

Kouvola

Site & Prefeasibility Study

Data center campus / Savonsuontie, Finland

11.14 ha / 45 MW incoming electrical / 34.2 MW studied IT

REFERENCE PROJECT / INDEPENDENT STUDY

HARMONISED EDITION / 10 SEPTEMBER 2026 / EN

Demonstration project on a real parcel. Proposed programme; no reserved grid connection or granted project permit.

A campus to test, a clear development strategy

PREFEASIBILITY FINDING

45 MW

proposed incoming programme

34.2 MW

studied IT load

11.14 ha

national cadastral parcel

THE SITE

An exact parcel and usable terrain data. Municipal zoning indicates a setting for technical activities; ground and drainage interfaces shape the project.

THE PROGRAMME

Four IT units, a water-conscious cooling strategy and phased delivery. The 30 / 45 / 60 MW cases show increasing pressure on equipment and land.

THE DECISION

Take 45 MW forward as the central design case. Compare real layouts before fixing buildings; first qualify land status, connection and drainage.

A documented site. A testable programme. A defined next stage.

One basis for every decision

Site evidence, programme assumptions and calculations: three distinct statuses.

01

SITE EVIDENCE

National cadastre, 2 m terrain, 2020 ortho, zoning map, Natura, roads and buildings. Each source retains its date and accuracy.

02

PROJECT ASSUMPTIONS

45 MW input, 5% reserve, 1.25 peak factor; two-level buildings, land allocation and cooling scenarios.

03

DERIVED CALCULATIONS

34.2 MW IT, land balance, event volumes, earthwork sensitivity and indicative rack count. Calculations accompany this study.

Six reading sequences

04–11

Context & planning

12–21

Ground, water & environment

22–28

Power & utilities

29–33

Access & operations

34–38

Programme & decision

39–40

Sources & method

Assumptions are grouped and identified. Buried routes, allocated power, fire approvals and permissions are not invented.

EARENDIL

ARCHITECTURE
& SITE DUE DILIGENCE

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PREFEASIBILITY

One basis for every
decision

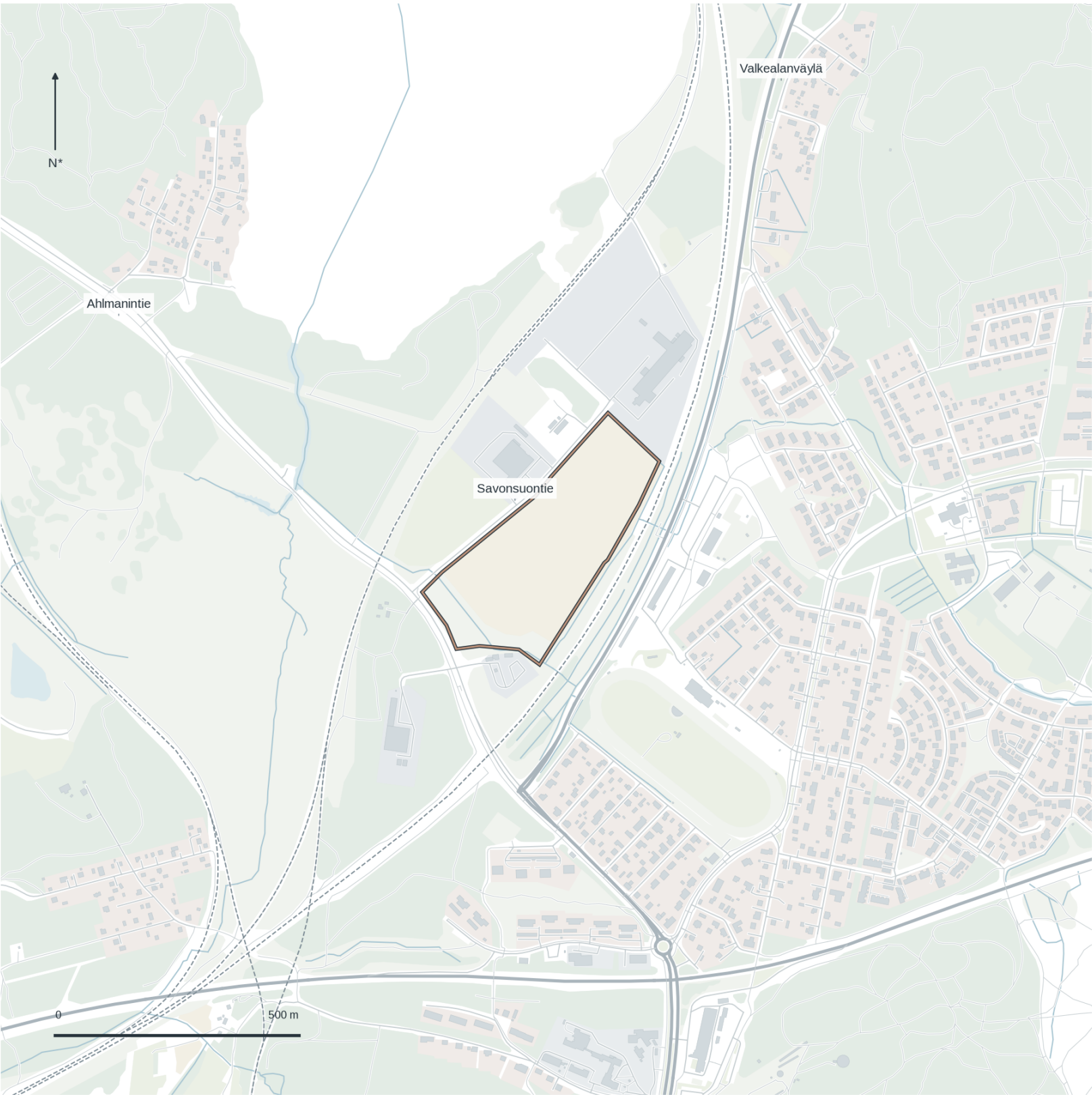
REV. 01 / 10.09.26

A3 / 420 × 297 mm

S02

Kouvola: a networked setting

The parcel sits within an active district structured by roads, rail and service facilities.



Existing roads / buildings / landscape

Sources and method: G01 · G05 · P05 / N*: grid north. Mapping and interpretation by Earendil. © OpenStreetMap contributors / ODbL.

11.14 ha

reference parcel

Savonsuontie forms part of northern Kouvola. The railway, Valkealanväylä and neighbouring activities define the main project interfaces.

This is a credible setting for a technical campus: infrastructure is documented, but proximity must be separated from actual service capacity.

DESIGN CONSEQUENCE

Develop a campus fitted to this district, resolving access and shared service interfaces from the programme stage.

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PREFEASIBILITY

Kouvola: a networked
setting

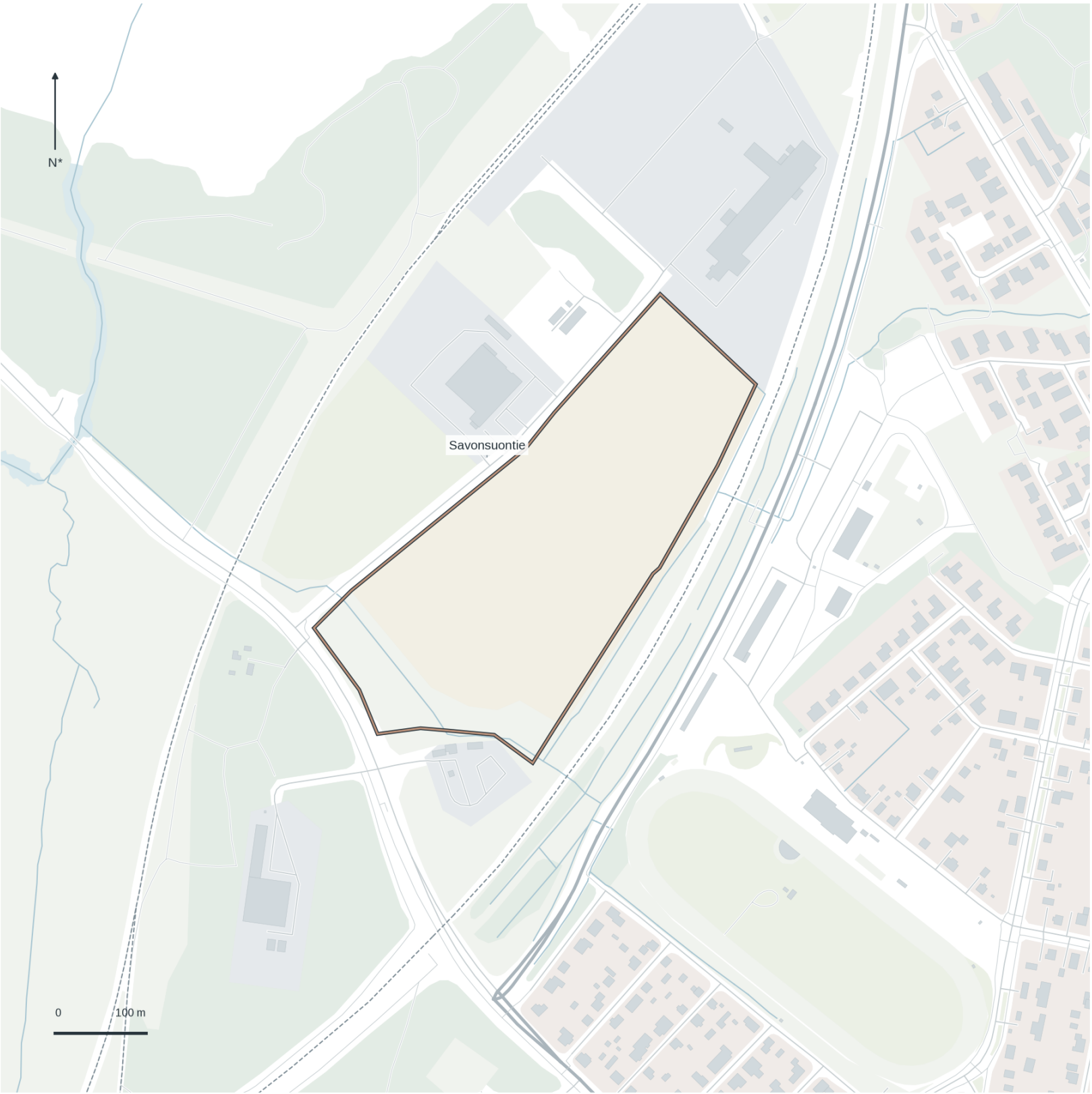
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S03

Read the uses before drawing

An open site adjoining operations, natural areas and infrastructure.



Grey: built uses • green: landscape • blue: water

Sources and method: G05 · P04 / N*: grid north. Mapping and interpretation by Earendil. © OpenStreetMap contributors / ODbL.

4

interfaces to resolve

To the southwest, service operations around Ahlmanintie require coordinated access. To the east, rail and Valkealanväylä form functional edges: no new crossing is assumed.

To the north and west, water and planted connections need more than a fence line. Technical frontages must also address noise and views from the surrounding area.

DESIGN CONSEQUENCE

Organise heavy movements towards the existing street network and keep ecological interfaces legible and maintainable.

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PREFEASIBILITY

Read the uses before
drawing

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S04

The real site, without distortion

Parcel 286-23-343-14 / municipal aerial collection identified as 2020.



Cadastral boundary • N*: EPSG:3067 grid north

Sources and method: G01 · G02 / N*: grid north. Mapping and interpretation by Earendil.

111,436 m²

area calculated from the cadastre

The national cadastral parcel is the sole reference boundary. Promoted development phases in the area do not describe exactly the same footprint.

The orthophoto records occupation at its acquisition date. Its natural colours are preserved; cadastral geometry and future design studies share one metric reference system.

DESIGN CONSEQUENCE

Carry this boundary and coordinate system through every later deliverable: siting, plans and 3D model.

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PREFEASIBILITY

The real site, without
distortion

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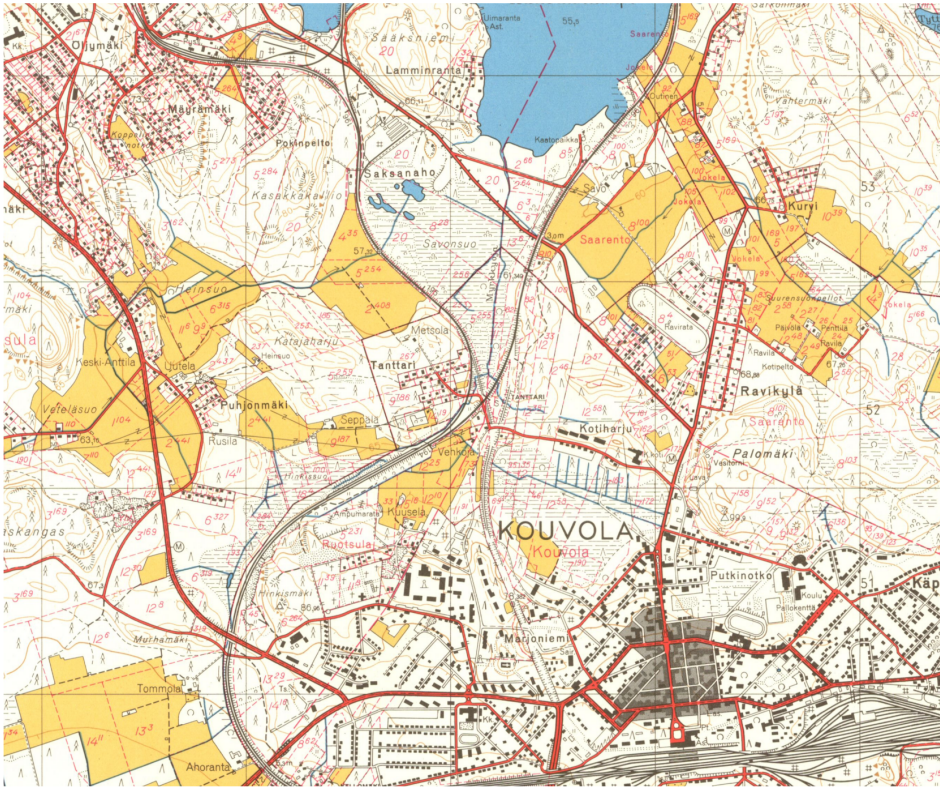
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S05

A landscape shaped by networks

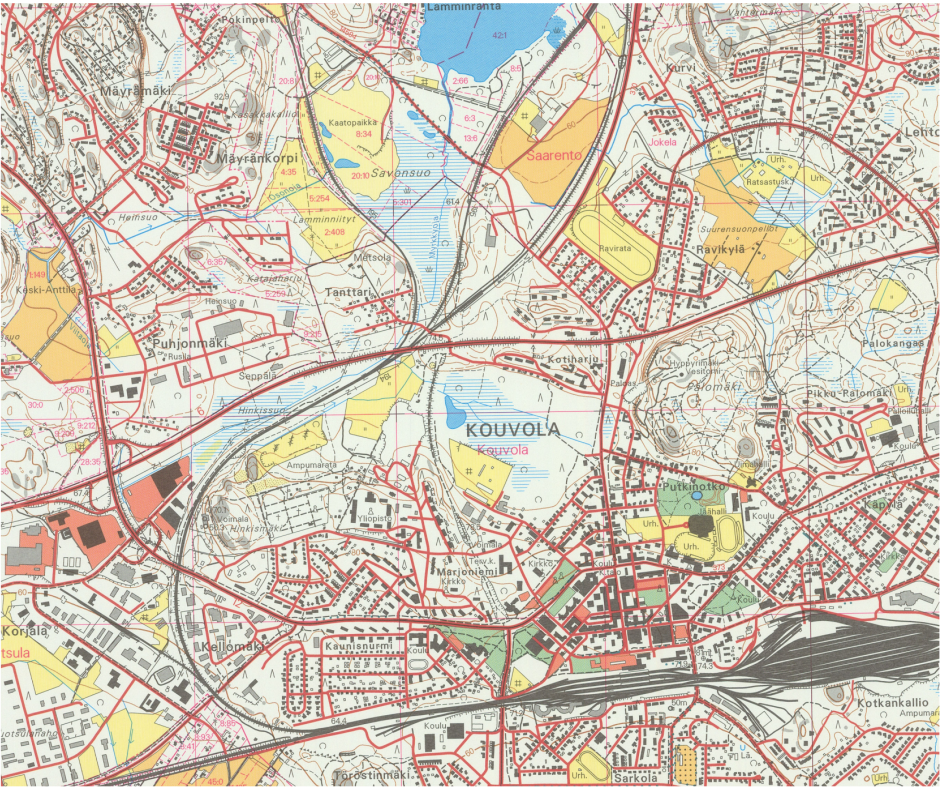
Geographic archives and recent occupation: distinguish the time periods.

1965



© Maanmittauslaitos · Peruskartta 1:20 000 · 311308 · CC BY 4.0 · 2026-09-10

1994



A LANDSCAPE RECORD

The national maps from 1965 and 1994 show fields, woodland and railways. They trace major landscape landmarks before the occupation visible in the municipal 2020 orthophoto.

READ ARCHIVES AT THEIR SCALE

These 1:20,000 sheets are digitised archives, without registration here. They cover a wider area than the site; no contemporary cadastral boundary is drawn on the scans. The 1953 aerial remains an unreproduced documentary reference.

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PREFEASIBILITY

A landscape shaped by
networks

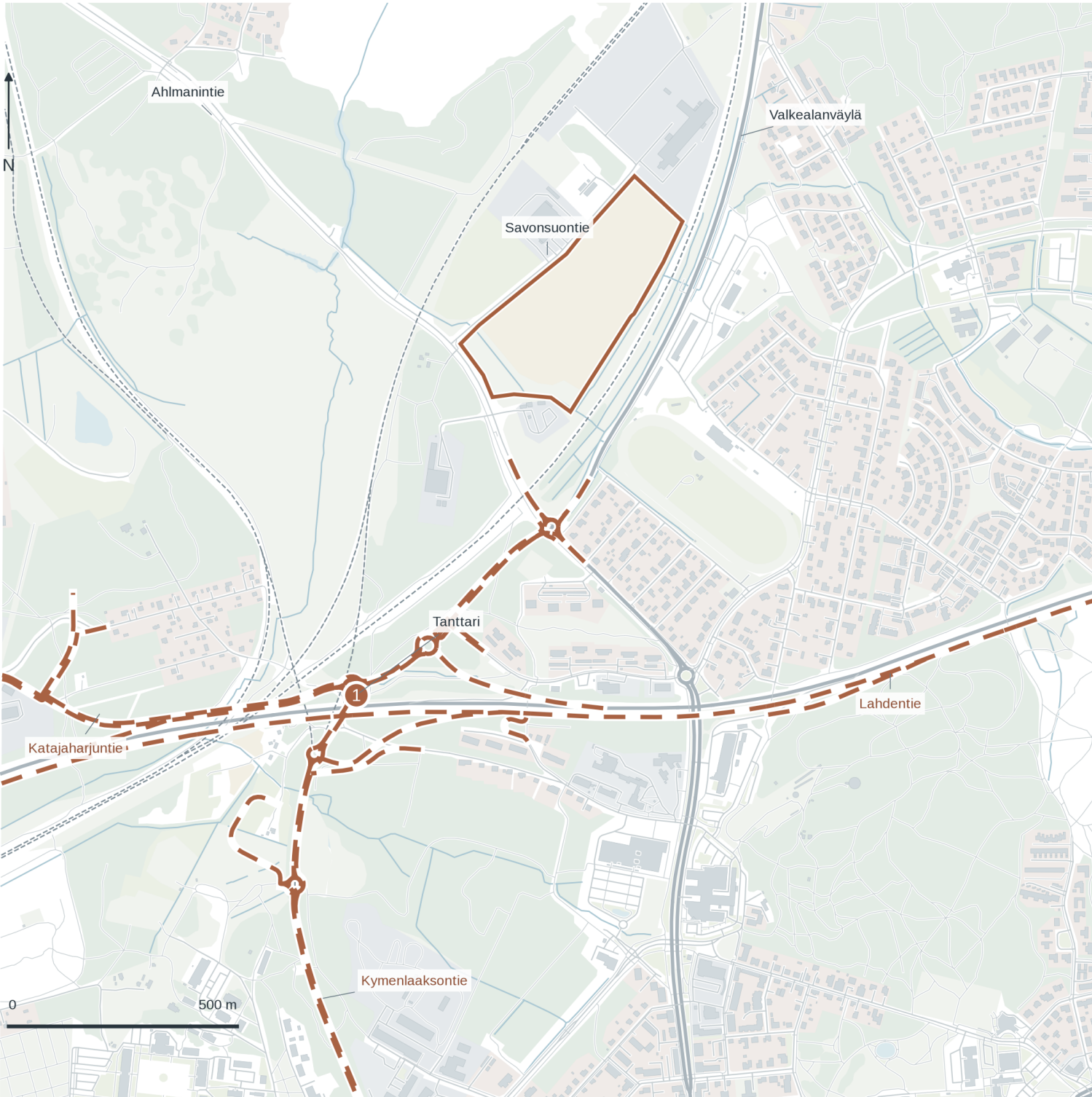
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S06

A changing neighbourhood

Surrounding projects are read against their actual delivery status.



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2026–27

a changing district

Tanttari proposes a VT 6 interchange, a Katajajarjuntie–Valkealanväylä link and a route towards the centre. Its plan was adopted on 22 January 2026, but the city states that an appeal prevents it taking effect.

The new Kuusaantie sorting station is under construction: earthworks started in December 2025, buildings follow in 2026–2027 and completion is planned for 2027. These projects explain the context; they secure no new campus access.

The dashed network remains proposed. Campus access does not depend on its delivery.

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A changing
neighbourhood

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S07

One cadastral boundary, several planning scales

The cadastre fixes the boundary; easements and access rights remain design interfaces.



Fine lines: surrounding parcels • accent outline: study

Sources and method: G01 · P02 · P03 · P05 / N*: grid north. Mapping and interpretation by Earendil. © OpenStreetMap contributors / ODbL.

286-23-343-14

national parcel reference

The study uses cadastral parcel 286-23-343-14, with a calculated geometric area of 11.1436 ha. This national boundary replaces promotional phase outlines, which do not describe exactly the same area.

Municipal evidence places the area within an employment context: the central plan adopted in 2015 designates it TP. Detailed plan 23/027 was adopted in 2024; its effective date was not established here. The current municipal map shows TVL, e=0.60, III.

DESIGN CONSEQUENCE

Use one cadastral boundary throughout the study; retain land availability as an unverified assumption.

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PREFEASIBILITY

One cadastral
boundary, several
planning scales

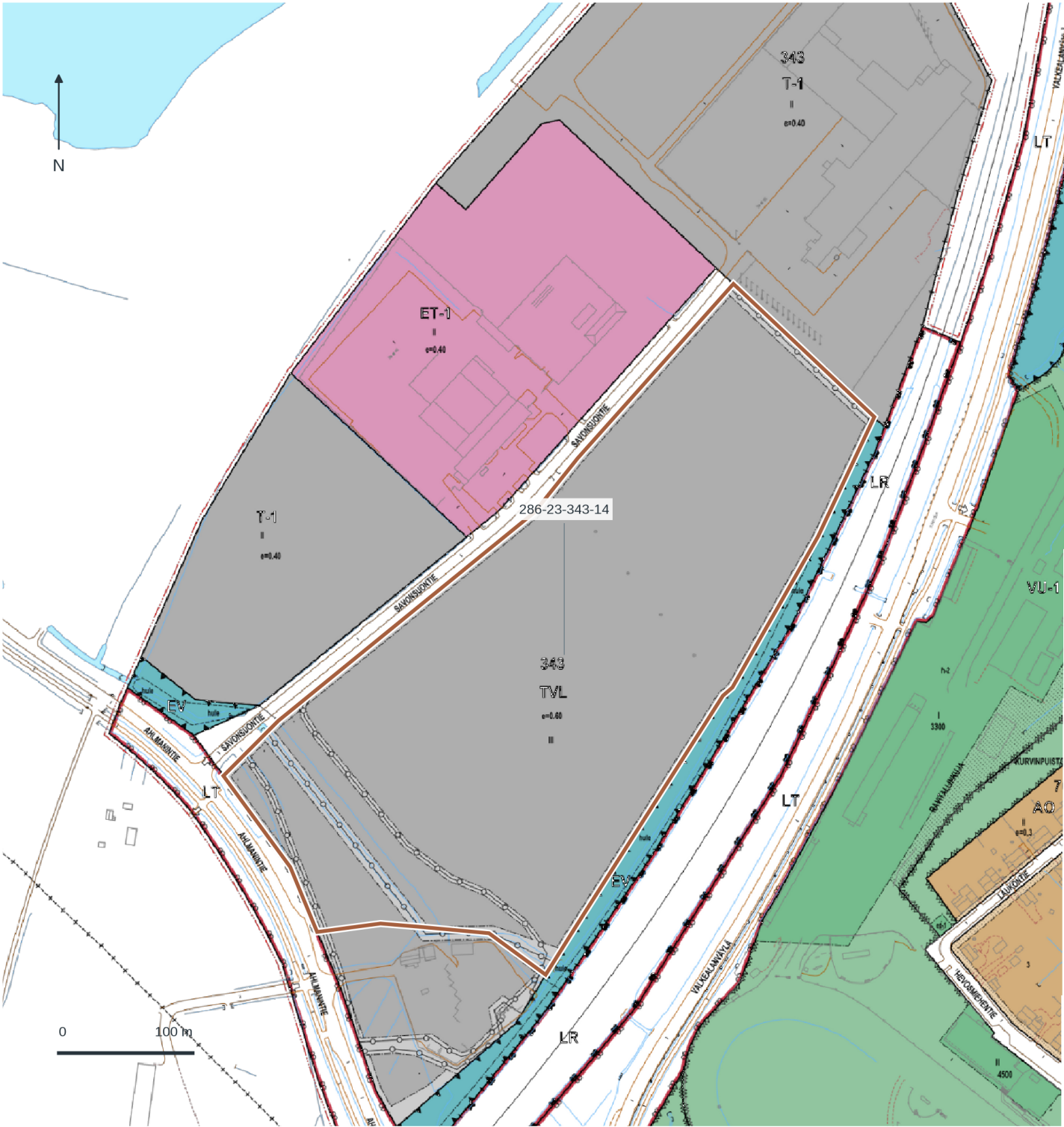
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S08

Translate the planning envelope into a programme

Municipal map interpretation; programme calculations, not a permit conclusion.



TVL

mapped industrial designation

e = 0.60

municipal map floor-area factor

III

three levels indicated by the plan

Applying the coefficient arithmetically to the parcel gives about 66,861 m². This is a gross reading envelope, to be reduced by rules, easements, parking and equipment.

Adopted: 21.03.2024. Effective date not established in the reviewed corpus.

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PREFEASIBILITY

Translate the planning
envelope into a
programme

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S09

Rules become design reservations

Translate site requirements into an envelope the siting study can test.

Use / height	TVL · e 0.60 · III	Test two levels first; preserve allowance for roof plant.
Ditches / utilities	Keep continuity	Reserve corridors before building footprints and coordinate crossings.
Noise / neighbours	Control sources	Orient technical yards, treat plant noise and allow useful screens.
Parking / access	Programme to develop	Separate visitors, operations, deliveries and rescue; allow for snow.
Water / ecology	Avoid hydraulic disruption	Keep upstream clean water, isolate pollution and plan exceedance routes.

Result: the usable envelope will be smaller than land area × floor-area factor. Prefeasibility prepares that trade-off; it does not declare all 66,861 m² deliverable.

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PREFEASIBILITY

Rules become design
reservations

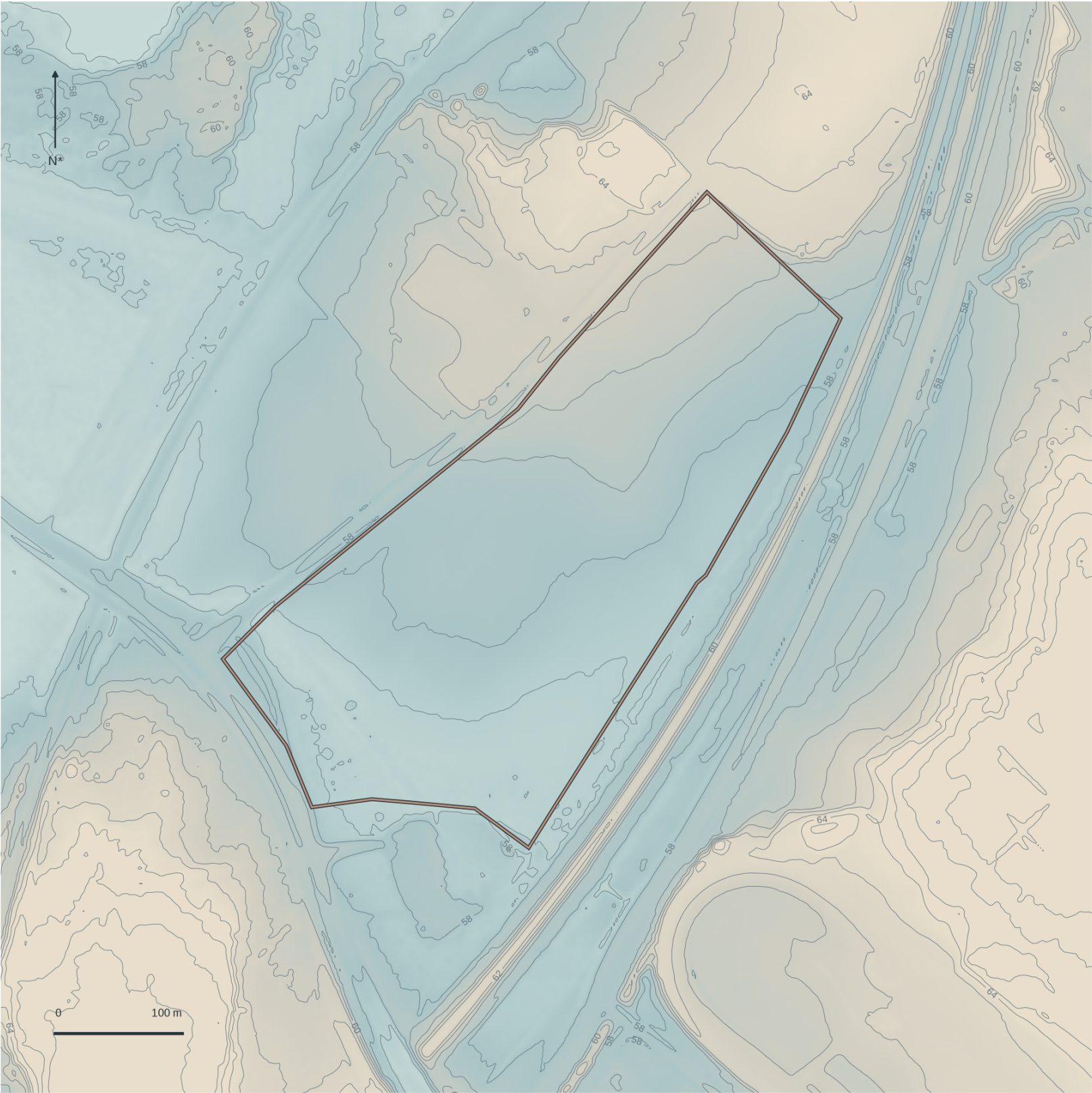
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S10

Moderate but consequential relief

National 2 m terrain model / 1 m contours / N2000 elevations.



55 → 64 m: blue green → sand • contours in metres

Sources and method: G03 / N*: grid north. Mapping and interpretation by Earendil.

6.03 m

measured ground relief

Ground levels range from 56.31 to 62.34 m across 27,859 cells within the parcel. The median is 58.06 m. Several platforms may work with this relief instead of levelling the whole site.

Elevation data support early sections and drainage reasoning. A site survey should resolve ditches, culverts, thresholds and utilities before project levels are fixed.

DESIGN CONSEQUENCE

Compare building and road levels together to limit earthworks and keep low points away from entrances.

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PREFEASIBILITY

Moderate but
consequential relief

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S11

Slope guides movement

Slopes derived from the 2 m terrain model; ground analysis, not a survey of existing roads.



0° pale green • 6° sand • 12° and above terracotta

Sources and method: G03 · A-S05 / N*: grid north. Mapping and interpretation by Earendil.

2 m

analysis grid

The gradient is calculated from neighbouring terrain cells. Warm tones identify breaks in the ground; more regular areas should be favoured for halls and technical yards.

An access gradient must be checked along its longitudinal profile and tie-ins. A slope raster alone cannot demonstrate truck access or rescue-appliance standing conditions.

DESIGN CONSEQUENCE

Avoid short ramps and abrupt gradient changes at gates, loading bays and utility crossings.

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PREFEASIBILITY

Slope guides
movement

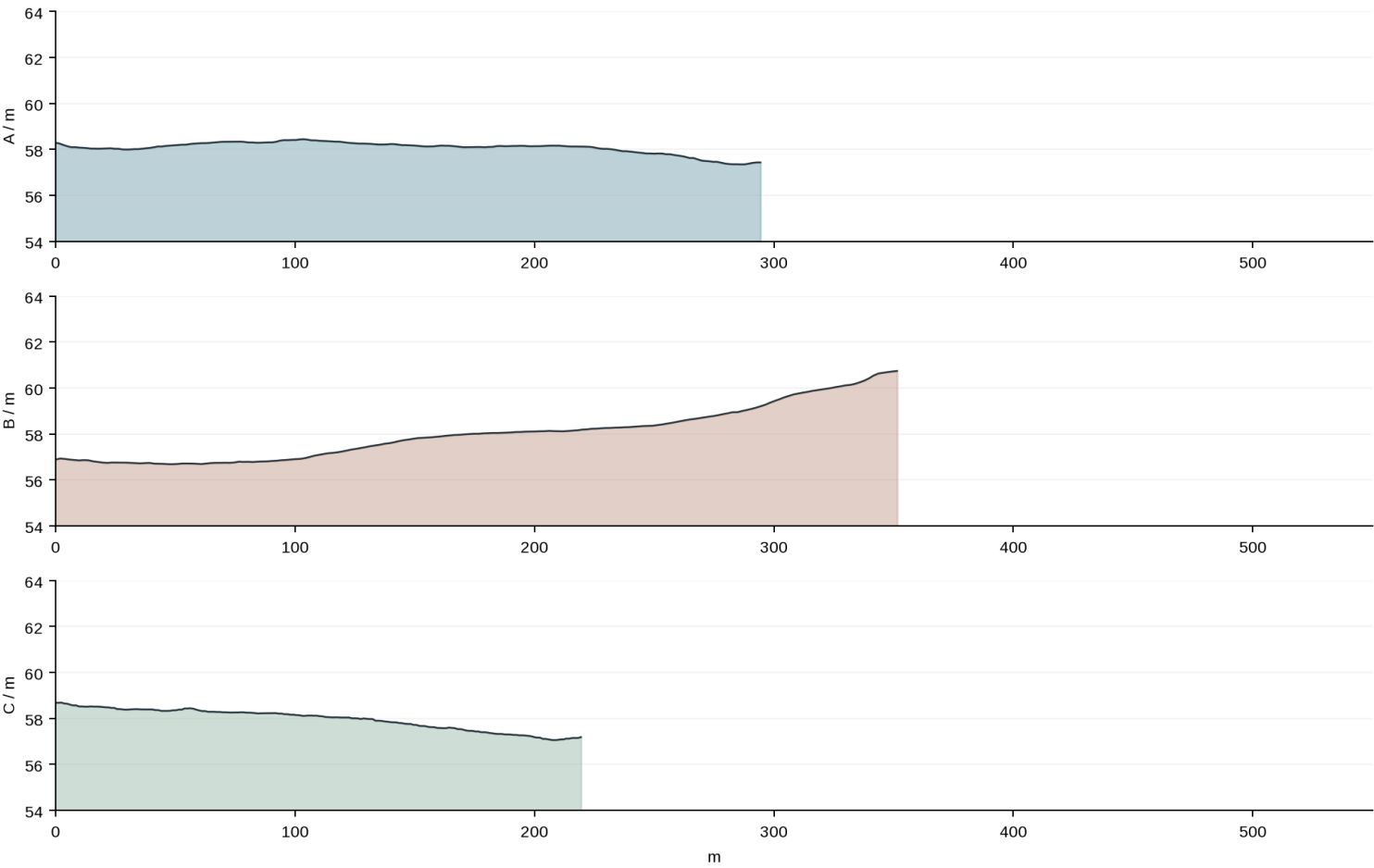
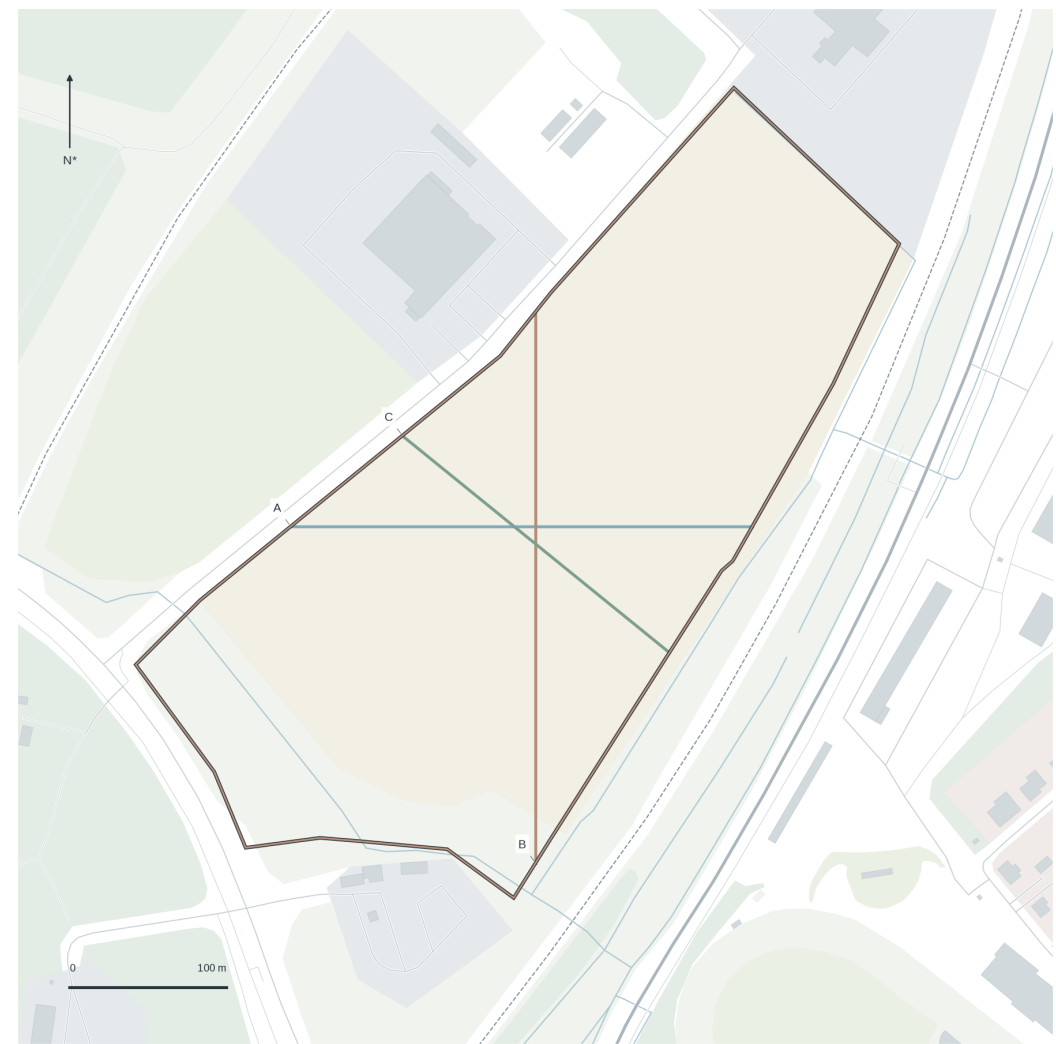
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S12

Three sections to understand the ground

Profiles sampled from the terrain model and clipped to the cadastral boundary.



SHARED REFERENCES

A, B and C are clipped to the cadastre. Profiles describe the existing DEM ground.

EXAGGERATED VERTICAL SCALE

Axes are in metres; height is exaggerated to make relief legible. No building is projected here.

VALUE FOR SITING

Compare platforms, access, thresholds and drainage in the same sections. Then verify through a site survey.

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PREFEASIBILITY

Three sections to
understand the ground

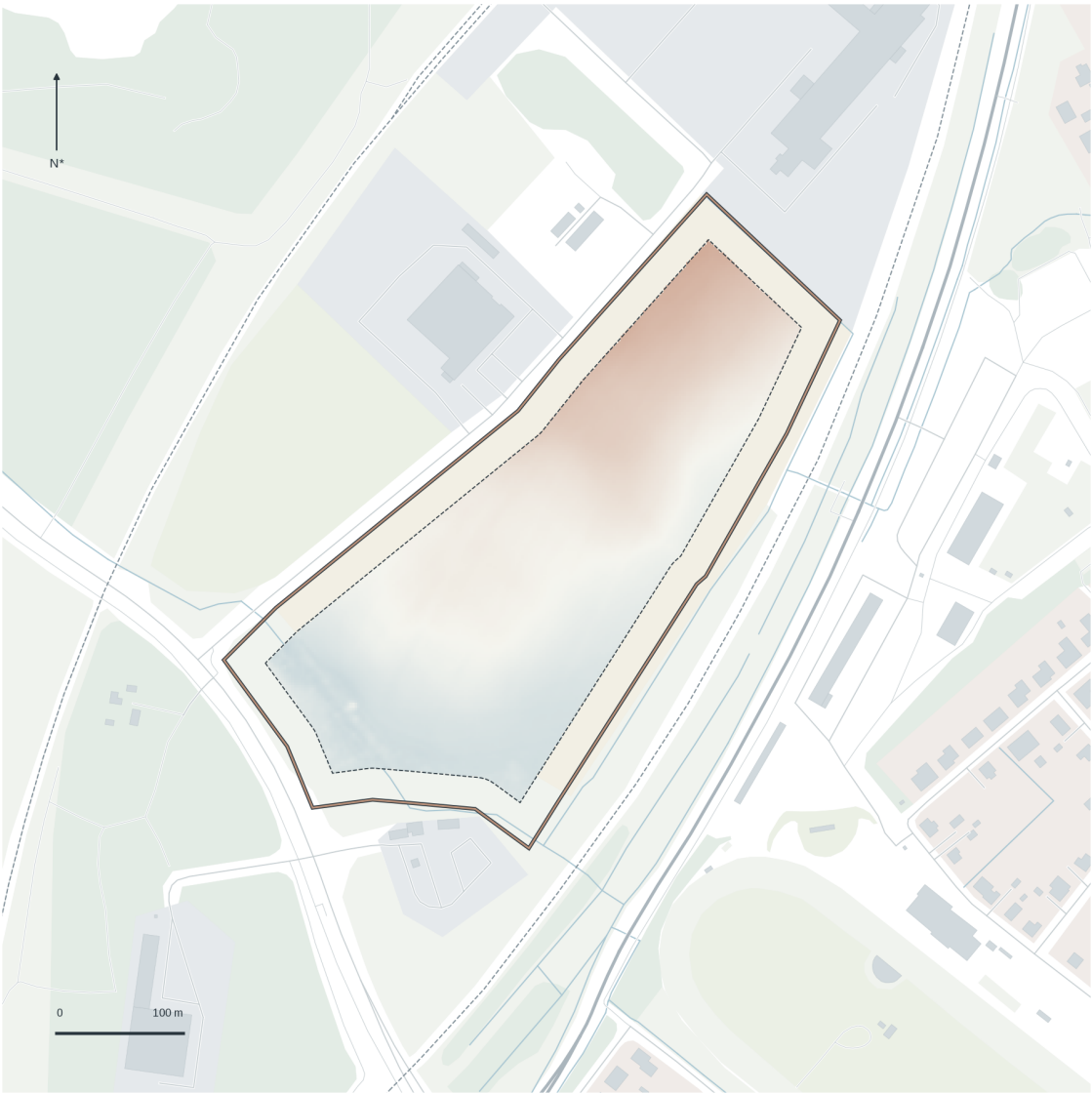
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S13

Test grading before choosing it

Sensitivity to three platform levels over the same inner footprint.



SAME FOOTPRINT

76,888 m² of cells inside an arbitrary 25 m inset. The inset serves the test, with no statutory status.

MAP AT 58 m

Blue: ground below the test level. Terracotta: ground above it. Volumes exclude stripping, bulking and settlement.

TRADE-OFF

A single level can move substantial material. Several platforms may reduce that requirement.

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Test grading before
choosing it

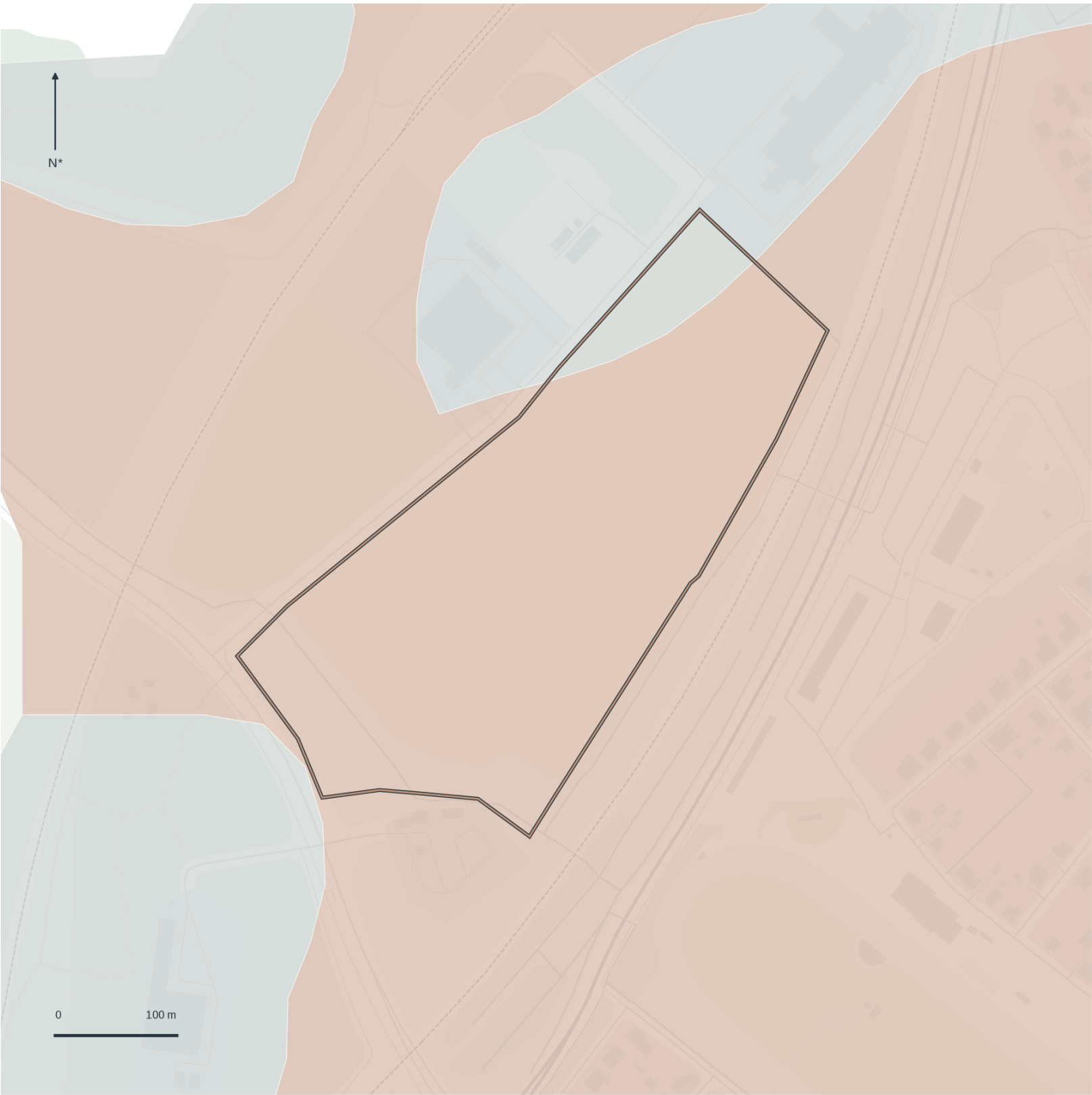
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A3 / 420 × 297 mm

S14

Foundations are a site question

GTK 1:200,000 map: regional geological evidence, not a geotechnical investigation.



Pink: clay • grey: rocky or unmapped ground

Sources and method: G04 · P04 / N*: grid north. Mapping and interpretation by Earendil.

93%

of the parcel in GTK clay class

The cadastral intersection with GTK gives approximately 93.05% clay class and 6.95% rocky ground. A precise cadastral outline does not increase the accuracy of this regional map.

The municipal report describes sand and clay over moraine in the area. Options to investigate include deep foundations, ground improvement and platforms suited to loads and allowable settlement.

DESIGN CONSEQUENCE

Target initial investigations at heavy buildings, transformers, generators and changes in ground conditions.

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PREFEASIBILITY

Foundations are a site
question

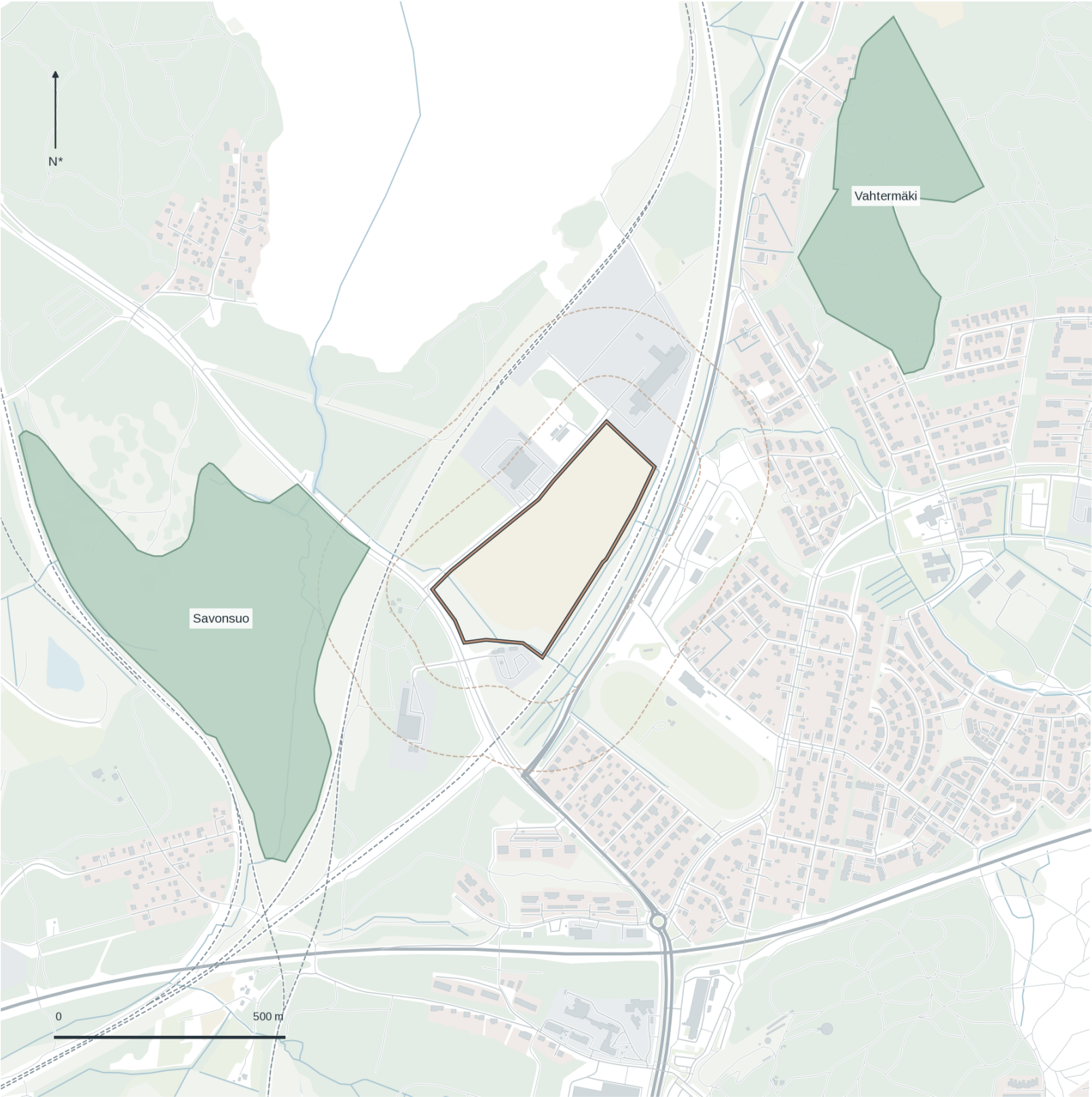
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S15

Nearby ecological connections

Two nearby Natura sites; neither overlaps the selected parcel.



Green: Natura • dashed: 100/250 m study bands, not statutory setbacks

Sources and method: P09 · P10 · P11 · G01 / N*: grid north. Mapping and interpretation by Earendil. © OpenStreetMap contributors / ODbL.

164 m

minimum distance to Savonsuo

Syke polygons place Savonsuo 164 m and Vahtermäki 506 m from the parcel, with no cadastral overlap. These geometric distances do not describe water pathways or species movements.

The 2024 road assessment and 2025 ELY opinion examine hydrology and Siberian flying-squirrel connections. The opinion finds the proposed planting and crossing measures necessary to mitigate road effects. That conclusion applies to the road project only.

DESIGN CONSEQUENCE

Map both protected areas, woodland and ditches; assess effects beyond the footprint as well as direct land take.

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PREFEASIBILITY

Nearby ecological
connections

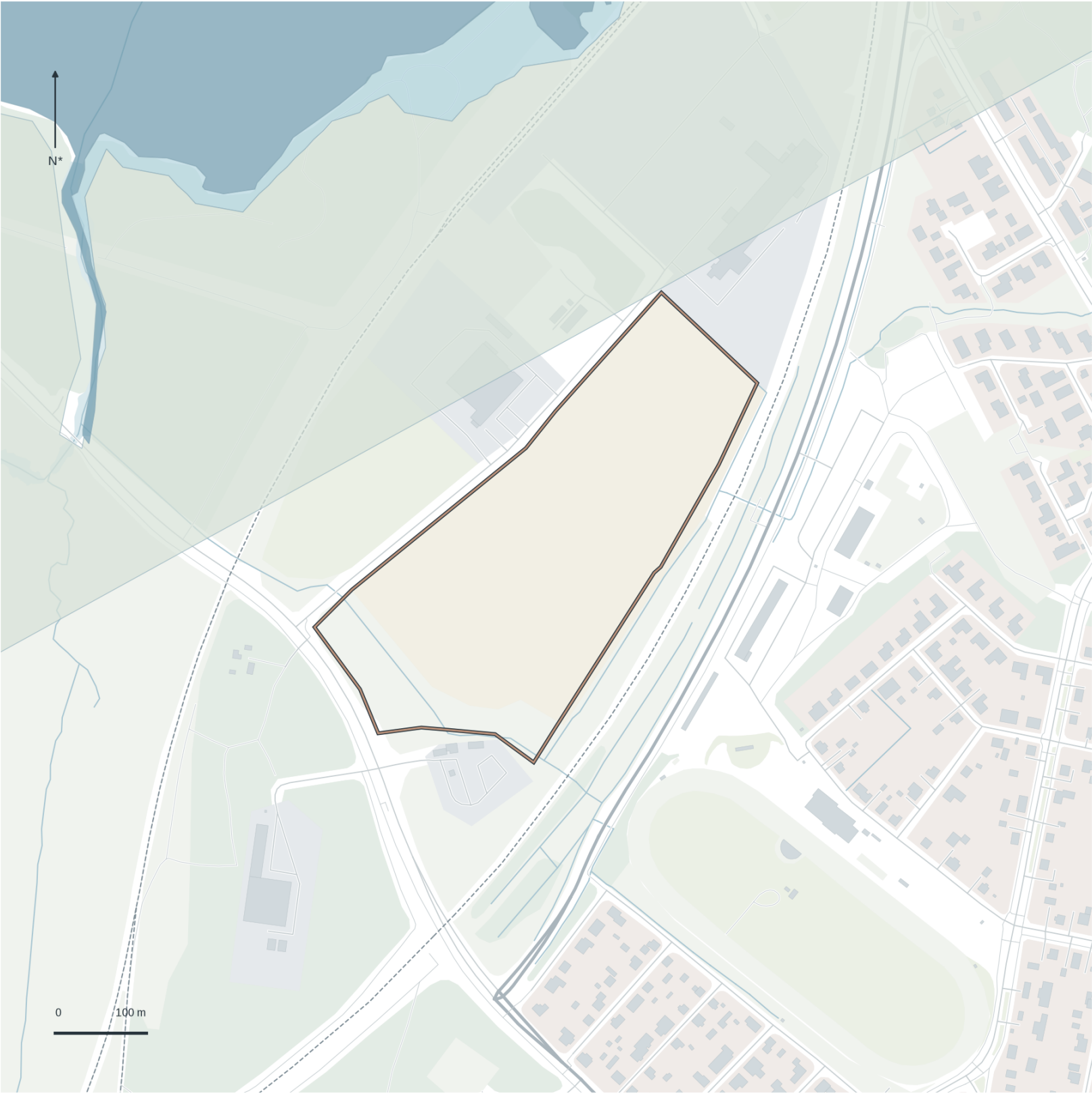
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S16

Separate missing coverage from low risk

The retrieved regional river-flood layer does not cover this parcel.



Grey green: mapped dry • light blue: 0–0.5 m • blue: permanent water

Sources and method: G06 · G03 / N*: grid north. Mapping and interpretation by Earendil. © OpenStreetMap contributors / ODbL.

0

overlap with retrieved classes

The upper Kymijoki 100-year map includes mapped dry ground, permanent water and flooded zones. None of these classes covers the chosen parcel.

The retrieved dataset is a general map based on 10 m terrain data, dated 2009. This does not establish that the site is flood-free. Local runoff, groundwater and blocked drainage remain separate questions.

DESIGN CONSEQUENCE

Set finished levels from outfalls and design flows, with an exceedance route independent of the buildings.

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PREFEASIBILITY

Separate missing
coverage from low risk

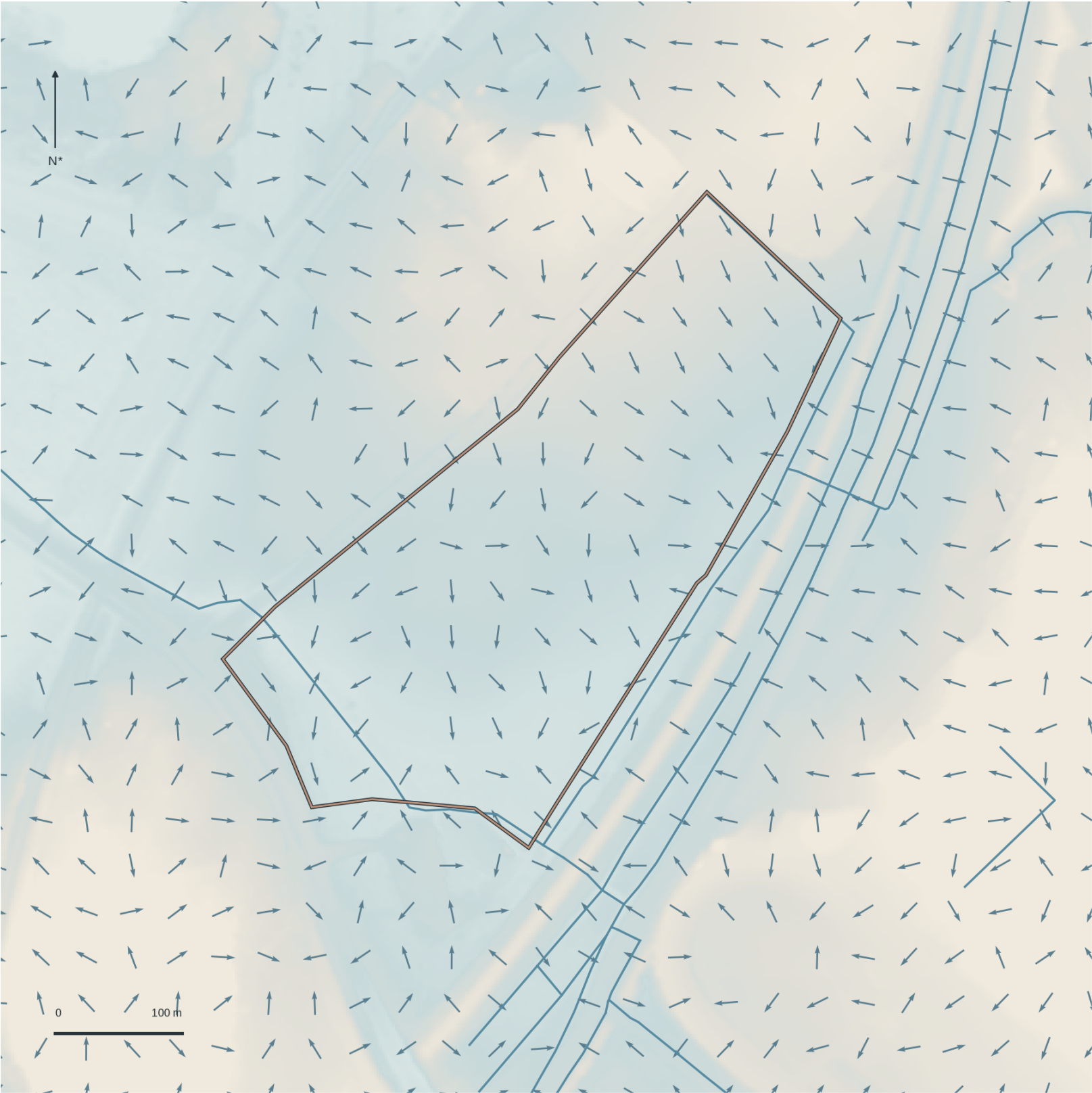
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S17

Water already passes through the area

Local steepest-descent directions; arrows are not a hydraulic model.



Arrows: local gradient • blue lines: mapped OSM watercourses

Sources and method: G03 · G05 · INF-S01 · INF-S09 / N*: grid north. Mapping and interpretation by Earendil. © OpenStreetMap contributors / ODbL.

2

systems to keep separate

The municipal report describes a large ditch carrying runoff from Ravikylä and Lehtomäki. This upstream catchment needs continuous conveyance and maintenance access.

The arrows show only the local terrain gradient. They do not model culverts, infiltration or buried structures. Clean upstream water should be separated from potentially polluted technical-yard runoff.

DESIGN CONSEQUENCE

Reserve a continuous drainage corridor before filling site edges with utilities and fences.

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PREFEASIBILITY

Water already passes
through the area

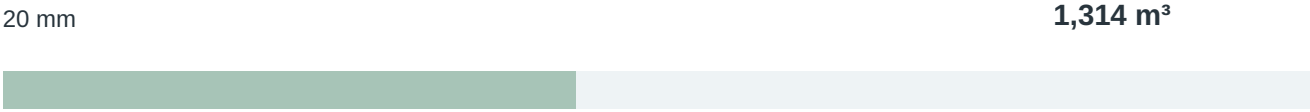
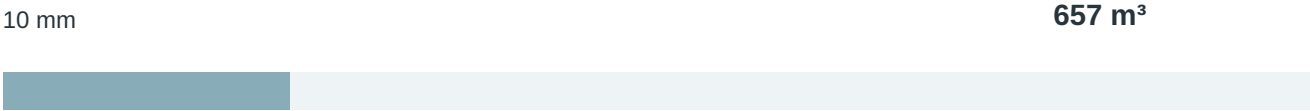
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S18

Give stormwater a measurable place

Event-volume balance without outflow: an initial land reservation.



1,708 m³

20 mm + 30% uplift

3,000 m³

nominal storage reservation prism

$62,000 \times 0.90 + 49,436 \times 0.20 = 65,687 \text{ m}^2$

Equivalent contributing area. Volume = area × rainfall. The three events are scenarios, not local statutory design storms.

RESERVE

10,000 m² land allowance for water; example prism 4,000 m² × 0.75 m. Side slopes and freeboard reduce usable storage.

SEPARATE

Upstream runoff, normal drainage and incident water must be separated. The external catchment is excluded from this calculation.

REFINE

Local rainfall, permeability, groundwater and permitted outfall flow will define actual sizing.

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PREFEASIBILITY

Give stormwater a
measurable place

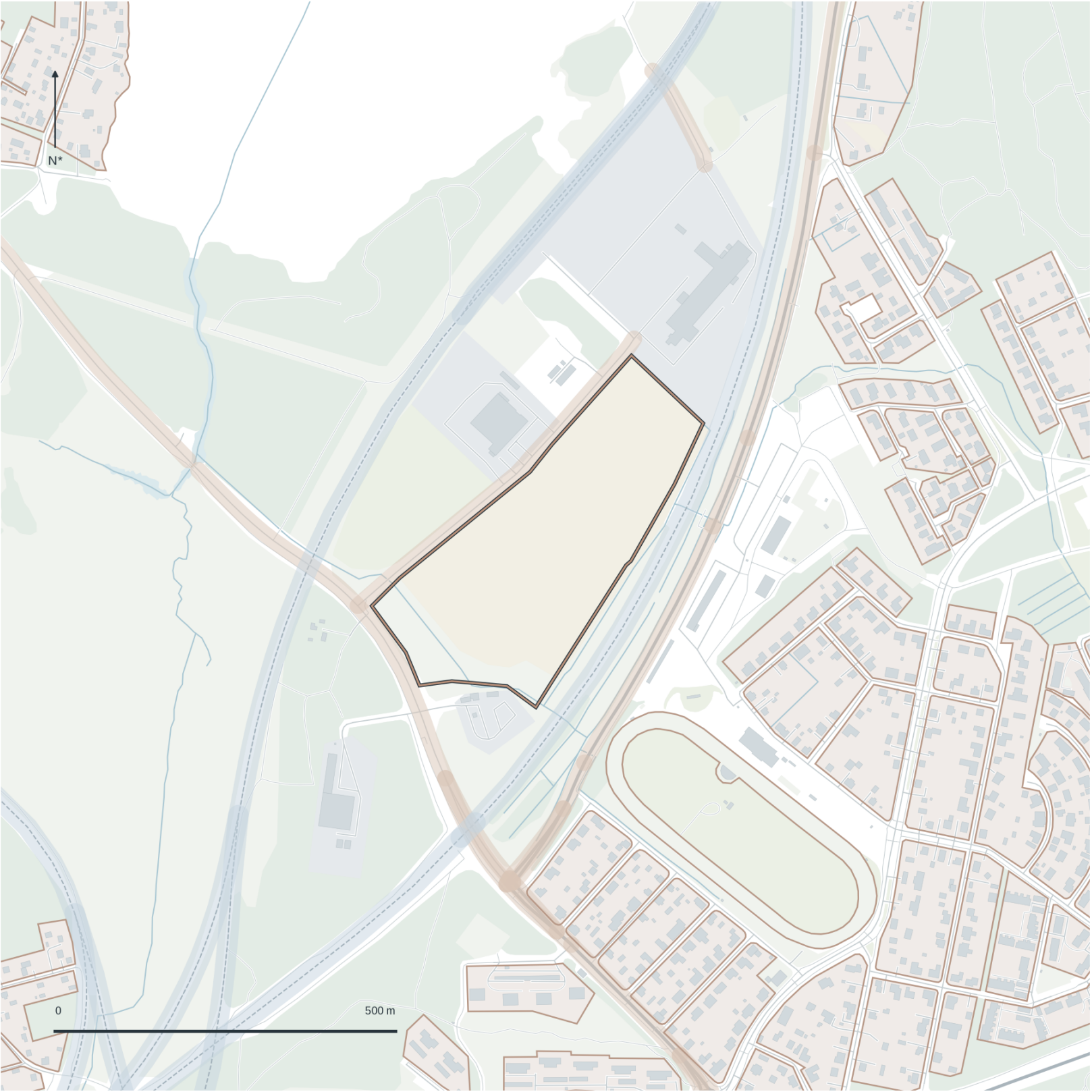
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A3 / 420 × 297 mm

S19

Environmental interfaces shape the site

Noise, rail, ground and technical storage influence the campus arrangement.



Colour bands: infrastructure emphasis, not statutory setback zones

Sources and method: P04 · P17 · P18 · G05 / N*: grid north. Mapping and interpretation by Earendil. © OpenStreetMap contributors / ODbL.

4

environmental interfaces

Report 23/027 identifies a major ditch, limited-capacity water services and 20 kV cables. Road and rail noise and vibration must also be considered.

For standby storage, Tukes classifies the facility using maximum quantities in tonnes and hazards across all products. The parametric fuel volume must therefore become a technical inventory before the applicable procedure can be established.

DESIGN CONSEQUENCE

Allow space for circulation, containment and water infrastructure; their sizing remains a prefeasibility task.

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PREFEASIBILITY

Environmental
interfaces shape the
site

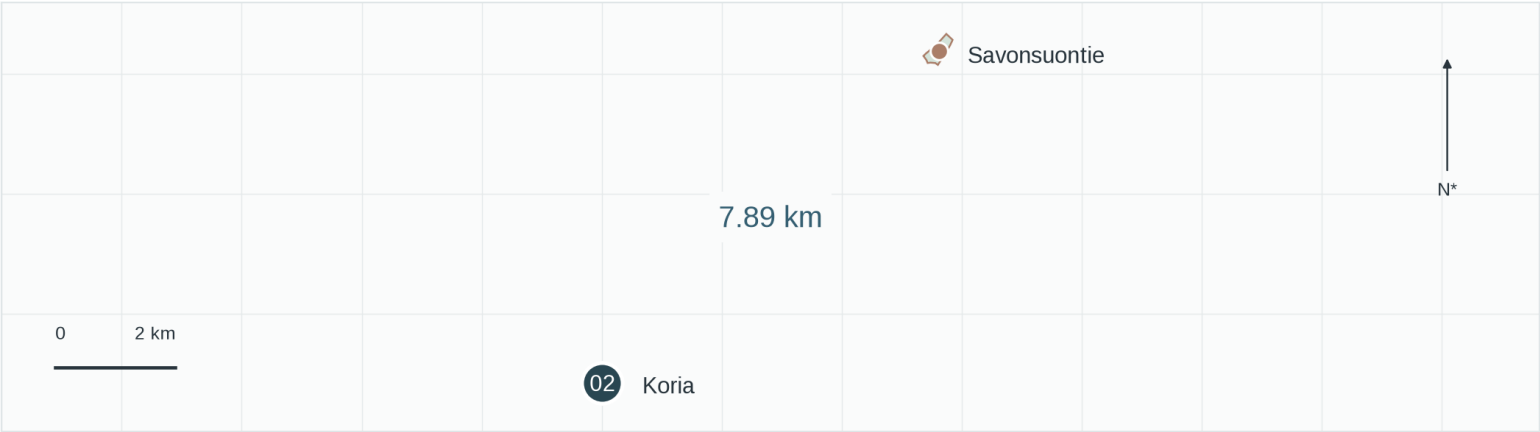
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A3 / 420 × 297 mm

S20

Connect a project, not a promise

Existing substations and networks; capacity and routes to agree with operators.



57.7 m

mapped 110 kV enclosure / parcel

The nearby enclosure is mapped in OSM at 110 kV. Its name and operator are not confirmed by an operator source. It lies outside the parcel.

Koria: 400 / 110 / 20 kV according to Fingrid, 7.89 km between its OSM centroid and the parcel centroid. Proximity establishes no bay, capacity or schedule.

The local 20 kV network is documented by KSS in the municipal report. Investigate a dedicated HV connection and its interfaces before fixing the programme.

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PREFEASIBILITY

Connect a project, not a
promise

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S21

45 MW electrical, 34.2 MW IT studied

The incoming programme is translated into IT load through an explicit peak design assumption.

45.0

MW incoming electrical

42.75

MW after 5% reserve

34.2

MW IT / factor 1.25

$$P_{IT} = P_{input} \times (1 - reserve) / peak\ facility\text{-}to\text{-}IT\ factor$$

EXPLICIT HEADROOM

2.25 MW remain within the incoming envelope. This headroom is not equipment redundancy.

A PEAK DESIGN FACTOR

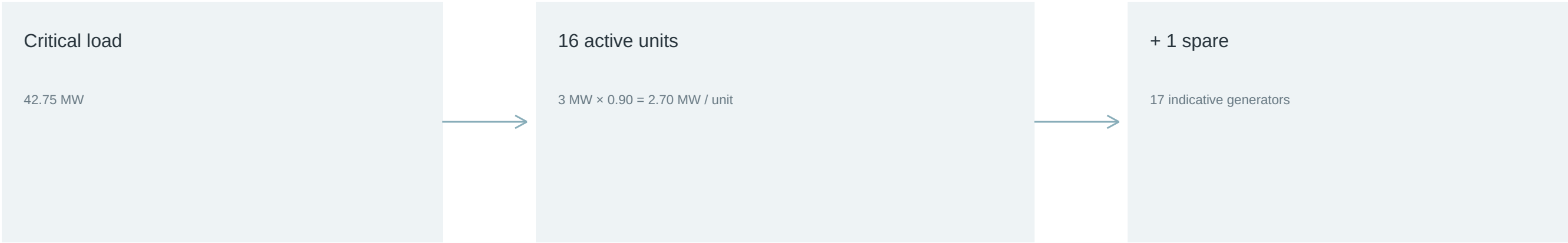
1.25 represents assumed auxiliary demand at the design point. It is not a measured or guaranteed annual PUE.

A DESIGN CASE

Incoming power is a chosen programme for comparing layouts. No network allocation has been secured.

Continuity takes land

Generators, UPS, fuel and maintenance must be sized together.



256.5 m³

useful fuel consumption / 24 h

0.45 MW

static margin after derating

ASSUMPTIONS

3 MW nominal per unit, 10% derating, 0.25 L/kWh and 24 h at full critical load. No manufacturer equipment is selected.

ALLOWANCES

Gross tanks larger than useful consumption, containment, refuelling and handling. Tukes classification depends on products and quantities.

TO DEVELOP

UPS topology, selectivity, transients, auxiliaries and availability requirements. N+1 unit count does not prove end-to-end resilience.

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PREFEASIBILITY

Continuity takes land

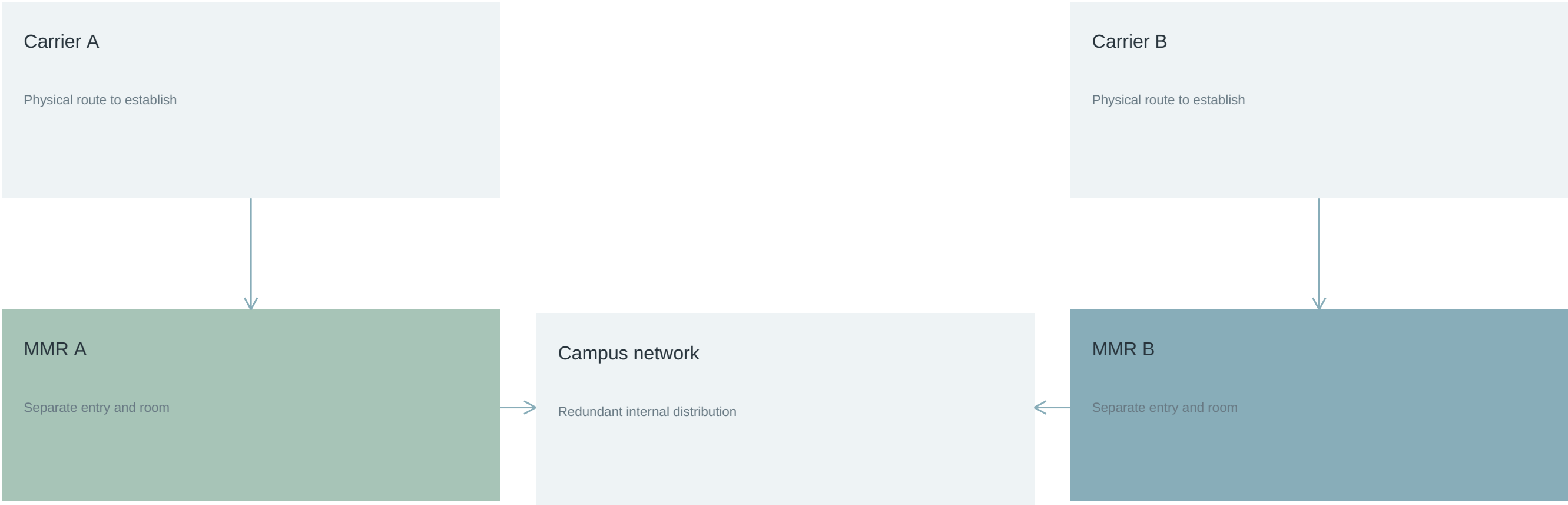
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A3 / 420 × 297 mm

S23

Two fibres do not prove diversity

Regional carrier presence and physically independent routes are different pieces of evidence.



LOCAL PRESENCE

Elisa lists Kouvola in its service area. Kouvolan Kuitu has local operations and announces integration into Valoo.

EVIDENCE TO OBTAIN

Two contracts are insufficient: obtain routes, shared structures, points of presence and chamber access.

SPATIAL CONSEQUENCE

Reserve two entries and two separate MMRs. This is a functional diagram; no real underground route is depicted.

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Two fibres do not prove
diversity

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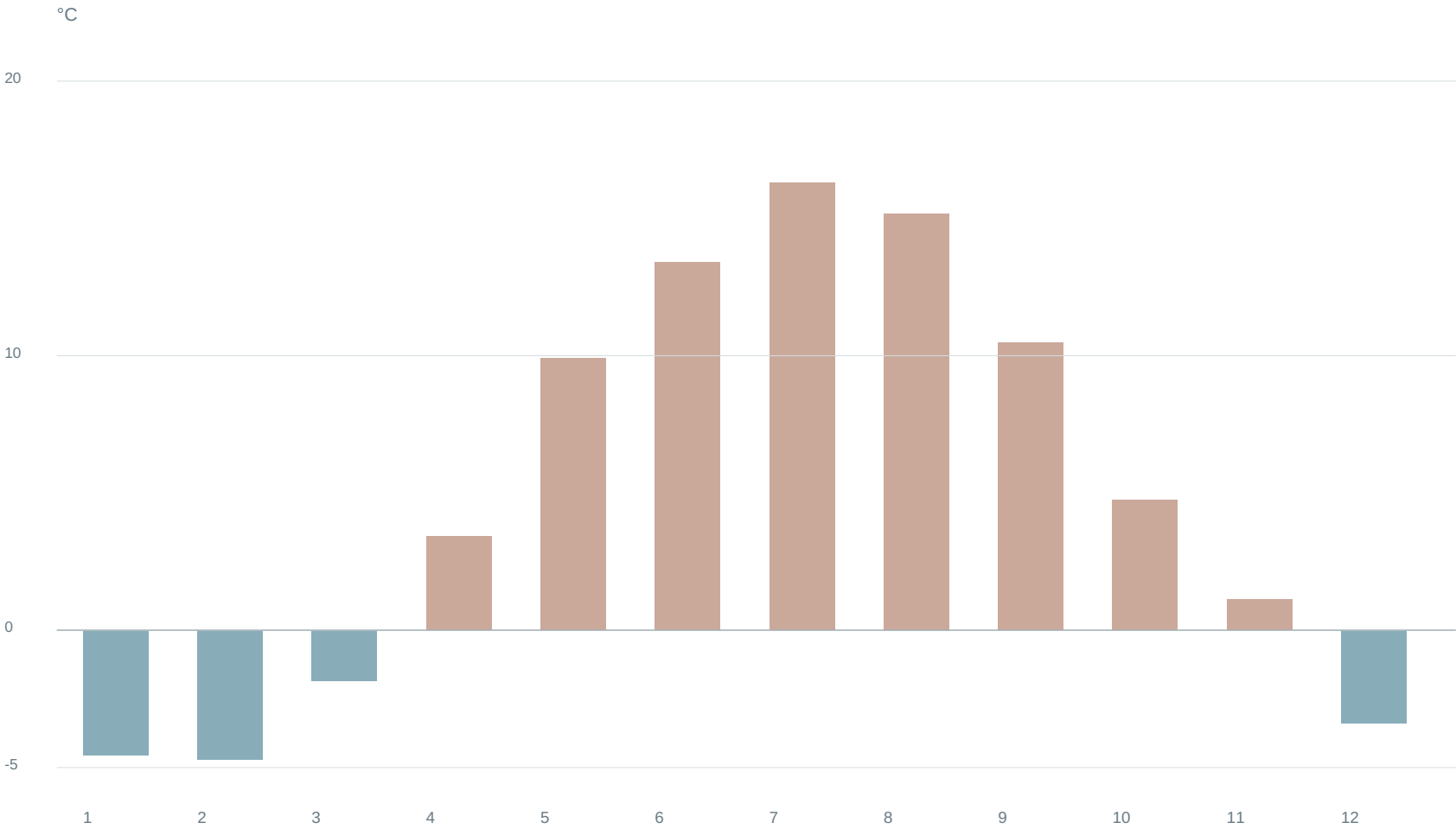
A3 / 420 × 297 mm

S24

Make climate a design parameter

FMI Jokioinen TRY2020 file: a regional energy proxy, not site design extremes.

Monthly mean temperature in the reference file



8,760 h

hourly reference year

6,009 h

below 10°C in this file

This is not a free-cooling hour count: thermal approach and loop temperature determine that.

REAL SOURCE

Jokioinen TRY2020 downloaded from FMI. Regional proxy, not a parcel weather observation.

TWO REQUIREMENTS

Design for summer heat and winter operation: freezing, snow, drains, batteries and roads.

FUTURE SCENARIOS

Future files and design-day data acquired. Test margins at design temperatures, separately from monthly means.

Kouvola

Reference
campus

INDEPENDENT STUDY

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SITE

Savonsuontie
Kouvola, Finland

PREFEASIBILITY

Make climate a design
parameter

REV. 01 / 10.09.26

A3 / 420 × 297 mm

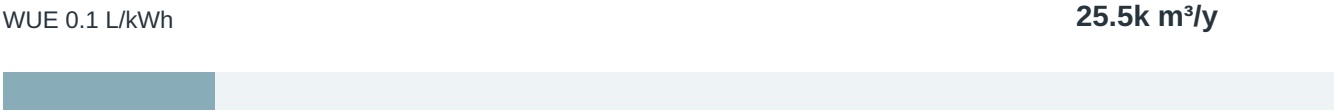
S25

Choose a water-conscious cooling strategy

Documented existing pipes do not support an assumption of water-intensive cooling.

90 / 75

mm PEH water / pressure sewer documented



75.4 m³/h

illustrative instantaneous wet case

The municipal report considers the pipes insufficient for water-intensive industry. Actual available flows are not established.

Proposed base: closed loop and dry heat rejection, with performance assessed at high ambient temperatures.

ANNUAL SENSITIVITY

34.2 MW IT at 85% mean load: 254.7 GWh/year. The three WUE values are separate annual assumptions.

PEAK WET CASE

34.2 MW evaporated, latent heat 2,450 kJ/kg, concentration cycles 3: 75.4 m³/h. This is not the annual WUE scenario.

SEPARATE FIRE WATER

Fire water is sized by hazard scenarios and available flow. No usable hydrant or flow is assumed secured.

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PREFEASIBILITY

Choose a
water-conscious cooling
strategy

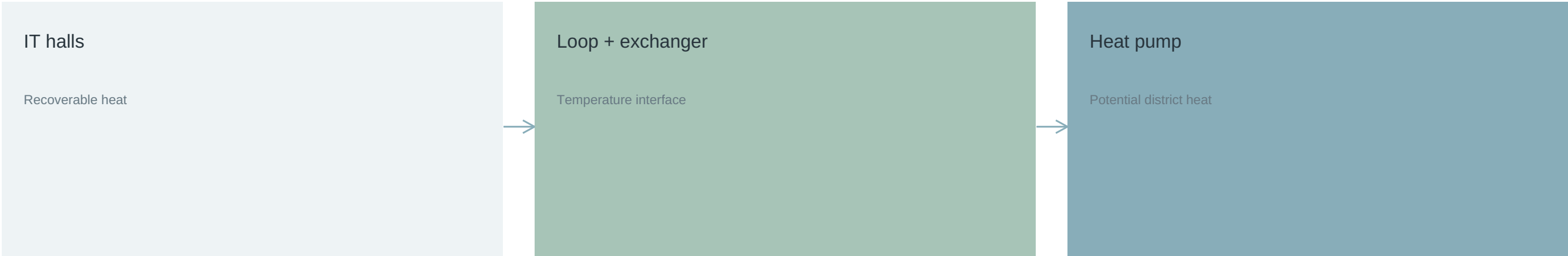
REV. 01 / 10.09.26

A3 / 420 × 297 mm

S26

Heat as an option to develop

An operational local precedent; no contracted heat outlet for the campus.



4 MW

KSS precedent at Mäkikylä

35 GWh/y

announced annual production

80–90 °C

precedent district-heat output

A REAL LOCAL CASE

KSS commissioned a wastewater heat pump at Mäkikylä in 2026. It demonstrates local heat-recovery capability.

A CAMPUS OPTION

Allow an interface, then check temperature, distance, seasonal demand, backup and operating responsibilities.

NO SECURED REVENUE

The precedent is not a contract for this campus heat. No efficiency, tariff or sold volume is built into the central case.

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PREFEASIBILITY

Heat as an option to
develop

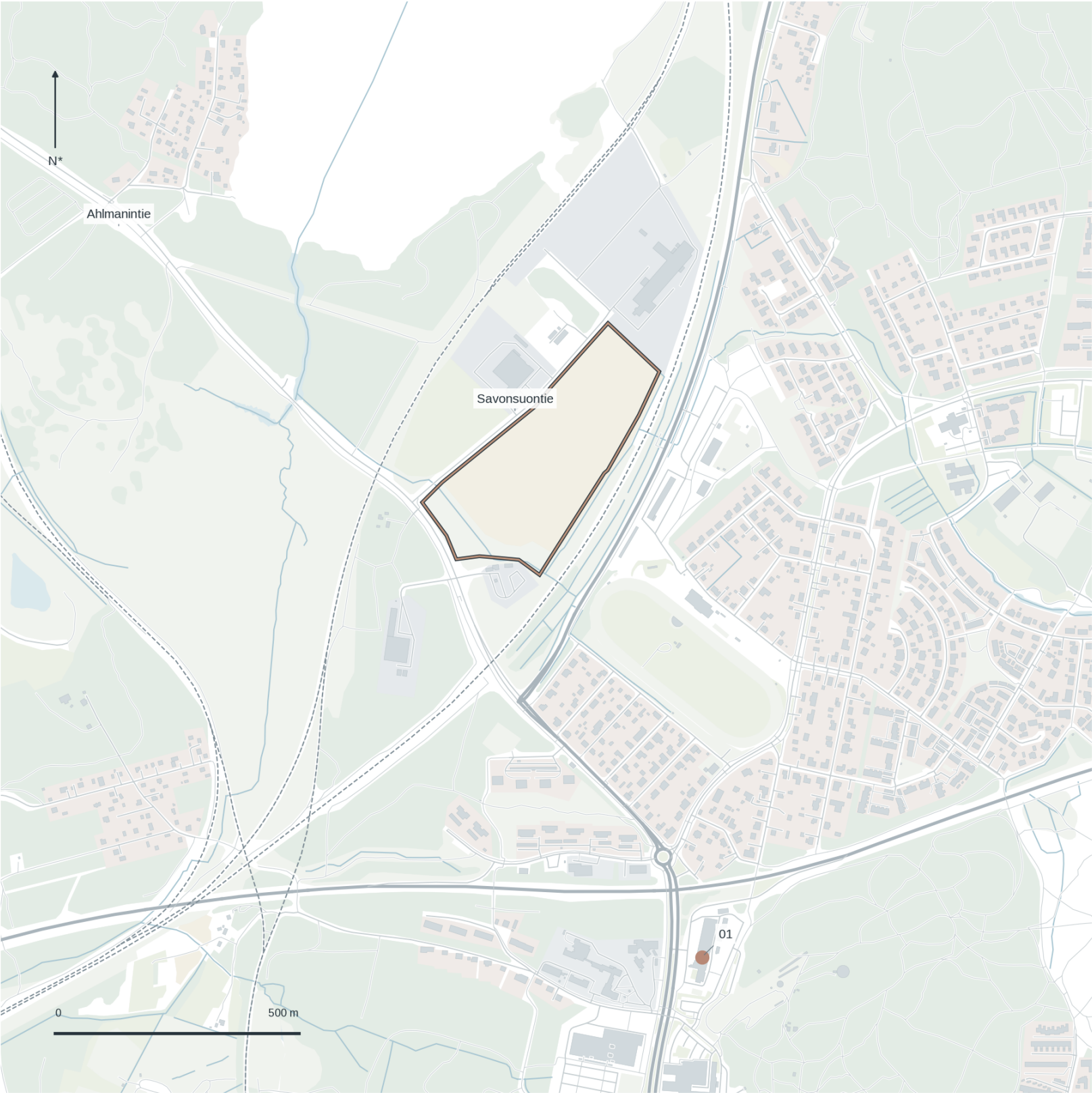
REV. 01 / 10.09.26

A3 / 420 × 297 mm

S27

Anchor access in the existing town

Savonsuontie–Ahlmanintie junction is mapped; the station point comes from the official public service.



01: official fire station • existing roads only

Sources and method: A-S01 · A-S02 · A-S03 · A-S04 / N*: grid north. Mapping and interpretation by Earendil. © OpenStreetMap contributors / ODbL.

1.07 km

station / centroid, straight line

Kouvola fire station is at Kauppalankatu 45. Its official point locates emergency services without turning a geometric distance into a response-time claim.

The campus study uses Savonsuontie as its approach. Heavy-vehicle movements must be checked through real junctions and then through the gates. Tanttarin road changes remain a contextual future scenario.

DESIGN CONSEQUENCE

Check swept paths, bearing capacity, queues and winter continuity along the complete route.

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PREFEASIBILITY

Anchor access in the
existing town

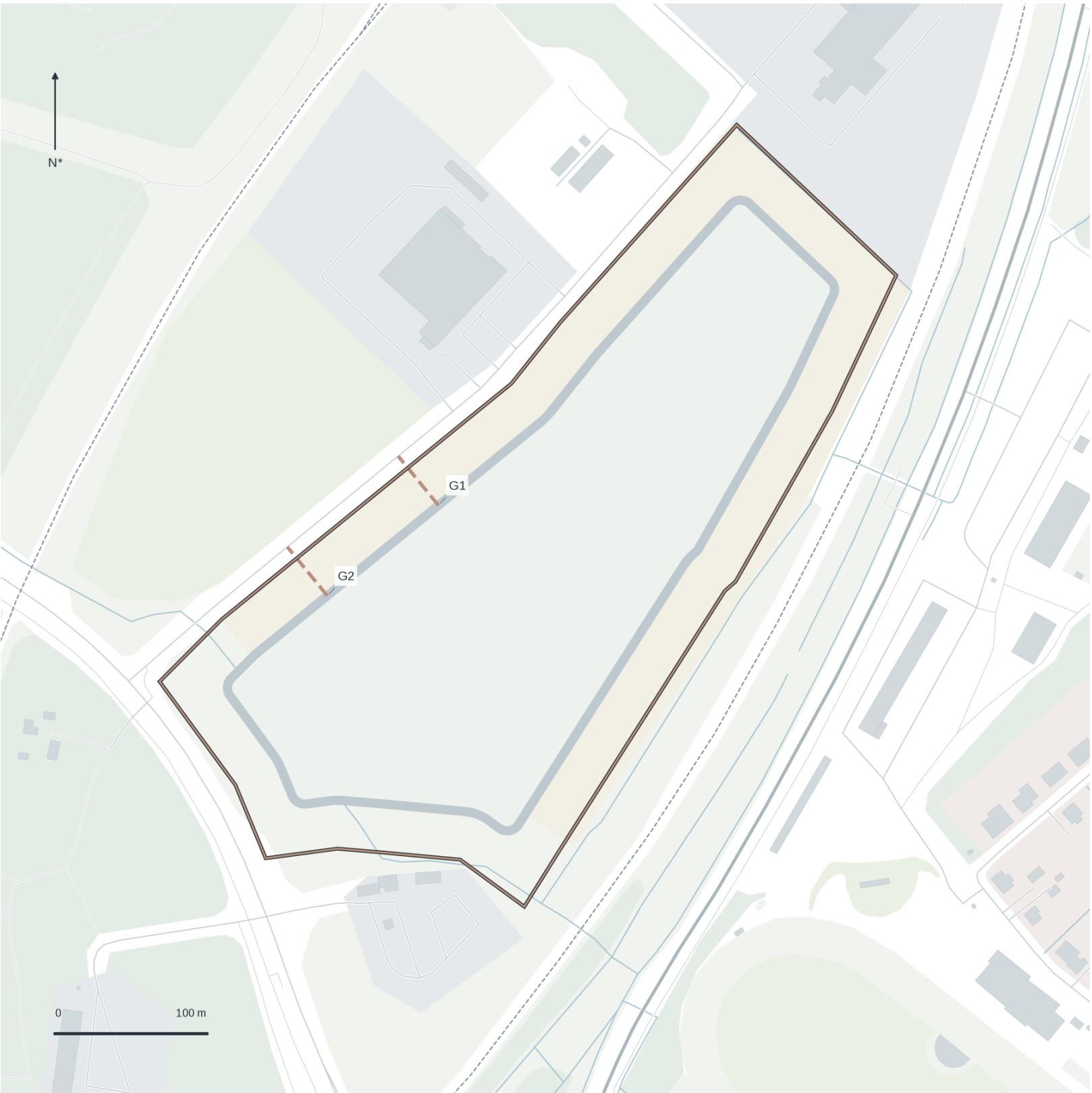
REV. 01 / 10.09.26

A3 / 420 × 297 mm

S28

A legible loop before the buildings

Reservation diagram within the parcel; G1/G2 are proposed access studies.



Grey: road reservation • terracotta dashed: proposed links

Sources and method: G01 · G05 · A-S05 · CALC / Earendil assumptions and calculations / N*: grid north. Mapping and interpretation by Earendil. © OpenStreetMap contributors / ODbL.

6 m

assumed loop width

A continuous loop avoids diagrammatic dead ends. It sits inside the cadastre with rounded transitions; the 6 m working width is not rescue or heavy-vehicle approval.

G1 and G2 test two links towards Savonsuontie. Delivery depends on access rights, ditches, structures and swept paths. Two gates do not make the external public road independent.

DESIGN CONSEQUENCE

Retain this continuity principle, then adjust roads around actual buildings and drainage structures.

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PREFEASIBILITY

A legible loop before
the buildings

REV. 01 / 10.09.26

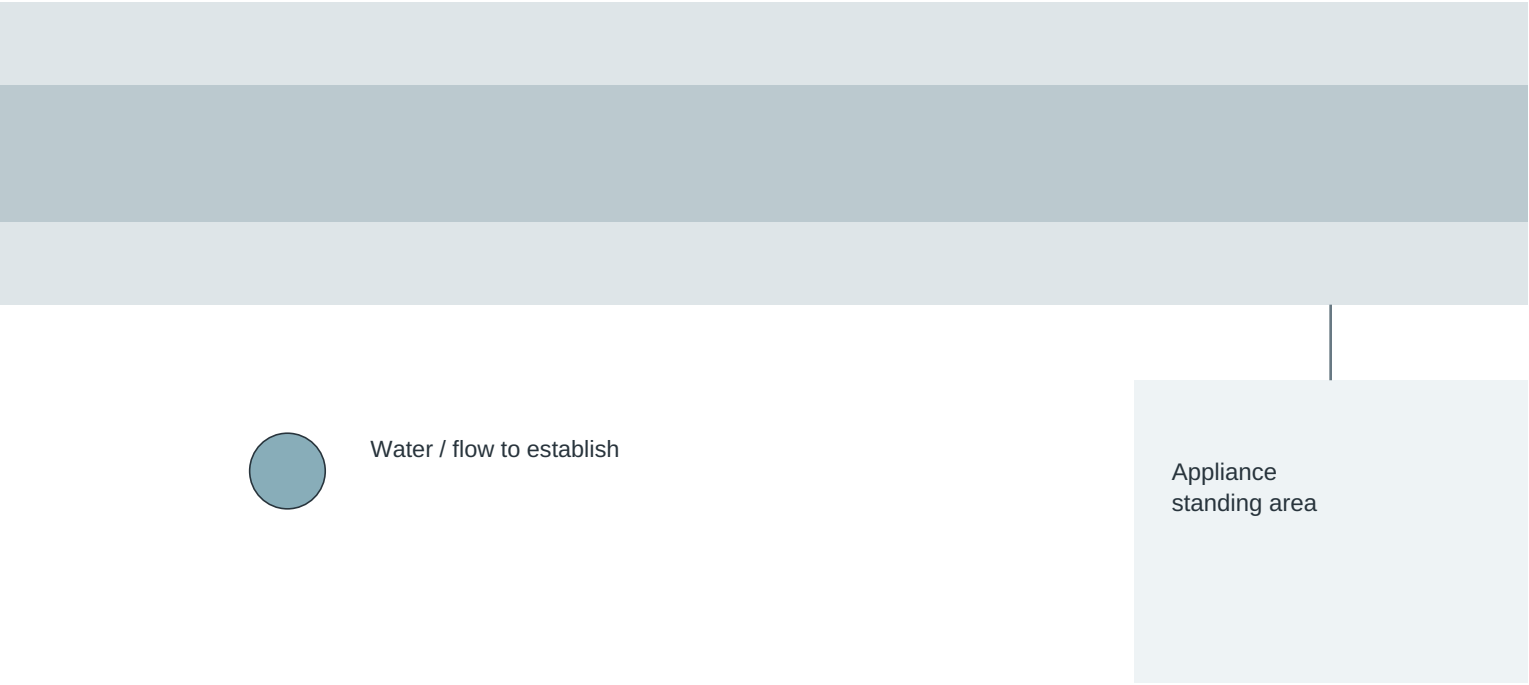
A3 / 420 × 297 mm

S29

Design intervention, not only the road

Coordinate access, water, isolation and containment. Functional diagram, not to scale.

CLEAR ROUTE / CLEARANCE / BEARING



3.5 m

regional guide clear width

4.2 m

guide clear height

Kymenlaakso 2014 guide, aerial appliance: 12 m outer radius and 32 t mass. Historical reference to confirm for this project.

CONTINUOUS ACCESS

Snow, barriers, signs and parking must not compromise the route or intervention area.

COMPLETE ARRANGEMENT

Rescue entry, electrical isolation, water, response plans and incident-water containment are linked.

SPECIFIC EQUIPMENT

Batteries and fuel add their own scenarios. Local BESS guidance does not apply indiscriminately to the whole site.

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PREFEASIBILITY

Design intervention, not
only the road

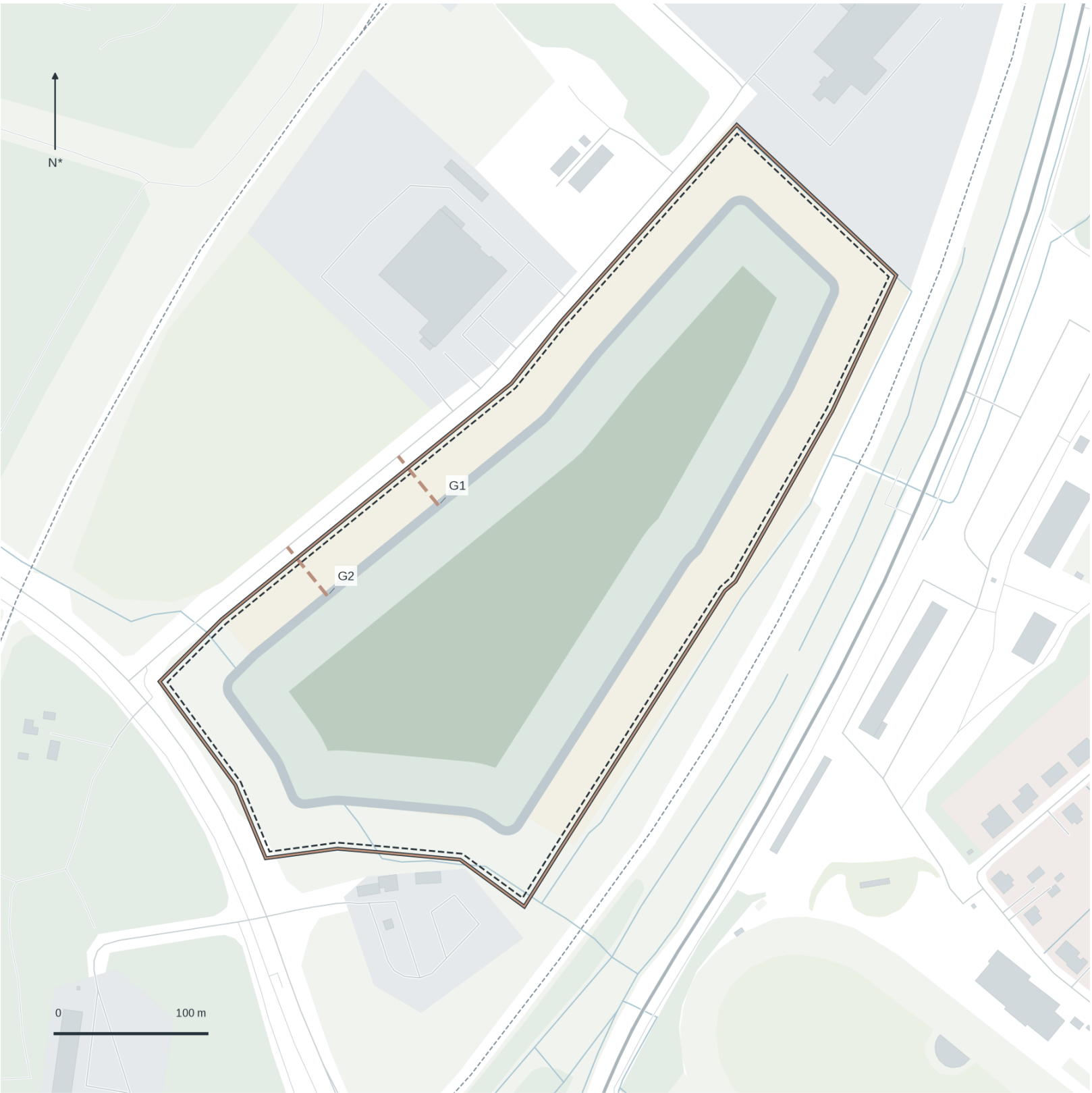
REV. 01 / 10.09.26

A3 / 420 × 297 mm

S30

Security as a sequence of thresholds

Concept zoning: public approach, screening, technical yard and critical rooms.



Dashed boundary: proposed fence • tones: control intensity, not statutory setbacks

Sources and method: A-S02 · A-S06 · G01 · CALC / Earendil assumptions and calculations / N*: grid north. Mapping and interpretation by Earendil. © OpenStreetMap contributors / ODbL.

4

proposed control levels

An inner perimeter follows a simple, maintainable boundary. Visitor and delivery screening should occur before access to critical areas, with space to hold a vehicle clear of the public street.

Security combines access control, surveillance, directed lighting, protected pedestrian movement and emergency entry. The coloured bands illustrate increasing control without fixing future room locations.

DESIGN CONSEQUENCE

Separate authorised flows while preserving reliable emergency entry and access to ditches and utilities.

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PREFEASIBILITY

Security as a sequence
of thresholds

REV. 01 / 10.09.26

A3 / 420 × 297 mm

A campus operable throughout the year

Maintenance, deliveries and snow belong in the land programme.

01

Arrive / Staff and visitors

Screening, parking and protected pedestrian route.

02

Deliver / Heavy vehicles and handling

On-site waiting, loading bay and access to storage rooms.

03

Maintain / Critical equipment

Replacement route, lifting, spares and isolation.

04

Operate in winter / Snow and freezing

Snow storage, clearance and drainage kept outside clear routes.

05

Refuel / Fuel and chemicals

Separate movement, delivery control and local containment.

06

Respond / Incident and rescue

Openable gate, identified isolations and incident-water access.

The 22,000 m² movement allowance covers roads, yards and parking: its precise allocation should emerge from 2D alternatives.

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PREFEASIBILITY

A campus operable
throughout the year

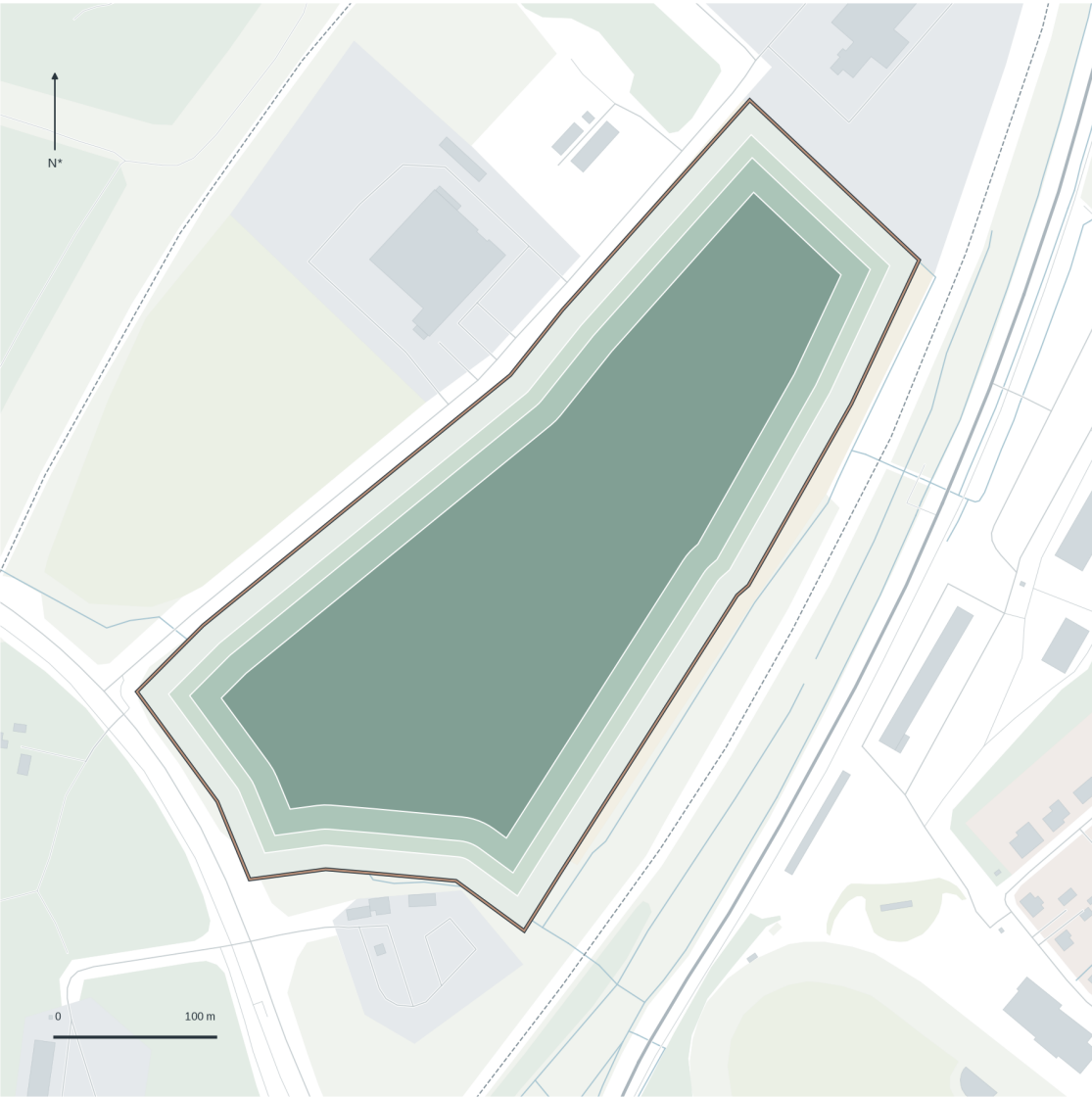
REV. 01 / 10.09.26

A3 / 420 × 297 mm

S32

Reserve land before filling it

An indicative envelope and a closed 11.14 ha land balance; no final siting is fixed.



TESTABLE GEOMETRY

15, 25 and 40 m inset bands test the envelope. These are design tools, not imposed setbacks.

22,000 m² FOOTPRINT

Two assumed levels give 44,000 m² floor area, below the arithmetic 66,861 m² envelope. This is not proof of compliance.

SPATIAL HEADROOM

About 3.94 ha remain for landscape and corridors. Real easements and interfaces may use part of that allowance.

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PREFEASIBILITY

Reserve land before
filling it

REV. 01 / 10.09.26

A3 / 420 × 297 mm

S33

IT capacity becomes a programme

Rack count depends on average power, not only hall area.

20 kW

average power per rack

40 kW

average power per rack

60 kW

average power per rack

1710

indicative racks

855

indicative racks

570

indicative racks

34,200 kW / 20 kW

34,200 kW / 40 kW

34,200 kW / 60 kW

IT 01 / 8.55 MW

IT 02 / 8.55 MW

IT 03 / 8.55 MW

IT 04 / 8.55 MW

CENTRAL CASE

40 kW average per rack gives 855 racks. This is an electrical programme, not a drawn cabinet count.

DENSITY AND COOLING

Rack power affects distribution, liquid cooling, maintenance and weight. Local peaks can exceed the average.

PLAN TO DEVELOP

Allocate halls, UPS, MMRs, workshops, welfare, storage and circulation before placing individual racks in the siting package.

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PREFEASIBILITY

IT capacity becomes a
programme

REV. 01 / 10.09.26

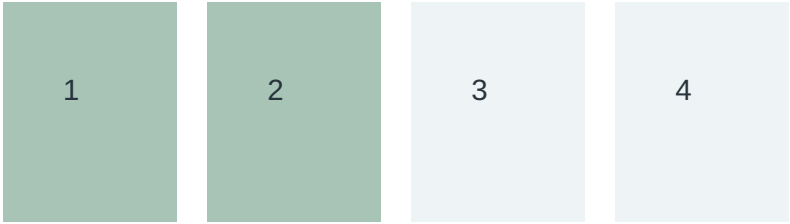
A3 / 420 × 297 mm

S34

Phase uses and infrastructure

Four 8.55 MW IT units; a 2 + 1 + 1 build-out to test.

Phase 1



17.10 MW IT

cumulative IT capacity

22.50 MW input

SHARED INFRASTRUCTURE

Prepare drainage, access and corridors for the whole site; equip only what the first phase needs.

Phase 2



25.65 MW IT

cumulative IT capacity

33.75 MW input

SEPARATED OPERATIONS

Construction and the live campus need separate flows, continuous security and rescue access.

Phase 3



34.20 MW IT

cumulative IT capacity

45.00 MW input

NO GUARANTEED DATE

The sequence is functional. Timing depends on connection, land, ground conditions and procedures.

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PREFEASIBILITY

Phase uses and
infrastructure

REV. 01 / 10.09.26

A3 / 420 × 297 mm

S35

Compare pressure on the site

30, 45 and 60 MW electrical: a programme comparison, with no guaranteed capacity.

30 MW

Lower pressure

22.8 MW IT

with the same 1.25 factor

570 racks at 40 kW

More room for margins, works and phasing.

ELECTRICITY

All three scenarios depend on a connection study. None is commercially available capacity.

45 MW

Central case

34.2 MW IT

with the same 1.25 factor

855 racks at 40 kW

Balanced programme to test through two real layouts.

LAND

45 MW remains the starting point. Keep 30 MW as a fallback if interfaces consume too much land.

60 MW

Intensive case

45.6 MW IT

with the same 1.25 factor

1140 racks at 40 kW

More MEP, heat and storage; land fit remains to be demonstrated.

INTENSIFICATION

60 MW needs its own alternative: higher density cannot be inferred from level count alone.

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PREFEASIBILITY

Compare pressure on
the site

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S36

The decision that opens the next stage

Take forward a central programme, then test it through real siting alternatives.

Take the 45 MW scenario forward.

Final capacity will depend on siting, connection and actual interfaces.

01 / QUALIFY

Land status, connectable power, operative rules, ditches and ground investigation. Prioritise facts that change the decision.

02 / COMPARE

Two orthogonal layouts on the same parcel. Compare levels, equipment, flows, water and access without moving constraints.

03 / DEVELOP

A separate 2D siting package, then the 3D masterplan. The same geometry, areas and electrical balance throughout.

Next deliverable: demonstrate the project on the land.

Sources, dates and reuse rights

Register 1 / geographic evidence and planning. Links in the PDF are active.

G01

NLS — cadastral parcel / INSPIRE

10.09.2026 • CC BY 4.0

G02

Kouvola — orthophoto / map services

Ortho 2020 • CC BY 4.0

G03

NLS / Paituli — elevation model 2 m

L 4444C • N 2000 • CC BY 4.0

G04

GTK — superficial deposits 1:200,000

10.09.2026 • CC BY 4.0

G05

OpenStreetMap — roads, buildings, landscape

10.09.2026 • © OSM contributors / ODbL

G06

Syke — flood hazard open services

Kymijoki 2009 • CC BY 4.0

P01

NLS cadastral parcel 286-23-343-14

2026-09-10 retrieval; feature version 2025-06-25

P02

Kouvola municipal zoning WMS

2026-09-10 retrieval

P03

Technical Board 21 March 2024 §61 adoption of plan 23/027

2024-03-21

P03–P05: indexed official text; original URLs unavailable (404) at retrieval.

CALC: Earendil calculations and assumptions supplied as JSON and scripts. Derived maps: EPSG:3067; N* = grid north; N2000 elevation. Source text is paraphrased; dataset licences are preserved.

Sources and method: / Full register, links and limitations in the companion technical pack.

P04

Ahlmanintien planning report 23/027

2024-03-04 report, amendments for board 2024-03-21

P05

Plan 23/027 participation and assessment plan

2024 board-stage attachment

P06

Tanttarin interchange current project status

Page updated 2026-03-02; checked 2026-09-10

P07

Tanttarin approved-stage plan report 07/004

2026-01-22 board stage

P08

VT6 Keltti–Tanttari overview attached to 2026 decision

2026-01-22 attachment; road scheme itself predates adoption

P09

Savonsuo Natura assessment for VT6

2024-09-09

P10

Etelä-Savo ELY opinion on Savonsuo Natura assessment

2025-07-22

P11

Syke INSPIRE Special Areas of Conservation polygons

Retrieved 2026-09-10; feature version 2016-09-13; decision 2015-03-27

P12

NLS historic map sheet 311308,1965

1965 print year; retrieved 2026-09-10

P13

NLS historic map sheet 311308,1994

1994 print year; retrieved 2026-09-10

P14

Kuusaantien sorting station operator project page

Checked 2026-09-10; current 2026–2027 programme

P15

Kuusaantien construction contract update

2026-07-03

P16

Kuusaantien environmental permit decision

2026-04-08 §36

P17

Tukes chemical inventory and hazard-ratio classification

Checked 2026-09-10

P18

Tukes establishing an industrial facility

Checked 2026-09-10

EARENDIL

ARCHITECTURE
& SITE DUE DILIGENCE

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PREFEASIBILITY

Sources, dates and
reuse rights

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A3 / 420 × 297 mm

S38

Sources and reproducible calculations

Register 2 / utilities, safety and calculation method.

INF-S01
Kouvola plan report 23/027, Ahlmanintien pienjäteaseman lähialue

2024-03-21

INF-S02
Sites and Development Opportunities — Savonsuontie/Savontalo

undated, checked 2026-09-10

INF-S03
Korian sähköaseman uudistaminen

Archive describes 2016–2019 works; checked 2026-09-10

INF-S04
Liittyminen kantaverkkoon

current page checked 2026-09-10

INF-S05
Verkkokiikari — grid scope

current page checked 2026-09-10

INF-S06
KSS Verkon kehittämissuunnitelma sai asiakkailta vahvan tuen

2026-07-20

INF-S07
Elisa Valokuitu ja Kaapeli-TV pientaloille

undated, checked 2026-09-10

INF-S08
Kouvolan Kuitu — local fibre services

current page checked 2026-09-10; Valoo change announced 2026-06-30

INF-S09
Hulevedet

updated 2025-01-22

P03–P05: indexed official text; original URLs unavailable (404) at retrieval.

CALC: Earendil calculations and assumptions supplied as JSON and scripts. Derived maps: EPSG:3067; N* = grid north; N2000 elevation. Source text is paraphrased; dataset licences are preserved.

Sources and method: / Full register, links and limitations in the companion technical pack.

INF-S10
Kouvola sai ensimmäisen lämpöpumppulaitoksensa

2026-04-28

INF-S11
Energialaskennan testivuodet TRY 2020

data prepared October 2020; page checked 2026-09-10

INF-S12
Jäähdytyksen mitoituspäivät — cooling design days

current page checked 2026-09-10

INF-S13
FMI open-data licence and terms

current page checked 2026-09-10

INF-S14
Näin liityt kaukolämpöön

current page checked 2026-09-10

INF-S15
Osavuosikatsaus 1.1.–30.4.2026

2026 report

A-S01
OpenStreetMap local native API extract

2026-09-10

A-S02
Kouvolan paloasema official rescue authority

2026-05-28 page update

A-S03
Official PTV service channel Kouvolan paloasema

2026-06-01T10:28:59.552924 record modified

A-S04
National rescue-service guidance: Pelastustie

accessed 2026-09-10

A-S05
Kymenlaakso Pelastustie regional guidance, updated April 2014

2012-10-23 updated 2014-04; municipal appendix 2021-10-27§39

A-S06
Rescue Act379/2011 §11

accessed 2026-09-10

A-S07
Kouvola plan23/027 report

2024-03-21 adoption; effective date unverified

A-S08
Kymenlaakso current guidance index

accessed 2026-09-10

A-S09
Kouvola energy-storage siting principles

2025 municipal guidance; adoption status not established

A-S10
NLS exact parcel286-23-343-14

2026-09-10

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Reference
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PREFEASIBILITY

Sources and
reproducible
calculations

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S39