SPECTELIX

WIRELESS. INSIGHT. ENGINEERED.

WI-FI ENGINEERING ASSESSMENT REPORT

BASE REPORT WITH OPTIONAL ENGINEERING SERVICES

Predictive RF planning and engineering analysis in CTT Indoor RadioPlanner

Project information	Value
Project	[Project name]
Client	[Client organisation]
Site address	[Site address, city, country]
Report number	SPECTELIX-WIFI-[000]-[YYYY]
Issue date	[DD Month YYYY]
Document version	1.0

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Document Control

PURPOSE OF THIS DOCUMENT

This file is an international Wi-Fi engineering report template. Bracketed fields, calculation tables, and RF-map placeholders are completed after the source data have been verified and predictive modelling has been performed.

Parameter	Value
Document title	Wi-Fi Engineering Assessment Report
Prepared by	SPECTELIX
Website	www.spectelix.com
Software	CTT Indoor RadioPlanner
Status	Template / working draft
Confidentiality	Client and authorised project participants
Basis of issue	[Contract / purchase order / statement of work]

Revision history

Rev.	Date	Description	Prepared by	Checked by
1.0	[DD MMM YYYY]	Initial report issue	[Name]	[Name]
-	-	-	-	-
-	-	-	-	-

Approval

Role	Organisation / department	Name	Signature	Date
Prepared by	SPECTELIX	[Name]		
Checked by	SPECTELIX	[Name]		
Approved by	[Client]	[Name]		

Contents

Navigation note
Update page numbers if pages are added or removed. In Microsoft Word, a dynamic table of contents may also be inserted using the built-in Heading styles.

1. Executive Summary

BASE REPORT

SPECTELIX has prepared this Wi-Fi engineering assessment for [project name] at [site address]. Based on the supplied floor plans and confirmed design inputs, a digital RF model will be developed to estimate coverage, resilience, roaming conditions, and expected wireless performance before equipment procurement and installation.

The objective is to determine a rational number of access points, define suitable installation locations, identify RF risks, and provide a documented basis for implementation and post-installation validation.

Preliminary status
Final conclusions are issued only after all CTT Indoor RadioPlanner outputs have been inserted and the result tables have been completed. Until then, the report remains a template and does not constitute a site-specific design approval.

Headline results

Metric	Target criterion	Modelled result	Status
Primary signal level (RSSI)	≥ [−67] dBm over [95]% of target area	[To be completed]	[Pass / Review]
Secondary coverage	Second AP ≥ [−75] dBm in critical areas	[To be completed]	[To be completed]
Signal-to-noise ratio	≥ [25] dB	[To be completed]	[To be completed]
Maximum throughput	≥ [Requirement] Mbps	[To be completed]	[To be completed]
Roaming	Adequate overlap between adjacent cells	[To be completed]	[To be completed]

Key recommendations

- Confirm wall, partition, glazing, and floor-slab materials before final modelling.
- Confirm concurrent user count, device mix, and peak traffic profile.
- Perform an on-site validation survey after installation.
- Document radio settings: bands, channel widths, transmit power, minimum data rates, and RRM policy.

2. Project Overview

Parameter	Project information
Project name	[To be completed]
Site address	[To be completed]
Client	[To be completed]
Facility function	[Office / warehouse / education / healthcare / hospitality / industrial]
Project type	[New build / refurbishment / existing network assessment]
Approximate area	[To be completed] m²
Number of floors	[To be completed]
Typical ceiling height	[To be completed] m
Operating hours	[Business hours / 24 × 7]
Maximum concurrent users	[To be completed]

2.1 Layout characteristics

The site may include enclosed offices, open work areas, meeting rooms, reception and waiting zones, technical rooms, storage spaces, corridors, lift lobbies, and service areas. RF propagation through structural walls, doors, glazing, shelving, machinery, and other obstructions shall be modelled using confirmed or agreed attenuation values.

2.2 Operational characteristics

- Business users may operate laptops, smartphones, tablets, voice handsets, and specialised wireless clients.
- Meeting and collaboration areas may create short-duration, high-concurrency demand.
- Open-plan areas may require a capacity-led design rather than a coverage-only design.
- Continuous roaming may be required in circulation and operational zones.
- Technical spaces shall be included only where wireless service is operationally required.

3. Source Data

The accuracy of the predictive model depends directly on the quality and completeness of information provided by the Client. All inputs shall be reviewed before modelling begins.

No.	Input	Preferred format	Status	Comment
1	Architectural floor plan	JPG received; DWG / PDF preferred	Received	Attached plan included in Section 3.2; scale and wall construction to be confirmed
2	BIM model	IFC / Revit	[Status]	Where available
3	Statement of requirements	DOCX / PDF	[Status]	Coverage, capacity, services, constraints
4	Equipment standards / approved vendor list	XLSX / PDF	[Status]	If manufacturer is prescribed
5	Photographs / video walk-through	JPG / PNG / MP4	[Status]	Materials and installation conditions
6	Existing network information	XLSX / PDF / export	[Status]	APs, controllers, switch ports, licences
7	User and device profile	XLSX / DOCX	[Status]	Concurrent users and traffic assumptions

3.1 Engineering assumptions

- Plan scale and site dimensions shall be confirmed by the Client.
- Building-material properties are based on verified data or agreed representative values.
- Furniture, people, temporary obstructions, and mobile equipment are modelled approximately unless detailed data are available.
- External RF sources and neighbouring Wi-Fi networks require on-site measurement for reliable characterisation.
- Predictive results shall be validated after installation.

3.2 Supplied Site Plan

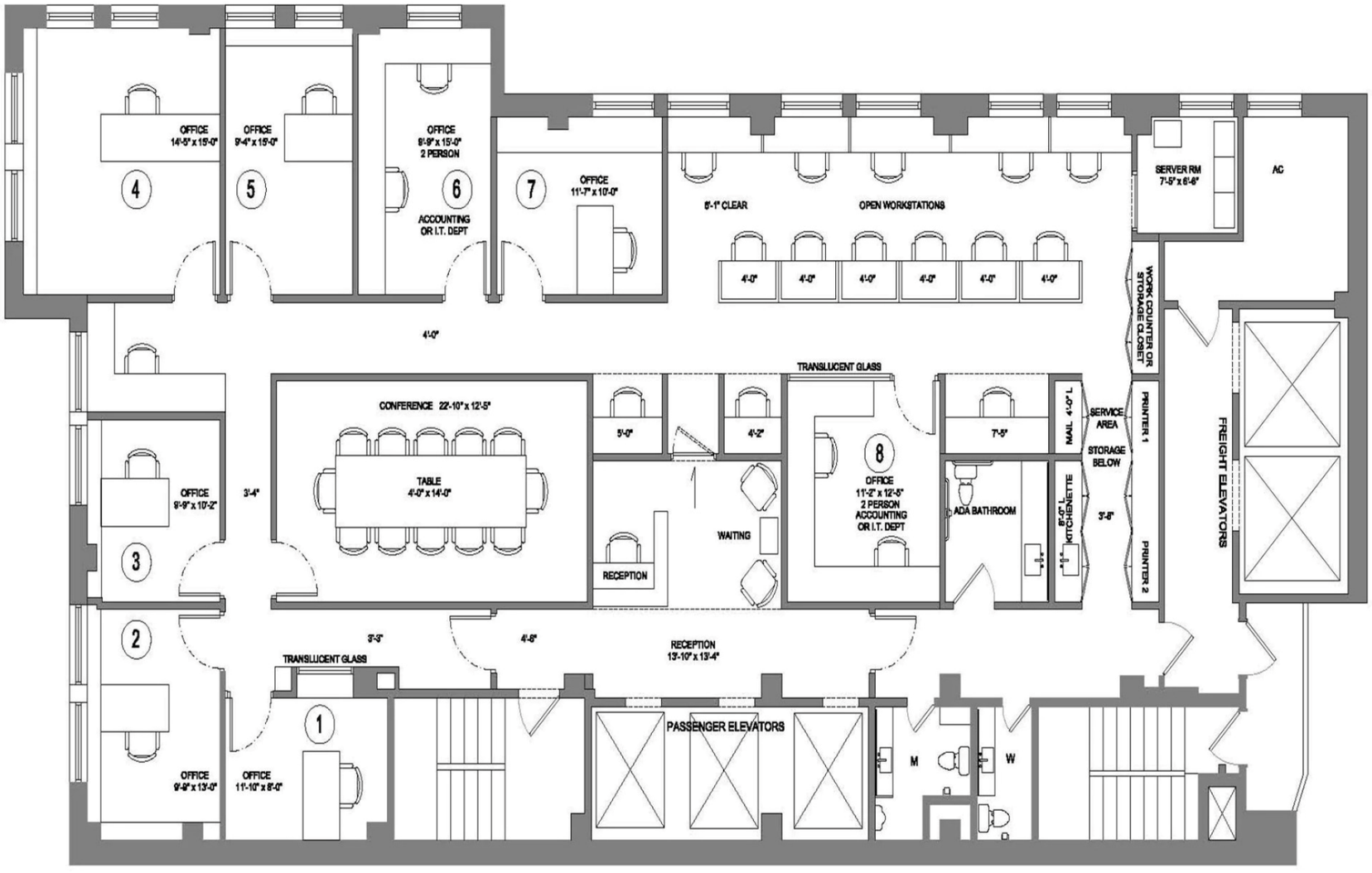


Figure 1 — Client-supplied office floor plan used as the graphical basis for digital-model preparation

Source-plan requirement
The supplied raster plan has been inserted into this report. Before predictive modelling, confirm the drawing scale, room dimensions, wall and glazing construction, ceiling heights, room functions, and installation restrictions. Until these items are confirmed, modelling outputs shall be treated as preliminary.

4. Wireless Network Requirements

Requirements shall be defined by business use case, client-device capability, service criticality, mobility, concurrency, security, and acceptance-test method. The values below are a working template and must be confirmed by the Client.

Parameter	General office	Voice / video	High density	Notes
Primary RSSI	≥ −67 dBm	≥ −60 to −65 dBm	≥ −65 dBm	Confirm against client type
Secondary RSSI	≥ −75 dBm	≥ −70 to −72 dBm	≥ −72 dBm	Supports resilience and roaming
SNR	≥ 20 dB	≥ 25 dB	≥ 25 dB	Recommended minimum
5 GHz channel width	20 / 40 MHz	20 / 40 MHz	20 MHz	Density and RF environment dependent
Latency	≤ 100 ms	≤ 50 ms	≤ 50 ms	End-to-end metric
Packet loss	≤ 2%	≤ 1%	≤ 1%	Validated on site

4.1 Supported services

- Corporate access to business systems and cloud applications.
- Video conferencing and unified communications.
- Voice over Wi-Fi where explicitly required.
- Mobile devices, tablets, laptops, scanners, and operational terminals.
- Guest Wi-Fi logically isolated from corporate services.
- IoT and specialist devices after confirmation of bands, protocols, and traffic profiles.

4.2 Acceptance criteria

Criterion	Verification method	Acceptance condition
Coverage	Passive survey / RSSI measurement	At least [95]% of target area meets the agreed threshold
Resilience	Secondary RSSI / Number of Servers	Backup AP available in critical zones
Signal quality	SNR and noise-floor measurement	Agreed threshold achieved
Performance	Active test / iPerf / application test	Agreed service level achieved
Roaming	Controlled client-walk test	No unacceptable voice/video interruption

5. Engineering Analysis Methodology

The assessment is performed using predictive RF modelling. The building geometry and materials are digitised, candidate access points are placed, and radio performance is calculated for the required frequency bands.

5.1 Workflow

1. Review source data, drawing scale, and modelling constraints.
2. Build the digital model in CTT Indoor RadioPlanner.
3. Assign wall, partition, floor, glazing, and obstruction properties.
4. Define coverage, capacity, mobility, and service requirements.
5. Place candidate access points and select antenna orientation.
6. Run iterative calculations and optimise AP locations.
7. Generate RF maps and summary statistics.
8. Prepare recommendations, limitations, and validation plan.

5.2 Propagation model

The model considers free-space path loss, attenuation through building elements, antenna characteristics, transmit power, mounting height, and relative AP geometry. Material losses should be supported by project data, manufacturer information, calibrated measurement, or an agreed engineering assumption.

5.3 Predictive-model limitations

- Dynamic furniture and occupancy are represented approximately.
- Client devices vary in sensitivity, antenna design, and transmit capability.
- Neighbouring Wi-Fi and non-Wi-Fi interference may change over time.
- Automatic radio-resource-management behaviour after deployment may differ from the planning model.

Mandatory validation
Predictive planning does not replace a post-installation site survey. Field measurements are required to verify coverage, interference, roaming, and service performance.

6. Digital Model Preparation

The digital model defines geometry, service zones, materials, heights, and installation restrictions. Each floor shall be modelled in a consistent coordinate system.

Model element	Source value	Value used	Source / comment
Plan scale	[Complete]	[Complete]	Confirm against dimensions
Ceiling height	[ ] m	[ ] m	Drawing / measurement
Structural walls	[Material]	[Material, attenuation]	Confirm construction
Partitions	[Material]	[Material, attenuation]	Confirm type
Glazing	[Type]	[Type, attenuation]	Confirm coating / framing
Floor slab	[Material]	[Material, attenuation]	Relevant for multi-floor sites
Large obstructions	[Description]	[Modelled / excluded]	Shelving, machinery, tanks, etc.

6.1 Modelling zones

Zone	Priority	Requirement	Special consideration
Work areas	High	Stable coverage and performance	Stationary and mobile clients
Open-plan / high density	High	Coverage plus capacity check	Peak concurrent usage
Meeting / collaboration	High	Video and voice support	Short-duration demand peaks
Reception / waiting	Medium	Corporate and guest access	Segmentation and roaming
Corridors / circulation	Medium	Roaming continuity	Avoid corridor-only AP placement unless justified
Technical spaces	As required	[Confirm]	Include only where operationally needed

7. Design Parameters

Parameter	Design value	Engineering note
Wi-Fi generation	[Wi-Fi 6 / 6E / 7]	Select according to requirements and client lifecycle
2.4 GHz band	[Enabled / limited / disabled]	Use for legacy and IoT where required
5 GHz band	Primary	Default enterprise working band
6 GHz band	[Where permitted]	Requires compatible clients and regulatory confirmation
Channel width	[20 / 40 / 80] MHz	Defined by density, spectrum, and service needs
Transmit power	[ ] dBm	Align with realistic client-device capability
Antenna type	Integrated / external	Based on AP model and mounting
Mounting height	[ ] m	Ceiling / wall / structure
Access point model	[Vendor and model]	Use exact radio model where available
Regulatory domain	[Country / domain]	Must match deployment location

Transmit-power principle
An access point should not transmit substantially more strongly than the client device. Excessive AP power can create an apparent coverage area with a weak return link, poor roaming behaviour, and inefficient channel reuse.

7.1 Radio-management assumptions

- RRM / ARM / DCA behaviour: [manual / automatic / hybrid].
- Minimum basic data rates: [to be confirmed].
- DFS-channel policy: [allowed / restricted / excluded].
- Band steering and client-load balancing: [enabled / disabled / vendor dependent].
- 2.4 GHz radios in dense zones: [enabled selectively / disabled where appropriate].

8. Proposed Access Point Placement

BASE REPORT

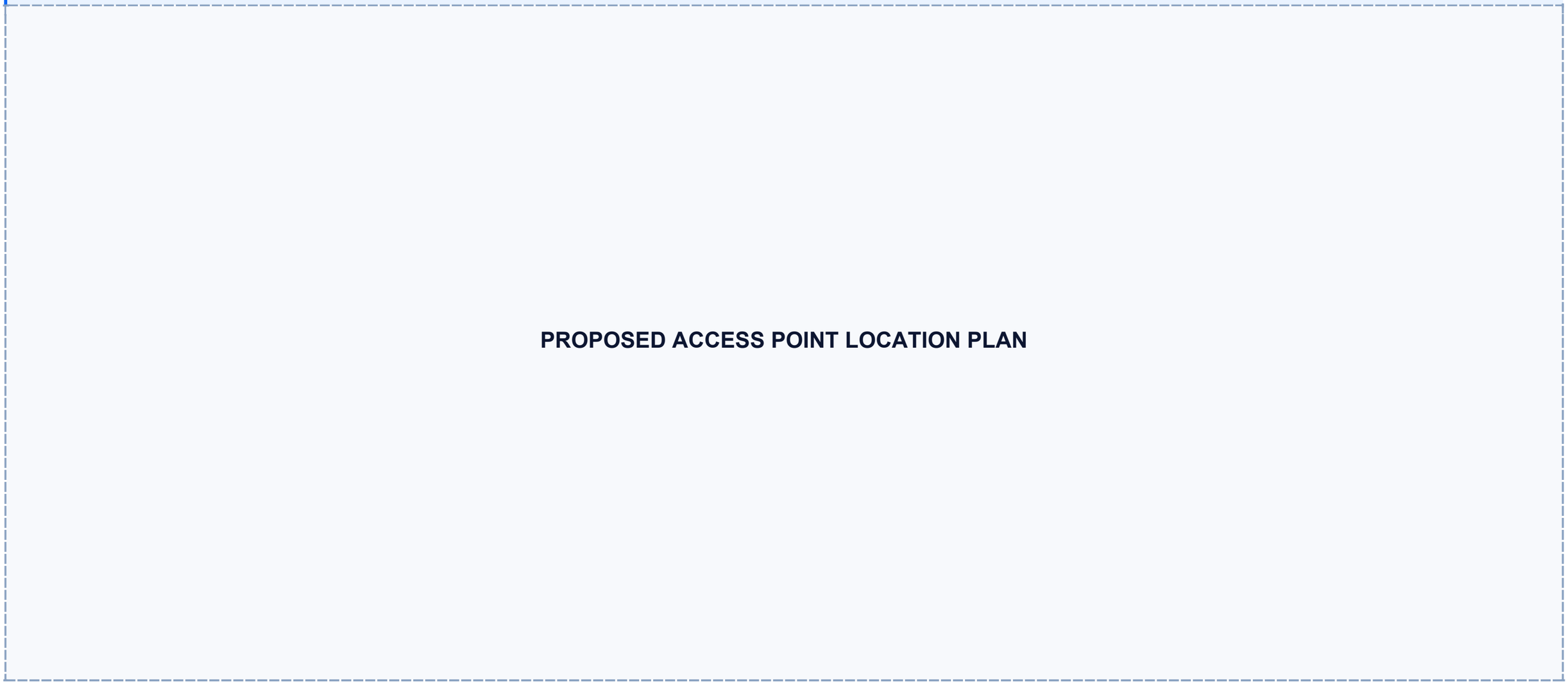


Figure 2 — Proposed access point location plan

AP ID	Room / zone	Reference / coordinates	Height	Model	Installation note
AP-01	[Complete]	[Grid / dimensions]	[ ] m	[Model]	[Ceiling / wall / cable route]
AP-02	[Complete]	[Grid / dimensions]	[ ] m	[Model]	[Ceiling / wall / cable route]
AP-03	[Complete]	[Grid / dimensions]	[ ] m	[Model]	[Ceiling / wall / cable route]

9. Engineering Analysis Overview

The core report includes nine RF outputs. Each subsection shall contain the CTT Indoor RadioPlanner map, the design threshold, an engineering interpretation, a conclusion, and specific corrective action where required.

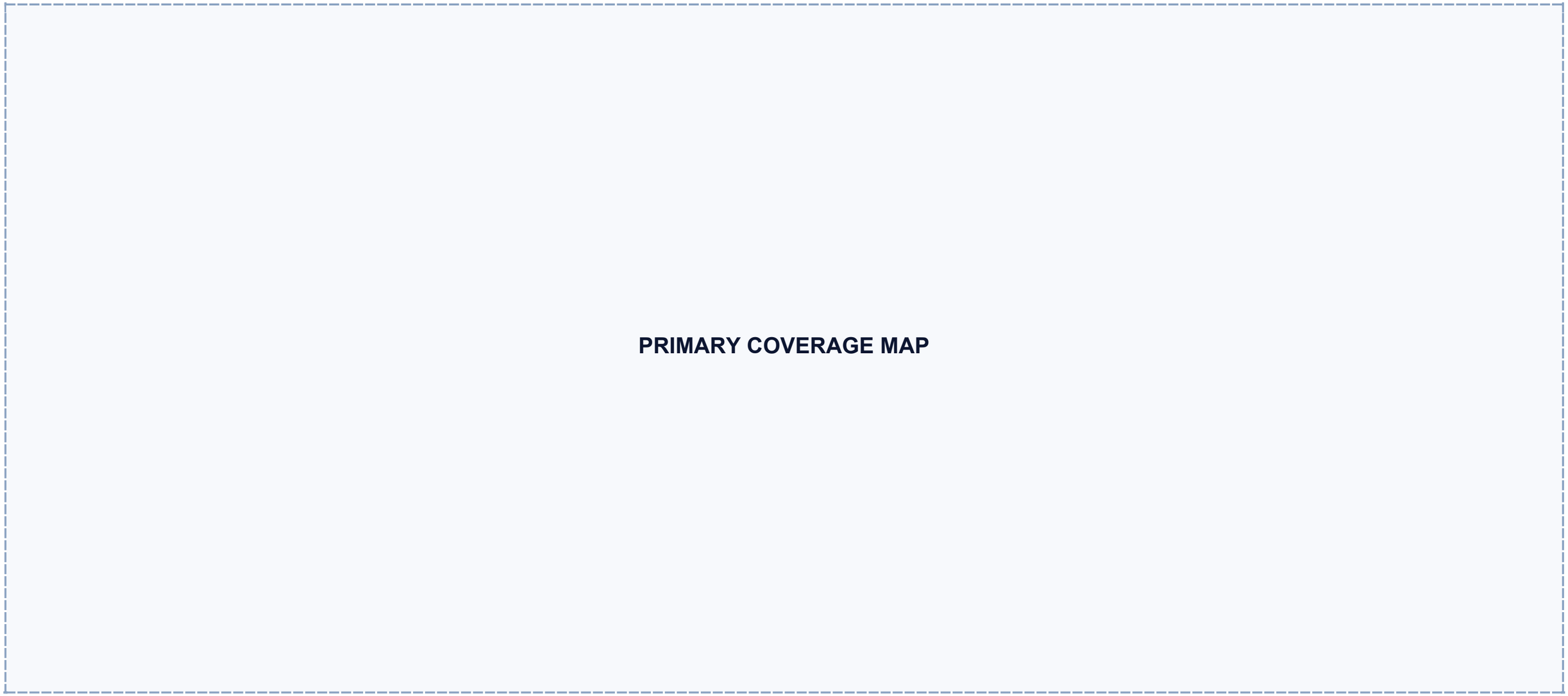
Section	RF output	Primary purpose
9.1	Signal Strength (RSSI)	Verify primary coverage
9.2	Secondary RSSI	Verify resilience and roaming overlap
9.3	Best Server	Review cell boundaries and serving-AP distribution
9.4	Signal-to-Noise Ratio (SNR)	Assess radio-link quality
9.5	Channel Interference	Assess co-channel / adjacent-channel risk
9.6	Maximum Throughput	Estimate client data-rate potential
9.7	Number of Networks	Review SSID / network visibility
9.8	Number of Servers	Verify available AP count and overlap
9.9	Maximum Aggregated Throughput	Estimate total capacity distribution

Required interpretation for every map

- State the exact frequency band, channel width, AP model, transmit power, mounting height, and legend range.
- Quantify the area that meets the target criterion.
- Identify weak zones, excessive overlap, sharp cell boundaries, or capacity hotspots.
- Explain the operational impact and recommend a corrective action.
- Record whether the result is compliant, conditionally compliant, or requires redesign.

9.1 Signal Strength (RSSI)

Insert the RSSI heatmap for each required band. Recommended base criterion: ≥ [−67] dBm over [95]% of target areas.

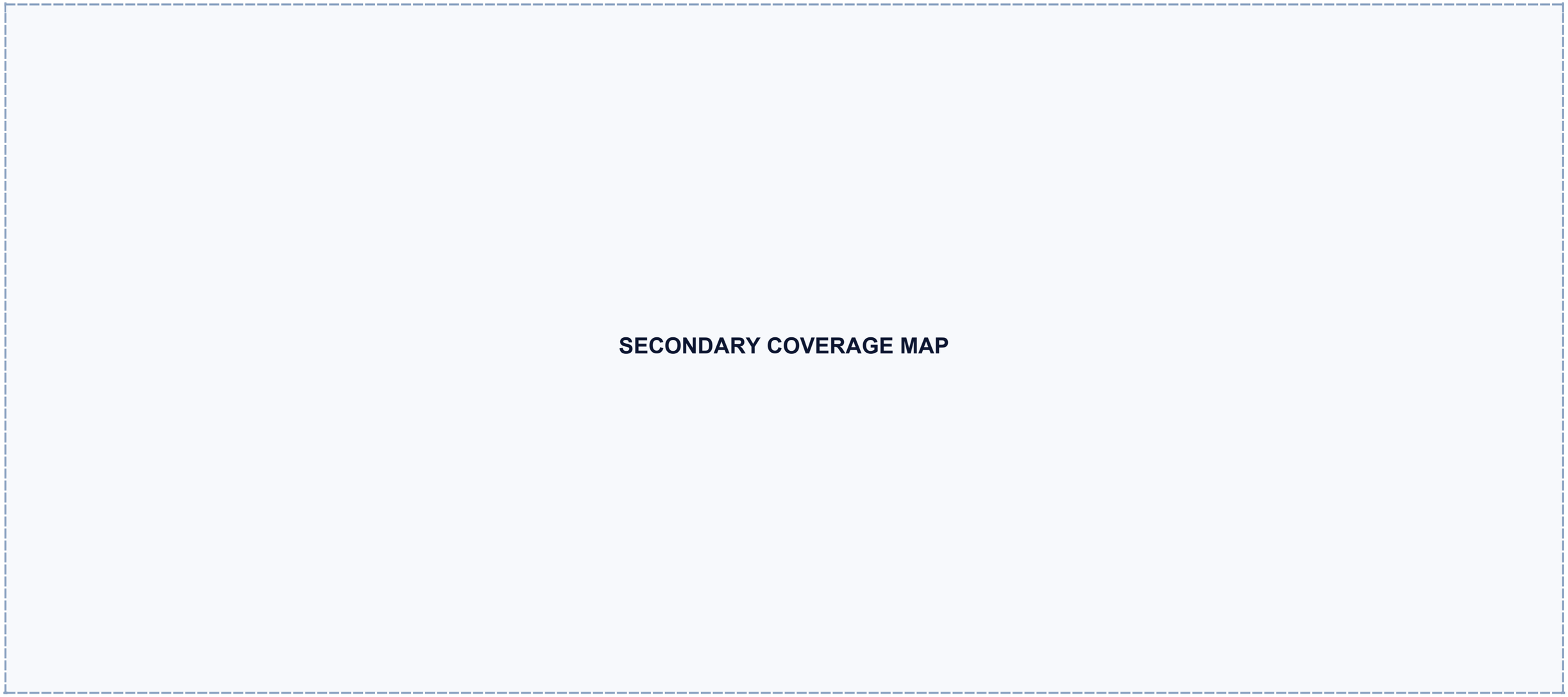


Engineering assessment

Assessment item	Value
Primary signal level	[−67 dBm]
Modelled result	[Result]
Affected zones	[List rooms / areas]
Status	[Compliant / Conditional / Redesign required]
Engineering comment	[Insert concise interpretation and recommendation]

9.2 Secondary RSSI

Insert the Secondary RSSI heatmap. Use it to verify service resilience and cell overlap for roaming.

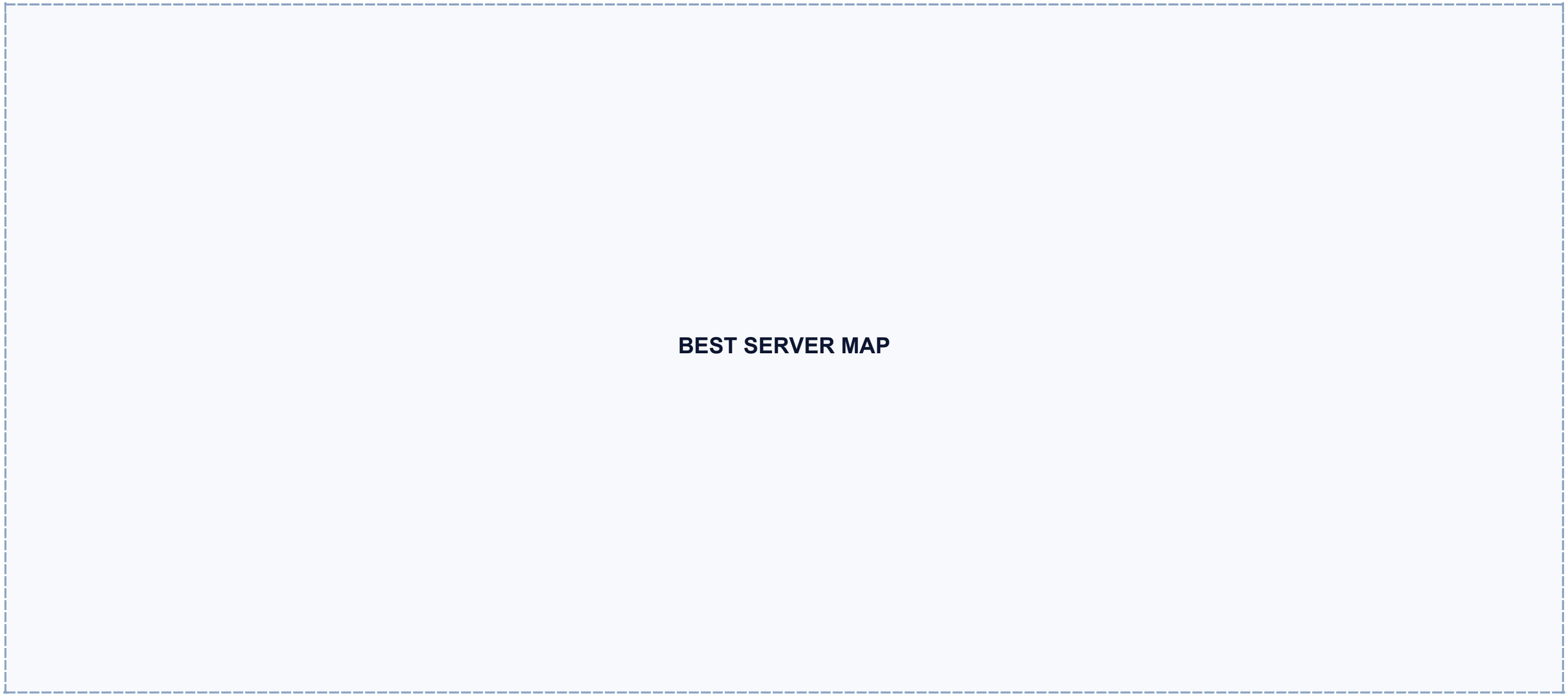


Engineering assessment

Assessment item	Value
Secondary signal level	[−75 dBm]
Modelled result	[Result]
Affected zones	[List rooms / areas]
Status	[Compliant / Conditional / Redesign required]
Engineering comment	[Insert concise interpretation and recommendation]

9.3 Best Server

Insert the Best Server map showing the dominant AP across each service zone. Review cell size, boundary placement, and unintended dominance.

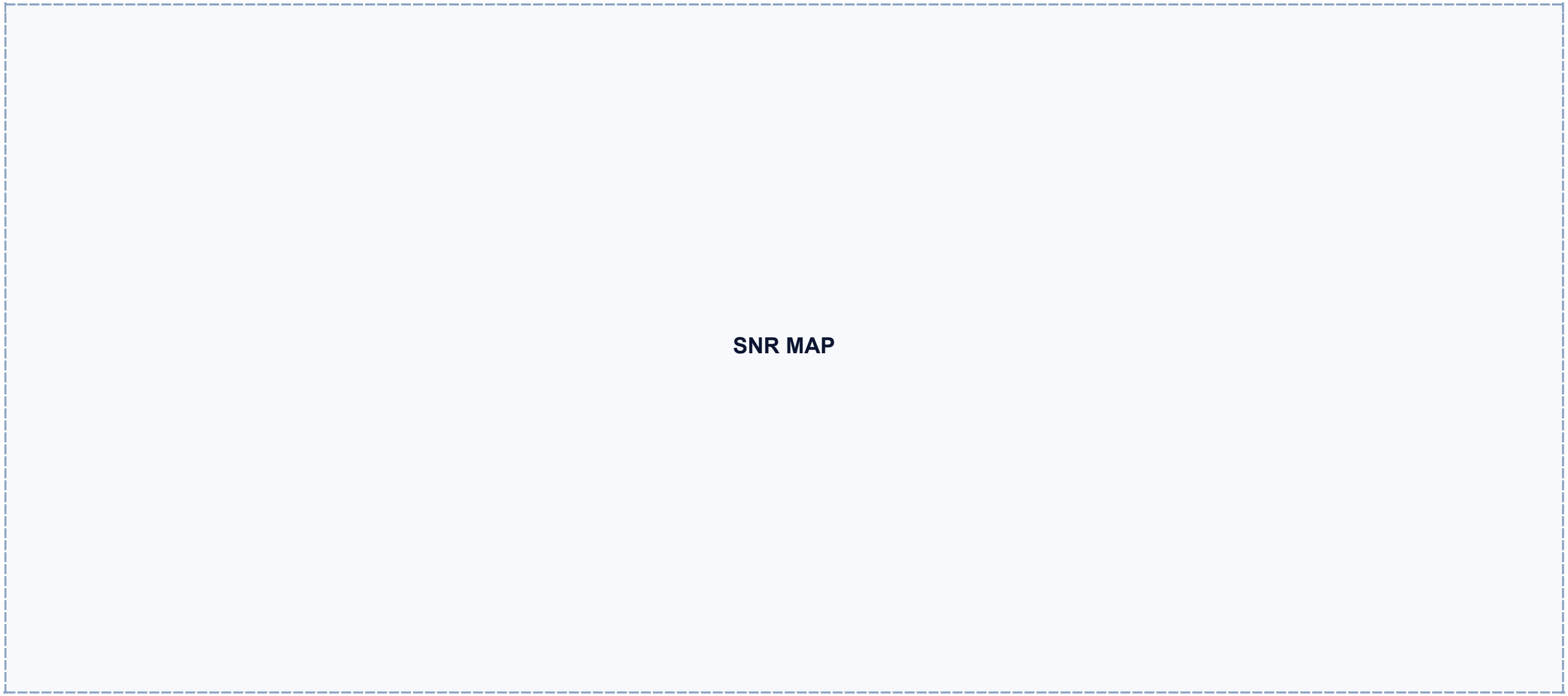


Engineering assessment

Assessment item	Value
Cell distribution	Balanced / controlled
Modelled result	[Result]
Affected zones	[List rooms / areas]
Status	[Compliant / Conditional / Redesign required]
Engineering comment	[Insert concise interpretation and recommendation]

9.4 Signal-to-Noise Ratio (SNR)

Insert the SNR heatmap for each required band. Use measured or agreed noise assumptions and document them explicitly.

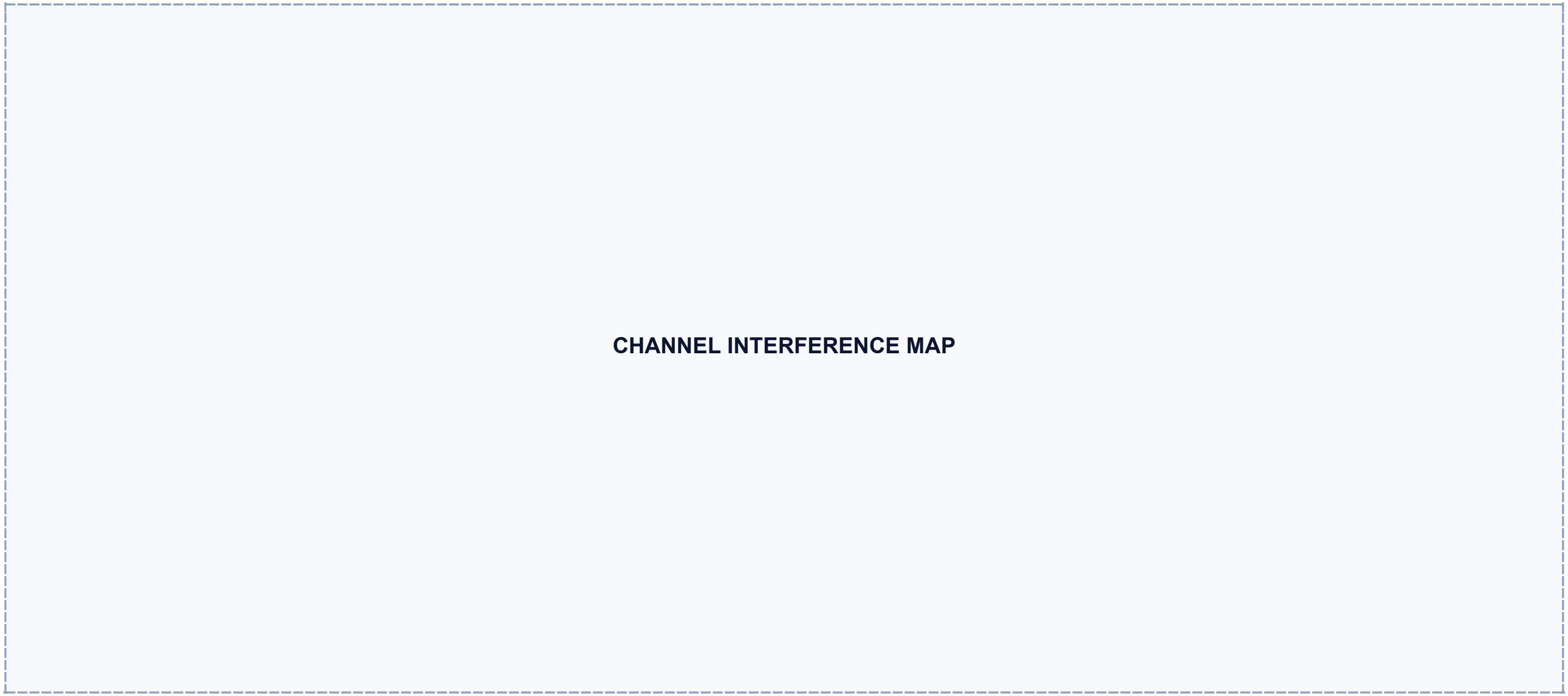


Engineering assessment

Assessment item	Value
Signal-to-noise ratio	≥ [25 dB]
Modelled result	[Result]
Affected zones	[List rooms / areas]
Status	[Compliant / Conditional / Redesign required]
Engineering comment	[Insert concise interpretation and recommendation]

9.5 Channel Interference

Insert the channel-interference output. Document channel plan, channel width, DFS policy, and AP transmit-power assumptions.



Engineering assessment

Assessment item	Value
Interference risk	Within agreed threshold
Modelled result	[Result]
Affected zones	[List rooms / areas]
Status	[Compliant / Conditional / Redesign required]
Engineering comment	[Insert concise interpretation and recommendation]

9.6 Maximum Throughput

Insert the estimated maximum-throughput map. State whether the output is PHY rate, TCP/UDP estimate, or other software-specific metric.

Engineering assessment

Assessment item	Value
Client throughput	≥ [Requirement] Mbps
Modelled result	[Result]
Affected zones	[List rooms / areas]
Status	[Compliant / Conditional / Redesign required]
Engineering comment	[Insert concise interpretation and recommendation]

9.7 Number of Networks

Insert the network-count map. Review the effect of multiple SSIDs and neighbouring networks on airtime and operational complexity.

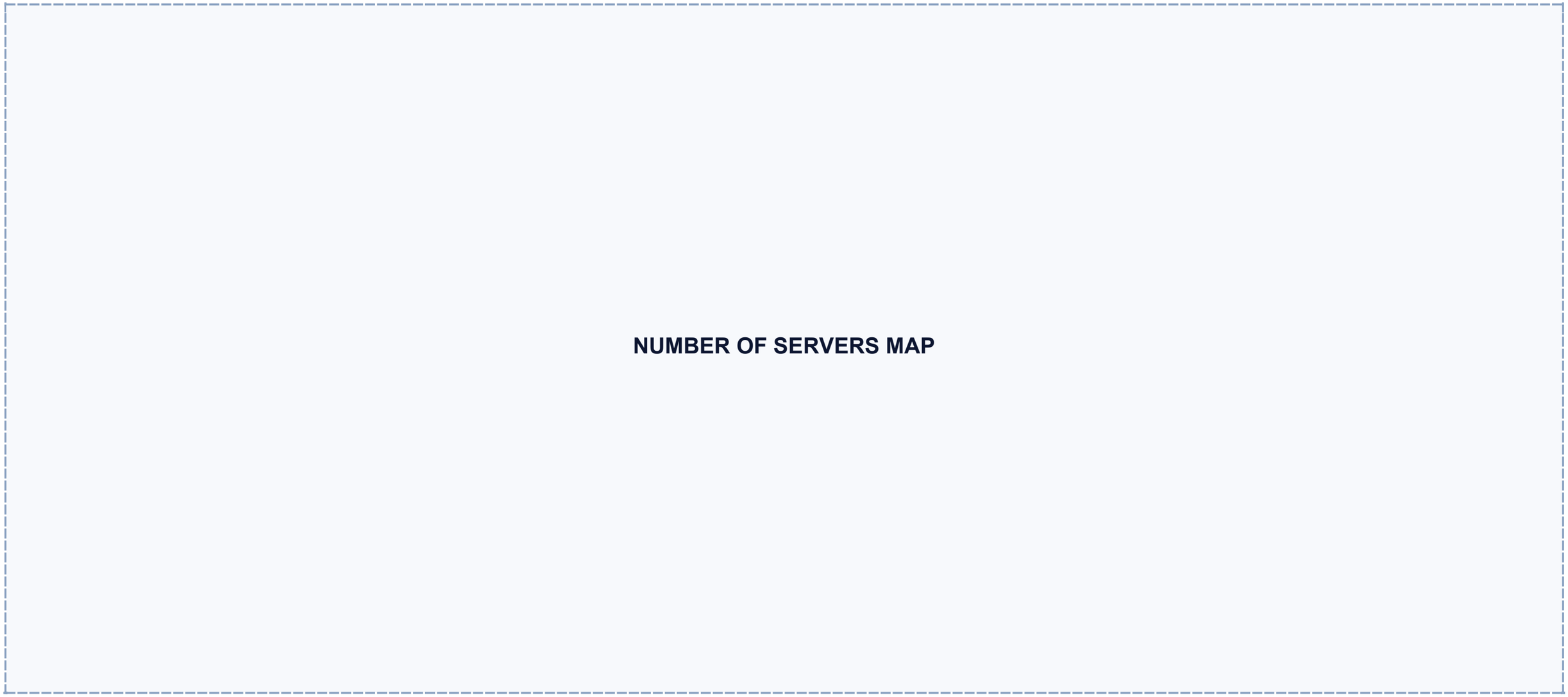
NUMBER OF NETWORKS MAP

Engineering assessment

Assessment item	Value
Visible networks	As designed
Modelled result	[Result]
Affected zones	[List rooms / areas]
Status	[Compliant / Conditional / Redesign required]
Engineering comment	[Insert concise interpretation and recommendation]

9.8 Number of Servers

Insert the available-server-count map. Verify that critical zones have adequate coverage redundancy without excessive overlap.



Engineering assessment

Assessment item	Value
Available APs	[2+] in critical zones
Modelled result	[Result]
Affected zones	[List rooms / areas]
Status	[Compliant / Conditional / Redesign required]
Engineering comment	[Insert concise interpretation and recommendation]

9.9 Maximum Aggregated Throughput

Insert the maximum aggregated-throughput map. Use the capacity model to interpret high-demand zones and total service potential.

AGGREGATED THROUGHPUT MAP

Engineering assessment

Assessment item	Value
Aggregated capacity	≥ [Requirement]
Modelled result	[Result]
Affected zones	[List rooms / areas]
Status	[Compliant / Conditional / Redesign required]
Engineering comment	[Insert concise interpretation and recommendation]

10. Overall Engineering Assessment

SPECTELIX ENGINEERING ASSESSMENT

This section consolidates coverage, resilience, capacity, mobility, interference, implementation risk, and future-readiness into one management-level conclusion.

Assessment area	Rating	Evidence	Comment
Coverage	[Green / Amber / Red]	RSSI, SNR	[Complete]
Resilience	[Green / Amber / Red]	Secondary RSSI, Number of Servers	[Complete]
Roaming readiness	[Green / Amber / Red]	Cell overlap, Best Server	[Complete]
Capacity	[Green / Amber / Red]	Capacity model, aggregated throughput	[Complete]
Interference risk	[Green / Amber / Red]	Channel Interference	[Complete]
Implementation readiness	[Green / Amber / Red]	Mounting, cabling, PoE, controller	[Complete]
Scalability	[Green / Amber / Red]	User growth and equipment lifecycle	[Complete]
Wi-Fi 7 readiness	[Green / Amber / Red]	6 GHz, switching, PoE, cabling	[Complete]

Engineering rating scale

Rating	Meaning	Required action
Green	Target achieved with acceptable engineering margin	Proceed subject to validation
Amber	Usable with conditions, risk, or limited margin	Resolve actions before implementation
Red	Target not achieved or material risk remains	Redesign or obtain formal deviation

Decision statement
Overall project status: [Proceed / Proceed with conditions / Redesign required]. The final status shall reference all open assumptions and mandatory field-validation actions.

11. Business and Operational Impact

RF metrics must be interpreted in terms of service continuity, user experience, operational efficiency, and implementation risk. The table below converts engineering findings into business impact.

Business service	Relevant RF factors	Potential impact	Assessment
Video conferencing	RSSI, SNR, packet loss, airtime	Freezing, poor audio, session interruption	[Complete]
Voice over Wi-Fi	Roaming, latency, packet loss, secondary coverage	Dropped calls or audible gaps	[Complete]
Cloud / office applications	Throughput, latency, coverage	Slow access and reduced productivity	[Complete]
Warehouse / operational terminals	Coverage, roaming, client compatibility	Transaction delay and process interruption	[Complete]
IoT / specialised devices	Band support, data rates, power-save behaviour	Unstable telemetry or control	[Complete]
Guest access	Capacity, segmentation, authentication	Poor visitor experience or security exposure	[Complete]
Network operations	Interference, AP count, management platform	Higher support effort and incident frequency	[Complete]

Business conclusion

[Insert a concise statement explaining whether the proposed design supports the Client's critical services, where the main risks are located, and which actions must be completed before procurement or go-live.]

Management priority
Recommendations should be ranked by business consequence, not only by RF severity. A marginal RF issue in a critical operational area may have a higher priority than a larger issue in a non-service area.

12. Consolidated Recommendations

All findings shall be consolidated in one action register. Each action should be specific, measurable, assigned, and linked to an expected engineering outcome.

ID	Priority	Finding / risk	Recommended action	Expected outcome	Owner
R-01	P1	[Complete]	[Complete]	[Complete]	[Client / Integrator]
R-02	P1	[Complete]	[Complete]	[Complete]	[Client / Integrator]
R-03	P2	[Complete]	[Complete]	[Complete]	[Client / Integrator]
R-04	P2	[Complete]	[Complete]	[Complete]	[Client / Integrator]
R-05	P3	[Complete]	[Complete]	[Complete]	[Client / Integrator]
R-06	P3	[Complete]	[Complete]	[Complete]	[Client / Integrator]

Priority definition

Priority	Definition	Typical timing
P1 — Critical	Required to meet mandatory coverage, capacity, safety, security, or service criteria	Before procurement / installation
P2 — Important	Material improvement to resilience, performance, maintainability, or lifecycle	Before commissioning
P3 — Optimisation	Best-practice improvement or future enhancement	Planned improvement

Recommendation quality
Avoid generic wording such as “optimise Wi-Fi.” State the exact zone, AP, parameter, change, owner, and acceptance evidence.

13. Implementation Roadmap

Stage	Key activities	Required inputs	Deliverable / gate
1. Confirm requirements	Approve use cases, target metrics, constraints, and user profile	Client requirements workshop	Approved design basis
2. Complete predictive design	Build model, place APs, run iterative RF calculations	Verified plans and materials	Issued RF planning report
3. Detailed implementation planning	Confirm cabling, mounting, PoE, switching, controller, licences	Site coordination	Construction-ready package
4. Procurement and staging	Order equipment, configure templates, validate licences	Approved BoM and budget	Staged system
5. Installation	Install APs, cabling, switching, and controller services	Approved locations and method statements	Installed network
6. Commissioning	Configure RF, security, SSIDs, QoS, monitoring	Configuration standards	Operational network
7. Validation survey	Measure coverage, SNR, interference, roaming, throughput	Installed and stable network	Acceptance survey report
8. Optimisation and handover	Resolve defects, tune RRM, hand over records	Survey findings	Final acceptance

Implementation dependencies

- Access to current architectural information and site areas.
- Early coordination of AP locations with lighting, ceilings, fire systems, and interior design.
- Confirmed PoE and switching capacity, including uplinks and resilience.
- Availability of licences, subscriptions, controller capacity, and cloud connectivity.
- Agreement on acceptance criteria before installation begins.

Change control
Any material change to walls, ceilings, AP models, antenna type, AP location, transmit power, or user density should trigger a design review before installation.

14. Network Capacity Analysis

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Capacity analysis determines whether the network can support the expected number of active clients and their simultaneous traffic demand. Coverage-only planning is not sufficient for high-density or business-critical environments.

14.1 Capacity-analysis inputs

Input	Required value	Source / assumption
Total users	[ ]	Client data
Peak concurrent users	[ ]	Client data / agreed ratio
Devices per user	[ ]	Device profile
Client capability mix	[802.11n/ac/ax/be, 1×1/2×2/3×3]	Asset survey / assumption
Application mix	[Voice / video / office / guest / operational]	Business use cases
Busy-hour traffic per device	[ ] Mbps	Traffic model
Airtime efficiency factor	[ ]%	Engineering assumption
Growth allowance	[ ]% over [ ] years	Client strategy
Required capacity margin	[ ]%	Risk policy

14.1.1 Capacity methodology

- Estimate peak concurrent clients by zone.
- Assign application demand and client capabilities.
- Calculate offered traffic and effective airtime demand.
- Check radio capacity, AP distribution, and channel reuse.
- Apply growth and engineering margin.
- Identify zones where additional APs are required for capacity rather than coverage.

14.2 Capacity Summary

Zone	Area	Peak users	Devices	Traffic demand	Planned APs	Capacity status
[Zone 1]	[ ] m²	[ ]	[ ]	[ ] Mbps	[ ]	[Pass / Review]
[Zone 2]	[ ] m²	[ ]	[ ]	[ ] Mbps	[ ]	[Pass / Review]
[Zone 3]	[ ] m²	[ ]	[ ]	[ ] Mbps	[ ]	[Pass / Review]
[Zone 4]	[ ] m²	[ ]	[ ]	[ ] Mbps	[ ]	[Pass / Review]
[Zone 5]	[ ] m²	[ ]	[ ]	[ ] Mbps	[ ]	[Pass / Review]
TOTAL	[ ] m²	[ ]	[ ]	[ ] Mbps	[ ]	[Overall]

Capacity conclusion

[State whether access-point count and channel reuse are sufficient for the expected busy-hour demand. Identify zones constrained by airtime, channel availability, low-capability clients, application demand, or uplink limitations.]

Capacity risk register

Risk	Likelihood	Impact	Mitigation
User density exceeds forecast	[L/M/H]	[L/M/H]	Validate occupancy and apply growth margin
Legacy clients consume excessive airtime	[L/M/H]	[L/M/H]	Minimum rates, band steering, lifecycle plan
Insufficient channels / excessive overlap	[L/M/H]	[L/M/H]	Reduce channel width / power; revise AP layout
Wired uplink or PoE constraint	[L/M/H]	[L/M/H]	Confirm switch, uplink, and PoE budget
Application demand changes	[L/M/H]	[L/M/H]	Monitor and review after go-live

Capacity caveat
Capacity results are sensitive to real client behaviour, protocol overhead, RF contention, and application patterns. Monitoring and post-deployment optimisation remain necessary.

15. Multi-Vendor RF Planning

OPTIONAL ENGINEERING SERVICE

Where required, separate predictive models may be prepared for multiple access-point vendors or product families. Each scenario shall use the correct antenna pattern, transmit-power limits, radio architecture, and licensing assumptions.

Comparison criterion	Option A	Option B	Option C
Vendor / platform	[Vendor A]	[Vendor B]	[Vendor C]
AP model	[Model]	[Model]	[Model]
Wi-Fi generation	[ ]	[ ]	[ ]
Radio architecture	[Dual / tri / flexible]	[ ]	[ ]
Antenna type	[ ]	[ ]	[ ]
Required AP quantity	[ ]	[ ]	[ ]
Controller / cloud model	[ ]	[ ]	[ ]
Licensing term	[ ]	[ ]	[ ]
Estimated lifecycle	[ ] years	[ ] years	[ ] years
Key advantage	[ ]	[ ]	[ ]
Key limitation	[ ]	[ ]	[ ]

Comparison rules

- Use identical project requirements and service-zone definitions.
- Use vendor-specific radio and antenna data.
- Document differences in channel plan, power limits, and mounting orientation.
- Compare total solution requirements, not AP quantity alone.
- Separate technical recommendation from commercial preference.

15.1 Comparative RF Maps

OPTIONAL COMPARISON OUTPUT

MULTI-VENDOR COMPARATIVE MAPS

Insert matched-scale RF outputs for Vendor A, Vendor B, and Vendor C. Use the same band, legend, target threshold, drawing, and modelling assumptions to make the comparison meaningful.

Option	AP quantity	Target-area compliance	Key observation	Engineering ranking
Vendor A	[ ]	[ ]%	[Complete]	[1 / 2 / 3]
Vendor B	[ ]	[ ]%	[Complete]	[1 / 2 / 3]
Vendor C	[ ]	[ ]%	[Complete]	[1 / 2 / 3]

Fair comparison
A lower AP count is not automatically a better result. Consider client compatibility, cell size, capacity, fault tolerance, channel reuse, lifecycle, licensing, and operational support.

16. Bill of Materials

OPTIONAL ENGINEERING SERVICE

The bill of materials shall reflect the selected design option and include active equipment, licences, power, cabling, mounting accessories, and implementation allowances.

Item	Description / model	Qty.	Unit	Purpose / note
Access point	[Vendor, model]	[ ]	ea.	Indoor / outdoor / special environment
Controller / management	[Appliance / VM / cloud]	[ ]	ea.	Include redundancy if required
AP subscription / licence	[Tier and term]	[ ]	lic.	Per AP / per site / term
Access switch	[Model, port count]	[ ]	ea.	PoE class and uplink capacity
Power supply / PSU	[Model]	[ ]	ea.	If external
PoE injector / midspan	[Model]	[ ]	ea.	Only where switch PoE is unavailable
Copper cabling	Cat 6A / approved type	[ ]	m	Permanent link plus allowance
Patch panels and cords	[Approved type]	[ ]	set	Rack and AP side
Mounting kit	[Ceiling / wall / pole]	[ ]	set	Per AP location
Optical uplink components	[Type]	[ ]	set	Where required
Professional services	Configuration / commissioning	[ ]	lot	Scope to be defined
Spares	[Recommended percentage]	[ ]	ea.	Operational reserve

Procurement note
Part numbers, licences, local regulatory variants, support terms, and end-of-sale status must be verified immediately before procurement.

17. Implementation Budget

OPTIONAL ENGINEERING SERVICE

The budget may be presented as alternative implementation scenarios. All costs shall be dated, stated in the agreed currency, and separated into equipment, licences, works, professional services, contingency, and tax.

Cost category	Minimum option	Recommended option	Enhanced / optimal option
Access points	[Currency] [ ]	[Currency] [ ]	[Currency] [ ]
Controllers / cloud management	[ ]	[ ]	[ ]
Switching and PoE	[ ]	[ ]	[ ]
Licences and support	[ ]	[ ]	[ ]
Cabling and accessories	[ ]	[ ]	[ ]
Installation labour	[ ]	[ ]	[ ]
Configuration and commissioning	[ ]	[ ]	[ ]
Validation survey	[ ]	[ ]	[ ]
Project management	[ ]	[ ]	[ ]
Contingency	[ ]	[ ]	[ ]
Subtotal excluding tax	[ ]	[ ]	[ ]
Tax / VAT	[ ]	[ ]	[ ]
TOTAL	[ ]	[ ]	[ ]

Budget assumptions

- Currency and exchange-rate date: [complete].
- Quotation validity: [complete].
- Taxes, customs, shipping, and local certification: [included / excluded].
- Working hours and access constraints: [complete].
- Cabling quantities include [ ]% allowance.
- Support and subscription term: [ ] years.

18. Equipment Selection

OPTIONAL ENGINEERING SERVICE

Equipment selection shall consider the complete technical and operational requirement, not only maximum radio specifications.

Criterion	Weight	Option A	Option B	Option C
RF performance and antenna fit	[ ]%	[Score]	[Score]	[Score]
Client and band compatibility	[ ]%	[Score]	[Score]	[Score]
Capacity and radio architecture	[ ]%	[Score]	[Score]	[Score]
Security and identity integration	[ ]%	[Score]	[Score]	[Score]
Management, analytics, and APIs	[ ]%	[Score]	[Score]	[Score]
Roaming and QoS features	[ ]%	[Score]	[Score]	[Score]
Switching / PoE compatibility	[ ]%	[Score]	[Score]	[Score]
Licensing and lifecycle cost	[ ]%	[Score]	[Score]	[Score]
Local support and supply chain	[ ]%	[Score]	[Score]	[Score]
Product lifecycle / roadmap	[ ]%	[Score]	[Score]	[Score]
TOTAL	100%	[ ]	[ ]	[ ]

Engineering recommendation

Preferred option: [Vendor / platform]. The recommendation is based on [RF suitability, client requirements, operational model, lifecycle, cost, and support]. Conditions and deviations: [complete].

Independence statement
Where SPECTELIX has no commercial relationship with the evaluated vendors, state this explicitly. Any commercial or partner relationship should be disclosed in the final report.

19. Final Engineering Conclusion

The final conclusion shall be concise, evidence-based, and suitable for both technical and management readers.

Conclusion item	Final statement
Design objective	[State whether the proposed design meets the agreed objective.]
AP quantity and placement	[State the recommended AP count and any critical placement conditions.]
Coverage	[Summarise RSSI and SNR compliance.]
Resilience and roaming	[Summarise secondary coverage and mobility readiness.]
Capacity	[Summarise busy-hour capacity and growth margin.]
Interference	[Summarise channel plan and interference risk.]
Infrastructure readiness	[Summarise PoE, switching, uplink, cabling, controller, and licensing readiness.]
Mandatory actions	[List all P1 actions and required deviations.]
Validation requirement	[Define the required post-installation survey and acceptance tests.]
Overall status	[Proceed / Proceed with conditions / Redesign required]

Final statement

[Insert a 150–250 word final engineering conclusion. Clearly distinguish modelled results, confirmed facts, assumptions, limitations, and actions required before acceptance.]

Use of this report
The report supports design decisions, equipment selection, procurement, implementation planning, and acceptance testing. It does not replace local permitting, licensed design documents, structural review, electrical design, cybersecurity approval, or site-specific safety procedures where these are required.

20. Limitations and Validation

20.1 Predictive-model limitations

- Results depend on the accuracy of plans, dimensions, and assigned material attenuation.
- Client-device performance may differ from the reference device used in modelling.
- Occupancy, furniture, doors, movable partitions, stock, machinery, and temporary obstacles can change RF conditions.
- External Wi-Fi and non-Wi-Fi interference are time-varying and cannot be fully predicted from plans.
- Automatic RF-management algorithms may alter channels and power after deployment.
- Throughput values are estimates and depend on protocol overhead, contention, uplinks, security, applications, and the wider network.

20.2 Post-installation validation scope

Test	Method	Evidence	Acceptance
Coverage	Passive survey	RSSI map and statistics	Agreed area threshold achieved
Signal quality	Passive survey	SNR / noise map	Agreed SNR achieved
Interference	Spectrum / Wi-Fi analysis	Channel and interferer evidence	No unacceptable risk
Roaming	Controlled walk test	Event log / packet capture / application test	No unacceptable interruption
Throughput	Active test	iPerf / service test	Agreed result achieved
Configuration	Controller / cloud audit	Export / screenshots	Matches approved baseline
AP location	Physical inspection	As-built plan and photographs	Matches approved placement or accepted deviation

Acceptance principle
A predictive design should be accepted only after the installed network has been measured under a stable configuration and all deviations have been documented.

Appendix A. Access Point Register

AP ID	Floor	Room / zone	Coordinate / reference	Mounting height	Model	MAC / serial	Switch / port	Status
AP-01	[ ]	[ ]	[ ]	[ ] m	[ ]	[ ]	[ ]	[ ]
AP-02	[ ]	[ ]	[ ]	[ ] m	[ ]	[ ]	[ ]	[ ]
AP-03	[ ]	[ ]	[ ]	[ ] m	[ ]	[ ]	[ ]	[ ]
AP-04	[ ]	[ ]	[ ]	[ ] m	[ ]	[ ]	[ ]	[ ]
AP-05	[ ]	[ ]	[ ]	[ ] m	[ ]	[ ]	[ ]	[ ]
AP-06	[ ]	[ ]	[ ]	[ ] m	[ ]	[ ]	[ ]	[ ]
AP-07	[ ]	[ ]	[ ]	[ ] m	[ ]	[ ]	[ ]	[ ]
AP-08	[ ]	[ ]	[ ]	[ ] m	[ ]	[ ]	[ ]	[ ]
AP-09	[ ]	[ ]	[ ]	[ ] m	[ ]	[ ]	[ ]	[ ]
AP-10	[ ]	[ ]	[ ]	[ ] m	[ ]	[ ]	[ ]	[ ]

Installation notes

- Confirm mounting surface and fixing method for every AP.
- Maintain clear separation from major metalwork, ducts, large luminaires, and other RF obstructions.
- Record cable route, patch-panel port, switch port, PoE class, and labelling.
- Photograph each installed AP and record any deviation from the issued plan.
- Update this register for the final as-built package.

As-built requirement
AP identifiers in the controller, drawings, labels, survey files, and asset register should be consistent.

Appendix B. Modelling Parameters

Parameter	2.4 GHz	5 GHz	6 GHz	Source / note
Modelled standard	[ ]	[ ]	[ ]	[ ]
Channel width	[ ] MHz	[ ] MHz	[ ] MHz	[ ]
Transmit power	[ ] dBm	[ ] dBm	[ ] dBm	[ ]
Antenna type	[ ]	[ ]	[ ]	[ ]
Mounting height	[ ] m	[ ] m	[ ] m	[ ]
Reference client	[ ]	[ ]	[ ]	[ ]
Minimum RSSI	[ ] dBm	[ ] dBm	[ ] dBm	[ ]
Secondary RSSI	[ ] dBm	[ ] dBm	[ ] dBm	[ ]
Minimum SNR	[ ] dB	[ ] dB	[ ] dB	[ ]
Noise floor	[ ] dBm	[ ] dBm	[ ] dBm	Measured / assumed
DFS channels	N/A	[Allowed / excluded]	N/A	[ ]
Regulatory domain	[ ]	[ ]	[ ]	Country-specific
Calculation height	[ ] m	[ ] m	[ ] m	Client device height
Grid resolution	[ ] m	[ ] m	[ ] m	[ ]

Material attenuation register

Material / construction	Thickness	2.4 GHz loss	5 GHz loss	6 GHz loss	Source
[Structural wall]	[ ] mm	[ ] dB	[ ] dB	[ ] dB	[Drawing / test / assumption]
[Partition]	[ ] mm	[ ] dB	[ ] dB	[ ] dB	[ ]
[Glazing]	[ ] mm	[ ] dB	[ ] dB	[ ] dB	[ ]
[Door]	[ ] mm	[ ] dB	[ ] dB	[ ] dB	[ ]
[Floor slab]	[ ] mm	[ ] dB	[ ] dB	[ ] dB	[ ]

Appendix C. RF Map Register

Use this register to confirm that every required CTT Indoor RadioPlanner output has been inserted, reviewed, and issued with consistent parameters.

No.	RF output	Band	Drawing / floor	Inserted	Reviewed	Comment
C-01	Signal Strength (RSSI)	[2.4 / 5 / 6 GHz]	[ ]	[Yes / No]	[ ]	[ ]
C-02	Secondary RSSI	[ ]	[ ]	[Yes / No]	[ ]	[ ]
C-03	Best Server	[ ]	[ ]	[Yes / No]	[ ]	[ ]
C-04	Signal-to-Noise Ratio	[ ]	[ ]	[Yes / No]	[ ]	[ ]
C-05	Channel Interference	[ ]	[ ]	[Yes / No]	[ ]	[ ]
C-06	Maximum Throughput	[ ]	[ ]	[Yes / No]	[ ]	[ ]
C-07	Number of Networks	[ ]	[ ]	[Yes / No]	[ ]	[ ]
C-08	Number of Servers	[ ]	[ ]	[Yes / No]	[ ]	[ ]
C-09	Maximum Aggregated Throughput	[ ]	[ ]	[Yes / No]	[ ]	[ ]

Map-quality checklist

- The legend is visible and uses the approved threshold range.
- The frequency band, channel width, AP model, power, and calculation height are stated.
- AP identifiers and floor / zone names are readable.
- The map is not stretched or cropped and retains the source aspect ratio.
- The engineering interpretation corresponds to the exact inserted map.
- All maps in a comparison use the same scale and assumptions.

Appendix C. RF Map Register (continued)

Additional or project-specific outputs

No.	Optional output	Required	Inserted	Purpose / note
C-10	Channel allocation plan	[Yes / No]	[ ]	Verify channel reuse and DFS policy
C-11	Transmit-power plan	[Yes / No]	[ ]	Verify cell size and link balance
C-12	PHY data-rate map	[Yes / No]	[ ]	Alternative to throughput map
C-13	Client health / expected MCS	[Yes / No]	[ ]	Vendor / software dependent
C-14	Coverage by AP failure scenario	[Yes / No]	[ ]	Resilience analysis
C-15	Capacity by zone	[Yes / No]	[ ]	High-density design
C-16	Outdoor coverage	[Yes / No]	[ ]	External service areas
C-17	Vertical coverage / floor leakage	[Yes / No]	[ ]	Multi-floor interaction
C-18	Existing-network survey map	[Yes / No]	[ ]	Current-state comparison
C-19	Post-installation validation map	[Yes / No]	[ ]	Predictive versus measured results

Figure-management fields

Figure no.	File name	Software version	Export date	Prepared by	Checked by
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

Version control
Retain the original export files and the modelling-project file used to generate the issued report.

Appendix D. Acceptance Checklist

No.	Acceptance item	Method / evidence	Status	Comment
1	Approved plans and requirements available	Document review	[ ]	[ ]
2	AP locations match approved plan	Physical inspection	[ ]	[ ]
3	AP model and antenna orientation correct	Inspection / controller export	[ ]	[ ]
4	AP naming and labels consistent	Controller / asset register	[ ]	[ ]
5	Cabling certification complete	Test results	[ ]	[ ]
6	PoE budget and class verified	Switch export / measurement	[ ]	[ ]
7	Firmware and licences valid	Controller / cloud audit	[ ]	[ ]
8	SSID, VLAN, security, and authentication verified	Configuration audit	[ ]	[ ]
9	Channel plan and transmit power reviewed	Controller / RF survey	[ ]	[ ]
10	RSSI coverage meets criterion	Passive survey	[ ]	[ ]
11	SNR meets criterion	Passive survey	[ ]	[ ]
12	Interference risk acceptable	Spectrum / Wi-Fi analysis	[ ]	[ ]
13	Roaming test passed	Walk test / capture	[ ]	[ ]
14	Throughput / application tests passed	Active test	[ ]	[ ]
15	Monitoring and alerting operational	NMS / cloud verification	[ ]	[ ]
16	As-built records complete	Document review	[ ]	[ ]
17	Open defects and deviations closed	Action register	[ ]	[ ]
18	Client acceptance signed	Approval record	[ ]	[ ]

Acceptance status
Use PASS, FAIL, NOT TESTED, NOT APPLICABLE, or ACCEPTED DEVIATION. Every failed or deferred item should have an owner and due date.

Appendix E. Terms and Abbreviations

Term	Definition
AP	Access Point.
BSS	Basic Service Set.
DFS	Dynamic Frequency Selection.
EIRP	Equivalent Isotropically Radiated Power.
MCS	Modulation and Coding Scheme.
MIMO	Multiple-Input Multiple-Output.
PHY rate	Physical-layer link rate; not equal to application throughput.
PoE	Power over Ethernet.
RRM	Radio Resource Management.
RSSI	Received Signal Strength Indicator, expressed in dBm.
Secondary RSSI	Signal level from the second-best serving access point.
SNR	Signal-to-Noise Ratio, expressed in dB.
SSID	Service Set Identifier.
Wi-Fi 6 / 6E / 7	Commercial names commonly associated with newer IEEE 802.11 generations and frequency-band capabilities.
Validation survey	Post-installation field measurement used to verify the predictive design.

Units

Unit	Meaning
dB	Relative power or attenuation ratio.
dBm	Absolute power referenced to 1 milliwatt.
MHz / GHz	Frequency or channel-width units.
Mbps / Gbps	Data-rate units.
m / m²	Length and area in SI units.

Terminology consistency
Use the same definitions, thresholds, and units in the requirements, maps, calculations, recommendations, and acceptance report.

Client Deliverables

WHAT THE CLIENT RECEIVES

Base report deliverables

- Wi-Fi Engineering Assessment Report in PDF and editable DOCX format.
- Predictive access-point placement plan.
- Nine core RF maps from CTT Indoor RadioPlanner.
- Engineering interpretation, compliance status, and consolidated recommendations.
- Implementation roadmap and acceptance-test requirements.
- Appendices containing AP register, modelling parameters, map register, and acceptance checklist.

Optional services

- Network capacity analysis by zone and busy-hour demand.
- Multi-vendor RF planning and side-by-side comparison.
- Bill of materials, licences, cabling, PoE, and implementation requirements.
- Budget scenarios: minimum, recommended, and enhanced / optimal.
- Vendor-neutral equipment selection and weighted technical evaluation.
- On-site survey, post-installation validation, optimisation, and acceptance support.

Final issue package
The final package should include the issued report, source RF maps, approved design inputs, open-action register, and any agreed supporting calculation files.