BUSINESS REVIEW 2017



Welcome to ECAS' 2017 Business Review!



Following the year of re-branding and 20 years milestone, we did not expect 2017 to be that eventful. We focused on building stronger internal ties and after hard

discussions and brainstorming, we were able to accomplish the goals that were set at the beginning of the year.

Through out the year, we have worked hard to strengthen our BIM team both in Singapore and the Philippines to better cater to the needs of our clients. We have also developed expertise using mass engineered timber in our structures to provide a more sustainable option to building materials.

With all these changes in the engineering side of our business, we have also made it of high importance the strengthening of our general business. As such, we embarked in the Business Excellence journey with SPRING and half way through 2017, we were given the Singapore Quality Class certification for our good business practices.

We look forward to making 2018 as exciting as the previous years. We hope you join us in that journey. In the meantime, please enjoy our Business Review.

> Kind Regards, Er. Chan Ewe Jin Managing Director



Game-Changing Technologies

With Singapore's shift in focus towards more sustainable building and construction practices, all members of the construction industry are engaging in the adoption of Design for Manufacturing and Assembly (DfMA) technologies where a substantial part of the construction and design is done off-site in a controlled environment. As part of the company's mission to adopt new technologies and keep up to date with standards, ECAS has adopted Mass Engineered Timber practices in its designs.

Mass Engineered Timber, known as MET, was adopted a few years back in Singapore as one of the construction materials. It is now a major construction component of new buildings. MET is an advance and productive construction technology, focusing on sustainability. It uses timber panels (or lamella) sourced from sustainable forest, glued together and cut to the standard dimensions or specific sizes in factories. They are then delivered to the site and assembled together. MET can be seen in two versions: Cross Laminated Timber (CLT) and Glued Laminated Timber (Glulam). In Cross-laminated Timber, layers of

wood are stacked perpendicularly and bonded with adhesives while Glulam has all the grains aligned to the same direction and glued with adhesives.

MET has many benefits and can be used for the construction of various types of buildings.

1. Reduction of manpower and construction time

As it is manufactured off-site and assembled on-site, it is a finished product whereby no further aesthetic treatment is required. MET has manpower savings and construction time is reduced.

2. High Strength-to-Weight ratio

Timber is stronger than concrete and steel in terms of Strength-to-Weight ratio.

3. Sustainable

MET is renewable and sustainable construction material. It is harvested from sustainable source where new trees are re-planted for every tree harvested. The use of MET reduces energy usage and carbon footprint, has better thermal performance and produces less waste, noise and dust during construction.

4. Its fire-resistant and can be easily maintained

MET does not burn, it chars. This inherent property allows the structure to be designed with the required fire-rating. Since the MET is a finished product by itself with anti-UV and anti-termite coating, there is minimum maintenance required though regular inspections is necessary to check for moisture content and presence of termites.

ECAS has used MET in the design and construction of the NTU Sports Hall, Pei Hwa Secondary School, Ahmad Ibrahim Secondary School, and the NTU Yunnan Garden Pavilion, amongst others.

While these technologies are beneficial as standalone technologies, the real gain in productivity and sustainability is when they are combined for a final project. ECAS is already using BIM to supplement MET and we hope to continue the adoption of other practices to better service our clients.

Sources: 1. Business Times Infographic: Building with Mass Engineered Timber. 25/04/2017. www.businesstimes.com.sg/sites/default/files/attachment/2017/04/25/BT_20170425_CCNTUWAVE25_2855225.pdf 2. Singapore Times: NTU's new sports hall The Wave. 24/04/2017. www.straitstimes.com/singapore/housing/five-things-to-know-about-ntus-new-sports-hall-made-of-mass-engineered-timber 3. BCA Build Smart: What is Mass Engineered Timber? 06/2017. www.bca.gov.sg/Publications/BuildSmart/others/buildSmart_17issue35.pdf





Pei Hwa Secondary School and Ahmad Ibrahim Secondary School ECAS was the Qualified Person (design and supervision) in MET works for both schools. The projects comprised of two-storey indoor Sports Hall made with MET. The 24 meter curve roof was made up of glulaminated rafter, cross-bracing and tie-beams including timber purlin. The second storey comprised glulaminated timber beams and CLT structural floor.

Business Excellence

Two years ago, ECAS embarked on a journey to understand its current performance, compare it to others in the industry, and strive for improvement. It was a journey to strive for Business Excellence. In 2017, ECAS was given the Singapore Quality Class certification by SPRING Singapore, a certification given to companies that have attained robust business fundamentals and that meet standards of good business performance.

During this time, we have studied our company in great detail. We have looked at the key components





We look forward to continuing our road towards excellence with all employees. After all, excellence is one of our core values.



EXCELLENCE | COMMITMENT | ASSURANCE | SAFETY

Projects Completed in 2017





ER495

Consulting services for the roadworks at Upper Serangoon Road between Hillside Drive and Lowland Road



C1762: QP for MRT Flood reinforcement for stations and tunnels, noise barriers, A&A for Bishan depot workstation, and A&A to SPLRT



Lor Halus Infrastructure works (Roads, drains & sewers) at Lor Halus



Bedok North MRT Station: DTL Construction and completion of civil defence Bedok Town Park Station and tunnels



Marina One 2-blocks of 30-storey office buildings and 2-blocks of 34-storey Residential Buildings (Total 1042 Units)



High Park Residences 6 blocks of buildings, 4 bungalows, 10 semi-detached and 9 shops, with carparks, swimming pool, and communal facilities



Overhead Bridge Pedestrian Overhead Bridge for West Coast Community Club



Community Club

Reconstruction of the existing Kebun Bahru Community Club with a roof terrace, multi-purpose hall and basement carpark



Marymount Convent School Erection of a 4-storey classroom block, a 5-storey classroom block and a 3-storey Indoor Sports Hall



Sengkang Hospital Development of an integrated regional Hospital, a community Hospital and specialist Outpatient Clinics



Hougang Bus Depot Modifications to existing depot



Church of St. Peter & Paul Alterations and additions and restoration works to existing Church



Wisma Geylang Serai and POB Lifestyle Hub including space for community activities and services. Pedestrian overhead bridge between centre and Geylang Serai Market

2017 Awards





ECAS Consultants Pte Ltd is a leading multidisciplinary engineering firm offering design consultancy, accredited checking, construction supervision, and inspection services to clients of the public and private sector for a range of projects in Singapore. The company is ISO 9001 certified for Quality, ISO 14001 certified for Environment protection, and OHSAS 18001 certified and bizSAFE STAR for Safety in the workplace. ECAS counts on Professional Engineers and more than 120 employees to support our clients in their projects.

Capabilities

Road and Bridge Engineering | Rail Engineering | Building Engineering | Tunnel Engineering | Infrastructure Engineering Geotechnical Engineering | Structural Engineering | Environmental Engineering | Mechanical Engineering | Traffic Planning

Services

Design Consulting Services | Construction supervision | Assessment and investigation | Design Review | Design for Safety Building Information Modelling (BIM) | Steel and Rebar Detailing | Project Management

Industries

Real Estate | Industrial | Utilities | Transportation | Infrastructure | Institutional

For more information on ECAS Consultants Pte Ltd, please check our website at www.ecas.com.sg or send us an email to info@ecas.com.sg For enquiries regarding the Review, please contact Sara Pinzon at sara.pinzon@ecas.com.sg