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**CE463 - M7**

# Identifying Research Problems in Civil Engineering

## 1. Identifying and resolving obstruction and low-pressure issues affecting fire hydrant functionality in densely populated areas of Sambag 2, Cebu City.

**RESEARCH PROBLEM:** The prevalence of closely packed residential houses in Sambag 2, Cebu City, and frequent fire incidents in the area emphasize key difficulties related to the efficacy and functionality of fire hydrants. The main issue includes obstructed access and deficient water pressure, which impair the efficiency of firefighting efforts. This research seeks to investigate the causes of fire hydrant blockages and low water pressure in the area and to formulate practical solutions to improve hydrant performance and reliability.

The study aims to address the following key questions:

1. What are the primary factors contributing to the obstruction of fire hydrants in Sambag 2?
2. How does low water pressure affect the efficacy of fire hydrants during emergencies?
3. What are the current constraints in the maintenance and management of fire hydrants in this area?
4. What practical and sustainable measures can be implemented to enhance the functionality of fire hydrants and ensure firefighting capabilities?

It aims to improve fire safety by addressing issues with fire hydrants in densely populated areas. By examining obstructed access and low water pressure, the study seeks to enhance firefighting efficiency and reliability, leading to better emergency response and increased community safety.

2. **The lack of a designated napping space forces students to nap in the library and study areas, causing discomfort and reducing space availability for others.**

**RESEARCH PROBLEM:** A fair number of students at Cebu Institute of Technology - University are observed taking naps in the library and study areas, often in uncomfortable conditions due to the lack of a designated napping area. This raises concerns regarding the satisfaction of the students when trying to rest between classes. The primary concern involves the absence of a comfortable space for resting, which forces students to sleep in awkward positions, likely affecting their well-being and academic performance.

The study aims to address the following key questions:

1. How does the lack of a designated nap time area affect the comfort and satisfaction of students?
2. What are the current napping habits and needs of students at Cebu Institute of Technology?
3. How would a dedicated nap area improve the overall student experience and well-being?
4. What are the design and construction considerations for creating an effective nap space on campus?

In the context of civil engineering, this problem is important because it involves the thoughtful design and utilization of campus spaces to enhance student efficiency. Creating a dedicated nap area requires careful planning to ensure that it meets safety, comfort, and accessibility standards, contributing to a more supportive and productive learning environment.

3. **Lack of a designated jeepney stop and sidewalk at Cebu Institute of Technology - University's back gate on Tres de Abril Street causing severe traffic congestion.**

**RESEARCH PROBLEM:** The back gate of Cebu Institute of Technology - University, located at Tres de Abril Street, faces significant congestion issues due to the lack of a dedicated bus stop station. The absence of a sidewalk forces students to wait for jeepneys on the road, causing traffic jams as jeepneys stop in the roadway to pick up passengers. The situation is further exacerbated by the absence of traffic enforcers and the occupation of the existing sidewalks by vendors, making the area congested and unsafe. This research seeks to explore the feasibility and design of a dedicated jeepney stop station that would reduce these issues.

The study will address the following key questions:

1. How does the lack of a designated sidewalk and jeepney stop contribute to traffic congestion and safety concerns?
2. What are the current pedestrian and vehicular traffic patterns at the back gate of Cebu Institute of Technology - University?
3. How would the introduction of a jeepney stop station improve traffic flow and safety for both students and drivers?
4. What are the design and regulatory considerations for creating an effective and safe jeepney stop station in this area?

In the context of civil engineering, this problem is significant because it involves the design and planning of urban infrastructure to improve traffic flow, safety, and accessibility. Developing a well-designed jeepney stop station requires careful consideration of pedestrian and vehicular interactions, as well as the integration of safety measures to ensure a smoother and safer transportation experience for students and locals.

## 4. Addressing safety concerns for female civil engineers on construction sites ensures that equal opportunities and their professional development are not compromised.

**RESEARCH PROBLEM:** The presence of civil engineering students and professionals in the field often sparks concerns related to safety, specifically on construction sites. These concerns, though well-meant, can inadvertently lead to disparate treatment or restraints in opportunities for female engineers, potentially affecting their professional growth and experience. This research seeks to investigate the underlying factors contributing to safety concerns for female civil engineers and to explore how these concerns can be resolved without compromising equality in the workplace.

The study will address the following key questions:

1. What specific safety concerns are commonly raised regarding female civil engineers, especially in the context of construction sites?
2. How do these concerns affect the participation and professional development of female engineers in the field?
3. What measures can be implemented to ensure safety while promoting equal opportunities and inclusion for female engineers?
4. How can the industry address safety concerns in a way that does not inadvertently discriminate or limit the roles of female civil engineers?

In the context of civil engineering, this problem is significant because it touches on both the safety and inclusivity of the workforce. Ensuring that safety measures are appropriately balanced with the need for equal opportunities is crucial for fostering a diverse and resilient engineering profession. Addressing these concerns can lead to a more inclusive environment where all engineers, regardless of gender, can contribute fully to the field.

## 5. Feasibility and Impact of Solar Panel Installation at Cebu Institute of Technology - University to Reduce Energy Costs and Stabilize Tuition Fees.

**RESEARCH PROBLEM:** The high energy fees of Cebu Institute of Technology - University have remarkably contributed to rising tuition costs, imposing a financial strain on the students. To resolve this issue, the feasibility of installing solar panels as a long-term, cost-efficient solution is being considered. Solar energy holds the potential to reduce the university's dependence on expensive electricity, thereby stabilizing or even lowering tuition fees. This research aims to explore the viability of solar panel installation on campus, focusing on its potential economic and environmental benefits.

The study will address the following key questions:

1. How does the current energy consumption and cost structure impact the university's tuition fees?
2. What are the long-term cost savings and return on investment associated with solar panel installation?
3. How would the installation of solar panels affect the university's overall energy efficiency and sustainability?
4. What is the design, engineering, and maintenance considerations for implementing solar energy infrastructure on campus?

In the context of civil engineering, this problem is significant because it involves the integration of sustainable energy solutions into campus infrastructure. Solar panel installation requires careful planning, design, and engineering to ensure that the system is efficient, reliable, and capable of meeting the university’s energy needs. By addressing these factors, the research aims to provide a blueprint for reducing energy costs and promoting environmental sustainability, ultimately benefiting both the university and its students.