

Societal Ethics in Civil Engineering during the COVID-19 Pandemic

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Introduction

In the midst of a global emergency such as this, we have stripped our communities down to their barest bones, the most essential to the fabric of our well-being. In doing so, we expose the true workings of our infrastructure and more glaringly, its vulnerabilities. As nonessential businesses and universities shut down, the civil engineering profession continued to operate as an essential business. While this classification is mostly a simple policy decision, civil engineers have the obligation to evaluate their necessary role in keeping society on its feet and identify their shortcomings. Although nonessential businesses have the responsibility to isolate to prevent viral transmission, it is the responsibility of civil engineers to provide quality infrastructure to society in crisis.

Development of Engineering in Societal Roles

Despite the role civil engineers play in the development of how society operates, they tend to forgo their roles as leaders in society. Instead, they prioritize loyalty to their employers rather than the public. In this current COVID-19 period, it is imperative to identify the pitfalls of valuing economic factors over societal factors. In order to understand the ethical obligations of an engineer, we must examine the history of how engineers fit into the fabric of society. While not technically recognized as a profession until relatively modern times, evidence of the practice can be shown as early as in Ancient Roman or Egyptian civilizations¹. The first use of the term "engineer" was used to refer to those in the military who designed engines. Until the 1800s, professional engineers exclusively worked in and were taught by the military. West Point Academy was created originally as a school for engineering. The origin of civil engineering came from the profession of engineering that branched off from military functions to create civilian projects¹. Since its origin—both official and not—the profession of civil engineering has been rooted in service to public welfare.

Until the creation of professional societies, and more particularly the implementation of their code of ethics, any social or ethical duty had only been implicitly communicated throughout the profession. In the development of the first codes of ethics, early engineering societies relied on ethical standards similar to that of their military origins such as loyalty to their superiors and fellow soldiers. Emphasis lied with a professional obligation to clients, employers, and fellow engineers while forgoing any social responsibility. In the world of engineering ethics, the idea of social responsibility did not gain traction until the 1930s after members of ASCE had been expelled from the society for exposing a contractor's corruption and in turn, violating expectations of professional loyalty². The current ASCE Code of Ethics not only includes, but prioritizes public wellbeing above all³. However, despite the implementation of public obligation in modern codes of ethics, current practice looks at economic value as a project's main priority

while overlooking its impact on society as a whole². Civil engineers tend to separate the task to be solved from its societal or ethical context. For instance, regardless of the part civil engineering plays in current controversial topics such as gentrification or hostile architecture, they pass on the ethical burden to management or elected officials. As the profession has evolved into its modern state, civil engineers have slowly moved away from their origins as leaders in society to prioritize the needs of their employers. Even as they slowly shift to develop their role in society, the execution of these values continues to lag in the profession. In the wake of the COVID-19 pandemic, it is important for the integrity of the profession to use this catalyst to reevaluate our ethical obligations to public welfare.

"Macroethics" in Civil Engineering

In the pursuit to act in accordance with the profession's ethical standards, it is important to recognize that individual engineers do not have the power to truly act in the interest of the public without the same actions from their corporate employer. In the realm of engineering, ethics has emphasized the analysis of individual morality. In other words, the ethical reputation of an industry rests upon individual moral actions carried out by the engineers it is comprised of. Author Richard Devon⁴ identifies the problematic nature of this premise as "akin to studying atoms in order to understand a world composed of molecules, organisms, continents, rivers, and oceans." It is then not sufficient to attribute an entire industry's shortcomings to individuals' moral choices. Thus, in order to truly practice the values set forth in the Code of Ethics, civil engineers must function as a united body to act on relevant societal issues.

Upon the rise of the social ethics discussion in the engineering sphere during the 1930s, engineers and ethicists alike have set out to expand on the societal context of engineering works. One such ethicist John Ladd differentiates engineering ethics into two categories: "microethics" and "macroethics⁵." Microethics encompasses the ethical values that involve individual relationships, such as that with a coworker, client, or employer. Macroethics refers to "the collective social responsibility of the engineering profession and to societal decisions⁵." It is with the implementation of macroethics that we can set out to determine a solution to bridge the gap between engineering works and their societal context. A relatively new view within the industry, putting macroethics to practice has met resistance and brings up the necessity of identifying certain issues that prevent the application of societal ethics in the industry. Author Edwin T. Layton Jr. places the obligation of overcoming such obstacles with professional engineering societies while simultaneously naming professional engineering societies as one such obstacle⁵. As these societies are made up of both industry professionals and those who overlook them, it is subject to the same faults, described by Mitcham², from a system of internal loyalties. Even further, Layton specifies corporate influence as a primary contributor to the lack of ethics, depicting engineers as "part scientist and part businessperson⁵."

Despite the seemingly contradictory nature of engineers trying to reform their ethical standards when they themselves are participants in the problem, Devon outlines the ways engineers are able to satisfy ethical obligations to society without yielding their financial

obligations, in what he calls the norms of engagement.⁴ Two focal points in Devon's norms of engagement are cognizance and cooperation. Cognizance is simply the awareness of the collective to realize the impact engineering can have on society. Instead of relying on individual actors to make moral decisions, it is more relevant in macroethics to place the onus on the collective to make the same moral decisions. In practice, the head of Philips Corporate Design, Stefano Marzano says, "Design is a political act. Every time we design a product, we are making a statement about the direction the world will move in...we must be aware of our power."⁵ Cooperation is then incorporating cognizance into the actions we make as a collective.⁵ In practice, this is similar to incorporating diversity in a workforce to reflect the values of the collective. By refocusing the ethical responsibility onto the industry instead of engineers, it eases the conflict between individual and collective values and opens the means to apply the same ethics to relevant issues in the larger society. Especially in the context of the COVID-19 pandemic, refocusing the ethical responsibility from the individual actor to the collective profession, civil engineers can further understand their role in the pandemic response.

Engineering Ethics in the COVID-19 Pandemic Era

Due to the nature of civil engineering work, this industry has played a role in almost every disaster in history, whether it be in its prevention, its response, or in rare cases, its cause. Despite the wide variety of the types of disasters that could possibly occur, from earthquakes to terrorist attacks, all disasters share many core characteristics. According to author Pimpley, et. al., all disasters are similar in that they are a "sudden, calamitous event that seriously disrupts the functioning of a [society] and causes human, material, and economic or environmental losses that exceed the community's or society's ability to cope using its own resources."⁶ While it is important to note that each disaster brings its own set of issues, the ethics of the role of civil engineering can, for the most part, translate across different disaster events. As explained previously, the civil engineering profession has an ethical responsibility to the wellbeing of the public.³ In the wake of the COVID-19 pandemic, it is evident that critical infrastructure is at the forefront of the response effort. According to the Institution of Civil Engineers, there is an urgent need for quality infrastructure in order to keep the public safe, particularly in low-income communities.⁷ While the pandemic response itself falls under the duty of the medical and civic leaders, its efficiency is reliant on the systems civil engineers have put in place. Authors Feniosky Pena-Mora and Albert Chen identify the role the civil engineering profession has in disaster response in that "the efficiency of these lifesaving operations depends on the delivery of required resources."⁸ Demand for water and energy shift from corporate buildings to personal homes as the public quarantines. Hospitals are pushed to capacity, as is their power usage. Across the country, healthcare officials need reliable facilities to transform into testing centers, makeshift field hospitals⁹, or vaccination centers. As a large percentage of the workforce remains at home and critical industries in our society are pushed to capacity, our infrastructure must have the capabilities to incorporate these shifts in demand and ensure the public continues to have the resources to isolate themselves.

Conclusion

Despite the fact that most businesses have the responsibility to isolate themselves for the safety of others, it is the role of the civil engineering profession to remain operational during the pandemic response. However, ethically, during a time that society is pushed to its limits, it is imperative for civil engineers to recognize their part in the functioning of society. In turn, it is the responsibility of the civil engineering profession in the wake of the COVID-19 pandemic, it is necessary for civil engineers to evaluate their ethical role in society, both as engineers and as members of a global community.

References

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