ANNEX 11

Conceptual[1] Site Development Plans for Building Safer Settlement Areas

1. Context

In the site assessment and prioritisation process conducted, the top two safer settlement areas that emerged in terms of project readiness were Novelty and Dumlao. Conceptual development plans and preliminary costs were prepared only for these two sites. The design principles and process by which these sites were developed shall guide subsequent planning efforts.

Design Considerations and Options Discussed

The design and planning of the basic shelter services for the two sites emanated from a set of key concepts and design principles crafted and established from discussions with AusAID, the City (particularly the Mayor and the technical working group from the Local Housing Office) and the potential target beneficiaries of the housing projects. Results of discussions were processed and anchored on lessons learned and good practices from previous socialised housing projects, such as the ADB-funded studies and projects namely, the Metro Manila Urban Services for the Poor Project and the Development of Poor Urban Communities Sector Project.

AusAID. The main objective for AusAID is to provide informal settler families living in danger areas with safer, disaster resilient communities. The conceptual development plans for the newly regained lands are also critical so as to secure these areas once these are vacated and prevent further encroachment. Another important consideration is for the design team to work closely with the Taguig City Government and incorporate their recommendations into the design. The output should be a project design that is replicable and is reflective of what the City envisions.

Taguig City. Mayor Lani Cayetano envisions a project that will provide more than shelter to the informal settler families in danger areas—the program should offer more than the typical low-income housing projects in the country in terms of aesthetics and community facilities. This model housing development should be with adequate commercial and open space amenities to entice the people to avail of the housing project. The Mayor also mentioned a few private middle class developments where they can get inspirations from for the housing development designs. The Mayor also stresses the need to optimise the limited space through the use of multi-storey housing structures. An interest on some green technologies, such as 'green roof,' has also been expressed. These sentiments were also shared by the LHO Technical Working Group and were used as take-off point in subsequent planning sessions with their group and the Design Team.

[1] Subject to confirmation and approval by beneficiaries during community consultations

Target Beneficiaries. Based on the surveys conducted, the sample informal settler families have expressed preference for single detached housing and would like to own the lot and housing unit. They also prefer spaces for livelihood and economic opportunities.

However, it was explained that given the scarcity of land for socialised housing in Taguig and the huge number of informal settlers, medium rise buildings (MRBs) shall be the prescribed housing type.

2. Key Concepts

Opportunities and resources for implementing safer settlement projects, especially in socialised housing, in the country are limited. The availability of an AusAID grant and with Taguig City's willingness to provide counterpart support gives an advantage to all parties involved—the Taguig City Government, AusAID, and design team—to ensure that the parameters of effectiveness, replicability, and sustainability are met during the design and implementation of Building Safer Settlements project.

Cost-effectiveness. The demand for socialised housing projects are high but there is not enough land and financial resources available. Costs should be carefully managed and focus on maximizing opportunities for PPPs. Also, given the overarching context of DDR and CCA, design features and green technologies that will be explored should be cost-effective in the long run (i.e., savings on operations and maintenance costs).

Replicability. The design principles should be replicable for future socialised housing projects, but design solutions will address site-specific conditions. For example, MRBs may be proposed as a standard housing design, but the architectural translations would be different per site. Similarly, mixed-use development plans would have different formats and character among a number of sites, taking into consideration specific site contexts.

Sustainability. The areas to be developed under this project will be under usufruct and will remain as properties of the City. It is projected that the (market) value of these properties would increase over time due to proposed developments. The key is **striking a balance** among all these interrelated but seemingly competing requirements of the project—physical, environmental, aesthetic, social, financial, economic, legal aspects—to obtain the optimum mix that would best fit a particular site.

3. The Design Principles

The following principles shall govern the designing and planning activities for the socialised housing sites:

a) Integrate DRRM and CCA in all aspects of the design process.
b) Balance optimum occupancy with liveability, open space requirements and civic functions responsive to the evolving Philippine urban way of life.
c) Promote mixed land use such as commercial and livelihood/entrepreneurial opportunities to cross-subsidise the residential component and enhance cost recovery and replicability.

d) Create walkable communities featuring interconnected open spaces and pathways to promote healthy living.
e) Plan for gender-sensitive spaces that are defensible, and incorporate accessibility for the physically challenged.
f) Adopt green technologies in the site and building system design where it would be the most robust and useful for energy savings and reduced carbon footprint.
g) Encourage social integration, civic awareness and participation in the larger community.
h) Foster distinct and decent communities with a strong sense of place and belongingness.
i) Comply with applicable code requirements such as BP 220 (Implementing Rules and Regulations for Economic and Socialised Housing), National Building Code, and the Structural Code of the Philippines.
j) Adopt a participatory community planning approach to instil ownership and pride.

4. Pilot Socialised Housing Projects

4.1 Novelty Site

4.1.1 Existing Conditions

The Novelty area is a 1.3-hectare site in Barangay Bagumbayan located in an industrial zone and bounded on the east by a residential area. The site is bordered by Joseph Sitt Street on one side and by other industrial parcels on other sides. It used to be a two-storey textile factory which had been demolished and the remaining debris material covers about 80% of the site. A major site preparation cost would involve the removal of the debris (**Figure 1**).

The site has very good adobe foundation based on GHD findings and sits on an outcrop rising to an elevation of about five meters at its highest point. The terrain of the site is sloping upwards from the front towards the rear of the property.

The area has a high potential for a mixed-use commercial development. Small-scale commercial establishments line along Joseph Sitt Street. About 23 vendors or owners of makeshift commercial stalls, and a tricycle terminal of about 10 tricycle spaces occupy the sidewalk along the perimeter fence of the property.

The site being located in an industrial zone has to be reclassified under a Sangguniang Panglungsod resolution to residential and earmarked specifically for socialised housing.

4.1.2 The Proposed Development Plan for Novelty

The proposed development plan for the Novelty Site is shown in **Figure 2**.

Land use components and yield

There are 3 major land use components: residential (58%), mixed use components (15%) and circulation systems (26%) as shown in **Table 1**. A detailed breakdown of the land use area allocation is presented as **Table 2** and the generated number of housing units for the site is in **Table 3**.

Table 1. Novelty Major Land Use Components Area Allocation

Major Components	Area (sqm)	%
Residential Block	8,055.65	58
Mixed Use Block	2,121.25	15
Circulation/Boundary Easements	3,611.10	26
Total	**13,788.00**	**100**

Table 2. Novelty Detailed Land Use Area Allocation

Major Components	Area (sqm)	%
Housing Structures	4,136.40	30
Mixed Use Area	1,378.80	10
Parks and Playgrounds*	4,660.34	34
Roads /Parking	3,278.41	24
Tricycle Terminal	313.80	2
TOTAL	**13,788.00**	**100**

**Also includes required easements, path walks, courtyards and services*

Table 3. Novelty Generated Number of Housing Units

MRB	No. of Units per Structure			Total No. of Units
	19sqm loftable	25sqm loftable	Total	
MRB Type 1	31	16	47	282
MRB Type 2	55	24	79	158
Totals				**440**

**Excludes Building Association Offices: 1 unit at ground level per MRB*
***Excludes units or areas allocated for community facilities and commercial facilities incorporated in four of the MRBs.*

Site Plan Features

1. A major feature of the proposed site plan is an 8-meter wide loop road encircling the residential buildings. A loop road has been provided not only for circulation but as a multi-functional service artery with various uses such as:
    - Required easement along the property boundary
    - Easement for the foundation of the MRBs
    - Easement for utilities such as power and drainage (The main onsite drainage has to be connected to the existing main drain at the Joseph Sitt Street. While the existing street

drain from the project site up to Sta. Maria Drive needs to be rehabilitated as part of the project).

- Right of way for disaster response in case of fire, rescue operations, etc.
- Right of way for community services such as solid waste collection
- Space for parking[2]

2. The mixed-use component is envisaged as a two-storey development with a gross floor area of 1,848 square meters. In this proposed configuration, a view corridor shall bisect the mixed use development at ground level. To the left of the view corridor shall be an open plan where temporary stalls and shops could be installed, while to the right of the view corridor shall house shops such as convenience stores, bakery, or food stalls. The second floor shall be allocated for other related goods and services. The temporary stalls shall be leased to the vendors presently occupying the sidewalk of the Novelty site. Eleven parking slots have been provided at the back of the mixed-use structure. Private sector partnerships shall be the likely mode for implementing this component.

3. A tricycle terminal is also included in the site development plan and will be located along the Joseph Sitt Street. With the vendors likely to be accommodated into the proposed commercial stalls, the full right of way access along Sitt Street can be regained and improved by the City. The sidewalk along the property's frontage, in particular, will be improved to complement the envisaged project.

4. The proposed MRB development has been purposely designed and planned in 'terraces', to gain additional floor space, while lending the development with a unique character (**Figure 3**). The additional floor spaces have been earmarked for a multi-purpose building or clubhouse area and community facilities such as day care, health centre, and small shops. By utilising the site's sloping contour, the development could be experienced at three levels. At the ground level, which matches existing street elevation, the mixed-use building is designated as the public space. At the back of this building where neighborhood commercial facilities are located, the area shall be designated as semi-public place. At the next level, which is about 2.5 meters above street level, will be the community facilities or clubhouse designated as semi-private space clustered around the courtyard. Towards the topmost level, about five meters above street level, will be the private residential MRBs clustered around the pedestrian ways.

5. The required easements and setbacks surrounding the MRBs will be utilised as pedestrian ways with landscaped path walks, stairways, and ramps linking all the open spaces from the ground level to the topmost level. The landscaping of these areas could be done later by the residents following a landscape and planting plan.

6. Both indoor and outdoor multi-purpose areas are included in the site plan. Courtyards and plazas serving as path walk linkages could be transformed as recreational/entertainment spaces (e.g.

[2] BP 220 prescribes one slot per eight residential units which would translate to 55 parking slots. Given a parallel parking configuration with proper breaks along curved edges, the 55 parking slots could fit along the outer side of the loop.

sports competitions and fiestas) to economic spaces for livelihood and enterprise (e.g. tiangge and weekend markets).

7. Urban verticals or vertical green plantings along the perimeter walls or building walls shall be utilised. New garden areas for planting using new soil could also be created within the atriums and courtyards.

   Figure 4 shows the proposed site perspective of the Novelty site.

Shelter / MRB Features

1. There shall be a mix of two types of 4-storey MRBs.[3] The typical MRB will consist of 12 units to a floor, and the L-shaped MRB will be 20 units to a floor (**Figure 5**). Mixing different types of MRBs provide a richer texture and quality to the development. The MRBs will be organised around an open space providing a counterpoint to the verticality of the buildings while enriching the interplay of both indoor and outdoor spaces.

2. An atrium feature, a climate change adaptation feature, will be provided in all MRBs. Additional planting along the atriums forming mini-gardens contribute to the MRB's openness, hominess and airiness. An atrium has many functions as follows (**Figure 6**):
   - Maximises natural day light and ventilation which reduces energy use;
   - Serves as an amenity for enticing ISFs to live in the MRBs
   - Fosters a sense of community and a sense of security.

3. One unit at the ground level has been allotted for each MRB's neighbourhood association office.

4. MRBs are designed with overhangs as protection from the sun especially the long side of buildings which are oriented to the west (**Figure 7**).

5. Garbage chutes, one for biodegradable and another one for non-biodegradable waste, shall be provided for each MRB and will be strategically located at one stairwell end of the buildings where it is most accessible for collection along the loop road.

Housing Unit Features

1. The minimum unit size is 25 square meters. For the typical unit, the core floor area is 19 square meters loftable to 25 square meters, while the non-typical or corner unit is 25 square meters loftable to 32 square meters (**Figures 8 and 9**).

[3] MRBs for socialised housing are allowed up to 5 storeys but since all the units are loftable, the floor to ceiling height is much higher. Therefore, a 4-storey MRB would already almost approximate a 5-storey building. The more conservative option is used in light of fire safety considerations and the balancing of density with parking and other open space requirements.

2. The room layout basically provides a kitchen sink, toilet and bath, laundry area, and the rest is left open as a multi-purpose living space. Additional rooms could be added as a loft, and the area below the loft can be used as another bedroom space.

4.2 Dumlao Site

4.2.1 Existing Conditions

The Dumlao site is located in Barangay Bagumbayan and has an area of 1.1 hectares. The site is surrounded by residential areas like the Sagrada Familia, a community mortgage program project on the east and south side, while a 50-meter wide residential land separates its eastern boundary from M.L. Quezon Avenue. North of the site is the Bagumbayan National High School which connects to the Sta. Teresa Elementary School via a covered walkway (**Figure 10**).

The Dumlao site is part of a larger planning area consisting of other socialised housing sites such as Habitat Bagumbayan which the city intends to develop into a mixed-use residential community. Consequently, the site's linkages would have to be planned within this macro perspective (**Figure 11**).

Grass, shrubs, and few trees cover the site. The land has low ground elevation relative to the surrounding areas which causes rainwater and sewage to drain towards the site. Geotechnical studies revealed unstable soil foundation. The site is generally underlain by about 12 meters of very soft to hard silty clay and loose to dense silty sand. Soil remediation and stronger foundations would be necessary if proposed building structures would be more than two storeys.

4.2.2 The Proposed Development Plan for Dumlao

Land use components and yield

There are three major land use components: residential (63%), mixed use components (3%) and circulation/boundary easements (34%) (**Figure 12**). A detailed breakdown of the land use area allocation is presented as **Table 3**, and the number of units generated by the proposed plans is presented as **Table 4**.

Table 4. Dumlao Major Land Use Components Area Allocation

Major Components	Area (sqm)	%
Residential Block	7,237.29	63
Mixed Use Parcel	381.60	3
Circulation/Boundary Easements	3,933.88	34
Total	**11,552.77**	**100**

Table 5. Dumlao Detailed Land Use Allocation

Major Components	Area (sqm)	%
Housing Structures	3,119.24	27
Mixed Use Parcel	381.60	4
Parks and Playgrounds*	4,621.08	40
Roads	3,350.33	29
TOTAL	11, 552.77	100

**Also includes easements, buffer, path walks and services*

Table 6. Dumlao Number of Housing Units per MRB Structure

MRB	No. of Units per Structure			Total No. of Units
	19sqm loftable	25sqm loftable	Total	
MRB Type 1	32	16	48	288
MRB Type 2	32	16	48	96
Total				**384**

Note: Excludes units or areas allocated for community facilities and neighborhood commercial facilities incorporated in the MRBs.

Site Features

1. The proposed site plan for Dumlao considered the most viable solution to address the flooding risks in the area without transferring the problem to neighbouring areas. The solution is to remove the unsuitable materials at the site and backfill up to two (2) meters in height to allow proper drainage. The proposed main drainage has to traverse through the adjacent elementary school campus and connect to the existing drainage along the MLQ Avenue. This is to avoid any expensive right-of-way acquisition, offsite access, and drainage development costs.

2. The main drainage pipes shall run along the proposed loop road along the property boundaries. To avoid drainage runoff from flowing to the adjacent properties, the drainage pipes to be constructed shall be sized properly to also function as holding canal. This shall be a mitigating measure for unexpected flood surges that may take a longer time to subside.

3. Aside from providing circulation and easement for drainage lines, the 8-meter loop road encircling the area shall also function as a multi-functional service artery, and will specifically serve as:
    - Required easement along the property boundary
    - Easement for other utilities such as power
    - Right of way access for disaster response in case of fire, rescue operations, etc.
    - Right of way access for community services such as solid waste collection
    - Additional space for parking (BP 220 prescribes 1 slot per 8 housing units which would translate to 48 slots) Parking spaces have also been carved out from the residential block.

4. The mixed-use commercial spaces will be occupied by dry goods stores, convenience stores, rice stalls (bigasan), and small retails shops (sari-sari stores). These commercial areas form part of the residential structures.

5. The MRBs will be clustered around an open park or the focal point of the residential community. Spaces for community facilities such as daycare centres, small clinic, neighbourhood association's office, multi-purpose areas will be provided at the lower ground level of these floors. An aerial view of the proposed plan depicts this concept (**Figure 13**).

6. The required easements and setbacks surrounding the MRBs will be utilised as pedestrian ways with landscaped path walks, stairways, and ramps, linking all the open spaces from the ground level to the topmost level. The landscaping of these areas could be done by the residents later following a landscape and planting plan.

Shelter / MRB Features

1. The typical architectural form of the MRB will be split-level, having a lower ground floor about two meters in height at the front of the building, and a 1.5-meter high rear space. Residential floors begin from the upper ground level as if on stilts. The lower ground floors will be designated for the commercial spaces and community facilities/amenities. The concept of 'raising' the residential floors intends to be a mitigating measure in an event of intense flooding (**Figure 14**).

2. Each MRB will consist of conjoined two clusters of six units to a floor, making it 12 units to a floor or 48 units per building, each with four storeys. Pile foundation is proposed for the 4-storey housing units. "MRBs for socialised housing are allowed up to 5 storeys but since all the units are loftable, the floor to ceiling height is much higher. Therefore, a 4-storey MRB would already almost approximate a 5-storey building. The more conservative option is used in light of fire safety considerations and the balancing of density with parking and other open space requirements."

3. There are two types of the split-level MRB: the shophouse format, and the Typical MRB. The main difference between the two types is on the designated use of the lower ground floors. The shophouses have mixed-use commercial use for its lower ground floor, while the typical MRB has community facilities, with small retail shops at most for its commercial spaces (**Figure 15**).

4. MRBs will be designed with overhangs as protection from the sun especially for the long side of buildings facing westwards.

5. Garbage chutes, one for biodegradable and another one for non-biodegradable waste, shall be provided for each MRB and will be strategically located at the stairwell ends of the buildings, accessible for collection along the loop road.

Housing Unit Features

1. The minimum unit size is 25 square meters. For the typical unit, the core floor area is 19 square meters loftable to 25 square meters, while the non-typical or corner unit is 25 square meters loftable to 32 square meters (**Figure 16**).

2. Room layout basically provides a kitchen sink, toilet and bath and laundry area and the rest is left open as a multi-purpose living space. Additional rooms could be added via a loft and below the loft another bedroom space could be generated.

4.3 Green Technologies

The types of feasible and cost-effective green technologies to be adopted in the proposed housing projects are still subject to further exploration and assessment. The costs and benefits of sustaining these green technologies would still need detailing. Initially, the following green technologies have the most potential for application in the area (**Figure 17**):

- Rainwater catchment
- Dual pipe system for potable and recycled water
- Solar powered streetlights
- Solar roof panels for lighting common areas

5. Newly Regained Land

5.1 Background

In the context of this study, the target beneficiaries of the socialised housing sites are ISFs in danger areas (e.g. areas prone to flooding and liquefaction, etc.). The sites to be vacated by the target beneficiaries are designated as Newly Regained Lands (NRL).

The two sites, Mauling Creek and Inland Lakeshore, are flood prone areas that have been selected as the case study areas for the NRL. However, concept plans and detailed cost estimates were prepared only for Mauling Creek due to lack of information and unclear and conflicting jurisdiction over the area. It is expected that detailed design for Mauling Creek will be done during program implementation.

5.2 Design Principles

The planning and design principles for the Newly Regained Areas should:

1. Prevent the repeat encroachment of ISFs by immediately securing the areas. A perimeter fence can be installed prior to construction activities to contain the area, and security guards can be posted on site during and after project implementation.

2. Adhere to the restrictions/guidelines as prescribed within a risk sensitive approach. In a risk sensitive approach, regulative intervention on different hazards zones varies with increasing levels of risks, and on the existing and proposed types of development within each zone. For example, in the case of Mauling Creek, which is a floodplain area, floodplain zoning ordinances could be ratified to make distinctions between a "floodway" and a "flood fringe." Floodway refers to high-risk area that is kept free from any development to allow floodwater to pass through this corridor unobstructed. Flood fringe, on the other hand, would allow some development but within allowable permits such as in the case of Inland Lakeshore.

3. Allow for a strategic alternative use of the NRLs in the future. In the meantime, employ a park and green plan approach which could be an interim solution until other options are decided on by the City.

5.3 Mauling Creek

5.3.1 Existing Conditions

The Mauling Creek, which is located in Barangay Bagumbayan, runs in an east-west direction and is located about one kilometer east of the Novelty site (**Figure 18**). Photos of the site from Mauling Bridge are also shown. As viewed from the bridge, the width of the site is about 38 meters beginning from a 5-meter road perpendicular to the bridge north of the Mauling Creek site, going southwards to the private residential structures, which are situated on higher or bridge height level.

The entire strip of makeshift dwellings along the Mauling Creek site is below the height of the bridge railing. Only rooftops could be seen from the bridge. The existing makeshift houses are largely cluttered and unplanned, and built on landfill of mixed debris, garbage, cement, etc. The width of the existing creek has been reduced to about three meters due to the proliferation of informal settlers. Trees can be found scattered within the site.

In the absence of a structure map of the area, for planning purposes, 2.75 hectares of Mauling have been carved out and presumed to house approximately 824 ISFs[4]— the number of ISFs that will be accommodated in the proposed new socialised housing sites of Novelty and Dumlao.

5.3.2 Concept Plan for Mauling Creek

1. The park and green concept for Mauling Creek is shown in **Figures 19** and **20**.

2. Existing trees in the area will be retained and woven into the design plan of pedestrian ways, and green areas.

[4] Computed ISFs is based on the density of 1 hectare is to 300 informal setter families which was approximated from 370.11 ISF per family cited by Mary Racelis, "Claiming a Future from a Problematic Present: The Meaning of Urban Citizenship for Slum Youth in Metro Manila", Paper presented at the International Symposium, "Cities of Extremes: Claiming Citizenship in the Urban Milieu" in The Netherlands, October 2007.

3. Widening of the creek will also be undertaken to facilitate the flow of its waters. The paving materials and softscapes that will be used in the area will be sturdy enough to withstand flooding.

4. The area will be secured 24 hours, 7 days a week by five (5) security guards in shifting assignments. The maintenance will be handled by the City or by a contractor.

5. Community involvement in securing the area should also be explored. Providing a park and playground would entice children to come and play, and women could be organised to implement livelihood projects in the newly developed Mauling Creek. Also, the presence of visitors in the Mauling Creek Park could also deter crime and 'squatting' in the area.

6. Additional mitigating measures need to be introduced, especially to minimise water pollution of the creek.

5.4 Inland Lakeshore

5.4.1 Existing Conditions

1. Based on the GHD geotechnical study, a number of hazards exist in the Inland Lakeshore such as its vulnerability to liquefaction and high incidence of flooding due to its water catchment feature (**Figure 21**).

2. The primary power transmission lines traversing the longitudinal length of the site also present another hazard.

3. Other environmental problems have occurred also due to improper housing developments along the Inland Lakeshore. In Hagonoy, a backfill of about 2 meters were provided for a socialised housing development project. As a result, the adjoining areas are more prone to flooding due to the backfilling activities.

4. There is a proliferation of informal settlers along the C6 road dike. These informal settler areas were reclaimed, albeit not engineered, to an elevation of about 12.5 meters. There were no observed sewage treatment and drainage system in the area. The growth of informal settlers remains unchecked, and claimants on the declared public land are increasing with several occupants presenting their copies of tax declaration.

5. Another site concern is the conflicting jurisdiction between the City Government and Laguna Lake Development Authority (LLDA) on the area which has to be delineated and resolved (**Figure 22**). The area owned by the City is supposedly covered by Ordinance No. 17-2002 allocating an area reserved for public parks, playgrounds and other public uses. The strip of land along Inland Lakeshore is further overlapped by varying residential easements from the west side along MLQ Avenue, then by the 100-meter easement for public lands along Laguna Lake. The LLDA's jurisdiction covers all lakeshore lands below 12.5 meters which are considered public lands.

NAMRIA is currently mapping the lakeshore areas including those along Taguig in order to establish what the LLDA legally covers.

6. The previous agreement between the City Government and LLDA has to be clarified particularly on the status of the MOA between the two parties on the plan to develop the lakeshore area into an intensive, mixed-use, commercial hub area with an international airport. The plan dubbed as 'Aerotropolis' was drafted by the Palafox Architectural firm.

7. There is a lack of a good working spatial base map to fully understand the existing conditions of the site and to properly delineate the jurisdictions of the various stakeholders of Inland Lakeshore.

8. A GIS-generated existing land use map was prepared by the Design Team together with the Local Housing Office for the first four kilometers of the Inland Lakeshore to have a more accurate picture of the present site conditions (**Figures 23 a to e,** GIS maps). The map reflects information taken from Google aerial photos, the data from the City Assessor's office, and from the foot survey data undertaken by the Local Housing Office. The foot survey map details the approximate number of shanties, private properties or concrete structures (some elevated to about 16 to 18 meters), transmission lines, junk shop, cockpit arena, and structures.

9. The 4.48-kilometer stretch of the Inland Lakeshore area covering approximately 123 hectares is largely unplanned (**Figure 24**). The Inland Lakeshore, given its proximity to C-6, has good potential for a mixed use development. Existing land use area allocation for this portion of the property is as follows:

Table 7. Land Use Allocation for Inland Lakeshore (South side)

Land Use	Area (hectares)	%
Residential	50.33	39
Major Infrastructure	2.84	2
Grassland	48.19	38
Trees	6.06	5
Vacant	10.63	8
Road	10.07	8
Total Area	**128.12**	**100**

**Length covered is equal to 4.48 kms*

The Inland Lakeshore given its proximity to C-6 has good potentials for a mixed use development and is still relatively vacant considering that this is the more developed half portion of the 8-km stretch.

5.4.2 Initial Concepts, Planning and Strategies

1. A focused group discussion was set up with AusAID, LLDA, Taguig City and the Design Team to redefine sustainable framework, master plan development, and planning strategies for the Inland Lakeshore.

2. LLDA admits to their powerlessness in enforcing their mandate because they are resource-handicapped. They intend to co-manage the lakeshore with LGUs since they are in a better position to deal directly with the communities.

3. Upon AusAID's suggestion, a Technical Working Group (TWG) to be composed initially of representatives from Taguig City and LLDA will be organised to review policies and programs for the Lakeshore area. The TWG will also address the issues and recommend solutions/measures to higher authorities in mitigating further deterioration of the socioeconomic and environmental quality of the area.

4. Ten barangays are covered by the lakeshore area in Taguig and these barangays should be represented and encouraged to actively participate in any planned initiatives for the Inland Lakeshore area.

5.4.3 Development Framework and Master Planning

1. There is a need to draw up a conceptual plan for the area to give the City Government, the ten barangays, LLDA, the Department of Public Works and Highways (DPWH) and other relevant entities with a framework that will guide the development of the area. The situation cannot wait for a full CLUP or a DRM plan to be completed before any action is taken.

2. The foremost activity to be implemented is to secure the area to prevent further encroachment of informal settlers.

5.4.4 Conceptual framework plan for the Inland Lakeshore area

1. As an output of the FGD session, an initial list of principles, strategies, assigned implementing agencies, and timetable was drafted. These are preliminary recommendations that need to be processed with inputs from other concerned groups and entities.

Table 8. Development Framework Plan for Inland Lakeshore Area

Principles	Strategies	Implementing Agency	Timetable
Secure the area	Co manage/ secure the area Inventory/ tagging/ID Incentives/ regulate	POSO supervises. Barangay handles day to day operations e.g lakeshore patrol.	Immediate
Stop / no reclamation	City and Barangay ordinance/ resolution	Barangay	Next two months
Preserve natural waterways	Inventory waterways system. Secure waterways Drainage plan	City Engineering Office Barangay LLDA engineers/technical team	Next 4 months
Initiate the dev of a land use plan and circulation system	-Alternative plans based on geotech studies, etc. -Select an option -Planning workshop in the barangays -Budget allocation (common	City Government With inputs from Barangay	Next 4 months

Principles	Strategies	Implementing Agency	Timetable
	facilities like roads to be funded by several barangays)		
Engage communities – increase public awareness	-Consultation - Information dissemination -Task people's organizations, etc	City Government With inputs from Barangay	Continuing
Promote economically vibrant community	-Conduct market study -Pilot test -Determine infrastructure with possible PPP	City Government With inputs from Barangay	In 12 months
Coordinate efforts among partners	-Planning -Financing -Implementation - Monitoring	National agencies like LLDA, DPWH, Private sector like Manila Water Company Inc., etc City Govt offices Barangays	Continuing
Resettle families within the city, as necessary	Identify suitable site, partners, etc	City Government and partners	In 12 months
Promote sustainability	Develop best option for financing the various infrastructures and facilities	City Govt, partners	Next 12 months and continuing

2. In the physical planning for the site, one approach is to designate the southern half portion of Inland Lakeshore for mixed uses mainly because it is already relatively built-up. The northern half portion of the Lakeshore area can be assigned for Low Impact Green Use as it is still relatively vacant and the environmental character of the site could be preserved.

   An initial list of potential components that can be considered for further study and validation are as follows:

   Mixed Use

   - Model green market
   - Small scale weekend markets
   - Water recreation
   - Low cost wastewater treatment facilities

   Low Impact Green Uses

   - Constructed wetlands (**Figure 25**).
   - Water recreation

   Parks and pathways, interspersed with public art, could serve as the integrative link of these two major uses. **Figures 26** and **27** are suggested first images for inspiration in the upcoming planning and design activities of the TWG for the Inland Lakeshore.

Figure 1:
Novelty Site Location Map and Site Photos

Figure 2:
Novelty Site Development Plan

Table 1. Novelty Detailed Land Use Area Allocation

Major Components	Area (sqm)	%
Housing Structures	4,136.40	30
Mixed Use Area	1,378.80	10
Landscaped Areas*	4,660.34	34
Roads /Parking	3,278.41	24
Tricycle Terminal	313.80	2
TOTAL	13,788.00	100

**Pathwalks, Courtyards, Plazas, Landscaped Easements*

Figure 3:
Multi-level or Terracing Design Feature

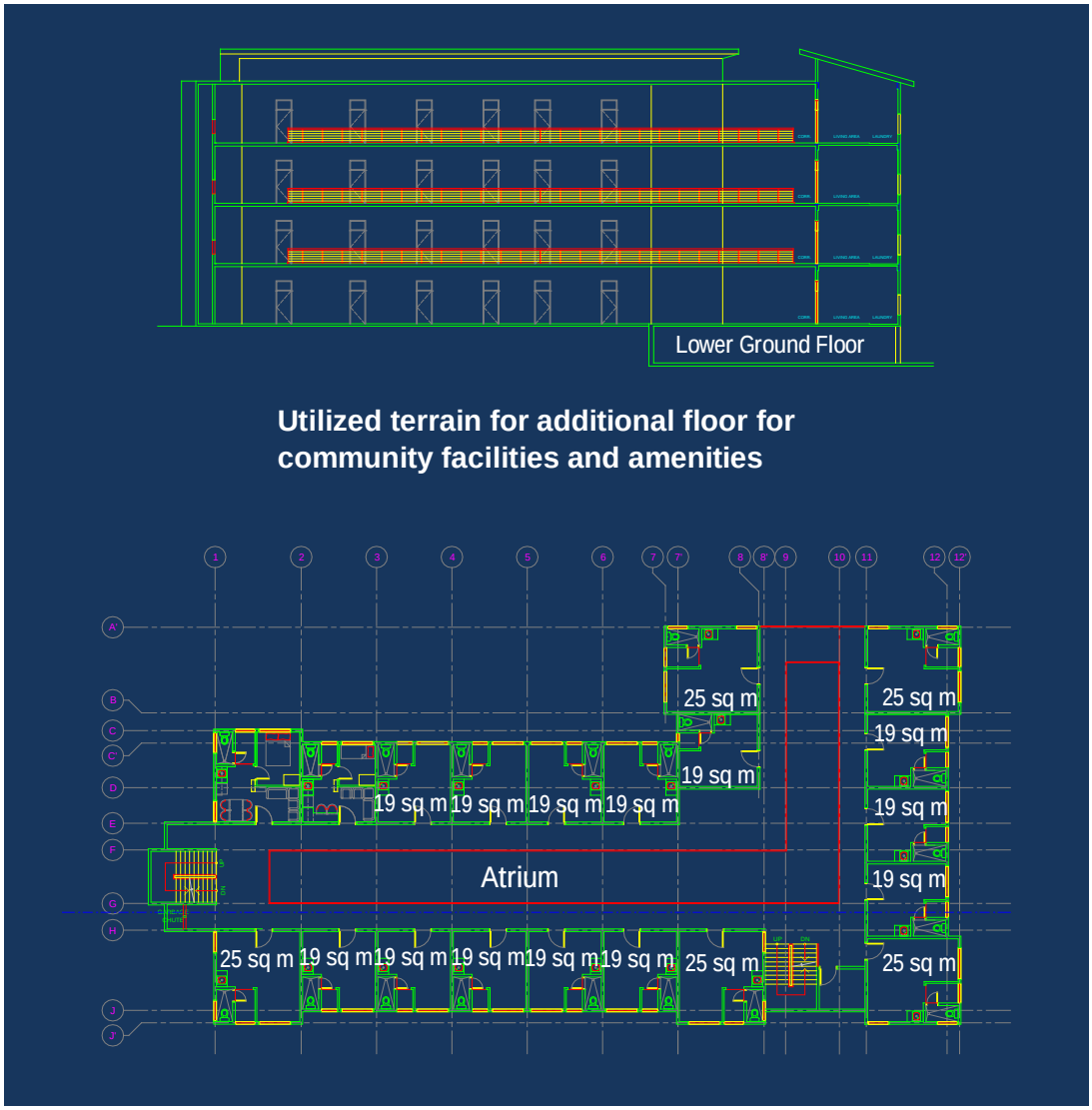
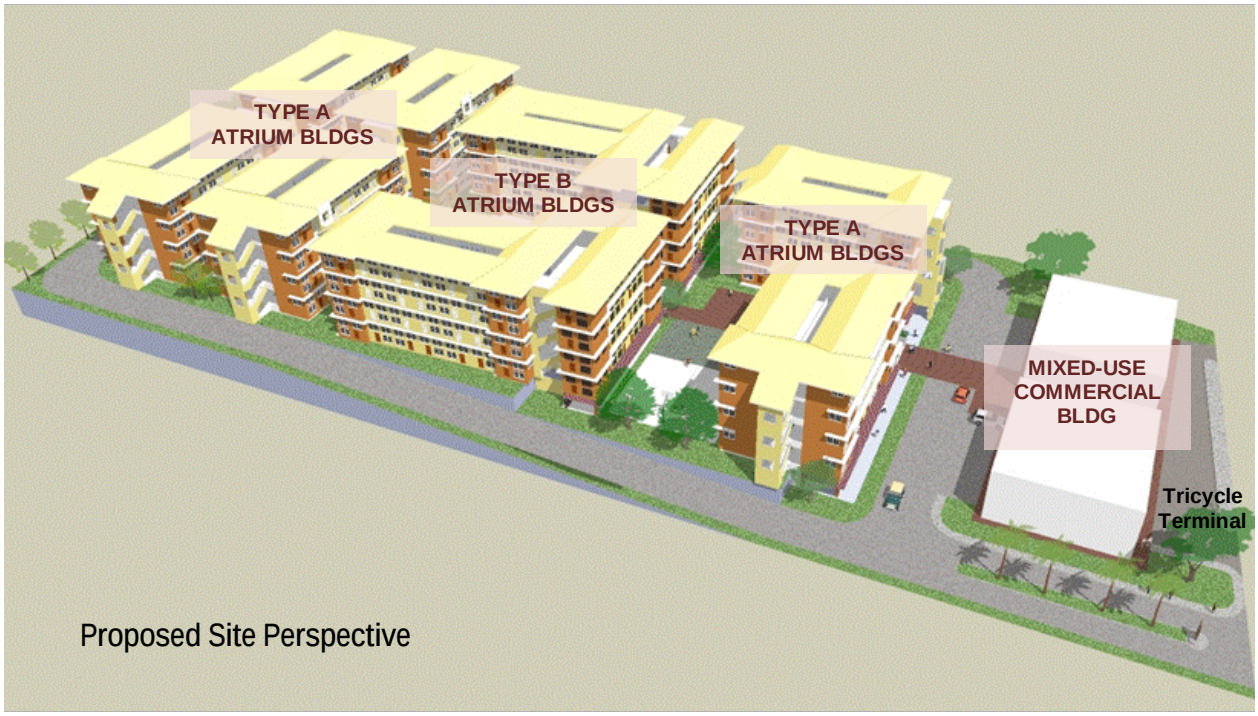


Figure 4: Novelty Site Perspective
Proposed Site Perspective



Existing Site

Figure 5:
Novelty Site - Typical Medium Rise Building with Atrium

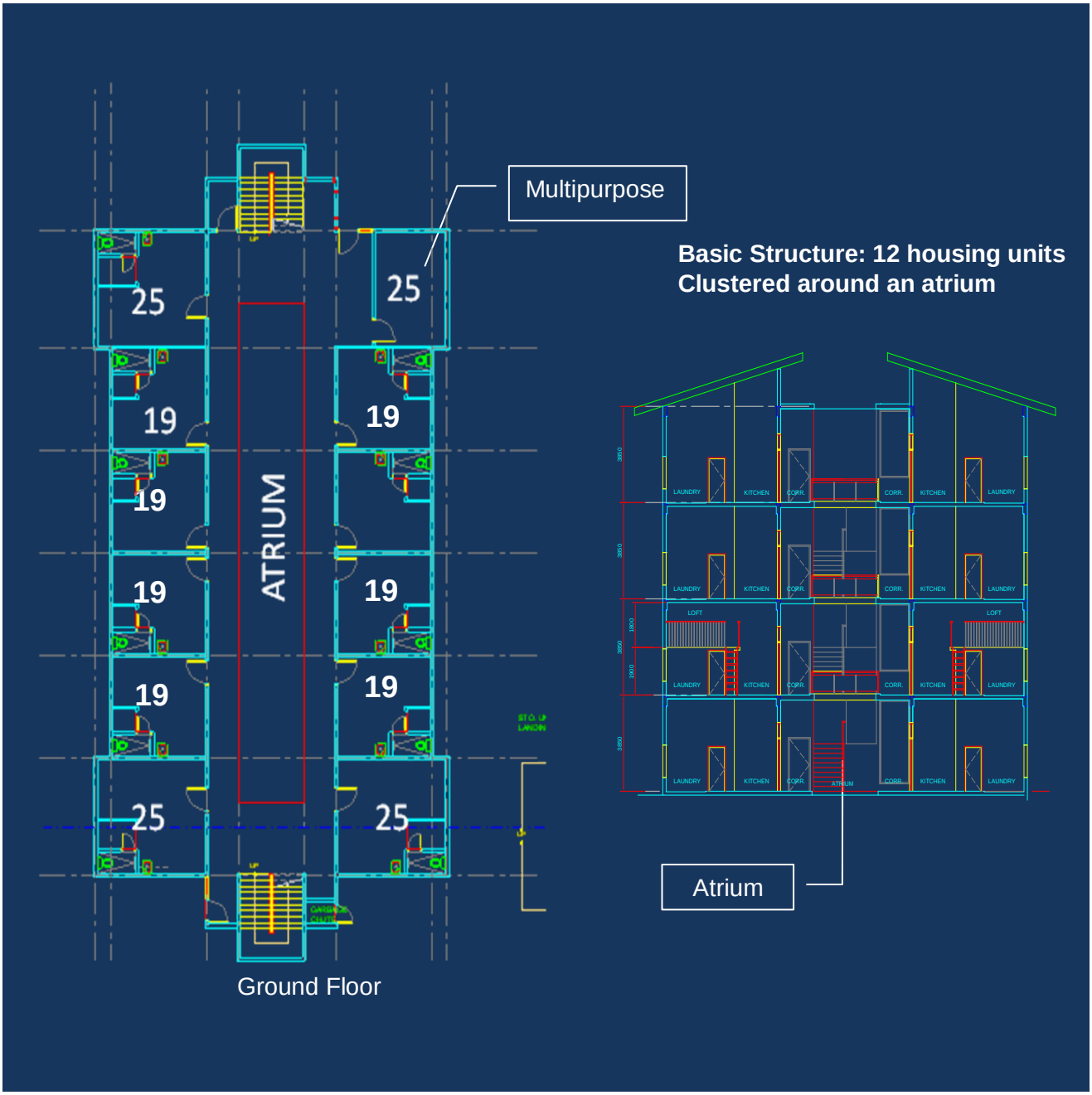
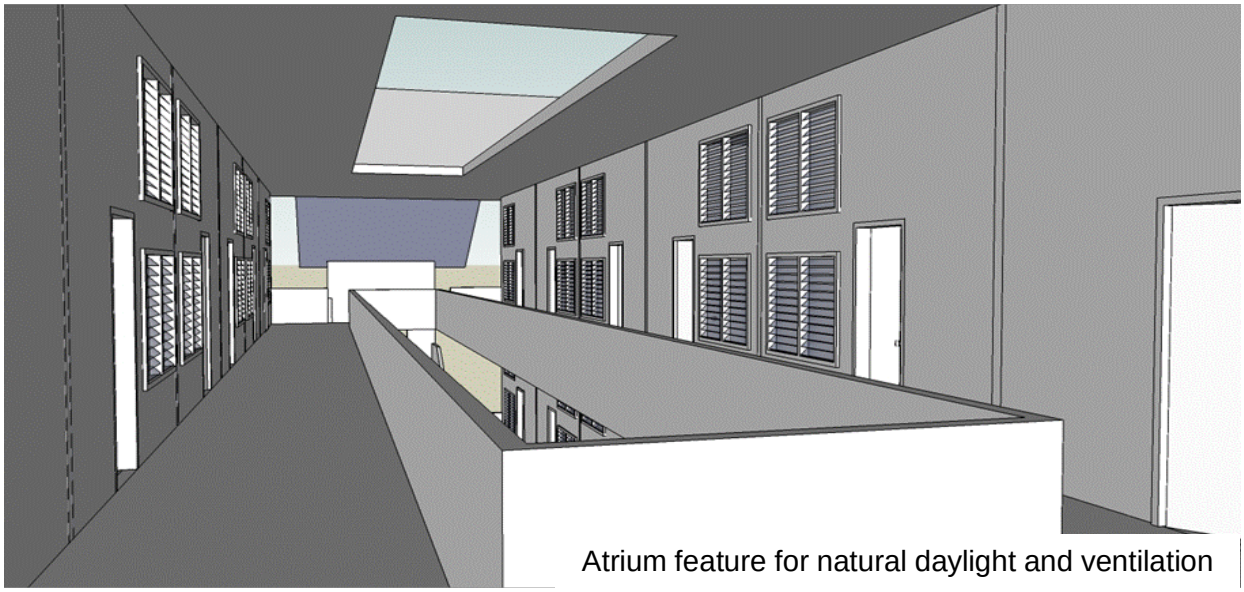


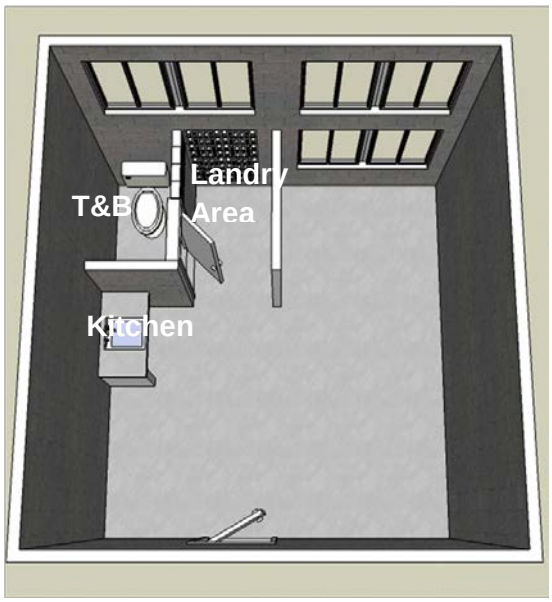
Figure 6:
Novelty Site – Atrium Design Features

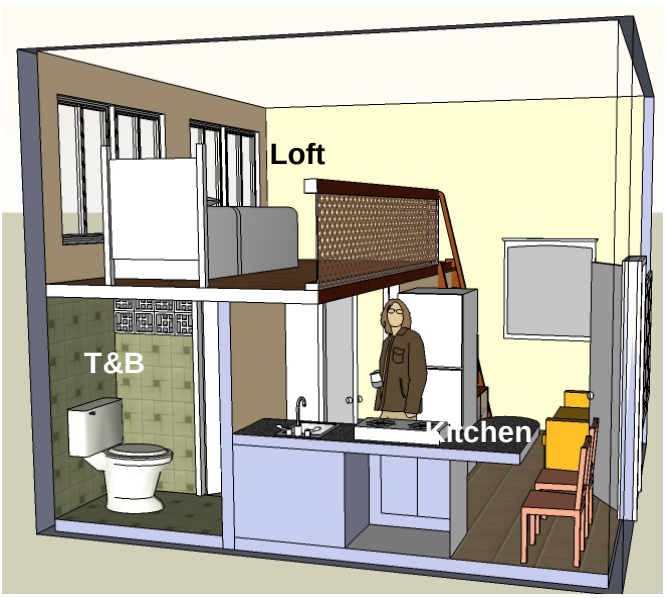


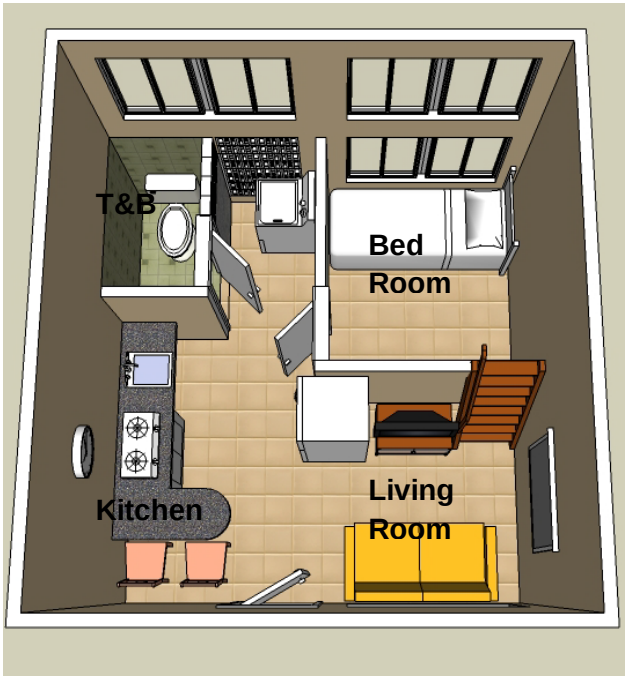
Atrium feature for natural daylight and ventilation

Figure 7:
Novelty Site - Overhangs as Building Design Features

Figure 8:
Novelty Site Housing Unit Design
Typical 19 square-meter Unit (loftable to 25 square meters)







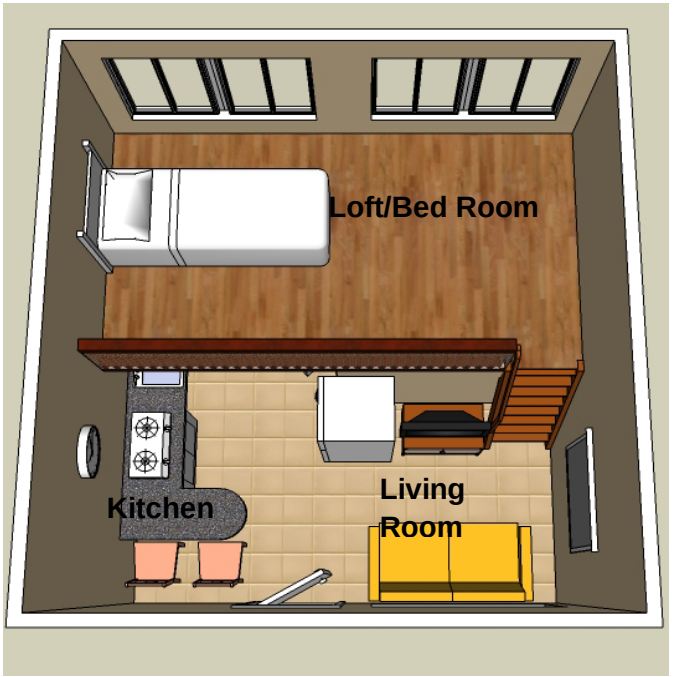
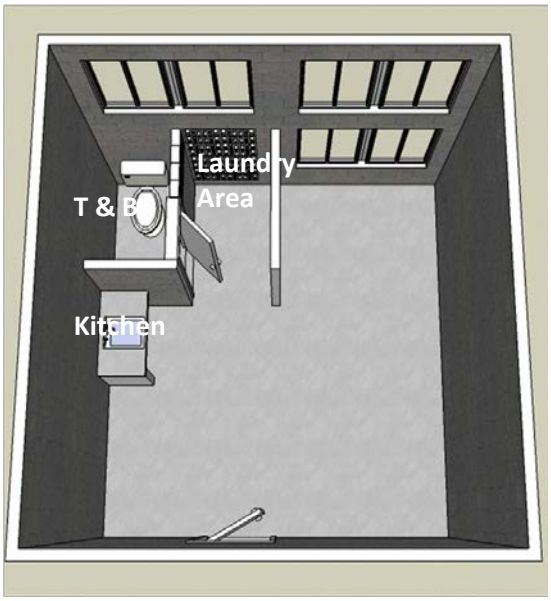
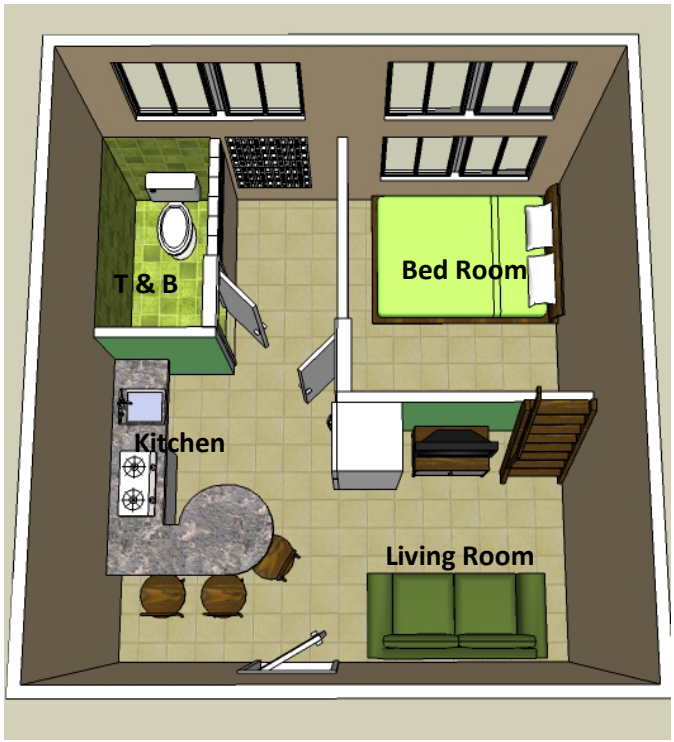


Figure 9:
Novelty Site Housing Unit Designs
Typical 25 square-meter Unit (loftable to 32 square meters)





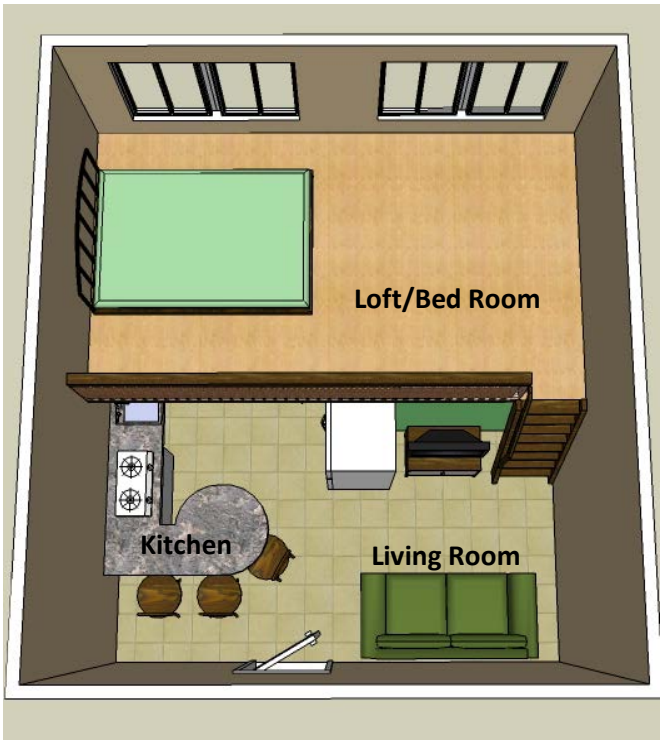


Figure 10:
Dumlao Site Location Map and Site Photos

Figure 11:
Dumlao Site Plan

Figure 12:
Dumlao Detailed Site Plan

Table 2. Land Use Allocation in Dumlao Site

Major Components	Area (sqm)	%
Housing Structures	3,119.24	27
Mixed Use Parcel	381.60	4
Open Spaces	4,621.08	40
Roads	3,350.33	29
TOTAL	11, 552.77	100

Figure 13:
Dumlao Aerial Perspective

Aerial Perspective

Figure 14:
Dumlao Typical MRB Design

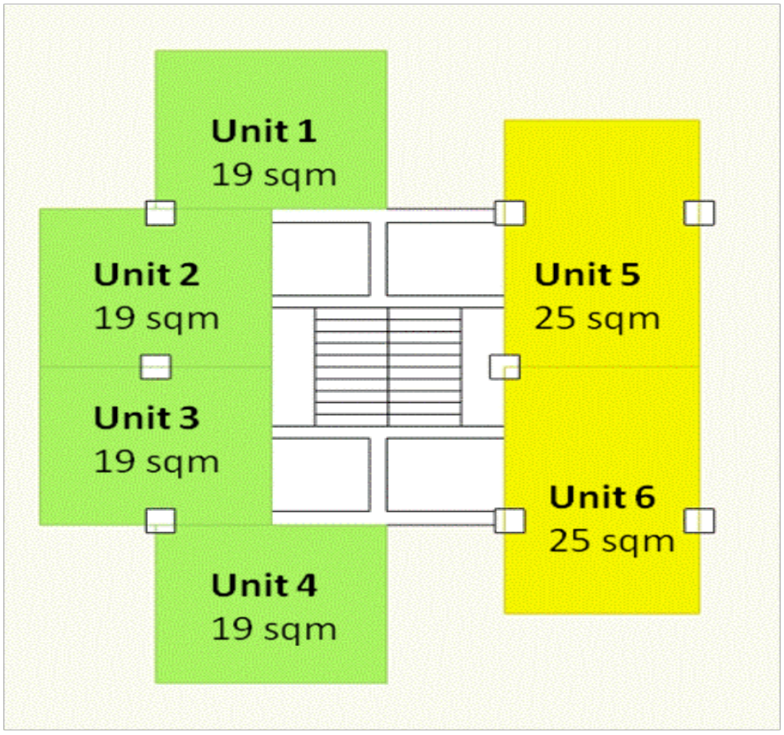


Figure 15:
Dumlao Housing Unit Design

View of the development from the loop road

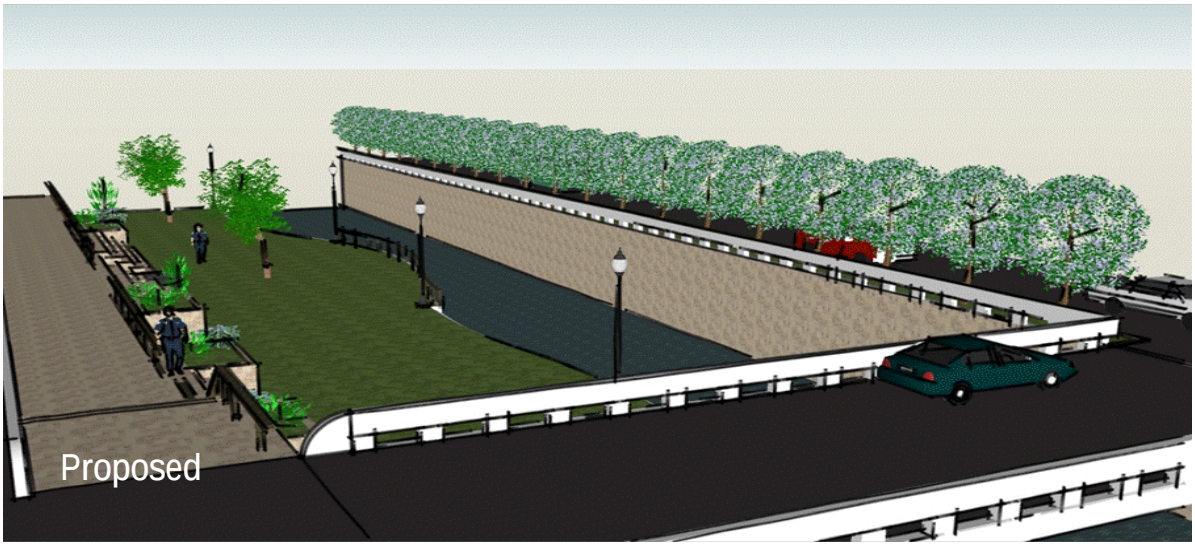
MRB Shophouses fronting the development

Figure 16:
Novelty Site Potential Green Technologies

Figure 17:
Mauling Creek Site
Location Map and Site Photos

Figure 18:
Park and Green Concept Plan for Mauling Creek

Figure 19:
Mauling Creek Site
View from the Bridge of Proposed Development of Mauling Creek



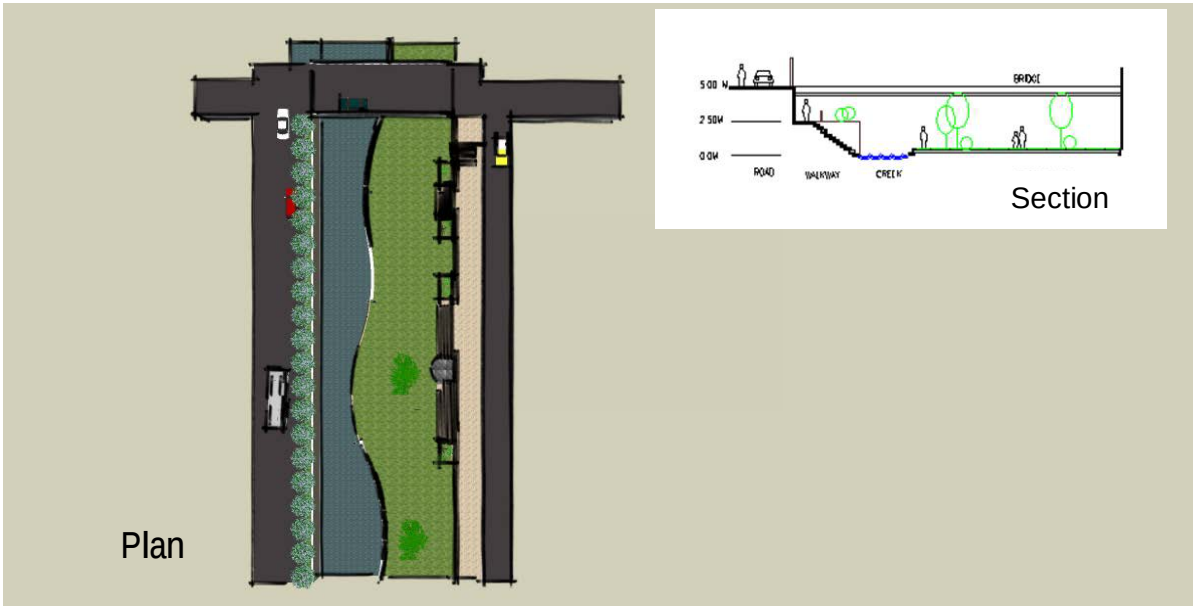
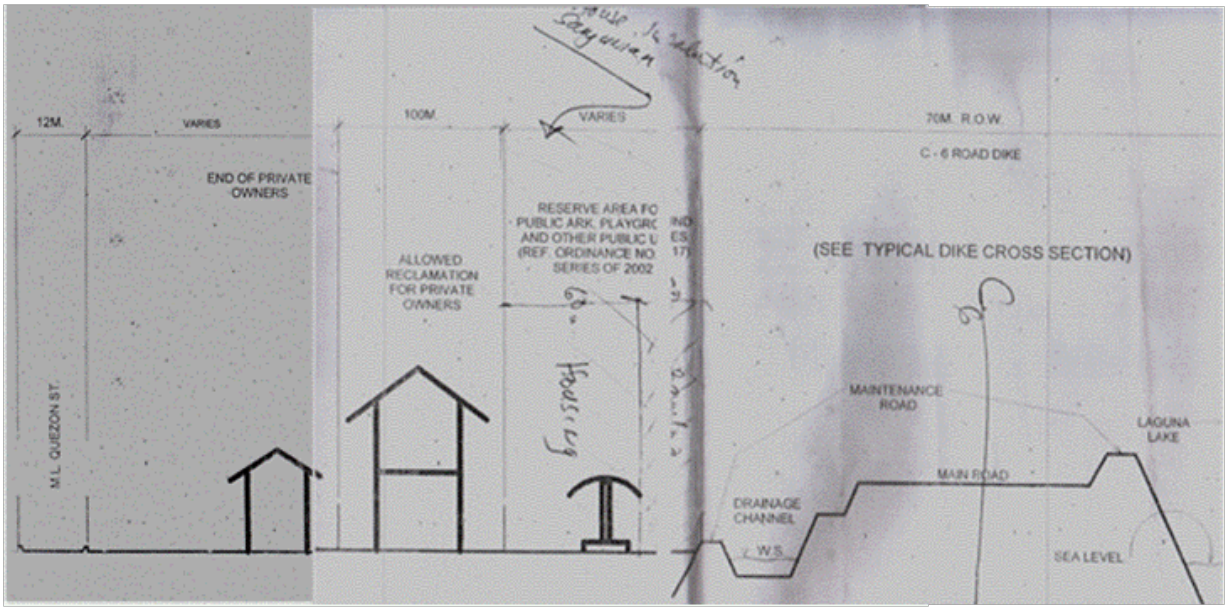


Figure 20:
Inland Lakeshore Site Photos

Figure 21:
Cross Section of Inland Lakeshore



Source: Local Housing Office, Taguig

Figure 22-A:

Inland Lakeshore
Concept Plan – Mixed Use Development (for first four-kilometer stretch) and Constructed Wetlands (for the remaining four kilometers)

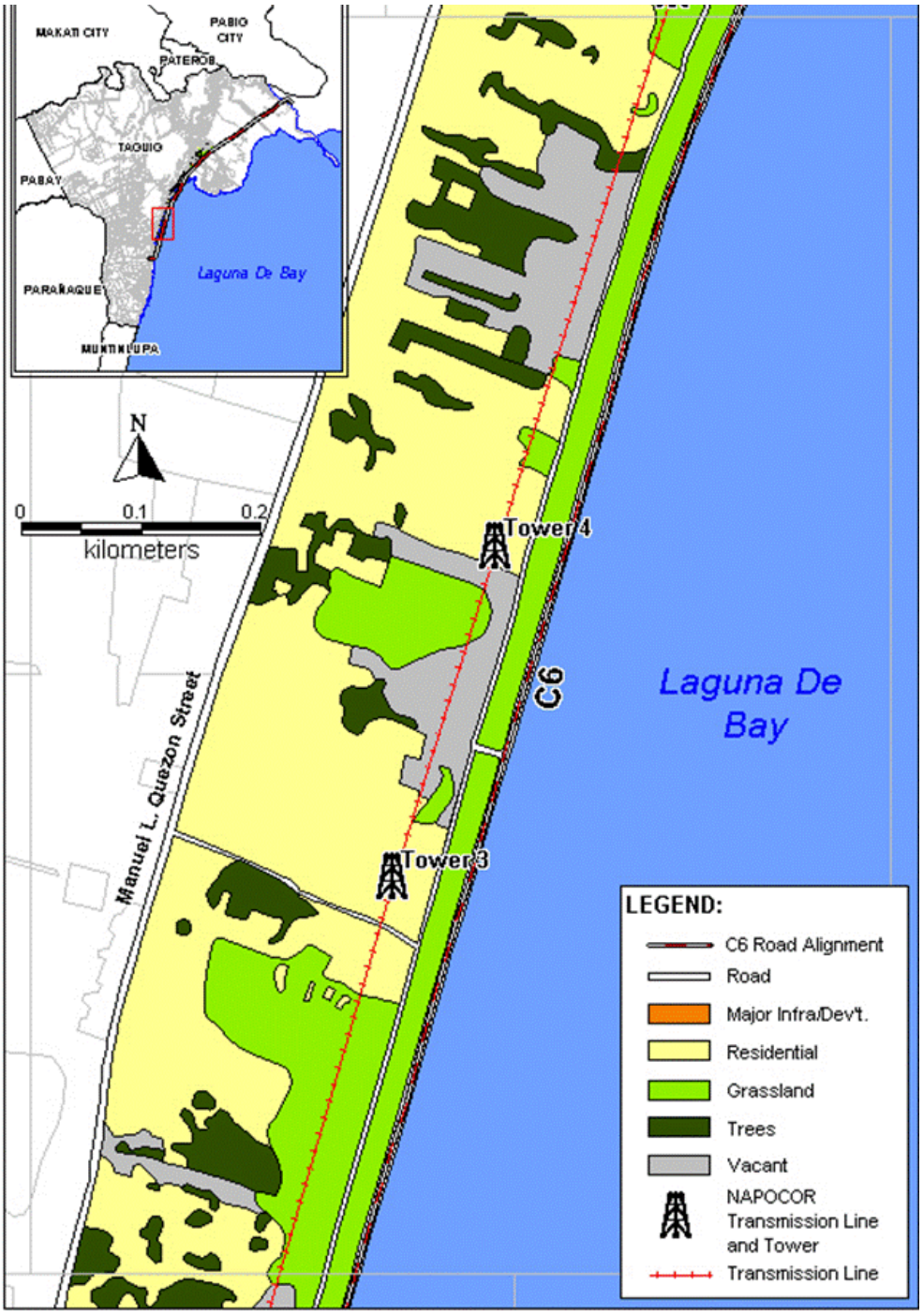


Figure 22-B:
Inland Lakeshore
Concept Plan – Mixed Use Development

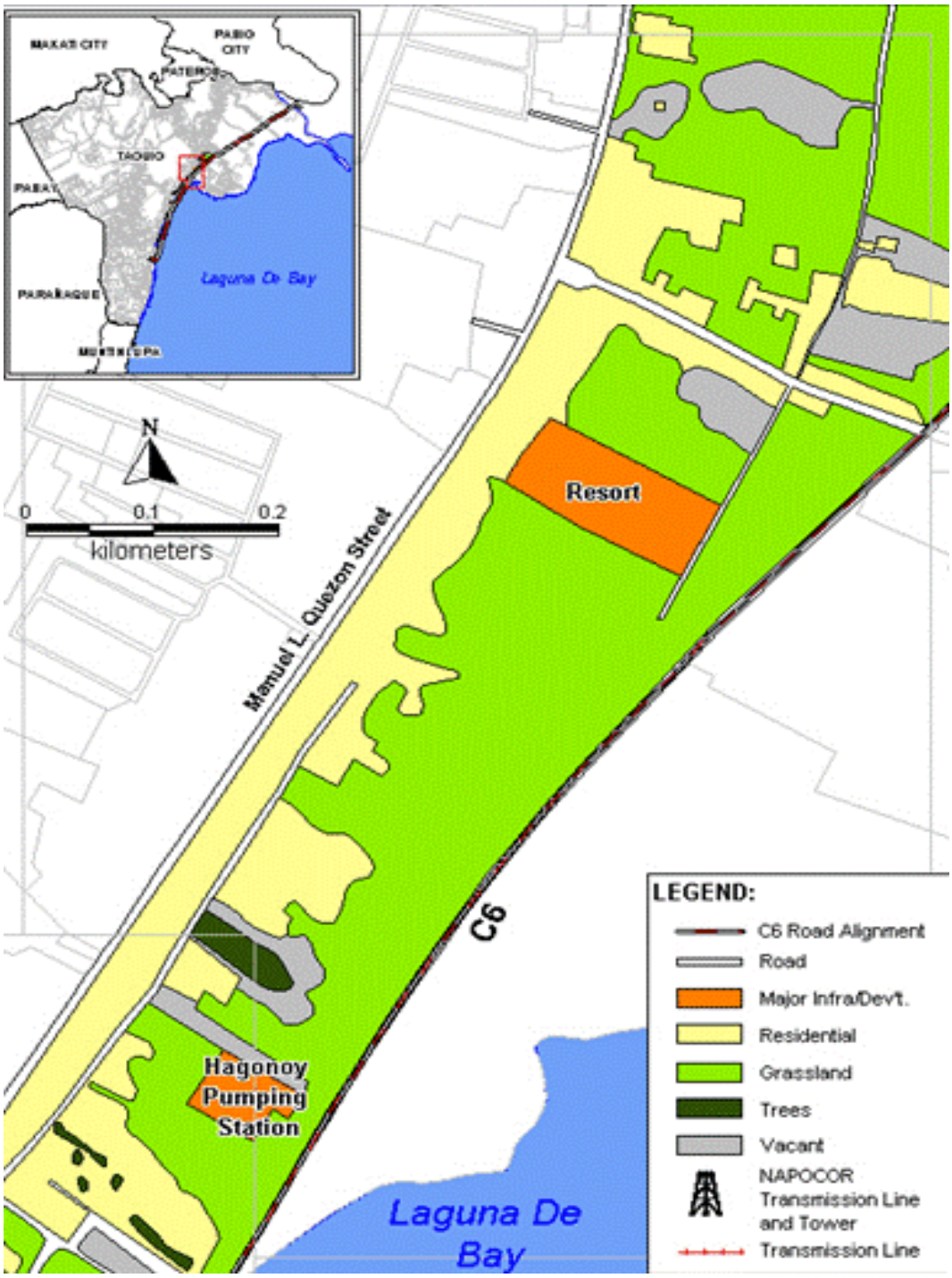


Figure 22-C:
Inland Lakeshore
Concept Plan – Mixed Use Development

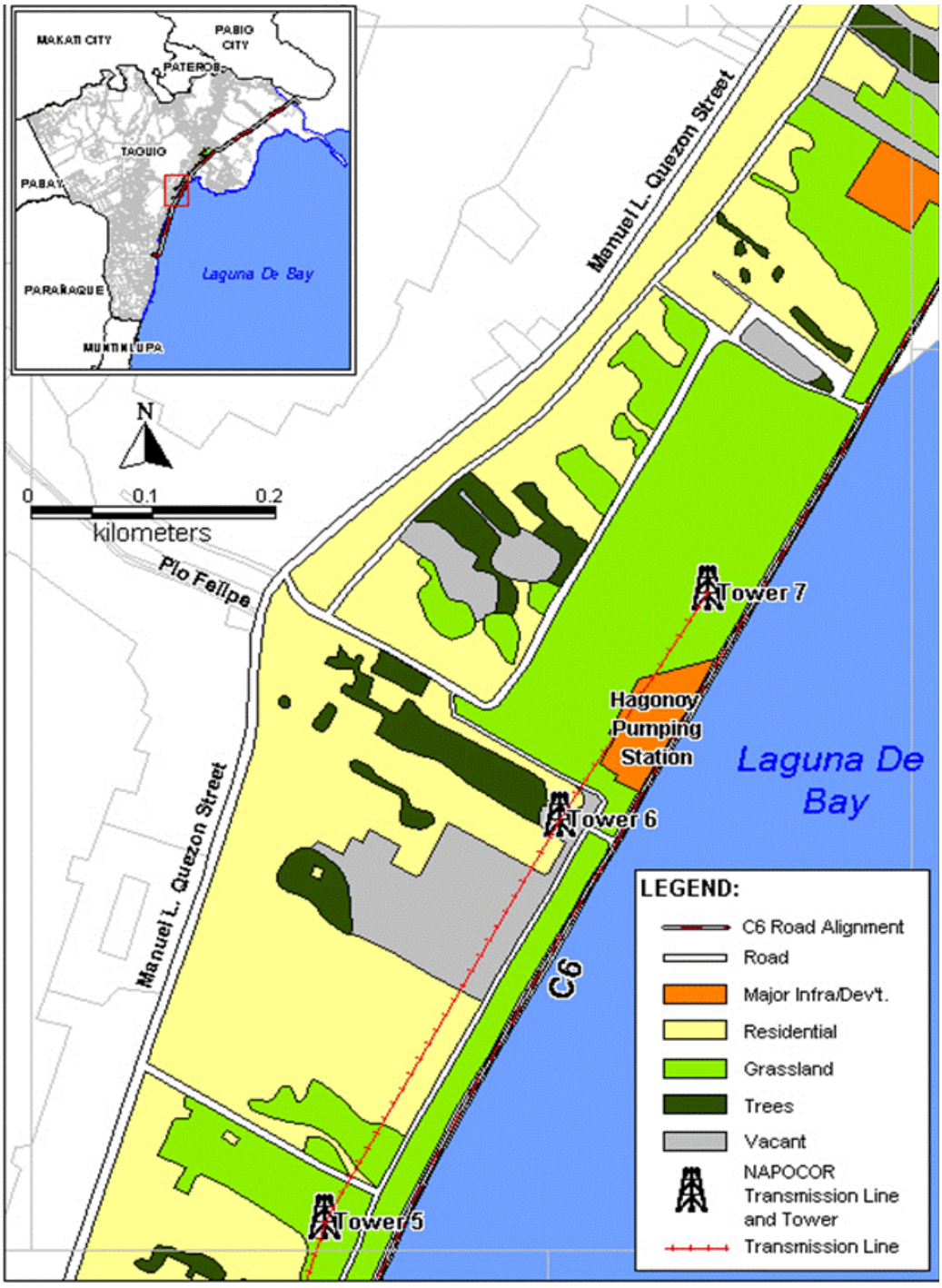


Figure 22-D:
Inland Lakeshore
Concept Plan – Constructed Wetlands

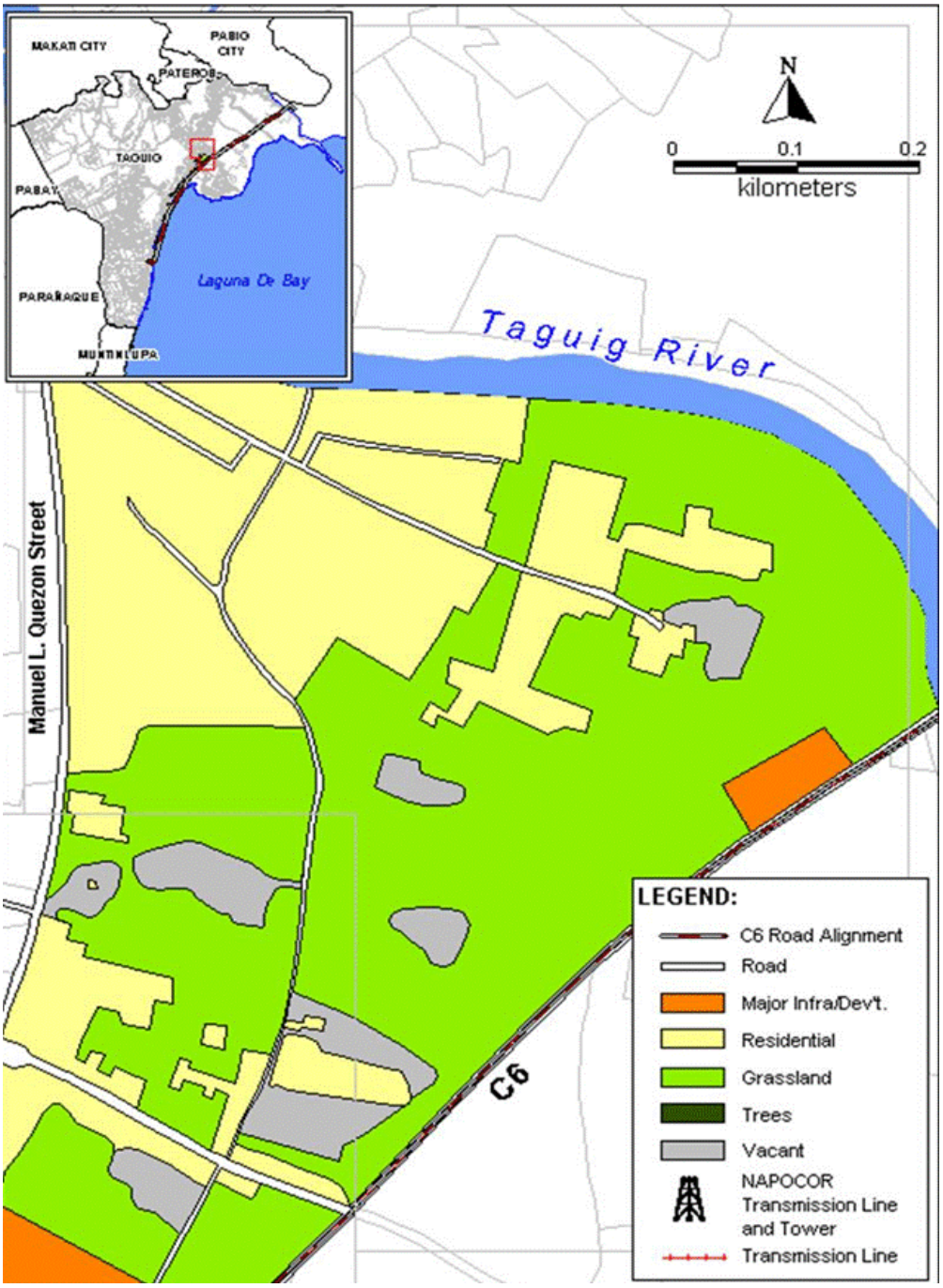


Figure 23:
Existing Land Use Plan (South)

Table 6. Land Use Allocation for Inland Lakeshore (South side)

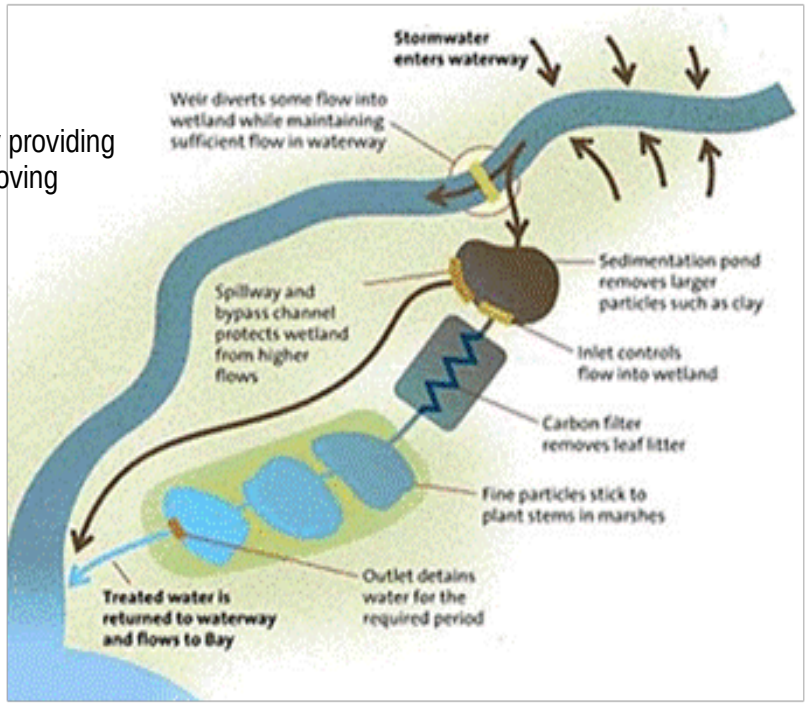
Land Use	Area (hectares)	%
Residential	50.33	39
Major Infrastructure	2.84	2
Grassland	48.19	38
Trees	6.06	5
Vacant	10.63	8
Road	10.07	8
Total Area	128.12	100

Length covered is equal to 4.48 kms

Figure 24:
Inland Lakeshore
Concept Plan –Constructed Wetlands

Constructed Wetlands
Potential Use for Inland Lakeshore (North Side)

Constructed Wetland
Offers a unique ecological function by providing a low cost and natural method of removing pollutants from storm water.



Inspiration: Lynbrooke Estate, Melbourne, Australia

Figure 25:
Inland Lakeshore
Mixed Use Area (South)

Park system as setting for Potential Mixed Uses

DESIGN INSPIRATION
Source: Los Angeles River Revitalization Master Plan (*www.lariverrmp.org)*

Figure 26:

Inland Lakeshore
Low Impact Green Areas (North)

Park system as setting for Low Impact Green Uses

DESIGN INSPIRATION
The Tanghe River Park in Qinhuangdao, China features a new installation of a red steel bench that runs for half a kilometer through the park
Source: *www.asla.org/sustainablelandscapes/redribbon*