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TRINIDAD & TOBAGO

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ISSUE NO.9

**Risks of Contractor Underbidding
for Contracts:
The Hazards of Underbidding**

**The Case for Internship and
Mentorship Programmes in State
Construction Contracts**

**We all need AIR:
A Project Manager's View**

**Water Conservation and
Wastewater Management at
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President's Message



Glenn Mahabirsingh
TCA PRESIDENT

Risks of Contractor Underbidding for Contracts

The Hazards of Underbidding

Within the construction industry, contract underbidding is becoming more prevalent and may be as a result of contractor errors or may be intentional. Despite appearing to be a shrewd tactic for acquiring projects and clientele, underbidding presents substantial hazards for contractors and can yield enduring adverse outcomes. This discourse delves into the various perils linked with contractors' underbidding of contracts and their repercussions on the industry. Underbidding denotes the submission of a bid for a contract that markedly undercuts the actual project cost. Contractors often resort to underbidding their competitors to outdo their projects and secure them. While it may yield fleeting benefits, underbidding entails numerous risks that can imperil a contracting enterprise's financial solidity and stature, potentially fostering feelings of unease and insecurity about its prospects. One of the primary perils of underbidding is the prospect of financial loss, which can have long-term implications for a contractor's business.



When a contractor underbids on a project, they essentially commit to delivering the requisite services or goods at a price that may not cover their expenditures. This can lead to cost overruns, diminished profit margins, and financial distress for the contractor in certain instances. Moreover, underbidding can precipitate cash flow predicaments, as the meagre profitability of the project may impede the contractor's capacity to meet operational costs and invest in future ventures.

Additionally, underbidding can deleteriously impact the calibre of work and service delivery. When contractors underbid projects to cut costs, they might have to compromise on the quality of materials, labour, or project management. This can lead to subpar work, project delays, and most importantly, damage to the contractor's reputation. Clients who receive subpar work due to underbidding are unlikely to give repeat business or recommendations, which can significantly hinder a contractor's long-term prospects.

Another risk entwined with underbidding is the strain it imposes on subcontractors and suppliers. To adhere to the diminished bid price, contractors may exert pressure on their subcontractors and suppliers to curtail prices or provide services at a reduced cost. This not only perpetuates a race to the bottom in pricing but can also incite strained relationships with subcontractors and suppliers, potentially engendering sentiments of undervaluation and diminished indispensability within the industry. At a broader industry level, the prevalence of underbidding can foment market distortions and inequitable competition.

Contractors who consistently underbid on projects engender unrealistic price expectations among clients, rendering it arduous for other contractors to tender competitive bids that accurately reflect the authentic project cost. This can erode the industry's overall quality and viability and engender market instability while facilitating an upsurge in unsustainable enterprises. In addition to the financial and operational hazards, underbidding also carries legal and ethical ramifications. If a contractor cannot fulfil a project due to underbidding, they may encounter legal disputes, contractual penalties, and claims for client damages. These legal repercussions can give rise to supplemental costs, reputational impairment, and protracted legal proceedings, thereby exacerbating the adverse impact of underbidding.



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Addressing the hazards associated with contractor underbidding necessitates industry stakeholders to champion equitable and transparent bidding practices. Clients ought to accord precedence to value and quality over the lowest bid price, while contractors should concentrate on accurately approximating the genuine project cost to ensure enduring viability.

Furthermore, industry associations and regulatory bodies can play a pivotal role in instituting guidelines and ethical standards that discourage underbidding and cultivate equitable competition. In conclusion, underbidding for contracts engenders considerable hazards for contractors, encompassing financial losses, compromised quality, strained affiliations, and legal retributions. By discerning the enduring implications of underbidding and advocating for equitable practices, contractors can uphold industry standards and ensure the sustainability of their enterprises. Equitable competition, realistic pricing, and an unwavering dedication to delivering quality work are not mere ideals but indispensable for the sustained success of contractors and the industry.



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The Case for Internship and Mentorship Programmes in State Construction Contracts

by Vaughn I. Lezama
Consulting Engineers Associates 2005 Ltd

A Call to Action

An article in the April-June 2024 edition of the TTCA e-magazine, penned by the TTCA President, Mr. Glen Mahabirsingh, on the subject *“Navigating the Future of Trinidad and Tobago’s Construction Industry Amidst an Ageing Workforce”*, called for the implementing of strategies to mitigate the risk of losing valuable knowledge and skills as experienced workers whose skills would have been honed during the period of two construction booms which the country experienced in the pass are now among an aging

and retiring workforce. This is a call for action to reverse the lack of opportunity to close the critical knowledge gap with the younger generation. Among the strategies proposed are knowledge transfer programmes, training and upskilling and Industry-government collaboration. I believe the latter, i.e. Industry-government collaboration, or to be more specific government-industry action, is the strategy that can provide sustainable results and the one that we need to explore as the vehicle for the sustained development of the country’s engineering capability and capacity to pursue its future developmental objectives.



Why the Dearth of Internship and Mentorship Opportunities?

The issue referred to above has a much broader reach and implication for the viability, capacity and capability of the local construction industry since it also impacts the diminishing opportunities for preparing quality entry level professionals in the construction sector among cohorts of engineering student and graduates. Given the remarkable changes made over the last 10 to 15 years in which the design-build method of procurement has become the overwhelmingly preferred method of project procurement in the public sector, there is urgent need to address the issue of opportunities for mentorship and internship of engineering students and graduates. There has been for some time now a dearth of direct engagement of the services of engineering consultants, except for the performance of forensic engineering investigations, and with the unsustainability of the involvement of engineering firms in Design-Build projects, in which Contractors are the lead proponents, the practice of engaging interns and the mentoring that goes with it, is no longer economically feasible for those engineering firms which still exist.



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Furthermore, Contractors, having to work with diminishingly small margins, are themselves challenged in offering opportunities for training of young interns who are not being prepared for employment within the company. There is therefore an urgent need for serious consideration of an initiative that demonstrates a commitment to both infrastructural excellence and the professional development of our next generation of construction professionals. This situation if not urgently addressed portends ominously for our construction human resource development and the industry as a the whole

State-Industry Collaboration

Major State Contracting Agencies in the construction sector, such as UdeCoTT, HDC, NIDCO and NIPDEC, are the stewards of public resources and facilitators of state housing and infrastructural development. These Agencies therefore have the unique opportunity to impact not only the physical landscape of the country but also the professional future of industry practitioners. The time has therefore come when Contracting Agencies in the construction sector need to include provisions in State Contracts to facilitate internship and mentoring opportunities for engineering students and graduate engineers. By integrating such provisions into state construction contracts, these agencies can drive positive change on multiple fronts. Such an initiative promises to enrich student learning outcomes, foster innovation and excellence in the construction sector and greatly benefit the next generation of engineering and construction talent.

Why the need for Internship and Mentorship Programmes

Internship and mentoring programs offer invaluable hands-on experience and guidance to students, construction trainees and recent graduates entering the construction workforce. By providing opportunities for them to work alongside experienced construction personal and professionals on state projects, State Contracting Agencies can contribute to their own professional growth and help bridge the gap between academic learning and real-world practice. Equally important is the sense of frustration that students and graduates face when such opportunities do not exist and the exasperation expressed by both UWI and UTT which these learning institutions face in the failure to achieve students learning outcomes associated with internship opportunities.

The integration of internship and mentorship provisions in state construction contracts represents a strategic investment in our future. It addresses immediate workforce needs, fosters innovation, and ensures the sustainability and quality of our construction projects. Taking such step will not only enhance the capabilities of our young engineers and trainees but also secure a brighter, more prosperous future for the country.



Benefits of Internship and Mentorship Programme in State Contracts

Bridging the Gap Between Education and Industry

Engineering students often graduate with substantial theoretical knowledge but limited practical experience. Internships provide the crucial hands-on learning that can only be gained in the field. By working on real projects under the guidance of seasoned professionals, students and recent graduates can apply classroom knowledge to practical challenges, enhancing their skills and readiness for full-time employment.

Cultivating a Skilled Workforce

The construction industry is currently losing through retirement and natural human attrition a cohort of experienced construction practitioners whose knowledge and experience were honed during a past period of elevated construction activities during a more economic buoyant economic times in the country, particularly in skilled engineering and construction roles. Internship and mentorship programs serve as a pipeline for developing and retaining young talent in the country. By giving students and graduates a head start, we ensure a steady flow of skilled professionals ready to meet the demands of future projects.

Promoting Innovation and Fresh Perspectives

Young engineers bring fresh perspectives and new ideas that can drive innovation. Their familiarity with the latest technological advancements and trends in sustainable construction can provide valuable insights that seasoned professionals might overlook. This cross-generational collaboration can lead to more efficient, innovative, and environmentally friendly construction solutions.

Enhancing Project Quality and Safety

Mentorship ensures that young engineers learn industry best practices directly from experienced professionals. This knowledge transfer is crucial for maintaining high standards of quality and safety in construction projects. Experienced mentors can provide guidance on risk management, adherence to regulations, and the importance of meticulous planning and execution.

Supporting Local Educational Institutions

The Departments of Civil Engineering at both UWI and UTT have expressed concerns on the diminishing opportunities for student internship and the impact of this on student learning outcomes. Partnerships between State Contracting Agencies and these educational institutions can enhance the quality of student learning outcomes and the engineering programs. These collaborations can result in curriculum improvements that better reflect industry needs and collaborative research projects. This symbiotic relationship benefits both the educational sector and the construction industry.

Fostering Economic Growth and Development

By investing in the professional development of engineering students and graduates, we are investing in the country's economic future. A well-trained, innovative workforce attracts new businesses and supports existing ones, contributing to overall economic growth. Additionally, it ensures that public infrastructure projects are completed efficiently, sustainably, and to the highest standards, benefiting all citizens.

Implementation and Feasibility

Internship and mentoring programmes can be feasibly incorporated into state contracts via the Employer's Requirements and/or the Particular Conditions of Contract, i.e. Clause 5.5 – "Training" of the FIDIC Conditions of Contract, which make provision for training of Employer's Personnel. An appropriate Clause can be inserted in the Particular Conditions to satisfy this requirement. Such a Clause will outline the obligations of the Contractor regarding the training of engineering interns nominated by the Employer, covering aspects such as nomination process, employment conditions, roles and responsibilities, duration of employment, reporting, compliance, indemnity, and conflict resolution. Organizations like the TTCA, APETT and the BOETT can provide templates for internship activities, task record and evaluation outcome for a structured industry internship programme supported by participating State Contracting Agencies.

Here are some reasons why incorporating internship and mentoring provisions via the FIDIC Training Clause in State Contracts is important and advantageous:

Corporate Responsibility: Investing in the development of aspiring construction professionals through internships and mentorship programs of State Contracting Agencies is an important contribution to national development to which such organizations should be actively committed. Nurturing talent early in their careers through the efforts of State Contracting Agencies will help cultivate important skill sets among such cohorts for the future and can contribute to possibly reviving the prospects for the long-term sustainability of the local engineering profession as a technical, knowledge base industry that can become globally competitive.

Knowledge Transfer: Experienced engineers and industry practitioners performing state contracts possess a wealth of knowledge and expertise that can be passed down to the next generation. Mentoring programs provide a platform for this knowledge transfer, ensuring that valuable insights and best practices are maintained and shared.

Stimulating Innovation: Engaging with interns and recent graduates can bring fresh perspectives and innovative ideas to any project. By fostering an environment that welcomes new talent, there exist the prospects to stimulate creativity and drive positive change in the industry.

Recruitment and Retention: Providing opportunities for internship can serve as a pipeline for recruiting top talent into construction companies. By showcasing the rewarding and impactful work being done, this can attract motivated individuals who may later choose to pursue careers within the organization in which they have served as interns.

Conclusion

It is strongly recommended that the major State Contracting Agencies in the construction sector consider including appropriate Clauses in its state contracts to establish internship programs and mentorship opportunities for engineering students and recent graduates. This should involve allocating specific Provisional Sums in Contracts for funding of internship stipends and associated mentorship personnel costs,

By taking proactive steps to incorporate internship and mentoring provisions into state contracts and coordinating internship placements with the Departments of Civil Engineering at both UWI and UTT, State Contracting Agencies can demonstrate a commitment to industry human resource capacity building, knowledge sharing, and fostering innovation within the engineering community.

The TTCA, APETT and BOETT would indeed welcome the opportunity to discuss with relevant State Contracting Agencies how our organizations can work together with these Agencies to implement internship and mentoring programs in State projects. Incorporating such provisions into state construction contracts is not only beneficial but also feasible and will support the professional growth and development of engineering students and graduate from our local learning institutions.



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Vaughn Lezama is a Civil Engineer with over 44 years of engineering practice. He is the Chairman and Principal Engineer at Consulting Engineers Associates 2005 Ltd. Eng. Lezama is registered with the Board of Engineering of Trinidad and Tobago and is a Fellow and Past President of the Association of Professional Engineers of Trinidad and Tobago. He is also a Member of the American Society of Civil Engineers. Eng. Lezama has extensive experience in Engineering Designs, Technical Studies, Construction Supervision, and Contract Administration. He is highly trained in the use of the FIDIC suite of Contracts. Currently, Eng. Lezama serves as the Registrar of the Board of Engineering of Trinidad and Tobago (BOETT) and is responsible for maintaining the Register of Engineers in accordance with the Engineering Profession Act No. 34 of 1985.



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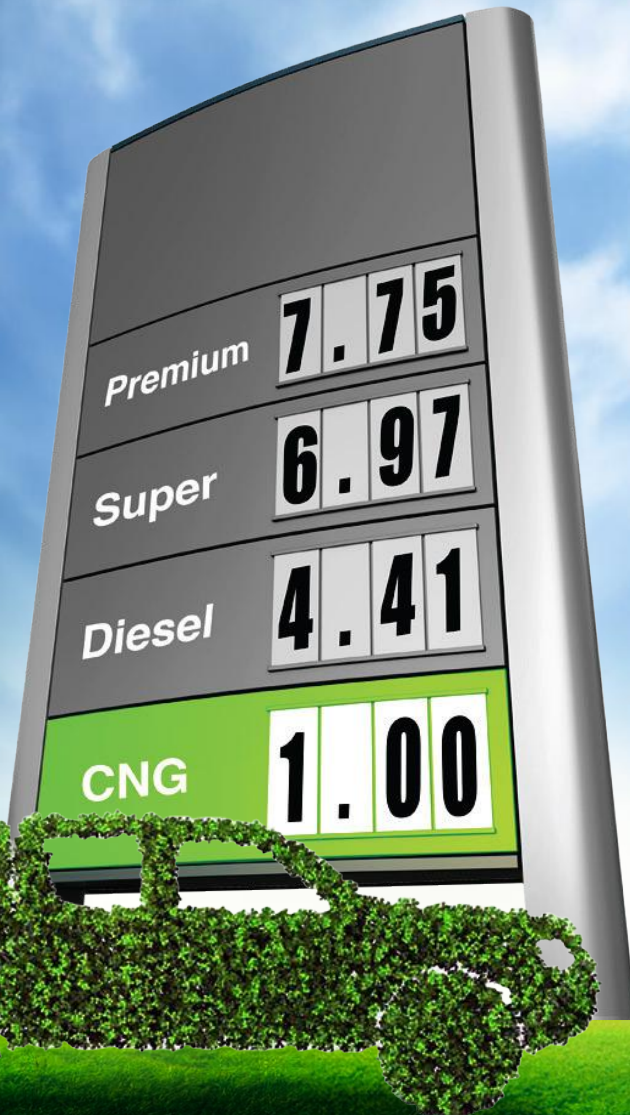
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Driving Change with BURMAC/CNG:

The Environmental & Financial Advantages of CNG for Fleets

In recent years, Trinidad and Tobago has seen a growing trend among fleet owners across various sectors towards converting their vehicles to Compressed Natural Gas (CNG). This shift is not without merit, as the benefits of CNG conversion are becoming increasingly apparent, particularly in terms of cost savings and environmental impact.

As fuel prices continue to rise, fleet owners are seeking sustainable and cost-effective alternatives, making CNG an attractive option worth considering. One of the key drivers behind this movement is the substantial cost savings associated with CNG. Compared to traditional gasoline or diesel, CNG typically offers significant reductions in fuel expenses. Fleet owners in Trinidad and Tobago are increasingly recognizing the economic advantages of CNG, as it allows them to substantially lower their operating costs without compromising performance or reliability. This financial prudence has not gone unnoticed, especially amidst the current economic climate where businesses are continuously seeking ways to optimize their operational expenditures.

Burmac CNG, a leading provider of CNG services that has been pivotal in supporting fleet owners through the conversion



process. Burmac CNG offers comprehensive CNG conversion services, designed to seamlessly transition fleets to CNG while ensuring optimal performance and safety. With an unwavering commitment to quality and customer satisfaction, Burmac CNG has solidified its reputation as the go-to choice for fleet owners seeking reliable and efficient CNG conversion solutions.

When considering the environmental impact, the benefits of CNG become even more pronounced. CNG is renowned for its significantly lower emissions compared to traditional fuels, making it a more environmentally friendly option. This reduction in greenhouse gas emissions aligns with global efforts to combat climate change and improve air quality. Fleet owners are increasingly cognizant of their environmental footprint, and the adoption of CNG presents an actionable step towards sustainability.

Amidst the uncertainties surrounding fuel prices, CNG stands out as a viable alternative that offers stability and predictability. Given the volatile nature of global oil markets, fleet owners are seeking alternatives that provide insulation from fluctuating fuel prices. CNG's relatively stable pricing, coupled with its cost-efficient nature, positions it as a reliable choice for fleet operations, offering a degree of financial security in the face of unpredictable fuel costs.

Despite the compelling advantages of CNG, there are several myths and misconceptions that have circulated regarding its efficacy and safety. Addressing these myths by presenting factual information is essential in dispelling any apprehensions among fleet owners. By elucidating the facts about CNG, such as its safety record, technological advancements, and widespread global adoption, fleet owners can make informed decisions based on accurate information rather than unfounded concerns.

The Burmac CNG team is dedicated to providing exceptional support and is always ready to help with any questions or address any concerns you may have. Furthermore, Burmac CNG offers complimentary assessments for your fleet conversion, ensuring a convenient and hassle-free process.

The case for converting vehicles to CNG has become increasingly persuasive for fleet owners across all sectors.

The combination of cost savings, environmental benefits, and the reliability of CNG as an alternative to traditional fuels makes it a compelling choice. With Burmac CNG Trinidad leading the way in providing top-tier conversion services, fleet owners have a trusted partner to facilitate their transition to CNG, ensuring a seamless and efficient conversion process. As the landscape of energy usage continues to evolve, CNG emerges as a sustainable and economically sound option that is poised to play a pivotal role in the fleet industry of Trinidad and Tobago.





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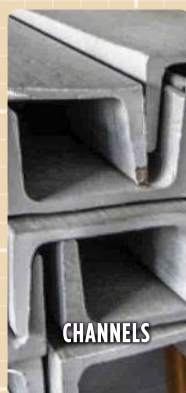
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We all need AIR:

A Project Manager's View

by Mikey Thackoor
NH International Caribbean Ltd



Let me set the stage: lights, camera, action—a bustling construction site on a sunny Caribbean island, where the turquoise waters meet golden sands and the rhythm of steel and concrete blends with the calypso beat in the background. As a project manager, I stand onsite, overseeing this dynamic symphony of workers, machinery, and materials. I feel at home. My journey in the field of construction has been nothing short of an adventure, filled with challenges, triumphs, and invaluable lessons.

As I continue on this journey as a practitioner in the construction field, I have had. I will continue to be privileged to lead diverse teams of people from all walks of life with differing skill levels, training, and experience. As a leader, I feel a profound sense of responsibility for each person on my team. I constantly strive to find the ultimate elixir for each, to enable them to perform at their best, “the Megatron Juice,” and instill in them that while perfection may be elusive, never relent in pursuit of perfection.

One of the most profound lessons I’ve learned for success and having a resilient team is the importance of providing my team with AIR—Authority, Inspiration, and Recognition. AIR isn’t just about ensuring the project gets done; it’s about creating an environment where each team member can thrive, give their best, and act with agency towards the shared goal while developing each person for the next challenge in the vibrant and diverse Caribbean context, where every project feels like a living, breathing entity, the concept of AIR becomes even more crucial.

Let me delve into this transformative concept of AIR, what it truly means, and how it can revolutionize your team in construction and any workplace.

Authority: Not Only Say, Do It Actively

As a project manager, I recall many projects on which we were tasked with performing miracles and leading teams of seasoned professionals and fresh apprentices alike. However, something was missing: empowerment. Decisions were bottlenecked at the top, causing delays and frustration.

Realizing this, I began to delegate authority, giving team leaders the power to make decisions onsite. This shift was like a breath of fresh air. Suddenly, issues were resolved swiftly, innovations sprang up from unexpected quarters, and the team felt valued and trusted. Of course, there were issues, but the gains outpaced the losses. It was as if the project sites had found a new rhythm that was more efficient and harmonious.





Authority isn't about abdicating responsibility; it's about empowering your team to take ownership of their work. It's about trusting the people we employ and letting them do what they do best, their job. When team members feel trusted to make decisions, they invest more of themselves in the project, leading to higher-quality outcomes and a more motivated workforce. This approach resonates naturally in the Caribbean, where community and collaboration are deeply ingrained in our culture, fostering a sense of shared purpose and camaraderie.

Inspire: By Our Own Actions

Inspiring your team is akin to being the lighthouse guiding ships through treacherous waters. During a project in Tobago, where we built a police station, the days were long, and the challenges seemed endless. The heat was relentless, and fatigue began to set in among the workers. At this moment, I remembered the importance of leading by example.

Every morning, I made it a point to be the first onsite and the last to leave. I rolled up my sleeves, worked alongside the crew, and showed genuine interest in their tasks and well-being. I worked the excavator and the shovel; no task was beneath me. This wasn't just about getting the job done; it was about showing my team that I was in the trenches with them every step of the way.

On one particularly sweltering afternoon, as we struggled to complete a crucial concrete pour, I decided to share a story about my beginnings in the industry—how I once worked through a similar challenge and what I learned from it. The sacrifices made to get to where I stood with them on that day. The story wasn't just a distraction; it was a lesson in resilience and perseverance.

Slowly but surely, the team rallied. They pushed through the exhaustion and fatigue, and we completed the project on time and with quality. It wasn't just the concrete that set solidly that day; it was our determination and spirit. By sharing my experiences and being visibly committed, I inspired my team to rise above the immediate hardships and keep their eyes on the larger goal.

In the Caribbean, inspiration is deeply tied to our stories and shared experiences. We come from a lineage of resilience, having weathered literal and metaphorical storms. When leaders inspire through action and narrative, it resonates profoundly, igniting a collective drive that propels the team forward.

Recognize: The Efforts

Recognition is the fertilizer that helps your team's efforts blossom. I recall a massive project in Dominica, where we constructed two emergency shelters that promised to be pillars of strength during times of natural adversity. The project was complex, requiring meticulous coordination and relentless effort from every team member.

Despite the hard work, I noticed morale dipping as the deadlines loomed. It wasn't that the team wasn't putting in the effort; their efforts were going unnoticed. Inspired by this realization, I initiated a simple yet powerful practice—recognition. Whenever we gathered, we acknowledged the week's achievements and mishaps, no matter how small. I recognized the effort.

We celebrated everything from innovative problem-solving and exceptional teamwork to individual milestones. These gatherings became a highlight, a time for everyone to feel valued and appreciated. We applauded all contributions, and confidence and engagement soared slowly but surely. Don't get me wrong, it was no kumbaya; we had challenges. However, recognition made them feel bulletproof; it gave them Superman's cape and put the B of Batman on their bellies.

Recognizing effort isn't just about grand gestures; it's about consistent and genuine appreciation. In the Caribbean, where community spirit and mutual respect are cornerstones of our culture, recognition fosters a supportive and motivated work environment. It builds a sense of belonging and encourages everyone to give their best, knowing their efforts will be seen and appreciated.

The Pursuit of Perfection

We strive for perfection in every project, even though we know it may be elusive. It's this relentless pursuit that drives excellence. I often tell my team, "perfection is elusive; however, the pursuit is not. Be relentless in your effort for perfection." This mindset has been the cornerstone of my success.

There were projects where the client had incredibly high standards, and the pressure was immense. We knew that achieving absolute perfection might be impossible, but that didn't stop us from striving for it. Every detail, from the tiles' placement to the woodwork's finish, was scrutinized.



Our relentless pursuit of perfection meant that the results were still outstanding, even if we fell short. The client was thrilled, not because everything was flawless but because our dedication and effort were evident in every aspect of the project. This pursuit pushed us to innovate, solve problems creatively, and maintain a level of excellence that set us apart.

Remember, someone provided you with AIR to help you reach where you are today. Don't deprive your team and those around you of the same opportunity. Do not be an oxygen thief. It's your responsibility to provide the AIR needed for growth and development.

Providing AIR to your team—Authority, Inspire, and Recognize—isn't just a managerial strategy; it's a way of nurturing the human spirit within the workplace. It's about creating an atmosphere where people feel empowered, inspired, and valued. This, in turn, drives project success and cultivates a resilient, high-performing team.

These principles are effective and essential in our vibrant Caribbean context, where the spirit of community and collaboration runs deep. They transform the workplace into a thriving ecosystem where individuals can breathe freely and contribute to their fullest potential.

By embracing AIR, you elevate your team's performance and enrich their professional journeys, creating a legacy of excellence and camaraderie that echoes far beyond the project.

“Leadership is not about being in charge. It is about taking care of those in your charge.”
Simon Sinek



Author
Mikey Thackoor

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Mr. Mikey Thackoor is an experienced professional in the construction industry with a track record of over 25 years working across the globe. Presently, he holds the position of Head of Operations (Eastern Caribbean) at NH International Caribbean Ltd. In this role, Mr. Thackoor provides expert leadership in project development, design, implementation, and execution to ensure optimal results are achieved.



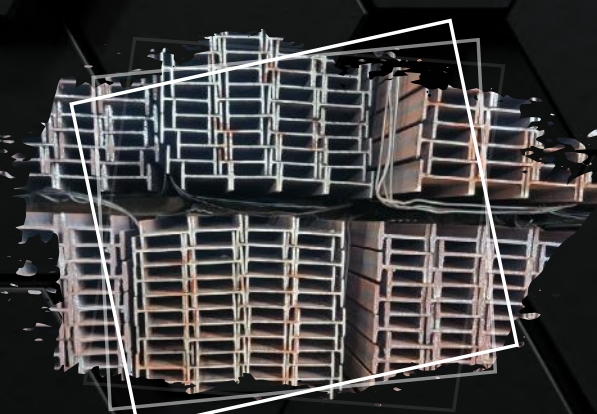
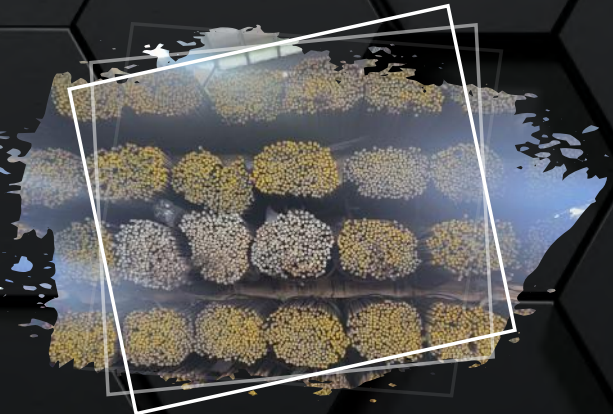
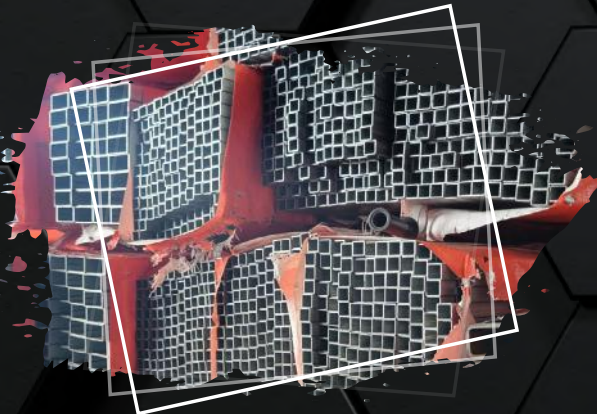
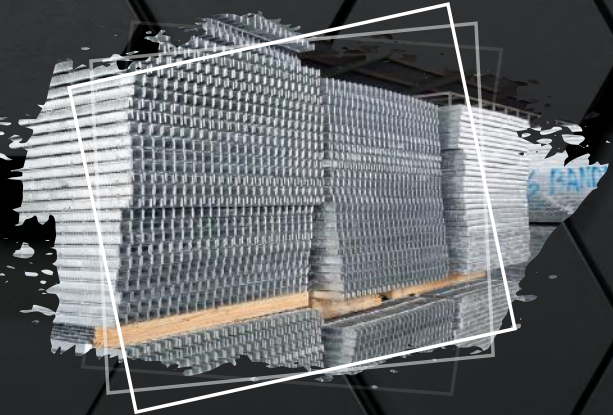
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Water Conservation and Wastewater Management at Construction Sites: A Holistic Approach

by Environmental Management Authority

Water conservation and wastewater management on active construction sites is essential for sustainable development, resource management and environmental protection. Construction activities often involve significant water usage for tasks such as concrete mixing, dust suppression, equipment cleaning and landscape irrigation, which typically results in the generation of wastewater effluent. Effluent of this nature requires specific management practices to mitigate environmental impact, ensure regulatory compliance and promote sustainability. Additionally, efficient water management strategies on construction sites can help reduce water consumption, lower costs and minimize the ecological footprint of construction projects. The following discussion details several strategies and best practices for water conservation and wastewater management on active construction sites.

Water Conservation

Efficient Water Use Practices: Reduction in water consumption

Low-Flow Fixtures: Install low-flow faucets, showers, and toilets in temporary facilities to minimize water use.

High-Efficiency Equipment: Use high-efficiency pressure washers and other water-consuming equipment.

Automatic Shutoff Valves: Equip hoses and other water-dispensing devices with automatic shutoff valves to prevent unnecessary water flow.

Dust Suppression:

- o Use alternatives to water for dust suppression such as chemicals or polymers.
- o Utilize non-potable or recycled water for dust control to conserve fresh water supplies.
- o Apply water during cooler parts of the day (early morning or late afternoon) to reduce evaporation losses.

Concrete and Material Use:

- o Use Recycled Water to mix concrete.
- o Use Ready-Mix Concrete.
- o Admixtures: Incorporate water-reducing admixtures in concrete to lower the water-cement ratio without compromising workability.

Water Recycling and Reuse: Maximize the use of recycled water onsite

Stormwater Management

- o Rainwater Harvesting: Collect and store rainwater for use in construction activities such as dust suppression and equipment cleaning.
- o Permeable Surfaces: Use permeable paving materials to allow rainwater infiltration, reducing runoff and promoting groundwater recharge.

Gray Water Systems: Install systems to capture and treat gray water for non-potable uses.

Closed-Loop Systems: Use closed-loop water systems for tasks such as cooling equipment or washing aggregates.

Education and Training: Educating the workforce about water conservation is crucial for the successful implementation of water-saving measures

Training Programs: Conduct regular training sessions on water conservation practices

Signage: Display signs around the site to encourage mindful water use.

Incentives: Implement incentive programs to reward teams or individuals who demonstrate outstanding water conservation efforts.

Innovative Technologies: Leverage innovative technologies to enhance water conservation efforts

Smart Irrigation Systems: Use smart irrigation systems with sensors and automated controls to optimize landscape watering.

Waterless Technologies: Consider waterless alternatives such as chemical dust suppressants or dry cleaning methods for equipment.

Drones and IoT: Employ drones and Internet of Things (IoT) devices to monitor water use and detect leaks in real-time.

Wastewater Management

Stormwater Runoff: Generated from Rainfall typically entrains Pollutants from the Construction Site: Best Management Practices:

Erosion and Sediment Control: Implement silt fences, sediment basins, and erosion control blankets to minimize sediment runoff.

Permeable Surfaces: Use permeable paving materials to increase infiltration and reduce runoff volume.

Vegetative Buffers: Establish grassed swales, filter strips, and other vegetative buffers around the site to trap and filter pollutants.

Stormwater Ponds: Construct retention or detention ponds to capture and treat stormwater before it leaves the site.

Good Housekeeping: Maintain clean and organized construction sites to reduce the amount of debris and pollutants that can be washed away by stormwater

Concrete Washout Water: Water used to wash out concrete mixers, trucks, tools and equipment.

Best Management Practices:

Designated Washout Areas: Establish contained areas for concrete washout, lined with an impermeable barrier to prevent leachate.

Washout Containers: Use portable washout containers to collect and manage washout water.

Recycling Systems: Implement systems to recycle washout water for reuse in mixing new concrete or other non-potable applications.

Dewatering Effluent: Water removed from excavations, trenches, and foundations to keep the work area dry

Best Management Practices:

Sediment Filtration: Use sediment traps, dewatering bags, or filtration systems to remove solids from the effluent.

Treatment Systems: Employ portable treatment units for chemical treatment if the effluent contains contaminants.

Sanitary Wastewater: Wastewater from toilets, showers, and other sanitary facilities used by construction workers.

Best Management Practices:

Portable Sanitary Facilities: Provide adequate portable toilets and sanitation facilities on-site, ensuring regular maintenance and servicing.

Septic Systems: Use temporary septic systems if portable toilets are not feasible, ensuring they are appropriately designed and maintained.

Waste Disposal: Contract licensed waste haulers to remove and dispose of sanitary wastewater at approved treatment facilities.

Equipment and Vehicle Wash Water: Water used to clean construction vehicles and equipment to remove mud, oil, and other contaminants.

Best Management Practices:

Wash Stations: Set up designated washing stations with impermeable surfaces and containment systems to capture wash water.

Water Recycling Systems: Implement closed-loop recycling systems to treat and reuse wash water, minimizing fresh water usage.

Oil/Water Separators: Use oil/water separators to remove hydrocarbons from wash water before recycling or discharge.

Chemical and Paint Wastewater: Water contaminated with chemicals, solvents, paints and other hazardous substances.

Best Management Practices:

Containment Systems: Use secondary containment systems to capture spills and prevent chemical contamination of stormwater.

Proper Storage: Store chemicals and paints in secure, weatherproof areas to minimize the risk of leaks and spills.

Waste Collection: Collect and treat chemical wastewater separately, ensuring it is handled by licensed hazardous waste contractors.

Spill Response Plans: Develop and implement spill response plans to quickly address and mitigate any accidental releases.

By conserving water, categorizing wastewater and implementing appropriate Best Management Practices, construction sites can significantly reduce their environmental impact, increase water resources and comply with regulatory requirements. These efforts contribute to the sustainability and responsible stewardship of natural resources in the construction industry.



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Durability/Performance

Zero Maintenance - NO POTHOLES

OUR FULL COMMERCIAL OFFER

DESIGN & EVALUATION - Strategic leads with commercial involved

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- Pavement designs with different technical solutions
- Develop final plan set
- Life-cycle analysis of costs and environmental impacts
- Life-cycle assessment of environmental impacts

EXECUTION - Commercial teams leads with Strategic involved

- Materials (concrete, cement, additives, aggregates)
- Construction: pavements, structure layers, curbs, sidewalks, others
- Maintenance & Rehabilitation
- Project supervision, technical training and support
- Finishing Tool Rentals

COMMERCIAL & OPERATIONAL SYNERGIES - Strategic Partnerships

- Identify public and private resources opportunities
- Develop engineers estimates
- Implementation of Sales Supply Contracts (Service Center)
- Implementation of Operational (Technical) Synergies



PROJECTS COMPLETED

- | | |
|--------------------------------------|--|
| ✓ Pt. Lisas Business Park - Phase II | ✓ Southern Sales Car Park - Point Lisas |
| ✓ East Lakes Gated Community | ✓ Secondary Access Road - Tortuga |
| ✓ IPI - Soleil Gated Community | ✓ Southern Sales - Morvant |
| ✓ Japan Motors Warehouse Complexes | ✓ Residential Road - Montrose, Chaguanas |
| ✓ Low Cost Supermarket Complex | ✓ Wendy's Carpark - Diego Martin |
| ✓ Tucker Warehouse - Chagaramas | ✓ Audi Car Park - Richmond Street, Port of Spain |

For more information please visit:

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- www.readymix.co.tt
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PRODUCTS WE OFFER

Did you know that Cemex TCL provides construction solutions for roads? We have been providing technical solutions for roads in over 60 countries.

We have been providing FREE technical services in Trinidad for the past 6 years.



CEMENT



PREMIUM PLUS

TYPE IP

Blended with Pozzolan

AGGREGATES

TYPE	NAME
Large size Limestone (Crushed) (Melajo & Mayo)	<ul style="list-style-type: none"> • 20 mm or 3/4" Limestone • 1-2" -25-50mm Limestone • 2-4" 50-100mm Limestone
Small size Limestone (Crushed) (Bermudez & Melajo)	10mm (-) or 3/8" Limestone

ADMIXTURES

TYPE	NAME
High range superplasticizer	ISOFLOW 7660
Retarder & Water Reducer	ISOPLAST2024
Retarder	ISORETARD 2201
Plasticizer and Retarder (Medium range)	ISOFLEX 7835
Waterproofing	ISOFUGE 9350
Air Entraining Agent	ISOSPHERE 5042
Corrosion Inhibitor	ISOINHIBIT 5400CF

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TTCA Welcomes New Member



Francis-Lau Construction Company Ltd

COMPANY PROFILE

Francis-Lau Construction Company is a reputable steel fabrication firm with over sixty (60) years of experience in the fabrication and erection of structural steel buildings in the region. We take pride in delivering high-quality steel structures that are durable, safe and aesthetically appealing. Meeting project deadlines is crucial and we strive to provide our services promptly without compromising quality. Our expertise in the field enables us to provide cost-effective solutions that cater to each client's unique need.

Our full-service fabrication facility is located at our headquarters in Trinidad and Tobago. We have a total production space of fifty thousand (50,000 ft²) square metres. Equipped with three overhead cranes totalling twenty (20) tonne lifting capacity, we can effortlessly handle the most significant and challenging projects. Moreover, our alliance in Guyana enhances our ability to provide innovative solutions for success in the thriving Oil and Gas sector.

We offer a comprehensive range of services covering everything from design to fabrication and erection. Additionally, we specialise in exporting steel structures to our clients' construction sites in Dominica, St. Lucia, St. Vincent and the Grenadines, Barbados, Grenada, St. Maarten, St. Kitts and Nevis, Guyana, and Suriname.

At Francis-Lau Construction Company Ltd., we believe that communication and collaboration are the cornerstones of successful projects. We value our clients' input and work closely with them to ensure that their specific requirements are met and that they are fully satisfied with the final product. Our transparent and honest approach are key to building strong and long-lasting relationships with our clients making them feel valued and included in the process.

Sustainability for us is not just a buzzword, It is a top priority. We are deeply committed to minimizing waste and reducing our environmental impact throughout the fabrication and erection process.

Our track record speaks for itself, demonstrating our ability to provide steel structures that are not only functional and efficient but also environmentally conscious. This commitment to sustainability reassures our clients and partners of our responsible approach to business.



TTCA Welcomes New Member

ELECTRICAL
INDUSTRIES
GROUP



Electrical Industries Group

Electrical Industries Group (EIG) is a leading manufacturer and exporter of industrial cables and electrical components, pvc pipes and fittings for the plumbing and electrical industries, and a distributor partner for global brands like ABB/General Electric (Switchgear), US Craftsman (Water Heaters) and CERA (Sanitary Ware). With a strong commitment to quality, innovation and customer satisfaction, EIG has established itself as a trusted partner to retail hardwares and project contractors in the construction, renovation and utilities industries. EIG's Caribbean headquarters is based in Trinidad, but it also operates subsidiaries in Barbados and Jamaica and exports to over 15 countries in and around the Caribbean basin.

To give a brief insight into making of EIG we begin with EIL (Electrical Industries Limited) which was initially formed in 1969 as a joint venture between AEI Compounds (UK) and a local Trinidadian firm. In 1997, it was acquired by Trinidad Electrical Manufacturing Corporation Limited and has become the largest manufacturer of electrical products in the English-speaking Caribbean. In 2009, the company acquired Agos Lighting, manufacturers of lighting fixtures, which added even greater value to the company's electrical portfolio. Seeking to break new ground, one of the largest PVC/plastics manufacturers Century Elson was also acquired in 2011, a household name well-known and recognized for quality as the leading providers of plastic construction and industrial packaging products.

On October 1st, 2014 the amalgamation of these companies lead to the formation of the Electrical Industries Group Ltd. With a rich heritage that spans over 80 years in manufacturing, distribution and exporting, EIG has cemented its position as a leader in the industry through consistent innovation, quality and service excellence. Today, while we are proud of our growth and achievement we continue to seek new and innovative ways to improve our products and processes to achieve optimal customer and employee satisfaction.



The company's comprehensive range of products includes:

- Electrical: cables, wiring devices, lighting solutions, switchgear, renewable energy and energy efficient products
- PVC/Plastics : water pipes and fittings, electrical conduits and fittings, rainwater guttering, water and septic tanks, packaging crates and pails
- Hardware: SPC flooring, Sanitary ware, Water Heaters, PVC Foam Board
- Consulting: Advice on industry standards, project management, RFQ, etc.

EIG is one of the few Caribbean based companies with a diverse manufacturing base that is certified from the international recognized standards institutions like:

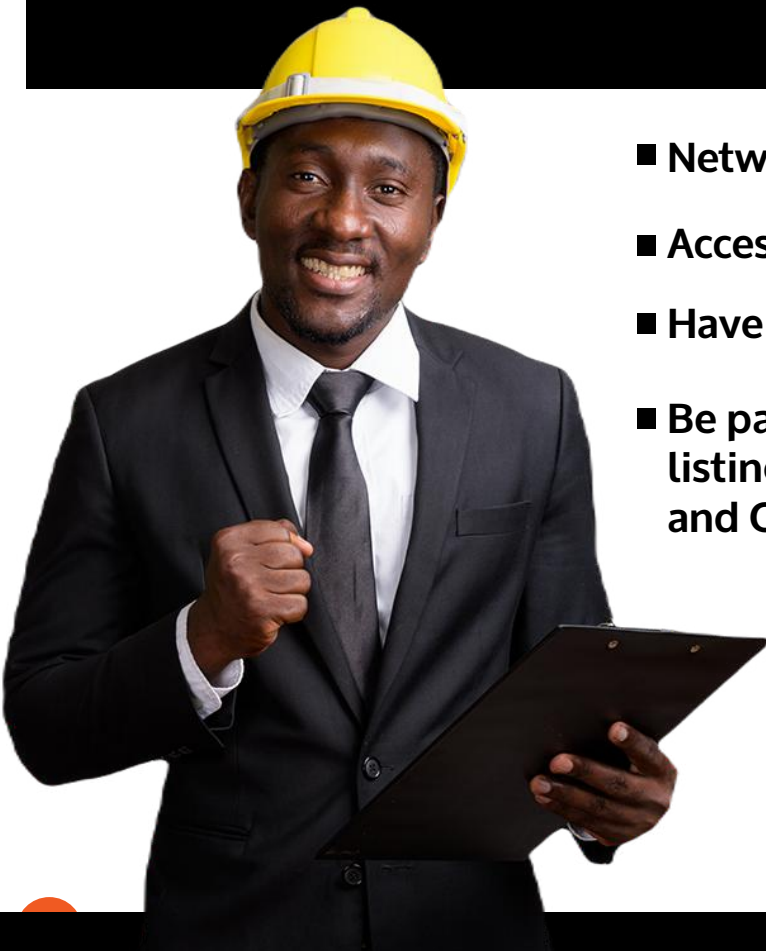
- ISO (International Organisation for Standardisation)
- UL (Underwriting Laboratories)
- ASTM (American Society for Testing and Materials)
- BASEC (British Approvals Services for Cables)
- KEMA KEUR (Netherlands/European Standard for Cables)

TTCA

TRINIDAD AND TOBAGO
CONTRACTORS ASSOCIATION




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- Have a Voice in shaping Industry Legislation
- Be part of TTCA's Database with Company listings on our Website, Annual Directory and Quarterly e-Magazine - The Contractor

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- Adam's Project Management & Construction Limited
- Agostini Building Solutions
- All Rock Investment Ltd
- Alpha Engineering & Construction Ltd.
- Anjay Limited
- ANSA Coatings
- ANSA Motors
- Anthony James Plumbing, Maintenance and Construction Limited
- Bhagwansingh's Hardware
- Broadway Properties Limited
- Building Professional Ltd
- Caribbean Industrial Research Institute (CARIRI)
- Capital Signal Company Ltd.
- CBE Trinidad Ltd.
- Comfort Engineering Limited
- Concepts & Services Company Limited
- Construction Services and Supplies Ltd
- Coosal's Construction Company Ltd.
- D. Lak Transport Ltd.
- Deonarine's Engineered Construction Ltd
- Eastern Engineering & Marketing Services (1994) Ltd.
- Electrical Industries Group
- Emile Elias & Co. Ltd.
- Fairways Construction Company Ltd.
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- International Interiors Ltd.
- Junior Sammy Contractors Ltd.
- JUSAMCO Pavers Ltd.
- Kall Co Ltd
- KEE-CHANONA Limited
- LAING Sandblasting & Painting Co. Ltd.
- Lifetime Solutions
- Logan Contracting & Transport Services Ltd.
- Lutchmeesingh's Transport Contractors Ltd.
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- Massy Machinery Limited
- Mecalfab Limited
- Namalco Construction Services Ltd
- National Quarries Company Ltd
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- Ramkaran Contracting Services Ltd
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- Roof Systems Ltd
- Rosscon Limited
- SAMCOLL Construction Co. Ltd.
- Sammy's Multilift Services Ltd.
- SCL (Trinidad) Limited
- Seereeram Bros. Ltd.
- Soar Construction Services Ltd
- Stages Building Group
- Syne's Contracting & Industries (1988) Ltd.
- T&Z Home Improvement Centre
- The Paramount Transport and Trading Co. Ltd
- TN Ramnauth And Company Ltd
- Total Housing Ltd
- Trinidad Cement Limited
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- Trinmesh Limited
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- Weathershield Systems Caribbean Ltd.
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