



# Carlos Hilado Memorial State University

Alijis Campus • Binalbagan Campus • Fortune Towne Campus • Talisay (Main) Campus

*A leading GREEN institution of higher learning in the global community by 2030*

*(Good governance, Research-oriented, Extension-driven, Education for Sustainable Development, and Nation-building)*

## College of Engineering

## BS in Civil Engineering

### CHAPTER 13: TRENDS AND ISSUES - CONCERNING CIVIL ENGINEERING PRACTICES

#### Members:

- Macariola, Michael Froyd

#### Technological Trends - THE "DIGITAL TRANSFORMATION"

The industry has shifted from basic CAD to highly integrated digital ecosystems.

- **Building Information Modeling (BIM) & Digital Twins:** By 2025, BIM is no longer just "nice to have"; it is becoming a requirement for large-scale government and private projects. Digital Twins (virtual replicas of physical structures) are being used for real time monitoring of bridges and dams.
- **AI and Machine Learning:** AI-driven project management tools are now used to predict cost overruns and safety risks.

#### Environmental Trends: - RESILIENCE AND SUSTAINABILITY

- **Sustainable Materials:** There is a surge in the use of "Green Concrete" (using *fly ash* or *recycled aggregates*) and "Self-Healing Concrete" to extend the lifespan of structures.
- **Flood Mitigation Focus:** Following the 2024-2025 flood seasons, there is a massive shift toward "*Nature-Based Solutions*", such as permeable pavements and urban

*bioswales*, moving away from purely "gray" (concrete) infrastructure.

#### Ethical and Legal Issues

##### A. The "Ghost Project" and Corruption Scandals

A major issue currently being investigated by the Senate Blue Ribbon Committee (as of late 2025) involves alleged "ghost" flood control projects.

- **Issue:** Allegations that billions of pesos were spent on projects that do not exist or were 40% "kickbacks."
- **Ethical Breach:** Violation of the PICE Code of Ethics regarding "honesty and impartiality" and the duty to hold "paramount the safety and welfare of the public."

##### B. "License Renting"

- **Trend:** *Triple-A* or *Quadruple-A* contractors "leasing" their licenses to smaller, unqualified builders.
- **Legal Conflict:** This violates *RA 544* (The Civil Engineering Law) and the professional regulations of the PRC, leading to substandard construction and safety hazards.

##### C. Technology Ethics and Data Privacy

- **Issue:** As engineers use AI and cloud-based BIM, questions of "Who owns the data?" and "Who is liable if an AI-designed beam fails?" have emerged.
- **Issue:** Cybersecurity for critical infrastructure (like water systems and power plants) is now an ethical responsibility for civil engineers.



# Carlos Hilado Memorial State University

Alijis Campus • Binalbagan Campus • Fortune Towne Campus • Talisay (Main) Campus

*A leading GREEN institution of higher learning in the global community by 2030*

*(Good governance, Research-oriented, Extension-driven, Education for Sustainable Development, and Nation-building)*

## College of Engineering

## BS in Civil Engineering

### D. Labor and Professional Practice Issues

- **Labor Shortage:** Even with a growing number of graduates, there is a "skills gap." Many senior engineers are retiring or working abroad, leaving a "hollow middle" of experience.
- **Revised Administrative Rules (2025):** The PRC recently updated the Revised Rules in Administrative Investigations, making it easier for the Board to investigate and revoke licenses for "*unprofessional, unethical, or dishonorable conduct.*"

### SUMMARY

Category	Trends /Issue	Ethical/Legal Connection
Technology	AI and Digital Twins	Liability and Intellectual Property
Environment	Green Building & Resilience	Duty to Sustainable Development
Public Trust	Flood Control Scandals	Transparency & RA 3019 (Anti Graft)
Professionalism	License Renting	RA 544 (Civil Engineering Law) & PRC Regulations

### References:

**CIVIL ENGINEERING LAW, REP. ACT NO. 544 (1950)**

- <https://issuances-library.senate.gov.ph/subject/civil-engineering-law-rano-544>

**PHILIPPINE INSTITUTE OF CIVIL ENGINEERS. (2001)**

- <https://pice.org.ph/code-of-ethics/>

**GOVERNMENT PROCUREMENT REFORM ACT, REP. ACT NO. 9184 (2003)**

- <https://www.gppb.gov.ph/laws-rules/republic-act-no-9184/>

**SENATE BLUE RIBBON COMMITTEE. (2025)**

- Inquiry into the national flood control master plan (Report No. 25-08).



# Carlos Hilado Memorial State University

Alijis Campus • Binalbagan Campus • Fortune Towne Campus • Talisay (Main) Campus

*A leading GREEN institution of higher learning in the global community by 2030*

*(Good governance, Research-oriented, Extension-driven, Education for Sustainable Development, and Nation-building)*

**College of Engineering**

**BS in Civil Engineering**