

# The Power of 10

Sustainability Report 2012



## The Power of 10

Experience has shown us that sustainability challenges are more urgent, complex and deeper than we thought 10 years ago; the opportunities, however, are equally greater. We are firmly committed and on the right track for a more sustainable business, with progress being made in increased business acquisition, capabilities and resilience. Grounded by these foundational years, we've connected business and sustainability and developed a Sustainability Action Plan up to the year 2020.

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**Front cover** We are pioneering the use of Building Information Modelling and extending its capabilities into 3-D, 4-D (time) and even 5-D (quantity take-off). In Hong Kong, we are calling for an industry-wide approach that fully realises the transformational power of this remarkable technology.

The online version of our sustainability report is available on our website, with Key Performance Indicators and an index aligning our report with Global Reporting Initiative (GRI) 3.1 sustainability reporting guidelines. Gammon self declares this report to a GRI Application Level of C+.

 For more information please visit [www.gammonconstruction.com](http://www.gammonconstruction.com)

### Our Brands



Civil, foundations, building, E&M and construction services covering plant and equipment, concrete technology and steel fabrication



Public-Private Partnership business



Engineering design services

## Chief Executive's Statement

In the 10 years since we began reporting on sustainability, our dialogue with stakeholders has grown from intentions towards a fuller understanding of the key enablers that embed sustainability in our operations.

As our understanding has evolved, we have realised multiple benefits as sustainability practices have become more widely adopted. Our advocacy of these practices has helped us become a leader in areas such as safety, the environment, sustainable business growth and social responsibility.

Safety at Gammon today is focused more on providing visible leadership not just from the CEO or our Directors but from all parties, especially those who lead or supervise works. The launch of our Zero Harm programme in 2009 was a milestone as it represented a new focus on planning and eliminating risks.

In 2012, we recognised that we must make bold commitments and seek radical actions that challenge industry norms. I am not content with incremental improvement. An example is increasing the ratio of electrical helpers to Registered Electrical Worker from 4:1 or 5:1 to 1:1 post energisation, and we are achieving this.

We have seen much progress on sustainability by transforming the building process, including methods such as onsite fabrication. Our cut-and-bend rebar facility at West Kowloon Terminus North and use of mechanised and precast methods at the Midfield Concourse project, for example, could serve as a model for the industry to attract more fabrication facilities and help achieve greater productivity.

For the future, we would like to offer workers viable long-term careers in the industry by offering better wages and allowing them to share in the industry's success. However, this needs to be done in a planned and structured way so that we are better able to manage our projects as well as workers' wage expectations.

According to a Hong Kong industry survey conducted in November 2012, Hong Kong will require an additional 8,000 to 10,000 workers during the peak construction period in 2013. I am convinced that government should extend their sponsorship of training to a full-term and that everyone in the industry should participate in training programmes as the number of workers currently in training is too low.

Through our Roadmap 2020, we have made a bold commitment to challenge industry norms and set an example in sustainability. We are doing this not only because it differentiates our Company, but because the next generation demands it of us.

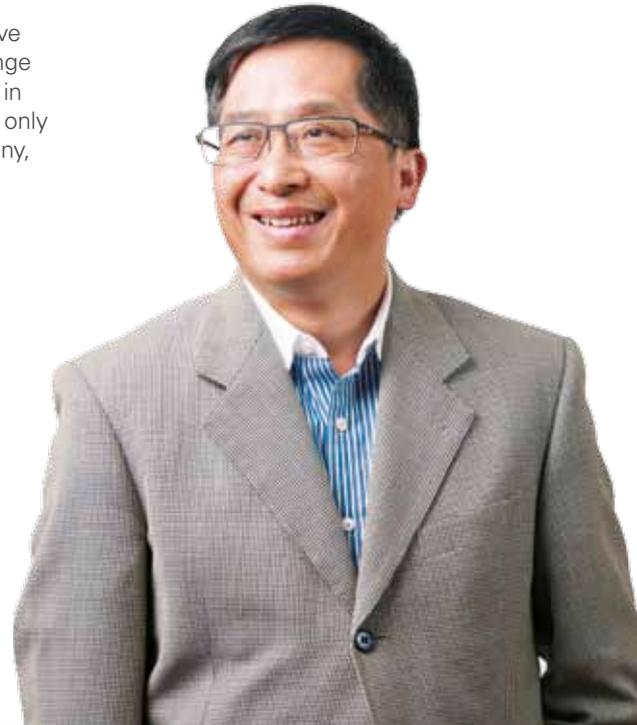
Our decision to provide leadership in sustainability is deliberate, and our Board is committed to making sustainability an integral part of all of our practices and processes.

But we will need the combined resources and commitment of all our stakeholders to make it happen.

Please join me in working together towards our shared future.



**Thomas Ho**  
Chief Executive  
Gammon Construction Limited  
March 2013



### Scope of this report

Gammon Construction Limited is a private company jointly owned by Jardine Matheson, an Asian-based conglomerate, and Balfour Beatty, a leading global infrastructure business. The principal activities of Gammon are civil engineering, foundation works, building construction, electrical and mechanical installation, manufacturing and supply of fabricated steel, manufacturing and selling concrete and rental of plant and machinery. This report covers the operations of the company and its subsidiaries in all markets for the 2012 calendar year.

## 2003–2012: 10 Years of Sustainability Reporting

With the launch of our HSE report in 2002, we became the first construction company in Hong Kong to report on its green strategy.

Innovation and planning have played a central role in the improvements we have made in this strategy. Technological advances, such as Building Information Modelling, modular design, mechanisation, steel fabrication and new concrete mixes, together with our investments in long-term personnel development, have all played a key role in our evolving sustainability strategy.

We have also been working closely with our supply chain partners to source sustainable timber, cement and steel, and engaging clients and subcontractors to promote safety, better labour relations and mutual economic gain.

### Roadmap for a Shared Future

Guided by our Roadmap, we are moving from setting year-on-year objectives and targets towards multi-year targets that span all four pillars of our sustainability framework. These have been integrated into our business planning objectives and strategies at the board level.

We have also reaffirmed our intent to provide industry leadership and encourage coordinated action among all industry stakeholders to promote sustainable construction.

To connect our Roadmap with the needs of the future, we have set up a Next Generation Stakeholder Panel, comprising staff who represent the voices of young professionals across our different departments.

### Governance and Benchmarking

The Executive Directors are responsible for creating the action plan and setting metrics. Progress is reviewed internally every half year, and our shareholder Balfour Beatty reviews our progress using a third party assessment.

Benchmarking our performance against 19 other global engineering and construction businesses, Gammon was ranked highly for senior level buy-in and robustness of data controls. Gammon also ranked in the middle for embedding sustainability.

Through forums and active roles in industry associations and societies, we have taken a leadership role not just for the promotion of Gammon's interests but for the betterment of the industry as a whole.

## 10 Years of Sustainability, and Beyond

### 2004

- Zero Accidents vision, a commitment to creating a safe and healthy working environment
- First Sustainability report issued under the 4-pillar framework



- Procurement Environmental Awareness Programme (PEAP) to increase awareness of sustainability among suppliers and subcontractors
- Innovative Fungi Bioremediation at North Tsing Yi Reclamation Project



### 2006

- 600 industry and internal stakeholders at first safety conference hosted by Gammon
- Young Professional Group (YPG) is born

### 2008

- First plant and equipment replacement schedule to reduce air pollution
- Grade 100 MPa high performance concrete at One Island East wins the 2007 Hong Kong Awards for Industries: Technological Achievement Awards



### 2002

- Balanced scorecards include sustainable metrics

### 2001

- Gammon implements ISO 14001
- *Construct for Excellence* report inspires Gammon's strategy

### 2003

- During economic downturn, Gammon relocates or seconds staff to retain their skills
- 2002 HSE report issued
- Gammon Academy established



### 2005

- Construction waste disposal charging scheme introduced in Hong Kong
- Green Mark scheme launched in Singapore



### 2007

- Asian Financial Crisis. 10 mega infrastructure projects launched as economic stimulus in Hong Kong



“Building on what we’ve learned the Roadmap looks at sustainability through the broader lens of the business and actions are defined towards a bigger vision for our future.”

Tony Small  
Director



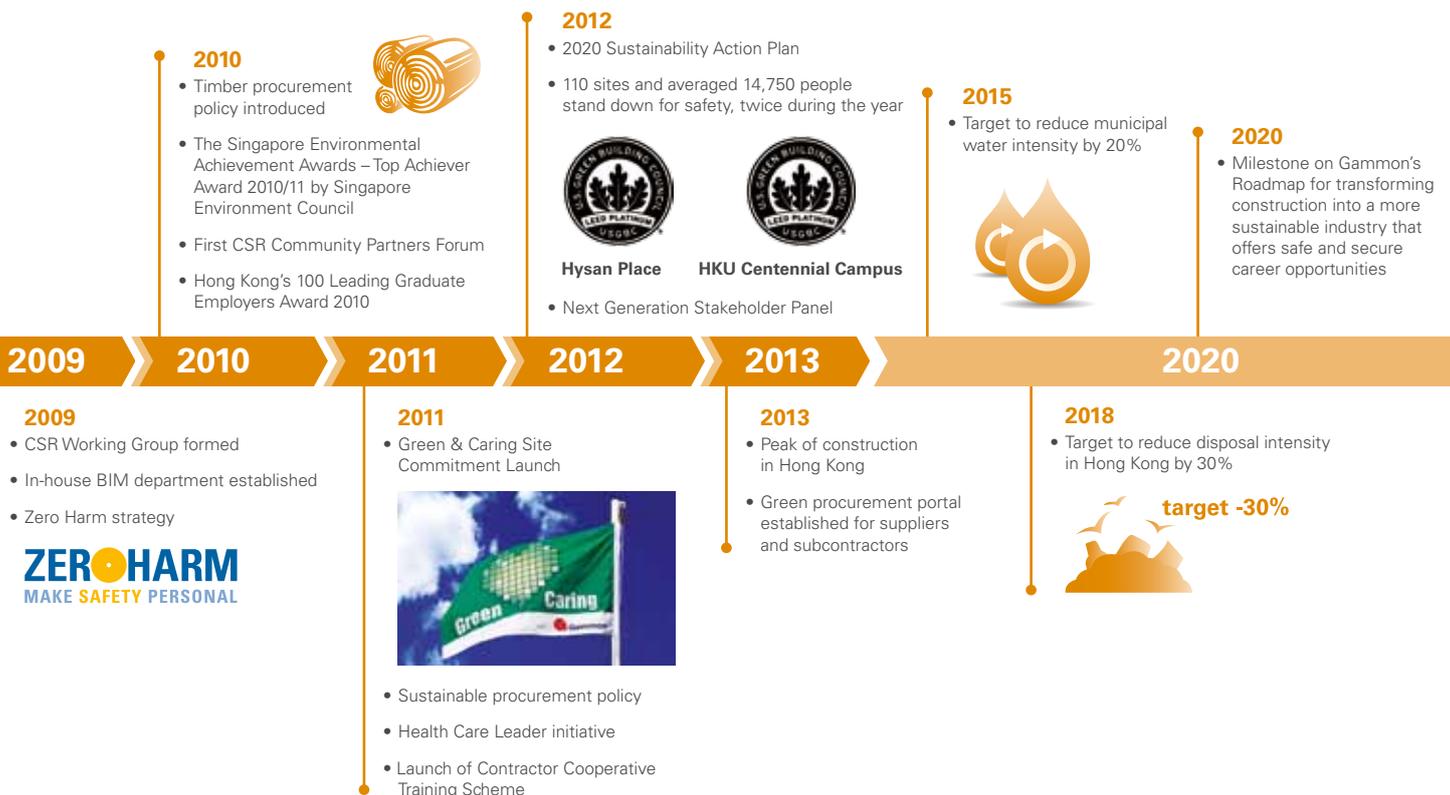
“We need everyone at Gammon to understand the Roadmap clearly so that they can contribute to our sustainability goals through their work, with the involvement of clients and the industry.”

Gilbert Tsang  
Executive Director

## ROADMAP 2020

**Our sustainability mission for the next eight years is our catalyst for change. It covers six strategic areas:**

1. Expanding Zero Harm to the whole industry.
2. Minimising our impact on the environment and reducing energy usage.
3. Procuring products, works and services that are safer and responsible.
4. Optimising design, methods and materials and offering alternatives.
5. Ensuring construction is a viable, long-term industry valued by society.
6. Adapting our skills and growing expertise to meet stakeholder needs.



# Gammon Stands Down for Safety

On 20 June, Gammon halted work across 110 worksites for the first time so that everyone could focus on the issue of safety.

The Stand Down, which is a component of visible leadership, was followed by a second Stand Down event in November.

On average, 14,750 Gammon staff and subcontractor workers participated in each Stand Down, including representatives of Gammon's shareholders, Jardine Matheson and Balfour Beatty.

These events reflect the change in mindset that has taken place at Gammon in regard to safety. Although Gammon has comprehensive safety systems in place, the Company recognises that the implementation of safety practices on worksites is critical, particularly in a more demanding environment of rising construction costs and stretched industry

capacity. Through discussions with the workforce during the Stand Down, we have been able to encourage a change in focus from improvising to planning.

The second Stand Down was particularly useful, with the debate more mature and meaningful.

The initiative was also an opportunity for senior management to provide visible and caring leadership, which together with effective planning is the single most important element in reducing accidents. This is essential for instilling a safety culture. Our analysis of fatalities and serious accidents showed that many cases of worker violation have been due to improvisations taken to get



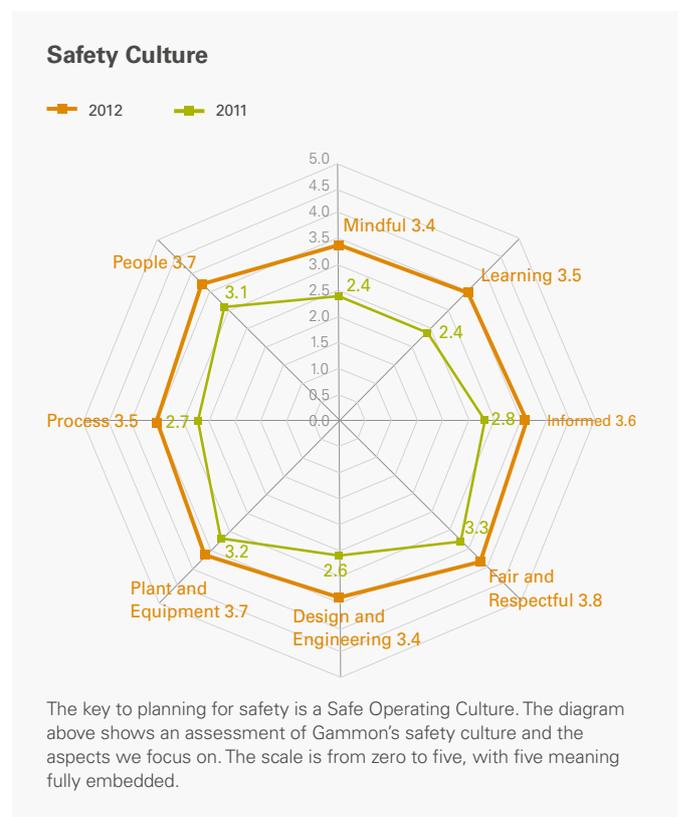
the job done and insufficient planning, particularly when a project must adhere to very tight deadlines.

The results of the two Stand Downs demonstrated that employees are becoming more willing to share their views on real problems and contribute ideas because they recognise that Gammon is serious about safety. With this bold commitment to challenge industry norms, Gammon will continue to emphasise visible leadership in safety not only at events such as the Stand Downs but throughout the year at our worksites.



# Zero Harm

**What matters most when it comes to worksite safety is providing visible leadership and challenging plans through the engagement of the frontline supervisors who directly interface with the workers.**



With the exception of one year, since we began reporting our performance in 2002 we have succeeded in bringing down our overall Accident Incident Rate.

Underlying this change is the fundamental shift in mindset that has occurred across Gammon. Previously, we attempted to prevent accidents by modifying worker behaviour but this had only limited results. Today, our focus is Zero Harm and the elimination of risks based on the layers of protection principle.

Zero Harm is all about putting in place systems that eliminate fatalities and serious injuries to workers and members of the public, as well as the risks that cause them. In 2012, we made a tremendous effort to emphasise learning and the implementation of safety practices on our sites, although we still have weak signals and near misses to remind us that safety still needs to be firmly embedded at all levels of the organisation and industry.

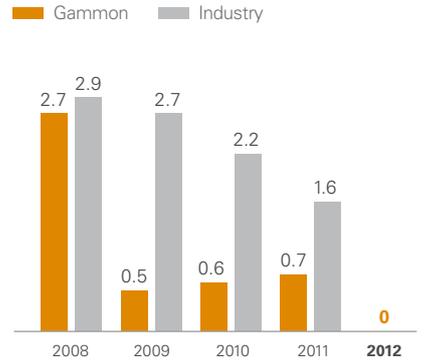


“We invest a lot of time and resources on the Directors’ Saturday site walks, where we don’t just talk safety, we do safety. Findings are reported and discussed weekly by the Executive Committee to identify the support needed for the project team.”

**John Clark**  
Head of Engineering

**Accident Frequency Rate Singapore**

per 1 million man hours worked



We achieved zero reportable accidents in 2012. Industry accident incident rates by the Singapore Government’s Ministry of Manpower. 2012 industry figures not available.

Through our exhaustive analysis of incidents, we have found that one of the key reasons contributing to accidents is poor or inadequate planning. We are now encouraging visible leadership, starting from the top, in terms of testing, challenging and coaching in all project planning. The Stand Down initiative is one example of how we are driving this message from top to bottom.

Another way we are embedding Zero Harm thinking is through our regular Saturday site walks, which involve a mix of management and various disciplines. The purpose of these site walks is not to find fault or stop work but to engage project teams and find solutions together. As a result of the exchanges that take

place, the links between management and the front line are much stronger and practical solutions are more forthcoming.

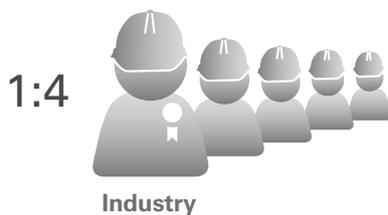
When incidents occur on a worksite, Gammon takes action immediately to investigate their causes and to rectify them. Directors will also hold on-site reviews of all incidents, however minor, and engage the workforce to seek solutions on how to prevent similar incidents in future.

Working at height is by far the leading contributor to worksite accidents in the industry, consistently accounting for over 50% of the fatalities that take place. Most commonly, falls occur from ladders and step-ladders.

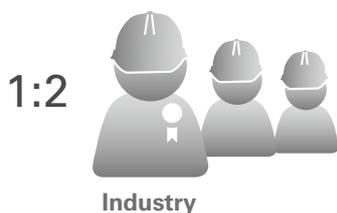
After reviewing these methods of access, we made a bold commitment to have workers use tower scaffolds or similar devices; ladders and step ladders are used only as a last resort. As well as reducing fatality risk, this should lead to a reduction in fractures from falls at height, particularly among older workers.

Incidents involving electricity are another major cause of fatalities; in 2012, eight deaths occurred in the industry due to electrical shocks. To prevent electrical incidents on our own sites, in 2012 Gammon trained 2,524 persons in the energising process and set the proper ratio of qualified electricians, registered

**Pre-energising Stage**



**Post-energising Stage**



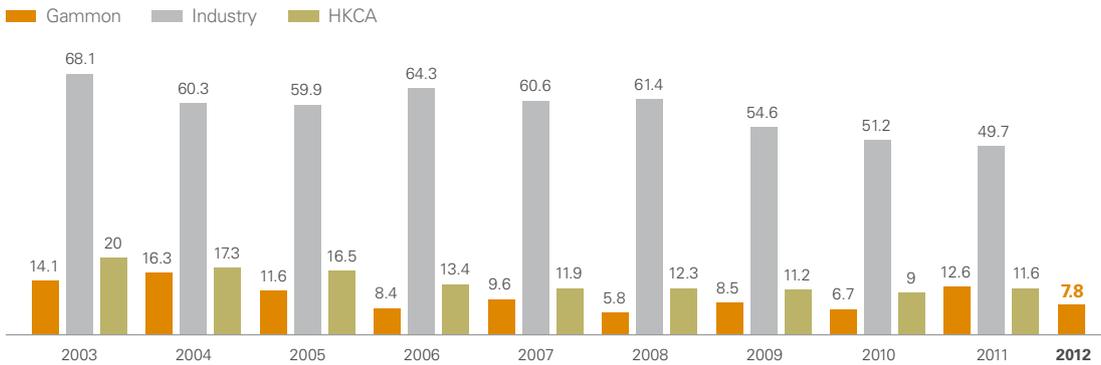
Ratio of qualified electricians and registered electrical workers to electrician’s helpers



Dynamic Risk Assessment is not paperwork. It is a continuous process of identifying what might go wrong and taking action to remove or control risks by monitoring the rapidly changing circumstances on site.

### Accident Incident Rate Hong Kong & Macau

per 1,000 workers



Industry accident incident rates are those reported by the Hong Kong Labour Department. 2012 industry figures not available.

electrical workers and electrician’s helpers. At the pre-energising stage, the ratio is now 1:2 and at the post-energising it is now 1:1, which is 50% greater than the industry practice.

We have also begun hiring our own direct labour to ensure we have qualified Registered Electrical Workers and electricians on every site, and will pay to have electrical workers qualified or re-qualified.

### Concern for our Workforce

Ten years ago at Gammon, our primary concern was safety; today our focus is on both health and safety.

Gammon now leads the industry with initiatives to promote health and safety, such as employing eight full-time nurses to provide free regular health checks on worksites and introducing preventive measures against heat stroke in hot weather. Our “New Person” programme, with helmet stickers to identify new hires, was another first that has been widely adopted by the industry.

Our onsite nurse visit and health checks continued to enjoy great success among workers, and Gammon is still the only private contractor to offer such a programme. During the year, 2,830 workers benefited from our health checks; since 2011, a total of 3,800 workers have been checked.



In 2012:  
**21,790**  
workers attended  
our Zero Harm  
Induction Centre.

One of our signature programmes, Green & Caring Site Commitment, in 2012 resulted in better housekeeping and improved worker welfare provisions. We see progress in our aim to become a clean, safe and considerate business, although the culture change needed to realise Green & Caring across all of our sites is not yet secured.



Our Choices. Based on three fictional construction workers, a new safety leaflet introduced supervisor Hei Gor, experienced worker Dee Gor and newcomer Ah Hong to Gammon sites in Hong Kong and Singapore.

# One Team, many Benefits

The HK\$6.2 billion Midfield Concourse Works project at Hong Kong International Airport is the largest solo contract ever awarded to Gammon.

The key to winning this contract was the internal collaboration between our Civils Division and Building Management teams, who pooled our expertise in engineering design, E&M, steel fabrication, concrete, and foundations.

This allows for tighter integration among all parties involved, because all process controls are handled by Gammon. It also ensures greater productivity by allowing us to provide more timely and efficient solutions as well as ensure greater sustainability through less material use and wastage.

One of Gammon's innovative solutions on this project, our early strength concrete

mix, reduces the form time by 30% to best suit the mechanised and precast methods, thus fully realising their efficiency. These methods also use half the labour and 25% of the time required, thus leading to an eight-fold improvement in safety.

By employing a specialised rock crusher, we can reuse nearly 200,000 tonnes of demolition waste as sub-base, with the added environmental benefit of reducing transport on and off the airport site.

And, by further refining the mechanical beam shutter developed by Lambeth for the Cathay Pacific Cargo Terminal, we can bring the benefits of precise and repetitive factory production to the worksite



while significantly reducing the risk of working at height.

Our control of design, implementation, methods, and materials is also enabling us to create sustainable options that will help the client meet their target of becoming the “greenest airport in the world” as well as achieving Hong Kong BEAM Plus certification.

Midfield is the first project on which we have been able to bring all of these capabilities together in one comprehensive package of skills and services. Moreover, integrated project delivery where all parties share the same goal leads to more sustainable outcomes.

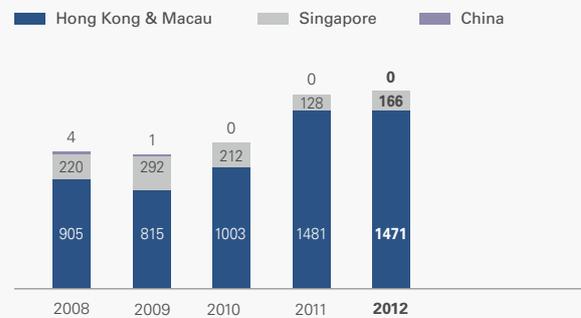


# Prosperous Markets

**Bringing many skills and capabilities together under one roof allows us to develop and deliver sustainable solutions for our clients.**

## Turnover

US\$ millions



Our turnover rose 30% in Singapore, while in Hong Kong and Macau it reached over US\$1,470 million. This was accompanied by a 20% increase in direct paid workforce needed to deliver on our growing order book in the years to come.

Hong Kong has a construction programme that is the envy of the world. Our industry continues to explore new ways to reduce costs through the trial of new contract arrangements by Government and MTRC. Gammon is at the forefront of realising the industry’s potential to transform by adopting methods based on new technologies.

## Advancing Construction through Innovation

Our industry needs to explore innovative procurement solutions that allow for value engineering and earlier contractor involvement, which will help drive down construction costs.

Earlier contractor involvement has also been identified as a way to facilitate safe construction. In this regard, Gammon welcomed the Hong Kong Government’s decision to explore collaborative contracting by trialling NEC (“New Engineering Contract”) arrangements.

“I have been particularly impressed with Lambeth’s emphasis on buildability and pragmatic approach to engineering out risk.”

**Kevin Poole**  
Deputy Director of Projects  
Airport Authority Hong Kong

We further support the vision of the Hong Kong Construction Association for improving productivity and construction efficiency by attracting precasting and rebar cut-and-bend facilities to Hong Kong. With commercial rebar cut-and-bend facilities, the number of steel fixers could be reduced by up to 40% during a period of critical labour shortages. We are seeing positive signs from Government in support of these facilities that would benefit both the public and private sector in the future.

In 2012, Gammon continued looking at productivity enhancements such as the mechanical shutter method now being used on the West Kowloon Terminus Station North and Midfield Concourse

projects. By bringing the benefits of factory-controlled production to the construction worksite, this system provides the opportunity to regain productivity while improving quality and safety. In addition, we are fortunate to have space on these projects for a precast yard that benefits safety, quality and speed of construction.

Other technology innovations include the Gammon-developed series of smartphone apps, the i-Simplification system, which streamlines safety inspection and permit checking, inspections and receipt of major materials. Currently, there are over 8,000 inspection records from our pilot and newly-awarded projects captured by these apps.

### Planning with BIM

We continue to push strongly for the wider adoption of Building Information Modelling, or BIM, in Hong Kong, which is currently not being used to its full potential.

BIM speeds up the planning and design process for complex projects by allowing them to be built virtually before construction begins. It also allows for clash detection and more accurate sequencing of works to avoid costly and time-consuming conflicts. Led by the designer, BIM facilitates quantity take-off by the contractor and additional refinements after construction has commenced.



The cut-and-bend factory at our West Kowloon Terminus Station North project is the first in Hong Kong to use computerised scheduling and automated cutting, bending and sorting.

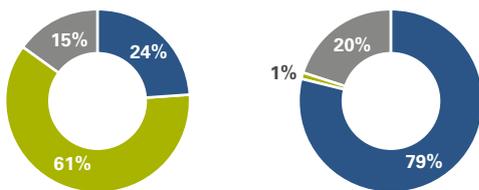


Gammon developed a suite of mobile phone apps that allow frontline staff and management to improve inspections and dynamic risk assessments on the spot without paperwork.

#### Order Book by Sector

Percentage

Public Quasi public Private



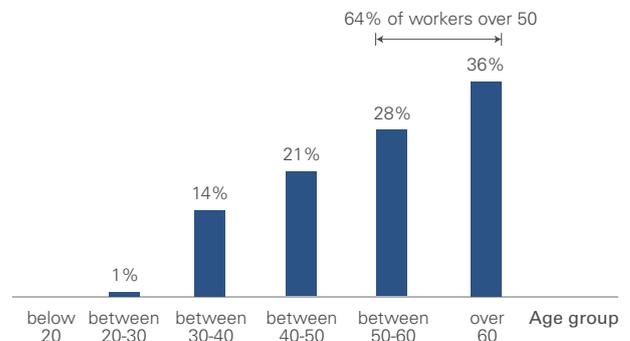
Hong Kong & Macau

Singapore

Our order book grew by 14% in 2012, with a notable rise of 30% in our Singapore operations in both public and private sectors. In Hong Kong, MTRC and Airport Authority contracts dominated the increase in our order book.

#### Forecasted Hong Kong Industry Demographics, 2022

Percentage



Projecting from year 2012 data to the year 2022, over half of the construction workers in Hong Kong will be over the age of 50. The industry must make every effort to train a local workforce, or we will lose their experience and require imported labour.

Source: Construction Workers Registration Authority, Hong Kong

What's more, BIM is a valuable tool for planning the whole life cycle of a building. BIM and the 3D models it generates encourages best practices in constructability, efficient design and opportunities for the owner to operate and maintain the building at optimum levels over the course of its lifetime.

To fully realise the transformational ability of BIM, Gammon would like to see the Hong Kong industry adopt the BIM model for streamlining the procurement process. This is already happening in other jurisdictions, where strict timelines have been put in place for the implementation of BIM.

### Greening our Supply Chain

Our green procurement strategy 10 years ago was focused on finding the best quality materials at the lowest price. In 2003, we expanded this strategy to include sustainable materials by establishing PEAP, our Procurement Environmental Awareness Programme.

Initially, we encouraged our supply chain to source sustainable materials whenever possible. During the first few years, we focused our efforts primarily on understanding and researching the market. Then, in 2006, we began setting specific measurable targets for procuring

timber from Forest Stewardship Council (FSC)/Program for the Endorsement of Forest Certification (PEFC) suppliers. Each year, we increased our targets – from 70% in 2009 to more than 95% in 2012 (actual rate achieved: 99%).

Today, we have extended our green procurement programme to embrace other materials such as steel, including recycled steel and steel sourced from nearby suppliers, and measuring its carbon footprint. Recently, we have begun offering biofuel for running our plant and machinery more sustainably.

Our aim is to establish sources of sustainable construction materials by continuing to support our supply chain partners and helping them establish a market for their products. Ultimately, we hope to create a tipping point where the market is self-sustaining. Already, we have helped two timber suppliers become FSC accredited suppliers, and we are currently working on more.

For 2013, our target is to set up a portal for sharing knowledge and developing a list of preferred suppliers/subcontractors.



We are starting to use B5 bio-diesel for the construction plant, which has added benefit of being made with cleaner Euro V diesel.



Susan Siu, Head of Procurement of Gammon (right) receiving the Gold Award, Green Purchasewise Award (Corporation), Hong Kong Green Awards 2012, from Prof. Ryoichi Yamamoto, Chairman, International Green Purchasing Network (left).

**Green procurement goes beyond contract requirements, and as such we have begun offering large-scale use of bio-fuel (B5) to our clients.**

“We applaud MTRC and our Hong Kong Government clients who are trying new contract forms with greater collaboration, which we believe will bring wholesale benefits to the industry.”

**Nigel White**  
Executive Director



# New Life for a Heritage Site

When undertaking historic renovation projects, we first think about conservation then we think about construction. This represents a new way of thinking for contractors.

The Central Police Station is a project that will conserve and revitalise one of Hong Kong's earliest and most important colonial structures. Built in the mid-19<sup>th</sup> Century, the complex was subsequently extended or altered in the following decades and eventually decommissioned in 2006.

Gammon is managing the project to restore this heritage site in the heart of urban Hong Kong, with the objective of conserving the past while providing a new facility for modern use. Out of the 19 buildings on the site, 16 will be retained and renovated, and two buildings will be constructed.

During the course of construction, special care is being taken to protect many of the site's features, such as old doors with glass, mouldings, tile floors and window frames. As the site also has a number of old trees, these had to be protected by fencing with a sealed base and foliage cleansing system.

Since the work site is located in a highly congested urban area, the need to reduce the impacts of construction, such as traffic, dust, noise and vibration, and minimise disturbances to nearby residents is paramount. Measures to reduce noise and air pollution and dust include



extensive use of acoustic shielding, considerate scheduling of works, the selection of appropriate construction plants, and strict control over emissions.

The project will help Gammon build up its skills and resources to undertake similar projects in the future. As society looks to retain legacy infrastructure, we anticipate many similar projects in the pipeline, such as in Kowloon East where the Development Bureau plans to restore old buildings and adapt them to modern needs.



# Environmental Stewardship

**Our approach to environmental stewardship is to go beyond compliance with existing laws and regulations and to treat the earth as a stakeholder.**

Environmental Targets	2012 Target	Actual
Inert waste diversion	40%	47%
Water recycling	50%	62%
Office energy efficiency	17kWh/m <sup>2</sup>	14.7kWh/m <sup>2</sup>
CO <sub>2</sub> Intensity	–	Developing internal tools and systems
Compliance actions	Nil	1*

\* HK\$2,000 fine in Hong Kong for a truck exiting a site with only half cover. One composition fine totalling S\$4,000 in Singapore. Also in 2012, we paid a fine of HK\$100,000 related to a noise incident that occurred in 2011.

Over the past 10 years we have been implementing measures to improve our environmental performance by measuring and mitigating the effects of our operations on the environment. Today, we have come to recognise that our targets must be longer term and more multi-dimensional.

## Reducing Carbon Emissions

Energy, the primary resource used in construction, can be divided into directly used energy (including diesel, gasoline, kerosene and LPG) and indirectly used energy (including electricity).

To minimise our energy consumption, we used to set specific year-on-year reduction targets of 5%. Now, we look at all of our businesses, identify what processes can be changed and determine the best balance between energy use and cost.

In tandem with this, we are monitoring our long-term greenhouse gas emissions and since 2005 have been working to reduce CO<sub>2</sub>(e) by gradually switching to electricity from diesel in our operations when we can.



Traditional Method

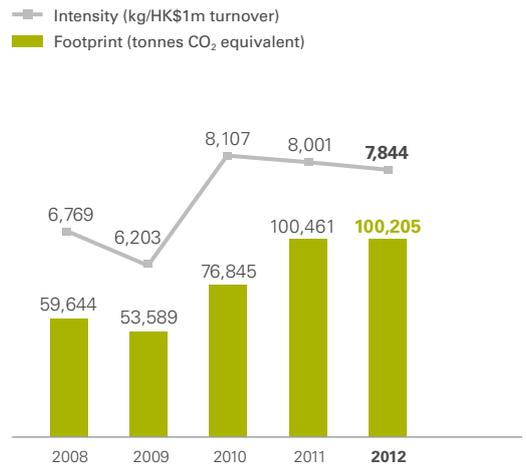
The best way to reduce waste and environmental impact is by refining design and method. The key to making this work was in the design details during the transient construction phase.

An innovative precast concrete retaining wall method reduces construction time and materials at Tolo Highway.



Innovative Method

### Carbon Footprint and Intensity



Carbon intensity has declined for 2 years even as our turnover increased. We attribute this reduction to the use of electric over diesel equipment.

We are also targeting the energy we consume in our offices. Under the WBCSD Building Energy Efficiency Manifesto, in 2012 we set baselines and conducted opportunity assessments primarily in the areas of lighting, electrical equipment and cooling.

In 2012, we formed an internal carbon task group comprising representatives of our various departments with the mission of embedding carbon accounting into our workflow for major materials. During the year, we modified our procurement systems to track Scope 3 data from suppliers and worked on in-house standards for calculations. Our ultimate goal is to support and enable our clients and supply chain towards lower-carbon infrastructure.

### “True” Waste Cost

Landfill space stress and scarcity in Hong Kong are making waste disposal an increasingly important business issue. For Gammon, the generation and management of waste impacts profitability and productivity, and adds to our logistics burden.

We see opportunity in addressing the true cost. In 2012, Gammon’s quantity of landfill waste increased to 38,759 tonnes, the majority of which came from building-related works.



We see opportunity in addressing the true cost of waste.

To drive long-term transformational reductions in our waste streams, our Sustainability Roadmap targets a 30% drop in landfill waste intensity by 2018. In 2013 we are focusing on the waste streams we can influence and will try our best to reduce waste generation and reuse waste materials rather than depending on recycling.

### Water Conservation

Water availability, quality and access have rapidly become critical global issues extending well beyond environmental concerns. At Gammon, water conservation is an integral part of our Sustainability Roadmap.

Many key construction processes require large volumes of water. In 2012, we directly consumed 1,258,943 cubic metres of municipal water at a rate of 98.6 cubic meters/HK\$1million turnover, which was 8.2% below our baseline.

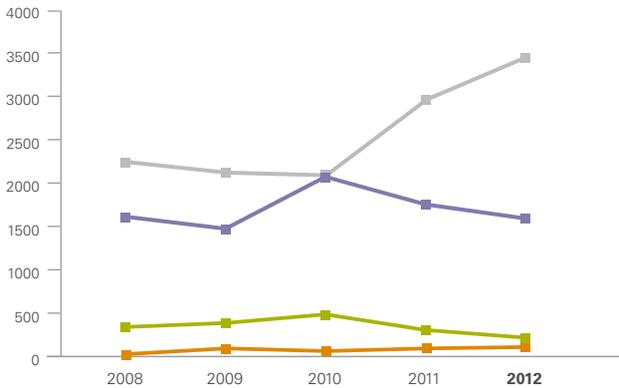


“We have set an ambitious target to reduce waste, and we are doing our best to meet it. To achieve waste reduction, we need to focus on buildability, reduce the extent of the wet trades and have contract periods that give more time to manage planning and logistics. Only then can we control waste.”

MK Woo  
Executive Director

### Energy Usage

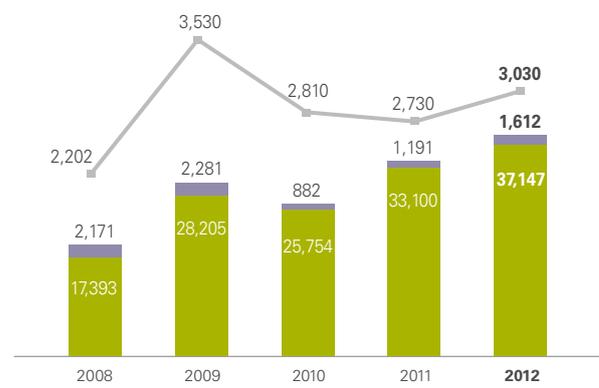
■ CO<sub>2</sub> (e) from air travel (tonnes)    ■ Electricity (kWh/HK\$1m turnover)  
■ Diesel (litre/HK\$1m turnover)    ■ Petroleum (litre/HK\$1m turnover)



Through promoting electrification, a clear relationship shows the electricity intensity up 16.2% and diesel down 9.2%; and our carbon intensity drop 2%.

### Waste Landfilled and Intensity

■ Singapore (tonnes)    ■ Hong Kong & China (tonnes)\*  
■ Intensity (kg/HK\$1m turnover)



\* No construction project was carried out in China during 2012.

To secure our future water resources, we have set our next target of reducing municipal water usage intensity by 20% in 2015. In addition to encouraging our own businesses to conserve water, we will work with our strategic partners to improve our water recycling.



**-20%**

Long term target of reducing municipal water usage intensity by 20% in 2015.

### Transforming the Building Process

Sustainability is a recurring theme in our innovation efforts and in the competitions we hold among our staff. Doing this requires the courage to challenge or break from traditional construction practices.

One approach is to make greater use of modularisation and prefabrication. Through the modularisation of our E&M systems, our projects benefit from less time on site, greater safety, a higher quality of workmanship and reduced wastage, all of which contribute to greater sustainability.

We are also using prefabrication on the West Kowloon Terminus North project, where we are automating the production process with an onsite rebar (reinforcement bar) cut-and-bend facility.

This project is the first in Hong Kong to use computerised scheduling and automated cutting, bending and sorting of rebar.

Another example of prefabrication can be seen on the Tolo Highway project, where we have incorporated a precast retaining wall skin that dramatically reduces construction time, eliminates about 70% of the timber formwork and yields a consistent high quality finish. Together with a climbing scaffold assembled from recycled components, this method results in a safe, tidy and highly productive work process.

We are still quantifying the benefits of this method. Previously, we had built a wall 7 metres high and 80 metres in length in eight months using the traditional method; with the precast design for the new wall measuring 11 metres high and 200 metres long, we expect to complete it in just four months (see photo on page 14).

### Sustainable Steel and Concrete

As concrete and steel are the two most widely used materials in construction, we will be increasingly focusing our efforts in the coming years to reduce the impacts of these materials. This is being achieved through sustainable procurement of recycled content, lower embodied carbon and the use of design alternatives to reduce the material quantities and plant required.

In addition to precast concrete, our Construction Services Division (CSD) is developing new, more sustainable concrete mixes. For the West Kowloon Terminus Station North of the Express Rail Link, CSD has formulated a low-volume-change concrete mix that minimises thermal expansion and cracking after the concrete has dried. As a result of this innovation, fewer workers and up to 30% less rebar are required when building concrete structures.



YT Lui, Gammon Director (left), receiving the Hong Kong Awards for Industries (Innovation and Creativity) for the Green Treatment of Marine Mud technology at the Kai Tak 1A site project from YK Pang, Deputy Chairman of the Hong Kong General Chamber of Commerce (right).

# On the Path to Sustainability

During Gammon's Sustainability Month in May 2012, we celebrated the completion of a nine-month community service project to upgrade footpaths at the Fung Yuen Butterfly Reserve.

The project at the Reserve, which is home to 80% of Hong Kong's butterfly population, was a tremendous opportunity for young Gammon engineers to practise project management skills, with senior staff providing professional advice along the way. It also enabled Gammon to realise the full extent of its capabilities by involving staff at all levels of the Company.

Originally, the Fung Yuen Butterfly Reserve had asked Gammon simply to provide the money for purchasing construction materials. We saw a greater opportunity. Working with the Reserve, we developed

a comprehensive solution that made use of 10 tonnes of waste materials and Gammon's unique capabilities.

For this project, 58 staff from across Gammon Group and our Lambeth engineering completed 218 metres of footpaths that help increase the area's accessibility and provide an environment which encourages natural groundwater seepage and recharge.

The teamwork needed to build the project benefited not only the Reserve, but also our staff who want to get involved and put



their skills to work in community projects. With this project, we were able to address the needs of a community organisation by contributing more than just financial assistance. This is central to our CSR efforts, as it makes our company stronger and more capable.

The work done by the team provides a strong testament to the community spirit at Gammon, and Fung Yuen was thrilled with the quality of the completed project as it survived a Typhoon 10 storm that struck Hong Kong later that summer.



# Strong Relationships

**Construction is still widely perceived as a “3D” industry – dirty, dangerous and demanding.**

Gammon Social Performance	2011	2012
Graduate Recruitment	105	<b>135</b>
Technician & Craft Apprentice Recruitment, Hong Kong	51	<b>73</b>
Training hours per staff employee	22.3	<b>22.8</b>
Volunteer hours	5,226	<b>5,225</b>
Number of community events	106	<b>109</b>
Scholarships	10	<b>30</b>

To put construction in a better light and resolve the critical skills shortage in the industry, we are working to make construction a more attractive career option. Our approach has been to build a culture of caring and trust at Gammon by, for example, retaining or redeploying as many people as possible during the 2003 downturn. This rational and thoughtful approach helped build our reputation as an employer that values its people.

Today, the demand for skilled workers industry-wide continues to outstrip supply. If we are to have sufficient numbers of workers during the peak of construction in 2013, urgent action must be without delay. Through initiatives such as our Green & Caring sites programme, the industry must commit to improve working conditions and welfare and provide workers with the skills they need to pursue long-term careers in construction.

## Jobs with a Future

Since 2010, Gammon has been collaborating with its subcontractors and CICTA to train new blood in trades with serious shortages of workers. The Contractor Cooperative Training Scheme (CCTS) is the main platform for this collaborative effort.

To bring in tunnel workers, for example, we held a job fair in 2012 with the promise that we would train new hires. We succeeded in attracting 300 young people and are now training 20. However, for the industry as a whole, this figure falls well short of the 8,000 workers needed for all tunnel projects underway or under planning in Hong Kong.



**“We shape our future”**

Formed in 2012, our Next Generation Stakeholder Panel represents the voice of young professionals at Gammon. They will serve a two-year term and provide independent views directly to senior levels on Gammon’s approach to and implementation of sustainability practices.

One solution would be for the Development Bureau of the Hong Kong Government and MTRC to make the provision of training mandatory for all new and existing contracts. We would also like to see Government extend their sponsorship of training programmes beyond the current three months, as many trades such as plumbing require a full year for certification.

In addition to training, Gammon has adopted a direct labour model of building up a workforce with multiple skills, rather than relying solely on subcontractors. This promotes greater efficiency while adding value to our clients’ projects.

Our Roadmap 2020 objective is to make construction a profession of pride. With higher wages now being offered in many trades, construction is becoming

a more desirable and stable career for workers, who can look forward to steady employment over the next 10 years on the large number of infrastructure and housing projects currently scheduled.

By enhancing the appeal of construction as a career, we hope to reverse the industry’s demographics which show that 10% of the workforce is over the age of 60. Through the initiatives introduced, our hope is to lower the average age of the construction workforce by five years, although we recognise that this target will be difficult to achieve in Hong Kong.

In Singapore, by contrast, we are still able to import sufficient manpower. We also employ our own workers, which gives us a strong competitive advantage in this very active construction market.

**Get Together for Tomorrow**

On 11 October, 350 clients, business partners and shareholders joined our Cocktail Reception – Get Together for Tomorrow in which we listened and we learned, as we believe that it is vital that we work with our customers and business partners so that together we can create a more sustainable future.



To deliver sustainable success to our customers, on 11 October, we got together with 350 clients, business partners and shareholders to share, listen and learn.



“This year, because of the shortage of skilled labour, we brought out a roadmap for each business unit with specific actions for recruiting and developing workers, such as welders and mechanical fitters in our E&M division.”

**Edmond Lai**  
Director, Human Resources

Gammon has adopted a direct labour model of building up a workforce with multiple skills, rather than relying solely on subcontractors. This promotes greater efficiency while adding value to our clients' projects.



Under Gammon's "New Person" programme, new hires wear helmet stickers so that older workers can pass on knowledge and skills to them.

### A Culture of Caring

Our corporate culture is unique among Hong Kong construction companies in its blend of the Chinese emphasis on relationships and Western systems and rationality. Our approach to client relationships also helps us win their trust and gives them the confidence that we can deliver to their quality standards.

Within Gammon, we place great importance on caring for our staff, which reinforces behaviours and helps get business done, both internally and externally. Our Green and Caring Sites initiative, for example, demonstrates that we are serious about worker welfare and safety. Together with worksite facilities such as lockers, canteens and WIFI, it is part of the respect that we give our workers.

We also engage regularly with the workforce through a variety of channels, most importantly via face-to-face breakfast and lunch meetings with frontline workers.

Our culture of caring extends beyond workers to their families. If workers are injured, we will visit their families and provide any necessary assistance. We also involve workers and their families in recreational activities. During the year, the Frontline Committee held a large number of activities, including a BBQ outing, boat trip, geo-park trip, dinner party, fireworks night with a buffet dinner and a visit to Noah's Ark, all of which were highly appreciated.

This approach to worker welfare and wellbeing ensures that our staff are loyal and long-serving, as is evident in the number of workers who have been with us for two and even three generations.



Rest shelters and user-friendly facilities on worksites are part of Gammon's culture of caring.

### Direct Workforce

monthly paid staff and daily paid workers



In 2012, our direct workforce expanded across all regions. The total workforce on our sites, including subcontractors, reached 17,576 persons. Training programmes for workers will continue to support bringing new blood into the industry.



To bring new blood into the industry and relieve the critical labour shortage, Gammon holds job fairs as part of its recruitment efforts.

# Commitment to Green and Caring Sites

Since the launch of our Green & Caring Site Commitment programme in 2011, a total of 81 sites have participated in the programme. 12 sites have been awarded the Flag with outstanding performance in 10 criteria and achieved a higher standard beyond what our client requires or the government mandates.

Our Green & Caring programme is based on key indicators and high standards that promote the green and caring culture of Gammon. Regular assessments mean that employees consistently monitor sites.

To guide us, we have developed progressive environmental and social construction standards.

## Criteria

- Site setup
- Site energy, water and waste management
- Bulk waste management and material storage
- Waste receptacles and usage
- Monitoring and reporting
- Worker welfare
- Access and egress
- Site cleanliness and tidiness
- Community engagement
- Segregation of plant and people

## Bonus

- Innovation
- Participation in awards

"SEC had the opportunity to visit one of Gammon's construction site offices and we were thoroughly impressed. "Green" is the last word one would use to describe a construction site office. However, any visitor to their site office would clearly see their strong commitment to environmental sustainability.

We hope that many others will follow in Gammon's footsteps and that the implementation of green practices will quickly become the norm in the construction industry."

### Jose Raymond

Executive Director  
Singapore Environment Council, 2012



For more information please visit  
[www.gammonconstruction.com](http://www.gammonconstruction.com)

## These projects earned flags in 2012



### Harbour Area Treatment Scheme Stage 2A, Hong Kong

- Noise reduced by >25dB(A) (insertion loss)
- Integrated bio-filtration barriers with spent mushroom compost was installed for improving the air quality
- 130,000 tonnes of C&D materials recycled/reused
- Merit in Hong Kong Award of Environmental Excellence in 2011



### Central Police Station Conservation and Revitalisation, Hong Kong

- Recycled 60% demolition waste
- Excellent tree protection measures
- Safe access and egress for all workfronts



### Civil and Track works for Addition and Alteration works at Bishan and Ulu Pandan Depots, Singapore

- Active involvement of staff in the Environmental Corpus Fund System
- Excellent stakeholder engagement
- Over 40% of steel from previous project was reused
- LTA Annual Safety Award and "Project Eco-office Certification" for site office by Singapore Environment Council
- Innovative precasting solutions greatly benefit productivity and resource optimization



## ASSURANCE STATEMENT

### SGS STATEMENT ON ASSURANCE of Gammon Sustainability Report 2012

#### NATURE AND SCOPE OF THE ASSURANCE

SGS Hong Kong Ltd was commissioned by Gammon Construction Limited. (hereinafter called "Gammon") to conduct an independent assurance of *The Power of 10 Sustainability Report 2012* (hereinafter called "the Report"). The scope of the assurance, based on the SGS Sustainability Report Assurance methodology, included all texts and 2012 data in accompanying tables, contained in the report. Data and Information of subsidiaries of headquarters were included in this assurance process, which covered Hong Kong, Macau and Singapore.

The information in the Report and its presentation are the responsibility of Gammon. SGS has not been involved in the preparation of any of the material.

Our responsibility is to express an opinion on the text, data, graphs and statements within the mentioned scope of assurance set out below with the intention to inform all Gammon's stakeholders.

This report has been assured at a moderate level of scrutiny using our protocols for:

- Evaluation of content veracity; and
- Evaluation of the report against the Global Reporting Initiative (GRI) Sustainability Reporting G3.1 Guidelines and the principles as set out in the AA1000 (2008).

The assurance comprised a combination of pre-assurance research, interviews with the management and employees, documentation and record review.

Financial data drawn directly from independently audited firms has not been checked back to source as part of this assurance process.

#### ASSURANCE OPINION

On the basis of the methodology described and the verification work performed, we are satisfied that the information and data contained within the Report verified is accurate, reliable and provides a fair and balanced representation of Gammon sustainability activities in 2012. The assurance team is of the opinion that the report can be used by the Gammon's stakeholders.

Findings and recommendations on its reporting process and content are separately submitted to Gammon for their consideration on the compilation of future sustainability reports. We believe that Gammon has chosen an appropriate level of assurance for this stage. In our opinion Gammon's *The Power of 10 Sustainability Report 2012* fulfills the content and quality criteria for the GRI G3.1 Guidelines Application Level C+.

**Signed:**

**For and on behalf of SGS Hong Kong Limited**

Ben Tsang - Senior Director, China and Hong Kong  
Systems and Services Certification  
19 March 2013  
[www.hk.sgs.com](http://www.hk.sgs.com)

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*We value and encourage dialogue on our reporting mechanism. Feedback provides insight that helps us to better communicate what is important and of interest to our stakeholders. We encourage questions or comments by contacting [environment@gammonconstruction.com](mailto:environment@gammonconstruction.com).*

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