referenced and approved; according to the documentation matrix.	Document register, completeness checklist	*42 of 42 mandatory items available; GIS import confirmation pending*	☐	Request missing documents; no final approval until clarified.
2	**As-built survey and plan consistency**	Route, heights and installations fully surveyed; tolerances according to survey specification (e.g. position ±0.10 m).	As-built plan, survey record, CAD comparison	*1,400 m documented; within specification*	☐	Re-survey, correct the as-built plan and re-check.
3	**Material and component traceability**	Components uniquely assigned to installation locations and material certificates; according to pipe system specification and BS EN 13941-1.	Component register, material certificates	*All components with batch and location reference*	☐	Reconstruct unclear assignments and confirm them with quality assurance.
4	**Weld seam and joint records**	All joints documented and assessed according to the test plan; BS EN 13941-2.	Weld seam register, NDT reports, joint records	*All test items passed*	☐	Block the joint, document rework and repeat test.
5	**Pressure test**	Test pressure, test duration and assessment fully documented; according to pressure test plan (e.g. 25 bar).	Pressure test records, measurement curves	*DP-01 and DP-02 passed*	☐	Clarify the result technically; repeat the test if necessary.
6	**Pre-insulated pipe monitoring system**	Continuity, insulation and assignment checked; limit values according to BS EN 14419 and test instruction.	Monitoring measurement record, assignment plan	*Sections tested; reference values documented*	☐	Locate fault, eliminate it and re-measure completely.
7	**GIS data quality and import**	Geometries and attributes complete and consistent; import error-free according to GIS interface specification.	GIS test report, import confirmation	*Data set validated; import pending*	☐	Correct the data set and re-validate; defer final approval.
8	**Operator takeover and approval**	Mandatory evidence, deviations and interfaces clarified; approval according to handover plan.	Handover record, list of outstanding items	*Technical review done; acceptance after GIS import*	☐	Track open points with owner and date; suspend approval.

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12 Completion notes

- All data, measured values, document identifiers, coordinates and approval statuses are example values of sample project FW-2431.
- Check standard editions against the contract status and binding list of regulations before use in the project.
- Take test pressures, test proportions, tolerances and acceptance values exclusively from approved project specifications.
- Document GIS acceptance, construction acceptance, commissioning approval and approval of the final documentation separately.
- Archive the final documentation in an audit-proof manner; hand over editable source data and PDF/A versions together.

13 Applicable documents

- Documentation matrix and document register
- As-built plan NETZ-2 including survey
- Pipe system specification and component register
- Weld seam register and NDT records
- Joint register and assembly records
- Pressure test plan and pressure test records
- Monitoring system and measurement records
- Deviation and defect register
- GIS handover data and import log
- Handover and approval record

14 Standards and regulations

Rules (edition)	Application in this document
BS EN 13941-2	Installation of directly buried pre-insulated district heating pipes.
BS EN 253	Factory-made pre-insulated pipe assemblies.
BS EN 448	Pre-insulated fittings.
BS EN 489-1	Pipe joints (joint casings) for pre-insulated systems.
BS EN 14419	Monitoring systems for buried district heating pipes.
BS EN 13941-1; CIBSE CP1	Design of pre-insulated pipe systems; Heat networks: Code of Practice for the UK.

The edition agreed in the project is authoritative; deviations in the contract or in the grid operator's technical specifications take precedence.

Approval / signatures

Role	Name	Date	Signature
Prepared: documentation (contractor)		*DD.MM.YYYY*	
Reviewed: site supervision (operator)		*DD.MM.YYYY*	
Approved: project management (operator)		*DD.MM.YYYY*	
Taken over: network operation / GIS (operator)		*DD.MM.YYYY*	

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Revision history

Rev	Date	Description	Author	Approval
00	*DD.MM.YYYY*	Initial issue (template)		

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