

# Download the virtual TOP toolkit: **[bit.ly/vtop-toolkit](https://bit.ly/vtop-toolkit)**



Contains:

- **Pre-Consultation PPT template**  
(used for discussion with BCA)
- **Airsquire's Exclusive Visual Guide**  
(Residential and Industrial)
- **Best Practices for Virtual TOP**



Workshop | 29 May 2026

# Planning Your First Virtual TOP

## BCA MasterClass

*Smarter Construction Inspections:  
Beyond Regulatory Compliance*

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CEO, Co-founder

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**Airsquire** | Insure, enhance, communicate  
construction sites better.

# 360° virtual inspection for regulatory compliance

Airsquire is your trusted local technology provider for BCA Virtual TOP in Singapore

**A&I**

## Highlights from Virtual Inspection Guidebook

### CONDUCTING THE VIRTUAL CAPTURE

**Project Team**

- Identify the areas to be scanned in the project
- Assigned personnel equip with 360 camera and walk throughout the project to do the scan
- Photos with sample measurements would need to be attached in the platform
- QP check through and inform BCA to review the capture when ready

**Note**

**Proper Lighting**  
Please ensure the areas scanned are sufficiently bright or light. Virtual would need to...

**Completed Site**  
Virtual would be like conventional inspection and the site must be captured in a TOP- ready condition

**QP to check compliance**  
QP would be responsible to ensure compliance and demonstrate to BCA through the sample measurements photos.

BuildSG BCA

360° Virtual Inspection Guidebook



Airsquire client shares on 360°



Airsquire founder shares on 360°

# Meet AirGo.

## Capture

AirGo Platform integrated with off-the-shelf 360° camera enables fast capture & upload.

## Visualise

Airsquire A.I. algorithm auto-generates 360° virtual spaces and auto-pins path on blueprint, within minutes, without GPS data.

## Share

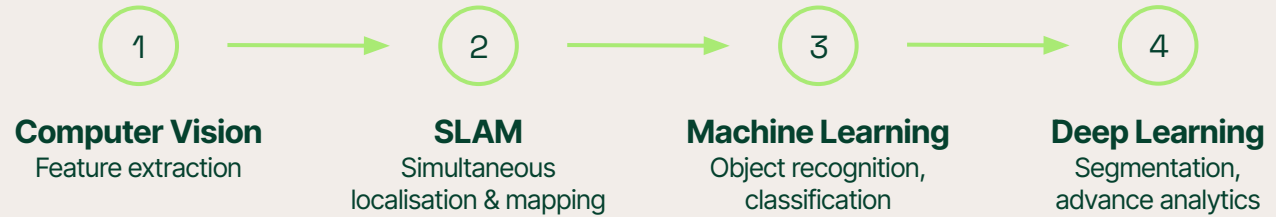
Review and share immersive 360° virtual sites via a simple URL.



▶ CAPTURE



# Airsquire A.I. Technology



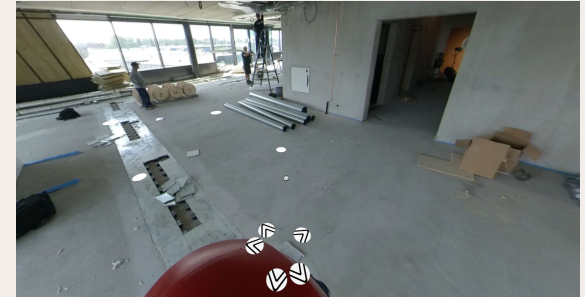
## 2D-360° Image Capture

Raw 360° images requires special image processing techniques to read and analyse thousands of images captured per walk



## 3D Space Reconstruction

Our A.I. recognises objects and features to automatically stitch and convert the hundreds of 360° images into a 3D space



## Visualisation & Analytics

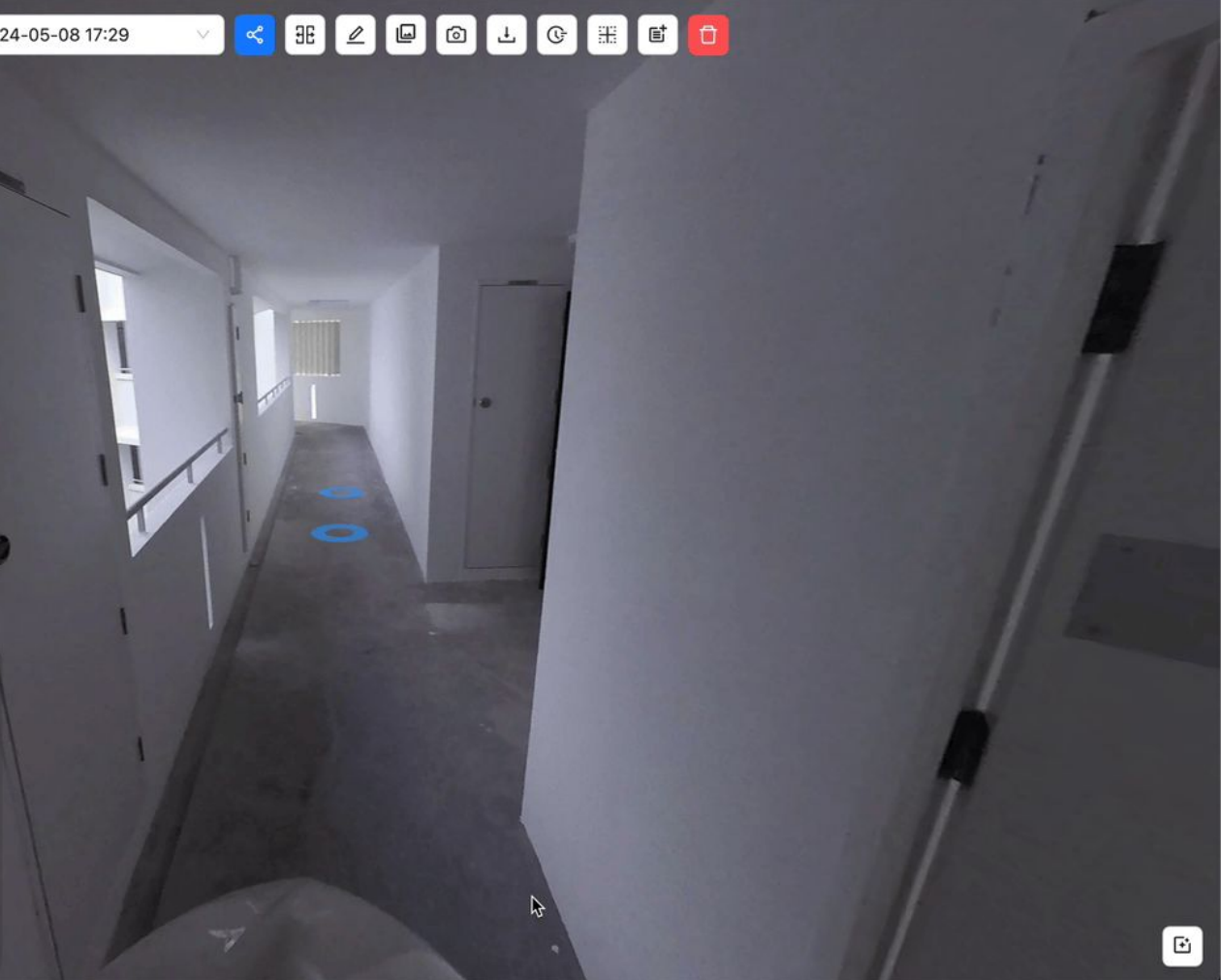
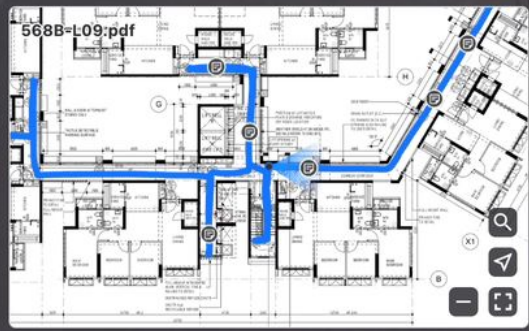
Our cloud & mobile viewer also enables the images to be viewed and accessed by our users

**VISUALISE**

2024-05-08 17:29



Markups (17)



Markup Overview

Frequency Overview

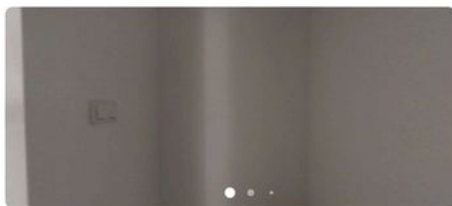
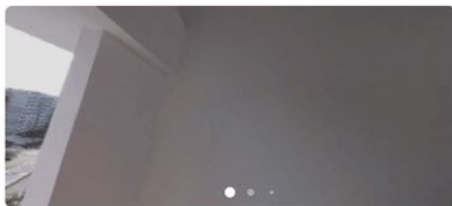
**SHARE**

+ 3 ...

VideoWalk Label

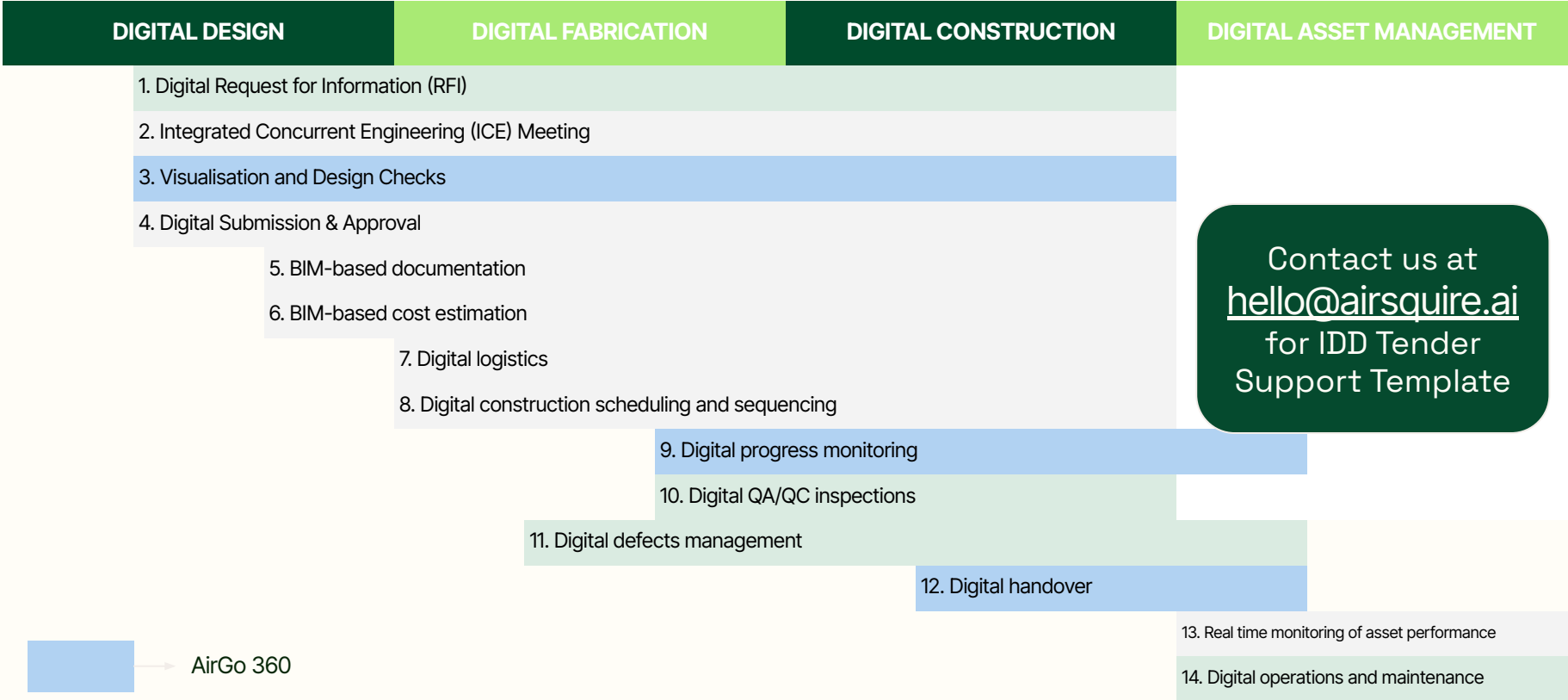
Spot Label

360 Label



# AirGo supports IDD Digital Use Cases

360° tech validated by BCA, HDB, JTC



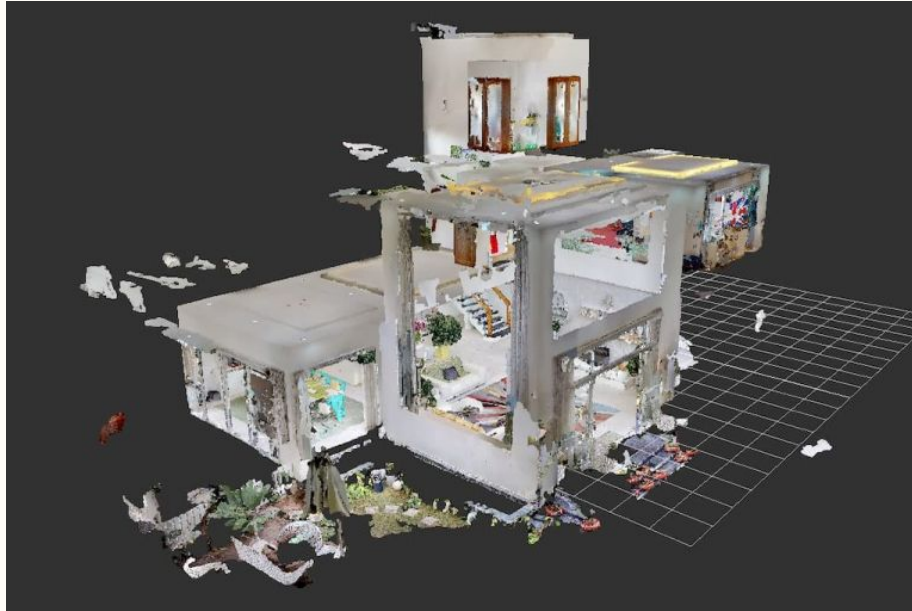
Contact us at [hello@airsquire.ai](mailto:hello@airsquire.ai) for IDD Tender Support Template

- AirGo 360
- AirGo 360 with CDE integration

# Future developments for Virtual TOP

There are ongoing pilots for the LiDAR initiatives in 2026 by BCA. Airsquire is now compatible with LiDAR scans too!

LiDAR scans for virtual inspection



**Reach out to us** if you're interested in conducting these pilots with us!

# Workshop Agenda

Planning Your  
**First Virtual TOP**



◀ CAPTURING

# Why are we here today?



## The Opportunity

Main contractors are **encouraged** to pursue virtual TOP over physical inspections for faster results.

- Beneficial for clients and main contractors
- Strongly encouraged by BCA
- Drive towards digitalisation



## The Challenge

Many stakeholders still face **uncertainty** regarding the implementation and benefits of virtual TOP.

- **Knowledge Gap:** Unsure of what goes into the process
- **Indecision:** Difficulty deciding if it's the right fit

# MasterClass Series (Part 1 of 3)

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## Lecture: Virtual TOP "5 Step" Process

Understanding the theoretical framework and BCA guidelines for virtual inspections.



## [Invite-Only Workshop] Practical: Using 360 camera for captures

Hands-on session mastering site documentation with specialized capturing hardware.



## [Invite-Only Workshop] Preparing your Virtual Inspection Plan

Guided exercise in developing a comprehensive strategy for your project's TOP.

# Virtual TOP: 5-Step Workflow

Planning Your  
**First Virtual TOP**



◀ CAPTURING

Recommended:  
**3 months**  
prep time

**V - 3<sup>MTH</sup>**  
(recommended)

## 1. Assess project suitability & book date **Important!**

Book a pre-consultation with BCA and submit Virtual Inspection Plan.  
Book virtual inspection date. ([BCA VTOP Website](#)) ([BCA VTOP Guidebook](#))

**V - 2<sup>MTH</sup>**  
(recommended)

## 2. Prepare for 360° capture

Engage 360°/ IT Consultant, procure & setup 360° software platform, hardware and training.

**V - 1<sup>DAY</sup>**  
(at least)

## 3. Conducting the capture

Capture 360° scans of inspection areas + markup measurements, in accordance with agreed inspection plan & checklist ([BCA VTOP Checklist](#))

**"V" Day**  
(submit)

## 4. Submission and review

Submit virtual scans + markup measurements. BCA will review & comment (Clarification/Observation/NC). Respond with clarifications (incl. waivers).

**V + 3<sup>W-DAY</sup>**  
(comment)

**WD Issuance**

## 5. Rectification and closure

**Closure Report**

Rectify all Non-Compliance(s) (NC) and Observation(s), capture rectification photos, generate and submit closure report.

**TOP Certificate**

— Main Con/ QP

— BCA workflow

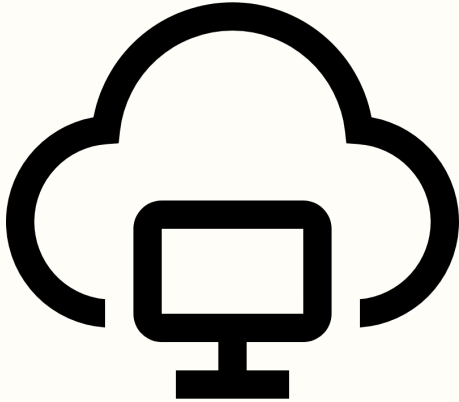
# 1. Assess project suitability



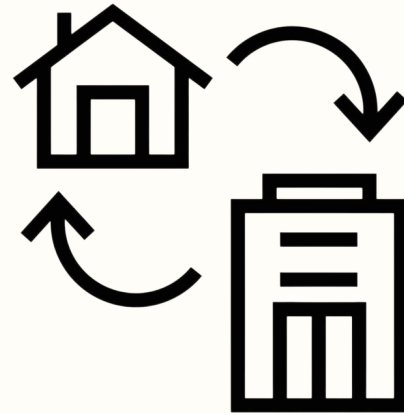
# Virtual TOP: Yes or no?

There are two types of inspections

## Full Virtual Inspections



## Hybrid Inspection (physical + virtual inspection)



# Virtual TOP: Yes or no?

What you should consider before deciding to go for virtual TOP

## Full Virtual Inspections accepted for:

- Newly erected **landed houses** by a Developer;
- Newly erected **industrial building** with typical floor plans;
- Parks and standalone structures (shelters, bus stops, linkways, etc.);
- Newly erected HDB residential blocks in **partial TOP** phases

(Note: this refers to HDB blocks under the second partial phase and beyond only. The first and last residential blocks and all mixed-use spaces would still be required to be inspected via a physical site inspection.)

- **A&A works** in localised areas

(Note: QP to arrange for discussion with the BCA Officer on their case on the areas that can be conducted via Virtual Inspections for larger A&A works).

## Hybrid Inspection (physical + virtual inspection) accepted for:

- Residential buildings in **private condominium** projects that are of typical design;
- **Hotel room floors** in commercial projects that are of typical design;
- **Office spaces** in commercial projects that are of typical design; and
- Institutional projects, for example, **schools and nursing homes**, that are of typical design.

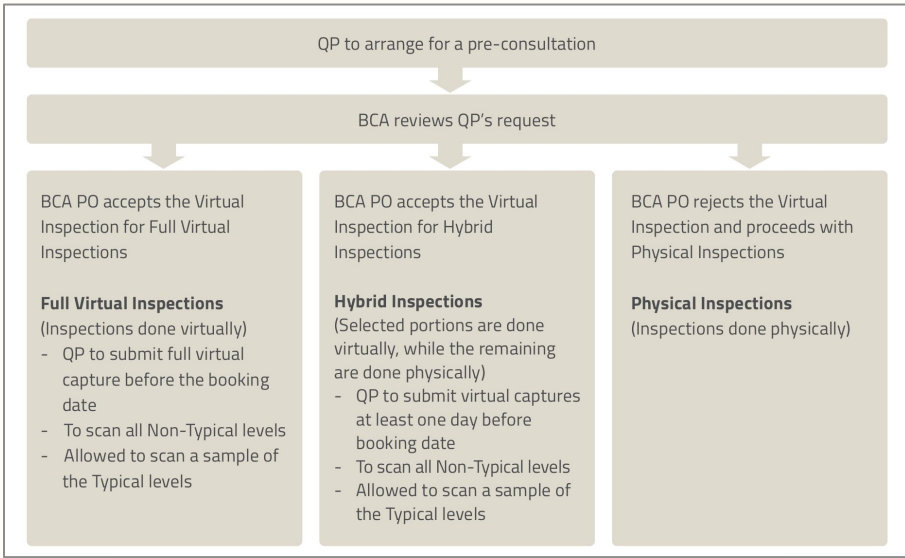
### Important!

Consult with both your QP (to determine the project's suitability) and arrange a **pre-consultation with BCA** (with virtual inspection plan prepared) to confirm that the inspection can be carried out virtually.

# Assess project suitability

Book a Pre-Consultation with BCA. Submit Virtual Inspection Plan (refer to [BCA VTOP Guidebook](#)).  
 Book Inspection Date.

## (A) Book a Pre-Consultation with BCA



**\* Typical Floors:**  
 A **minimum of 3 typical floors** should be selected in each building for the virtual inspection. This translates to approximately **1 scan for every 10 floors**. These typical floors should represent the standard layout and features of the building.

## (B) Submit Virtual Inspection Plan

<b>Project Reference Number</b>		<b>Project Description</b>
		<b>360 Capture Platform Vendor</b>
BCA inspection Booking Date	<i>Please update when you have made the booking</i>	<b>BCA Processing Officer</b>
<b>Type of Inspection</b>	<b>Areas Covered</b> (Please indicate which are typical design and which are not)	<b>Proposed Scanned Area</b>
<b>Virtual Scan 1</b>	<i>Example:</i> Block 3A, 1st Storey, Void Deck (Non-Typical); Block 3A, Floor 2, Residential (Typical: Floor 2 to 11); Block 3A, Floor 12, Residential (Typical: Floor 11 to 15); Block 3A, Roof, Roof for Maintenance (Non-Typical);	<i>Example (delete non-applicable):</i> Main Entrance, Interior Spaces, Retrofit Bathroom, Common Corridor at Residential Levels, Staircase, Service Area, Accessible Parking Lot, Common Parking Lots and Driveway, Common Areas Accessible Route, Roof for Maintenance, Roof for Public Access <b>(attached coloured Floor Plans)</b>
<b>Virtual Scan 2</b>		
<b>Physical Inspection</b>	Not Applicable	
<b>Please also submit the plan with each Virtual/Physical scan areas coloured for our reference</b>		

# Support you will receive from Airsquire

We will support you with your pre-consultation with BCA to help you create a virtual inspection plan for submission.



**Your BCA  
pre-consultation  
template starts  
here**

[airsquire.ai](https://airsquire.ai)  
[hello@airsquire.ai](mailto:hello@airsquire.ai)

**Airsquire** | Insure, enhance, communicate  
construction sites better.

Receive a **free copy** of Airsquire's [pre-consultation template](#), which includes:

- A checklist to guide QP how to prepare for the pre-consultation with BCA
- A guide to planning for your virtual/hybrid inspections

## 2. Prepare for 360° capture



# Prepare for 360° capture

Engage your friendly 360° platform, a typical package would consist of **software platform, 360° hardware** w accessories and **training services**.

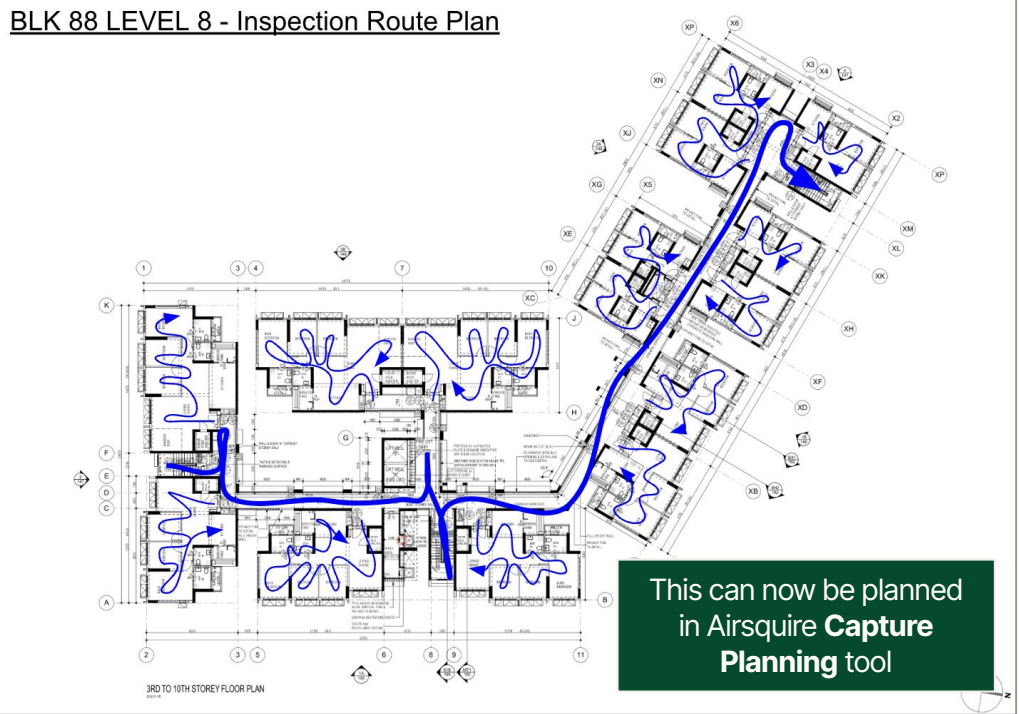


## Equipment: 360 Capture platform

S/N	Description
01	Ensure that the platform allows users to capture 360 Capture using most 360 cameras.
02	The platform must be able to capture by continuous capture, by spot captures, or by mixed captures. <ul style="list-style-type: none"> <li>• For large areas, continuous capture must be used.</li> <li>• For smaller areas such as a toilet unit, spot capture is allowed. However, the operator must ensure the spot capture is able to clearly capture all four sides of the room, the floor and ceiling.</li> <li>• Mixed capture refers to the utilisation of both types of capturing methods.</li> </ul>
03	The platform must be able to tie every photo and capture to an uploaded building plan.
04	The platform should allow for comments and additional photo evidence to be attached to the 360 Capture.
05	External parties (e.g. BCA inspectors) must be able to access the 360 Capture.
06	For the purpose of a TOP/CSC inspection, BCA inspectors must be able to tag comments on the 360 Capture.
07	QPs must be able to attach evidence of compliance (e.g. photo, video) to show the rectification of BCA comments.
08	Users must be able to generate a report on all the comments to facilitate proper documentation.

# Capture plan & checklist

Use QP's submitted **virtual inspection plan** as reference for the floors to capture **full 360° scan coverage**. Use the **inspection checklist** ([BCA website](#)) to identify **areas for sample measurement photos**.



Description of Requirement	Acceptable Requirements	Areas	Specific Item	Quantity	Mode of Evidence
The height of a barrier shall not be less than 1.0 m at all locations	>1000mm	All Applicable Areas	Barriers	3	Photo of Measurement
The barrier shall not be less than 1000mm or 850mm when measured from the last climbable toehold whichever is higher	>850mm or >1000mm	All Applicable Areas	Barriers	3	Photo of Measurement
In non-industrial buildings, the size of any opening or gap in a barrier shall not be larger than 100mm diameter sphere.	>150mm	All Applicable Areas	Barriers	3	Photo of Measurement
In industrial buildings, the size of any opening or gap in a barrier shall not be larger than 150mm diameter sphere.	>150mm	All Applicable Areas	Barriers	3	Photo of Measurement
Gratings and gaps along the accessible route	<12mm	All Applicable Areas	Common Areas Accessible Route	1	Photo of Measurement
Width min. 1500mm (Primary Accessible Route)	>1500mm	All Applicable Areas	Common Areas Accessible Route	3	Photo of Measurement
Width min. 1200mm (Secondary Accessible Route)	>1200mm	All Applicable Areas	Common Areas Accessible Route	3	Photo of Measurement
Operating Controls and Devices should be located at a height of between 450 mm to 1200 mm from the floor level	1200mm > x > 450mm	All Applicable Areas	Common Areas Accessible Route	1	Photo of Measurement
The operating part of controls, electrical sockets and switches shall be located at 350 mm or more from the internal corner of a room or obstruction as shown in Figure 64 (c).	>350mm	All Applicable Areas	Common Areas Accessible Route	1	Photo of Measurement
Headroom > 2.0 m (Common circulation space)	>2000mm	All Applicable Areas	Common Areas Accessible Route	3	Photo of Measurement
The doorway of the entrance must be 850mm minimum for a single leaf door. If the doorway has two independently operated door leaves, at least one active leaf must be a minimum of 850mm	>850mm	All Applicable Areas	Door	1	Photo of Measurement
On the pull side, a minimum space of 600 mm adjacent to the leading edge of the door with a minimum clear floor space of 1500 mm wide by 1500 mm deep	>600mm	All Applicable Areas	Door	1	Photo of Measurement
On the push side, a minimum space of 300 mm adjacent to the leading edge of the door with a minimum clear floor space of 1200 mm wide by	>300mm	All Applicable Areas	Door	1	Photo of Measurement

example: **full 360° coverage scan** for each floor selected

**BCA Checklist (version 2026-04)**

(generic excel checklist for all building types)

# Create Capture Plans

Create (or Confirm) capture paths and spots using the **Capture Planning** tool.

The screenshot displays the 'Project Files' section of the AirSquire Capture Planning tool. The interface includes a top navigation bar with the AIRSQUIRE logo, a home icon, a document icon, and the text 'AirGo 360 Live Demo'. On the right side of the top bar, there are icons for a checklist, a refresh, a globe, and the email address 'support@airsquire.ai'. Below the top bar is a dark blue sidebar with several icons, including a folder icon, a document icon, a camera icon, a gear icon, and two circular icons at the bottom (one with a rocket and one with a speech bubble). The main content area is titled 'Project Files' and features a 'Capture Plan Manager' button and a search bar. Under the 'Folders' section, there are several folder icons with names and three-dot menus: 'Create New Folder', 'Fusionopolis', 'Sample - Defect with ...', 'Demo for BIM', 'PBU Tracking (Demo)', 'Office Block (Sales De...', 'Residential Block R', 'Factory Block C', 'Site (Road and Drain)', 'Factory Block B', 'Office Block A', and 'Hospital Block H'. Below the folders is a 'Sheets' section with an 'Upload Sheet' button and a large dashed box containing the text 'Click or drop file(s) here to upload' and 'Supported file formats: png, jpeg, pdf.'.

# Capture plan & checklist

**BONUS:** Receive a copy of Airsquire's proprietary visual guide to supplement BCA's checklist!



Airsquire's proprietary visual guide supplementing BCA checklist

- Includes **photos** and **guidelines** to adding measurements
- Making it **easy for engineers** (without TOP experience) to perform scanning & add measurements

Exclusive

Air Aisquire

For Reference Only - Do Not Redistribute  
Visual Guide to Virtual TOP Checklist: Industrial

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**Visual Guide to Virtual TOP Checklist: Industrial**  
By Airsquire (October 2025)

**What is this visual guide for?**  
This visual guide, brought to you by Airsquire, is meant to accompany BCA's 360 virtual inspect meant to help developers, main contractors, and consultants (including QPs) understand and official documents for the latest requirements.

**What is Virtual TOP?**  
Virtual inspection for TOP refers to the use of 360 reality capture prior to the issuance of TOP or Airsquire's 360 reality capture solution, inspectors can examine the entire environment from var on-site visits, 360-degree capture technology contributes to time and cost savings associated.

**Before starting:**

- QP to show evidence of compliance at each non typical level (if there are more than 1)
- QP to show evidence of compliance for both accessible and non-accessible zone (if applicable)

Main Entrance for Accessible (if applicable)			
S/N	Clause	Guidelines on what to inspect As per BCA guidelines	Video Walk on AirGo How your virtual scans look like
1	72.3	Doorways shall be level	
2	72.2(b)	On the push side, have a minimum space of 300mm adjacent to the leading edge of the door	
3	4.4.6.3	The leading edge of the door leaf must not be set more than 150mm from the wall surface	
4	72.1	The doorway of the entrance must be 850mm minimum for a single leaf door. If the doorway has two independently operated door leaves, at least one active leaf must be a minimum of 850mm	

Air Aisquire

For Reference Only - Do Not Redistribute  
Visual Guide to Virtual TOP Checklist: HDB

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**Visual Guide to Virtual TOP Checklist: HDB**  
By Airsquire (October 2025)

**What is this visual guide for?**  
This visual guide, brought to you by Airsquire, is meant to accompany BCA's 360 virtual inspection checklist available on the BCA website. The guide is meant to help developers, main contractors, and consultants (including QPs) understand and check BCA's checklist more easily. Always refer to BCA's official documents for the latest requirements.

**What is Virtual TOP?**  
Virtual inspection for TOP refers to the use of 360 reality capture prior to the issuance of TOP or CSC for a building or development project. With Airsquire's 360 reality capture solution, inspectors can examine the entire environment from various angles and perspectives. By reducing the need for on-site visits, 360-degree capture technology contributes to time and cost savings associated with inspection processes.

**Before starting:**

- QP to select one room type each to show compliance at each floor
- QP to include different room type for each floor
- Noted the items are non-exclusive and QP is encouraged to attach more documentation of compliance.

Main Entrance				
S/N	Clause	Guidelines on what to inspect As per BCA guidelines	Video Walk on AirGo How your virtual scans look like	Visual Guide Usually tagged as TOP Markups on AirGo
1	2.2.3(a) 72.3	Difference in levels between the floor of the entrance to the unit and adjoining common area must not be more than 50mm		
2	72.2(b)	On the push side, have a minimum space of 300mm adjacent to the leading edge of the door		
3	4.4.6.3	The leading edge of the door leaf must not be set more than 150mm from the wall surface		

Industrial Guide

HDB Guide

# 3. Conducting the capture



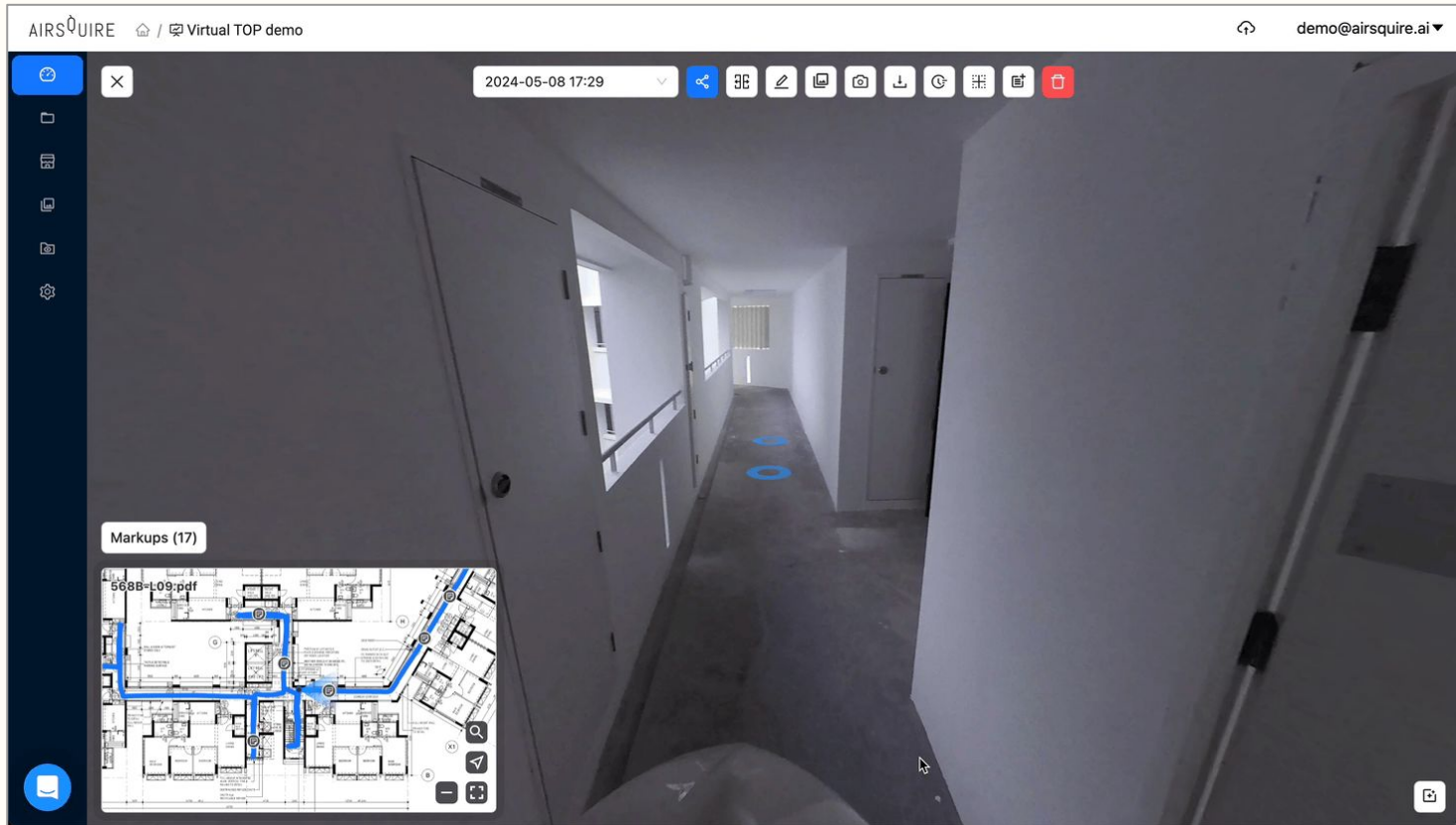
# Conducting the capture (360° scan)

Connect the camera to AirGo mobile app, walk around the floor to scan, upload the data for A.I. to process.



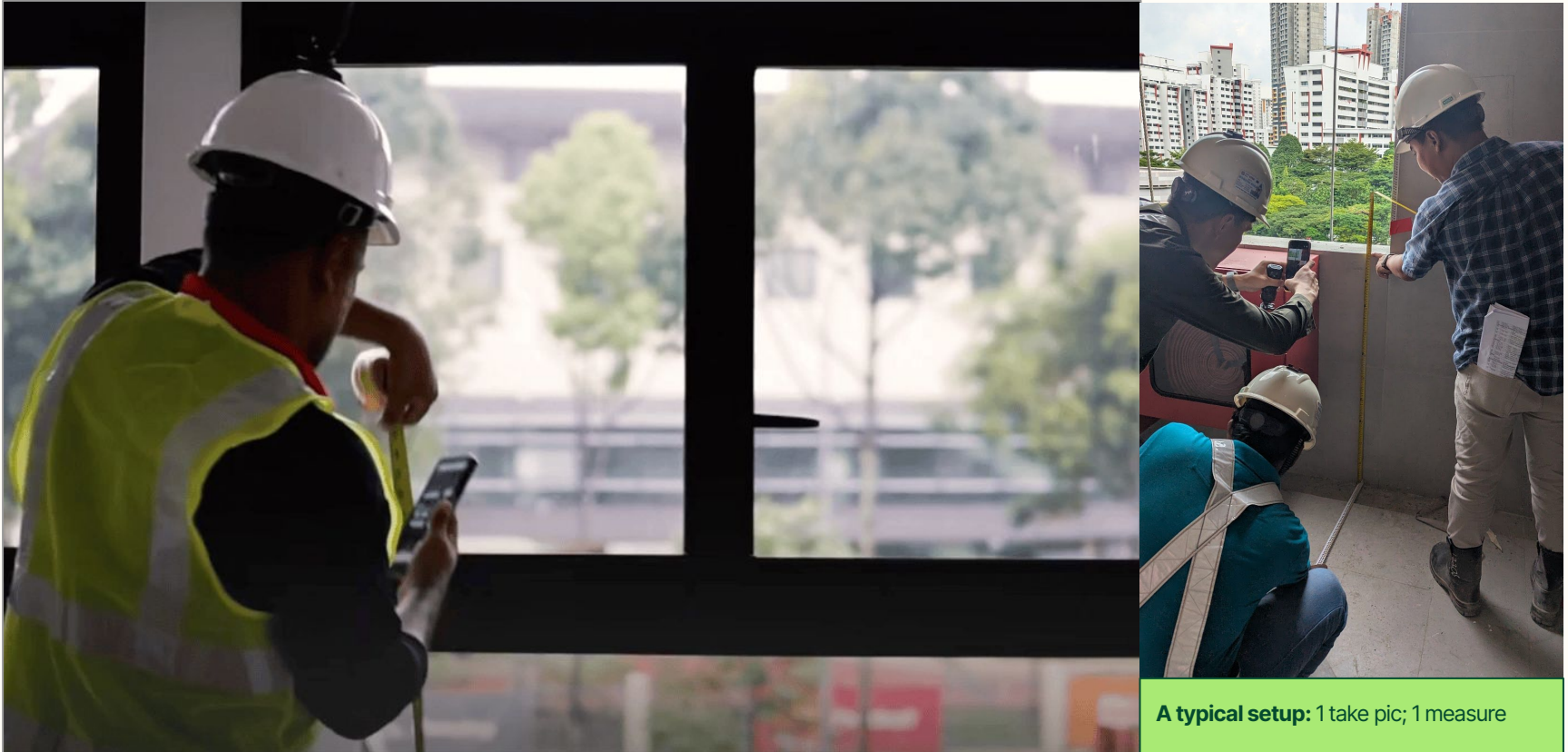
# Conducting the capture (360° street-view)

After uploading, A.I. automatically maps the path on the floor plan, and create a "street-view" of the floor.



# Pin close-up measurements

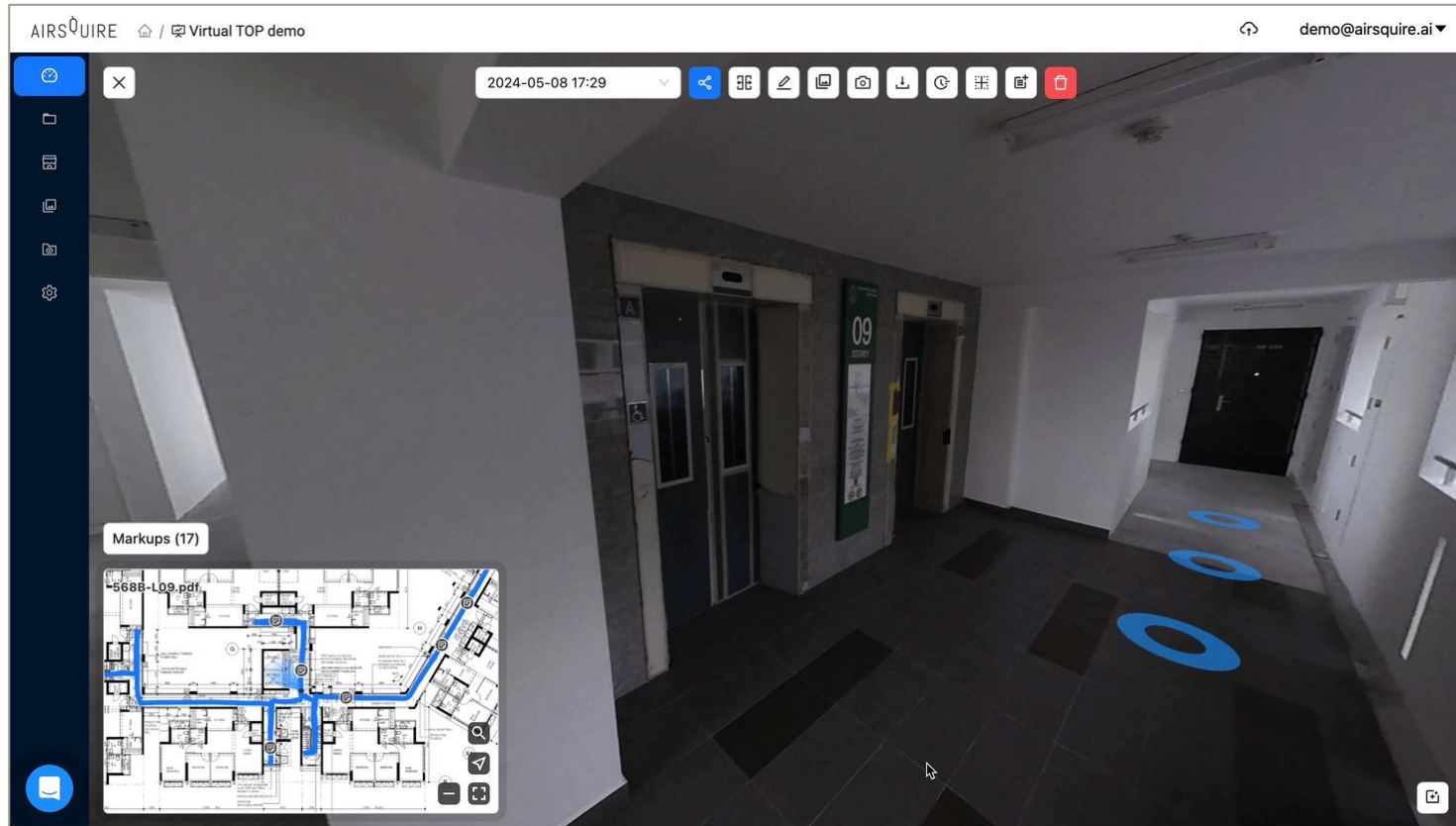
Refer to **BCA checklist**, use AirGo mobile app to capture **close-up measurements**, pin to 360° space.





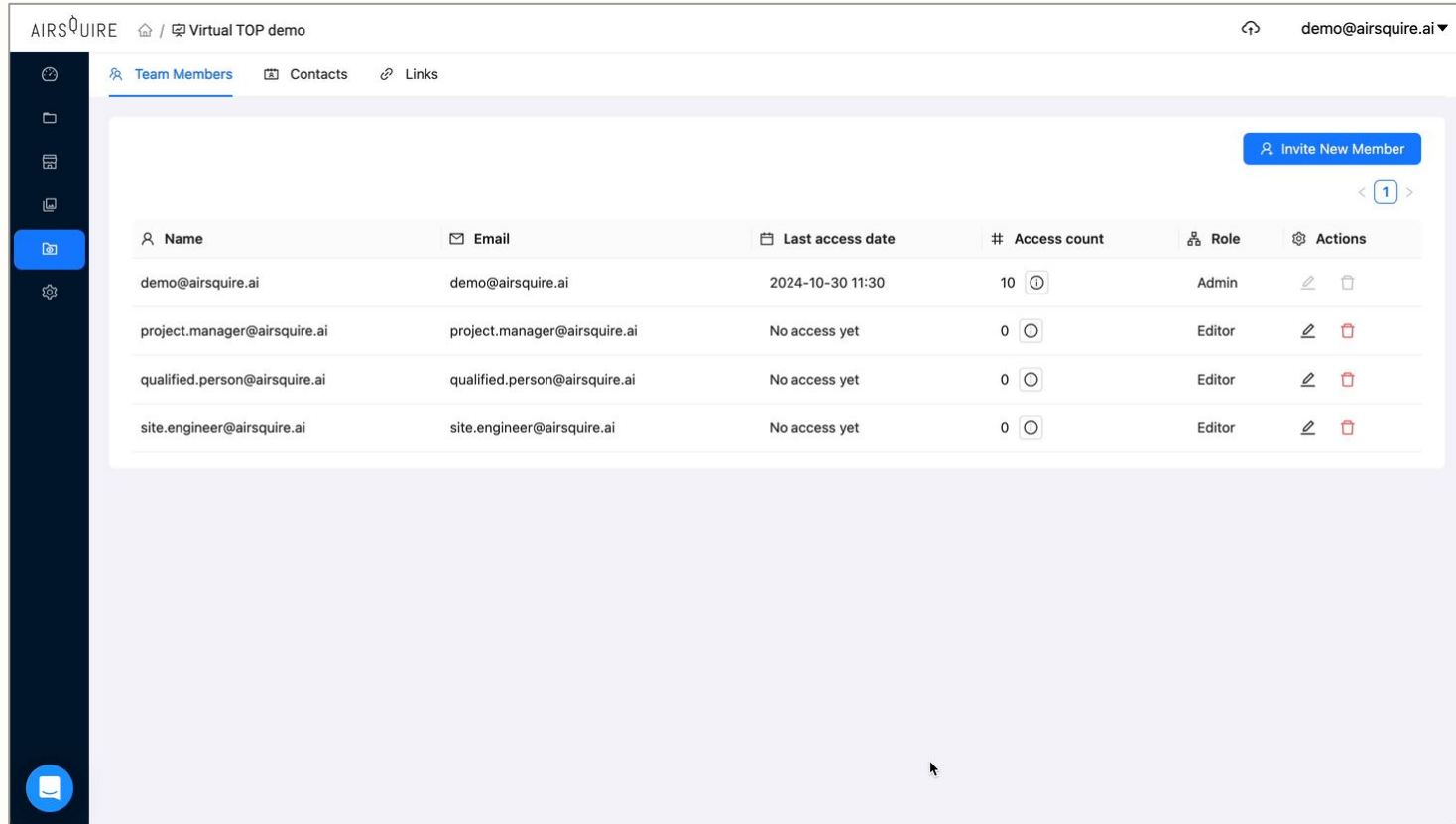
# PM / QP review first.

PM and QP review the captured space and close-up measurements on AirGo web app.



# Invite BCA inspectors to inspect

When ready for virtual TOP, add inspectors as “inspector role” to the AirGo project. **Email BCA** when the capture is completed and ready for the virtual inspection.



The screenshot shows the AIRSQUIRE web interface. The top navigation bar includes the AIRSQUIRE logo, a home icon, the project name 'Virtual TOP demo', and the user email 'demo@airsquire.ai'. Below the navigation bar, there are tabs for 'Team Members', 'Contacts', and 'Links'. The 'Team Members' tab is active, displaying a table of team members. A blue button labeled 'Invite New Member' is located in the top right corner of the table area. The table has columns for Name, Email, Last access date, Access count, Role, and Actions. The data rows are as follows:

Name	Email	Last access date	Access count	Role	Actions
demo@airsquire.ai	demo@airsquire.ai	2024-10-30 11:30	10	Admin	[Edit] [Delete]
project.manager@airsquire.ai	project.manager@airsquire.ai	No access yet	0	Editor	[Edit] [Delete]
qualified.person@airsquire.ai	qualified.person@airsquire.ai	No access yet	0	Editor	[Edit] [Delete]
site.engineer@airsquire.ai	site.engineer@airsquire.ai	No access yet	0	Editor	[Edit] [Delete]

# BCA inspectors view list & previews

During virtual TOP, BCA inspector views 360° space and inspection “markup” dashboard.

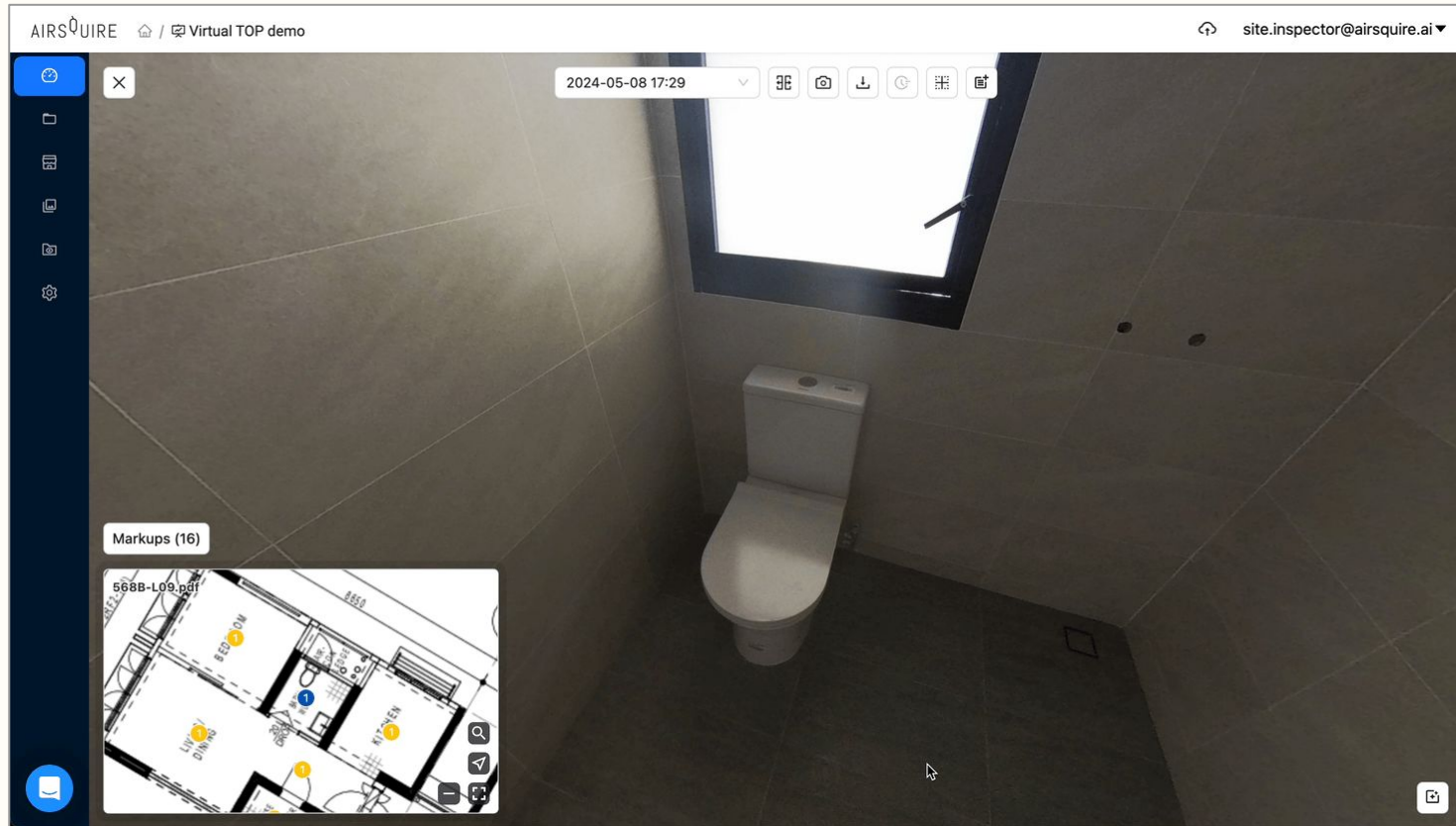
The screenshot displays the AIRSQUIRE Virtual TOP demo interface. At the top, the user is logged in as 'site.inspector@airsquire.ai'. The main navigation bar includes 'Progress Overview' (selected), 'Markup Overview', and 'Frequency Overview'. Below this, there are filters for dates (2024/04/15 to 2024/11/07), a '+ 3 ...' dropdown, and three dropdown menus for 'VideoWalk Label', 'Spot Label', and '360 Label'. The interface is organized into three rows, each representing a different inspection area:

- Row 1:** '568B-L01 & External.pdf' (00/115). Includes a site map, a 360-degree view of an interior hallway, and a 360-degree view of an outdoor courtyard area with a timestamp of 2024-05-08 17:33.
- Row 2:** '568B-Roof.pdf' (05/113). Includes a site map, a 360-degree view of a rooftop area with railings, and a 360-degree view of a rooftop terrace.
- Row 3:** '568B-L09.pdf' (128/111). Includes a site map, a 360-degree view of a high-rise building facade, and a 360-degree view of an interior room.

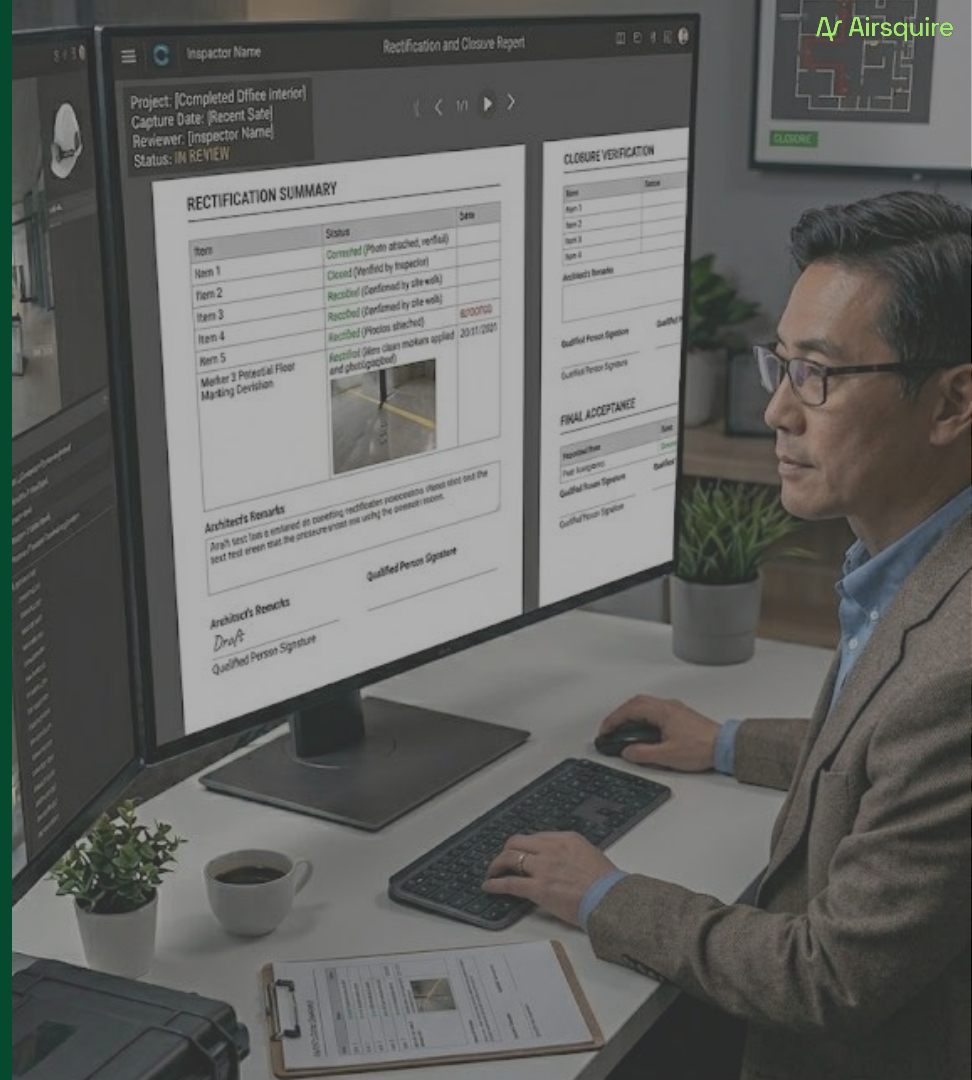
A vertical sidebar on the left contains various navigation icons, and a chat icon is located at the bottom left of the sidebar.

# BCA inspectors pin TOP markups & comments

Markup **category** can be clarifications / non-compliance / observations



# 5. Rectification and closure



# QP generate rectification report

QP **chooses before/after photos** and generate **closure report**, submit in response to WD

AIRQUIRE [DEMO] AirGo Sales Demo - VTOP (2025-11) project.manager@airsquir...

Progress Overview Markup Overview Frequency Overview

TOP 2025/11/20 - 2026/05/04 Sheet Category Status Author Share Export

Inspection Status Clause

### Markup Status

Open  
Rectified/Clarified  
Closed

### Markup In Sheet

Rectified/Clarified Closed

### Markup Category

No Category

#	Title	Sheet	Status	Inspection Status	Severity	Category	Created At	Updated At	Due Date
123	Ventilation Provision	Ind - Typical	●	Clarification Required	M		2025-11-20	2026-01-28	
124	Sign to indicate which are ...	Ind - Typical	●	Non-compliant	M		2025-11-20	2026-01-28	
126	Measurement between bo...	Ind - Typical	●	Clarification Required	M		2025-11-20	2026-01-28	
127	Measurement of Protrusion	Ind - Typical	●	Clarification Required	M	Gifski	2025-11-20	2026-01-28	

# Virtual TOP “5 Steps Process” Summary

## Key Takeaways

**01** Understand that **VTOP requires all stakeholders** (client, QP, main con, BCA) to be aligned

**02** Always start with a **Pre-consultation** with BCA

**03** Plan a Pre-consultation **>3 months prior** to TOP date (ideally >6 months)

**04** Engage your friendly **360 platform provider** to guide you through the process (that's Airsquire!)

**05** **VTOP is a powerful tool** to enhance handover efficiency (**your team must learn how to wield it**)

# Workshop feedback

**[bit.ly/feb-vtop-feedback](https://bit.ly/feb-vtop-feedback)**

*Before you go, please help to complete a short survey to help us know how we did!*

**Let us know if you would like to be invited for Part 2 & Part 3 of the Hands-On Workshop in the survey!**



# Thank You!

Please contact  
me to discuss  
further!

**Kyle Tan**  
Founder & CEO

+65 9229 0709  
[kyle@airsquire.ai](mailto:kyle@airsquire.ai)



**Airsquire** | Insure, enhance, communicate  
construction sites better.