



**Brightline**  
NETWORKS

# Wi-Fi Design Report

Harbourview Offices, Levels 1 and 2

2 floors, 14 access points

|                                               |                                                               |
|-----------------------------------------------|---------------------------------------------------------------|
| Prepared for<br><b>Harbourview Properties</b> | Site or project<br><b>Harbourview Offices, Levels 1 and 2</b> |
| Prepared by<br><b>Brightline Networks</b>     | Date<br><b>October 15, 2026</b>                               |
| Reference<br><b>BL-2026-014 Rev A</b>         | Design basis<br><b>5 GHz, -65 dBm minimum</b>                 |

**2**

Floors

**14**

Access points

**97.9%**

Coverage at -65 dBm

**-55.9**

Average signal, dBm

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1. Executive summary

Harbourview Offices, Levels 1 and 2 is designed as 2 floors with 14 access points (2 models) for the 5 GHz band and a -65 dBm minimum signal. The forecast meets the target on 2 of 2 floors. Predicted coverage across the design is 97.9% and the average strongest signal is -55.9 dBm. These figures are planning estimates from the Signal Plan model and should be confirmed with an on-site survey.

Scope and notes

Scope: new Wi-Fi 6 network for both office levels, designed for 150 concurrent clients per floor with voice and video calling. Open-plan areas are the priority.

|        |               |                     |                     |           |
|--------|---------------|---------------------|---------------------|-----------|
| 2      | 14            | 97.9%               | -55.9               | 2 models  |
| Floors | Access points | Coverage at -65 dBm | Average signal, dBm | Equipment |

Results by floor

| Floor   | APs | Coverage | Avg RSSI  | Roaming backup | Below target | Result       |
|---------|-----|----------|-----------|----------------|--------------|--------------|
| Floor 1 | 7   | 97.9%    | -55.9 dBm | 91%            | 48 m²        | Meets target |
| Floor 2 | 7   | 97.9%    | -55.9 dBm | 91%            | 48 m²        | Meets target |

Key findings

- All 2 floors reach at least 90% coverage at -65 dBm.
- Client capacity and throughput are sufficient on every floor for 150 concurrent clients at 5 Mbps each.
- Roaming backup (a second access point at -72 dBm or better) covers 91% of the design on average.
- Signal from other floors reaches -75 dBm or better on 8% of floor area on average. Stacked access points should use different channels.

## 2. Design basis

### Design inputs

| Parameter                    | Value                                              |
|------------------------------|----------------------------------------------------|
| Floor size                   | 60.0 m by 39.0 m (2,342 m²)                        |
| Scale method                 | Enter floor width and length                       |
| Design band                  | 5 GHz                                              |
| Channel width                | Auto (20 MHz at 2.4, 40 MHz at 5, 80 MHz at 6 GHz) |
| Minimum signal               | -65 dBm, voice and video                           |
| Office environment           | Typical office                                     |
| Mounting height              | 2.7 m                                              |
| Concurrent clients per floor | 150                                                |
| Target per client            | 5 Mbps                                             |
| Inventory                    | Automatic recommendation (Cisco Meraki)            |
| Floors                       | 2, 3.5 m floor to floor                            |
| Slab type                    | Concrete (20 dB)                                   |

### Signal model

| Parameter                 | Value                                               |
|---------------------------|-----------------------------------------------------|
| Free-space loss at 1 m    | 47.1 dB                                             |
| Path-loss exponent        | 2.25                                                |
| Link margin               | 8 dB                                                |
| Wall scaling at this band | x1.2                                                |
| Client reference power    | 15 dBm                                              |
| Access point EIRP         | 15 dBm + model gain - 2 dB (6 GHz capped at 30 dBm) |
| Coverage metric           | Share of sampled points at or above the minimum     |

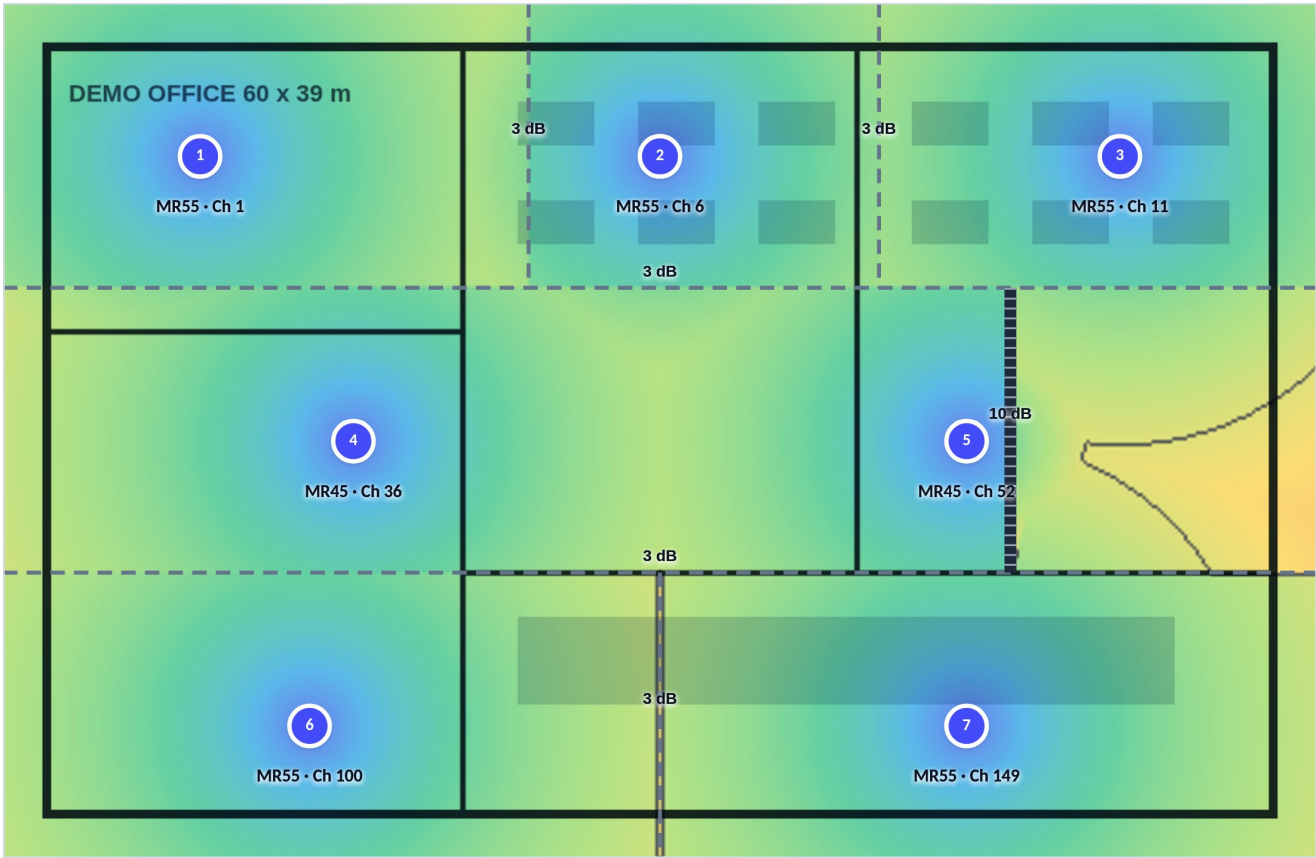
### Wall losses at 5 GHz

| Wall type   | Value per wall | At 5 GHz |
|-------------|----------------|----------|
| Glass       | 2 dB           | 2.4 dB   |
| Drywall     | 3 dB           | 3.6 dB   |
| Brick       | 6 dB           | 7.2 dB   |
| Concrete    | 10 dB          | 12.0 dB  |
| Lift / core | 18 dB          | 21.6 dB  |

### Floor-to-floor loss

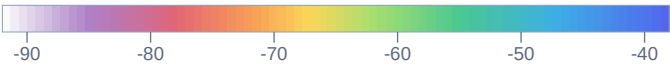
| Slabs crossed | Loss at 5 GHz |
|---------------|---------------|
| 1 slab        | 24 dB         |

### 3. Floor 1: forecast and access points



Predicted signal on floor 1, 5 GHz. Plan size 60.0 m by 39.0 m.

Signal strength (RSSI, dBm)



Outline: -65 dBm minimum signal

97.9%

Coverage at -65 dBm

-55.9

Average signal, dBm

-63

Weakest 5%, dBm

91%

Roaming backup

48 m<sup>2</sup>

Below target

#### Access points on this floor

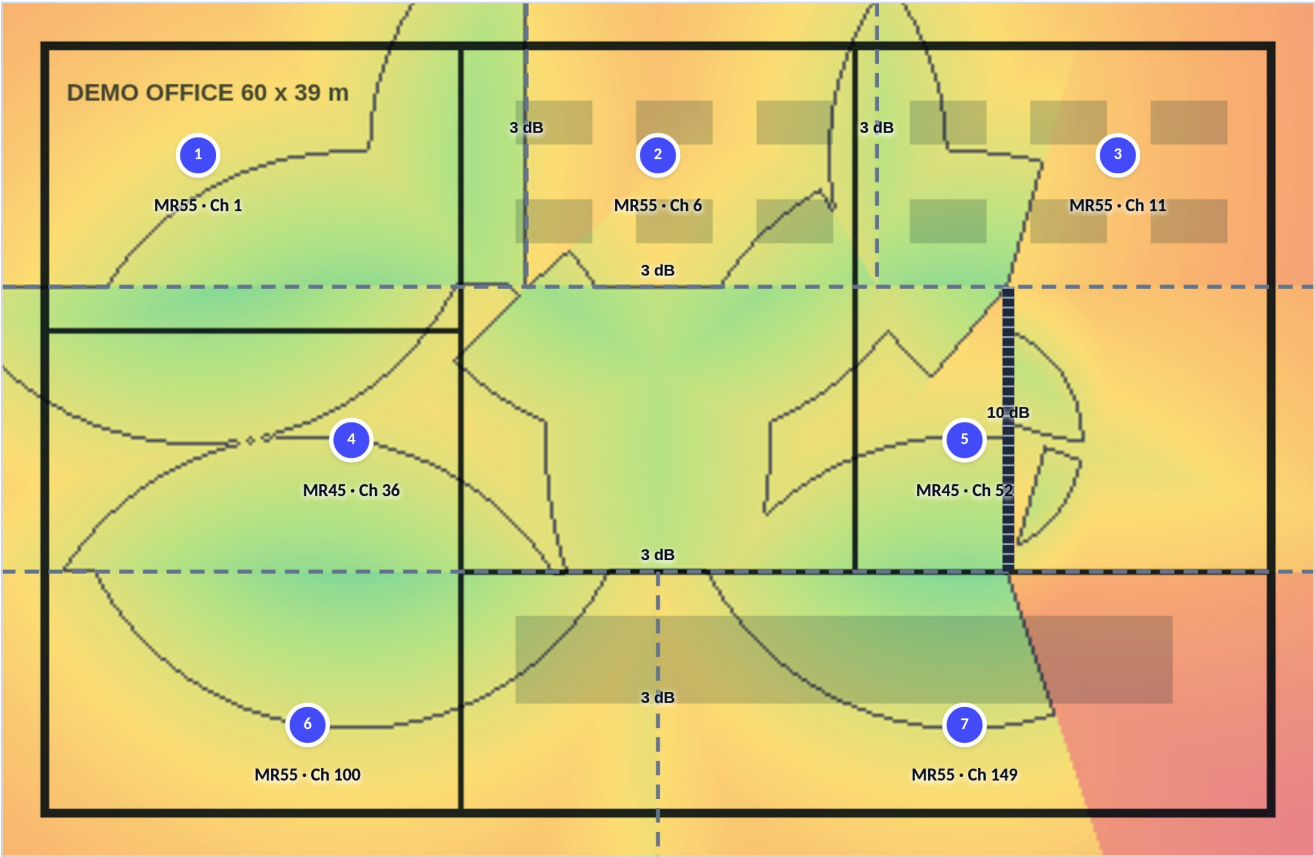
| AP    | Model | X      | Y      | Channel | Width  | EIRP   | Mbps | Clients |
|-------|-------|--------|--------|---------|--------|--------|------|---------|
| AP-01 | MR55  | 9.0 m  | 7.0 m  | 1       | 40 MHz | 19 dBm | 645  | 59      |
| AP-02 | MR55  | 30.0 m | 7.0 m  | 6       | 40 MHz | 19 dBm | 645  | 59      |
| AP-03 | MR55  | 51.0 m | 7.0 m  | 11      | 40 MHz | 19 dBm | 645  | 59      |
| AP-04 | MR45  | 16.0 m | 20.0 m | 36      | 40 MHz | 19 dBm | 385  | 50      |
| AP-05 | MR45  | 44.0 m | 20.0 m | 52      | 40 MHz | 19 dBm | 385  | 50      |
| AP-06 | MR55  | 14.0 m | 33.0 m | 100     | 40 MHz | 19 dBm | 645  | 59      |
| AP-07 | MR55  | 44.0 m | 33.0 m | 149     | 40 MHz | 19 dBm | 645  | 59      |

Signal from other floors reaches -75 dBm or better on 0% of this floor.

Walls on this floor

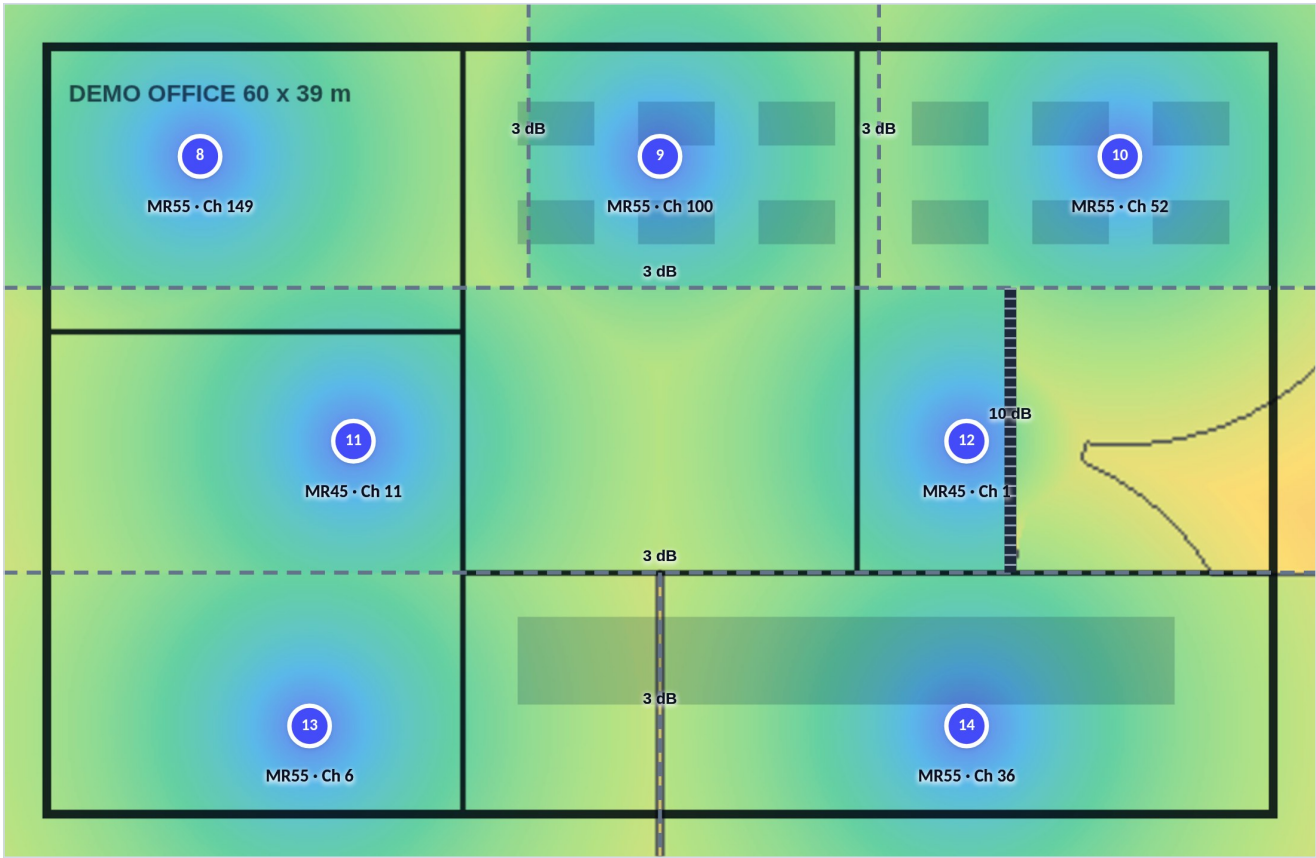
| Wall type | Count | Total length | Loss each |
|-----------|-------|--------------|-----------|
| Drywall   | 5     | 159.0 m      | 3 dB      |
| Concrete  | 1     | 13.0 m       | 10 dB     |

Roaming backup



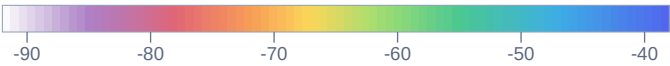
Second-strongest access point at each point. A second AP at -72 dBm or better gives clients somewhere to roam to.

# 4. Floor 2: forecast and access points



Predicted signal on floor 2, 5 GHz. Plan size 60.0 m by 39.0 m.

Signal strength (RSSI, dBm)



Outline: -65 dBm minimum signal

97.9%

Coverage at -65 dBm

-55.9

Average signal, dBm

-63

Weakest 5%, dBm

91%

Roaming backup

48 m<sup>2</sup>

Below target

## Access points on this floor

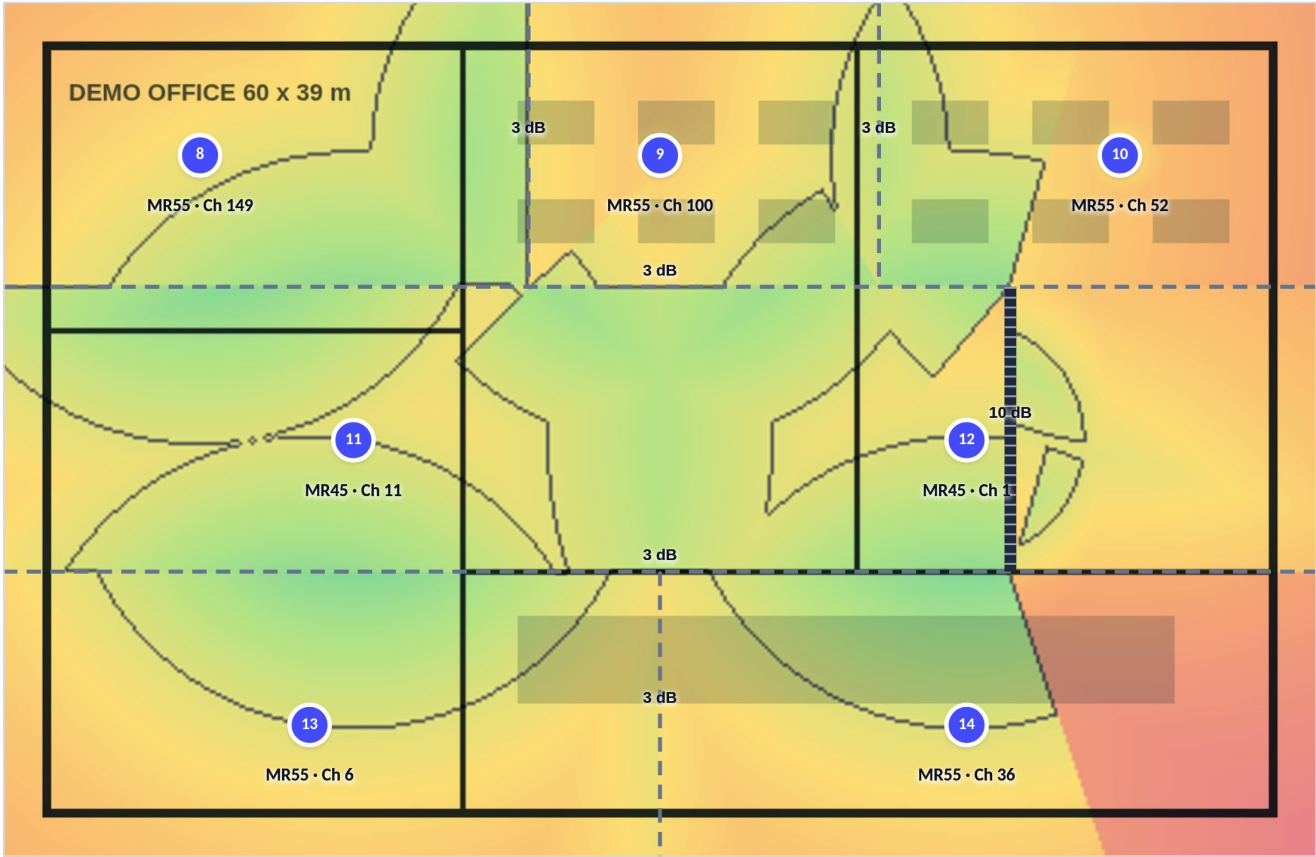
| AP    | Model | X      | Y      | Channel | Width  | EIRP   | Mbps | Clients |
|-------|-------|--------|--------|---------|--------|--------|------|---------|
| AP-08 | MR55  | 9.0 m  | 7.0 m  | 149     | 40 MHz | 19 dBm | 645  | 59      |
| AP-09 | MR55  | 30.0 m | 7.0 m  | 100     | 40 MHz | 19 dBm | 645  | 59      |
| AP-10 | MR55  | 51.0 m | 7.0 m  | 52      | 40 MHz | 19 dBm | 645  | 59      |
| AP-11 | MR45  | 16.0 m | 20.0 m | 11      | 40 MHz | 19 dBm | 385  | 50      |
| AP-12 | MR45  | 44.0 m | 20.0 m | 1       | 40 MHz | 19 dBm | 385  | 50      |
| AP-13 | MR55  | 14.0 m | 33.0 m | 6       | 40 MHz | 19 dBm | 645  | 59      |
| AP-14 | MR55  | 44.0 m | 33.0 m | 36      | 40 MHz | 19 dBm | 645  | 59      |

Signal from other floors reaches -75 dBm or better on 16% of this floor.

Walls on this floor

| Wall type | Count | Total length | Loss each |
|-----------|-------|--------------|-----------|
| Drywall   | 5     | 159.0 m      | 3 dB      |
| Concrete  | 1     | 13.0 m       | 10 dB     |

Roaming backup



Second-strongest access point at each point. A second AP at -72 dBm or better gives clients somewhere to roam to.

## 5. Equipment and capacity

### Equipment list

| Model | Brand        | Wi-Fi   | Qty | Streams | Width  | EIRP   | Mbps/AP | Clients/AP |
|-------|--------------|---------|-----|---------|--------|--------|---------|------------|
| MR55  | Cisco Meraki | Wi-Fi 6 | 10  | 8x8     | 40 MHz | 19 dBm | 645     | 59         |
| MR45  | Cisco Meraki | Wi-Fi 6 | 4   | 4x4     | 40 MHz | 19 dBm | 385     | 50         |
| Total |              |         | 14  |         |        |        |         |            |

### Capacity by floor

| Floor   | Clients | Client capacity | Demand   | Throughput capacity | Result     |
|---------|---------|-----------------|----------|---------------------|------------|
| Floor 1 | 150     | 395             | 750 Mbps | 3995 Mbps           | Sufficient |
| Floor 2 | 150     | 395             | 750 Mbps | 3995 Mbps           | Sufficient |

### Installation summary

- 14 PoE ports and cable drops are needed, one per access point.
- Planned mounting height is 2.7 m. Floor-to-floor height is 3.5 m.
- Check each model's PoE class on its datasheet. Wi-Fi 6E and Wi-Fi 7 access points often need 802.3at or better and multi-gigabit switch ports.

## 6. Recommendations

- Walk the site with an access-point-on-a-stick survey at the planned positions before cabling, and survey again after installation.
- Review the channel plan and transmit power during commissioning. Re-run the design if walls or the layout change.
- Slab loss is the least certain input in a multi-floor design. Measure the signal one floor above and below a test access point and adjust the slab type.
- Confirm PoE budget, cable routes and mounting hardware for every location.

## 7. Assumptions and limitations

- Log-distance path loss with exponent 2.25 and 47.1 dB free-space loss at 1 m for 5 GHz. A 8 dB link margin covers client antennas, body loss and fading. Forecasts are downlink only.
- Wall loss is the value chosen per wall, scaled by 1.2 for 5 GHz.
- Access point EIRP is balanced to a 15 dBm client plus each model's antenna gain, less 2 dB for pattern averaging, or the vendor's average-pattern gain where one is published. At 6 GHz it is capped at the indoor low-power limit.
- Throughput and client capacity per access point follow from each model's streams, channel width and Wi-Fi generation. They are planning values, not vendor guarantees.
- Coverage figures come from a sampled grid of about 828 points per floor; the heatmap is interpolated between samples. Interference from neighbouring networks is not modelled.
- Floors are 3.5 m apart with concrete (20 db) slabs; cross-floor paths use the three-dimensional distance and add slab loss.
- Regulatory power limits vary by country. Confirm yours.

This report is a preliminary predictive design. Validate current AP specifications, regulatory domain, antenna behavior, channel width, mounting constraints, PoE, cabling and roaming, and confirm the result with an on-site RF survey before deployment.