

Sustainability, Diversity Top Priorities for Young Civil Engineer

Michelle Mbai aspires to advance sustainable practices and racial and gender inclusion in engineering.

By Sharon Aschaiek



Among other projects, Michelle Mbai, P.Eng., contributed to the Go Rail expansion project in the Greater Toronto Area and Hamilton, for which she led inspections into water drainage systems along railway corridors.

When it comes to protecting the integrity of Ontario's natural and built water systems, there is no such thing as business as usual for water resources engineer Michelle Mbai, P.Eng. (she/her).

Each proposed infrastructure project requires Mbai to conduct a customized analysis to determine its distinct impact on surrounding watercourses, wetlands and drainage systems. Given Ontario's rapid population growth and the rising demand for new infrastructure, she must exercise innovative thinking and practices to ensure there is proper quality, sufficient availability and effective conveyance of water resources. "I enjoy the fact that the systems I'm designing are protecting not only communities but the environment, now and for future generations," says Mbai.

As the only civil engineer with a specialty in water resources at engineering consulting firm EnVision Consultants Limited in Mississauga, ON, Mbai brings much-needed expertise to the company's services. Working with other engineers, designers and project managers on residential, commercial and industrial development projects, Mbai conducts floodplain assessments of sites being considered for development and provides expert input on building in ways that are harmonious with the surrounding environment. She also conducts hydrologic and hydraulic modeling and designs surface drainage and stormwater management systems to accommodate new developments.

DESIGNING FOR RESILIENCE

Born and raised in Nairobi, Kenya, Mbai's penchant for designing and building emerged in childhood, when she enjoyed creating paint-

ings, jewelry and dollhouses. She also recalls accompanying her father to residential construction sites, including underground and aboveground water storage facilities, and being fascinated by the complexities of building various structures.

Those interests shaped the direction of her study-abroad dream, and she chose to pursue civil engineering at Western University. In her third year, Mbai specialized in the environmental engineering option, which focuses on developing technical solutions to preserve the natural environment and mitigate the effects of climate change and pollution. Since graduating in 2018, Mbai has applied this expertise at consulting firms AECOM, WSP and LEA Consulting before landing her current role.

Staying relevant in her area of expertise requires Mbai to engage in ongoing professional learning that extends beyond understanding Environment Ministry guidelines, city policies and practices for stormwater management and local and global urban development trends. She says it also means monitoring climate change patterns that are causing increasing floods and droughts and adapting the solutions she designs to be resilient well into the future. Mbai regularly consults with local conservation authorities to understand current and emerging threats to the stability and vitality of aquatic ecosystems. "The data we produce in our work show that future development policies and guidelines will need to be updated to respond to the risks of climate change," Mbai says. "Things will need to change as the world changes...designs will need to be more sustainable."

NAVIGATING PREJUDICE

Another area of needed change, Mbai says, is for engineering to be more welcoming to women and racialized minorities. As a Black woman in a profession where racial and gender inclusion are still a work in progress, Mbai has experienced microaggressions by colleagues, such as surprise at her English fluency, fascination with her afro and assumptions about Wi-Fi access in Kenya.

"[They] made me feel othered and undermined, as though my identity and abilities were reduced to misconceptions and prejudices," Mbai says. This inequity first became apparent to Mbai at Western, where she was the only Black woman in her graduating class. As Mbai navigates these diverse challenges, what sustains her commitment is knowing that her work is serving the well-being of both citizens and the natural world.

Mbai's experience also led her to volunteer with several community organizations, including acting as a liaison with Black engineering students for non-profit organization Black Engineers of Canada and as a mentor for Elevate Youth Toronto, which supports career goals of socially disadvantaged Black youth. Currently, Mbai does industry outreach for the Society of Women Engineers Toronto. "In the workplace, it's always better when you see people who look like you," Mbai says. "Change is slow, but progress is happening—I am seeing more women and BIPOC in engineering." **e**