

Developer Guide to Hyperoptic Managed Wi-Fi

Author: Paul Kyriakides

Division: Technical Design Team (Policy & Innovation)

Version 2.0

Date: 17 February 2025

Contents

Version History.....	5
Contact Information	5
Document Overview.....	6
About Hyperoptic.....	6
What is the Hyperoptic Managed WiFi Product?	7
Which Communal Areas Are covered?	8
Enabling Smart Building Technology	8
The Hyperoptic Scope in Brief	9
Infrastructure Overview	11
Our Engagement Process.....	12
Prelims Phase.....	13
Stage 0. Strategic Definition	13
Stage 1. Preparation and Brief	13
Supporting Documentation to Hyperoptic	13
Documentation From The Developer.....	14
Design Phase	15
Stage 2. Concept Design.....	15
Stage 3. Developed Design	15
Stage 4. Technical Design	15
Construction Phase	16
Typical Site Considerations	16
Stage 5(a). Construction - Mobilisation.....	17
Pre-Installation Key Dates	17
Typical On Site Activities Timeline Flow.....	18
Stage 5(b). Typical Construction – to - Practical Completion	20
In the case of 3rd party Installations.....	20
In the case of Hyperoptic Installations	20
Retrospective Installations (Part 1: Scope)	21
Retrospective Installations (Part 2: CDM Compliance).....	21
Practical Completion	22
Installation Procedure	22
Service Support Phase.....	24
Stage 6. Handover and Close Out.....	24
In Use Phase.....	24
Stage 7(a). In Use – Consumer Engagement and Ongoing Support.....	24
Stage 7(b). In Use – Infrastructure & Network Maintenance.....	25
The Hyperoptic Design	26
Design Pack Example: Site Wide Layout	27
Design Pack Example: Cabling Schematic.....	28
Heat Mapping: Desktop Predictive Survey	29

The WiFi Standard	29
What is Power over Ethernet (PoE)?	29
The Hardware	30
The Ruckus SmartZone	30
The Ruckus Switches	30
Typical Parent – to - Child Switch – to - AP Connectivity	31
Which Access Points (APs) Do Hyperoptic Use?	31
The Ruckus H550 Indoor Access Point:	32
The H550 Wired & WiFi Convergence of Home Devices:	33
The Ruckus R350 Indoor Access Point:	34
The Ruckus R650 Indoor Access Point:	34
The Ruckus T350c Outdoor Access Point:	35
The Ruckus T750 Outdoor Access Point:	35
Fitting the APs	36
Best Practice for APs in Communal Areas	36
Termination Within a Property	37
Large Apartments, Duplex Units & Penthouses	38
Hardwiring Around The Property	39
AP Type & Color Coding Symbols	40
Residential AP Selection & Coverage	41
Data Cabinets	43
Typical Internal Wall Mount Cabinet	43
Typical Internal DP-1a Floor-Standing Cabinets	44
Cabinet Placement: DP-1a	45
Typical DP-1a Cabinet Weight & Power Consumption	45
Cabinet Placement: Child DP Cabinets	46
Cabinet Placement: Child DP Cabinets in Risers	47
Typical Child DP Cabinet Weight & Power Consumption	47
DP Cabinet Securing & Fitting Guidance	48
Preparation	48
Wall Mounted Cabinets	48
Cabinet Fitting & Fixings	49
Floor Standing Cabinets	49
Typical DP Cabinet Network Connectivity	50
Cabinet Power Requirements	51
Cabinet Earth Bonding	51
Power Consumption Calculation	51
Network Power Resilience	52
The UPS Requirement	52
Site Wide Power Back-up	52
Power Resilience	52
Power Resilience Solution	53
The Incoming Backhaul Connection	54

Ethernet Access Direct (EAD)	54
Hyperoptic Optical Fibre Backhaul	54
Backhaul Installation Considerations	55
Backhaul Cable Routing into DP-1a Cabinet	56
Backhaul Sizing and Resilience.....	57
DP-1a Cabinet Backhaul & Power Connections.....	58
Cable Infrastructure Specification	60
Optical Fibre Spine Distribution Cable.....	60
Optical Fibre Cable Installation Guidance	60
Preparation	60
Optical Fibre Cable Installation Practices	61
Bend Radius	61
Securing the Fibre Cables.....	62
Data Cables Specification.....	62
Cat6A Cable Installation Guidance	62
Preparation	62
Cat6A U/FTP Cable Installation Practices.....	63
Securing the Cat6A Cable.....	64
Cable Identification	64
Appendix A: Template: Tasks & Responsibilities Required to be Completed On Site	65
Appendix B: Template: New Site Information Sheet	70

Version History

Version	Author	Job Title	Date	Changes
1.0	Paul Kyriakides	Technical Design Manager	15/11/2024	Initial draft
2.0	Paul Kyriakides	Technical Design Manager	13/02/2025	Updated AP symbols & colour codes

Contact Information

Author: paul.kyriakides@hyperoptic.com

Document Overview

This document has been compiled to provide an understanding of the Hyperoptic Managed WiFi infrastructure to guide the developer and site managers to our design & installation processes.

The document covers the Hyperoptic scope in brief, design, architecture, component parts and materials specification.

It is a universal guide to standards and best practices for installation of the physical infrastructure requirements to be undertaken by the developer, in order for Hyperoptic to provide the required services. Along with the tasks and responsibilities needed to be undertaken pre-installation & during installation.

The Developer Guide is intended to give the generic on-site engagement process and the deployment cycle to ensure efficient build of our infrastructure and services.

About Hyperoptic

Founded in 2011 to shake up the broadband market, Hyperoptic delivers hyperfast full fibre to homes and businesses in the UK and was the first provider to make gigabit speeds available to UK residents.

We work with property owners, developers and partners, designing and installing dedicated full fibre infrastructure to new buildings and existing developments. We focus exclusively on high density urban areas and cover 64 towns and cities in the UK.

Broadband that's in your corner, we put the customer at the heart of everything we do – with a hyper reliable connection, hyper fair pricing, hyper simple switching and hyper service and support.

What is the Hyperoptic Managed WiFi Product?

- A dedicated Wifi network product developed to address connectivity and technology solutions and challenges of developers, investors, building managers & residents of multi-tenant buildings. The Hyperoptic Managed Wifi product covers residential Build-to Rent, student housing and commercial spaces and venues.
- Wifi is provided by a series of Access Points (APs) throughout a development:
 - a) Within each residential property
 - b) In the Internal and External communal spaces.
 - c) Within the Back-of-House (BoH) and landlord areas.
- The Hyperoptic Managed WiFi product allows residents, guests and building managers to roam around their development and remain connected to their devices and to their own individual network.
- Once logged in, the network will continuously search for and connect to the nearest Access Point.
- The process is automatic, creating a seamless experience in which an individual can move throughout the development without experiencing any disruption in their connection.



Note:

1. The Hyperoptic WiFi network is standalone specifically for WiFi enablement & any agreed hardwired connections such as enabling business connections.
2. The network & its components cannot be altered or added to by the developer or 3rd party, without prior evaluation & written agreement from Hyperoptic.
3. Access into all cabinets & the components installed within cabinets, remain exclusive to Hyperoptic. No 3rd party access is permitted.

Which Communal Areas Are covered?

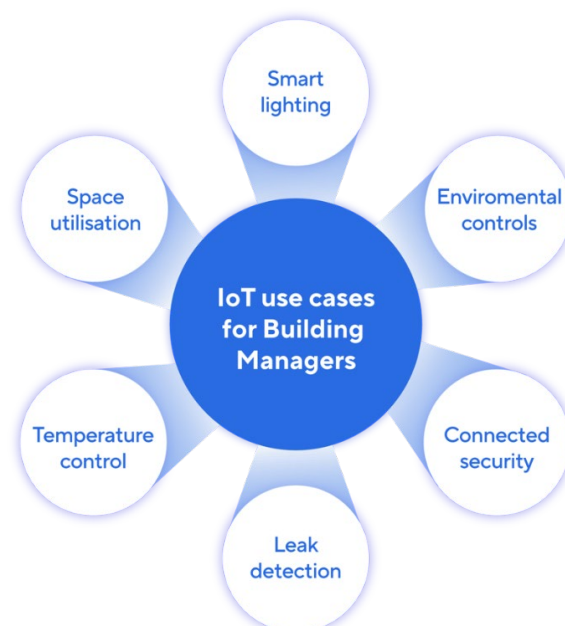
The Managed WiFi Product means site wide WiFi connectivity. As part of the design, we will allow for AP coverage in:

- Reception and concierge lobbies
- Residential corridors and lift lobbies
- Gyms, Spas, swimming pools
- Resident lounges
- Car parks, internal and external
- Electric vehicle charging point areas
- Communal workspaces
- Landlord areas, such as Plant rooms, Switch rooms, Post rooms, storage and delivery areas
- Communal open spaces, such as gardens, parks, roof terraces
- Play areas
- External open spaces, roof terraces & walkways
- Any other areas which the client identifies

The developer is to clearly identify any other areas needing to be covered.

Enabling Smart Building Technology

- The Hyperoptic Managed Wifi product is NOT a Managed Services network on which we design and build specific services, such as door entry, CCTV or Building Management Systems.
- However, our network allows for the access to smart building technologies, within a development, and to connect such devices through wireless connectivity if these devices and systems are Wifi capable.
- A typical Hyperoptic Managed Wifi deployment provides the Access Points and a Wifi network infrastructure, through which a building's Internet of Things (IoT) and smart technologies can be connected.



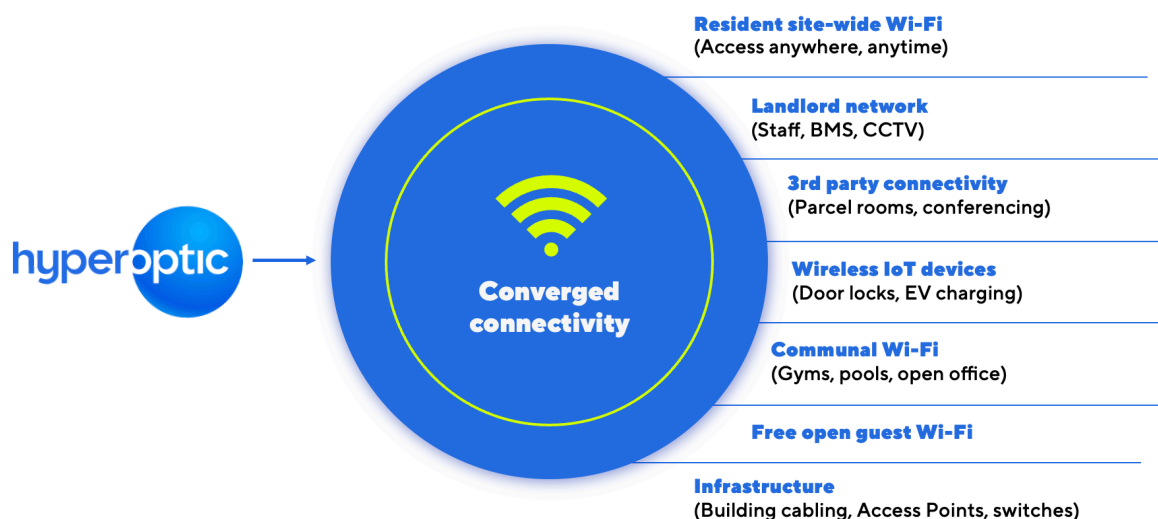
The Hyperoptic Scope in Brief

The Hyperoptic Managed Wifi solution offers a cabling and service solution for multiple occupancy residential and commercial environments.



- Hyperoptic work with developers to ensure that the residents, guests, and building managers have seamless access to the Hyperoptic WiFi network whilst roaming around the development.

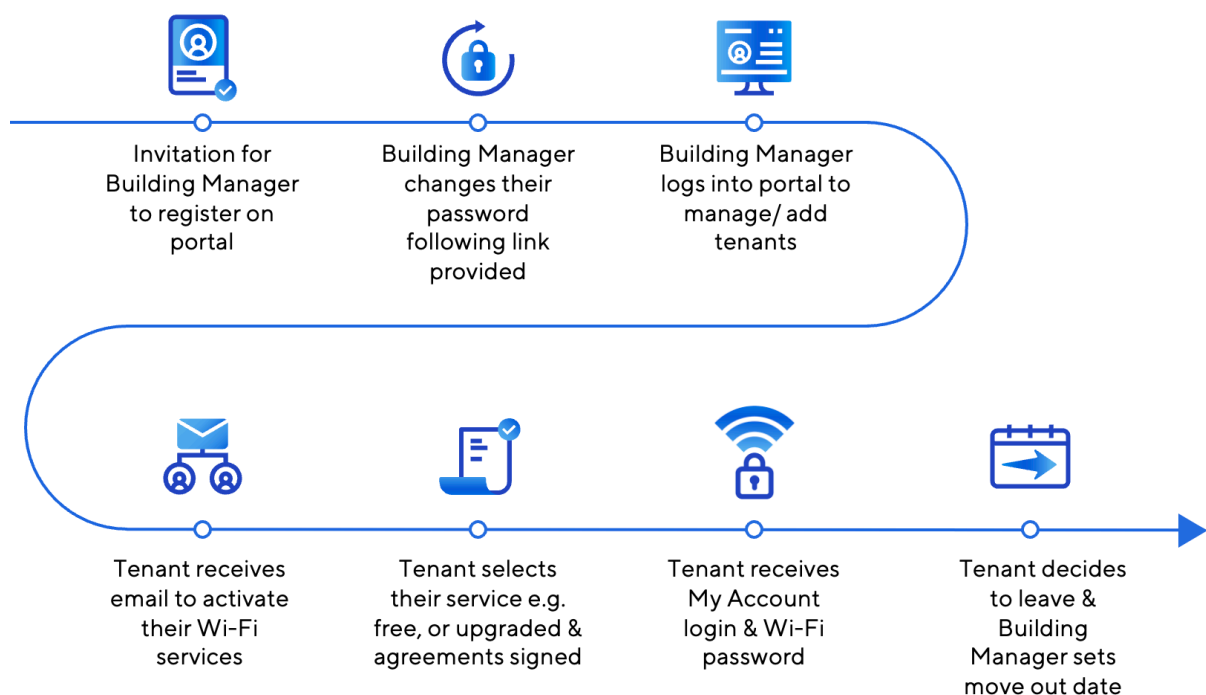
Converged network for tenants, staff and 3rd parties



- Hyperoptic will design and identify the infrastructure materials needed based on the information and drawings provided by the developer.

- As part of the design phase, we will undertake a predictive desktop survey to ensure the best possible placement of Access Points (AP) and the coverage needed to support multiple users and devices.
- Each Access Point will have a pre-wired data cable connected to it, and each AP is connected to our network and ready for service prior to Moving In or Completion dates.
- Hyperoptic will deliver the incoming backhaul fibre connection into the development from our external network or nearest Openreach exchange to our Parent DP-1a cabinet within the development.
- The DP-1a cabinet will be connected to Child DP cabinets which are designed to be in strategic areas around the development. It is from the DP cabinets that cable connections to the APs will be made.
- Child DP cabinets will be connected to the DP-1a Parent cabinet via optical fibre cables.
- Hyperoptic will free issue the cabinets and cables to be installed by the developer.
- Hyperoptic engineer teams will connect & test all cabling, fit the APs, install the equipment within the cabinets and commission the network.
- Hyperoptic will manage, guide and train building managers to help residents, staff and guests to be onboarded and connected.

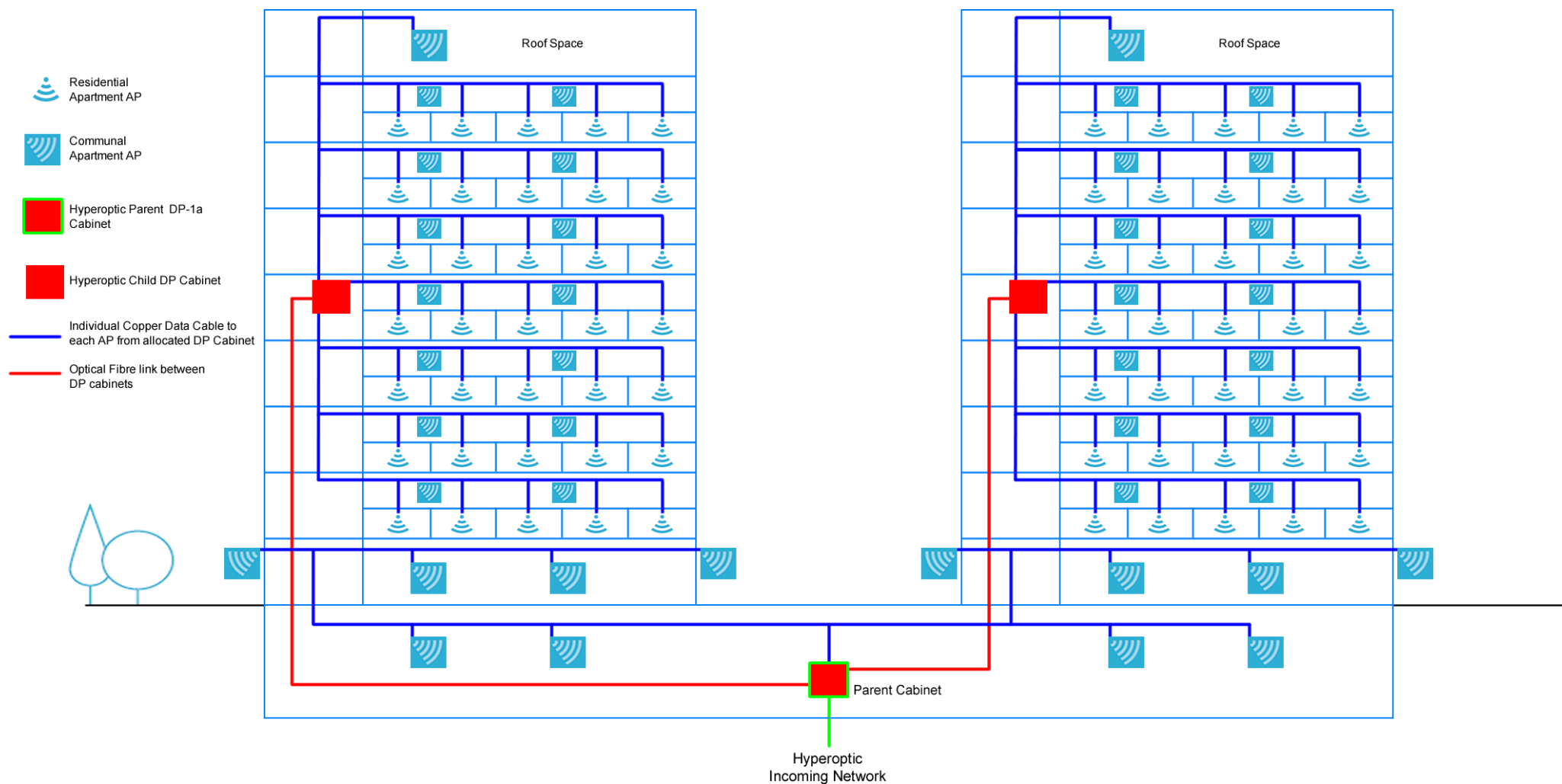
Onboarding building management & tenants



A full list of the tasks and responsibilities to be undertaken can be found in Appendix A (Tasks & Responsibilities Required to be Completed On Site)

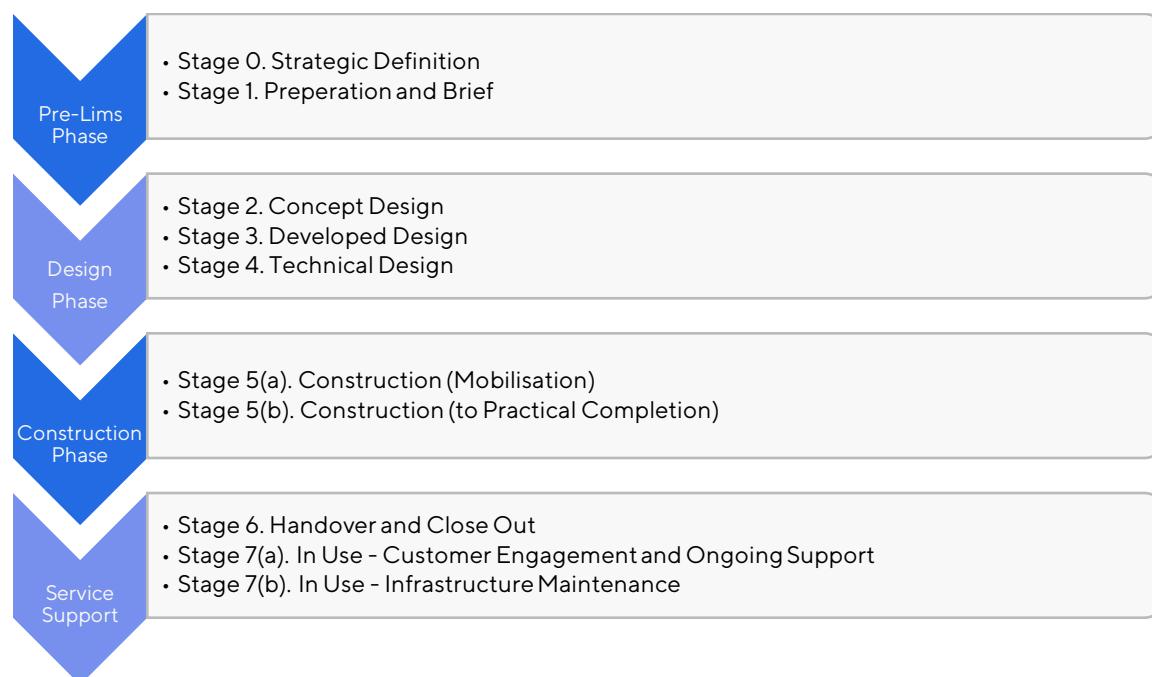
Infrastructure Overview

- Hyperoptic will deliver a dedicated Incoming Backhaul fibre connection from our external network directly to a Hyperoptic Parent data cabinet planned within the development.
- It will be from the Parent cabinet that the Hyperoptic network will be distributed around the development to Child cabinets.
- The cabinets will provide dedicated hardwired data cabling to each of the Access Points (APs).



Our Engagement Process

The Hyperoptic engagement process, following Royal Institute of British Architects (RIBA) Plan of Work 2020, organises the process of managing, and designing building projects and administering building contracts into key Work Stages. The sequence or content of Work Stages may vary, or they may overlap to suit the procurement method. Each stage has project requirements (Tasks, Updates or Deliverables) and Key Considerations. These stages have been assigned to one of four phases as illustrated in the Hyperoptic Engagement Workflow below:



The process allows for a Total Quality Management (TQM) framework that focuses on delivery of our products and services of the highest quality to maximise customer satisfaction and meet regulatory standards, even as our customer needs change. These include:

- Planning & setting targets
- Choosing methods to achieve plans & targets
- Monitoring progress
- Taking corrective action when necessary

Prelims Phase

Stage 0. Strategic Definition

For Managed Wifi, it is crucial for the client to provide the most up to date drawings, information & where service is required, to allow Hyperoptic to provide a robust design, budget & build strategy.

- Clear objectives & requirements to be confirmed between Hyperoptic & the client.
- Main activities to be completed by our pre-sales team include:
 - The collation of the project details
 - The definition of the client brief: (see Appendix B: Template New Site Information Sheet) identifies the information to be recorded.
 - The completed sheet will provide the basis for the project from which a Strategic Brief is issued.
 - The Strategic Brief assures us that the information we have collected is correct and our perception of your requirements agrees with your own.

Stage 1. Preparation and Brief

- Preliminary research will be conducted by Hyperoptic to establish if the project is viable.
- To assist in the development of the Project Brief.
- Identify the feasible options & any project risks.
- Agreement of the Project Brief.
- So that a detailed design can be progressed, the client provides:
 - Site plans & For Construction Drawings
 - Wall & ceiling construction (material composition) detail drawings.
 - Schedule of accommodation
 - Client technical team contact details

Supporting Documentation to Hyperoptic

A full allocation of drawing plans, information, especially where WiFi is needed, along with the accommodation schedule allows Hyperoptic to compile an informed proposal. Without these it is much harder to create an accurate portrayal of our installation.

In addition to the detail captured in the Site Information Sheet, we require the following drawings and information, **in CAD or PDF format**, to support completion of the Predictive desktop survey report, drawings pack & proposal document:

Documentation From The Developer

- [Site Plan](#) of the whole development and any additional phases to be considered.
- [Site Phasing Plan](#). To ensure the correct location of the parent DP-1a cabinet and to ensure that phases are made live based on the build program.
- [Full \(For Construction\) or \(Stage 4\) Technical Design\) General Arrangement \(GA\) floor layouts](#) to be able to plot the AP locations & generate a Predictive survey report.
- GA floor layouts should include lower levels such as basements, car parks etc. these will enable a view of the possible cabinet locations and the fibre link cable routes between the cabinets and any fibre enclosures. As well as any outdoor spaces needing coverage.
- [Wall & Ceiling construction \(material composition\) detail drawings](#).
- [Mechanical and Electrical \(M&E\) containment drawings](#) of all floor levels of all buildings including basement and lower level floor layouts.
- [Full Accommodation schedule](#) - to show the number of units and plot numbers per floor within each building and any numbers split on the individual floors, such as duplex units.
- [BT Openreach duct and chamber proposal drawing](#): Where the development is using an Openreach network to connect to buildings
- [The Site Wide Combined Services drawing](#): showing incoming & site wide telecoms routes.
- [Additional areas to be covered](#): Full list of locations of where the WiFi service is required. Such as: outdoor spaces, rooftop terraces, residential lounges, reception lobbies car parks, back of house areas, gym or landlord WiFi services.
- [Outdoor Areas Landscaping Layouts](#): To determine best locations for outdoor APs.
- [Outdoor Telecoms Routes](#): To determine where best APs can be placed & selection of the correct cable type.
- [Apartment type layout drawings](#): Typical unit layout drawings to help assess and suggest best coverage solution. Including any duplex units & penthouses.
- [Comms Rooms or similar](#): Locations of any Main Comms Rooms, Plant Rooms, Sub-Comms Rooms or Sub-Plant Room to best place our DP cabinets.
- Potential location of internal Parent DP-1A cabinet. To be within the first phase of the build and as close as possible to the Incoming Comms duct.
- [Risers](#): Ideally vented risers would be the best option when sub-rooms are not available. To avoid cabinets over heating causing outages. Cabinet Depth required 550mm + 100mm front & side clearance to access equipment within cabinets.
- [Site Services & User Onboarding](#): Please provide the preferred names & types of services to also be considered in the design. We need to know where these services are located, such as Staff, Residents &/or Guest.
- [Additional Service Points](#): Where other areas are needing coverage or a standalone network connection, to be considered and proposed locations. Such as retail and commercial units. As well as any services needing an enabling connection at their head-end, such as door-entry, CCTV etc.

Design Phase

Stage 2. Concept Design

The Concept Design is a response to the project brief. This phase details what we think we will do based on the construction drawings & information provided. This stage also includes the collation of indicative project costs. A Predictive Survey Report, drawings pack & proposal document illustrating our proposed solution is issued to the client, and on acceptance, project change control procedures are introduced.

Stage 3. Developed Design

This stage involves the detailed documentation of the major physical and engineering systems following coordination with the client contractors (e.g. design, mechanical & electrical etc.). The design drawings and outline specification will be developed with consideration for the proposed phased works (if any), the project's buildability strategy and site logistics. The project design, developed sufficiently to allow preparation of the cost plan, should aim to confirm at its conclusion the finalisation of:

- Infrastructure layouts, of the development and relevant phases
- Functional relationships, the phasing of the construction
- System relationships (including integration of/to any principal building systems and/or specialist systems).
- Sub-contractor relationships, where there is a necessary dependency on other contractors

The output of this stage will be a body of documents which will form the basis of the contract, and which will include:

- Master Services Agreement (if not already in place)
- Way Leave (Site specific appendix to sit under any relevant MSA)
- Install Agreement (Site specific appendix to sit under MSA)

Stage 4. Technical Design

Conclusion of the *Developed Design* shall ensure the business case; cost plan and design proposals have been reconciled and are consistent. At this point a site design meeting of the building(s) can be progressed, this will be coordinated by our Sales or technical team to ensure that the developed design can be formalised as a Technical Design.

The Design Team shall compile detailed technical data and information relating to the brief and will complete a hand-over to the Hyperoptic Area Delivery Manager (ADM) responsible for construction coordination.

The ADM will identify and prepare a schedule of all regulations and standards applicable to each of the proposed design solutions. Agreement of the design elements is critical to the success of the design process. With design development complete the output is structured

and documented as drawings and specifications to procure outstanding materials, equipment and construction resources to undertake the building work.

The Hyperoptic Designer shall maintain regular reporting throughout. Our ethos is to ensure all communication is: clear; concise; relevant; up to date; consistent; and transparent. Reporting will be delivered on request, with complementary updates throughout the critical delivery phases on request.

Construction Phase

Following agreement of the contract Hyperoptic will start gearing up, which includes the allocation of resource and materials.

- Planning, Scheduling and Supervision
 - A Hyperoptic **Area Deployment Manager** (ADM) will be assigned to the development.
 - The ADM will be your single point of contact for any on-site and/or technical support you may require from the proposal stage, through installation and onto go-live.
 - Hyperoptic Team Leaders will be briefed by the Client Project Manager and will be issued with a Risk Assessment and Method Statement.
 - The Hyperoptic representative will liaise with the contractors appointed supervisors to discuss any design, operational or Health and Safety Issues as appropriate.
 - The installation activities can be arranged to accommodate your overall building development plans to enable efficient coordination/scheduling of Hyperoptic and other sub-contractors.
 - The ADM will agree with you to a Schedule of Work prior to commencing any installation activities.
 - Hyperoptic provides PPE free of charge to all staff and their appointed contractors. The ADM will ensure that PPE is used as and when advised by the client or the client's representative. All staff are issued with appropriate PPE and are trained in its use.

Typical Site Considerations

- The client or clients Construction Design Management Coordinator (CDM) is responsible for ensuring all areas required for the installation of this network will be readily available for the Hyperoptic engineers.
- All areas with restricted access (fob or key access) will be either open or facilities are made for the Engineers to be provided with the fobs or keys.
- Cabinet locations, such as Comms rooms, plant rooms & sub-rooms are ready serviceable for equipment to be installed & made live during each of the build phases where request from the site has been made to the ADM for Hyperoptic to attend.
- Any potential delays will be reported back to the Hyperoptic contact immediately so that any delays are minimised.

Stage 5(a). Construction - Mobilisation

This stage sees the preparation of engineering resources. The production of programmes which align with the primary contractors Master Development Programme and the production of Risk & Method Statements (RAMS) and Hyperoptic Network *Site Configuration Files & Build Tracker*.

This phase is the first client engagement with the Hyperoptic Area Deployment Manager (ADM), this will include:

- Introduction to and discussion with the Site Manager/M&E Manager/Electrical Sub-Contractor to ensure all parties understand the installation methodology and agreed the scope.
- Time scales for first and second fix of cabling and ductwork completion to be reviewed in case of programme change.
- Readiness of the DP Cabinet locations & expected timeframes for readiness.
- Hyperoptic Engineering force to be engaged and secured.
- Installation information and RAMS to be given to the Hyperoptic Lead Engineer for familiarisation.
- Free issue of materials to be delivered to site for 3rd party contractors to install.
- 2 weeks' notice is required to ensure delivery in good time.
- It is imperative that any change to the programme is communicated to the Deployment Manager in good time to allow for changes to mobilisation.

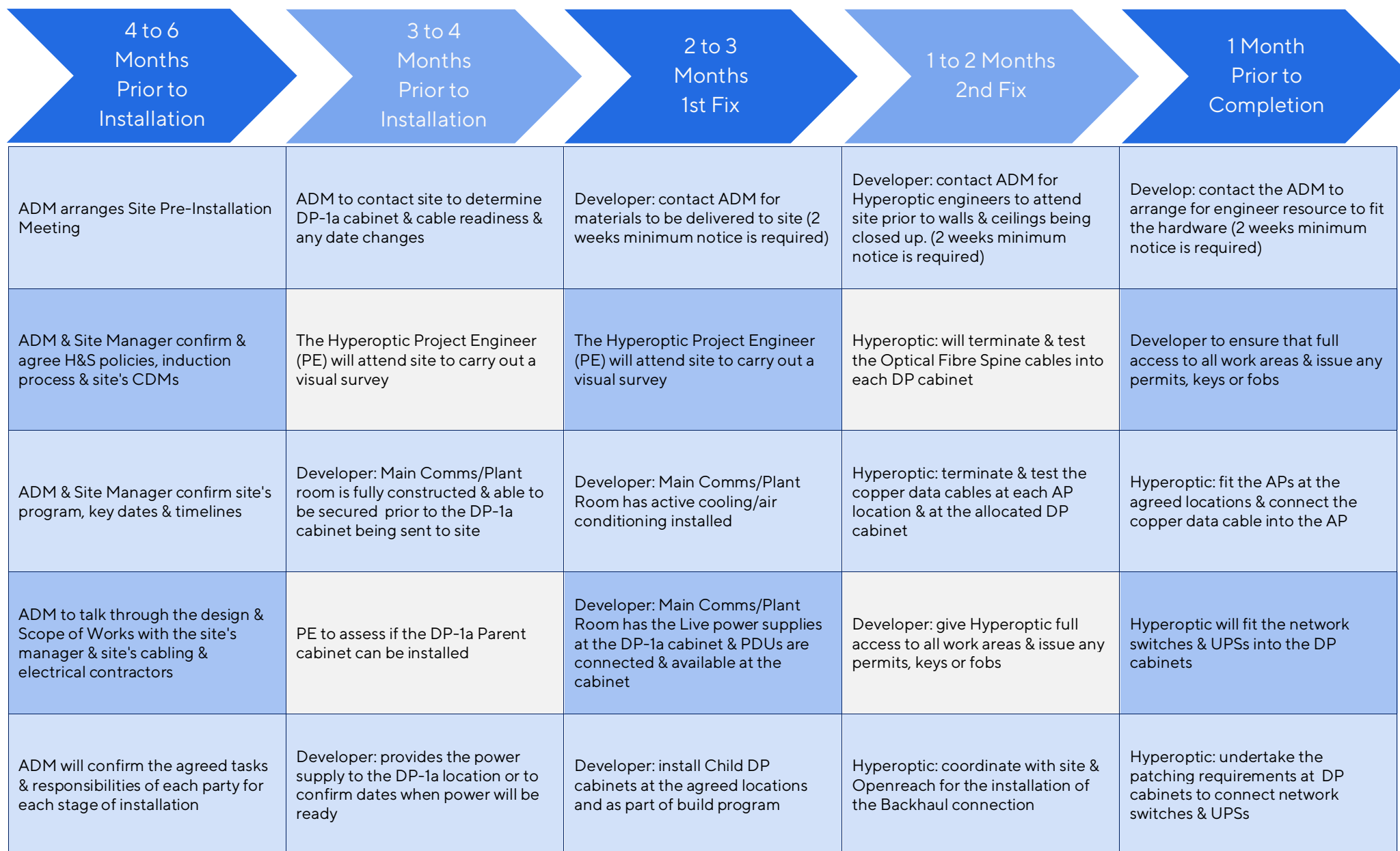
Pre-Installation Key Dates

Hyperoptic understands that each site is different, and the dates & timeframes set may move.

- It is critical for the developer to ensure that the agreed enabling works needed for the Managed WiFi infrastructure installation must be completed to allow Hyperoptic to meet the agreed installation works & to activate the network.
- Any delays to enabling works being carried out or changes to these dates must be communicated to Hyperoptic as soon as possible.

The below chart gives the typical timelines and the on-site activities to be carried out.

Typical On Site Activities Timeline Flow



ADM will confirm the enabling works needed to be undertaken by the developer prior to 1st & 2nd Fix through to equipment installation & commissioning	Developer: install "lead-in" telco duct & containment routes from the site boundary to DP-1a for the Backhaul connection to be installed	Developer: provide Child DP cabinets locations with active cooling/air conditioning or vented airflow	Developer: give full access to the duct & containment routes to install the Backhaul cable to the DP-1a cabinet	Hyperoptic: activate the network service to each AP & test the connectivity back to the allocated DP cabinet
ADM & Site Manager confirm & agree DP-1a & Child DP cabinet locations & power with expected timeframes for readiness	Developer: confirm when site telco ducts will be connected from the site boundary to the external Openreach network	Developer: install 13 Amp unswitched fused spur power supply to each of the Child DP cabinets & connect the free issue PDU. PDU to be left in cabinet	Openreach &/or Hyperoptic to test & make live the Backhaul connection at DP-1a	Developer: restricted access into the Hyperoptic DP cabinets to Hyperoptic staff only
ADM will take the developer's cable contractors through the cabling methodologies & install best practice	PE to confirm that the developer has made the Backhaul route accessible & it is clear of any obstructions	Developer: Child DP cabinet locations have secure, lockable doors with restricted access	Developer: update ADM or PE to any changes to date & changes to the Hyperoptic design (Any changes to design must be given in writing to Hyperoptic to agree)	Developer is to ensure that no other services are connected into our DP cabinets other than the agreed Hyperoptic service as designed.
ADM prepares & issues 1st Draft RAMs to his Project Engineer & to Site	PE to check the readiness of the developer owned cables routes so that cables can be ordered to site	Developer: install & label the free issued Optical Fibre Spine cables between the DP-1a & Child DP cabinets		Hyperoptic will "Soak Test" the network & APs to ensure that there are no issue & to resolve any issues
ADM confirms materials to be delivered to site & storage requirements & the POC to receive delivery	PE to order cables & cabinets to site as required (2 weeks minimum notice is required for delivery of materials)	Developer: install & label the free issue copper data cables from the allocated DP cabinet to each individual AP location		Hyperoptic will carry out a "Post Installation" of all installed & active equipment to ensure the coverage & Hyperoptic standards are met
Developer to update ADM or PE to any changes to date & changes to the Hyperoptic design (Any changes to design must be given in writing to Hyperoptic to agree)	Developer to update ADM or PE to any changes to date & changes to the Hyperoptic design (Any changes to design must be given in writing to Hyperoptic to agree)	Developer to update ADM or PE to any changes to date & changes to the Hyperoptic design (Any changes to design must be given in writing to Hyperoptic to agree)		Hyperoptic will carry out a training program to educate building managers & others to the onboarding methods & processes to activate users & services to the Managed WiFi network

Stage 5(b). Typical Construction – to – Practical Completion

This phase translates to the Completion Certificate into a finished product. The deliverables from this stage shall be tested and evaluated in view of the client requirements and project objectives. Fixed design and consideration of time and cost constraints should ensure limited change during this stage.

In the case of 3rd party Installations

Communication with the Hyperoptic Area Deployment Manager is paramount at this stage.

- Updates regarding the progress of the first fix installation and the timeframes for the second fix are required to be transmitted regularly to ensure Hyperoptic achieve the milestones set by the Build Programme.
- Delivery of the ducting from the external site to the Comms intake location is critical to ensure day one connectivity. (Please see “The Incoming Backhaul Connection” section of this document).
- Once the cabinets are installed and the first fix is complete, then Hyperoptic engineers will attend site to terminate cabling and final test the cabling to ensure that the installation is suitable to transmit our service.
- Hyperoptic will install and commission the network active equipment, APs and any routers needed to connect to the Hyperoptic network and conduct a soak test to ensure the connection to the wider network is stable.

In the case of Hyperoptic Installations

Communication with the Hyperoptic Area Deployment Manager is paramount at this stage.

- Updates regarding the program change for the first fix installation and time frames for the second fix are required to be transmitted regularly to ensure Hyperoptic achieve the milestones set by the Build Programme.
- Delivery of the ducting from the external site to the Comms intake location is critical to ensure day one connectivity. (Please see “The Incoming Backhaul Connection”).
- Hyperoptic Engineers install the first fix cabling in line with the Build Programme to the agreed location of each AP and between the Hyperoptic cabinets and any fibre enclosures where applicable.
- Hyperoptic engineers will attend site to terminate cabling and final test the cabling to ensure that the installation is suitable to transmit our service.
- Hyperoptic will install and commission the network active equipment, APs and any routers needed to connect to the Hyperoptic network and conduct a soak test to ensure the connection to the wider network is stable.

The Hyperoptic Area Delivery Manager (ADM) throughout the Mobilisation and construction period shall ensure that:

- The required handover activities that were planned and detailed during earlier project stages are undertaken.
- All stakeholders in the handover process are involved throughout these stages.
- The monitoring and reporting of all costs associated with the handover is maintained.
- Any necessary certification from external agencies is obtained.

Retrospective Installations (Part 1: Scope)

In the instance where the installation of the Managed WiFi network has been delayed, requirements added or where client engagement & wayleave has been agreed post construction/completion. Then it may be necessary for Hyperoptic to:

- Carry out an extensive on-site survey to view cabinet locations, cable routes, AP locations & power distribution boards.
- The survey will identify any risks & hazards so that the RAMS can be created & agreed.
- Install fire rated ceiling access hatches, if there are none available, to be able to access the cable routes.
- Install all the optical fibre cables to link the data cabinets to the Parent cabinet.
- Install all the copper data cabling from the allocated DP cabinets to each individual AP.
- Install the APs.
- Install the DP cabinets.
- Install the power supply to each cabinet.
- Test & certify the electrical works to the latest standards.
- Earth bond each cabinet.
- Install any additional containment routes.
- Undertake any fire sealing where cable routing requires existing fire seals to be breached.

It is absolutely critical for site manager or building manager to communicate with the Hyperoptic Area Deployment Manager to coordinate:

- The Hyperoptic scope of works
- Timeframes
- Health & Safety requirements
- Any enabling works & access to work areas.

Retrospective Installations (Part 2: CDM Compliance)

Where it is agreed with the client and Hyperoptic, whereby Hyperoptic is to be the Principal Designer and the Principal Contractor for Retrospective works after the developer's completion, then, Hyperoptic will comply with The Construction (Design and Management Regulations 2015 (CDM 2015) to govern the management of health, safety and welfare when undertaking such projects.

Hyperoptic will send to the client an "Active Client Appointment" letter to be signed by the client and returned to confirm the agreement and appoint Hyperoptic as the Principal Designer and Principal Contractor for our installation works.

However, if the works fall within the client's own CDMs coordination, then Hyperoptic will comply with the policies and processes set out to them by the client or client's appointed representative.

Practical Completion

The client contract administrator certifies practical completion when all the works described in the contract have been carried out, including the any relevant snagging period.

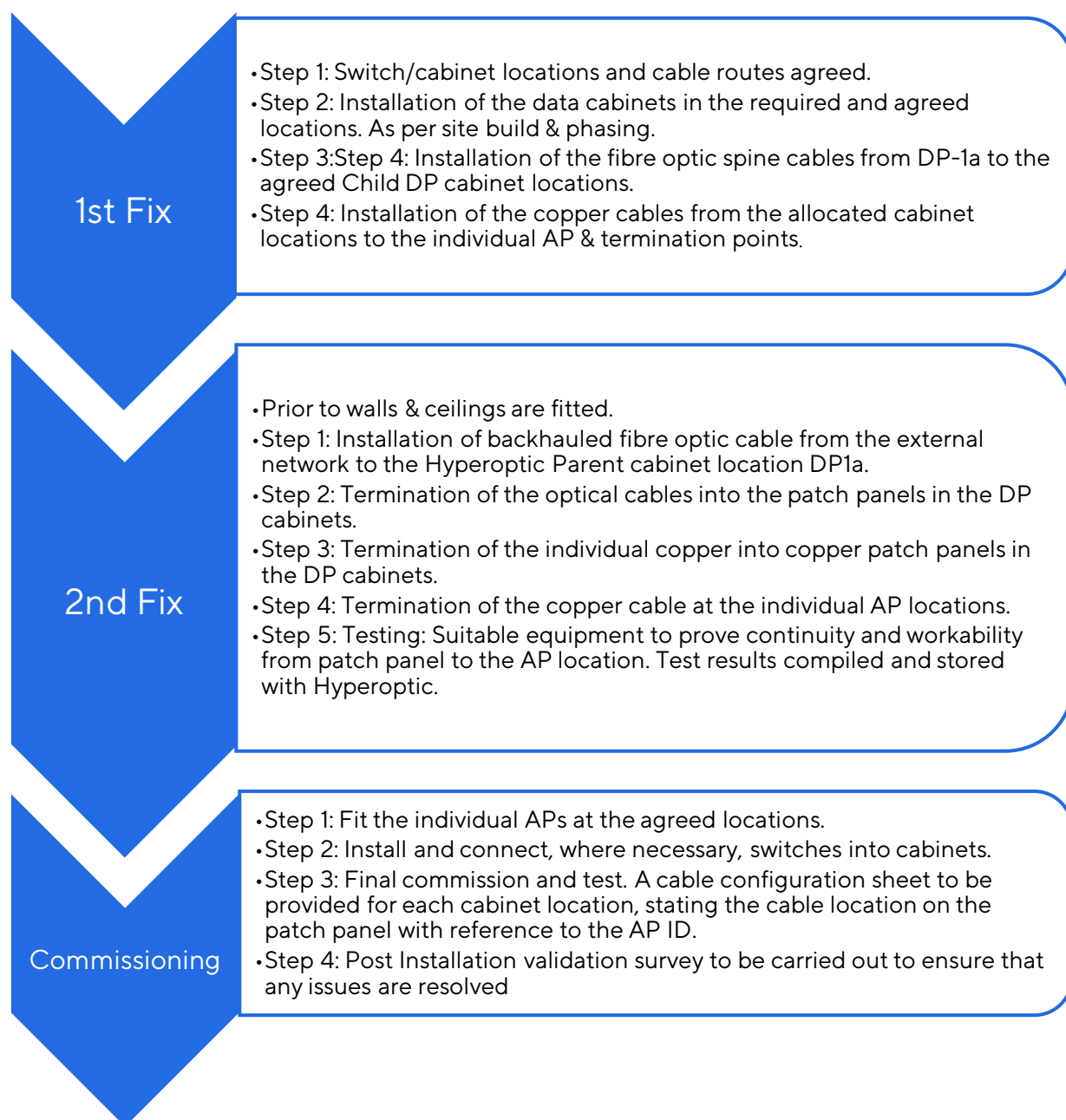
Installation Procedure

A Hyperoptic Area Deployment Manager (ADM) will be assigned to each site. The ADM will be your single point of contact for any on-site and/or technical support you may require from the proposal stage, through installation and onto go-live.

The installation activities can be arranged to accommodate your overall building development plans to enable efficient coordination/scheduling of Hyperoptic and other sub-contractors. (Please see Appendix B for Tasks and Responsibilities within a development).

The ADM will agree with you a Schedule of Works prior to commencing any installation activities.

The typical installation process is described in the below diagram:



- At the end of the installation the ADM will perform a site walkthrough ensuring that any issues are addressed.
- The ADM is also responsible for ensuring that all test results and any changes to the proposal are captured in an “As Built” document pack. This is an internal Hyperoptic document to ensure that once installation is complete and our service is live, Hyperoptic can fully support and manage our network in your building.

All Hyperoptic data engineers are trained and CSCS accredited. You should advise your ADM if you have any specific training/accreditations/qualification requirements for on-site Hyperoptic personnel.

Service Support Phase

Stage 6. Handover and Close Out

Post-construction activities following practical completion. Handover of all **'As constructed'** information, including any relevant quality certificates for work completed by Hyperoptic or our sub-contractors, final accounting, and project closure procedures. This phase includes our continuing engagement with you for the support and maintenance of the delivered infrastructure and with the end-users of the Hyperoptic product.

In Use Phase

Stage 7(a). In Use – Consumer Engagement and Ongoing Support

On sites where 100% of the ongoing WiFi service is paid for centrally by the client on behalf of all residents and where building management is present:

Customers should engage with their building management who will place their service order, this can be requested prior to moving in or upon arrival. Building management should call Hyperoptic client support on **02033 319 1471** or email: client.support@hyperoptic.com. Base packages are included FOC as paid by the building management company.

In a situation where a customer would like to cancel their service with Hyperoptic they should engage with their Building Management company in the first instance to process the termination. The customer will receive an email to confirm their termination acceptance including any upgraded services taken. Further details with regards to cancellation terms can be found by consulting our terms of service, located on our website.

On sites where non-100% service has been agreed, with no building manager present:

Customers should visit www.hyperoptic.com to place their service order. Alternatively, should they require assistance with ordering or would like to pre-order services prior to moving in they should contact Hyperoptic customer support on **0333 332 1111** and select **(option 1)** and one of our agents can assist with placing an order.

Assuming a Free of Charge (FoC) trial period offer is extended to a customer; a contract will be entered with Hyperoptic if no notice is given to Hyperoptic prior to the offer expiring. A 9-month contract will be entered after which rolling monthly service agreement terms will apply.

Customers should take notice of the expiration of their trial period and ensure the 30-day notice period is observed to avoid entering standard contract terms.

In a situation where a customer would like to cancel their service with Hyperoptic they should contact our customer support team by calling **0333 332 1120**, 30 days prior to their desired service end date. Customer support will require confirmation of the cancellation request by

email upon acceptance of cancellation. Further details with regards to cancellation terms can be found by consulting our terms of service, located on our website.

The below statements are true for both 100% and non-100% customers:

In most instances, the customer premise will already contain the necessary infrastructure to support instant activation of service (Hyperoptic active equipment).

Within New Build sites we aim to provide both the active termination point and Customer Premise Equipment (CPE) for Day 1 occupancy.

As a standard Hyperoptic shall provide access to the Hyperoptic internet to all residents, and a Hyperoptic CPE to anyone who places a service order.

Residents are encouraged to visit www.hyperoptic.com and view our residential terms and conditions for details on provisioning of speed, SLAs and so on. Should any resident take service with Hyperoptic they will be able to access our support centre by calling **0203 995 3330** or by emailing business.support@hyperoptic.com. Customers may also raise a support ticket through our customer portal. Our support centre operates 24/7 365 days for most customer queries.

Customers may upgrade or downgrade their subscription via their My Account login or by contacting our customer support team, who can support one policy change per calendar month. Please be aware that downgrading your policy restarts the original contract period, upgrades do not affect the contract length.

Stage 7(b). In Use – Infrastructure & Network Maintenance

Hyperoptic perform:

24x7 proactive monitoring of active network components (e.g. switches, APs, UPS)

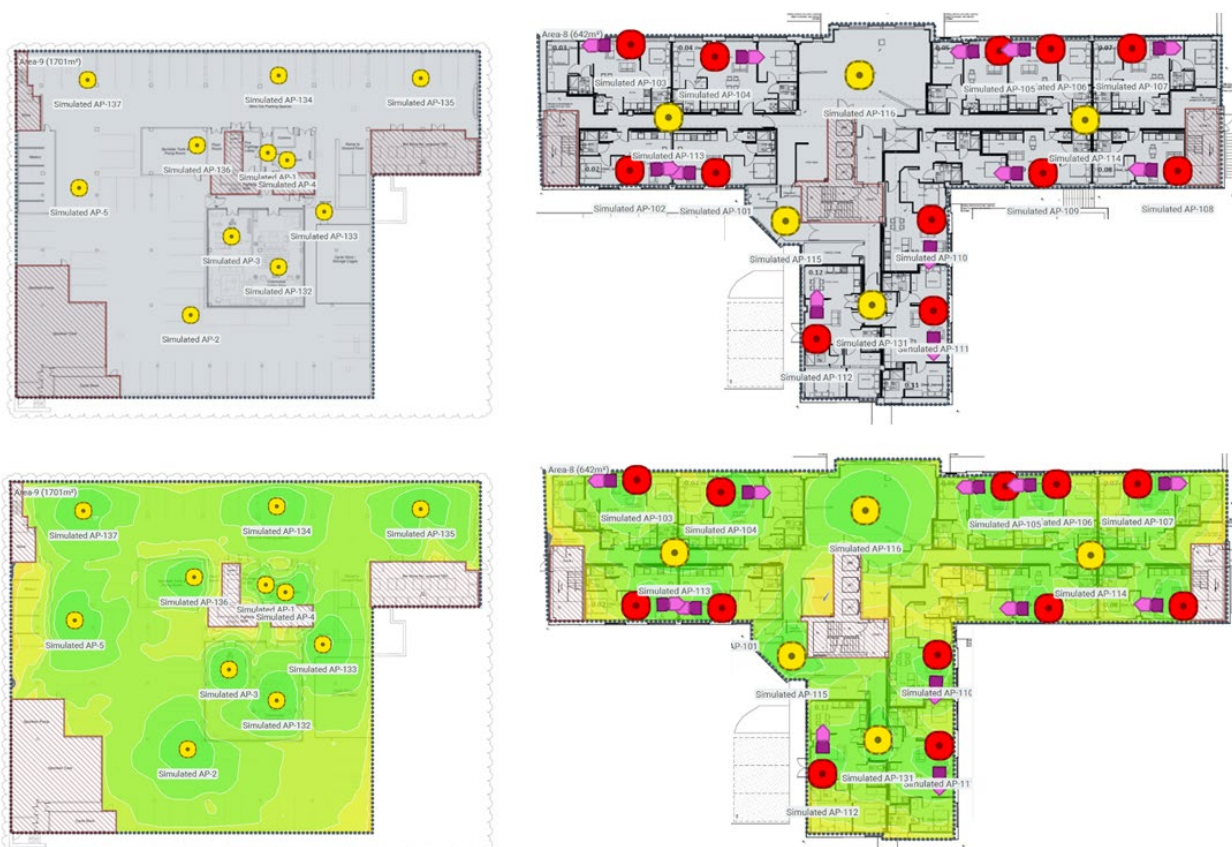
24x7 proactive monitoring of network utilisation

24x7 Emergency field engineer call-out

The Hyperoptic Design

The Hyperoptic desk top design is compiled from the drawings and information provided by the developer or appointed representative.

Hyperoptic will carry out a predictive desktop survey to plot the AP locations and generate a WiFi coverage map for each floor.



A design drawing pack will be issued to the developer to show the cabinet locations and cable distribution to be installed, as well as the floor layouts with AP locations.

For the process to move forward efficiently Hyperoptic would like to have the site-specific design reviewed and confirmed to its workability by the developer or his appointed representative. Once this concept has been commented on and any amendments made, Hyperoptic will move the design to a developed design status.

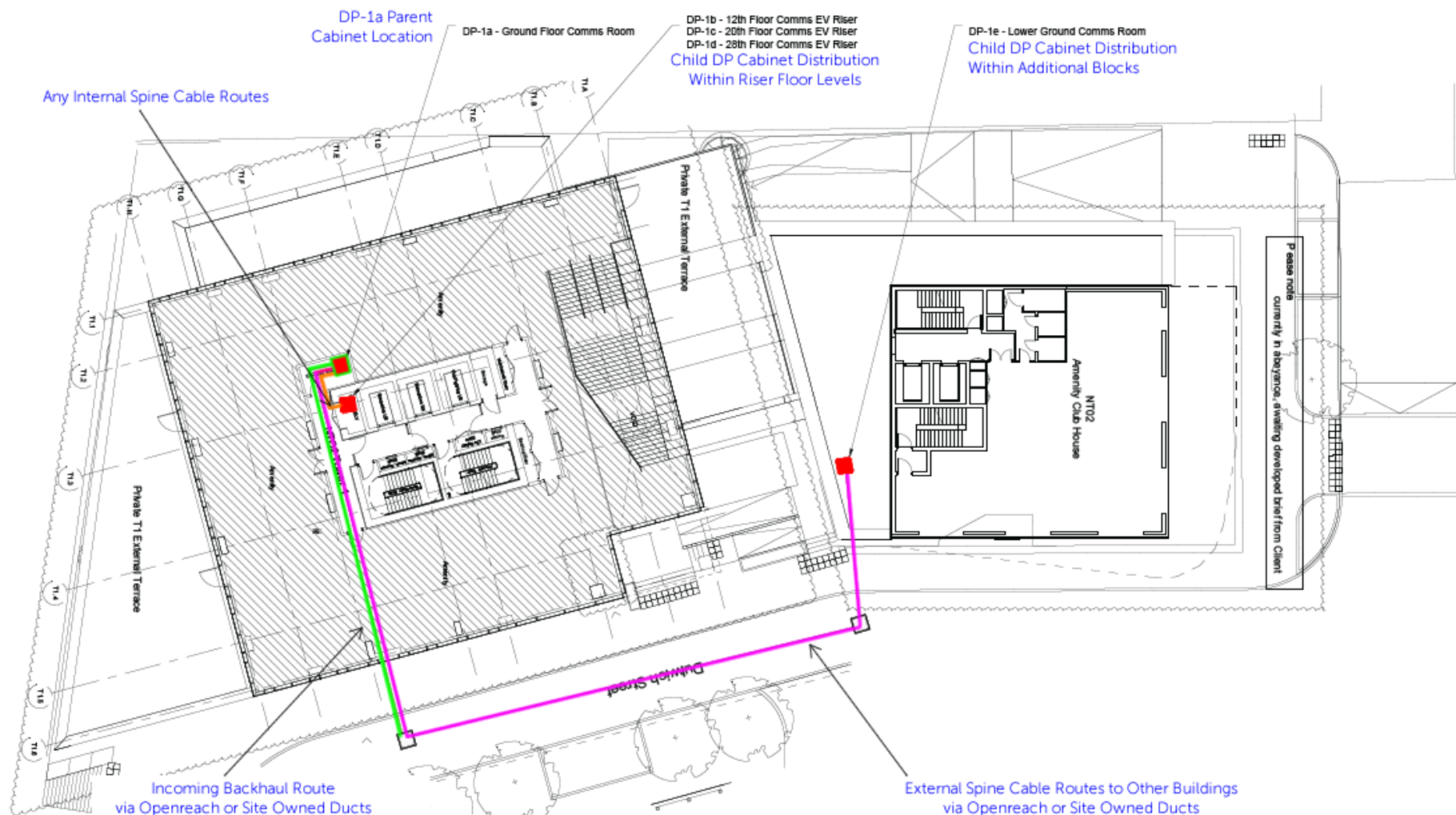
At the developed stage of design, if there are any further changes to the build design or additional service requests then Hyperoptic should be made aware so that the design is updated, and any actions and additional materials are captured.

It is beneficial to have the Hyperoptic solution incorporated into a development's design specification and if timing is appropriate, included into the tender package of the M&E contractor for the installation of the cable network & cabinets.

Design Pack Example: Site Wide Layout

The annotated Site Layout GA drawing is created from the drawing provided by the developer.

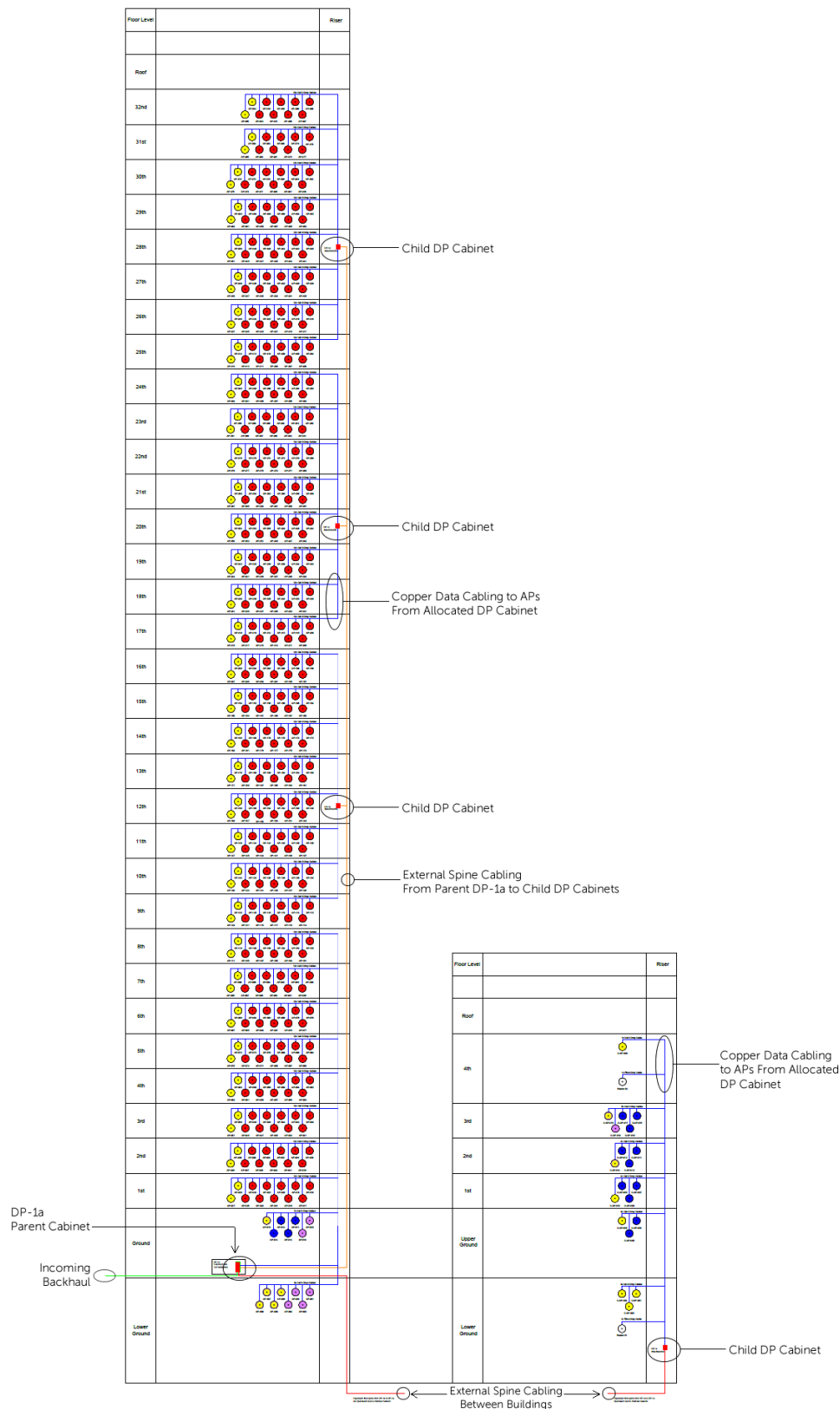
It is included in the design drawing pack & shows how the backhaul & spine will be distributed around the development. Along with the DP locations.



Design Pack Example: Cabling Schematic

The Cabling Schematic drawing is created from the information by the developer & the predictive desktop survey. It is included in the drawing pack.

It shows the DP cabinet locations, the spine distribution cabling to cabinets, the AP types & their IDs & the copper cabling from APs to their allocated serving cabinet.



Heat Mapping: Desktop Predictive Survey

Hyperoptic use a Wireless Network Planning tool.

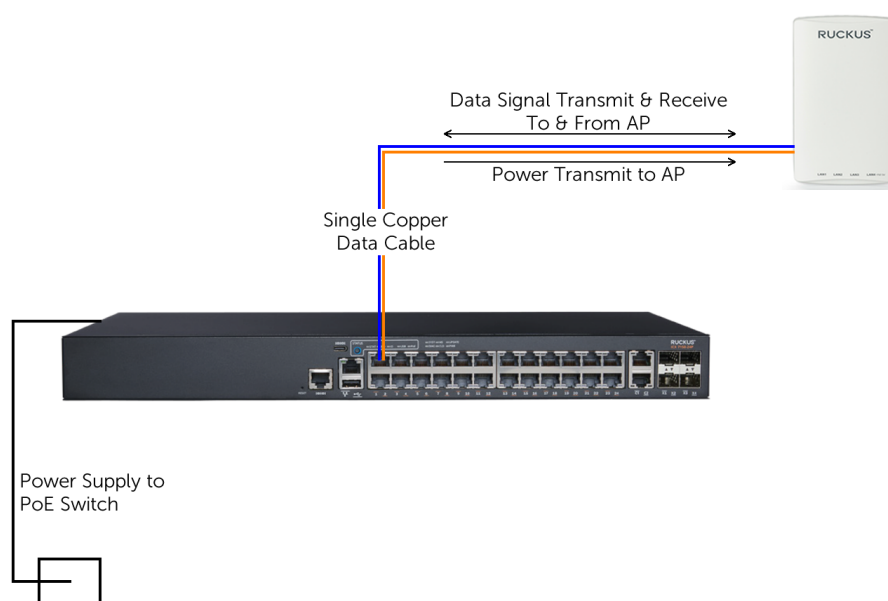
- This is a desktop tool which also has a site survey capability when connected to its supported survey device.
- The tool allows us to automate much of the planning process and to predict the best coverage.
- The Wireless Network Planning tool allows us to pre-determine the number of access points as well as the optimal location where AP should be installed.

The WiFi Standard

Wifi 6 standard, also known as 802.11ax, is the wireless standard adopted by Hyperoptic. It is faster than the previous Wifi standards. Wifi 6 is the latest standard which has been developed in response to the growing number of devices requiring Wifi connectivity. It provides better performance in congested areas, from packed venues, workspaces, to your own device-packed home.

What is Power over Ethernet (PoE)?

- Power over Ethernet (PoE) is a term used to describe a set of standards that allows DC electrical power and data to be transmitted simultaneously along the same cable to an Access Point.
- It removes the need to provide a separate electrical power source at the AP.
- The PoE solution provides both data and power to the AP via a copper data cable.
- Power is distributed to APs via the dedicated PoE enabled switches installed within the Hyperoptic cabinet.
- This allows for multiple APs to be connected to the network from a central distribution point.
- Installation and maintenance are simplified and kept within Hyperoptic's control.
- Therefore, a Power over Ethernet (PoE) solution to Access Points is the preferred solution.



The Hardware

Hyperoptic have chosen the Ruckus brand for APs and switch hardware used in our design and deployment plan.

The Ruckus SmartZone

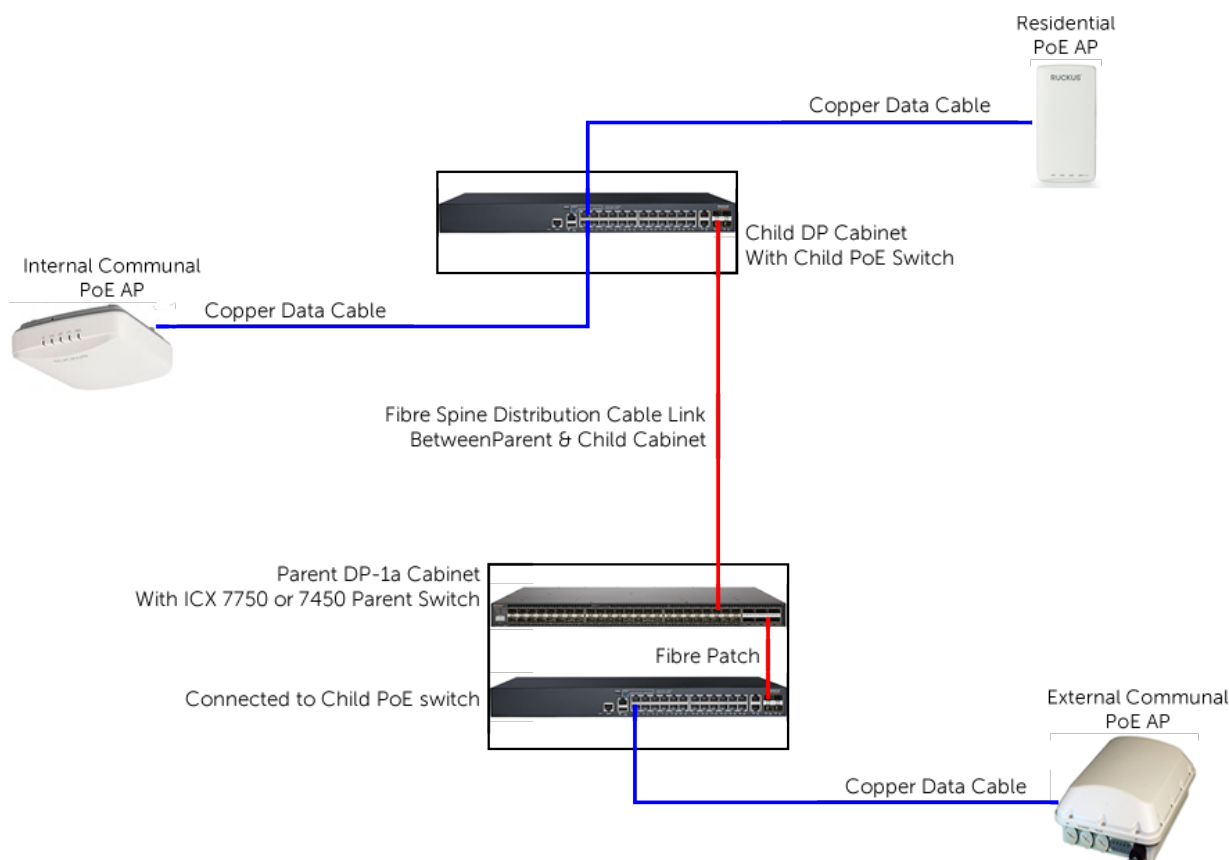
- Hyperoptic use the Ruckus SmartZone Network Controllers to simplify network and AP setup, management, enhance security, minimise troubleshooting and ease upgrades for Ruckus APs and switches.
- It is a Virtual SmartZone (vSZ) which has NFV-based and Cloud ready WAN controllers for service providers.
- The Ruckus product offers a managed and licenced “based” hardware and Cloud provisioning, as well as support through our own management portal.
- Therefore, it is necessary to provide a “Gateway” hardware solution that connects our physical AP infrastructure to the Cloud based network.

The Ruckus Switches

- The Ruckus ICX family of switches work together to simplify our network set-up and management. They offer enhanced security, minimise troubleshooting and make upgrading easier.
- The switches are designed to handle next generation WiFi 6 & future wireless technology. They support multigigabit APs at increased data speeds & offer 10Gb + uplink capability.
- These switches work seamlessly with the Ruckus SmartZone network controllers, APs and Ruckus Cloud to deliver high-performance to deliver cost effective unified wired and wireless access solutions.
- They provide Core, Aggregation and Access connectivity whether the requirement is for a single switch or a site wide network using multiple switches. To provide flexibility and investment protection.
- These switches are easily stacked, mounted and connected into the Hyperoptic DP cabinets by the Hyperoptic engineers.
- Switch type selection is dependent on the information provided by the developer, the number of APs designed and the services needing WiFi connectivity.
- Each Access switch is connected to the Hyperoptic network via an optical fibre connection.
- The Core & Aggregation switches are connected to our external network via the incoming backhaul connection within DP-1a.

Typical Parent – to – Child Switch – to – AP Connectivity

A basic overview of how switches are interconnected to service APs.



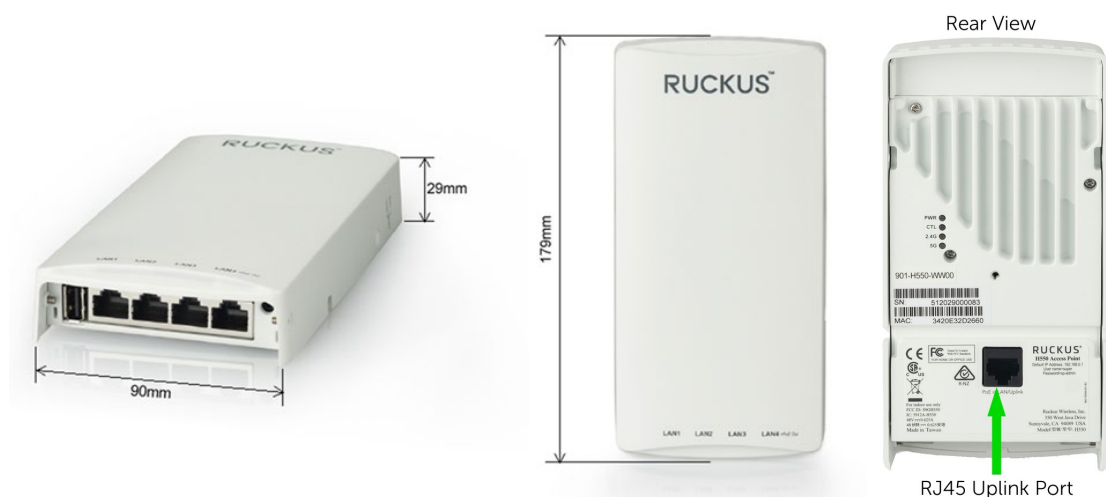
Which Access Points (APs) Do Hyperoptic Use?

Hyperoptic uses a variety of Ruckus APs for smart management of the WiFi network through the Ruckus SmartZone Network Controllers. The selection of the following AP types gives us the ability to service commercial, communal and residential environments.

Access Point Type	Uses
Hyperoptic Branded H550	Apartment AP
Hyperoptic Branded R350	Indoor Communal AP Also used as an additional AP in large apartments to improve coverage
Hyperoptic Branded R650	Indoor Communal AP
Hyperoptic Branded T350c	Outdoor Communal AP
Hyperoptic Branded T750	Outdoor Communal AP

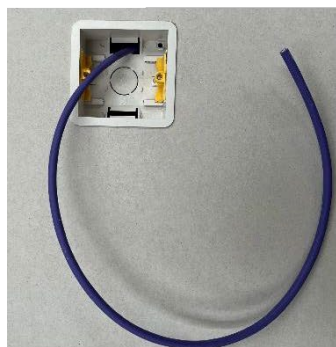
The Ruckus H550 Indoor Access Point:

1. The H550 is the preferred AP to be used within residential properties.
2. Ideal for hotel rooms and student residences.
3. The H550 is wall mounted, only, over a standard single gang dry-lining pattress back box.
4. **Surface mounted back boxes are not to be used to mount the H550 on.**
5. Cannot be installed within utility cupboard as this will give poor coverage.
6. Power over Ethernet (PoE) enabled.
7. Has 4x RJ45 Ethernet ports and 1x USB port.



The H550 Wall Mounting Plate

The metal back plate allows the Access Point to be securely fitted to a wall.
The plate is to be fitted over a single-gang flush mounted backbox.
This allows the data cable to be connected directly into the back of the H550 without the need of a faceplate.



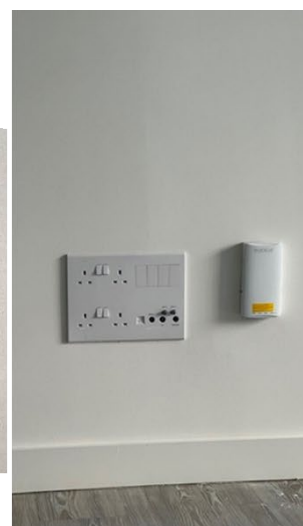
Incoming Data Cable
with RJ45 Plug Fitted



The Mounting Plate is screwed to
the flush mounted back box & an
RJ45 plug is fitted to the cable end



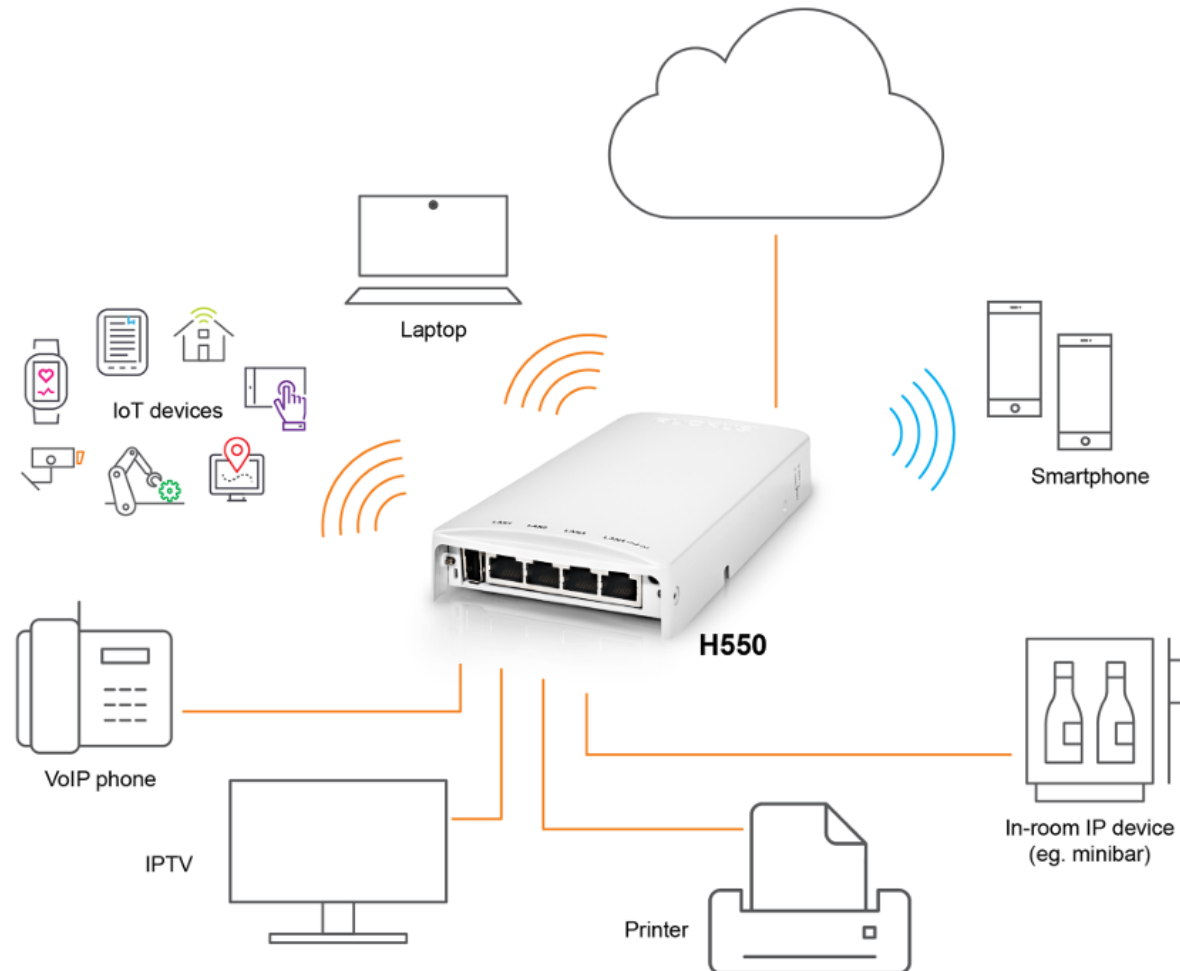
The cable is plugged into
the back of the H550



H550 hooks securely
onto the back plate

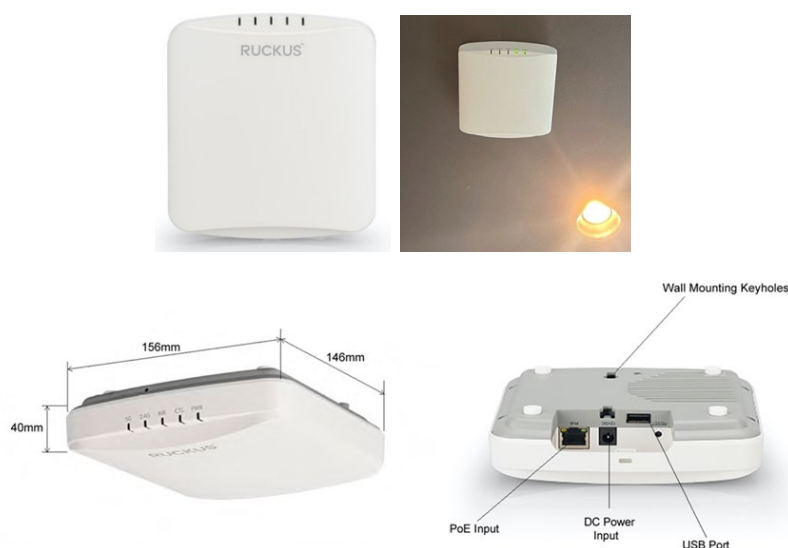
The H550 Wired & WiFi Convergence of Home Devices:

The H550 AP allows the resident to connect to wireless capable devices & smart home technologies. The 4 RJ45 data ports allow for bandwidth hungry devices to be connected directly to the H550.



The Ruckus R350 Indoor Access Point:

1. The R350 is the preferred AP to be used in Internal communal areas of a development.
2. Ideal for office areas or communal areas such as gyms, resident lounges, reception areas, bars, and restaurants.
3. The R350 is also used as an additional AP in residential properties where extra Wifi coverage is needed to cover blind spots.
4. The R350 can be mounted horizontally to the ceiling or wall mounted above 2.5m.
5. Fixed directly onto a fixed ceiling, ceiling grid or tray work using appropriate bracket types depending on the ceiling type.
6. Power over Ethernet (PoE) enabled.



The Ruckus R650 Indoor Access Point:

1. The R650 is a powerful AP used in busy Internal communal areas of a development.
2. Ideal for office areas or communal areas such as gyms, resident lounges, reception areas, bars, and restaurants.
3. The R650 can be mounted horizontally to the ceiling or wall mounted above 2.5m.
4. Fixed directly onto a fixed ceiling, ceiling grid or tray work using appropriate bracket types depending on the ceiling type.
5. Power over Ethernet (PoE) enabled.



The Ruckus T350c Outdoor Access Point:

1. The T350c is the preferred AP to be used in External communal areas of a development.
2. Ideal for outside areas such as car parks, residential outdoor spaces, and outdoor venues and campuses.
3. The T350c is best mounted above 2.5m (to protect from vandalism) vertically to a post or building structure using its versatile bracket options.
4. The T350c can also be mounted horizontally and is able to be adapted using the inbuilt adaptive antenna system.
5. Power over Ethernet (PoE) enabled.



The Ruckus T750 Outdoor Access Point:

1. The T750 is a powerful AP used in busy External communal areas of a development.
2. Ideal for outside areas such as car parks, residential open spaces, outdoor venues and campuses.
3. The T750 is best mounted above 2.5m (to protect from vandalism) vertically to a post or building structure using its versatile bracket options.
4. The T750 can also be mounted horizontally and is able to be adapted using the inbuilt adaptive antenna system.
5. Power over Ethernet (PoE) enabled.



Fitting the APs

- The APs will be installed & connected to the network by Hyperoptic teams.
- The AP locations are determined by Hyperoptic from the Predictive desk top Heat Mapping survey to give the best coverage possible, within each area identified by the client.
- It is crucial that the physical installation of each AP is to be at the locations shown on the accompanying site-specific drawing pack & coverage report document.
- If APs are NOT placed as designed, then Hyperoptic may NOT be able to ensure the necessary coverage required.
- Any change to the locations or the potential to hide APs within ceilings, walls, or enclosures, will need to be communicated to Hyperoptic in writing to validate and to mitigate any potential impedance of coverage.
- APs will only be installed once plastering, tape & jointing & painting works have been completed by the developer.

Best Practice for APs in Communal Areas

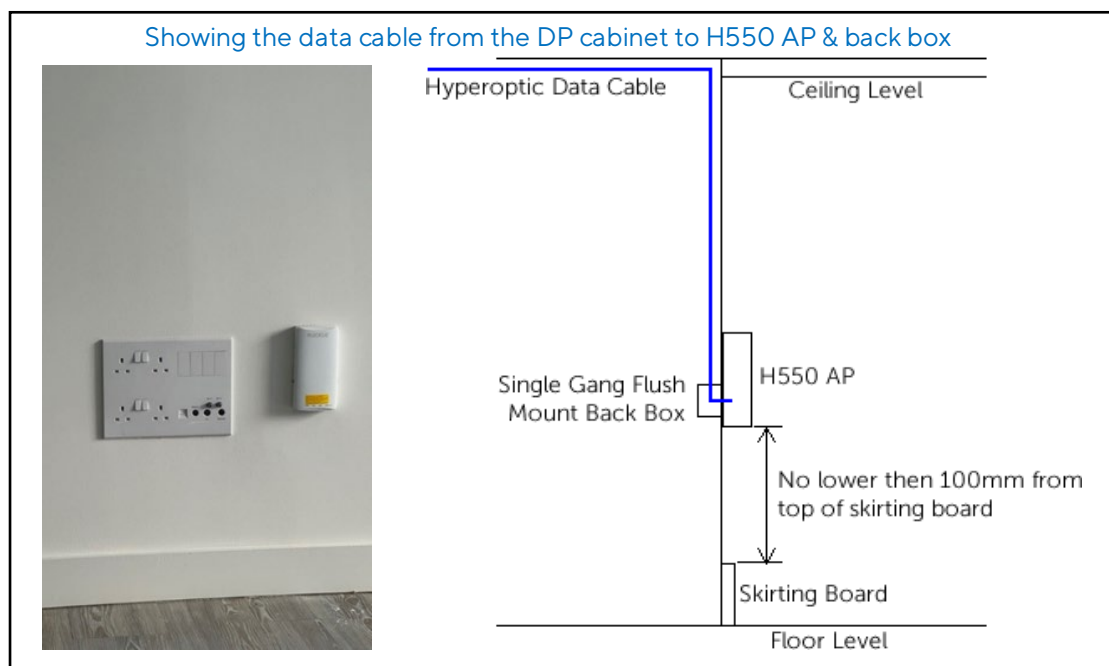
When installing communal APs, it is necessary to understand the best practices recommended by manufacturers.

- In nearly every scenario, APs are to be installed below the ceiling line.
- Either fitted to the ceiling or onto a wall.
- Below ceiling offers the best user experience.
- Below the ceiling limits the obstructions to coverage and service. Such as, utility pipes, metal fixtures, HVAC ducts.
- These can negatively impact the AP's RF signal & impede the wireless performance.
- Below ceiling installations avoid harmful environments full of dust, warmer temperatures & unshielded electrical components.
- In the scenario where ceilings are to be left open, the APs are to be mounted to the underside of containment tray or basket & below all other services.
- If APs are to be mounted on walls, then these should not be placed behind walls or enclosures.
- Placing APs behind walls or within enclosures will impede the service & coverage.
- Warmer temperatures & dust will affect the performance of the AP.
- The desktop survey will determine the best location or if any additional APs are needed, within an area, to ensure a clear WiFi path to users.
- The APs are not to be painted over for any aesthetic reasons, this will make any warranty null & void.

Prior to any changes or relocation by the developer to move APs into ceilings or behind walls or into enclosures, the developer will need to send a request to Hyperoptic in writing for validation & advice.

Termination Within a Property

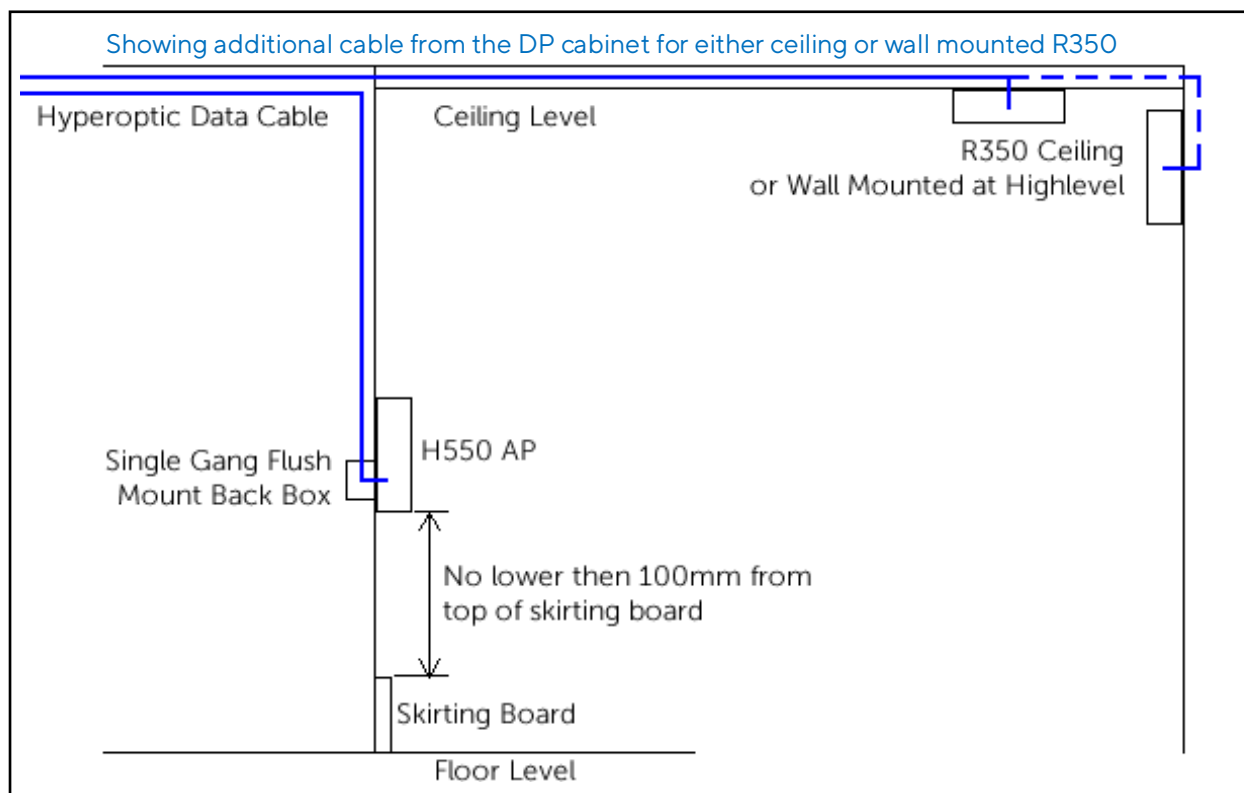
- The developer is to install each Hyperoptic copper data cable to each property from the designated DP cabinet as identified within the site-specific design & accommodation schedule.
- The individual data cables are to be routed from the designated riser utilising the site's own telecoms containment routes &/or within the site's telecoms ducting to each AP location with.
- The cable will be routed into the top of a standard single gang flush mounted pattress back box via the wall void.
- **Surface mounted back boxes are not to be used to mount the H550 A & back plate on.**
- The location of the back box is to be within the lounge area next to the TV or media services plate.
- The back box is to be no lower than 100mm above skirting level to allow for the 4x data ports at the bottom of the AP (when fitted) to be accessed for hardwire patching to devices or the media plate.
- A 2m cable coil is required to be left at the back box.
- An RJ45 plug will be fitted to the cable end by Hyperoptic engineers.
- The H550 wall mounting back plate will be fitted to the flush mounted back box.



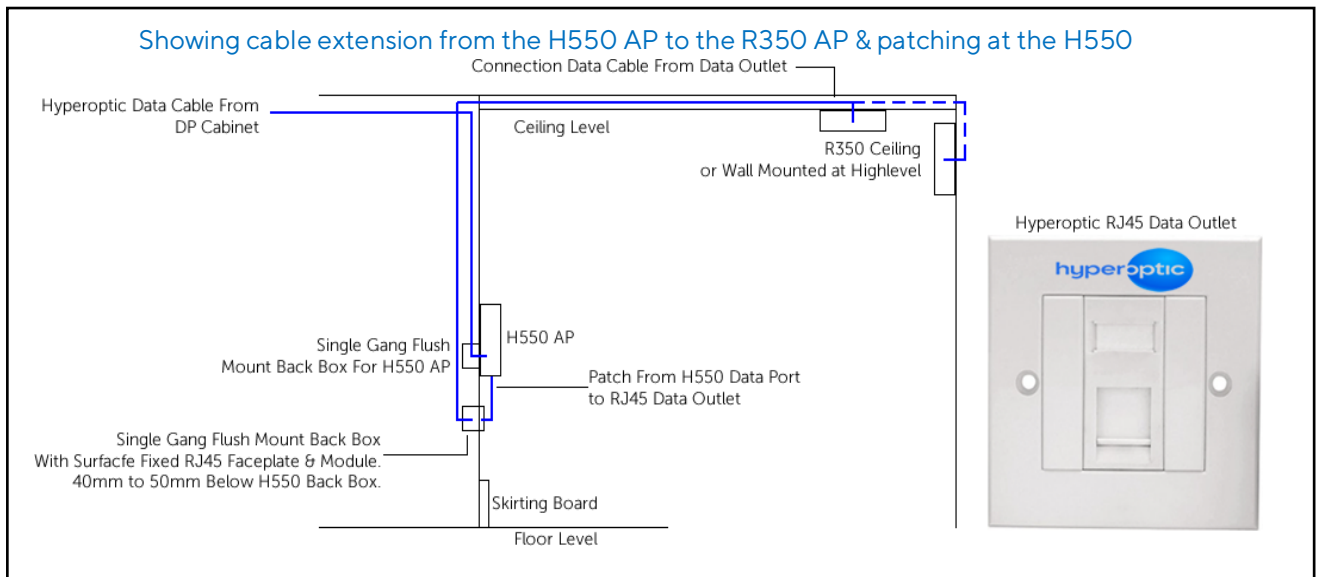
- **The H550 AP cannot be installed within utility cupboard as this will give poor coverage.**
- The Hyperoptic AP will become our point of service within the property.
- The H550 AP will not require a power supply within the property.

Large Apartments, Duplex Units & Penthouses

- Where the developer drawings show larger properties & where the predictive desk top survey identifies less than full coverage of a property, then the design will plan for an additional wall or ceiling mounted AP.
- In this instance, Hyperoptic will plan for an R350 AP as well as the H550.
- The R350 is to be mounted at highlevel below the ceiling line.
- The R350 is not to be placed within a utilities cupboard or a non-sanctioned enclosure. Any enclosure will not to be approved by hyperoptic in writing.
- A second data cable will be included in the design plan to allow for standalone connectivity from the allocated DP cabinet.
- The design heat mapping will determine the best location for the R350 AP.

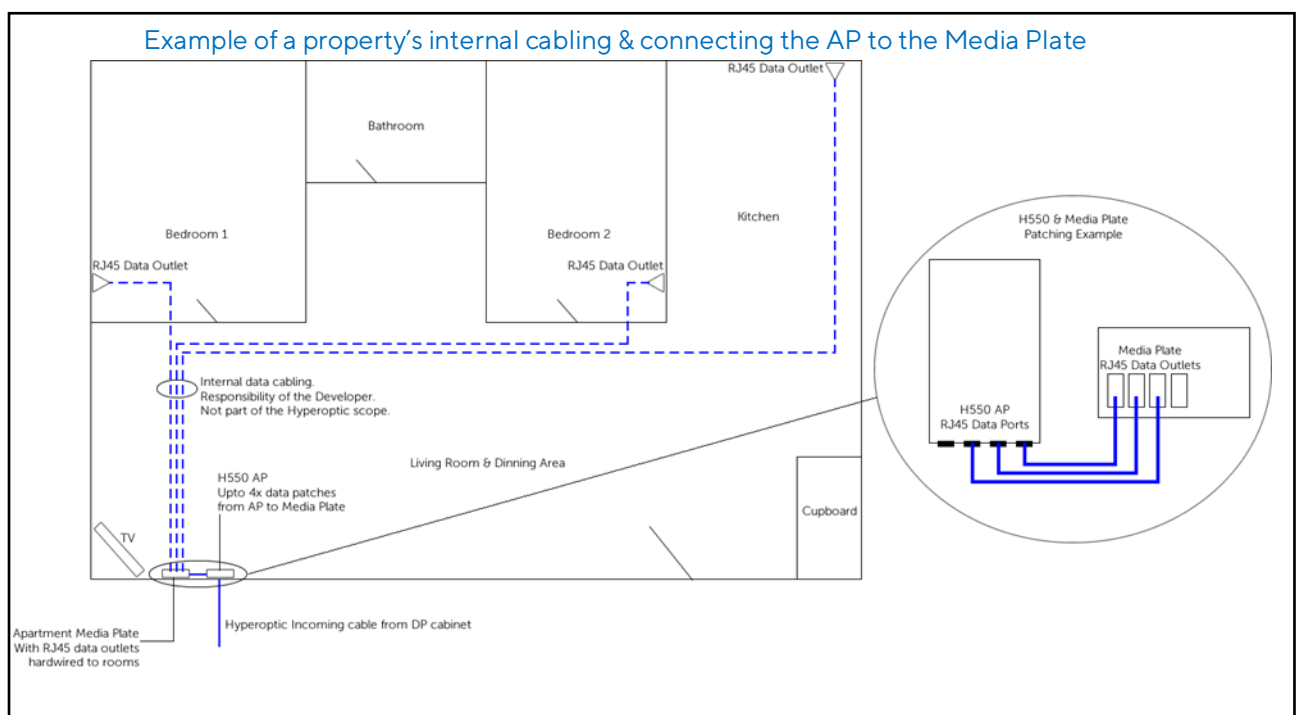


- Alternatively, if it is deemed necessary for an R350 to be installed within a unit after 1st Fix and prior to walls & ceiling being sealed within a property, then it may be possible to route a cable from the H550 AP location to where the R350 is needed.
- This will require a second single gang flush mounted back box to be fitted 40mm to 50mm below the H550 back box.
- A data cable is required to be routed through the wall & ceiling void to where the R350 AP will be fitted.
- An RJ45 data outlet will be terminated to the cable & screwed onto the back box.
- The data outlet faceplate will be Hyperoptic branded
- A patch cable will be used to connect from one of the data ports on the H550 AP to the data outlet to provide connectivity to the R350 AP.



Hardwiring Around The Property

- Ideally, the media plate should have Cat6 or Cat6A RJ45 data outlets hardwired to provide cable connections to rooms, such dining area, bedrooms & kitchen.
- As such, the Hyperoptic service can utilise this to provide a hardwired service to those areas within the property.
- For this, the Hyperoptic H550 AP can be patched at the H550 data ports to the RJ45 data outlets on the media plate. Maximum of 4 connections.
- It is important to note that each property's internal data wiring network (with the exception of any cabling needed for an R350 AP) beyond the Hyperoptic service cable would be a developer requirement and is not part of the Hyperoptic scope.

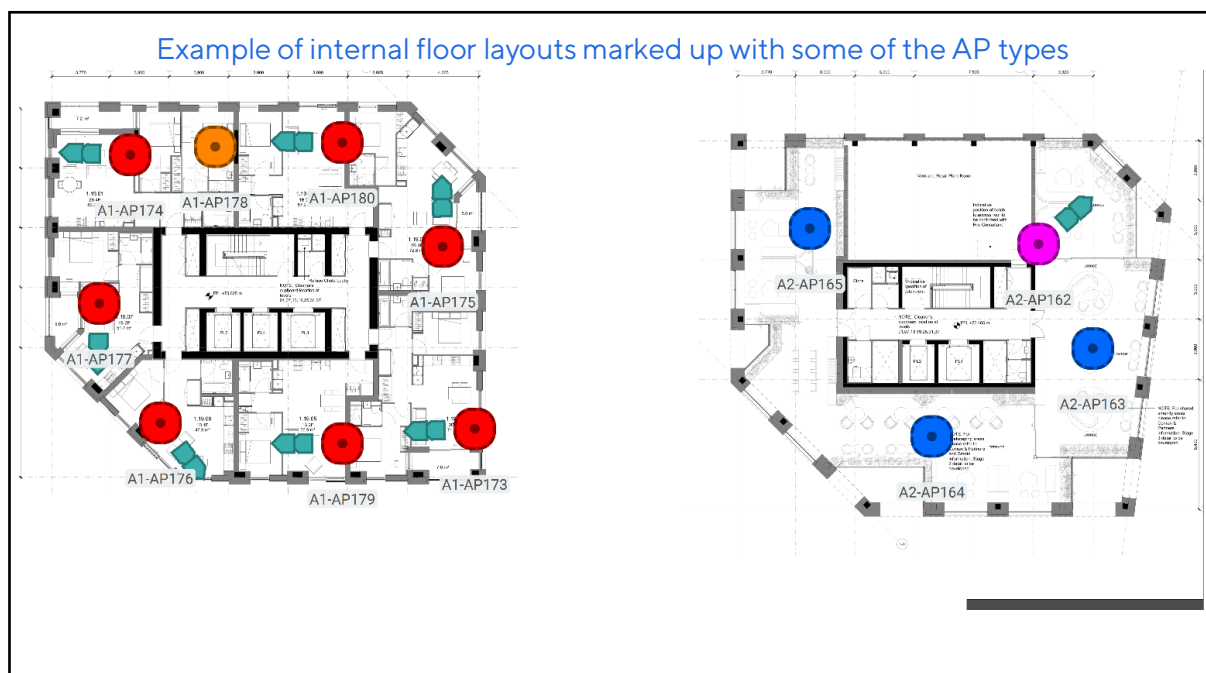


AP Type & Color Coding Symbols

- When creating an Access Point design, it is critical to differentiate between the different types of APs and if they are to be located externally or internally.
- It is also necessary to clearly differentiate between residential APs and Communal APs when looking at the floor drawings.
- Therefore, the design drawings are to show the AP types using the colour code below:

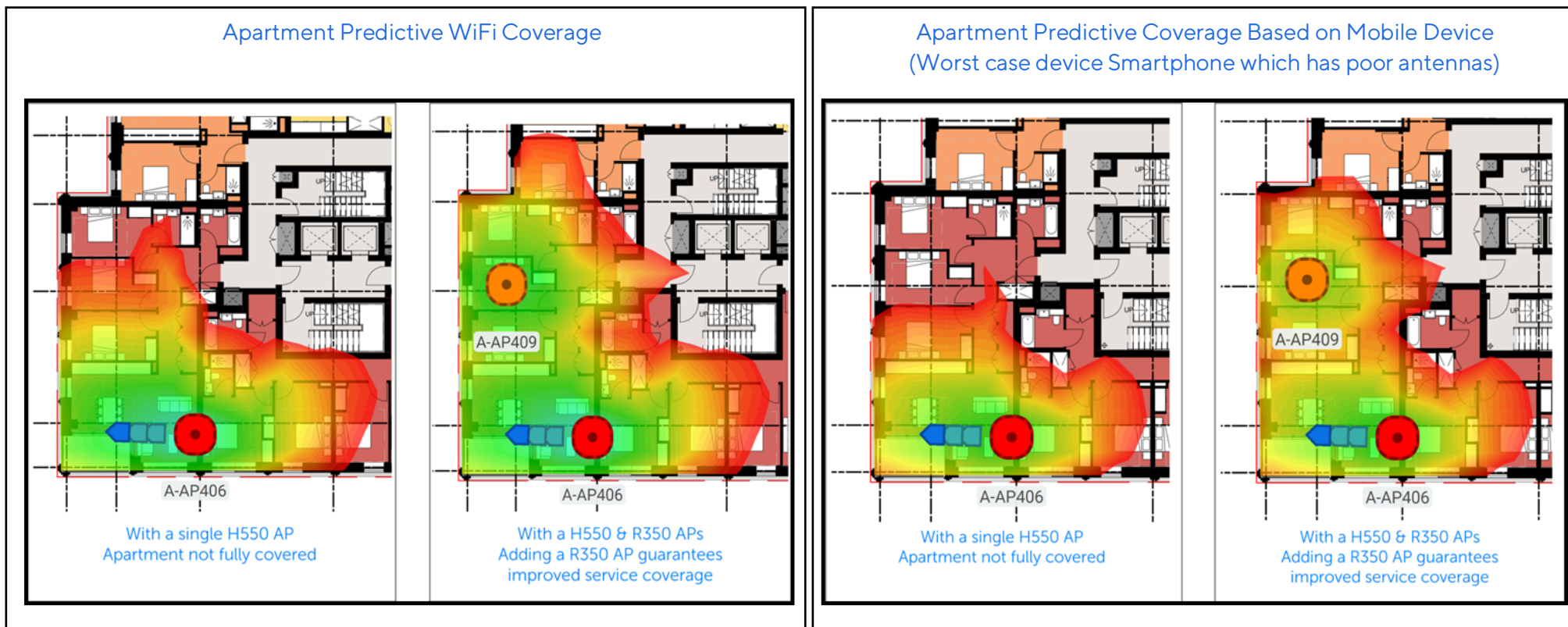
	H550 Residential Internal Wall Mounted Access Point (AP) with Orientation Arrow		R650 Communal Internal Ceiling Mounted Access Point (AP)
	R350 Residential Internal Wall Mounted Access Point (AP) with Orientation Arrow		T350c Communal External Wall / Pole Mounted Access Point (AP) with Orientation Arrow
	R350 Residential Internal Ceiling Mounted Access Point (AP)		T350c Communal External Ceiling Mounted Access Point (AP)
	R350 Communal Internal Wall Mounted Access Point (AP) with Orientation Arrow		T750 Communal External Wall / Pole Mounted Access Point (AP) with Orientation Arrow
	R350 Communal Internal Ceiling Mounted Access Point (AP)		T750 Communal External Ceiling Mounted Access Point (AP)
	R650 Communal Internal Wall Mounted Access Point (AP) with Orientation Arrow		Hyperoptic Router
AP 01		HR 01	

- For Business premises, the same Communal AP types are used.



Residential AP Selection & Coverage

1. Each residential property will have the H550 wall mounted AP selected as the default.
2. If the residential property is large or duplex and the heat mapping survey identifies that a single H550 AP does not fully cover the apartment space, then an R350 ceiling/wall mounted AP is to be planned to guarantee improved service coverage.
3. The heat map process will determine the best predictive location within the property for the R350 to be mounted.
4. If the design shows both H550 & R350 APs within a property, then each AP is to be hardwired individually back to the allocated DP cabinet.

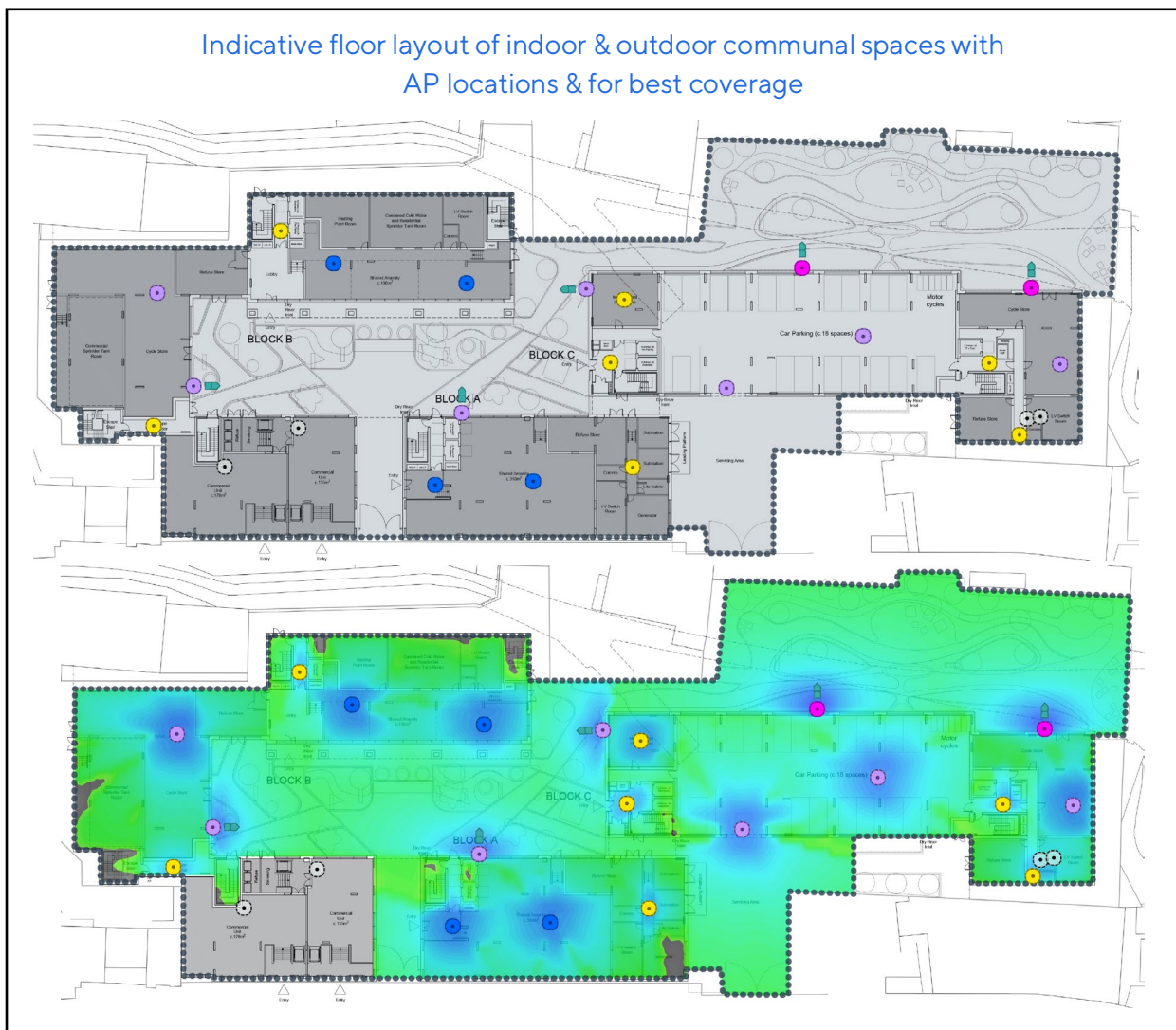


Internal Communal and Back of House (BoH) Areas:

1. Internal communal areas are those areas which are accessed by the residents, building staff and guests inside of a building.
2. Back of House (BoH) areas are those areas only accessed by building staff, such as plant rooms, security areas and switch room, etc.
3. The internal communal AP variants available are:
 - The R350 ceiling mounted AP
 - The R650 ceiling mounted AP

External Communal and Back of House (BoH) Areas:

1. External communal areas are the roof terraces, garden and open spaces around a building which are accessed by the residents, building staff and guests.
2. Back of House external areas only accessed by building staff, such as loading bays.
3. Bin stores, open car parks, covered car parks, etc. should all be planned to external APs. Using external APs in these areas helps to mitigate any temperature control issues and protect the AP from water damage.
4. The external communal AP variants available are:
 - The T350c vertical mounted AP
 - The T750 vertical mounted AP



Data Cabinets

- The Hyperoptic desk top survey will identify the quantity, locations & size of the data cabinets required within the development. Typically, these cabinets are to be located inside of buildings.
- The cabinet is referred to as Demarcation Points or DP cabinets.
- The DP cabinets will house the network switches, all the spine distribution cable patch panels, UPS, and the copper patch panels.
- The cabinet sizing will vary depending on the number of APs being connected to it & the hardware needed to be placed into the cab to supply service.
- Typical cabinet sizes used:
 - 12U, 620mm (h) x 600mm (w) x 550mm (d) wall mounted.
 - 15U, 770mm (h) x 600mm (w) x 550mm (d) wall mounted.
 - 18U, 905mm (h) x 600mm (w) x 550mm (d) wall mounted.
 - 21U, 1050mm (h) x 600mm (w) x 600mm (d) floor standing.
 - 27u, 1380mm (h) x 800mm (w) x 1000mm (d) floor standing.
 - 42u, 2000mm (h) x 800mm (w) x 1000mm (d) floor standing.
- These cabinet sizes will allow for the additional weight of the UPS system & allow for airflow within the cabinet.
- Cabinet types may vary depending on manufacture & supplier.
- Hyperoptic suggest that the Parent DP-1a location is confirmed and made available at the earliest opportunity for delivery of the Backhaul to the cabinet.

Typical Internal Wall Mount Cabinet



Typical Internal DP-1a Floor-Standing Cabinets



Cabinet Placement: DP-1a

Ideally, the DP-1a cabinets are to be located in dedicated main Comms rooms. However, Hyperoptic understand that some developments may not have dedicated Comms rooms. In this instance, electrical plant rooms or services intake rooms may be utilised.

- The DP-1a will be a 42U, 27U or 21U floor standing cabinet. The height of the cabinet will be determined by the components needing to be installed within.
- The DP-1a cabinet is exclusive to the Hyperoptic service & cannot be used or adopted for other services without written agreement from Hyperoptic.
- Prior to the installation of the cabinet, the developer is to ensure that the room is ready for the installation of the cabinet & active equipment.

The following points cover the conditions needed to be implemented by the developer prior to cabinet & components being installed:

1. Well ventilated, to allow for heat dissipation.
2. Active cooling or air conditioning to maintain room temperature between 18°C & 24°C. (average heat dissipation from equipment of 3000BTU/Hr + 500BTU/Hr for fibre & copper panels terminated).
3. Walls & ceilings are sealed or painted with hard-wearing, anti-static floor covering.
4. Room must be debris & dust particle free.
5. There must be no overhead waste & water services.
6. Must have a permanent door & lock which should be secure at all times.
7. Access to be restricted to authorised personnel.
8. Allow for working space around the cabinet: 1200mm (front), 1200mm (rear) & 900mm (one side).
9. The necessary power supply to the cabinet is available prior to the backhaul & active components being installed & prior to the system needing to be made live.
10. That the cabling routes are in place & end at the cabinet.
11. The backhaul route to the cabinet is in place.

Typical DP-1a Cabinet Weight & Power Consumption

The chart below gives the typical DP-1a cabinet types & sizes that may be used & the typical weight & power consumption with equipment installed.

DP-1a Cabinet Type	Cabinet Size (mm) (H x W x D)	Typical Weight (kg)	Typical Power Consumption (w)
42U Floor Standing	2000 x 800 x 1000	270.3	2496
27U Floor Standing	1380 x 800 x 1000	155.25	1248
21U Floor Standing	1050 x 600 x 600	148.15	1062

Cabinet Placement: Child DP Cabinets

Typically, Child DP cabinets are placed in strategic locations around the development to ensure that each data cable length does not exceed the permissible lengths. These lengths are limited to a maximum of 70 metres per data cable.

- Where sub-Comms rooms are available, Hyperoptic will utilise these. However, Hyperoptic understands that some developments may not have dedicated sub-Comms rooms, or these rooms are located in areas where some data cables may exceed the permitted maximum length of 70 metres. In this instance, it may be necessary to place cabinets in sub-plant rooms or service/telecom risers.
- The Child DP cabinets can be a 15U or 18U wall mounted cabinet variety or 21U floor standing cabinet. The height of the cabinet will be determined by the components needing to be installed within.
- For sub-Comms rooms & Plant rooms, the developer is to ensure that the room is ready for the installation of the cabinet & active equipment.

The following points cover the conditions needed to be implemented by the developer prior to cabinet & components being installed:

1. Well ventilated, to allow for heat dissipation.
2. Active cooling or air conditioning to maintain room temperature between 18°C & 24°C. (average heat dissipation from equipment of 3000BTU/Hr + 500BTU/Hr for fibre & copper panels terminated).
3. Walls & ceilings are sealed or painted with hard-wearing anti-static floor covering.
4. Room must be debris & dust particle free.
5. There must be no overhead waste & water services.
6. Must have a permanent door & lock which should be secure at all times.
7. Access to be restricted to authorised personnel.
8. Allow for working space around the cabinet: 1200mm (front), 1200mm (rear) & 900mm (one side).
9. The necessary power supply to the cabinet is available prior to the backhaul & active components being installed & prior to the system needing to be made live.
10. That the cabling routes are in place & end at the cabinet.
11. The backhaul route to the cabinet is in place.

Cabinet Placement: Child DP Cabinets in Risers

Where there is a need to place DP cabinets within risers, where there is no other alternative, then these spaces must have sufficient space to accommodate the Hyperoptic DP cabinet.

The UPS components dictate that the cabinet depth to be no less than 600mm.

These spaces are to have:

1. Good ventilation to allow for heat dissipation.
2. Where possible active cooling or air conditioning to be in place.
3. Walls & ceilings are sealed or painted with hard wearing, anti-static floor covering.
4. Riser space must be debris & dust particle free.
5. There must be no overhead waste & water services.
6. Must have a permanent door & lock which should be secure at all times.
7. Access to be restricted to authorised personnel.
8. Working space around the cabinets to fully open front & side doors to allow the installation, upgrade & maintenance of the cabinet components.
9. The necessary power supply to the cabinet is available prior to the backhaul & active components being installed & prior to the system needing to be made live.
10. That the cabling routes are in place & end at the cabinet.
11. The backhaul route to the cabinet is in place.

Typical Child DP Cabinet Weight & Power Consumption

The chart below gives the typical Child DP cabinet types & sizes that may be used & the typical weight & power consumption with equipment installed.

Child DP Cabinet Type	Cabinet Size (mm) (H x W x D)	Typical Weight (kg)	Typical Power Consumption (w)
21U Floor Standing	1050 x 600 x 600	137.98	2038
18U Wall Mounted	905 x 600 x 550	126.12	1888
15U Wall Mounted	770 x 600 x 550	118.69	1416
12U Wall Mounted	620 x 600 x 550	89.2	622

DP Cabinet Securing & Fitting Guidance

Securely fixing the data cabinets in their designated location is vital for the safety, stability, and performance of the network infrastructure.

Proper installation not only ensures the protection of valuable equipment but also minimise the risk of damage, disruption, or accidents as a poorly fixed cabinet can pose a serious safety hazard.

Preparation

To ensure that the cabinets are secured sufficiently, and the correct fixings are used the following steps need to be considered:

1. Identify the surface material (concrete, wood, plasterboard, etc.).
2. Determine the total load, including the cabinet and equipment. (typical weight of cabinets are shown on pages 47 & 49. The cabinet sizes are specified in the site specific design proposal document & drawing pack which is issued to the client).
3. Select fixings rated for the weight and load.
4. Consider environmental conditions & ensure the area is vented & free from dust & debris.
5. Consult installation guidelines from the cabinet manufacturer to ensure compatibility with the fixing method.

By carefully evaluating these factors, the most suitable fixing products to securely mount a data cabinet can be chosen, ensuring long-term safety, stability, and performance of the cabinet and network equipment.

Wall Mounted Cabinets

The cabinets are designed with 4 fixings points which are located in the back panel of the cabinet.

Fixing points viewed from the back of cabinet



Fixing points viewed from inside the cabinet



Cabinet Fitting & Fixings

To secure the cabinet at the proposed location there is the requirement to use suitable fixings.

The below are the fixings recommended by Hyperoptic at time of compilation, although every installation is different and so a specific evaluation is required on each cabinet location to ensure the most suitable fixing is proposed and used for the wall type that the cabinet is to be fitted to.

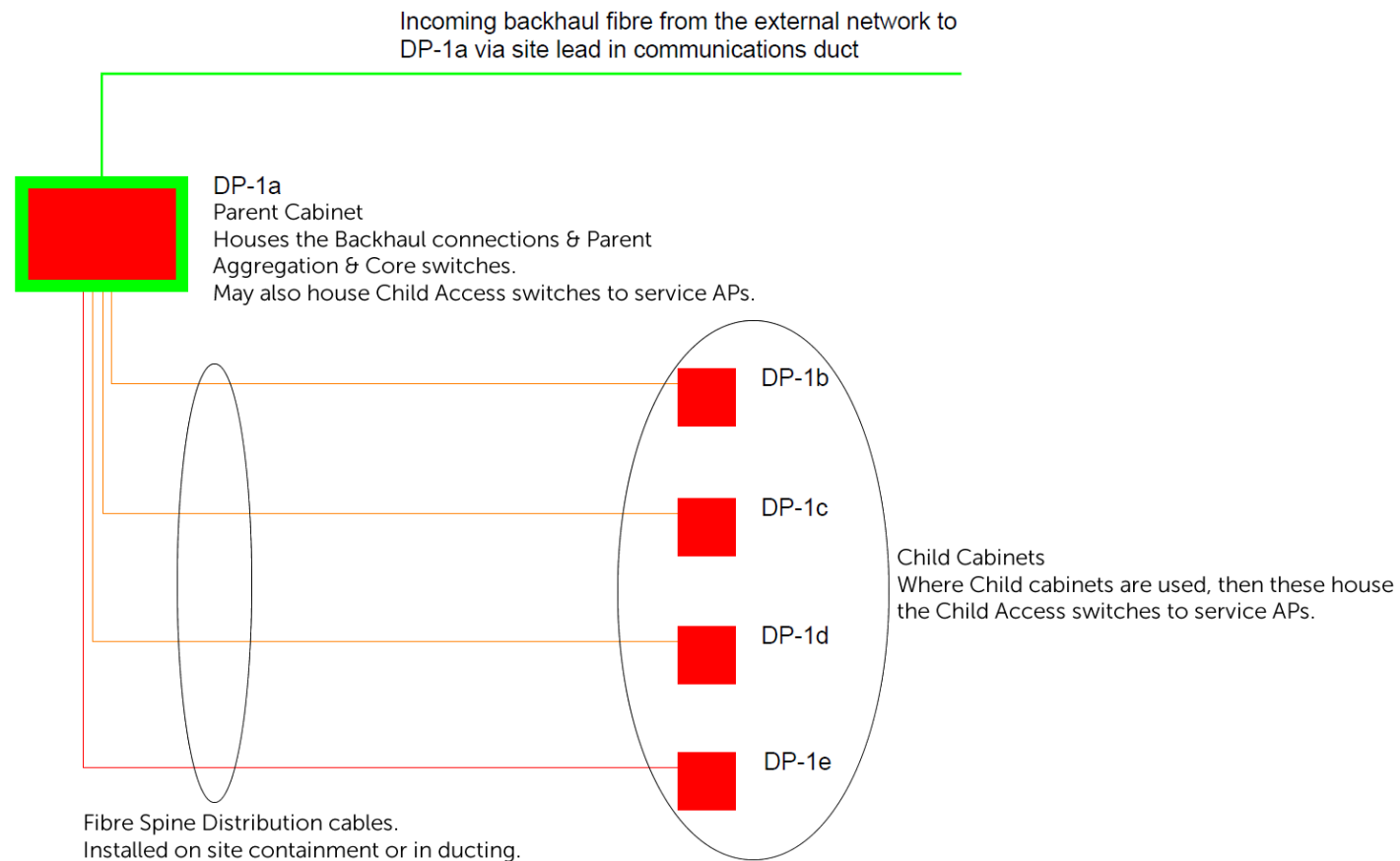
- For installation into substates such as concrete, brick and block work, it is suggested that 10mm x 60mm HILTI HRD – HR Anchors accompanied with penny washers be used.
- For installation into substates such as plasterboard, it is suggested that an appropriate fixing method is used to ensure that the plasterboard does not give way to the weight of the cabinet over a period of time.
- Where the cabinet is to be fitted to a single skin plasterboard, it is suggested that a strong enough backboard is fitted to the wall on which the cabinet is to be mounted

Floor Standing Cabinets

- The Floor Standing Cabinets can be obtained in a variety of sizes to accommodate the site-specific equipment being proposed.
- These cabinet maybe provided with casters. The casters are not to be used.
- The cabinets are designed with fixings points which are located in the base panel of the cabinet.
- The fixing points are to be used to secure the cabinet to the floor.
- Appropriate fixing types are to be used when considering floor composition.
- The fixings are to be set deep enough to avoid the cabinet from being moved or tilted.

Typical DP Cabinet Network Connectivity

- The DP-1a cabinet will be the start point (Parent) of the Hyperoptic network within the development.
- The Child DP cabinets are strategically located around the development.
- The Child DP cabinets are connected to DP-1a via the optical fibre spine distribution cables.



Cabinet Power Requirements

- It is the responsibility of the developer to install & certify the power supplies at each DP cabinet.
- The standard power supply type to each DP cabinet is to be a Single Phase 13 amp un-switched fused spur from the nearest available “Essential Services” fuse board.
- However, where the design shows more than 500 APs, then the DP-1a cabinet will require 2x 13 Amp un-switched fused spurs from separate fuse boards where possible.
- Every DP cabinet supplied by Hyperoptic will have Power Distribution Units (PDU) included.
- Each PDU is to be connected to the un-switched fused spur by the developer’s electrical contractors.
- The chart below gives a breakdown of power supply depending on the cabinet requirements:

DP Cabinet	Size of Site AP Count	Required Power at Cabinet	Power Supply Quantity	Fuse Board Distribution
DP-1a	Upto 500	13 Amp Un-Switched Fused Spur	1	From a single fuse board
DP-1a	Above 500	13 Amp Un-Switched Fused Spur	2	Ideally from 2 separate fuse boards
All Child DPs	N/A	13 Amp Un-Switched Fused Spur	1	From a single fuse board

Cabinet Earth Bonding

Each DP cabinet will be required to be earthed to the building’s Main Earth Terminal (MET).

Power Consumption Calculation

- As part of the design process, each DP cabinet will have a power consumption calculation carried out, in Watts, to identify the total power consumption of all active devices within each DP cabinet designed.
- Once the total power consumption is known, this will allow for the appropriate sizing of the UPS power back-up per cabinet.

Network Power Resilience

- The Communications Act 2003 (CA2003), Section 105A(4) requires Hyperoptic, to “take all appropriate steps to protect, so far as possible, the availability of [its]... electronic communications network”.
- This is not restricted for only our broadband products. The Managed WiFi installation model is no different & therefore, we have an obligation to take all necessary steps in maintaining network availability & manage the risk of power loss appropriately.

The UPS Requirement

- It is absolutely necessary to provide adequate power back-up time of a minimum of 90 minutes, to each DP cabinet using an Uninterrupted Power Supply (UPS) system installed within each DP cabinet.
- Where power consumption is greater due to the amount of Active equipment needed, then additional External Battery Modules (EBM) will be used and connected to the UPS device, all within the cabinet.
- The UPS & EBM are free issued by Hyperoptic & installed by our engineers.

Site Wide Power Back-up

- If the development has backed up power in case of outages, then it would be beneficial to assess the possibility to provide a second independent, second power supply to each Hyperoptic cabinet via the power back-up network.
- If this is a possibility, then this would help to reduce the dependency on each cabinet requiring its own UPS and therefore, reduce the size and weight of the cabinet.
- If building back-up power is available then this should also be a second 13-amp, un-switched fused spur.

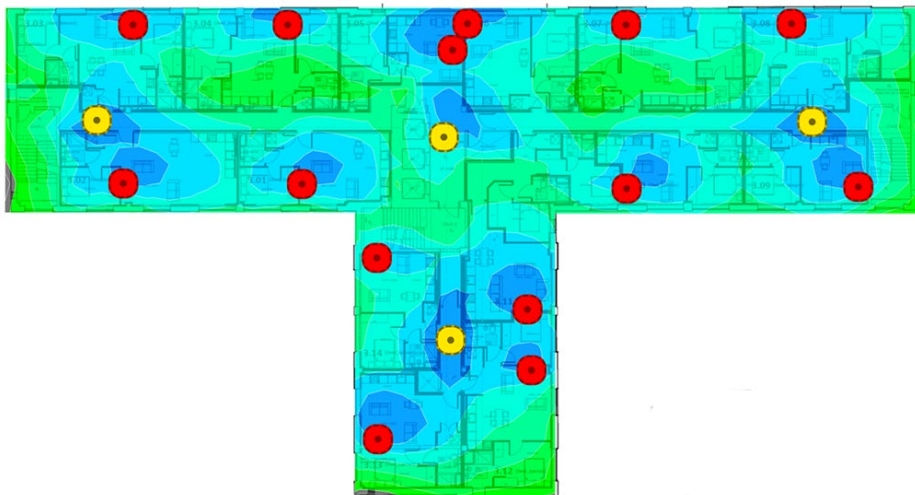
Power Resilience

- The Hyperoptic Managed WiFi product does not provide a voice capability and therefore, a Battery Back-Up Unit (BBU) into each property is not an option.
- Nor do the APs have a functionality to allow for a BBU.
- Because APs are serviced as PoE and power is centralised at the cabinet, it is necessary to back-up the switches at the cabinet.
- PoE switches, by their nature, have a higher power consumption than standard network switches.
- It is not feasible to provide power resilience for PoE switches serving both residential and communal APs simultaneously.
- This will require very large, very heavy, very expensive UPS systems.
- This is not practical due to the limited spaces we have available within buildings to locate our cabinets.

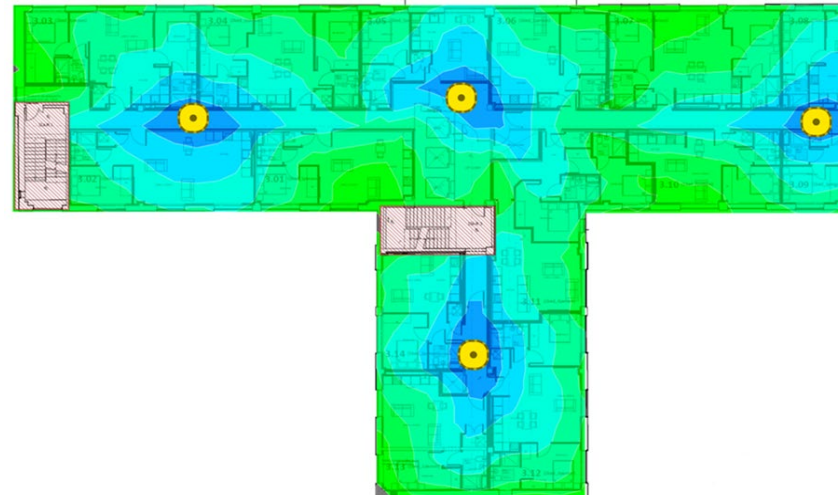
Power Resilience Solution

- To overcome the power back-up issue for residential units, and to continue to provide service if a cabinet suffers an outage, Hyperoptic will design a backed-up service to residential corridor APs as standard.
- This solution requires that communal APs are placed within the residential corridors.
- These residential corridor APs will be connected to a dedicated PoE switch. The switch will be backed-up to the UPS.
- Each residential floor will be designed to have best coverage communal APs.
- It is these APs which will then give “Bleed-in” coverage into the apartments if residential APs go down.
- This shows that Hyperoptic has carried out due diligence to The Communications Act 2003 (CA2003), Section 105A(4).
- Desk top heat mapping of floors will identify the amount of both residential and communal APs needed per floor, as well as the coverage to be expected.
- The following heat maps show an indicative view of what the coverage will look like with residential APs turned on and with residential APs turned off with only the communal APs being active.

Predictive coverage map showing the coverage of both communal and residential APs on a “generic floor layout



Predictive coverage map showing the backed-up service communal APs when the residential APs are turned off



The Incoming Backhaul Connection

The incoming Backhaul fibre connection is the circuit which is routed from the nearest Openreach exchange or Hyperoptic optical fibre node and linked back to the Hyperoptic Data Centre.

- The Incoming Backhaul connection is one of Hyperoptic's priorities on any site and it is required to be installed to ensure network connectivity is in place prior to residential first occupancy or network activation dates.
- Hyperoptic advise that your site will need to be registered by the developer/client with Openreach New Sites.
- This allows Openreach to plan for any off-site works to provide incoming telco services routes to the site boundary.
- It is also recommended that developer/client to also consider applying for the Openreach "Network In Advance" (NIA) service.
- NIA allows for any enabling off-site works to be undertaken to avoid any delays with blockages, Civils, permits, etc, in advance of the Backhaul connection being ordered.

Ethernet Access Direct (EAD)

- Where Hyperoptic are to use Openreach as their Backhaul provider, this is more commonly known as an Ethernet Access Direct (EAD), which is an Openreach product. The EAD is an Ofcom regulated product and paid for by Hyperoptic.
- Openreach are required to install the Backhaul fibre from their external network to the Parent DP-1a cabinet within the development.
- The EAD Backhaul fibre is arranged by Hyperoptic is an independent product which is separate to any Openreach requirements that the development may have.
- The EAD is installed by Openreach on behalf of Hyperoptic.
- Hyperoptic have dedicated office staff to support Hyperoptic ADMs and PEs to coordinate with site management for the delivery of the EAD to the DP-1a cabinet.
- Once the ADM is satisfied that the enabling works have been completed, then ADM will order the Openreach works to commence.
- Average lead times for Openreach delivery vary between 2 to 6 months.
- The earlier that the enabling works are completed & the DP-1a location is ready, or confirmed dates of expected readiness, the sooner the EAD can be ordered.

Hyperoptic Optical Fibre Backhaul

- Hyperoptic has built a network infrastructure in strategic areas within certain towns and cities. These are known as Hyperzones & are installed within Openreach infrastructure using the Openreach Physical Infrastructure Access (PIA) product.
- The fibre cables & nodes are owned & dedicated to Hyperoptic use only to service buildings & individual homes & businesses.
- Where sites are located close to a Hyperzone network & where network capacity permits, Hyperoptic will provide our own Backhaul connection from the nearest available node to our DP-1a cabinet.

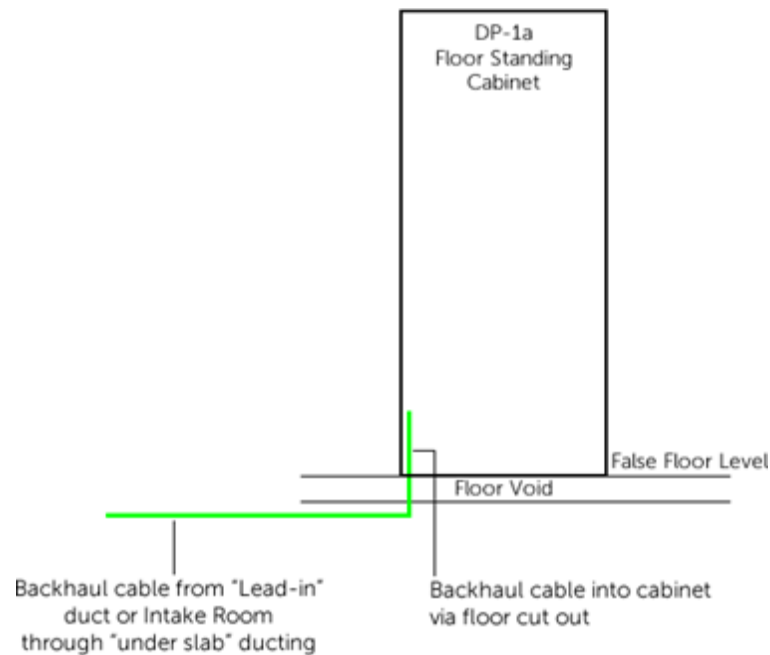
Backhaul Installation Considerations

- Incoming Backhaul Fibre will be routed into the site via the incoming “lead-In” telco ducts installed by the developer from the site boundary into the building which is to house the DP-1a cabinet.
- The “lead-in” duct location should be coordinated with the developer & the Openreach New Sites representative to ensure duct connectivity with the Openreach network & nearest chamber,
- Hyperoptic advise that the “lead-in” duct is installed at the earliest possible time to avoid any delays in the telco services being delivered to the site.
- Hyperoptic suggest that the Parent DP-1a location is confirmed and made available at the earliest opportunity for delivery of the Backhaul to the cabinet.
- If the route from the building’s point of entry & “lead-in” location to the DP-1a cabinet requires containment to be installed, then this should be in place at the earliest opportunity to allow Hyperoptic & Openreach to deliver the incoming connection.
- It is the responsibility of the developer to ensure that the duct connectivity & containment routes are in place.
- The developer is to give unrestricted access to the Backhaul cable route when required to do so by Hyperoptic & Openreach.
- The Hyperoptic ADM & PE will coordinate with site management for the readiness & delivery of the Backhaul connection.
- The installation of the Incoming Backhaul Fibre will be undertaken by a 3rd party contractor or Hyperoptic engineer teams responsible for delivering the Backhaul circuit.
- The contractor will be working on behalf of Hyperoptic, and all arrangements will be made via Hyperoptic and the site management team to facilitate access.
- It is requested that at the time of fitting and testing of the Backhaul Fibre, into the Parent DP-1a cabinet, that either the permanent power supply or temporary 230v power is made available.

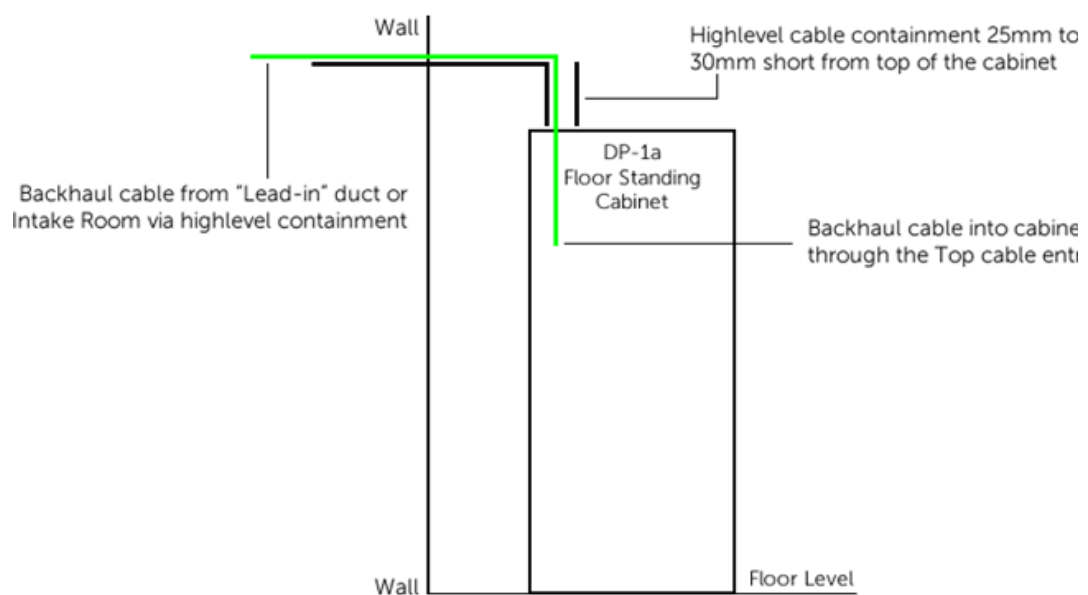
Backhaul Cable Routing into DP-1a Cabinet

The following drawings will give the developer some options on how to bring the backhaul to the Parent cabinet within the Comms room/Plant room.

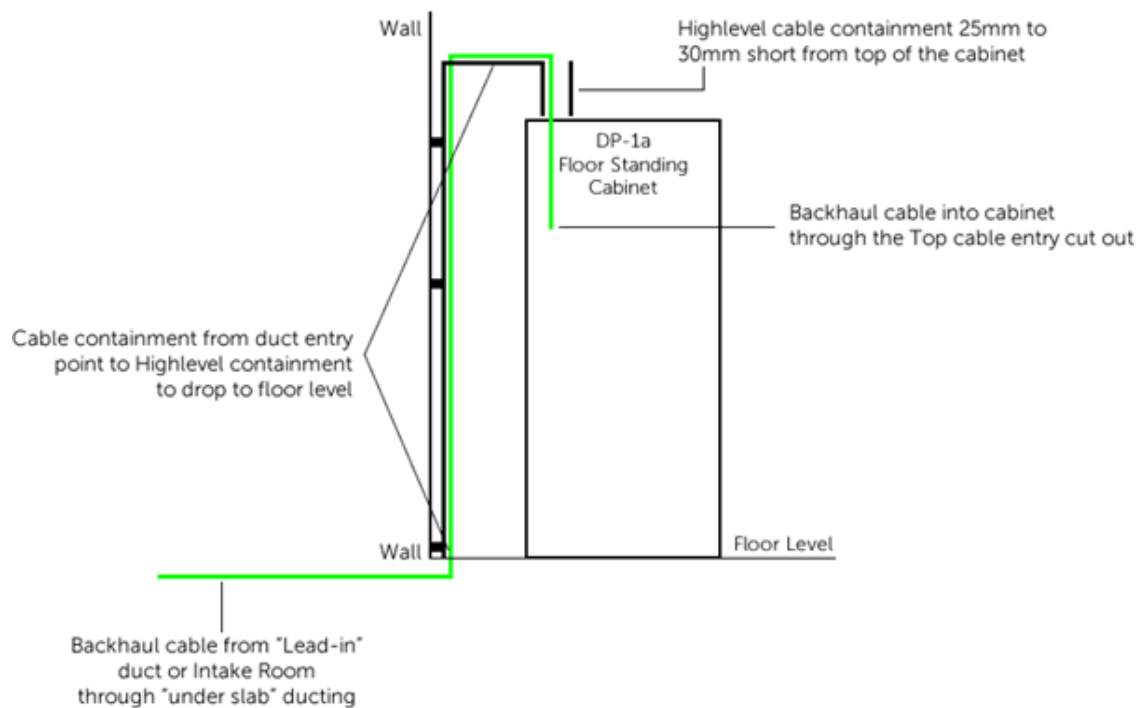
1. Where the backhaul is routed into the main room via under slab ducting.
2. If routed through a false floor, will require a cut out in the floor to enter the cable into the cabinet.



1. Where the backhaul is routed into the main room via highlevel containment for the backhaul cable to be routed into the top of the cabinet.
2. Containment is to stop short by 25mm (min) of touching the top of the cabinet.



1. Where the backhaul is routed into the main room via under slab ducting & where the duct entry is away from the cabinet.
2. Containment required up the wall from the duct entry point to highlevel containment.
3. Cable entry is from the top of the cabinet.
4. Containment is to stop short by 25mm (min) of touching the top of the cabinet.



Backhaul Sizing and Resilience

- A key part of the Managed WiFi product and network architecture is the Backhaul to provide access to the outside world.
- To provide Backhaul resilience & capacity, Hyperoptic has standardised the Backhaul bandwidths based on the size of the development & the quantity of APs required.
- Therefore, it is absolutely critical for the developer to give clear information & instructions of where WiFi connectivity is required, right across the site.
- The following Chart shows the formula deemed applicable for backhaul resilience:

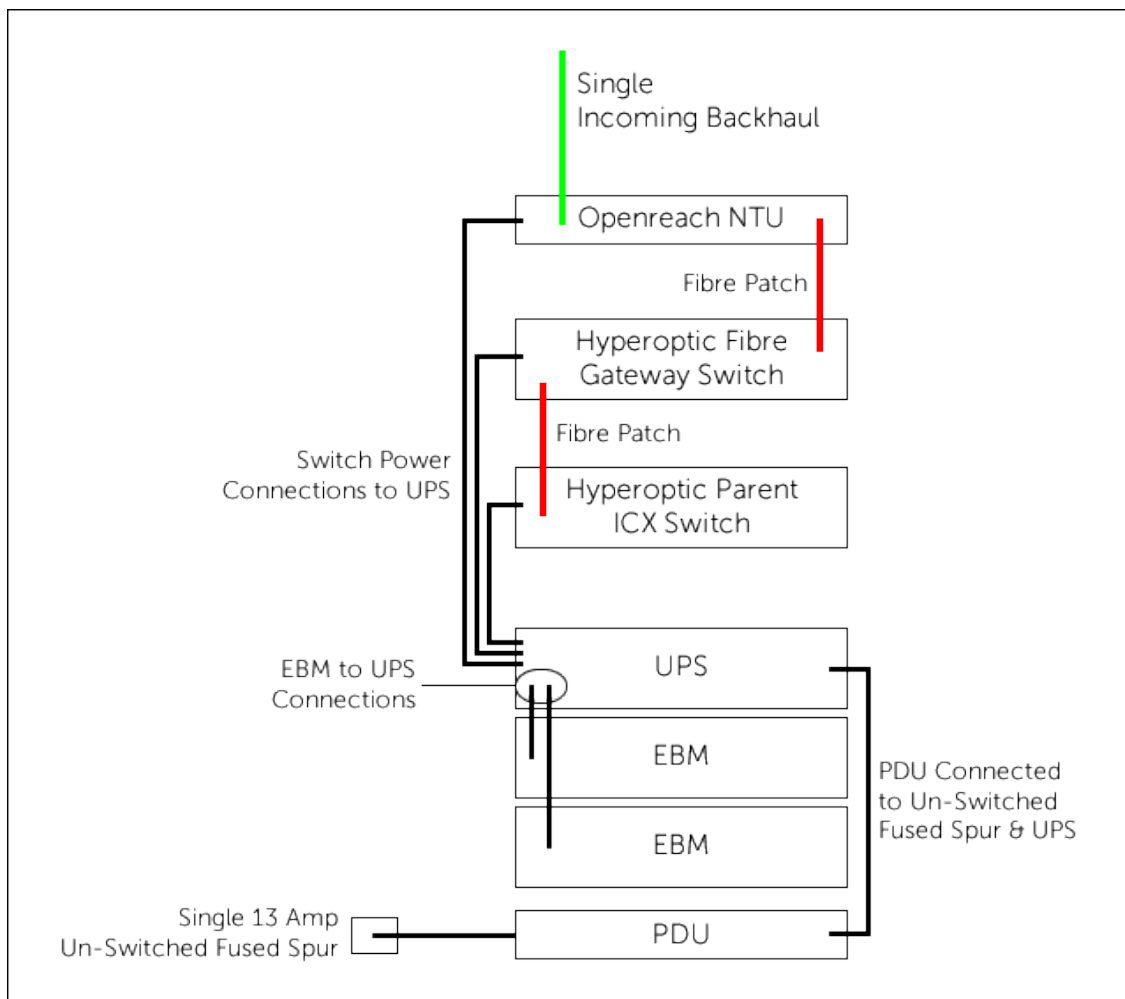
AP Count	Backhaul Bandwidth	Backhaul Quantity
0-230	1G	1
231-500	10G	1
501-2000	10G	2

- The sizing of the Backhaul in this way we mitigates contention issues on our network.
- Redundancy is provided by doubling power supplies and fans or by doubling appliances (or both).
- If two Backhaul connections are needed, then it is necessary for the developer to provide two power supplies to the DP-1a cabinet.
- This ensures that our Parent switches & UPSs are spread across the two power supplies.

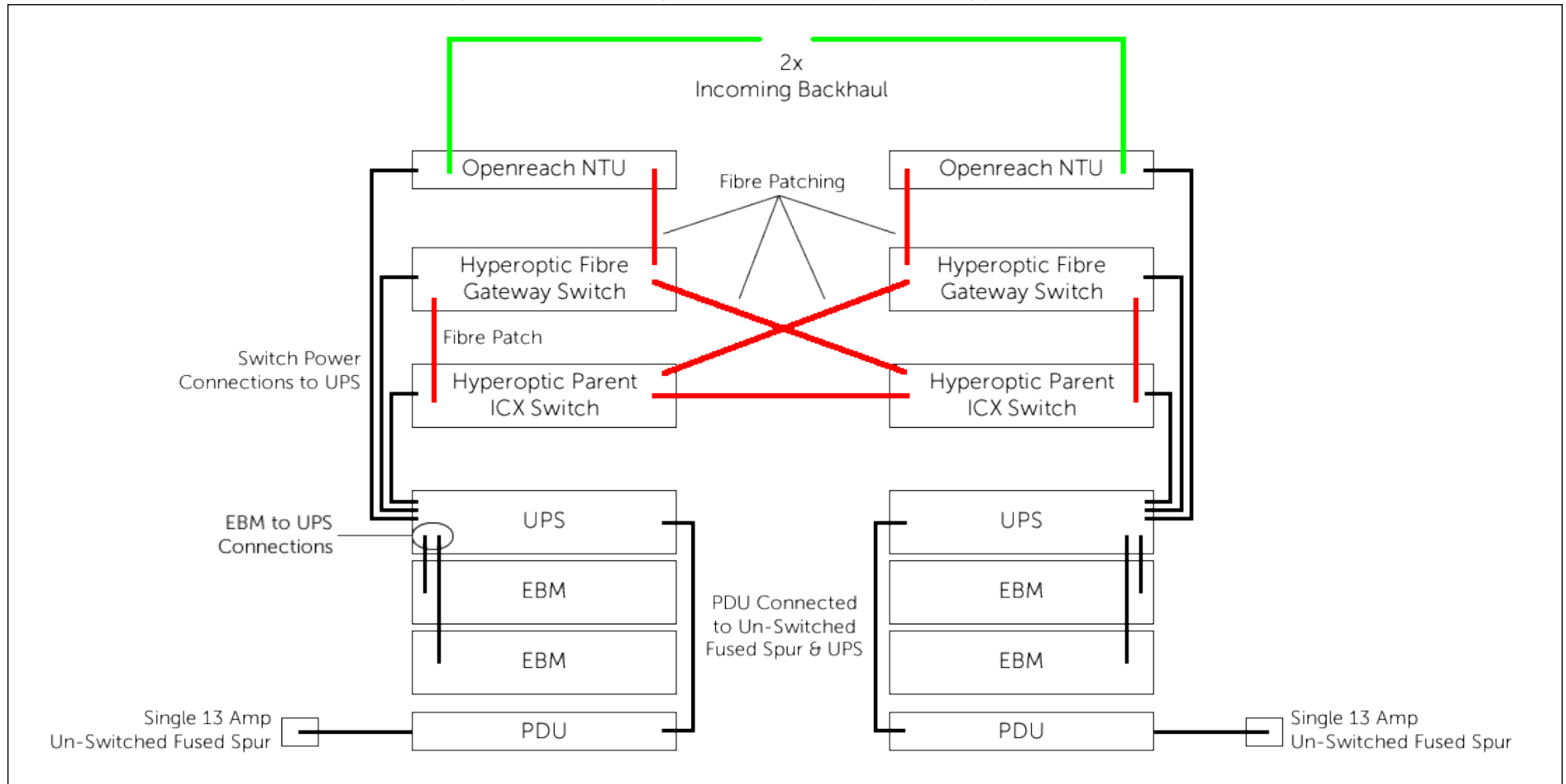
DP-1a Cabinet Backhaul & Power Connections

The following schematics show how the Parent devices in DP-1a are to be connected to the outside network & how they are connected to the UPS.

Parent switching connections using a Single Backhaul & a single power supply to the DP-1a cabinet



Parent switching connections using 2x Backhauls & 2x power supplies to the DP-1a cabinet



Cable Infrastructure Specification

Hyperoptic will free issue all cables required for our infrastructure, for the developer to install.

- All cabling to be installed within buildings will be CRP rated and will comply with all current European standards and exceed the requirements of BS6701:2016 + A1:2017, certified to EuroClass Cca, s1a, d0, a1, according to EN13501-6 for installation cables.
- All installed cables will be tested to industry standard using calibrated test equipment. All results will be recorded and submitted by Hyperoptic.
- All our installations are carried out according to industry best practice and strict adherence to cabling standards (TIA/EIA-568 and ISO/IEC 11801 and IEC 60794).
- Prior to the cable installation, it is necessary to obtain the Hyperoptic design proposal and drawing pack to identify the AP and DP cabinet locations.
- These documents will outline the locations of the cabinets and the Access point (AP) locations.

Optical Fibre Spine Distribution Cable

- The optical fibre cables are used as the backbone to link the Parent DP-1a cabinet to the Child DP cabinets.
- It is the fibre spine cables which provide the live network connectivity to each of the network switches within each DP cabinet.
- Hyperoptic use the following fibre optic cable specifications: Singlemode OS2 fibre optic cable.
- Fibre is not subject to electro-magnetic interference and therefore can be installed next to electrical cabling.
- The fibre spine cables can be installed onto the site's own telecoms containment or within telecoms ducting.
- Optical fibre is not restricted to length limitations, therefore, can be routed long distances.

Optical Fibre Cable Installation Guidance

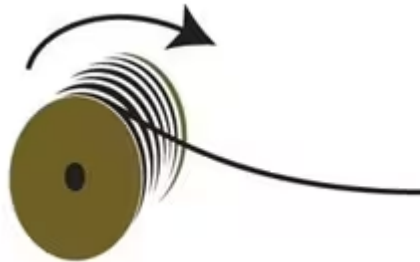
Preparation

Use the latest Hyperoptic design drawing pack to identify the following:

1. The locations of each of the DP cabinets to which cables are needing to be installed.
2. The cable type & size required for each specific run.
3. The containment routes to cabinets are in place & any risks to sharp edges or tight bends are identified.
4. The length of the route to ensure labour resource is available to avoid over stretching the cable when being pulled.

Optical Fibre Cable Installation Practices

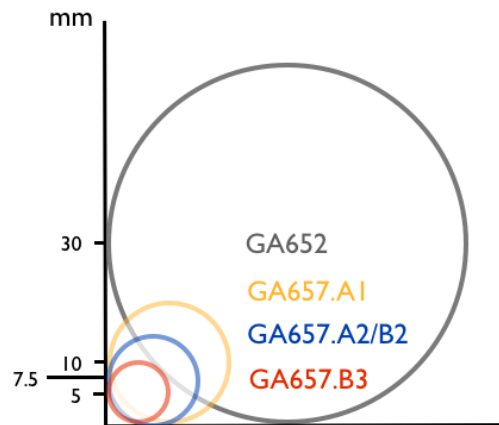
- Fiber optic cables should never be subject to excessive twist. Excessive twist in the cable causes bending stress in the fibres, resulting in degradation of the network signal.
- When pulling the cable from a reel, the cable should always be rolled off the reel by supporting the reel so it can turn instead of spinning the cable off over the end flange of a stationary reel. Spinning the cable from a stationary reel/drum puts a twist in the cable for every turn on the reel.



- The cable should be pulled by hand as much as possible.
- The cable should be pulled in a steady, continuous motion and never jerked.
- Pulling tensions should always be monitored to ensure the minimum possible tension is applied to the cable.
- The use and positioning of the cabling installation accessories to ease the installation and reduce and manage the sharpness of bends.
- Where possible suitable resource should be used to ease the installation and reduce the tension load applied on the cables.
- This could involve the use of cable jacks, cable drum stands or dispensers, lubricants, guiding rollers and a multitude of other cable installation accessories.
- When running cable vertically, take note of the cable weight.
- Install cables in a sequence that applies the least amount of strain to the cable.
- Where possible start the installation at the top and work down the building, to allow gravity to assist.
- After installation, any hanging cable will need to be secured to support the weight.

Bend Radius

- Never exceed the cable bend radius. Fiber is stronger than steel when you pull it straight, but it breaks easily when bent too tightly. This will harm the fibres.
- Optical fibre cables are categorised by the bend insensitivity of the cable.
- The main categories of the fibre cables are:
 - G652
 - G.657.A1
 - G.657.A2/B2
 - G.657.B3
- The minimum category the Hyperoptic supply is G.657.A1.



- If the cable specification is unknown, then standard is to maintain a minimum radius of 20x the diameter of the cable.
- If cables are damaged during installation, then these will need to be replaced with new cable.

Securing the Fibre Cables

- The fibre cables are required to be secured to ensure they are supported along the route.
- The products and techniques for fixing and securing the cables are required to follow the latest compliance policy and practice standards to align with the building and fire regulations, such as the use of non-combustible fixings.
- Any fixing & securing tie are NOT to be pulled tight around the cable or cable bundle. This could also impede the network signal.
- If the cables are to be left coiled make sure they are secured and protected from damage and out of the way of other trades.

Data Cables Specification

- Cat6A U/FTP is the preferred Ethernet cable used for our Managed WiFi product.
- These cables are used to connect from the network switch ports to provide each APs with network connectivity and Power over Ethernet (PoE).
- Depending on the type of installation, armoured, shielded, internal or external data cable may be required.
- All Cat6A U/FTP cables to be installed must not exceed 90 metres in maximum distance under the TIA/EIA-568-B standard.

Cat6A Cable Installation Guidance

Preparation

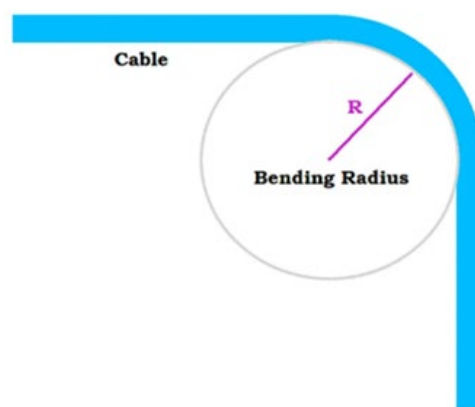
Use the latest Hyperoptic design drawing pack to identify the following:

1. The locations of each of the APs to which cables are needing to be installed.
2. Where & which DP cabinet the APs are allocated to.

3. Determine the cable lengths needing to be installed. No cable run to any AP is to exceed 90 metres.
4. If any cables will exceed 90 metres, please notify your Hyperoptic ADM or PE.

Cat6A U/FTP Cable Installation Practices

- The Cat6A U/FTP cables will be routed onto the development's telecoms containment.
- Power cables generate electrical fields that can create Electromagnetic interference (EMI), which can interfere with the transmission of data over an Ethernet cable.
- To eliminate the effects of EMI on the Hyperoptic service the Ethernet cables should be avoided from being routed parallel with power cables, but if this is not possible then a minimum distance of 300mm should be maintained.
- If it's not possible to maintain this distance, then the cables should be installed with physical barriers to shield the Ethernet cables.
- Care must be taken to avoid damage and/or crushing the cables during the installation.
- Avoid putting any kinks or tight twist whilst pulling in the cables.
- Ensure there is sufficient space throughout the cable runs to avoid crushing & creasing of the cables whilst maintaining a sufficient bend radius.
- The bend radius for Cat6A U/FTP cable should not exceed 4x the cable diameter, which equates to 28mm. which is the size of the below circle:



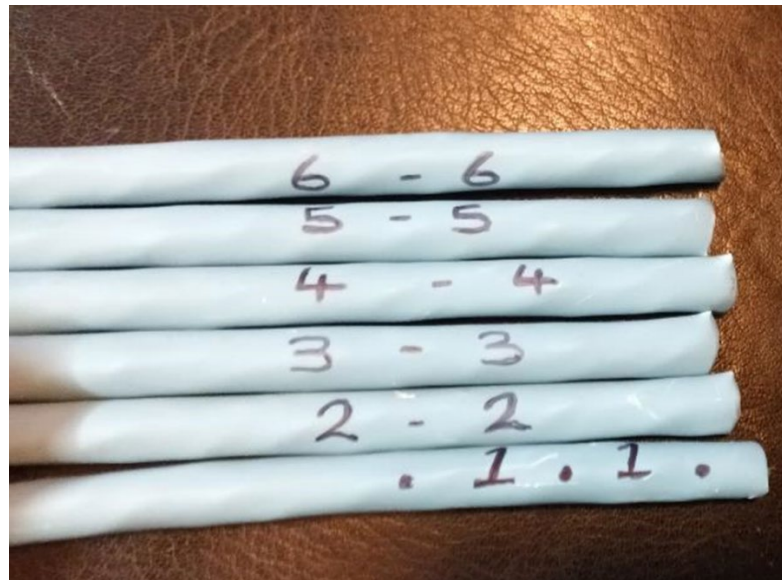
- A minimum of 3 metres of coiled cable should be left at the cabinet location.
- The cable coil is to be left no more than 0.25 metres from the cabinet location to ensure sufficient length to reach the termination panel within the DP cabinet.
- A minimum of 2 metres of coiled cable should be left at the AP location.
- The cable coil is to be left no more than 0.25 metres from the AP location to allow for sufficient length to terminate the cable & connect to the AP.
- For residential property APs, these are to be presented into a dry lining or flush back box, which the AP will be secured to.
- For communal APs, these are to be presented into a surface mounted back box above the ceiling line if space permits.

Securing the Cat6A Cable

- All cabling must be secured and supported to conform with Chapter 52 - BS 7671:2018 +A2:2022 to ensure the cabling (wiring System) would need to be supported in such a way as to prevent premature collapse if this may lead to the hindering of evacuation and firefighting activities as per Note 1 to Regulation 521.10.202 - BS 7671:2018 +A2:2022.
- All horizontal cabling must be supported by containment (minimum metal banding) all vertical cabling must be secured using suitable non-combustible supports or fixings and metal cable ties.
- If the cables are to be left coiled make sure they are secured and protected from damage and out of the way of other trades.

Cable Identification

- It is a critical requirement for each cable to be clearly identified so their route can be known.
- The AP units are individually named and numbered and so it is needed that the servicing cables are able to be identified to ensure that the APs can be identified upon the patch panels within the associated cabinet.
- It is instructed that each cable that is installed within the cable installation phase be labelled using a permanent marker or other suitable method and that each cable is numbered at both the cabinet and the AP locations.
- So, at a cabinet location each cable will be labelled with an individual number that will correspond to the number that has been written on the other end of the cable at the AP location.



Appendix A: Template: Tasks & Responsibilities Required to be Completed On Site

Prior to installation works & as part of the agreement between the Developer & Hyperoptic, it is necessary for the tasks & responsibilities to be agreed. The list below identifies those tasks & which party is responsible for carrying out those tasks, so that an Installation Agreement can be compiled & signed as part of the Wayleave process. The list can be adapted to suit any agreement reached with Hyperoptic & budgeted accordingly.

Tasks	Responsibility	
	Developer	Hyperoptic
• Denotes the party responsible for the identified task		
Incoming Backhaul		
Engage with Openreach New Sites to determine location of incoming ducts	•	
Provide & install any telecoms duct & chamber locations from the site boundary & into the building &/or to the DP-1a cabinet location	•	
Provide any pull ropes needed for the installation of the incoming fibres through the ducts	•	
Provide & install any telecoms containment from the "Lead-in" telecoms duct to the DP-1a cabinet as required	•	
Communicate & coordinate with Hyperoptic, Openreach & site management to readiness & access to backhaul routes	•	•
Provide full access to the backhaul routes	•	
Ordering & management of the installation of the Hyperoptic backhaul in coordination with Openreach or other 3rd Party provider		•
Ensure that 230v power is available & Live at the DP-1a cabinet to allow for testing & activation of the backhaul on the day install	•	

DP Cabinet Fitting		
Free issue of the DP data cabinet types & PDUs (via the appointed ADM)		•
Fitting of the free issue DP cabinets at the agreed locations (as per the design) using the correct & suitable fixing methods	•	
Provide & install (to the latest European & British electrical regulations & standards) the dedicated 13 Amp Un-switch fused spur at each cabinet location (DP-1a will require 2x power supplies)	•	
Connect the free issued PDU to the un-switched fuse spur & leave PDU in the cabinet	•	
Earth Bond each DP cabinet to the latest electrical standard	•	
Telecoms Cable Routes		
Provide & install all telecoms containment & duct routes as needed to connect each Child DP cabinet to the Parent DP-1a cabinet	•	
Provide & install all telecoms containment routes to connect the drop cables from the AP to the Child cabinets	•	
Containment main routes to have sufficient space for the Hyperoptic cables (50mm to 150mm space, depending on quantity of cables needing to transit the routes)	•	
Provide any dedicated containment (including any conduit from the outside of properties to the AP location within the property)	•	
Fibre Spine Distribution Cables Install		
Free issue of all optical fibre spine cables		•
1st Fix: Installation of the fibre spine cables to connect the Child DP cabinets to the Parent DP-1a cabinet as set out in the Hyperoptic design. To use the containment routes provided (to be installed as to site build program)	•	
Installation of any other optical fibre cables to special areas as agreed. Such as business units & management services, etc	•	
Clearly label each of the cables to allow Hyperoptic to identify start & end points	•	
Notify Hyperoptic as to cable readiness for termination & testing	•	
Give access to Hyperoptic to terminate & test all fibre spine cabling at the DP cabinets & any specialist areas (as part of the site build program)	•	
Installation of the free issue optical fibre panels in the DP cabinets		•
2nd Fix: Terminate & test all fibre spine cabling between DP cabinets & other specialist areas		•

Copper Cables Install		
Free issue of the Copper cables		•
1st Fix: Installation of all copper cables to each AP location from the allocated DP cabinet as set out in the Hyperoptic design, using containment routes (as part of the site build program)	•	
Clearly label each of the cables to allow Hyperoptic to identify start & end points	•	
Notify Hyperoptic as to cable readiness for termination & testing	•	
Give access to Hyperoptic to terminate & test all copper cabling at the DP cabinets & AP locations (as part of the site build program)	•	
Installation of the free issue copper panels in the DP cabinets		•
2nd Fix: Terminate & test all copper cabling between DP cabinets & each APs location		•
Access Point Install		
Free issue of the Access Point devices		•
Notify Hyperoptic of the areas available for AP fitting (APs are to be fitted to the wall & ceiling locations shown on the design)	•	
Give access to Hyperoptic to fit the APs	•	
2nd Fix: Fit the APs & connect them to the Hyperoptic network		•
DP Cabinet Hardware Install		
Free issue of the Hyperoptic Active network switches & UPSs		•
Notify Hyperoptic of the DP cabinet readiness & timeframes to complete fitting	•	
Give access to Hyperoptic to fit, test & commission the switches & UPS at each DP cabinet locations (as to site build program)	•	
Fit, test & commission the Active equipment within each DP cabinet via the Hyperoptic process		•
Connect the APs to their allocated switches within the DP cabinets		•
Verify & test the connectivity to each AP is serviceable via the Hyperoptic process		•
Compile a patching schedule for each DP cabinet to show the switch & AP connections made within the cabinet		•
Restrict all access into each DP cabinet to only Hyperoptic staff	•	•

Key Dates & Timeframes		
Provide the Hyperoptic ADM with completion & handover dates of areas at the earliest opportunity	•	
Provide the Hyperoptic ADM with any changes to completion & handover dates of areas at the earliest opportunity	•	
Provide the Hyperoptic design team & ADM with any changes floor layouts Provide the Hyperoptic ADM with a minimum of 10 working days to: (1) Order & dispatch materials. (2) Attend site meetings. (3) For engineers to attend site to carry out 2nd Fix & testing.	•	
Provide the Hyperoptic ADM with a minimum of 10 working days to: (1) Order & dispatch materials. (2) Attend site meetings. (3) For engineers to attend site to carry out 2nd Fix & testing.	•	
The Hyperoptic Project Engineer will carry out a per-installation survey to understand site readiness for the Parent cabinet: ○ Main Comms room/Plant room is fully constructed & able to be secured. ○ Assess if the DP-1a Parent cabinet can be installed. ○ If yes, order the cabinet for the developer to install at the agreed position. ○ The “lead-in” telco ducting & containment are in place from the site boundary. ○ Confirm that the connection of the “lead-in” duct to the Openreach network has been completed. ○ Routes are accessible & clear of any obstructions.		•

The Hyperoptic Project Engineer will carry out a per-installation survey to understand site readiness for the following: ○ Main Comms room/Plant room to have active cooling/air conditioning installed. ○ Main Comms room/Plant room power supplies to the cabinet are installed & the PDU is connected & available in the DP-1a cabinet. ○ Sub-Comms rooms/Plant rooms or agreed locations have the Child DP cabinets installed. ○ Sub-Comms rooms/Plant rooms or agreed locations have active cooling/air conditioning installed. ○ Sub-Comms room/Plant room or agreed locations have power supplies installed to the Child cabinets & the PDU is connected & available in each of the Child cabinets. ○ Infrastructure containment routes installed. ○ Fibre optic Spine distribution cables installed from the Parent DP-1a cabinet to the Child DP cabinets, as per the design. Developer to do initial test for continuity & clearly label the cable ends. ○ Copper data cabling installed from the allocated DP cabinets to the individual AP locations, as per the design & Hyperoptic accommodation schedule.		•
Post Installation Survey to assess coverage & connectivity		•
Completion Documentation		
Provide "As-Built" documentation		•
Provide the patching schedules to show how the switches & APs are connected to the network within the DP cabinets		•
Provide the electrical test certificates for each DP cabinet power supply	•	
Health & Safety		
Provide the Hyperoptic ADM with the site's health & safety policies & induction process	•	
Provide site with the necessary RAMS prior to works		•
In The Case of Retrospective Installation CDMs		
Hyperoptic to send "Active Client Appointment" letter to client or client's appointed CDM representative		•
Client or client's appointed CDM representative to sign & return the "Active Client Appointment" letter to Hyperoptic to confirm Hyperoptic as the Principal Designer & Principal Contractor	•	

Appendix B: Template: New Site Information Sheet

It is required that the following information sheet is filled out and sent to your Hyperoptic contact or Hyperoptic Business Development Manager.

The information below will allow us to further understand your needs:

Developer Name:	
Site Name:	
Full Site Address:	
Post Code:	
Size of Site:	
No. of residential units:	
No. of retail/commercial units:	
No. of blocks within the development boundary:	
No. of blocks to be considered within the design proposal:	
Communal areas where WiFi is desired. Such as: <u>Outside Spaces:</u> <u>Roof Top Terraces:</u> <u>Residential Lounges:</u> <u>Reception Lobbies:</u> <u>Car Parks/EV Charge Points:</u> <u>Basement Levels:</u> <u>Gym:</u> <u>Back of House Areas:</u> <u>Landlord WiFi Services:</u> <u>Any other areas to be considered, list here:</u>	
If full, site wide coverage is required, please tick here	☐
Will your development have power supply back-up in the instance that the main power supply is interrupted?	

Is the construction program phased?
If Yes, which phase or block will be constructed first?
Is there a build program available?
Estimated shell & core completion date:
Preferred AP location within the residential properties will be situated next to the TV & media plate as a default. Suggest alternative location. Residential AP will not be placed in utility cupboards or similar.
Estimated 1st fix date:
Estimated 2nd fix date:
Estimated 1st occupancy date:
Are there any Comms/Plant Rooms & Sub-Comms/Plant Rooms? YES/NO
If YES, location of where these are within the building or buildings
Confirm if there if the rooms are ventilated &/or air cooled
Additional user services requiring WiFi connectivity & SSIDs: Name them here:

Ready to upgrade your connectivity?

Get in touch today:

Visit hyperoptic.com/broadband/property/managed-wi-fi



We're in your corner