UNIVERSITY OF SAN CARLOS
Talamban Campus, Nasipit Road, Cebu City, Cebu

Department of Civil Engineering

Metro Cebu River Scan Challenge 2025: Community Architecture and Landscape Development Concepts

---

Submitted by:
Group 5 - Water You Doing

Date of Submission:
April 30, 2025

Community Architecture and Landscape Development Concepts

1. Identifying Action Areas:
    - Based on the interview and Socio-Economic

Issue Identified	Details/Findings
Waste Disposal In the River	• Need for Increased frequency of river cleanups. • Lack of proper waste disposal regulations
Source of Trash	• River flow from the upstream barangay to barangay • Industrial waste disposal malpractice
Flood Mitigation Efforts	• Riprap wall implemented • The project was delayed due to funding and the working period
Residential Waste Collection	• Schedules are consistent • Does not address the accumulated waste in the immediate surroundings

- Site Analysis

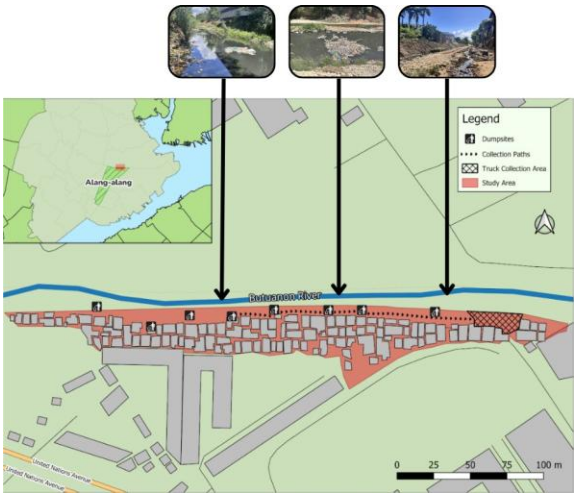

Figure 1. Barangay Alang-Alang

The site map shows the stretch of the Butuanon River adjacent to the Alang-Alang area, highlighting the key areas of concern related to the waste management and accessibility to the river. The photo identifies the actual conditions along the river where the Barangay Alang-Alang

is located and illustrates the different dump sites and levels of pollution. The symbols indicate the dumpsites and dashed lines mark waste collection paths throughout the study area and a crosshatched section designates truck collection from the area, which appears limited to the eastern edge of the community. The study area is highlighted in red, emphasizing a dense residential zone with direct exposure to the river with The lack of multiple tracks in the area to collect the garbage and the linear pattern of waste disposal suggest that strategic challenge in managing waste throughout the entire community. These findings need support for a more efficient and broader waste collection and treatment system integrated into the design proposal.

2. Site Development Plan

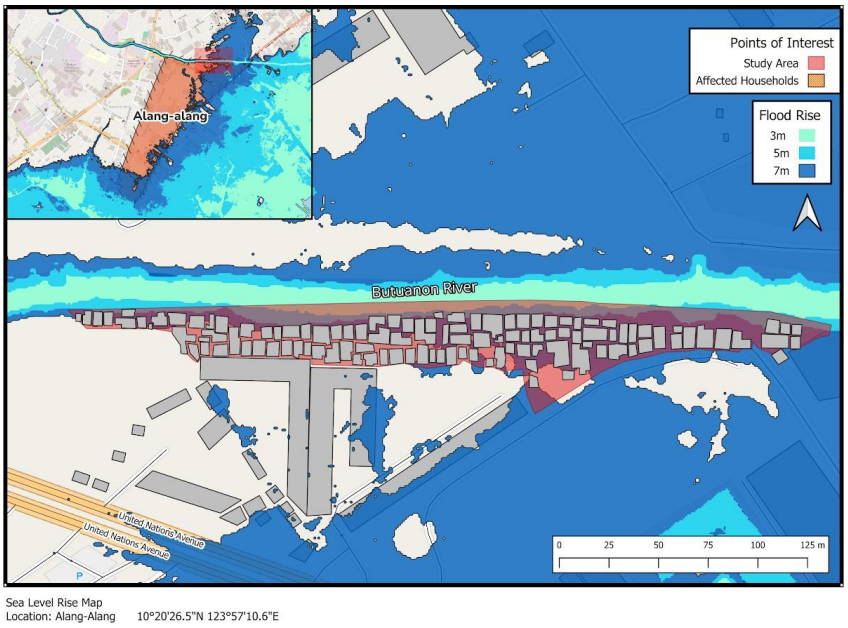

Figure 2. Site Plan

The site development plan for Barangay Alang-Alang, situated along the Butuanon River in Mandaue City, addresses pressing environmental and socio-economic concerns identified through community interviews and site analysis. The area faces recurring issues with improper waste disposal, much of which originates from upstream barangays and industrial sources rather than the local residents. The river serves as a conduit for accumulated trash, worsened

by inadequate enforcement of waste regulations and limited waste collection coverage, particularly beyond the eastern edge of the community. Although riprap flood mitigation structures have been implemented, project delays due to funding constraints have reduced their impact. The existing waste collection schedule is consistent but insufficient in addressing the buildup of trash along immediate surroundings, contributing to the river's pollution. The study map highlights a densely populated residential area highly exposed to the river, with minimal infrastructure for waste management and limited access routes for collection trucks. To address these challenges, the development plan proposes expanding and enhancing the solid waste collection system with new access paths and strategically placed waste transfer points. It also recommends reinforcing and extending flood control measures, enforcing stricter industrial waste regulations, and integrating community-led river cleanup efforts.

3. Concepts, Sketches, Visualizations

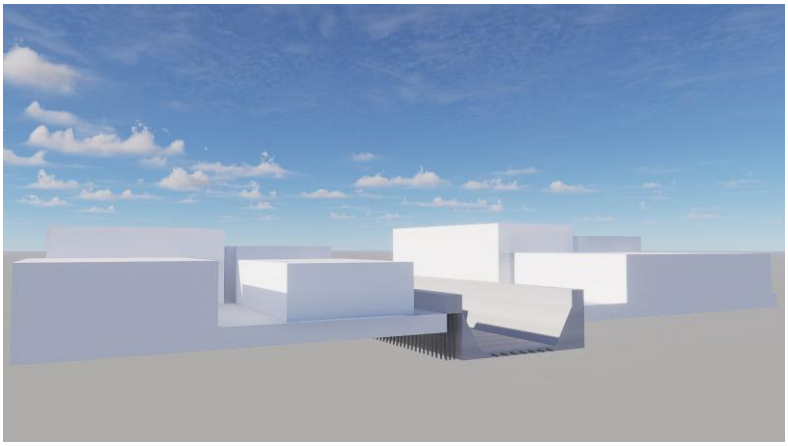

Figure 3. Concept

To support flood mitigation and waste management efforts in Barangay Alang-Alang, the proposed design introduces a reinforced concrete river channel structure aimed at controlling water flow, improving waste capture, and enhancing access to the Butuanon River for maintenance and emergency purposes. This infrastructure integrates functional and structural elements tailored to the specific site conditions and spatial constraints of the area.

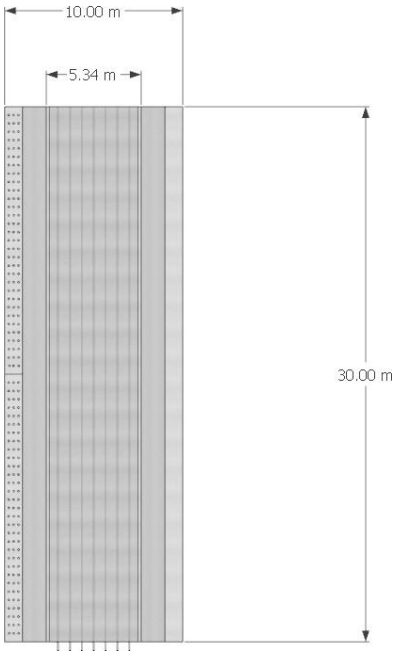

Figure 4. Top View

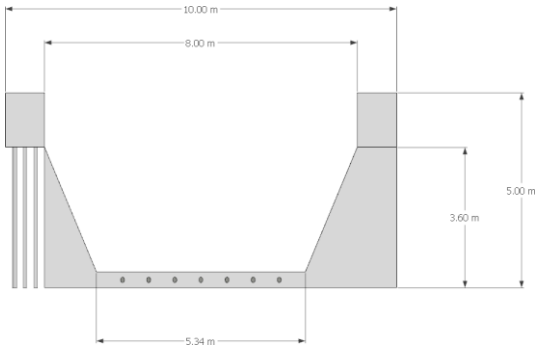

Figure 5. Front View

Design Description

- Bottom Channel Width: 5.34 meters – This dimension accommodates water flow during regular and peak flood events.
- Top Opening Width: 10.00 meters – Allows greater volume handling and debris passage.
- Channel Depth: 5.00 meters (3.60 meters main channel + 1.40 meters for foundation and support)

Design Intent and Functionality

- Flood Mitigation: By controlling flow velocity and volume, the structure reduces overflow risk into nearby residential areas.
- Waste Capture and Management: The integrated filtration system allows for debris collection, minimizing pollution from upstream and local waste.
- Urban Integration: Designed for compatibility with surrounding structures, ensuring accessibility and long-term maintenance efficiency.