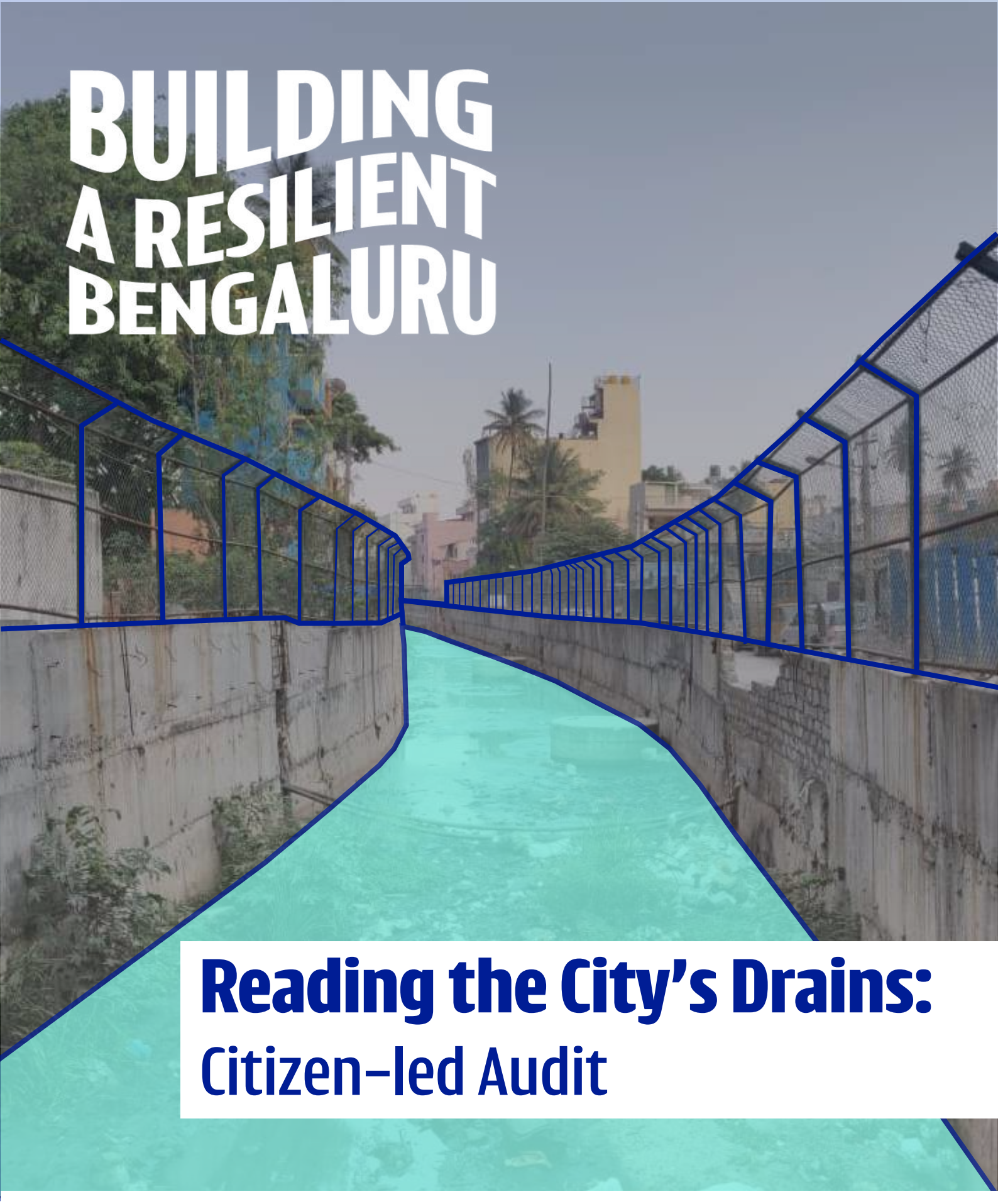



# Reading the City's Drains:
## Citizen-led Audit

BSF Small Grants Programme 2025 | Stormwater & the City

BENGALURU SUSTAINABILITY FORUM
mwdf foundation urban action and research
OORVANI

# Contents

# 1 Bengaluru's Stormwater System

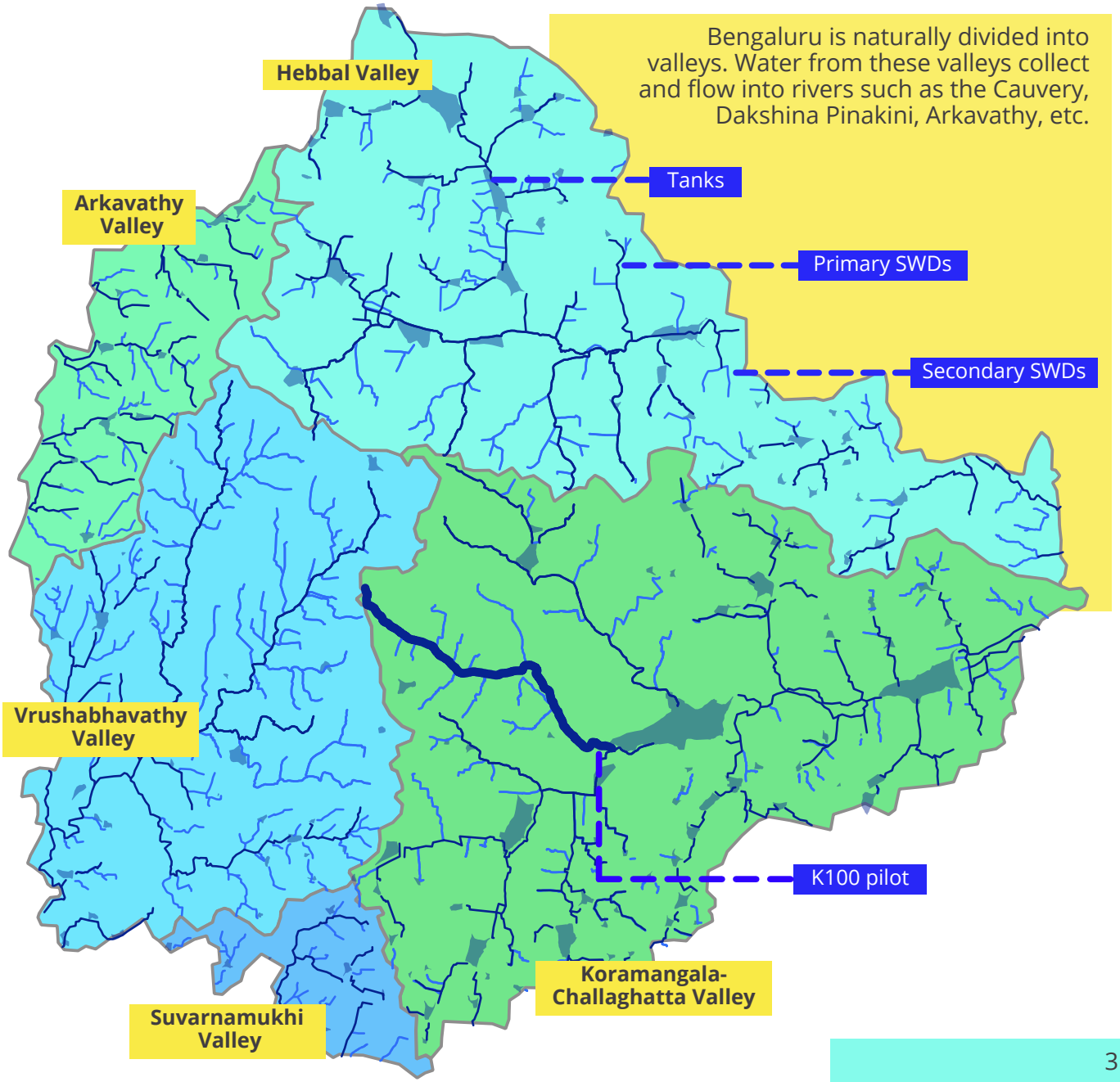
A stormwater system is an essential infrastructre made of connected stormwater drains or SWDs that help manage rainwater and prevent flooding in a city.

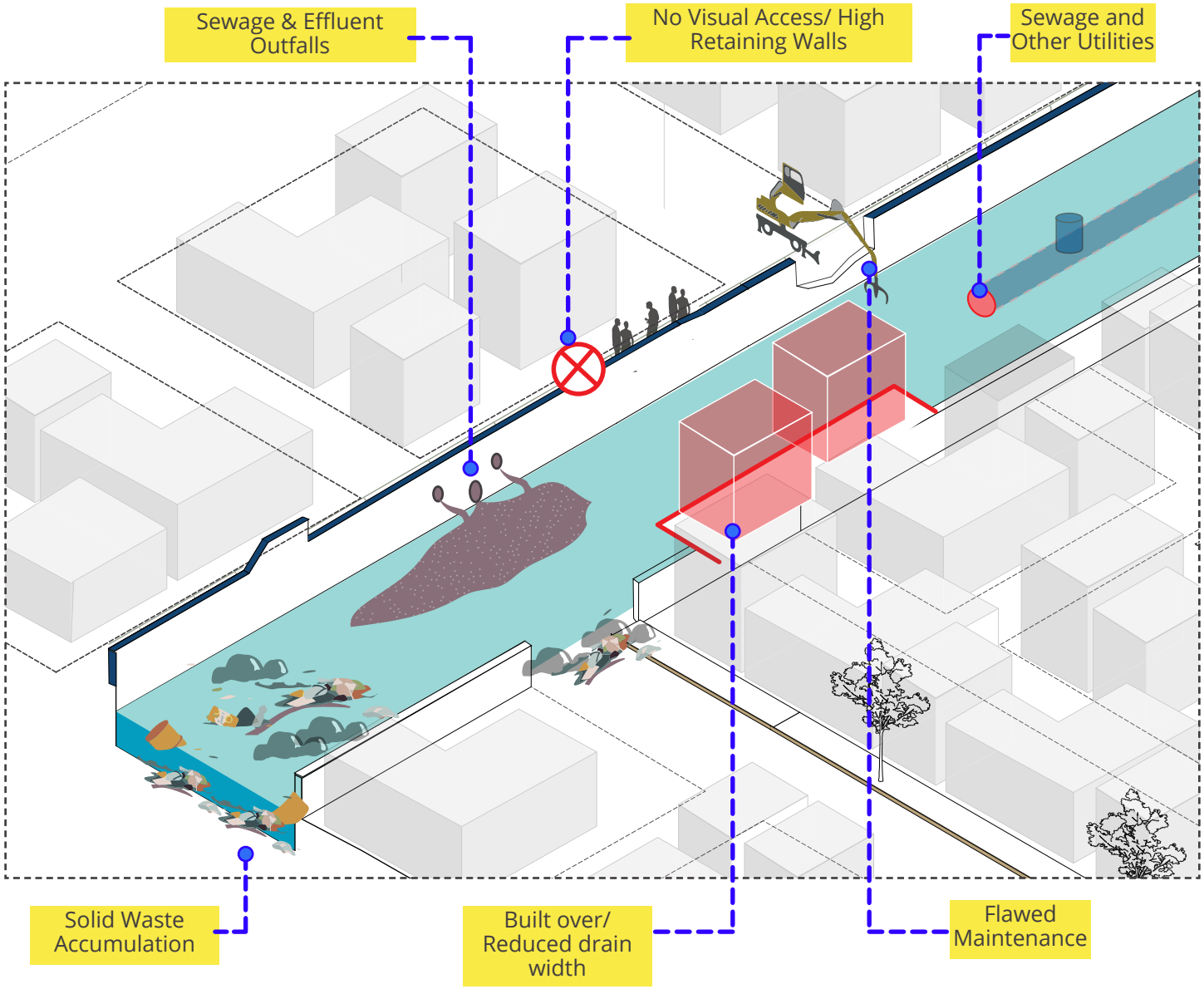
In Bengaluru, the primary and secondary stormwater drains/ SWDs, also called rajakaluves span over 842 kilometres, forming the city's largest public water infrastructure system.

Historically, these rajakaluves were designed, harnessing the natural terrain of the city, to connect a series of tanks through an overflow mechanism. Thus enabling water storage, retention, and conveyance across the city.

However, despite their critical role in flood management, water quality, and public health, this system has been dramatically altered, built over and misused.

With erratic and intense rainfall patterns on the rise, the city's stormwater system is under considerable stress leading to urban challenges we see today.






**Way Forward**

The city's stormwater system holds untapped potential as shared urban spaces that support ecology, public health, and community resilience.

The K100 Citizens' Waterway pilot, conceptualised by Mod Foundation in partnership with the BBMP and other civic stakeholders demonstrated that understanding stormwater drains as both hydrological assets and urban public spaces can guide flood mitigation and urban design in Bengaluru.

With the World Bank's INR 3600 Crore investment in transforming Bengaluru's stormwater systems, now is a critical moment to ground this transformation in data, public participation, and design thinking. However, successful transformation must begin with the right information.

Together, we can reshape Bengaluru into a resilient, climate-ready city—one where water networks are protected, celebrated, and sustained for generations to come.

# 2 Information Before Action

Information is the first crucial step towards action. The information about the city's stormwater system is currently dated, unreliable and insufficient for meaningful transformation.

It is also crucial to make information on the city's stormwater system observable by communities and the public at large to drive any positive change.

A database of stormwater drains ensures visibility and accountability. It allows for context-sensitive interventions rather than quick engineering fixes.

The GIS data currently available to the public about the condition of stormwater drains and their paths on-ground is inaccurate or non-existent.

By reviewing on-ground alignments and identifying urban adjacencies through typology workshops, we have arrived at a reliable database for the next step: Collecting hyperlocal on-ground information.

Through the Citizen-led audits, the stormwater drains (SWDs) are made visible and observable to the public and build awareness about Bengaluru's stormwater system.

The database created through the audits will feed into a city-wide dashboard showcasing information about stormwater infrastructure, vulnerability to waste accumulation, water quality and challenges in upkeep of the SWDs.


Collating all GIS data available on SWD


Reviewing the data and identifying the SWD typologies


Collecting ground level information through CITIZEN-LED AUDITS

# 3 Citizen Audit

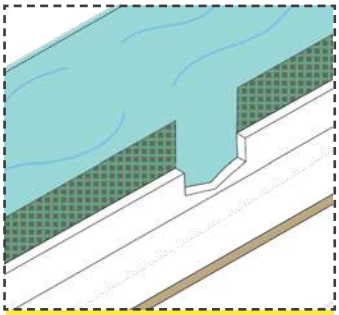
## About Citizen Audit

The citizen-led audit is a participatory and civic awareness activity intended to build awareness and visibility of Bengaluru's stormwater system amongst the public, facilitate citizen engagement, enable the public to contribute reliable and accessible information about the stormwater drains in the city, and inform future local action.

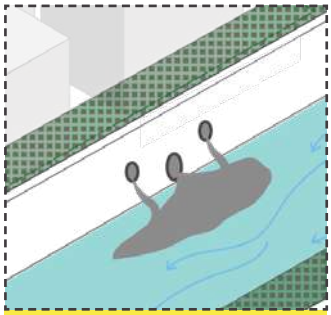
Using audit tools, the participants will step out to see and record the stormwater drains (SWDs) through observations and visual data collection of physical conditions, flood resilience, water quality, solid waste, community ownership and maintenance of SWDs. For every audit the participants will observe one given segment of a stormwater drain and submit geo-tagged photos and observations.

The objective of this workshop is to build a database of verified on ground information about the physical condition of Bengaluru's stormwater system. This data will feed into a publicly accessible interactive stormwater dashboard for the city.

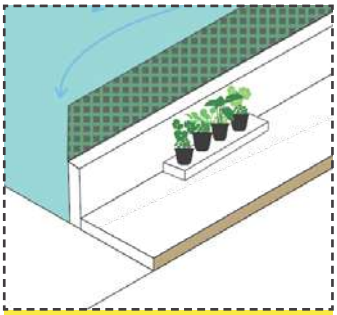
Parameters considered for a stormwater drain citizen audit



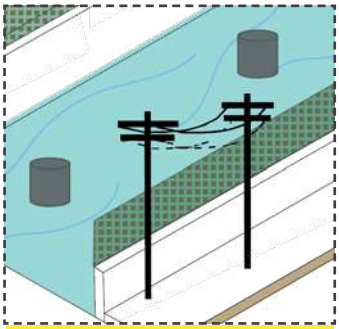
Physical conditions



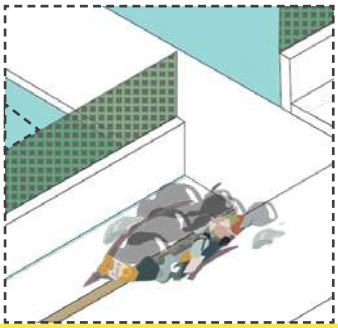
Water quality



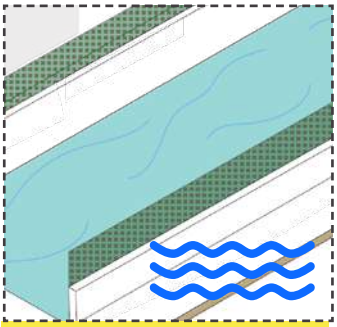
Community ownership



Adjoining utilities



Solid waste



Flooding and maintenance

# Tools

The participants will be using accessible and easy to use phone applications for the citizen audit. These applications/ apps will be either built-in to the phone or free to download. However, keep in mind to use an android phone as the audit tool is only android-compatible. Listed below are the apps to keep ready-to-use in your phone before the audit day:

**ODK Collect App**
To input observations using the audit forms

**Google Maps**
To check locations and observation points

**Phone Camera**
To collect visual information

# Methodology

**Pre-Audit**

**A masterclass to build knowledge and capacity to conduct audits**

- Understand Bengaluru's stormwater system
- Identify stormwater drains to audit
- Form teams & divide roles
- Set up apps and download audit forms

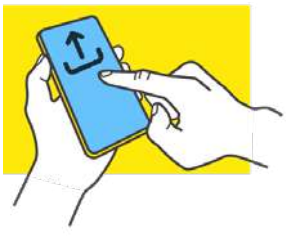
**Audit Day**

**A day in the field to see, observe and record the stormwater drain (SWD)**

- Physical condition and adjoining utilities
- SWD connections, water quality, solid waste and clean up efforts
- History of flooding and maintenance

**Post-Audit**

- Submit all forms and upload additional data
- Audit feedback



# 4 Step-by-Step Guide

## Pre-audit Prep

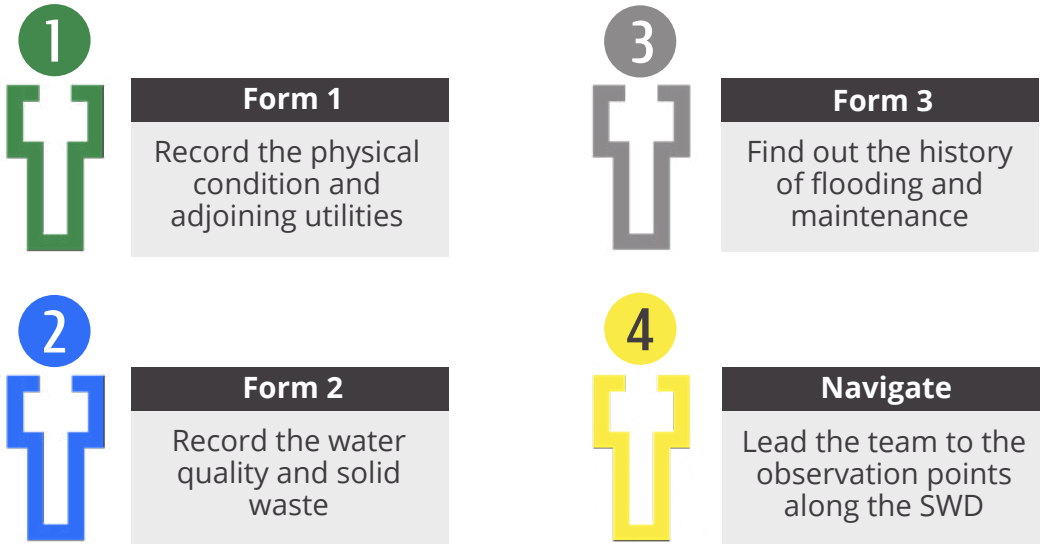
- All the participants will **learn about Bengaluru's stormwater system**, going over its history, current problems in design, management and governance, climate adaptation and good practices though the masterclass.

  Access the document here.

- Participants will be divided into **teams of four**.
- Each team will be given a **unique code** that will come in handy during the audit.
- Each team will be assigned **one segment of an SWD** to audit.

### Team & Roles

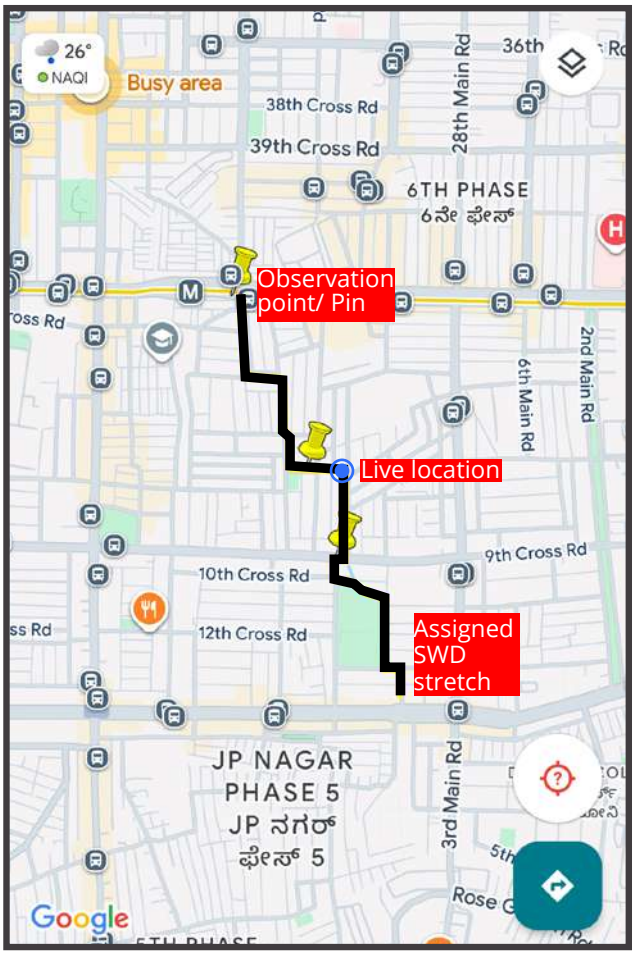
- To conduct the audit, each team has to **fill three audit forms** at several locations. Three participants should be assigned each of the three forms, available on the ODK collect app. One participant should navigate and lead the team to the observation points using Google My Maps.




### About the Audit Forms

- Each form is divided into sections. Form 1 and 2 should be filled by participant 1 and 2. Form 3 should only be filled at least once by participant 3.

| Form 1 | Form 2 | Form 3 |
|---|---|---|
| Record the physical condition and adjoining utilities | Record the water quality and solid waste | Find out the history of flooding and maintenance |
| General information and safety | General information and safety | General information and safety |
| Retaining wall | SWD connections and water quality | Flooding and maintenance |
| Bridge condition | Solid waste and cleanup efforts | |
| Utility lines and manholes | | |




### SWD Location Map

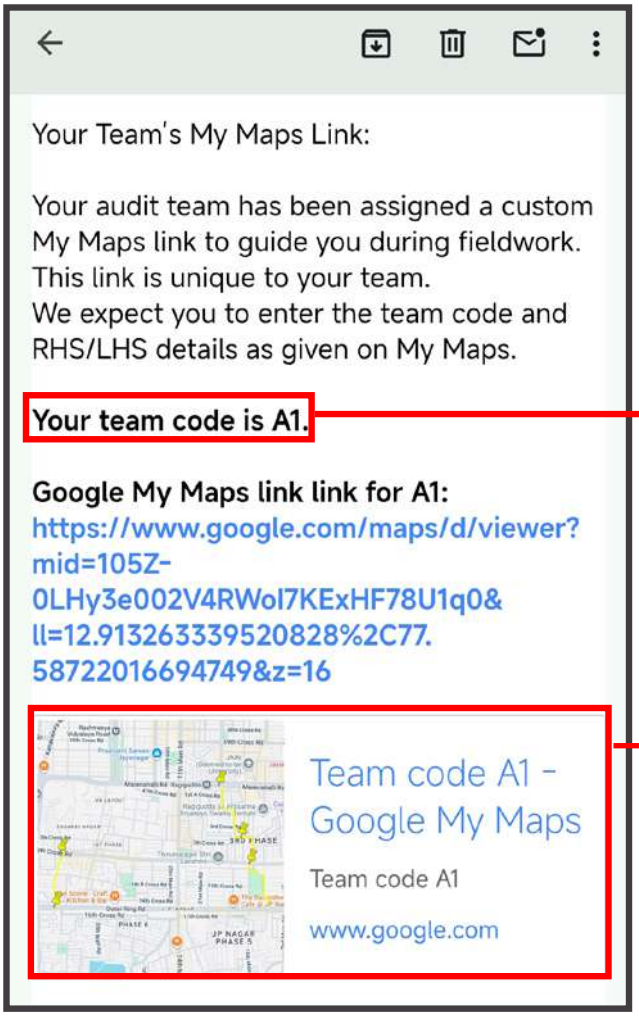
A Google My Maps link provided to the team for reference will show the assigned SWD as a line feature. The **starting point and multiple observation points** will be marked as points. The LHS and RHS wall also be marked on the points.

Using the provided Google My Maps link, participant 4 will walk along the SWD stretch and stop at every pinned location for observations to be recorded. Each pin is 100 meters apart.

The 'live location' mark (denoted by the blue dot) can be used to navigate and align yourself to the path marked out on the map.

When the 'live location' mark hovers over a pin, the team can stop at a safe location and record their observations.

Note that the **pins are only indicators**, the team can record at places they may find more suitable.

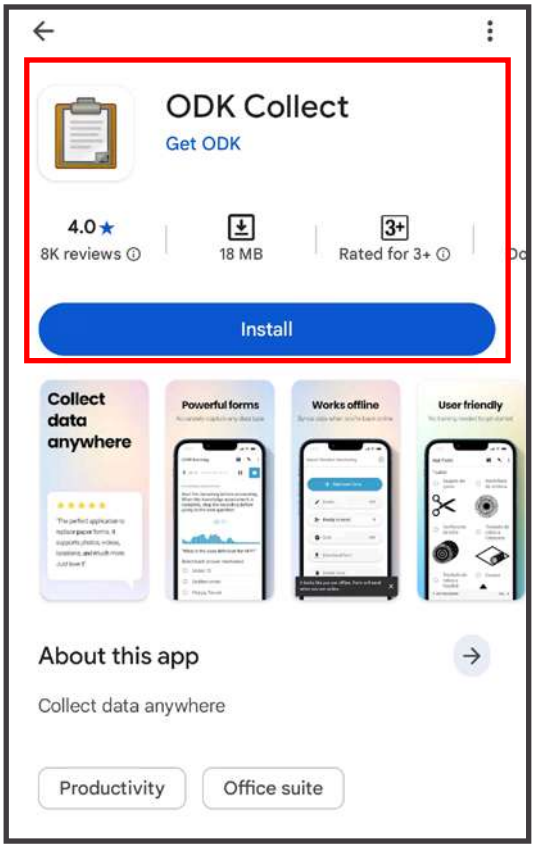



**Unique Team Code**

**Google My Maps Link**

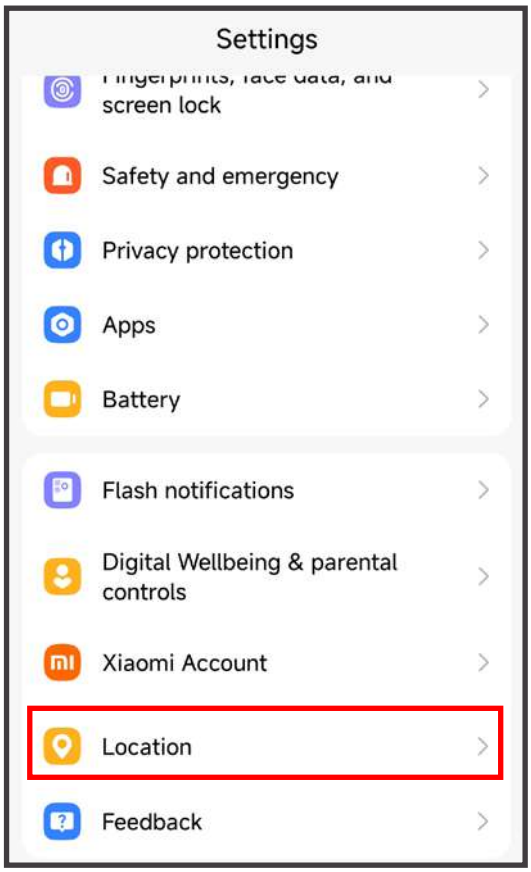
- Details about the unique team code and Google Maps location to the assigned SWD will be **communicated through an email**.

## Download the Audit Tool

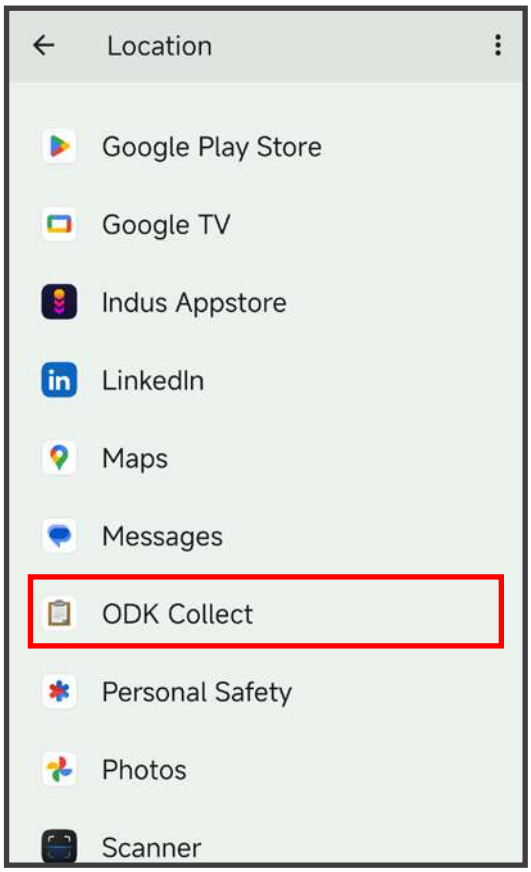



- Link to **download the audit tool "ODK Collect"** has also been provided in the email. Conversely, the participants can download the audit tool by searching for it on the Google Play Store.

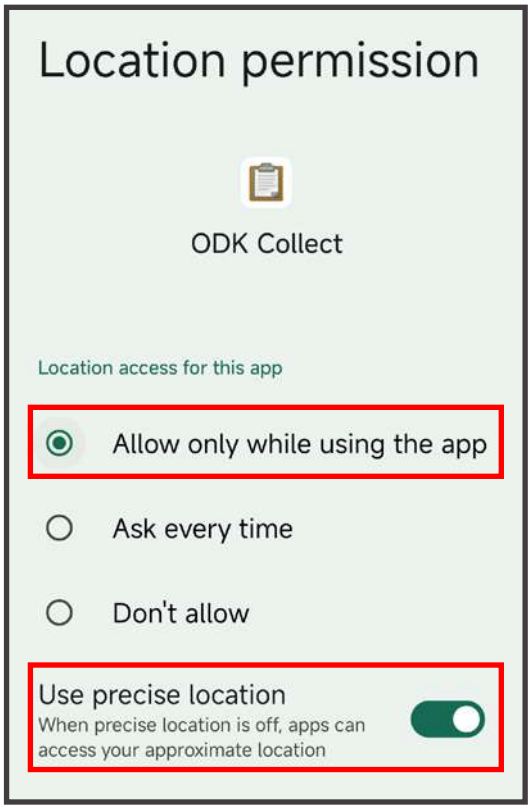
## Enable Location Access



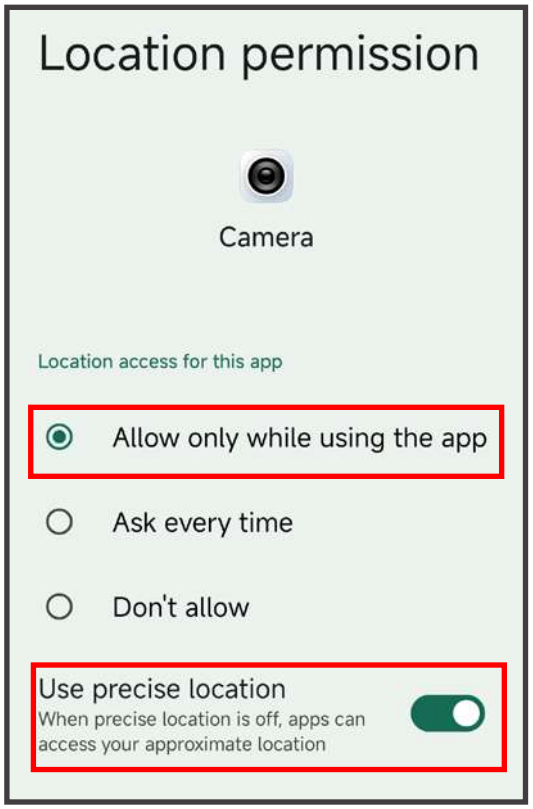

- Open phone settings and scroll down to find the "Location" page.




- Inside the "Location" page, you will see a list of apps. Select "ODK Collect" from the list to change the location permissions for this app.

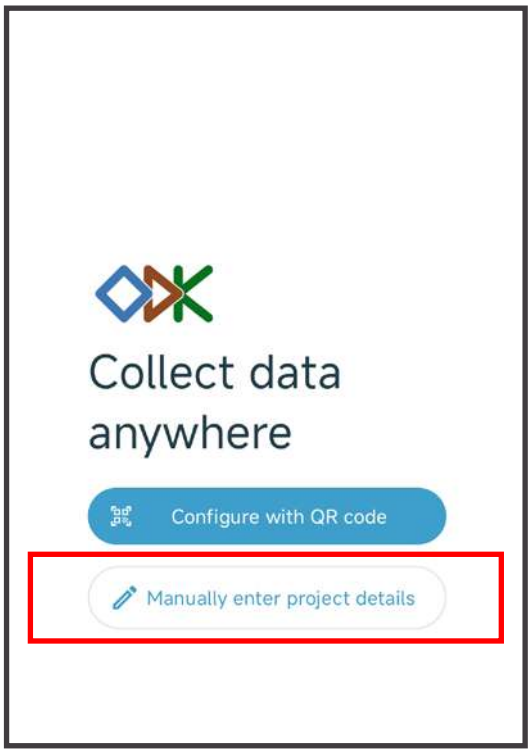



- Under Location permission, select "Allow only while using the app." Toggle on "Use precise location."



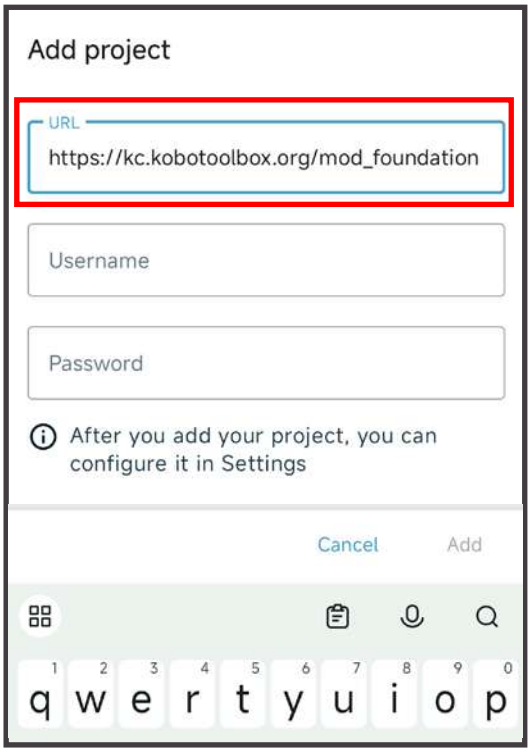

- Follow the same steps to allow location access for the Camera app.

**Download the audit forms**




- Open ODK Collect. A homepage will appear. To continue forward, you can either select the "Configure with QR code" option or the "Manually enter project details" option.

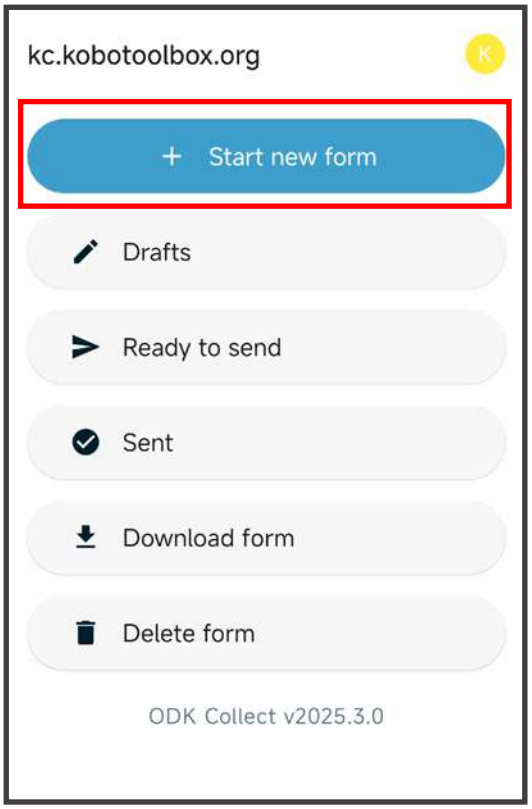
- To configure with QR code, scan the above QR code.



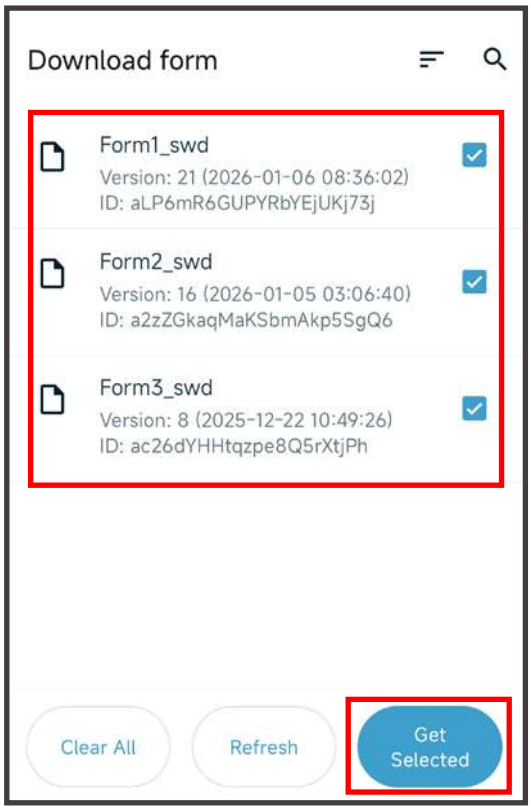

- To manually enter project details type the URL given below and select “Add.”

  URL: [https://kc.kobotoolbox.org/mod_foundation](https://kc.kobotoolbox.org/mod_foundation)

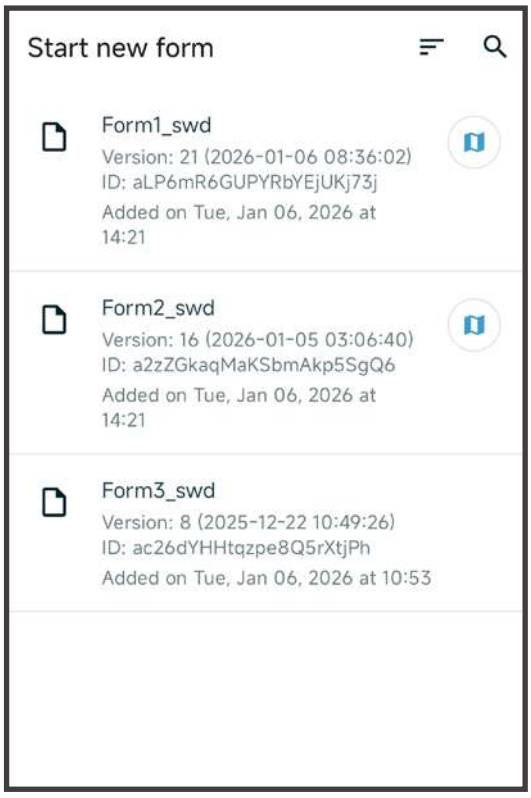
  Leave the username and password boxes empty.




- Once configured, the above page will appear. Select “Start new form” to download the audit forms.




- Tap all the check-boxes to select all forms. Then select “Get Selected” to download.

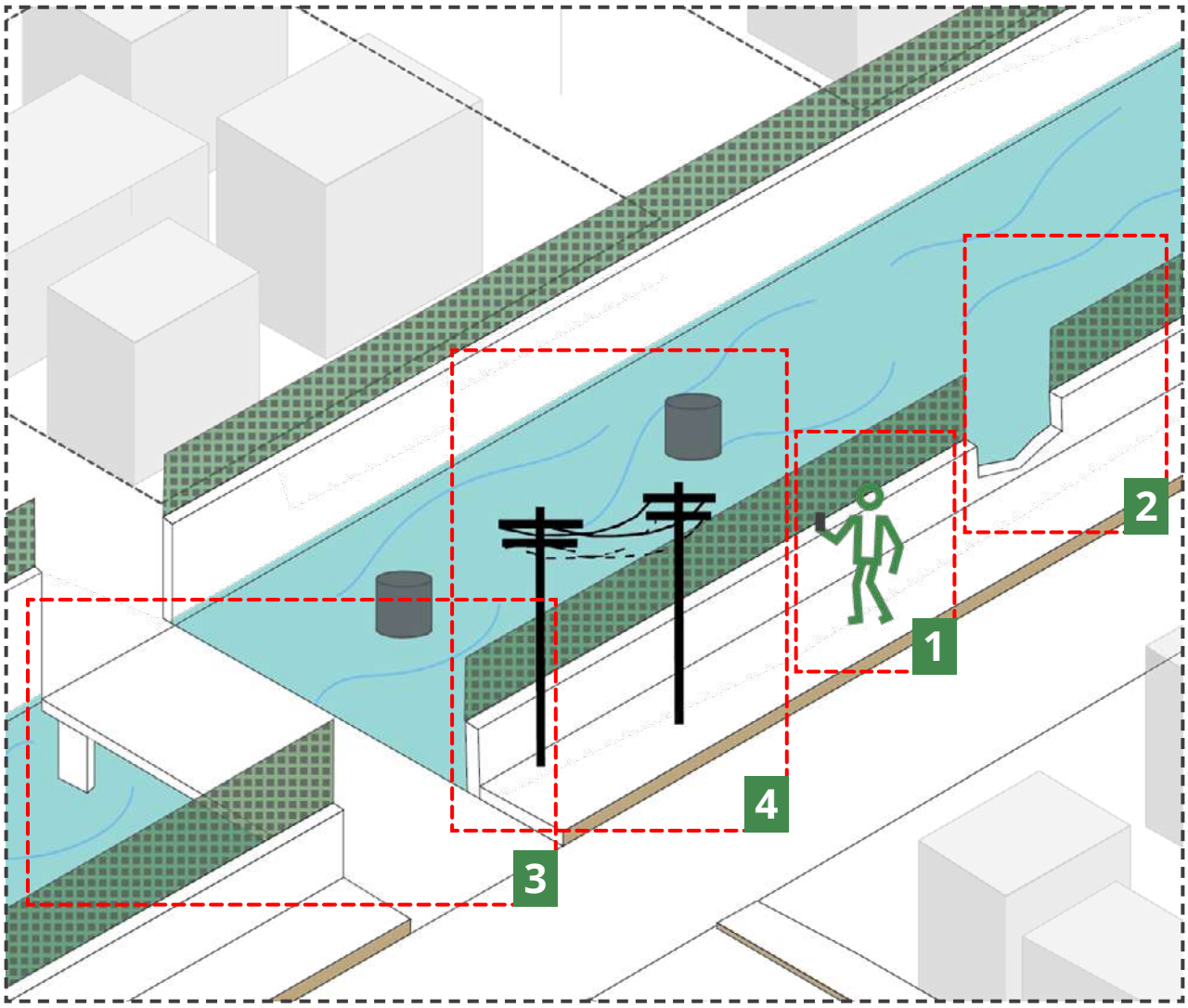



- Now you have all forms ready to start the audit!

# FORM 1

## OBSERVING THE PHYSICAL CONDITION OF STORMWATER DRAIN (SWD) AND ADJOINING UTILITIES

This form helps the participant record information regarding (1) the physical condition of the retaining wall that enclose the SWDs, (2) the bridges that exist at particular distances over the SWDs, (3) and utilities such as power lines, sewer lines etc that tend to run along the SWDs.




### 1 General information and safety

Ensure safety
Select team code
Select side of stormwater drain
Record current location
Record date and time

### 2 Retaining wall

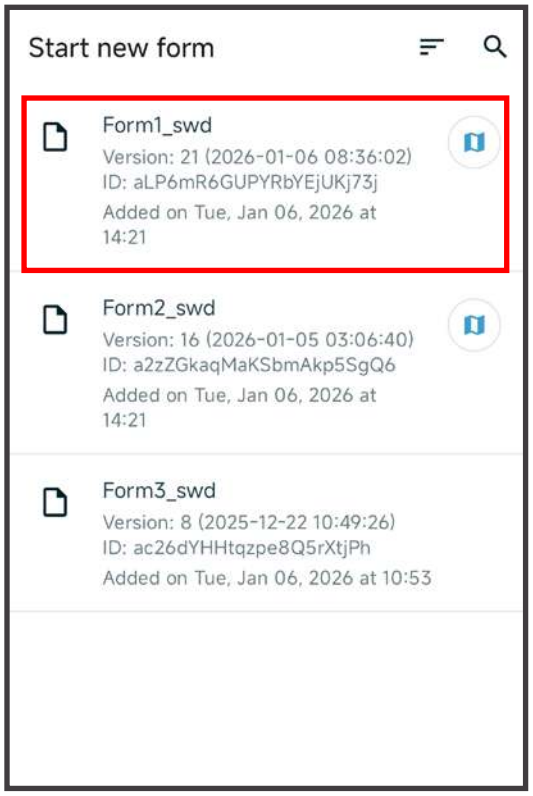
Condition of the retaining wall
Height of the retaining wall
Presence of fence
Material type
Street character

### 3 Bridge condition

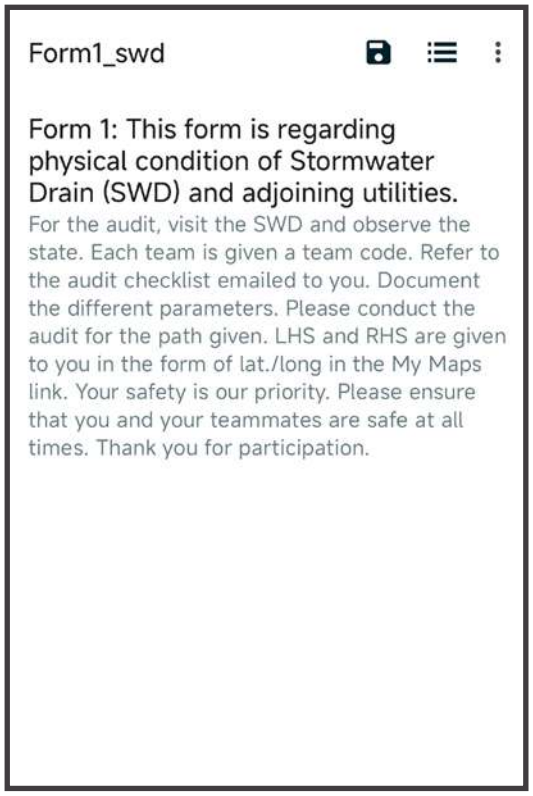
Type of bridge
Condition of the bridge
Number of piers

### 4 Utility lines and manholes

Utility lines along the SWD
Utility lines inside the SWD
Sewer manholes

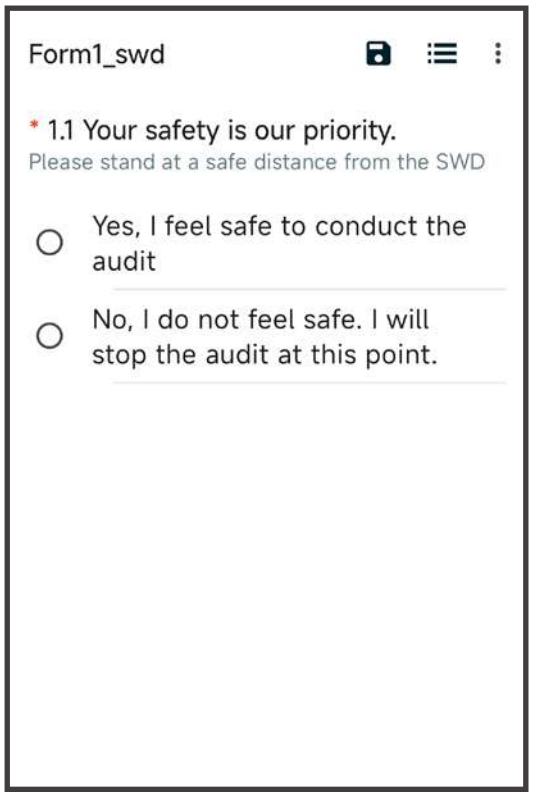



- To start form 1, click on '**Form1_swd**'

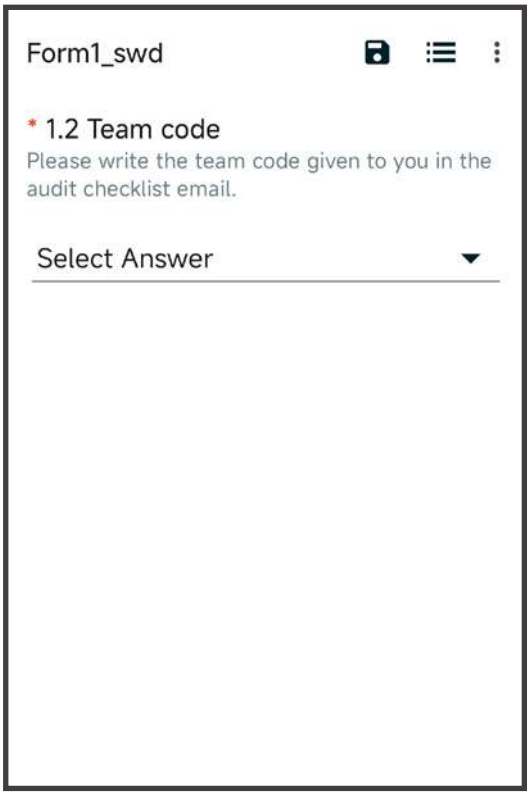



- Once selected, the form explains the general rules of the audit.

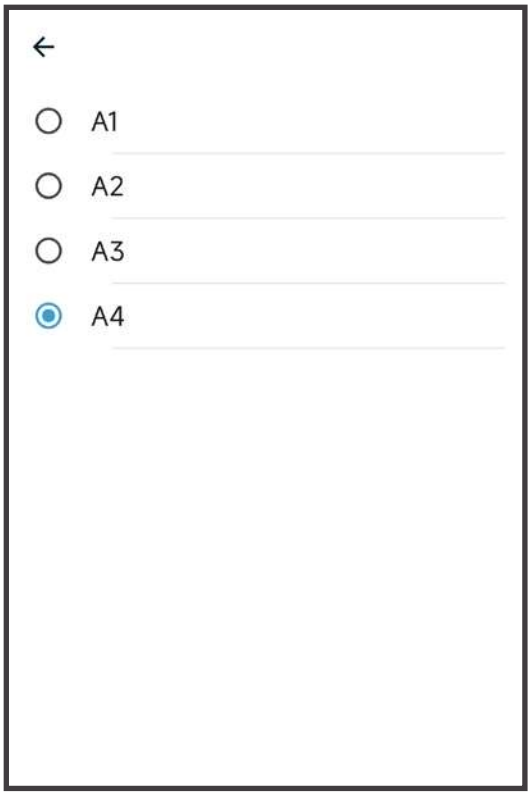

- Before you begin observations confirm your safety and record general information in Section 1.




- Make sure to stand at a safe distance before you start recording your observation.

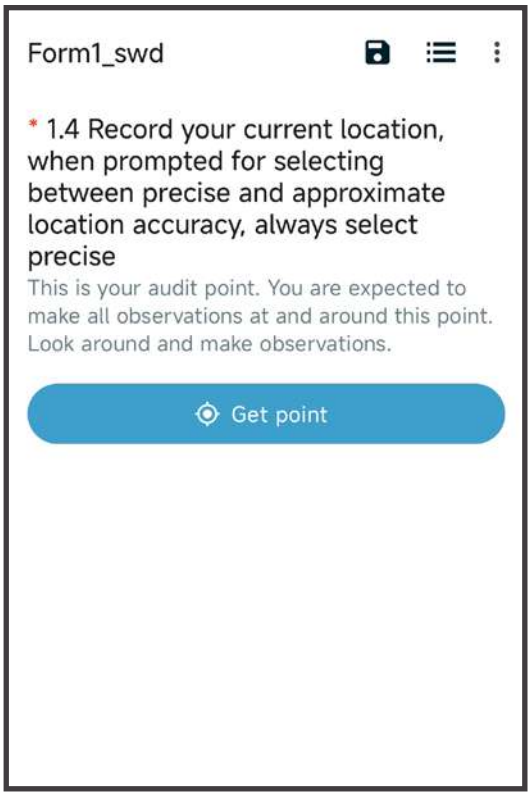



- Select your team code from the drop down list (your team code is assigned to you in the email communication.

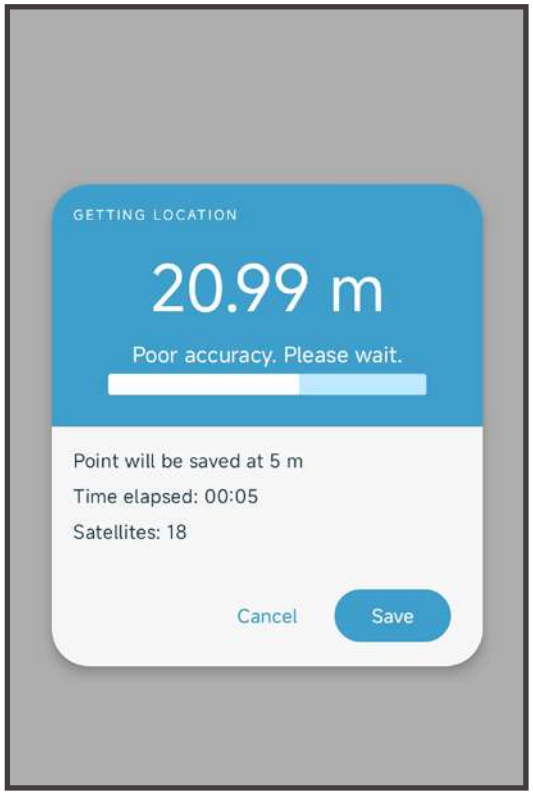



- Select from the drop down list.

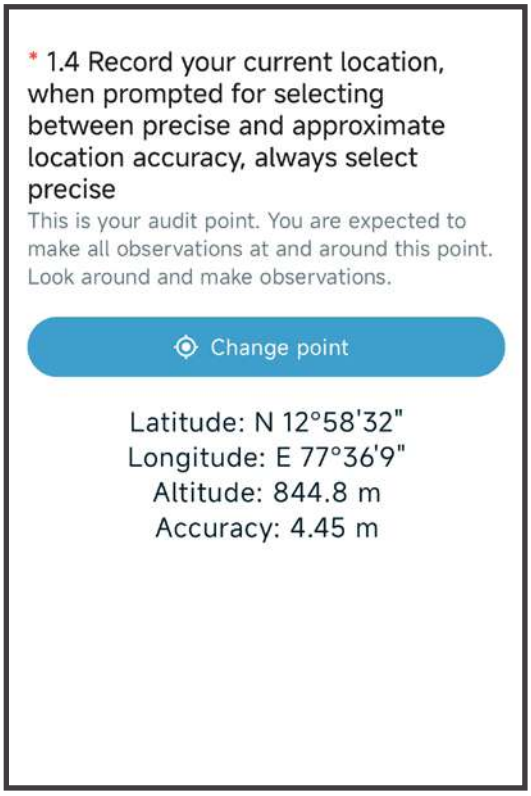

- Mention if you are standing on the LHS or RHS side of the stormwater drain (SWD).



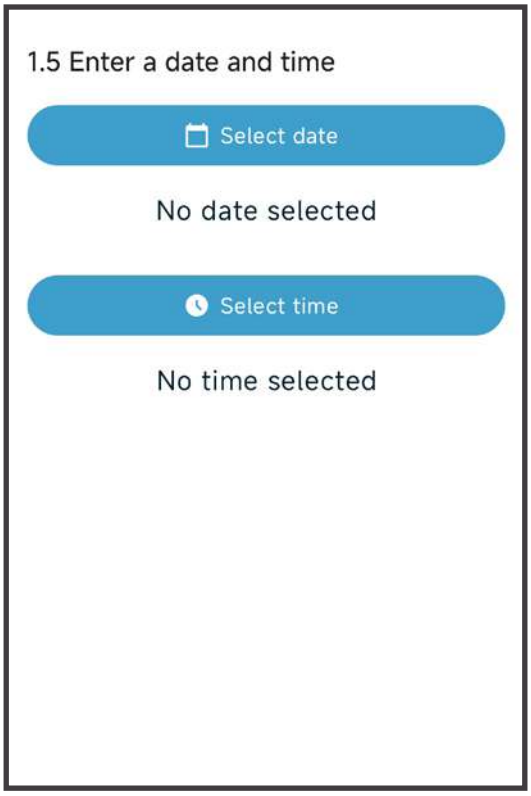

- Select 'Get point' to record the precise location of your observation point.



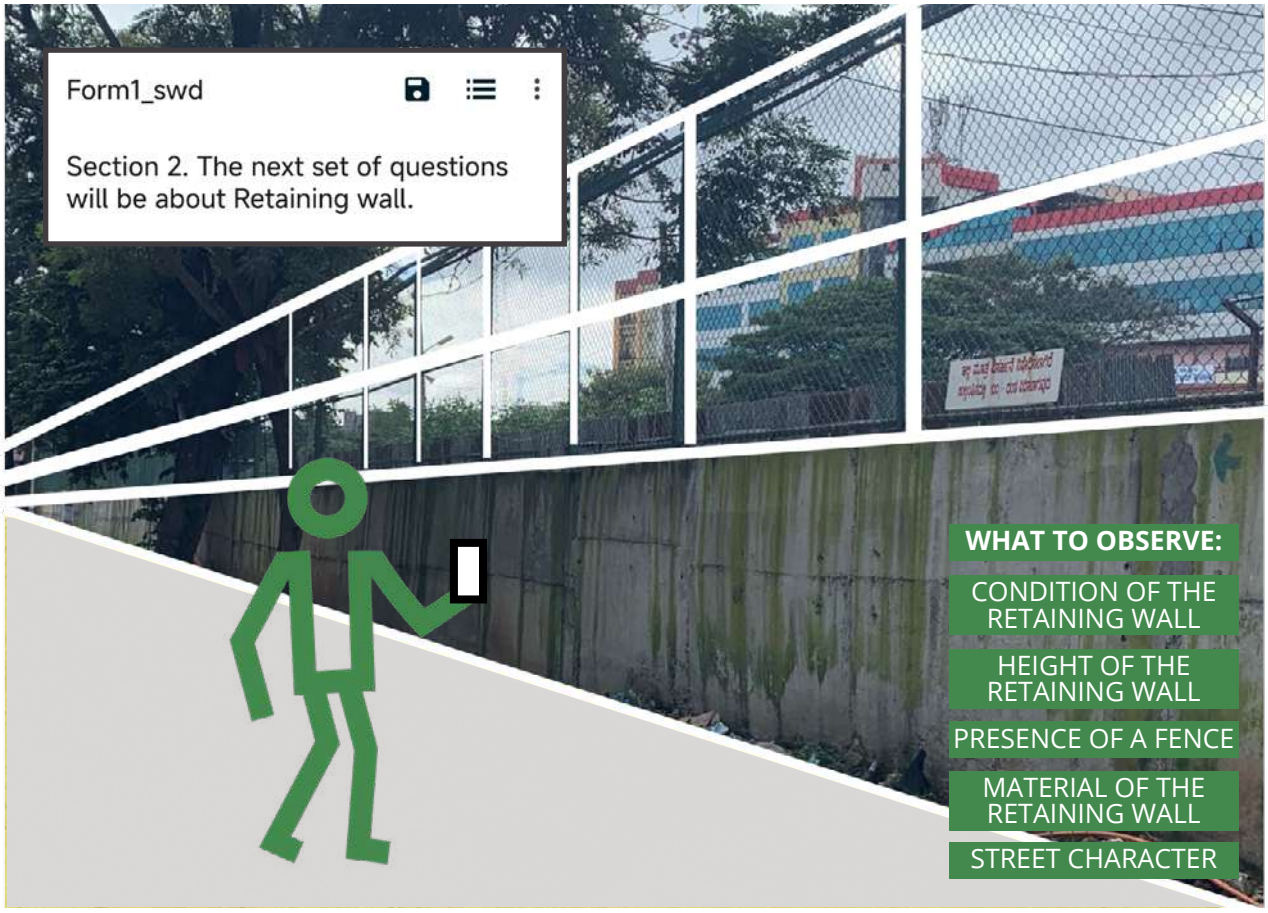

- Wait till the location accuracy is within 5 metres.



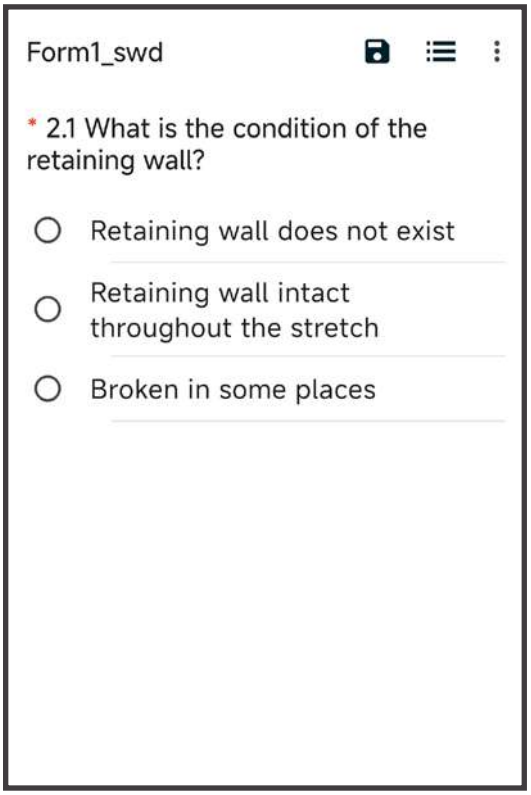

- Your location cooradinates, altitude and accuracy will be recorded for the specific observation.



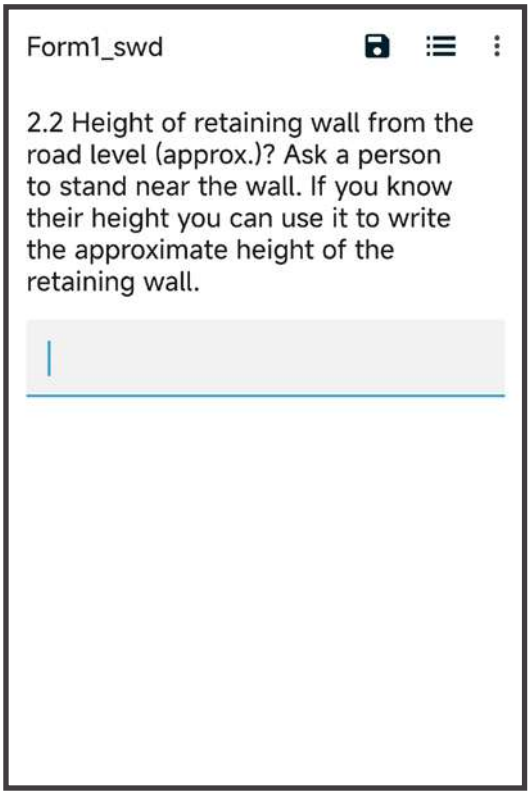

- Enter the date and time for the specific observation.



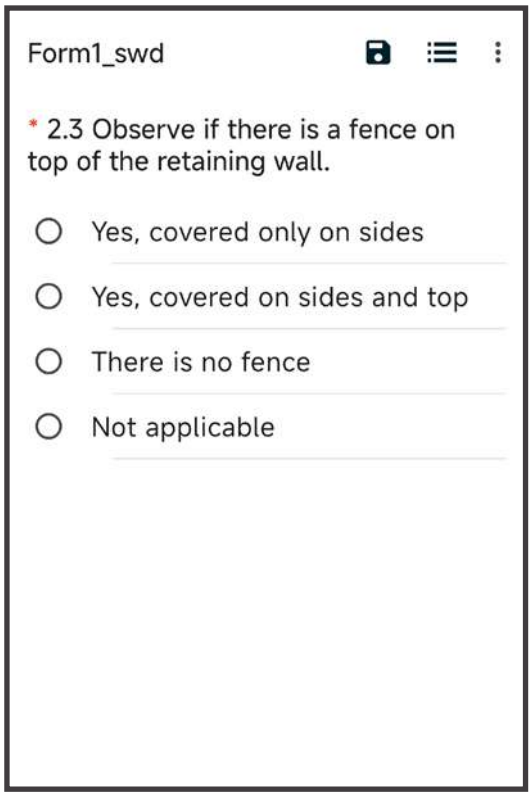

Observe the retaining wall in Section 2. You will be required to click photos of the retaining wall. **Refer to best practices on how to click the ideal photo and the reference sheet** at the end of this section to guide you to make observations.



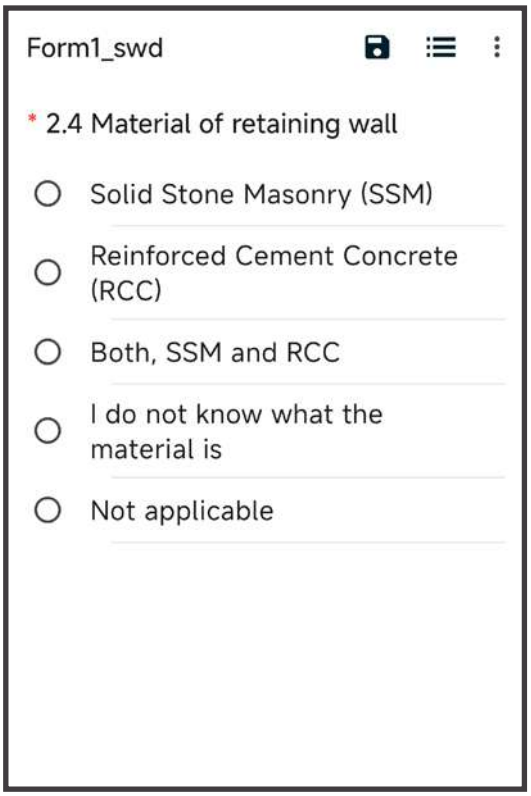

- Observe the condition of the retaining wall along the SWD and select the relevant option.



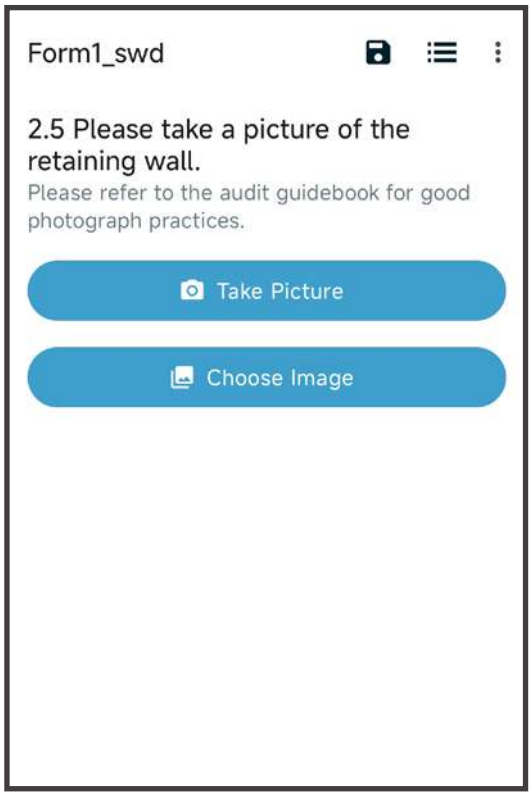

- Calculate the approximate height of the wall from the road (not from inside the SWD.) Mention the height in feet.



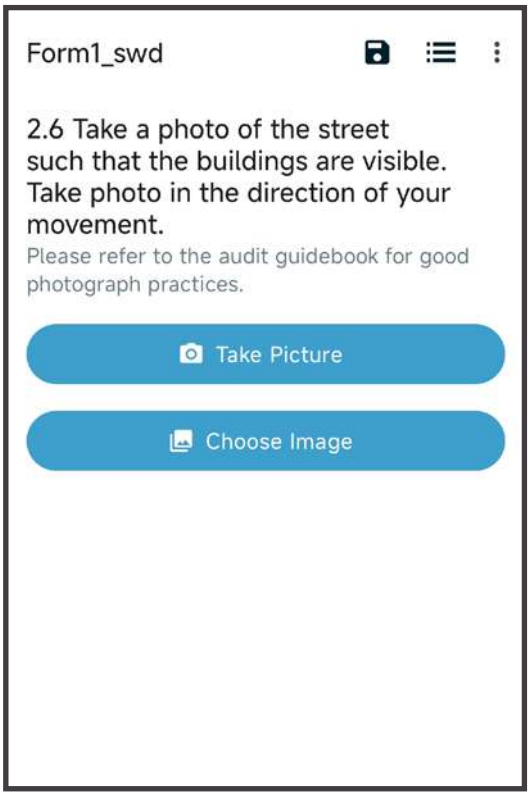

- Check if there is a fence on the sides and top of the SWD.




- Check the material of the retaining wall. It may be built out of RCC, SSM or a combination of the two.




- Click a photo of the retaining wall and fence by selecting 'Take Picture'. Refer to the best practices in the following page.




- Click a photo of the street by selecting 'Take Picture'. Refer to the best practices in the following page.

# Best practices for clicking a photo of the retaining wall:

Click the photo facing along the SWD.

Make sure a section of the retaining wall and fence from top to bottom is clearly visible. Include some of the surroundings.

A person can be in the frame and stand near the wall as reference.

Don't click the photo facing straight towards the wall.

Don't click the photo from across the road.

Avoid clicking where there are a lot of obstructions blocking the view of the retaining wall.

Don't crop the top or bottom of the wall and fence.

# Best practices for clicking a photo of the street:

Click the photo facing toward the street.

Make sure the buildings along the road are visible. You may also include part of the retaining wall of the SWD in the photo.

Don't crop out or zoom in on the buildings. Find the angle that captured most of the buildings opposite the SWD.

Avoid clicking where there are obstructions such as vehicles blocking the view of the street.

# Reference Sheet for Retaining Wall and its Conditions

This reference sheet is provided to familiarise the participant on what to look out for when conducting the audit.

## Condition of Retaining Wall

No retaining wall

Intact

Broken

## Height of Retaining Wall

Height 6 to 7 feet

Height 2 to 3 feet

## Presence of Fence

Fence on side

Fence on side and top

No fence

## Material of Retaining Wall

Solid stone masonry (SSM)

Identified by the bumpy stone and mortar texture

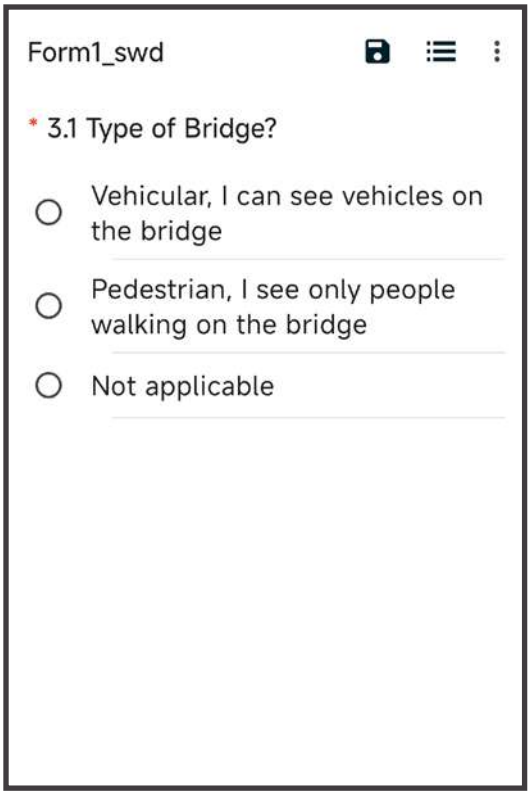
Reinforced Cement Concrete (RCC)

Identified by the flat and vertical concrete slabs

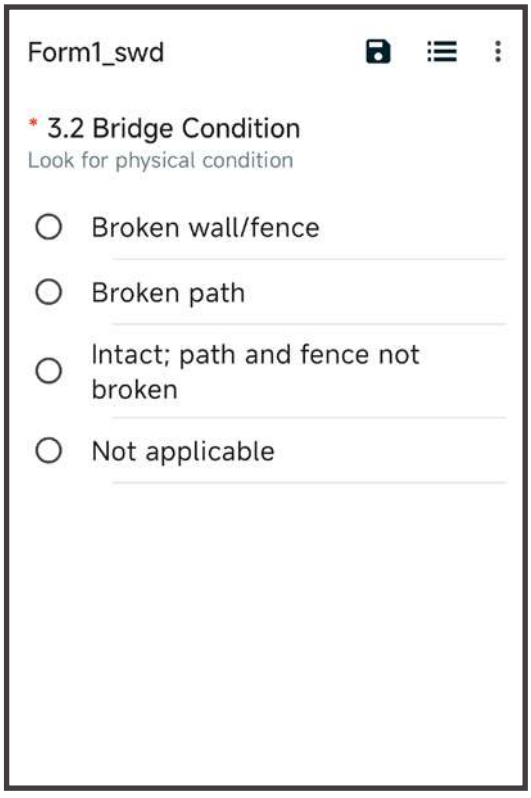

Both

Wall is clearly divided into SSM and RCC

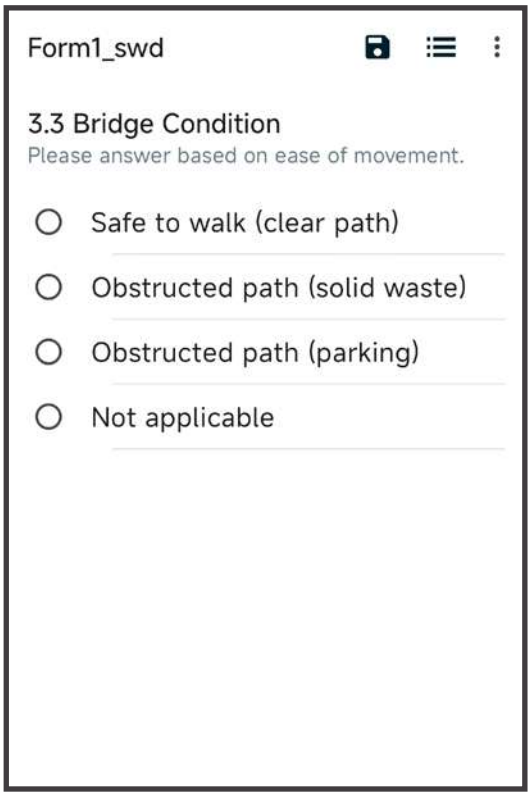

Observe the bridge and its condition in Section 3. You will be required to click photos of the bridge. **Refer to best practices on how to click the ideal photo and the reference sheet** at the end of this section to guide you to make observations.



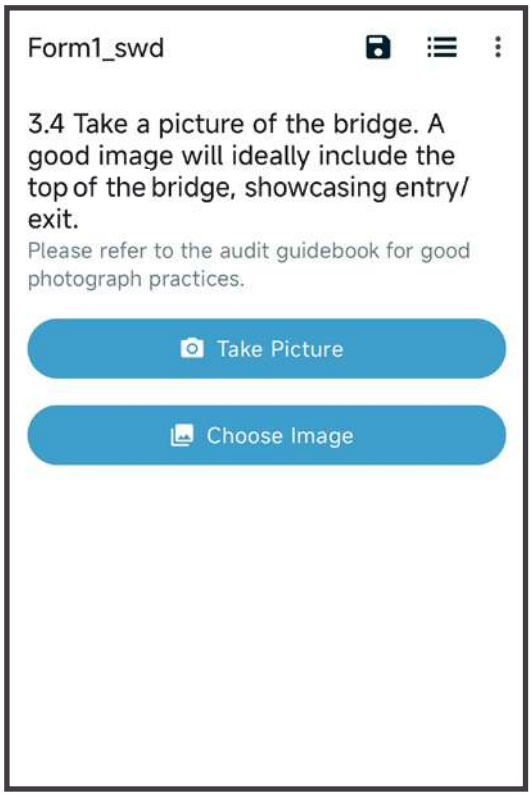

- Bridges can be either pedestrian or vehicular. Judging by how the bridge is being used select the appropriate response.




- Observe the physical condition of the bridge based on broken or intact path and fence.




- Observe the ease of movement on the bridge based on clear or obstructed path.




- Click a photo of the bridge by selecting 'Take Picture'. Refer to the best practices in the following page.

# Best practices for clicking a photo of the bridge:

Click the photo facing towards the bridge at an angle where most of the bridge is visible.

A person can be in the frame and stand on the bridge as reference.

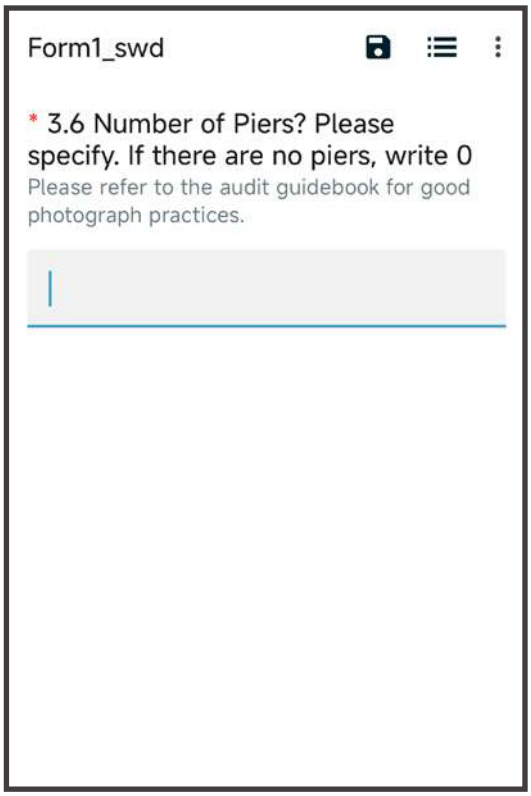
If possible, include some of the surroundings in the frame.

Also make sure to include the bridge walls, fences and path or any obstructions on the bridge.

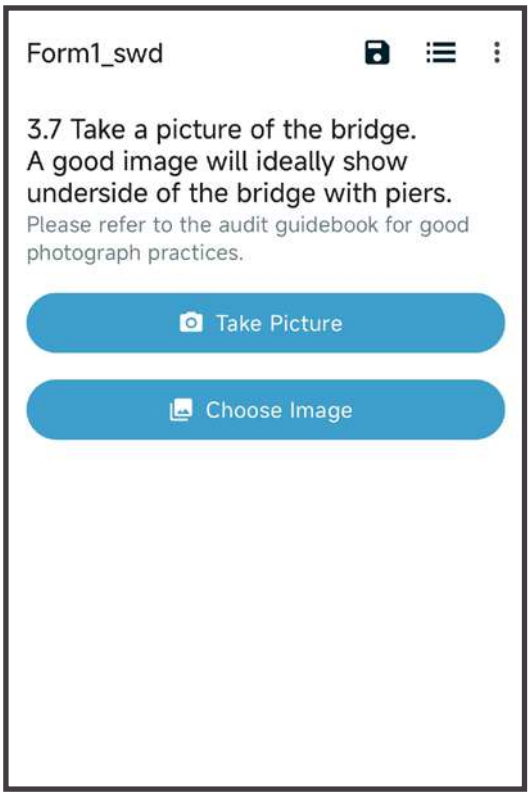
Don't click the photo standing on the bridge or standing parallel to the bridge.

If the bridge is too wide, you may click from across the road.


- Bridge is usually supported by piers that emerge from inside the SWD. Check if you see any piers under the bridge.




- If you see piers, count and fill the number. If there are no piers, type 0.




- Take a photo of the bridge by selecting 'Take Picture.' Refer to the best practices in the following page.

# Best practices for clicking a photo of the bridge piers:

Click the photo facing towards the bridge at an angle such that the piers below it are visible. Include the base of the piers where they stand on the SWD

You may click the photo from a distance to inclue the entire bridge in the frame.

You may also click a photo of bridges that don't not have piers.

Don't click the photo standing on the bridge or standing perpendicular to the bridge. Make sure to include the opposite ends of the bridge in the frame.

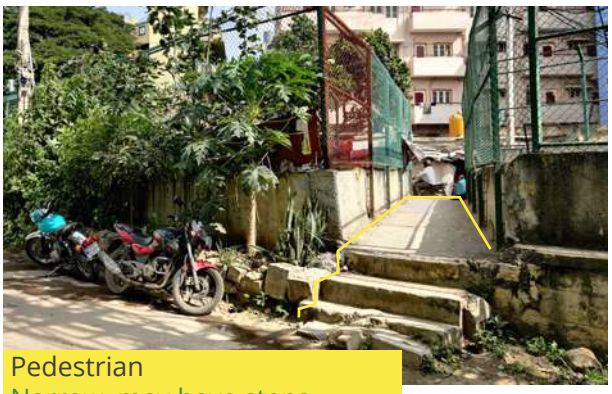
Do not zoom in too close, crop out the bridge or click the photo from a horizontal angle looking over the bridge.

# Reference Sheet for Bridge and its Condition

This reference sheet is provided to familiarise the participant on what to look out for when conducting the audit.

## Type of Bridge

Vehicular
Wide road, predominantly used by vehicles



Pedestrian
Narrow, may have steps, predominantly used by people

## Bridge Condition– Physical condition

Broken wall or fence

Broken path

Intact wall, fence and path

## Bridge Condition – Ease of movement

Safe to walk/ clear path

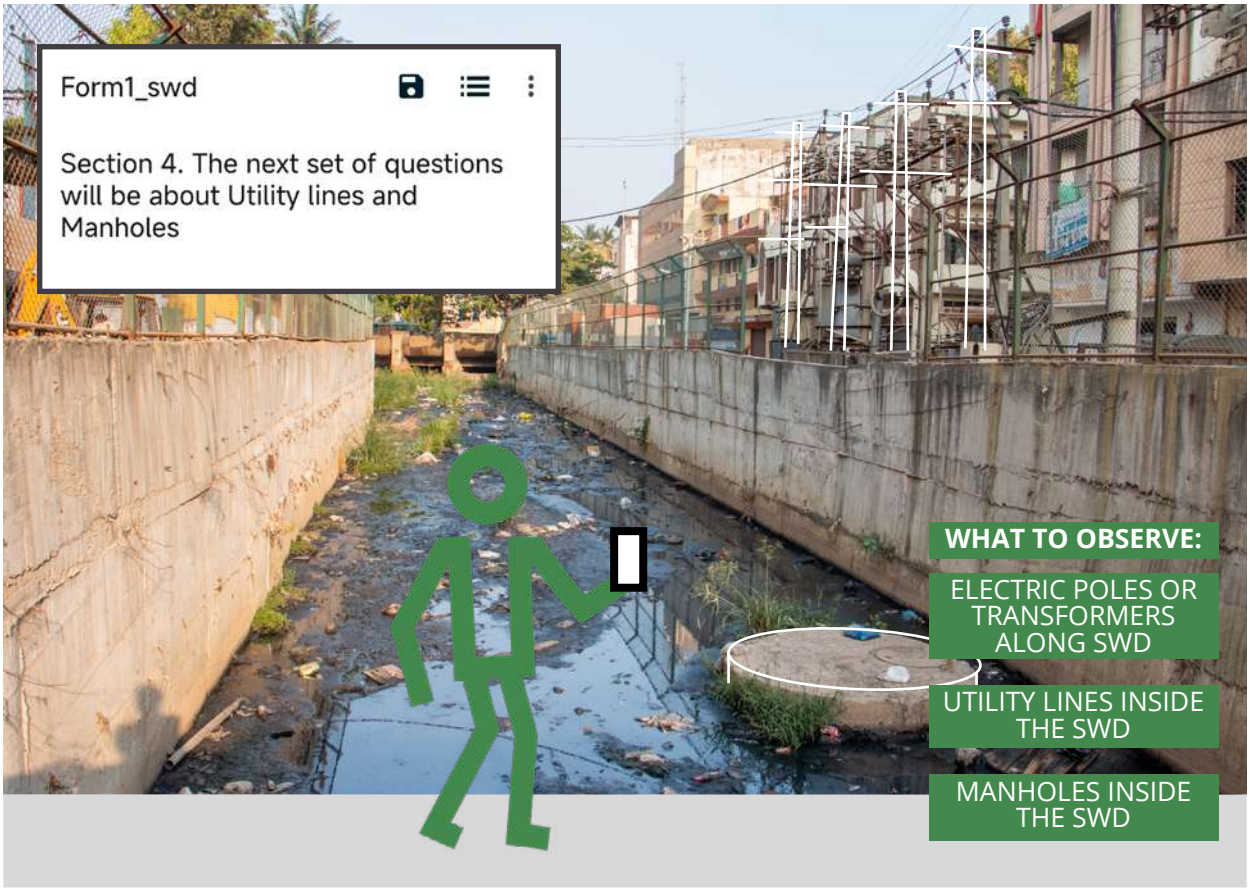
Obstructed path (solid waste)

Obstructed path (parking)

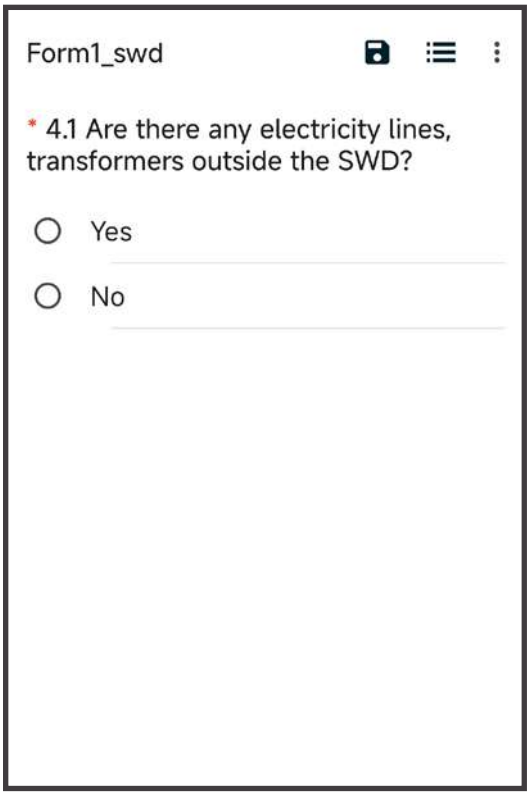
## Piers

Bridge with piers

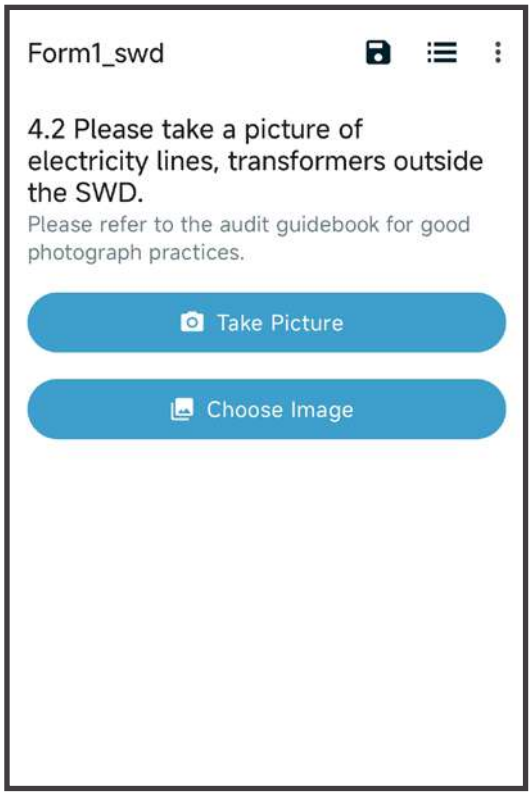
Bridge without piers



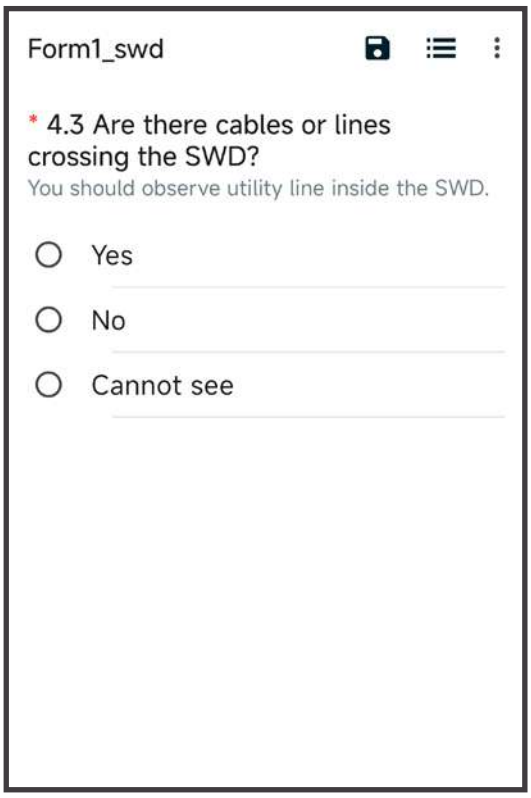

Observe the utility lines and manholes in Section 3. You will be required to click photos of the utilities. **Refer to best practices on how to click the ideal photo and the reference sheet** at the end of this section to guide you to make observations.



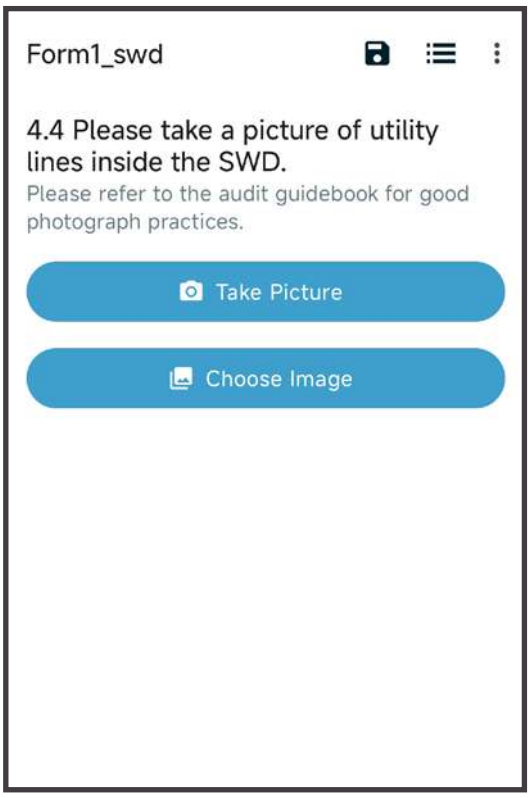

- Note the presence of electric poles, transformers or electric boxes along the SWD (outside the SWD).




- Take a photo of the electric lines you see outside, along the SWD by selecting 'Take Picture.' Refer to the best practices in the following page.




- Note the presence of any cables/ lines inside/ crossing the SWD.




- Take a photo of the utility lines inside the SWD by selecting 'Take Picture.' Refer to the best practices in the following page.

## Best practices for clicking a photo of the utility lines outside:

Click a photo of the utility lines that are outside but running along the SWD.

You may click the photo a little away and from across the road to include all the utilities in the frame.

Don't stand too close or crop out the utility structures. SWD retaining wall and fence should be visible in the background.

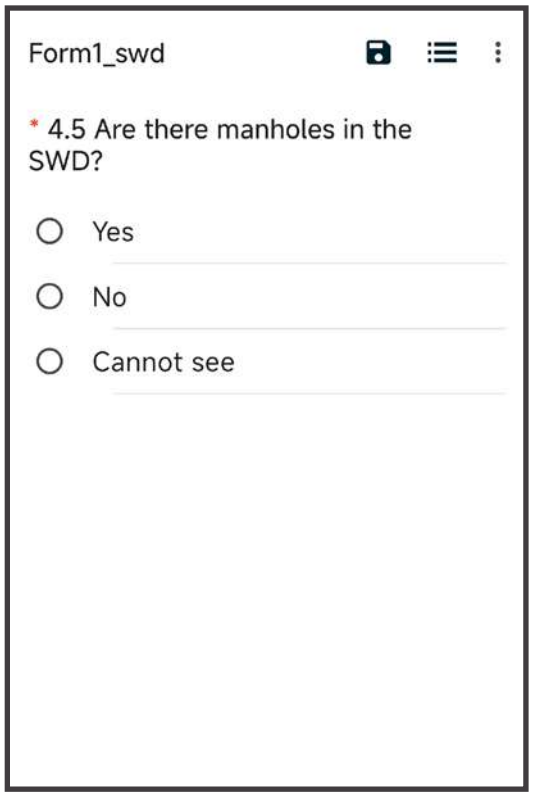
Don't click the photo of the utility lines that are across the road from the SWD.

## Best practices for clicking a photo of the utility lines inside:

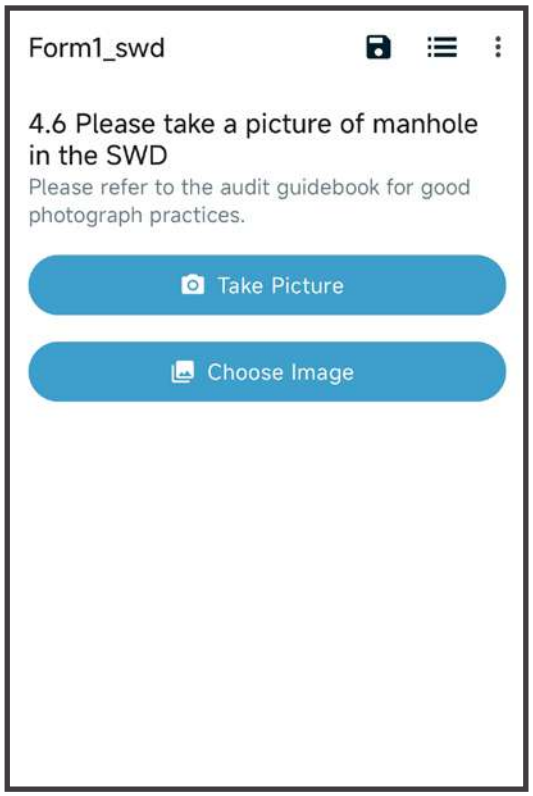
Make sure to include both ends of the utility lines crossing the SWD.

Click the photo along the SWD, include SWD and surroundings in the frame.

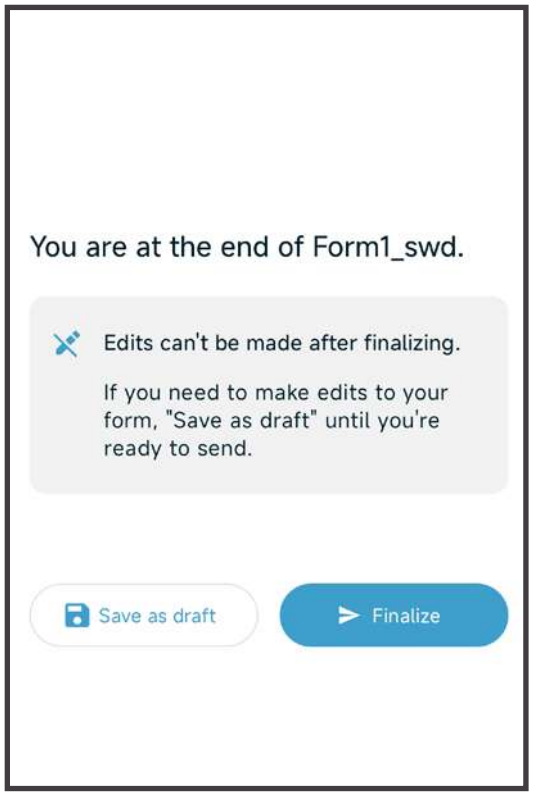
Do not zoom in too close or crop out the utility lines.




- Note the presence of manholes inside the SWD (indicating presence of a sewer line.)




- Take a photo of the manholes by selecting 'Take Picture.' Refer to the best practices in the following page.




- Select 'Finalize' to submit the form before moving on to the next observation point.

  Please repeat form 1 at every point along the SWD.

# Best practices for clicking a photo of the manholes:

The photo of the manhole should include the SWD base and retaining walls along with some of the surroundings.

In case of multiple manholes, try to include all in one frame.

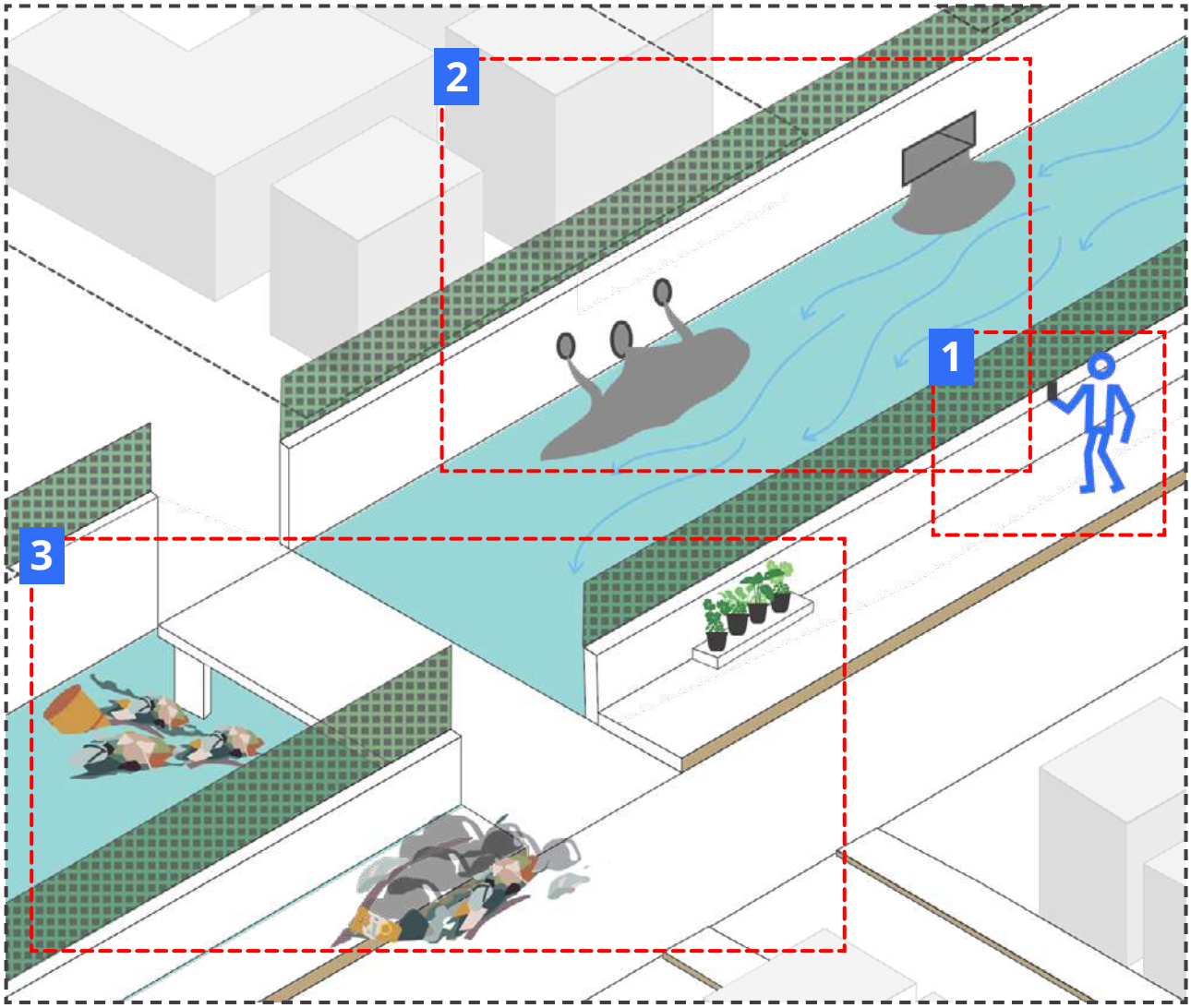
Do not zoom in too close or crop out the manholes or surroundings.

Do not take photo where other objects such as vegetation or solid waste may obstruct the view of the manhole.

# FORM 2

## OBSERVING THE WATER QUALITY AND SOLID WASTE ALONG SWD

This form helps the participant record information regarding (1) the stormwater connections to the SWD and the water quality and (2) the solid waste inside and outside the SWD.




### 1 General information and safety

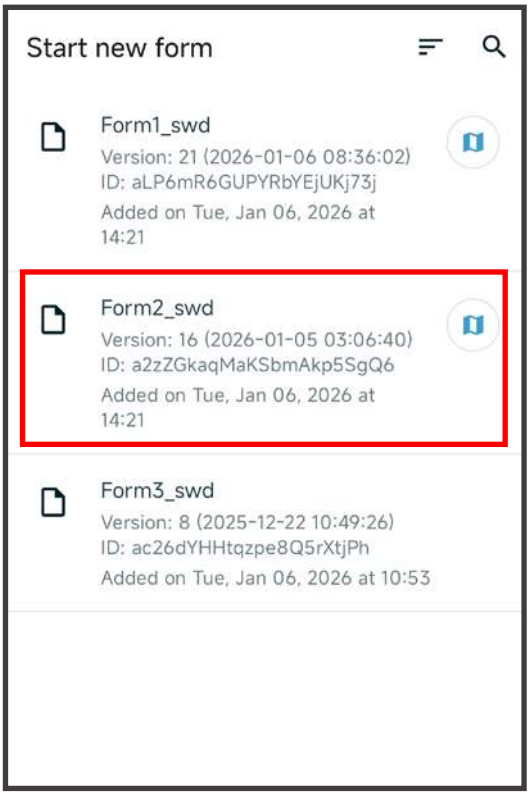
Ensure safety
Select team code
Select side of SWD
Record current location

### 2 Water Flow and Water Quality

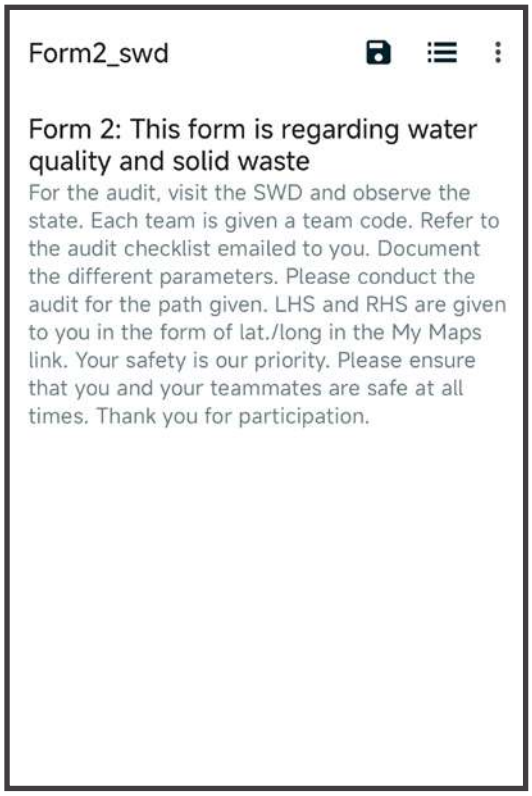
Stormwater connections
Unauthorised connections
Stagnant or flowing
Signs of contamination
Water colour
Turbidity
Odour

### 3 Solid Waste

Waste inside the SWD
Types of waste inside the SWD
Waste outside the SWD
Types of waste outside the SWD
Signs of clean up effort
Signs of community ownership



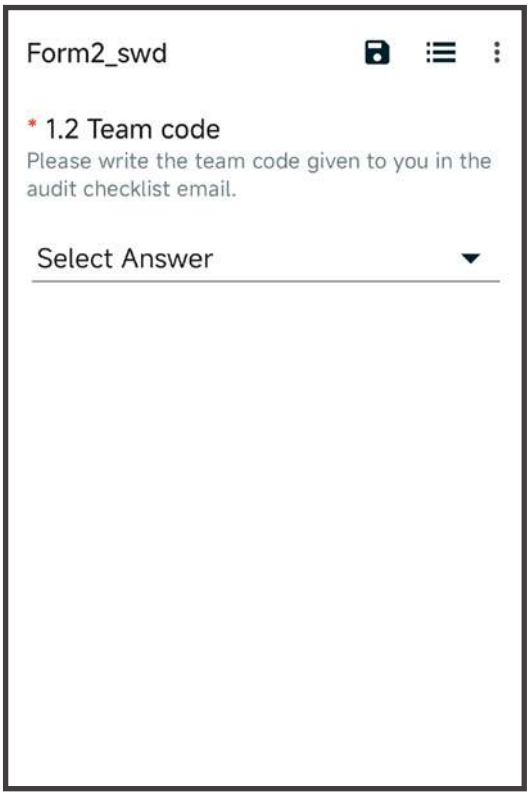

- To start form 2, click on 'Form2_swd'



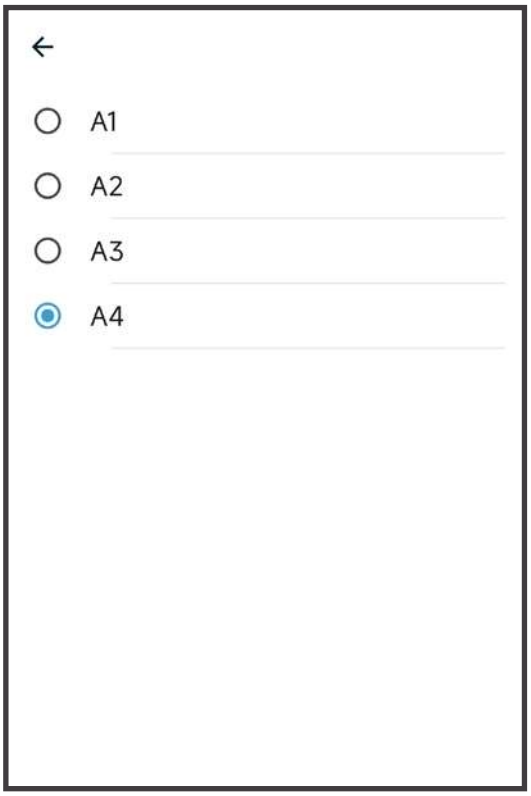

- Once selected, the form explains the general rules of the audit.


- Before you begin observations confirm your safety and record general information in Section 1.


- Make sure to stand at a safe distance before you start recording your observation.

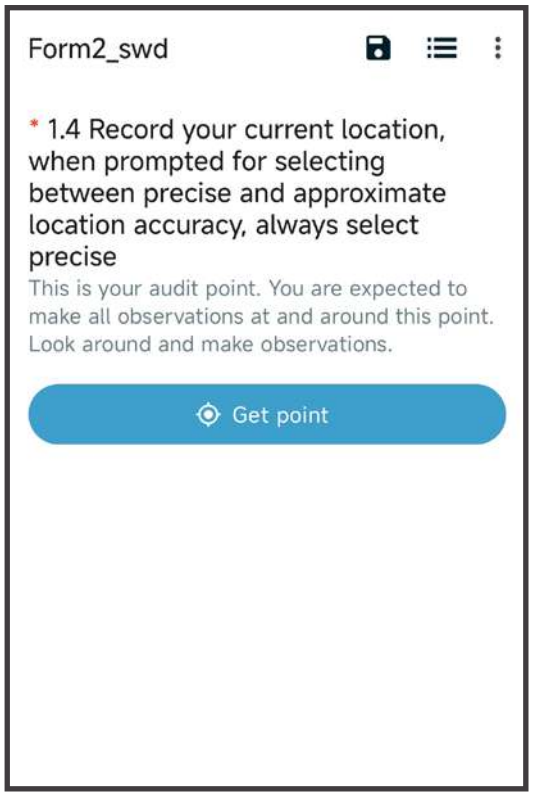



- Select your team code as assigned to you in the email communication.

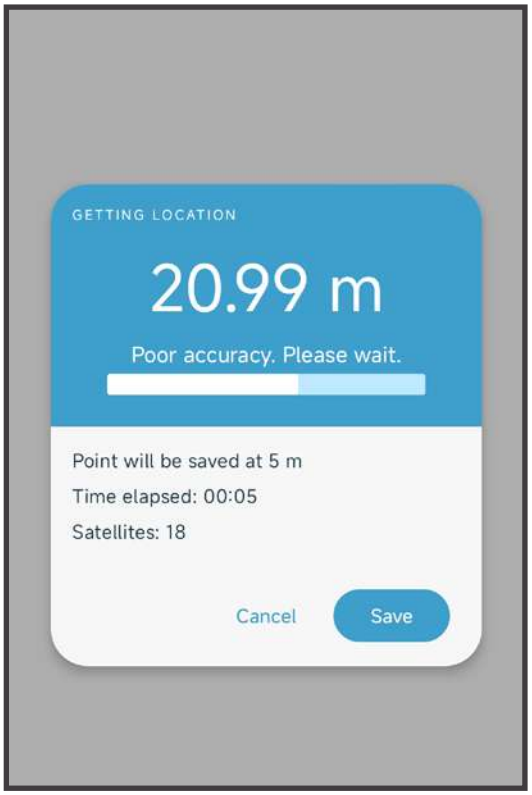



- Select from the drop down list.

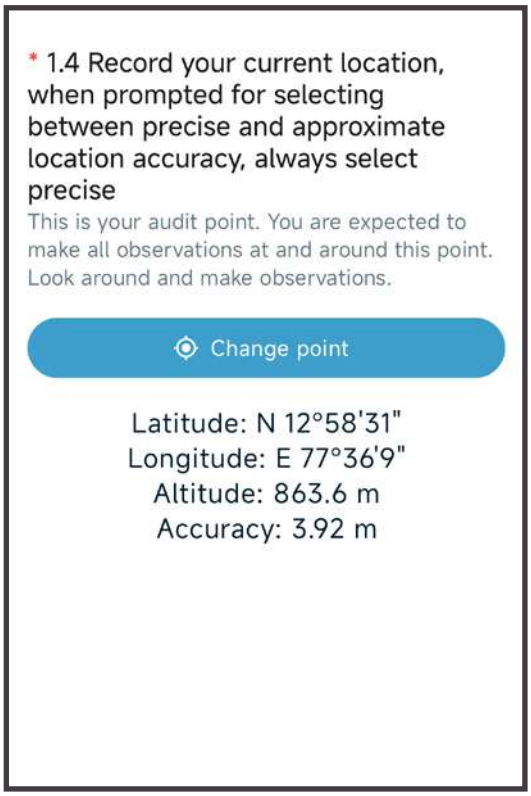

- Mention if you are standing on the LHS or RHS side of the SWD.




- Select 'Get point' to record the precise location of your observation point.

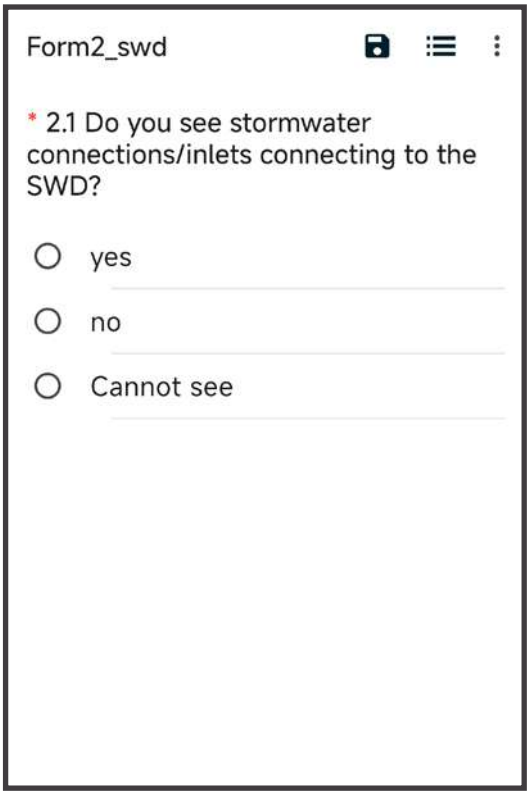



- Wait till the location accuracy is within 5 metres.

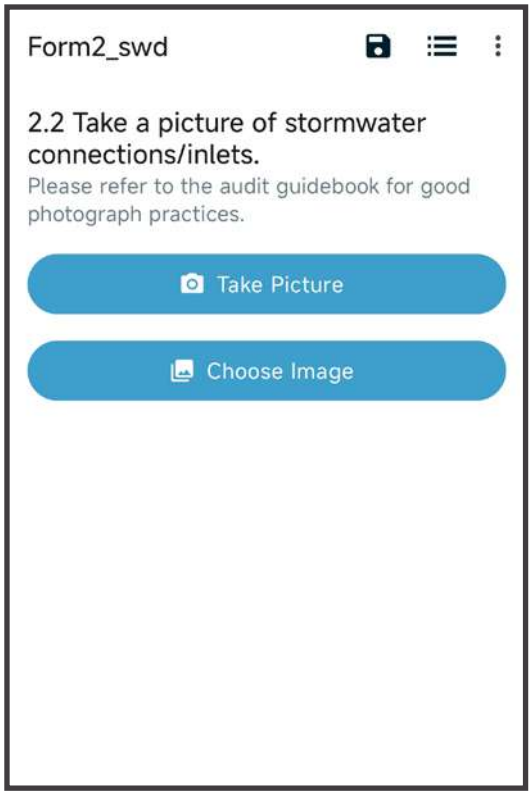



- Your location cooradinates, altitude and accuracy will be recorded for the specific observation.

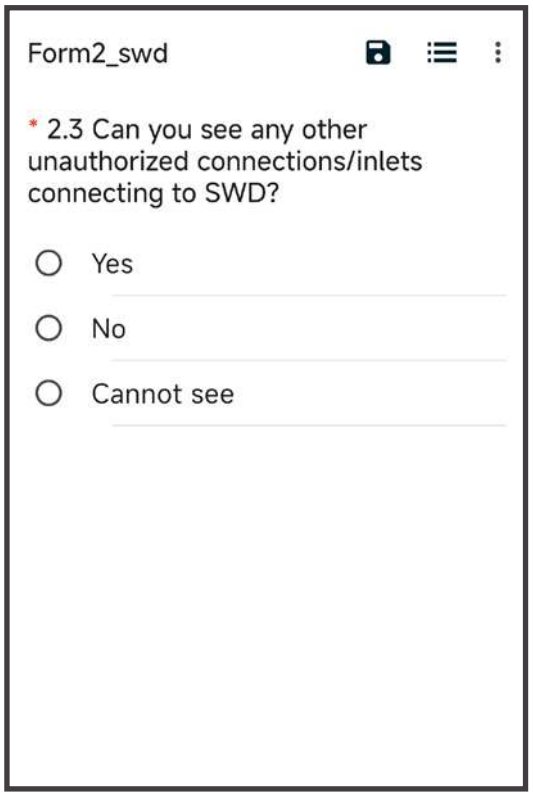

Observe the SWD connections and water quality in Section 2. You will be required to click photos of the SWD. **Refer to best practices on how to click the ideal photo and the reference sheet** at the end of this section to guide you to make observations.



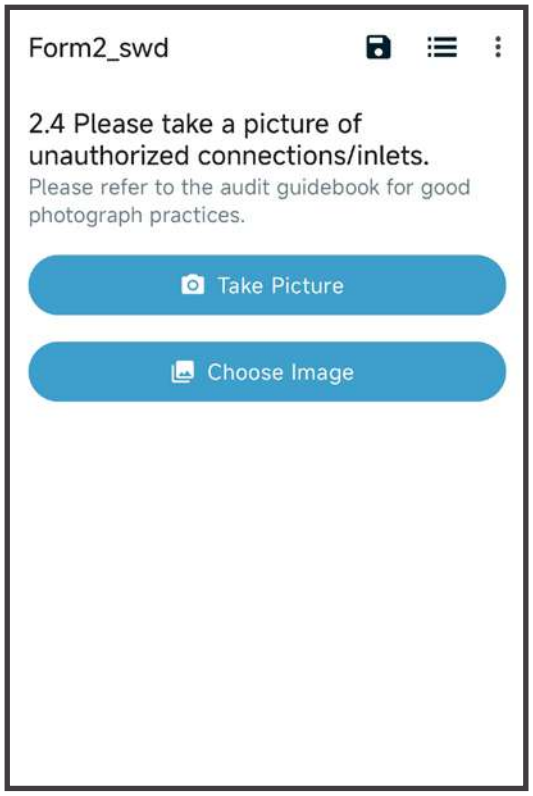

- Look for stormwater connections that join the SWD, you will be able to see inlets on the inner side of the retailing wall.



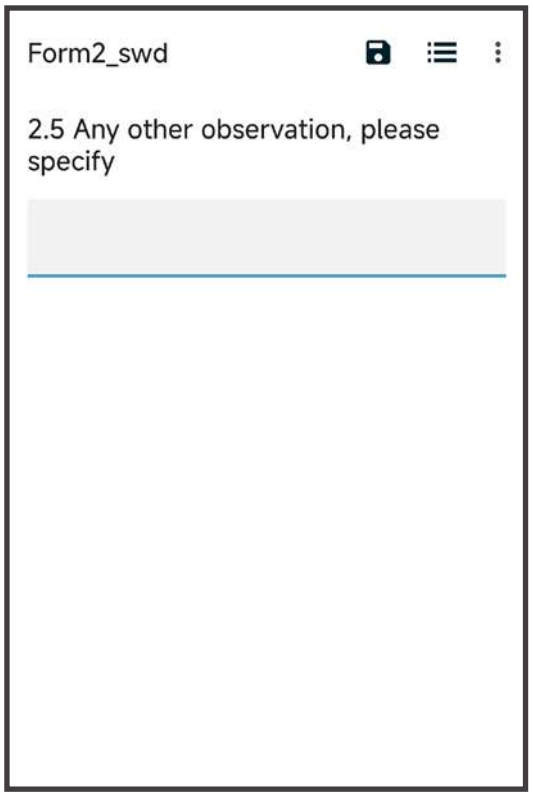

- Take a photo of the inlets you see by selecting 'Take Picture.' Refer to the best practices in the following page.




- Look for inlets connecting the abutting buildings to the SWD.




- Take a photo of the inlets you see by selecting 'Take Picture.' Refer to the best practices in the following page.




- Mention any other observations about the stormwater or unauthorised connections here.

## Best practices for clicking a photo of stormwater connections/ inlet:

Click a photo of the stormwater inlets joining the SWD.

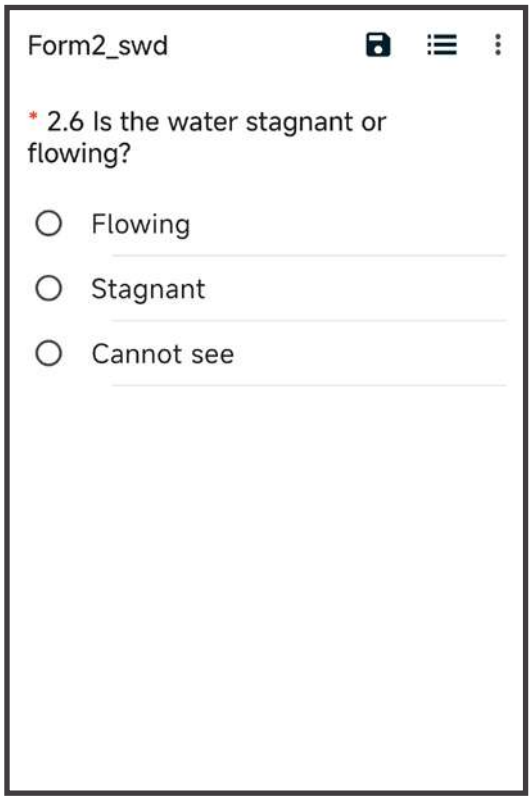
You may take the photo at an angle to include the SWD and some of the surroundings in the frame.

Don't zoom in too close or crop out the stormwater inlet.

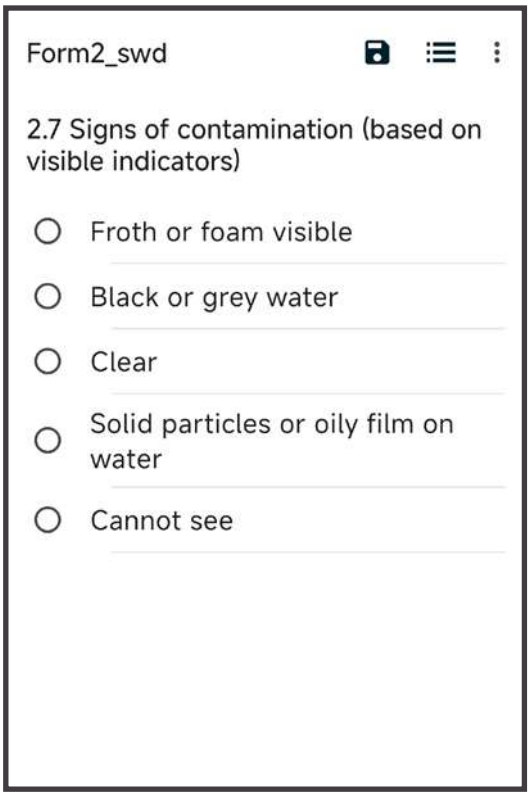
## Best practices for clicking a photo of unauthorised inlets:

Click a photo of the outlets from buildings going into the SWD. You may take the photo at an angle to include the SWD and some of the surroundings in the frame.

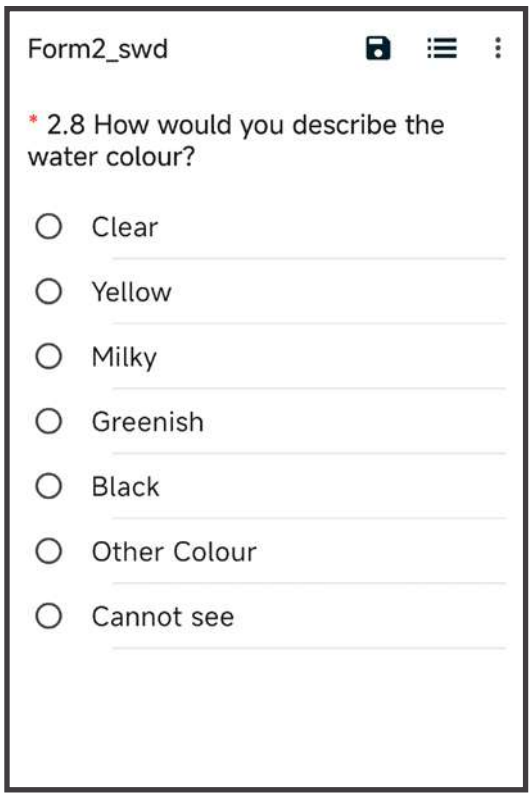

Do not zoom in too close or crop out the surroundings from the frame.



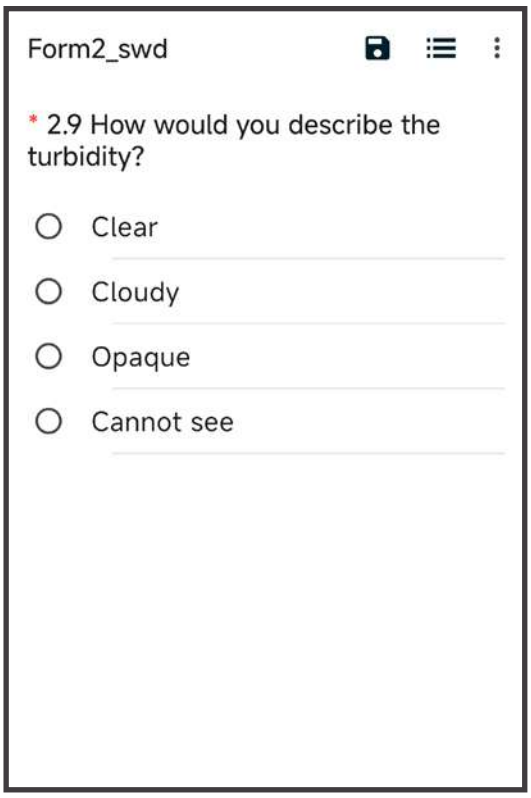

- Observe the water flow, it gives clues about the functionality of the SWD.



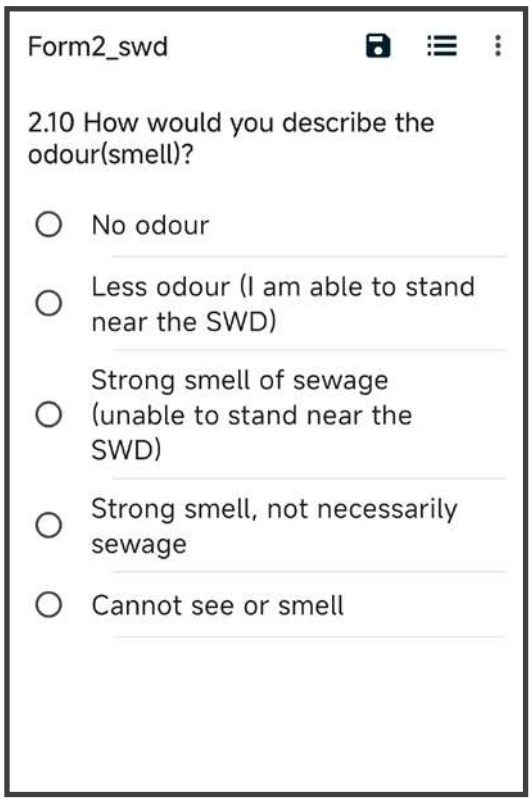

- Observe the visible signs of contamination, it indiacted the quality of water in the SWD.



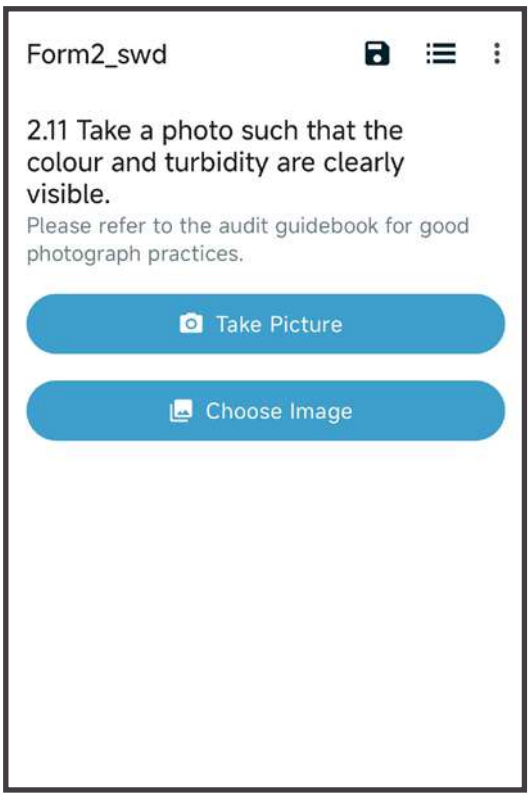

- Observe the colour of the water in the SWD. Water colour indicates the type of impurities/ effluents that may be mixing with the stormwater.




- Observe the clarity of water in the SWD. Turbidity indicates the presence of suspended particles in the stormwater.




- Based on effluents or sewage mixing, SWDs tend to have an odour that indicated the extent of contamination.




- Take a photo of the water by selecting 'Take Picture.' Refer to the best practices in the following page.

# Best practices for clicking a photo of the water:

The photo of water should include the SWD retaining walls along with some of the surroundings.

Do not zoom in too close that only the water is visible.

Do not tilt the phone to take the photo. Keep the phone upright and lower it to take the ideal photo.

# Reference Sheet for Stormwater Connections

This reference sheet is provided to familiarise the participant on what to look out for when conducting the audit.

## Stormwater connections/ inlets

Identified as tertiary connections (often structured concrete roadside inlets ) that join the SWD (the primary drain).




## Unauthorised connections/ inlets

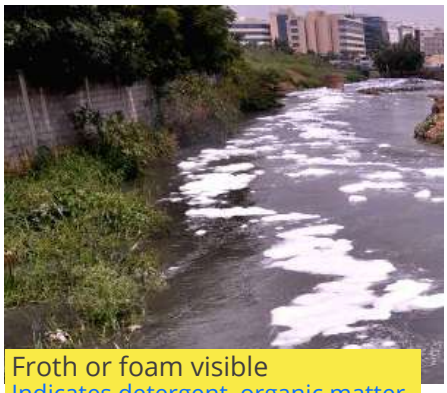
Identified as adhoc connections (often multiple holes/ piped inlets coming out of buildings) that add to the SWD (the primary drain).




# Reference Sheet for Water Quality

This reference sheet is provided to familiarise the participant on what to look out for when conducting the audit.

## Signs of contamination



Froth or foam visible
Indicates detergent, organic matter breakdown or high water velocity

Black or grey water
Indicates sewage cross-connection or industrial waste

Solid particles or oily film
Indicates soil runoff, construction debris, trash or oil leaks from roads

## Water colour

Clear
No visible contamination

Yellow
Indicates soil runoff, plant matter, certain metal-rich discharges

Milky
Indicates detergents, paint, cement slurry, dairy/ food processing

Greenish
Indicates algae growth in slow or stagnant drains

Black
Indicates sewage cross-connection or industrial waste

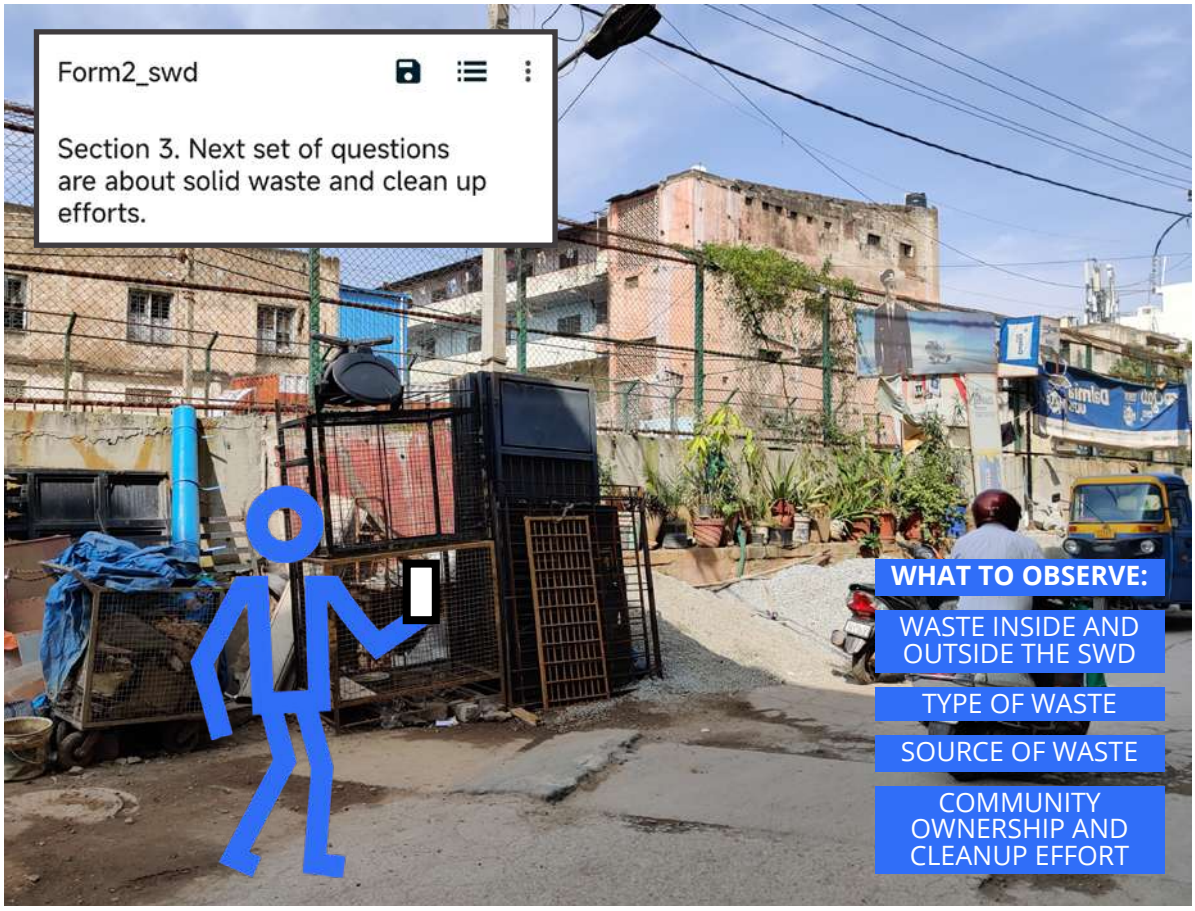
Other
Bright unnatural colours indicate textile/ food dyes

## Turbidity

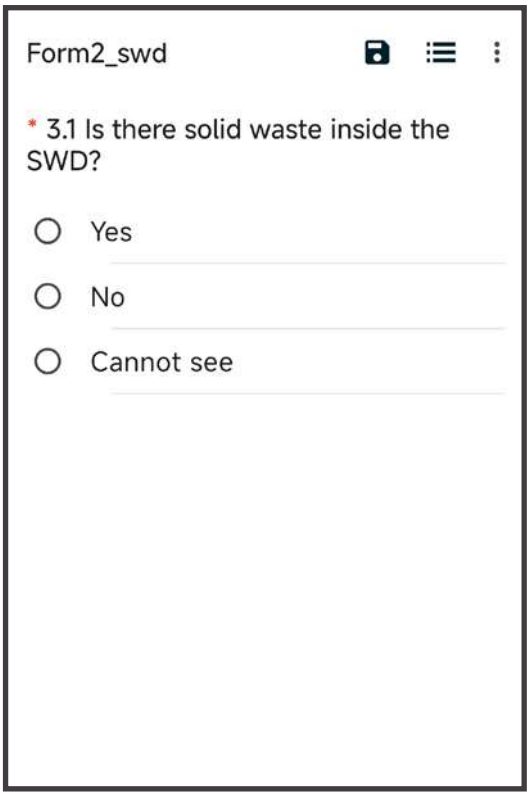
Clear
No visible contamination

Cloudy
Light or fine suspended particles

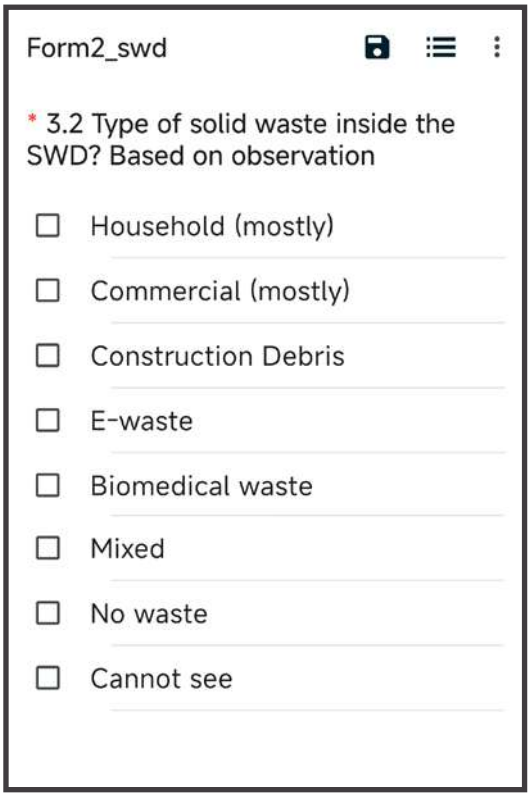
Opaque
Dense or heavy suspended particles




Observe the solid waste in Section 3. You will be required to click photos of the SWD. **Refer to best practices on how to click the ideal photo and the reference sheet** at the end of this section to guide you to make observations.

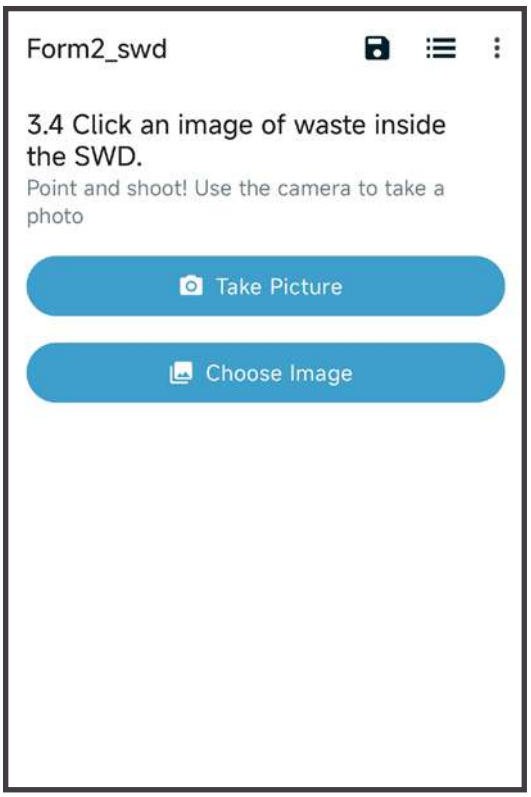



- Look for solid waste collected inside the SWD.



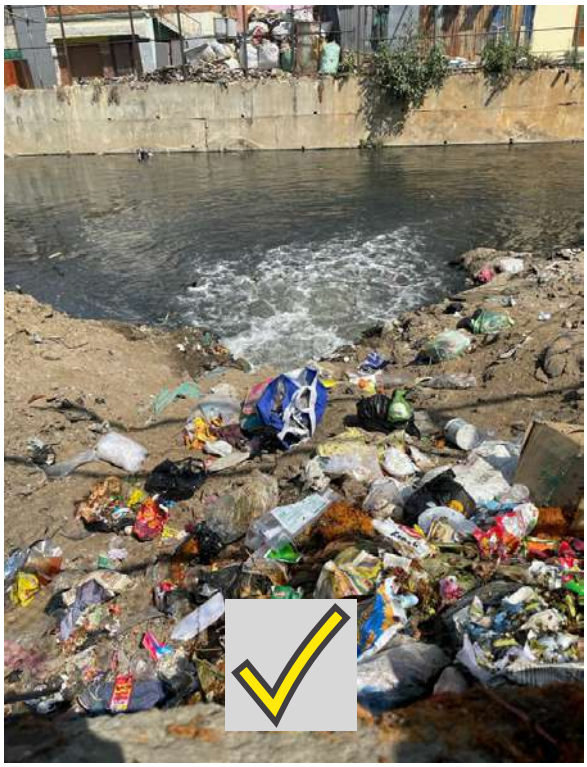

- Observe and identify the type of solid waste and check the boxes that apply.


- Look around and try to find out the likely source of this waste.




- Take a photo of the waste by selecting 'Take Picture.' Refer to the best practices in the following page.

# Best practices for clicking a photo of the soild waste inside the SWD:



The photo of the solid waste should include the SWD with some of the surroundings.

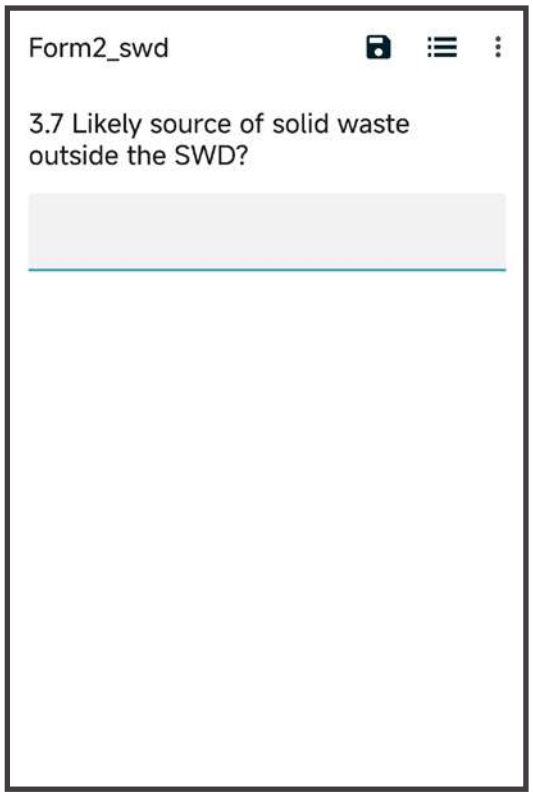
Most of the solid waste in the SWD should be included in the photo. If solid waste is scattered, take photo covering most of it.

Do not tilt the phone to click a photo. Keep the phone upright and lower it to set the frame.

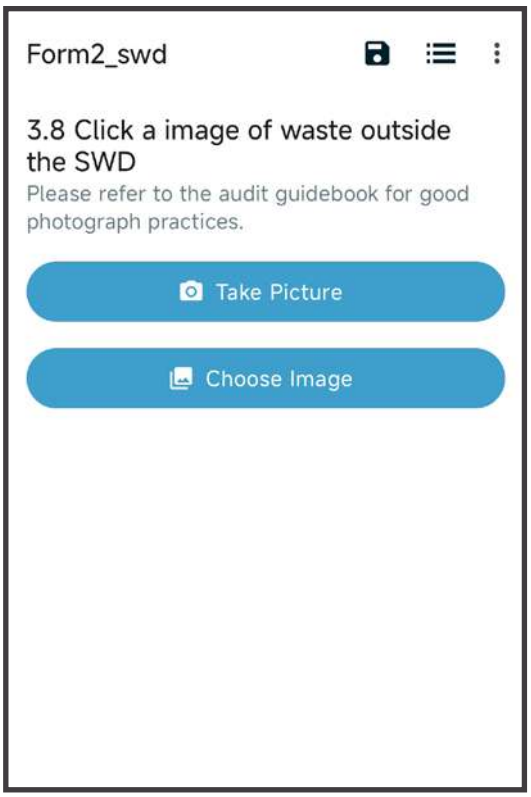
Do not zoom in too close or crop out the solid waste.


- Look for solid waste black spots outside the SWD, along the retaining wall.


- Observe and identify the type of solid waste and check the boxes that apply.




- Look around and try to find out the likely source of this waste.



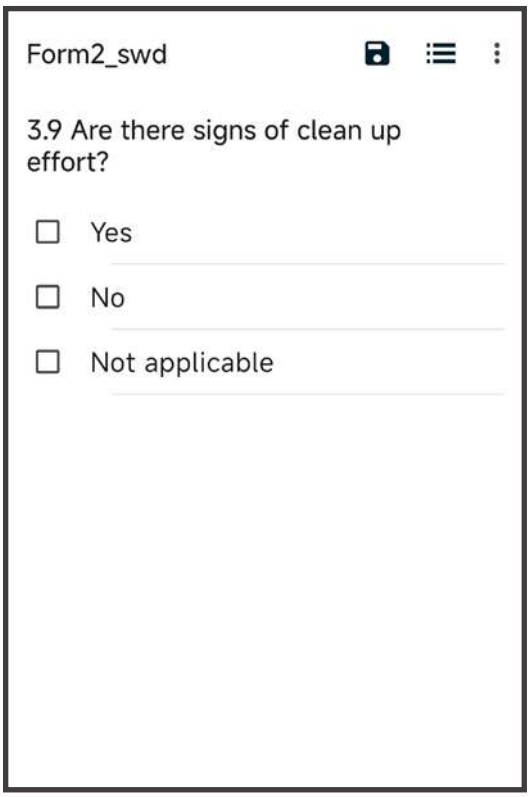

- Take a photo of the waste by selecting 'Take Picture.' Refer to the best practices in the following page.

## Best practices for clicking a photo of the soild waste outside the SWD:

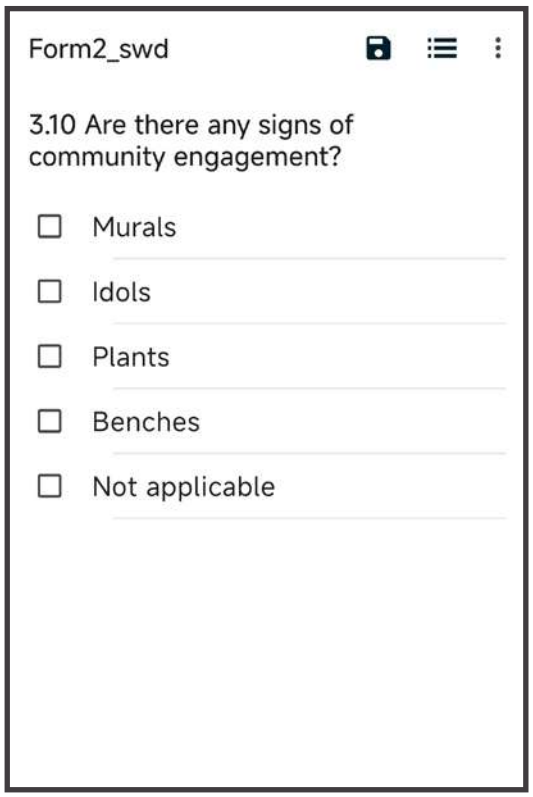
The photo should be angled to include the SWD retaining wall with some of the surroundings.

All of the solid waste along the SWD should be included in the photo. Do not zoom in too close or crop out the solid waste.

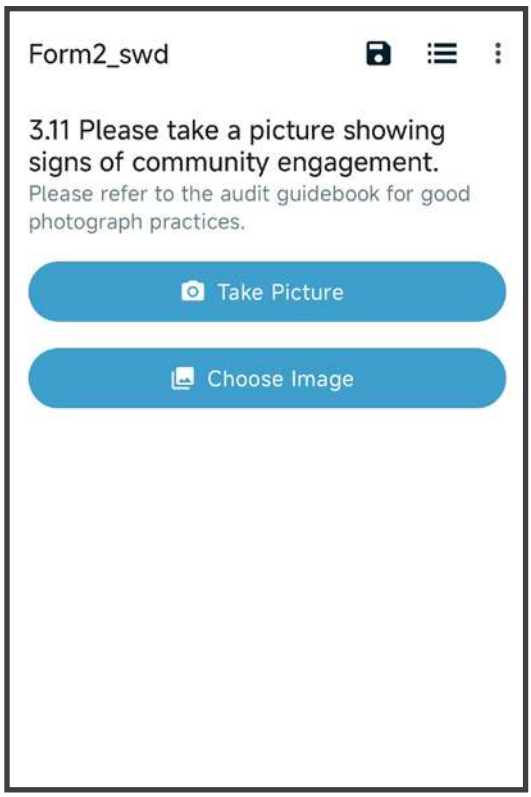
Do not click photo of solid waste present on the other side of the road.



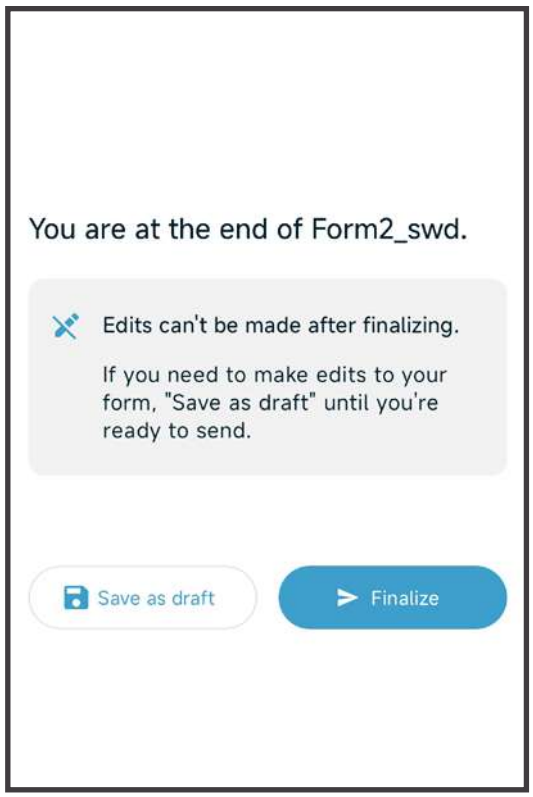

- Look for signs of clean up effort possibly done to avoid solid waste black spots.




- Look for signs of community ownership possibly enforced to avoid solid waste black spots.




- Take a photo if you see signs of community engagement by selecting 'Take Picture.'




- Select 'Finalize' to submit the form before moving on to the next observation point.
  Please repeat form 2 at every point along the SWD.

# Reference Sheet for Solid Waste and Community Engagement

This reference sheet is provided to familiarise the participant on what to look out for when conducting the audit.

## Solid Waste Types

Household Waste
Household items or food waste wrapped in small plastic bags
Present in residential areas

Commercial Waste
Commercial & industrial items, or small plastic waste
Can be seen around markets

Construction Debris
Sand and concrete waste
Present around nearby construction sites

E-waste
Discarded electronic devices such as phones, TVs, batteries

Biomedical Waste
Waste generated by hospitals, clinics or labs such as needles, chemicals, animal/ human tissue

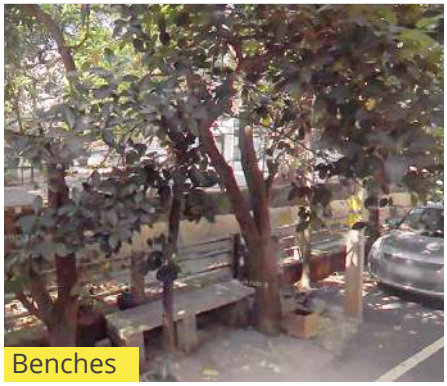
Mixed Waste
A mix of all kinds of waste.
Seen in mixed land use areas

## Signs of community engagement

Murals

Idols

Plants



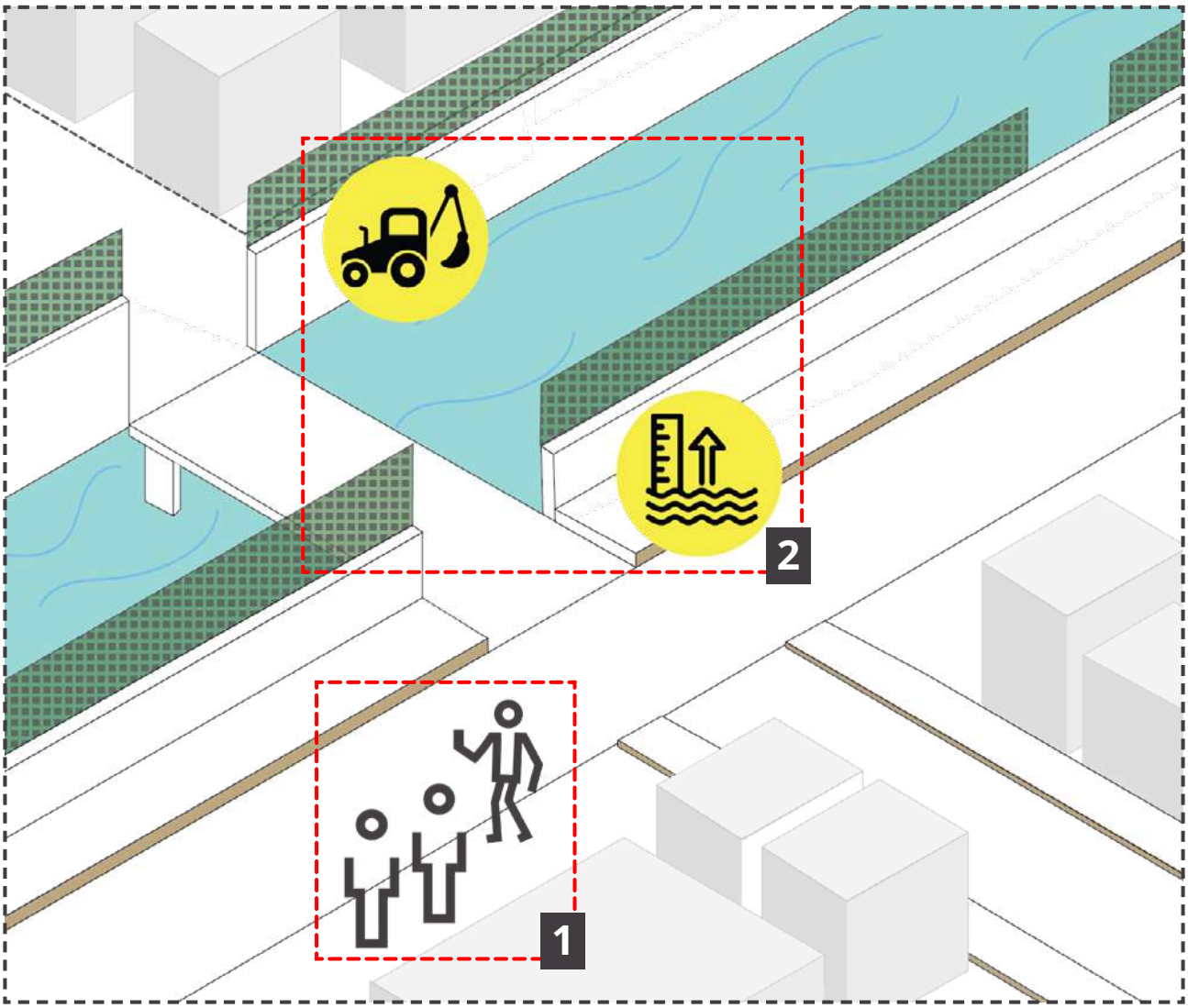
Benches


Signs/ Posters

# FORM 3

## FINDING OUT THE HISTORY OF FLOODING AND MAINTENANCE

This form helps the participant record information about flooding history and maintenance of the stormwater drain. The participant is expected to interview people who live or work near the SWD to fill this form.

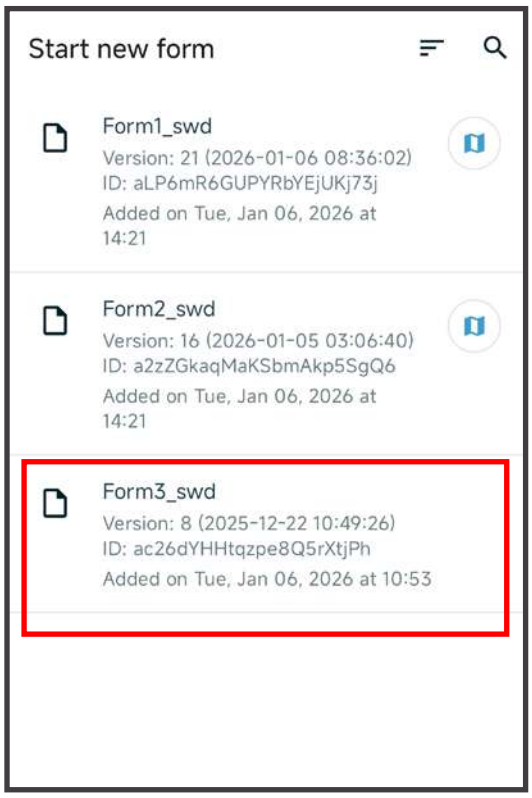



**1 General information and safety**

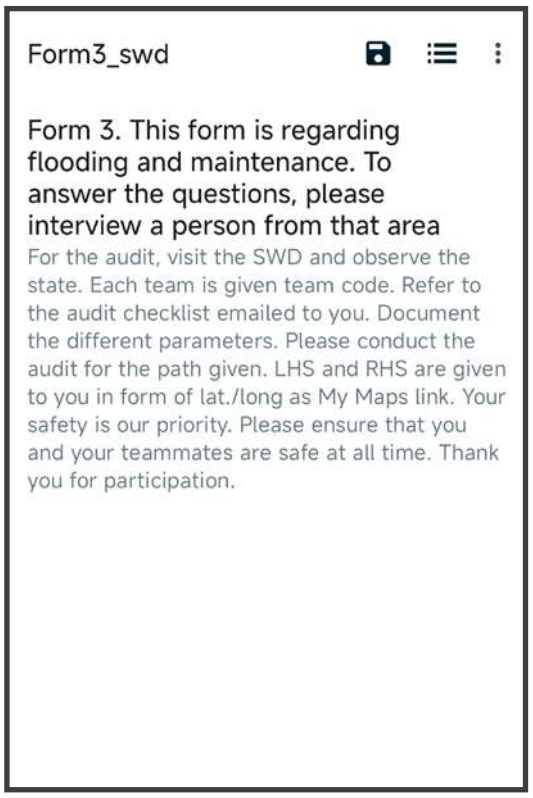
Ensure safety
Select team code

**2 Flooding and maintenance**

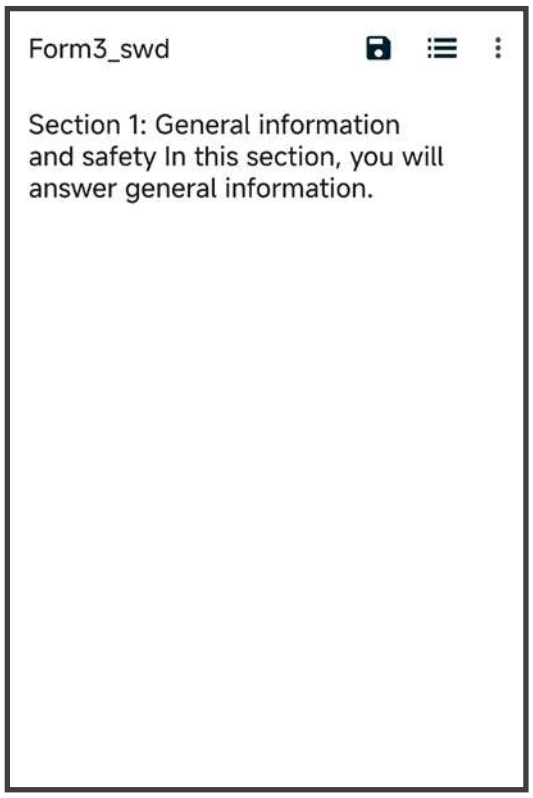
History of flooding
Flooding on road
Frequency of desilting and cleaning
Maintenance agency




- To start form 3, click on 'Form3_swd'

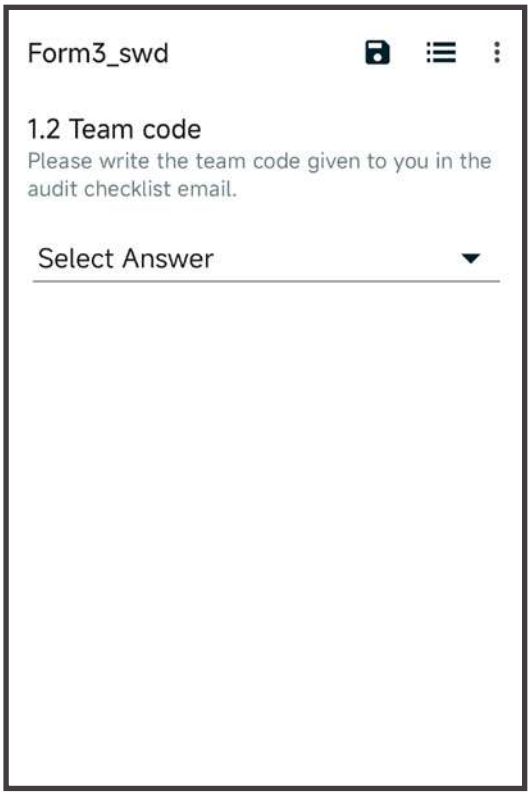



- Once selected, the form explains the general rules of the audit.



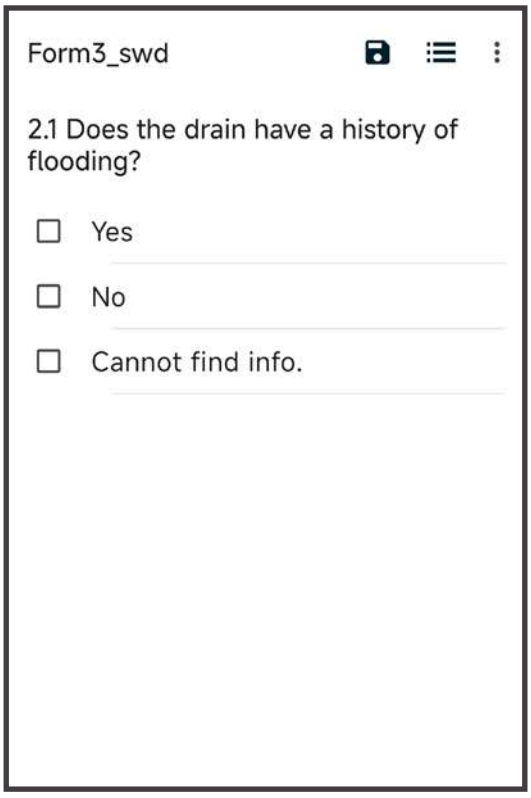

- Record general information in Section 1 before you begin observations.


- Make sure to stand at a safe distance before you start recording your observation.

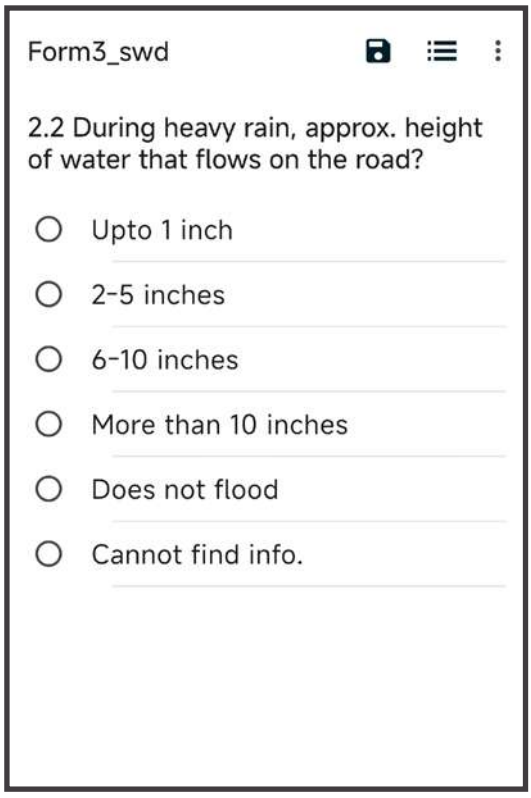



- Select your team code as assigned to you in the email communication.


- Section 2 comprises of questions pertaining to flooding and desiliting. You are expected to fill in the form by taking responses from people who live or work in the area.

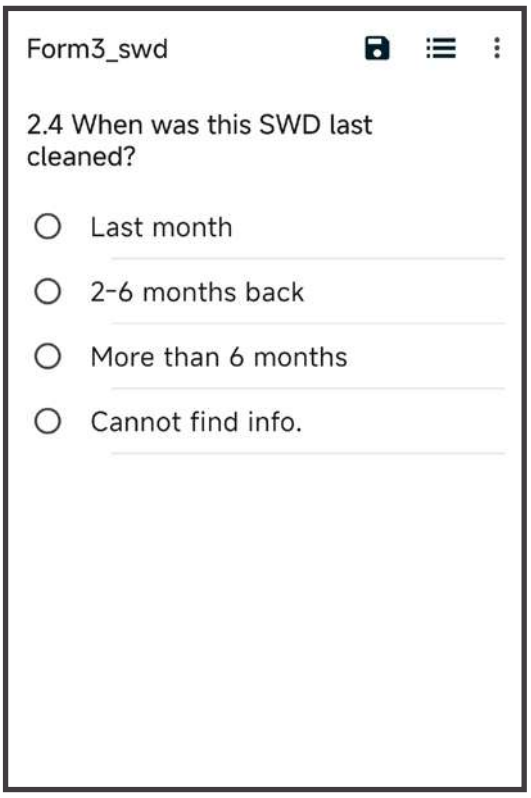



- Talk to people in the area and find out if the drain has a history of flooding.

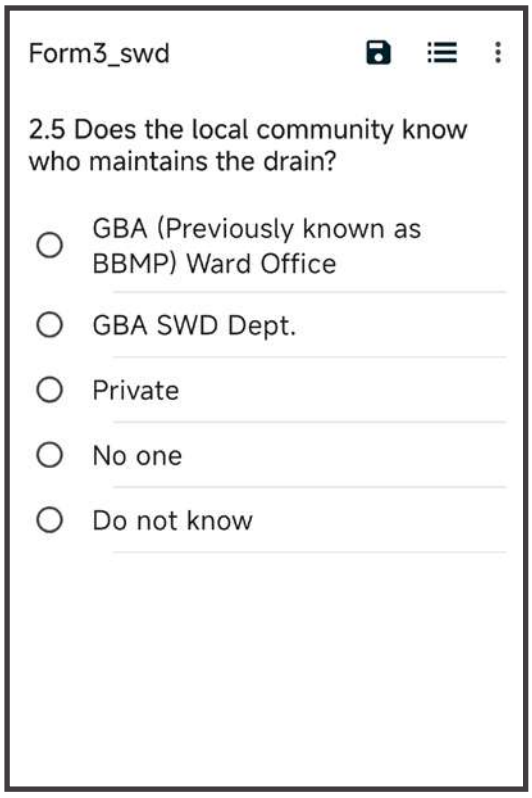



- In case the drain has a history of flooding, find out how much water collects on the road.

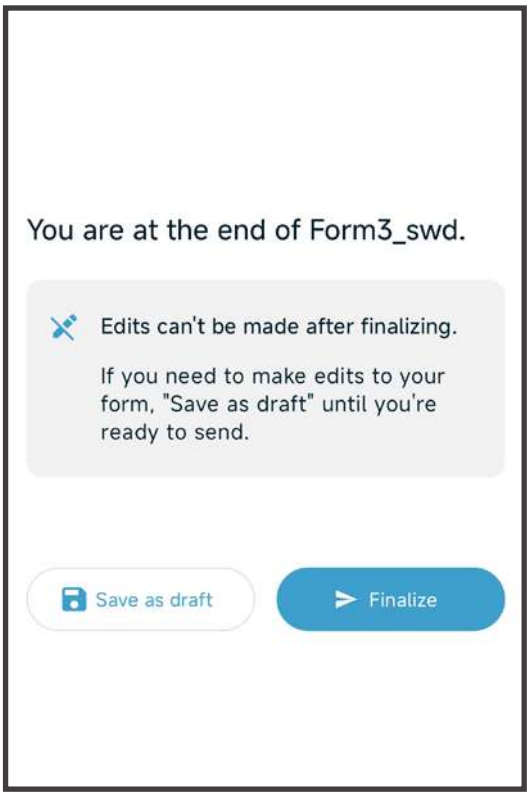

- Find out how often the SWD is desilted as part of maintenance to prevent flooding.




- Find out how often the drain is cleaned as part of maintenance to prevent flooding.



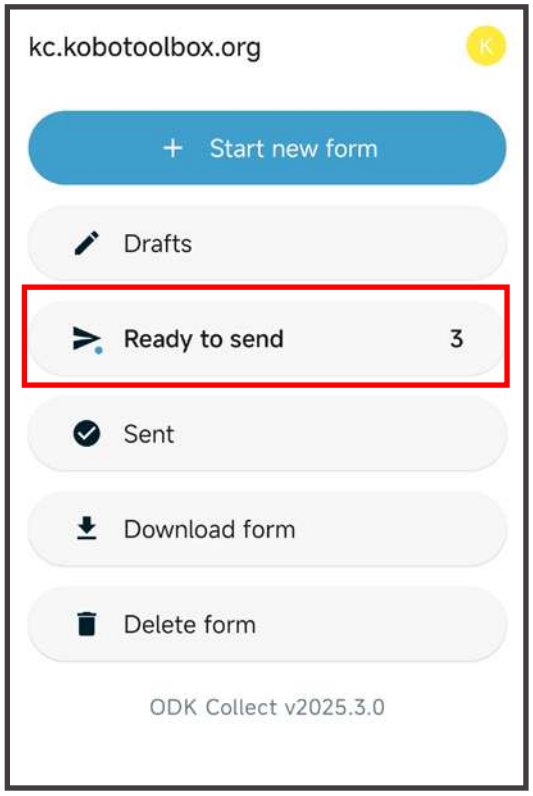

- Ask the people you are interviewing if they know who is in charge of SWD maintenance.



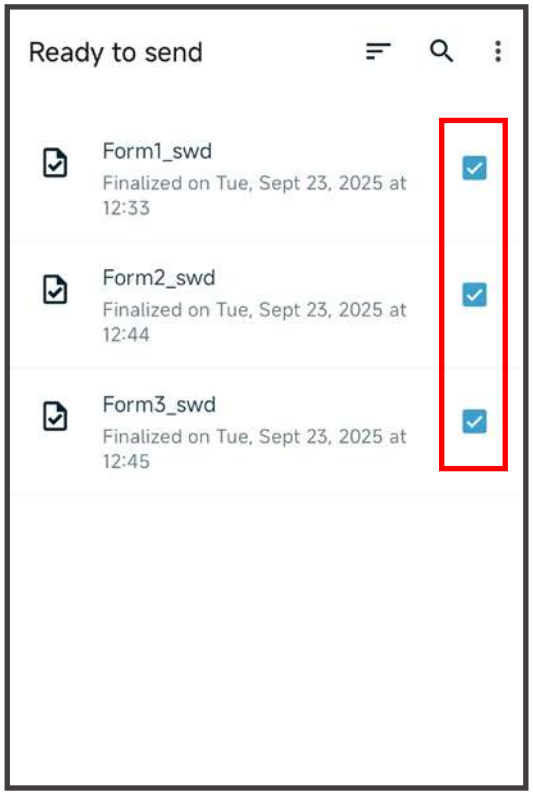

- Select 'Finalize' to submit the form before moving on to the next observation point.
Please fill form 3 once at the beginning and once at the end of the audit.

# Upload and Submit

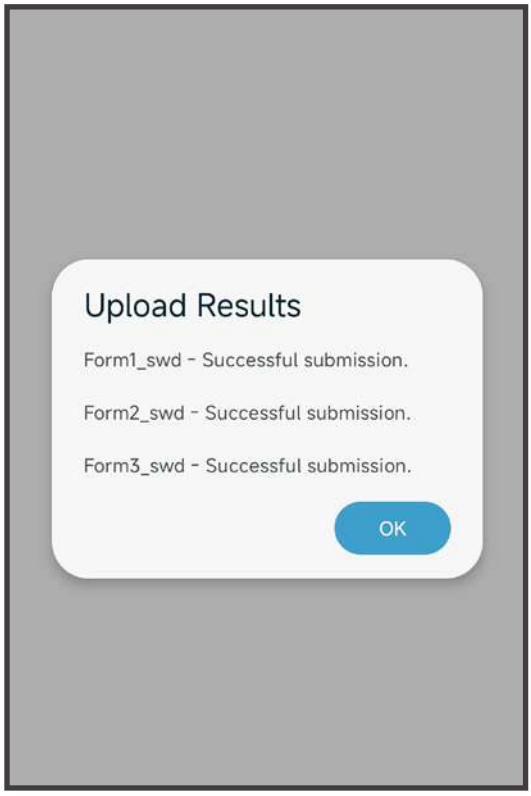
- To submit the recorded forms, follow the given steps.



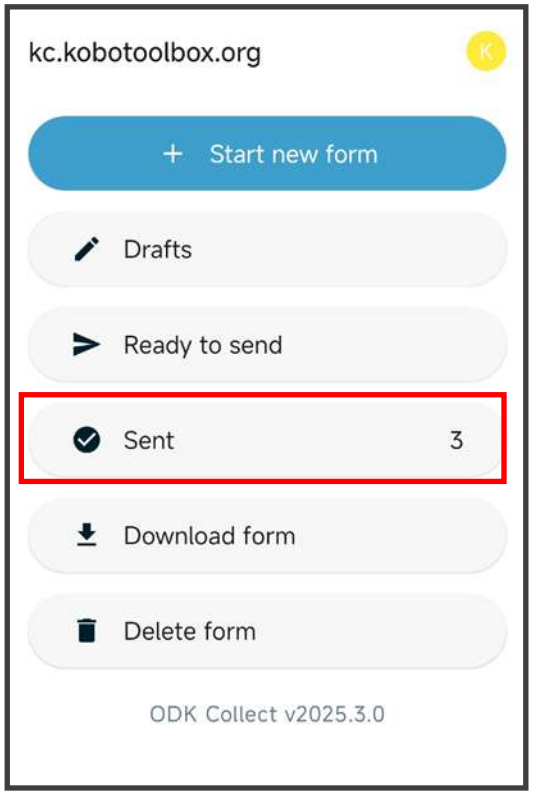

- All your forms will now be in 'Ready to send' folder.




- You can view all the forms here. Select all the forms you want to submit.




- Wait for the forms to upload then select 'OK'.




- Once submitted you can view your forms in the 'Sent' folder.

# 5 Building a Resilient Bengaluru Campaign

The Building a Resilient Bengaluru Campaign reimagines the city's stormwater systems as lifelines—vital infrastructure that protect against floods, secure water, and enrich urban life. For decades, these networks have been seen as little more than neglected backwaters. Yet they form the largest public water infrastructure in Bengaluru and hold untapped potential as shared urban spaces that support ecology, public health, and community resilience. The campaign aims to make these hidden systems visible and actionable.

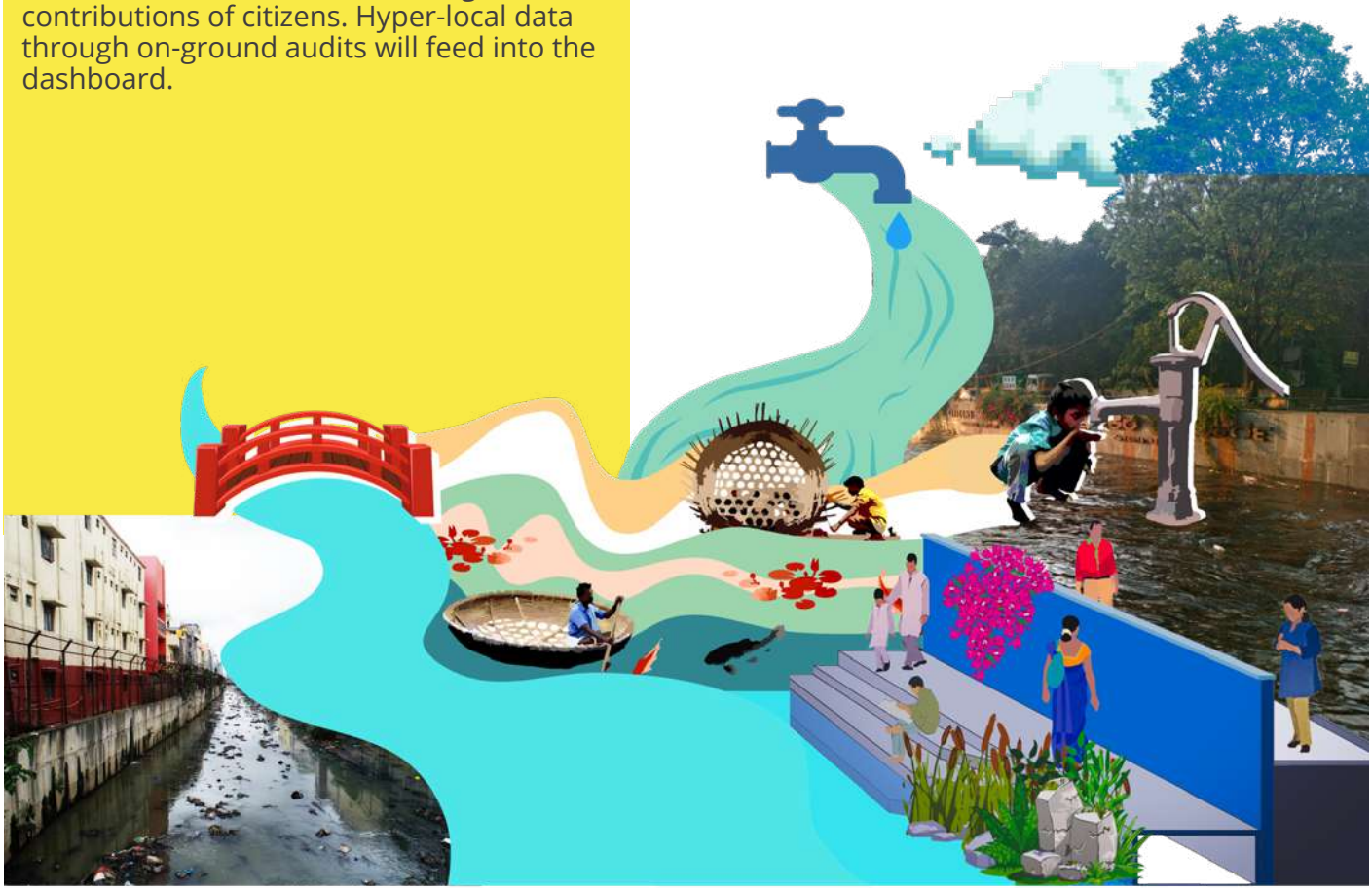
Stormwater and the City is an initiative by Mod Foundation and Oorvani Foundation supported by the BSF Small Grants Programme to build an open, interactive digital dashboard aimed to integrate spatial data, institutional mapping, and citizen insights about the stormwater drainage network in Bengaluru.

The publicly available dashboard will feed into the dashboard containing all stormwater information, the citizens can map and track drain conditions, understand governance responsibilities, and contribute real-time observations and geo-tagged stories.

Through guided community walks, storytelling events, and workshops the campaign aims to foster public awareness, while creative tools—maps, data, and stories—enable people to see and value the water systems around them.

At its core, the campaign calls for shared stewardship. By engaging residents, civic groups, experts, and policymakers, it builds collective pride, accountability, and long-term ownership of Bengaluru's waterways.

The dashboard is activated through the contributions of citizens. Hyper-local data through on-ground audits will feed into the dashboard.



# What are the goals?

**PHYSICAL AND INSTITUTIONAL MAPPING**

**Collect data on stormwater networks**

- Collate GIS and planning data
- Typology workshop
- Identify overlaps and gaps in institutional responsibility across agencies like BBMP, BWSSB, and BDA

**DIGITAL DASHBOARD**

**Visualise this data digitally**

- Story maps on the historical evolution of water infrastructure in the city
- Interactive map to explore stormwater drain typologies, catchments, and valley systems
- Governance tracker to visualize institutional jurisdictions
- Citizen audits with tools for users to submit geo-tagged photos and observations

**COMMUNITY ENGAGEMENT AND AWARENESS**

**Involve communities**

Build civic awareness and participation through social media campaigns and specific events. These activities will activate the dashboard, generate hyperlocal data, and seed community stewardship for resilient infrastructure planning.

# Mission

To turn Bengaluru's stormwater systems into community assets by using open data and citizen action, building accountability and preparing the city for climate challenges.

# Vision

A resilient Bengaluru where stormwater systems are seen as lifelines, cared for through citizen ownership and transparency, creating a greener, safer, and climate-ready city for everyone.

**A city-wide effort to make Bengaluru flood-resilient by reimagining rajakaluves, drains, streets, rooftops, and lakes as vital water systems.**

# 6 Do's and Dont's

### Guidelines to ensure safety and comfort:

- Carry a cap, an umbrella or a raincoat, and a water bottle.
- Wear comfortable shoes.
- Always keep a safe distance from the stormwater drain when noting observations or taking photos.
- Stick with your team and follow the navigator.
- Take breaks whenever necessary.

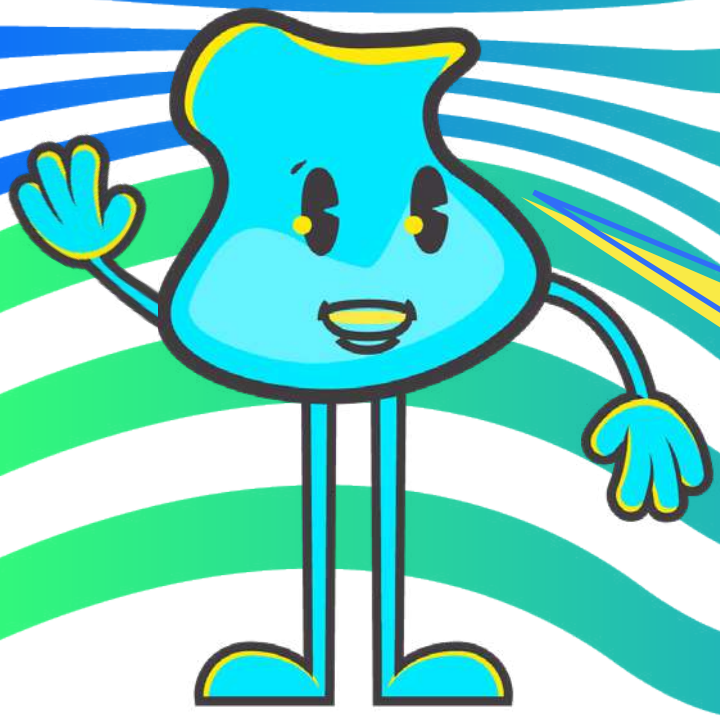
### Guidelines on camera usage:

- Keep 1GB space in your phone empty for photos.
- Enable location on your phone's camera app to allow geotagging.
- Remember to clean the phone camera lens before taking pictures.
- Take pictures only in portrait orientation.
- Remember to hold the phone straight when clicking photos to avoid angled photos.

### Guidelines for a successful audit:

- Remember to keep your phone battery charged before stepping out.
- Set up the apps before stepping out for audit.
- The ODK Collect App is only compatible with Android phone.
- Check reference sheets as a guide for what to observe.
- Check best practices to click the ideal photos.
- Guidelines on observation points given to the participants are to be used as a reference. You can choose to record observations at other points as well.

# BUILDING A RESILIENT BENGALURU



**Thank you for your participation!**

## For updates regarding the project visit our website!

https://buildingaresilientbengaluru.com

resilientbengaluru@gmail.com

Write to us