

Building Information Management System (BIMS)

- [About BIMS](#)
- [9.1 Building Information Dashboard](#)
- [9.2 Buildings](#)
- [9.2.3 Add Containment to Building](#)
- [9.2.4 View containments connected to the Building](#)
- [9.3 Building Survey](#)
- [9.3.2 Approve Building Structure](#)
- [9.3.4 Download Building KML File](#)
- [9.4 Low Income Community](#)

About BIMS

The BIMS is a core module of the IMIS that serves as a comprehensive database of all buildings within a municipality. It encompasses detailed information about each building maintained by the Buildings sub-module, including: Physical attributes (structure type, number of floors, and year of construction); Location details (address and geographical coordinates with building footprints); Usage and ownership (Building usage, ownership status, and associated tax codes); Utilities and services (sources of water, solid waste management services, access to sanitation, access to roads, etc.); Demographics and classifications (basic demographic data and classifications for low-income community areas). Buildings are central to IMIS, functioning as the foundational entities that interconnect all other components essential for efficient municipal service delivery.

New buildings constructed post-IMIS implementation are recorded through the IMIS mobile application during the building permit process and updated for new constructions. The app, currently available for Android, captures building footprints and related data for new structures. Additional building attributes are updated during municipality's business process in delivering various services such as sanitation assessments, sanitation service delivery and other services. However, this needs to be incorporated into the municipality's service delivery policy.

BIMS provides an interactive dashboard dedicated to building related information. This dashboard provides visual insights into building data from multiple perspectives. BIMS provides comprehensive interfaces and tools for data entry, updates, queries, and analysis. The system has a map-based integration feature that provides geospatial visualization tools for location identification. The module has data extraction tools that have capability for generating data in various formats, including CSV, Shapefiles, and KML files.

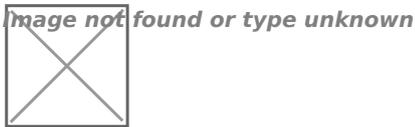
BIMS offers municipalities valuable insights into Building infrastructure status, utility and service access and the critical data for planning, management and monitoring and evaluation of sanitation system and services in CWIS approach.

The data maintained by BIMS helps municipality to monitor the CWIS indicators such as (i) % of LIC population with access to safe individual toilets / % of total population with access to safe individual toilets, (ii) Population with access to safe individual toilets, and (iii) Low-income community (LIC) population with access to safe individual toilets.

9.1 Building Information Dashboard

9.1.1 Navigating to Building Information Dashboard

- Open the sidebar and click on **Building IMS** to expand.
- Select **Building Dashboard**.



Overview:

- The Building Information Dashboard provides a quick synopsis of the information maintained in this module. The count boxes provide a glance at the status of different buildings, and sanitation systems, and the charts provide a graphical representation of the information.
- The user can interact with the chart's tools (refer to section 6.8 Chart Card Tools).
- While hovering over the charts, it provides further information.

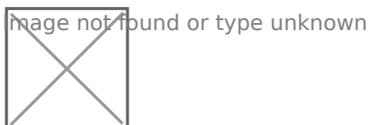


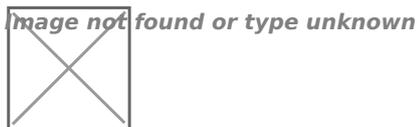
Figure 9- 1 Building Dashboard

9.2 Buildings

The **Buildings** sub-module maintains the detailed information about each building maintained by the Buildings sub-module, including: Physical attributes (structure type, number of floors, and year of construction); Location details (address and geographical coordinates with building footprints); Usage and ownership (Building usage, ownership status, and associated tax codes); Utilities and services (sources of water, solid waste management services, access to sanitation, access to roads, etc.); Demographics and classifications (basic demographic data and classifications for low-income community areas). Buildings are central to IMIS, functioning as the foundational entities that interconnect all other components essential for efficient municipal service delivery.

9.2.1 Navigation to Buildings

- Open the sidebar and click on the **Building IMS** to expand.
- Select **Buildings**.



Overview:

The Buildings Page lists all the attribute records stored in the module and provides different Tools, Actions and Tools that can be used according to the requirements. For more details (refer to section 5 Filters, section 6 Actions and section 8 Tools).



Figure 9- 2 List Buildings page

9.2.2 Add Building

- Click on the **'Add Building'** button.



User will be redirected to the following page:

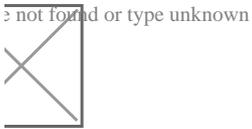
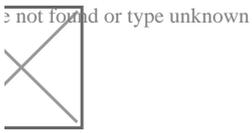


Figure 9- 3 Add Building Page

- After filling out the form, click **Save** and make sure a pop-up message is displayed, refer to section 7.1 Save for more details.
- If a mandatory form field is left out or any form failed validation during the form submission a validation message box will be prompted, refer to section 7.2 Validation Message Box for more details.

Overview:

The building add form is designed to collect and manage information about various attributes. It incorporates various skip logic that activates based on the information entered by the user. The details of the form fields are explained below:

Owner information

1. Owner Name - Full name of the building owner.
2. Owner NID - National Identity Card Number of the building owner.
3. Owner Gender - Gender of the building owner.
4. Owner Contact Number - Contact number of the building owner, it takes numeric values only.

Building Information

1. Main Building - Defines if the building is the main or auxiliary building. Select 'Yes' if it is a main building, and no if it is an auxiliary building. If 'No' is selected the Main Building House Number field is prompted.
 - Main Building House Number - Unique identifier for the associated main building if building is auxiliary.

2. Ward Number - Identifier for the local administrative unit.
3. Road Code - Identifier for the road that the building is connected to. The dropdown menu for selecting the Road Code only displays the codes that are maintained in the Road Network sub-module of the Utility IMIS module.
4. House Number - Unique address code of the building.
5. House Locality / Address - Address of the building.
6. Tax Code / Holding ID - Identifier for the building's tax record.
7. Structure Type - Type of the building structure.
8. Surveyed Date - Specific date on which the data collection was completed.
9. Construction Date - The date on which the building was constructed.
10. Number of Floors - Number of floors of the building, it allows only numeric values.
11. Functional Use of Building - The functional use of the building. When the subsequent Functional Use of Building is chosen, the Use Category of Buildings field is prompted which is also mandatory field to fill-up. The user can choose the use category with the following options:

Functional Use of Building	Use Category of Buildings
Residential	Residential, Housing, Apartment, Orphanage, Old-aged Home, Hostel
Mixed (Residential, Commercial, Office uses)	Mixed
Educational	School, College, University, Training Center
Health Institution	Hospital, Clinic/ Health Post
Commercial	Shop, Restaurant, Hotel/ Resort, Offices (Private), Shopping mall/ Super Market, Party Palace/ Banquets, Business Complex
Industrial	Industry, Factory, Warehouse, Workshop, Printing Press
Agriculture and Livestock	Agriculture Farm, Livestocks
Public Institution	City hall, Museum, Public Library and archive, Public transportation terminal, Parking, Post office, Community Toilet, Public Toilet
Government Institution	Municipal Office, Ward Office, Government Office, Police Office. Fire Station, Army barrack, Jail
Recreational Institution	Club, Stadium, Cinema/theatre, Sports complex, Fitness center, Recreational center
Social Institution	NGO, INGO, Political Party, Guthi house, Media, Social Group/ Samiti Bhawan
Cultural and Religious	Temple, Church, Mosque, Stupa, Hermitage (kuti), Mourning house, Bihar/Gumba, Bhajan Mandal, Cultural Centers
Financial Institution	Bank, Cooperative/ Finance
Vacant/Under Construction	Vacant building, Building under construction

- If the user selects the options from the “Use Category of Building” that is either “Public Toilet” or “Community Toilet”, then the following fields are hidden from the add form:

§ Office or Business Name

§ Number of Households

§ Population of Building

§ Male Population

§ Female Population

§ Other Population

§ Differently Abled Male Population

§ Differently Abled Female Population

§ Differently Abled Other Population

1. Office or Business Name - Name of the business or office in the building, only prompted if the selected Functional Use is not “Residential”.
2. Number of Households - The total number of households served by the building.
3. Population of Building - Total number of individuals present within the building. This field is automatically calculated by summing the male, female and other population counts, but user can also enter the total population manually.
4. Male Population - Number of males living in a building
5. Female Population - Number of females living in a building.
6. Other Population - Number of individuals of other gender living in a building.
7. Differently Abled Male Population - Total number of differently abled males living in a building.
8. Differently Abled Female Population - Total number of differently abled females living in a building.
9. Differently Abled Other Population - Total number of differently abled individuals of other genders living in a building. The values for Differently abled male, female and other population value must not exceed the respective value of the male, female and other population fields.
10. Estimated Area (m2) - The approximate area calculated from the dimensions of the building polygon. It is not visible in the Add Building form but it is visible in the view details of the record, and is automatically calculated based on the size of the polygon that is submitted.

LIC Information

1. Is Low Income House – Indicate whether the household living in the building is a low -income household.
2. Located in LIC – Indicate whether the building is located in a low-income community area. If "Yes" is selected, the LIC Name field will be displayed.
3. LIC Name: Name of the LIC area if building is in LIC area. The dropdown menu for selecting the Road Code only displays the codes that are maintained in the Low Income Community sub-module of the Building IMS module.

Water Source Information

1. Main Drinking Water Source – Main source of drinking water supply to the building, if the user selects the option "Municipal/Public Water Supply," the water supply customer ID and water supply pipeline code will be displayed.
 - o Water Supply Customer ID - Unique identifier for the water supply customer record, if available.
 - o Water Supply Pipe Line Code - Code of the water supply pipe line that is connected with the building.
2. Well in Premises - Indication whether a well is present on the building premises.
 - o If 'Yes' is selected, Distance of Well from Closest Containment (m) : - Distance from the well to the nearest containment field is prompted.
 - o Distance of Well from Closest Containment (m) – Distance 'in meters' from the well to the nearest containment, if applicable.

Solid Waste Management Information

1. SWM Customer ID - Unique identifier for the solid waste management customer record, if available.

Sanitation System Information

1. Presence of Toilet - Identifies whether the building has a proper space for toilet facilities.
2. If "No" is selected, 'Defecation Place' field is prompted.
 - o Defecation Place - Indicates the designated area for an individual's defecation.
 - o Open Defecation - Indicates the place for an individual's defecation in an outdoor environment (fields, forests, bushes)

- o Shared Toilet - Indicates the defecation place is used by multiple households.
- o Community Toilet - Indicates that the household uses a shared toilet that is built for the community
- o If the option 'Community Toilet' is selected, the Community Toilet Name field is displayed.
 - i. Community Toilet Name - Name of the community toilet being used by the building's residents.

3. If "Yes" is selected, following fields are prompted:

- Number of Toilets: Total number of toilets present in the building, the number of toilets value should be at least "1" and should always be a positive number.
- Households with Private Toilet - Number of households with private toilets.
- Population with Private Toilet: Total number of individuals that use private toilets.
- Toilet Connection: Connection of building's sewage system.

Additional fields are prompted according to the options selected:

- i. Onsite Treatment (eg., Anaerobic Digester /Biogas, DEWATS)
- ii. Composting Toilet (eg.; Ecosan, UDDT, etc.)
- iii. Shared Septic Tank: If the option 'Shared Septic Tank' is selected BIN of pre - connected building field is displayed
- iv. BIN of Pre - Connected Building: The BIN/House number of the pre-registered building that has the containment already connected with it. The dropdown menu only displays the codes that are maintained in the Buildings sub-module of the Building IMS module.
- Sewer Network - When the option 'Sewer Network' is selected Sewer Code field is displayed.
 - i. Sewer Code: Code of the Sewer line that is connected to the building.
- "Septic Tank or Pit / Holding tank"- Upon the selection of the septic tank or pit/ holding tank, the form fields differ slightly from those of other sanitation systems due to the inclusion of containment information.
 - i. Building Accessible to Desludging vehicle - Indicates that the building's location can be easily accessed by a desludging vehicle

4. Containment Information (Only shows up when selected Sanitation System is either Septic Tank or Pit/ Holding Tank)

- Containment Type - Type of the containment that is used by the building.
 - i. By selecting either Septic Tank or Pit/ Holding Tank, the containment information is also different according to the type of containment.
 - ii. If the user selects the Sanitation System / Toilet Connection as “Septic Tank”, the tank related fields are displayed:
 - Tank Length (m): Length of the containment.
 - Tank Width (m): Width of the containment.
 - Tank Depth (m): Depth of the containment.
 - iii. Additional field is displayed if the containment is related with the sewer connection. When the option “Septic Tank connected to Sewer Network” is selected “Sewer Code” field is displayed.
 - iv. If “Septic Tank connected to Drain Network” is selected “Drain Code” is displayed.
 - v. If the user selects the Sanitation System / Toilet Connection as “Pit/ Holding Tank” - different form fields are displayed:
 - Based on the selection of the “Pit Shape”, corresponding dimensions for Tank Length, Tank Width, Tank Depth and Pit Diameter, Pit Depth fields are displayed:
 - If Pit Shape “Cylindrical” is chosen Pit Diameter and Pit Depth is displayed.
 - a. Pit Diameter (m): Diameter of the pit.
 - b. Pit Depth (m): Depth of the pit.
 - If Pit Shape “Rectangular” is chosen Tank Length, Tank Width and Tank Depth is displayed.
 - a. Tank Length (m): Length of the containment.
 - b. Tank Width (m): Width of the containment.
 - c. Tank Depth (m): Depth of the containment

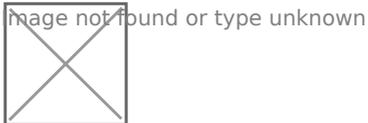
- If 'Lined Pit connected to Sewer Network ' is selected, "Sewer Code" field is displayed.
- If "Lined Pit connected to Drain Network" is selected "Drain Code" field is displayed.
- Drain Network - If "Drain Network" is selected Drain Code field is displayed.
 - i. Drain Code: Code of the Drain line that is connected to the building.
- Water Body - Waste from the toilet directly discharged into a water body (river or lake).
- Open Ground - Disposal of waste in an open field.
- Containment Volume (m3) - The volume of the containment, automatically generated according to tank length, width, depth or pit diameter, pit depth in cubic meter. The user is allowed to overwrite the auto calculated volume.
- Containment Location - Location of the Containment.
- Septic Tank Standard Compliance - Compliance standard of the Septic tank.
- Containment Construction Date - The date on which the containment was constructed.

Figure 9- 4 Containment Information

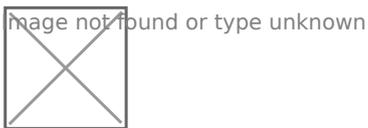
5. Building Footprint (KML File): Geospatial coordinates of the building (represented as a polygon) in KML file format. This will be pre-filled if the building is being added from the Building Survey Page as the building footprint has already been collected via mobile application.
6. House Image – Image of the building. If image is uploaded during the Add Building process, then that image will be displayed, if not image collected during the emptying process will be displayed. Additionally, if image is already present for the building, it will not be collected during the emptying process.

9.2.3 Add Containment to Building

When the user intends to make changes to the building details (edit), by clicking on **edit** button, user will be given an option to Add Containment to Building.



- The user will then be allowed to add new containment information to existing buildings.

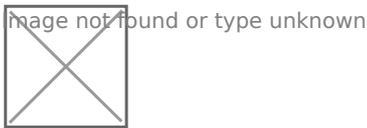


- The form fields of the add containment are the same as the above-explained containment information in the form fields of the add building (refer to section 9.2.2 Add Building).
- The user can also **edit** the containment information from the building edit page by simply clicking the edit button, which redirects to the edit containment page.
- If the user attempts to modify the sanitation system technology and the system encounters different containment information, the system will not allow the user to change the containment details directly. The user must update the appropriate containment information (delete containment connection, edit containment type), and then modify the sanitation system technology.
- When editing the building data, if a user attempts to delete the connection between the building and the containment, the following conditions must be met:
 1. If the containment has application data with an "Emptying Status" of False, the connection to the building cannot be deleted.
 2. If the application data is emptied, meaning the "Emptying Status" is True, the connection between the building and the containment can be deleted. In this case:

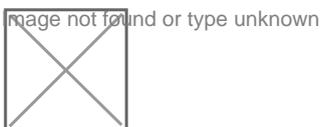
§ If the containment has a single connection to the building, it will be completely deleted.

§ If the containment has multiple connections (for example, a Septic Tank connected to both a Sewer Network and a Drain Network), only the connection to the building will be removed, and the Sewer Code or Drain Code for that containment will be nullified if the containment has outlet connections.

- Additionally, new containment information/ connection can also be carried out as per the requirements. Example: If the user initially has the sanitation system set to Sewer network and needs to add containment information, the user should click the '**Add Containment to Buildings**' button, fill out the required fields, and click '**Save**'. This will dynamically update the Sanitation System and add the containment information. The error message below is displayed if the user attempts to add a different containment to the existing one:

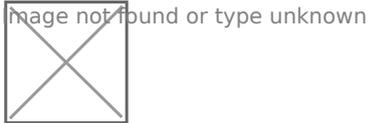


- For the deletion of either building or containment data, If the building has no connection with the containment, user can easily delete the building data, if it has the connection with the containment user must follow the below steps:
 - o Step1: To completely remove the building data, first user must remove the connection between the building and containment. This can be accomplished by clicking on the “**View Containments Connected to Building**” button. Upon selecting the **details** button, the user will be redirected to the containment details where user can proceed to delete the specific containment associated with the same building.
 - o Step 2: If the user attempts to delete building or containment data without removing the connection between the building and containment, the system will notify the user with an error message as:

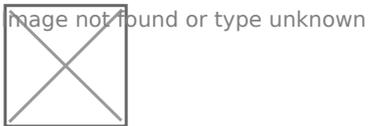


9.2.4 View containments connected to the Building

- Click on the Building button in the Action Column.



- A pop-up with containments connected to the building will be displayed.



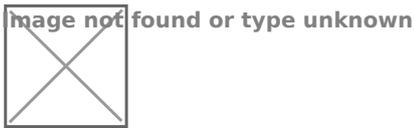
The user can click on the information icon (i) to view the details of the containment.

9.3 Building Survey

The **Building Survey** sub-module is dedicated to maintaining information about field surveys conducted to identify and digitize both pre-existing and new buildings in the municipality via the Building Information Collection mobile application. This application captures the building footprint and stores it in the Building Survey list. Users can add the building footprints stored in this module by approving the building and adding the necessary attribute fields as explained in the Add Building section (refer to section 9.2.2 Add Building). A separate detailed user manual is also available for the **Building Information Collection Mobile App User Manual**.

9.3.1 Navigation to Building Survey

- Open the sidebar and click on the **Building IMS** to expand.
- Select **Building Survey**.



- This redirects to the **Building Survey** page.
- The user can see the list of building survey data collected through the mobile application
- User can add a new building by clicking on the **Approve** button in the action column (refer to section 9.3.2 Approve Building Structure).
- The user can preview the location of the Building (refer to section 9.3.3 Preview Building Location), download the building's KML File (refer to section 9.3.4 Download Building KML File), delete the building record (refer section 6.3 Delete Record), and filter the data.



Figure 9- 5 Building survey lists

Refer to **Building Information Collection Mobile App User Manual** for detailed instructions for the building footprint survey/ collection process.

9.3.2 Approve Building Structure

- Click on **Approve Building Structure** in the Actions column.



- The Approve Building Structure form is displayed, and the fields are similar to Add Building (refer to section 9.2.2 Add Building), however, the Building Footprint (KML File) and the Surveyed Date are prefilled (refer to below Overview section)
- The following marked fields are pre-filled through the mobile application and then the detail information on the building.

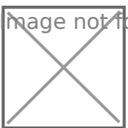
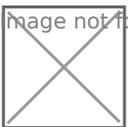


Figure 9- 6 Approve Building

9.3.3 Preview Building Location

- Click on the **Eye** button in the Action Column



- A Popup window as KML Viewer will appear that shows the location of a building under survey.

Overview:

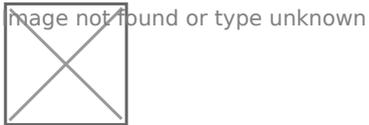
image not found or type unknown



Figure 9- 7 Preview building location (KML viewer)

9.3.4 Download Building KML File

- Click on the **Download** button in the Action Column



Overview

- A KML file will be downloaded, and the user can check and verify the downloaded KML footprint whether it is valid or not via Google Earth/QGIS.

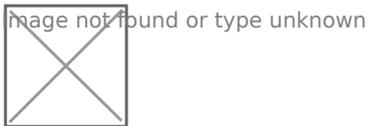


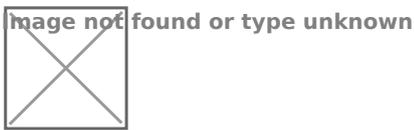
Figure 9- 8 Validating KML file in Google Earth

9.4 Low Income Community

The Low-Income Community sub-module is dedicated to maintaining information regarding the low-income communities in the city, along with the area they cover. This module enables the system to maintain individual buildings that are in LIC area along with their attribute information

9.4.1 Navigation to Low Income Community

- Open the sidebar and click on the **Building IMS** to expand.
- Select **Low Income Community**.



Overview:

The Low Income Community Page lists all the attribute records of Low Income Communities stored in the module and provides different Filters, Actions, and Tools that can be used according to the requirements. For more details (refer to section 5 Filters, section 6 Actions and section 8 Tools).

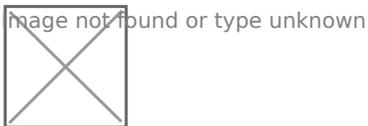
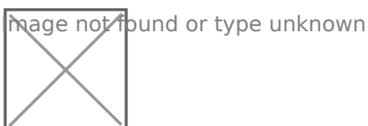


Figure 9- 9 : List of Low Income Community

9.4.2 Add Low Income Community

- Click on '**Add Low Income Community**' button.



- User will be redirected to the following form:

image not found or type unknown



Figure 9- 10: Add Low Income Community

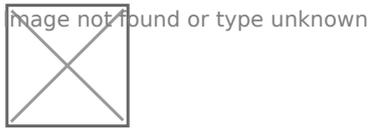
- After filling out the form, click **Save** and make sure a pop-up message is displayed, refer to section 7.1 Save for more details.
- If a mandatory form field is left out or any form failed validation during the form submission a validation message box will be prompted, refer to section 7.2 Validation Message Box for more details.

Overview:

The **Add Low-Income Community** page consists of information that is explained below:

- Community Name: Name of the community.
- No. of Buildings: Total number of buildings in the community.
- Population: Total number of people in the community.
- No. of Households: Total number of occupied households within the community.
- Male Population: Total number of males living in the building.
- Female Population: Total number of females living in the building.
- Other Population: Total number of individuals of other genders living in the building.
- No. of Septic Tanks: Total number of septic tanks used by the buildings within the community.
- No. of Holding Tanks: Total number of Holding Tanks in the community.
- No. of Sewer Connections: Total number of connections to the municipal sewer system within the community.

- No. of Community Toilets: Total number of communal toilet facilities available in the community.
- Area: Choose the location where the low-income community is located and draw the corresponding area on the map.
 - o The top left corner displays the zoon-in and out button.
 - o The top right corner tab displays the Layers and Base maps.



Note:

- All fields takes only numeric value except “Community Name”.
- Deletion of Low Income Community data is not permitted when it is associated with building data.