CHAPTER 5. CONCLUSION AND SUGGESTION

This section serves as the closing of the research by consolidating the core findings established in the previous chapters. It details the final conclusions regarding the formulation of the safe work method statement, which was developed strictly using preliminary project documentation. Additionally, it offers actionable suggestions intended for both industry practitioners and future academics seeking to expand upon this proposed framework.

5.1. CONCLUSION

1. The study divided the foundation construction process into 12 work packages, including land clearing, excavation, steel reinforcement, and mass concreting, using a Work Breakdown Structure (WBS) and Work Method Statement (WMS). Applying this structure through the Multi Hazard Identification (MHI) process, the study identified and mapped a total of 127 site incidents and hazards, making a traceable risk baseline for complex foundation construction works.
2. The study combined analytical models with operational safety protocols to form the framework's core principles and components. For the analytical principle, the study used a Monte Carlo simulation to calculate hazard probabilities instead of relying on subjective estimation. For the operational components, the study developed the Integrated Determining Control (IDC) system, sorting measures into Human, Engineering, and Management controls. The framework also embeds procedural components into the SWMS, including strict compliance with the Hierarchy of Controls, a live re-assessment loop, stop-work authority, and a Plan-Do-Check-Act (PDCA) close-out cycle, all aligned with Indonesian standards and international standars (PP 50/2012, Permen PUPR 10/2021, SNI 8460:2017, ISO 31000).
3. By synthesizing the comprehensive hazard baselines, the Monte Carlo risk calculations, and the Integrated Determining Control (IDC) protocols, this study developed an integrated risk-based Safe Work Method Statement (SWMS) framework for pile raft foundation construction. The framework integrates these elements into a decision-based flowchart, which features strict go/no-go operational gates and a severity escalation mechanism to guide site execution. To ensure its practical field applicability, the proposed framework was rigorously validated by seven experts, achieving an overall mean score of 2.63 on a 3-point scale. This result

firmly places all components within the "valid without revision" category, demonstrating that the framework provides a self-improving, joined-up safe-work flow that forces construction teams to prove task safety prior to execution and ensures that fatal-level severity risks are never overshadowed by low probability scores.

5.2. SUGGESTION

Drawing on the findings set out above, the following recommendations are offered to refine the framework and to guide its further development and application.

1. Strengthen the expert validation.

   Future studies should combine the Google Form with in-person discussion or focus-group sessions and a larger, more diverse panel, so that low scores can be probed, recommendations elaborated, and the validation given greater statistical weight.
2. Complete the supporting documentation.

   The Expert Profile table and a finer rating scale would improve the transparency and traceability of the validation process.
3. Broaden the framework's coverage.

   The model could be developed further for other trades and structure types, each accompanied by fresh hazard identification and revalidation, so its use can be widened with confidence.
4. Open avenues for further research.

   Building on the validated expert judgment, subsequent research could complement the practitioners' estimates with empirical evidence published accident statistics or project incident records and extend the Monte Carlo simulation across all incidents, further reinforcing the risk values rather than replacing the experience-based basis already established.
5. Confirm the values in pre-construction planning.

   Where the framework is applied, its likelihood values, controls and decision gates can be reviewed together with the owner, contractor and supervising consultant as a practical final check.