

**China's First Overseas
University - in Malaysia**
Xiamen University Malaysia Campus
See page 1-2

**Future Growth of Our Nation
Over MRT Tunnel**
Agile Tropicana Development
See page 3-4

**An Insight with The New
IEM PRESIDENT 2016/17**
IR. TAN YEAN CHIN
See page 7

Cover Story

Malaysia's 1st Drawbridge

Kuala Terengganu Drawbridge
See page 5-6



First Overseas Campus

approved by **Chinese Government**



Client : XMU Jiageng Education Development Sdn. Bhd.
Developer : Sunsuria Development Sdn. Bhd.
Architect : Garis Architects Sdn. Bhd.

Consisting of 5 multi-storey academic blocks on a car park podium, a science centre with an arts auditorium, a student activity centre with multi-storey sports facility, 5 multi-storey student accommodation buildings, a multi-storey restaurant, a clock tower and an amphitheatre.

Slanted Columns & Ring Beams

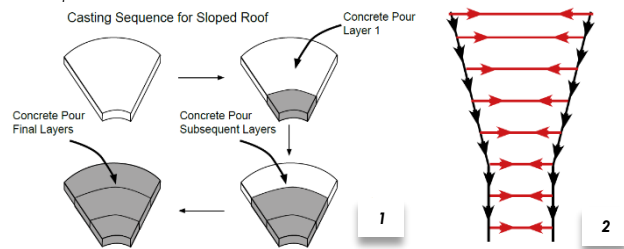
The A3 block is the main academic block and the largest structure in the university campus with a total floor area of 58 598 m². This block houses a 7-storeys library with the centre of each floor being a large atrium space with an increasing diameter at each floor, featuring the structural slanted columns that have been placed at its perimeter.

The slanted columns and the ring beams were further analysed to confirm the behaviour of the unique structural elements. The ring beam with the floor slab behave like a tie beam and restraints the movement of the slanted columns in the horizontal direction.

Sloping Roof

The A1, A2, A4, and A5 academic blocks are the other academic blocks with a total floor area of 21 854 m² over 5 floors. Within these blocks, all the teaching and learning facilities such as lecture halls and teaching rooms are provided. At the centre of each floor is a large atrium at each floor where large circular voids were created.

The roof structure for A1, A2, A4 and A5 blocks was designed and constructed as reinforced concrete structure due to architectural requirements on the laying of the roof tiles. Hence, the casting of the sloped roofs were done in several layers to achieve the required finish quality and consistency.



- 1 Casting sequence of concrete roof beam and slab in a few of horizontal layers
- 2 Schematic diagram indicating loadpath for ring beam (tension) and slanting column (compression)
- 3 Constructed slanting columns and ring beams
- 4 Aerial view of A4 block in construction



- 5 Student activity centre with multi-storey sports facility
- 6 Successful placement of post-tension beams on site
- 7 Steel Girder Box of Basketball Court at Student activity centre



6



7

Post-Tension Beams

The Auditorium block has a total floor area of 6 281 m² over 3 floors. This block provides an auditorium with a capacity to hold 600 people along with a basement floor for various other usage. 2 m deep post-tension beams were the adopted solution for the main beams across the 27 m span Auditorium block. Post-tension beams effectively reduce depth required by conventional reinforced concrete beam for a better space usage and provide a more economical design. During construction, these beams were cast on a flat ground and pre-stressed before being hoisted into place by two 400 tonne cranes.

Steel-Girder Boxes

The B1 block is a designated activities block with a total floor area of 32 582 m² over 5 floors. Within this block, sports facilities which include swimming pool and a basketball court have been provided. The roof of the basketball court spans 33.6m, which is the largest building span in this project. For this roof, 2 m deep steel girder boxes were seen as the most suitable solution to achieve such long span. The steel girder boxes solution also offers faster construction speed at site.



Image Courtesy of www.visitkl.gov.my

AGILE

Tropicana has engaged G&P Professionals Sdn

Bhd to assess the impact of the proposed high rise mixed development to the future MRT tunnels as the future KVMRT Line 2 tunnels (Northbound and Southbound) will have its proposed alignment cutting across the project site.

Project Challenges

One of the biggest challenges of this project is to control the movement of the MRT tunnels within the stringent criteria according to Railways (Railway Protection Zone) Regulations 1998 (PU(A) 367 1998). Some of the important criteria are listed as follows:

- ❖ Total movement <15mm in any plane.
- ❖ Differential movement < 3mm in 6m (1:2000) in any plane.
- ❖ No sheet piles, piles, foundation, boreholes or wells shall be driven within First Reserve.
- ❖ For the pile foundation constructed in the Second Reserve, the piles are designed so that they are debonded within the zone of influence of the underground structure and develop all of their load either in shear or end bearing from soil located below zone of influence of the structure.

Why 3-D Finite Element Model?

- To assess the anticipated movement of the MRT tunnels due to the development
- To model complex soil-structure interaction (i.e. MRT tunnels at varying depths and orientations)
- To examine the proposed piled foundation with non-regular loadings pattern that could not be properly modelled and assessed using 2D analysis

Analisis 3D
Interaksi tanah-struktur
dan pondasi tiang
pada MRT yang
memotong lokasi
proyek.

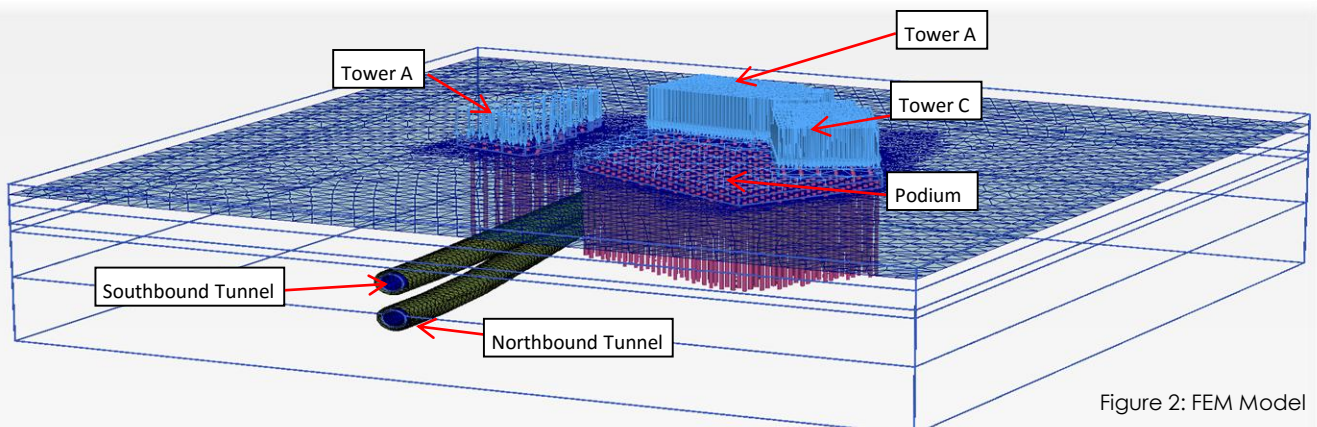


Figure 2: FEM Model

Design Assumptions for 3-D Finite Element Analysis

Loadings

For preliminary feasibility studies purposes, surface loads were applied to simulate the loadings from the proposed towers of up to 82-storeys, as shown in Figure 2.

Ground Geometry

Due to the varying bedrock levels encountered based on preliminary Subsurface Investigation (SI) information, two cases corresponding to Deep Bedrock condition (Bedrock assumed at 35.5m below existing ground level, EGL) and Shallow Bedrock condition (Bedrock assumed at 10m below EGL) were assessed in the 3D analysis (Figures 3a & 3b).

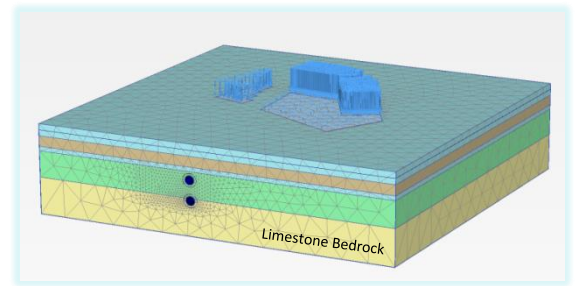


Figure 3a: Deep Bedrock Condition

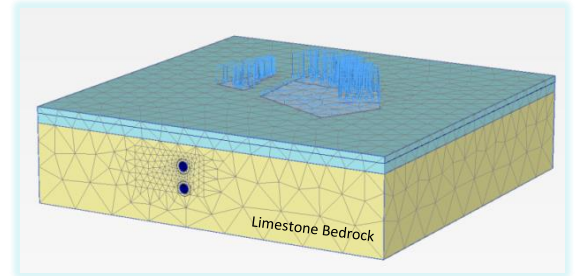


Figure 3b: Shallow Bedrock Condition

Pile Debonding

According to the Railways Act, pile sleeving shall be provided to debond the pile from the soil within the Second Reserve area. Therefore, longer pile will be expected to compensate the loss of friction contribution at pile debonded area. Due to the close proximity of the proposed building to tunnels, numbers of affected piles are significant, as shown in the typical cross sections for Deep (Figure 4a) and Shallow Bedrock Conditions (Figure 4b). In order to explore a more economical design, 3-D FEM were carried out to assess the impact of the pile foundations without debonding treatment into the future MRT tunnels' reserve zone.

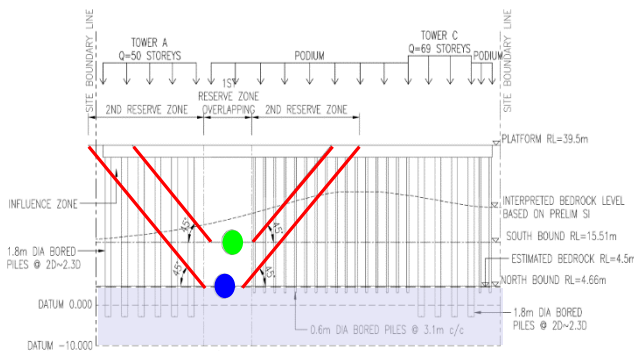


Figure 4a

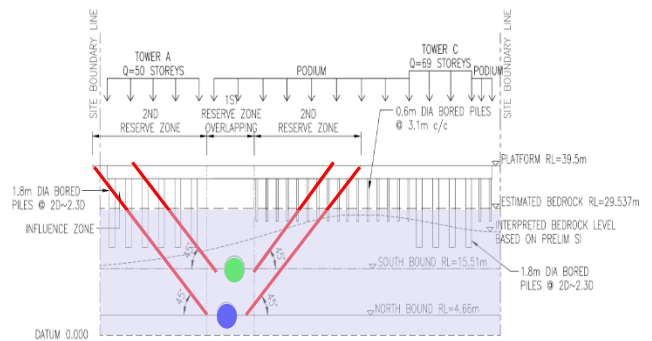
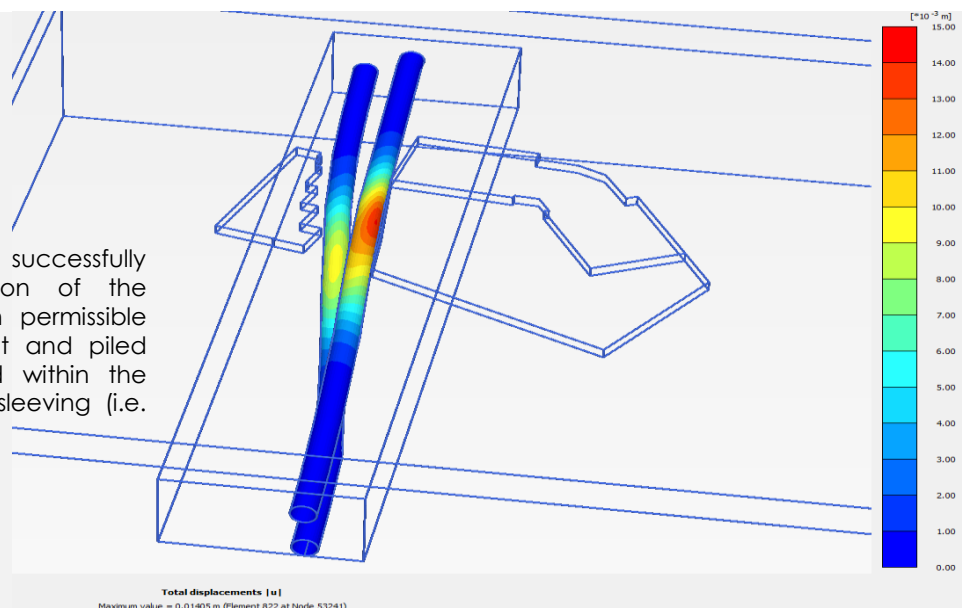


Figure 4b

Summary

The results of analyses have successfully proven that the deformation of the underground tunnels is within permissible limits set by the Railways Act and piled foundation can be adopted within the Second Reserve without pile sleeving (i.e. without pile debonding).



Pioneering Malaysia's First Drawbridge



- Overall Bridge Length is 632.0m
- Width is 23.0m
- Clear span of drawbridge is 76.0m long

Drawbridge that links Muara North and Muara South (two reclaimed areas on the north and south of Terengganu River) to create a strategic connection between Kuala Terengganu City across the north and south of Terengganu River, which leads all the way to Kuala Terengganu's Sultan Mahmud Airport.

G&P Geotechnics Sdn Bhd have been engaged by Zelan-Hasrat Sedaya Consortium to provide alternative design for pile cap and foundation system of four (4) marine piers (namely Pier P3, Pier P4, Pier P5 and Pier P6).

The subsoil condition is summarised in Figure 1.

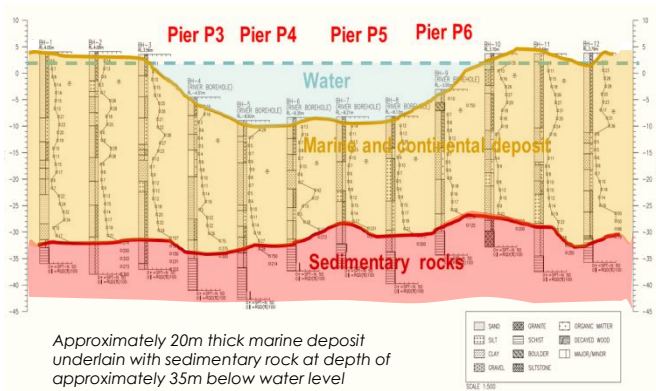


Figure 1: Subsoil Condition

"The challenge is to ensure the foundation movements are within drawbridge operation limits with lateral loadings such as wind loads or vessel collision."

- Ir. Koo Kuan Seng
(Project Engineer)



Figure 2: Site Condition during Construction of Pile Cap

Design Requirement

- ✓ Vertical settlement of pile group < 10mm
- ✓ Lateral displacement of pile group limited to 20mm in any direction.
- ✓ Pile cap crack width requirement = 0.1mm (Table 1 in BS5400-4 "Extreme Environment" for marine structures with concrete surface exposed to abrasive action by sea water)
- ✓ Accidental ship impact load
- ✓ Wind load on drawbridge and towers.

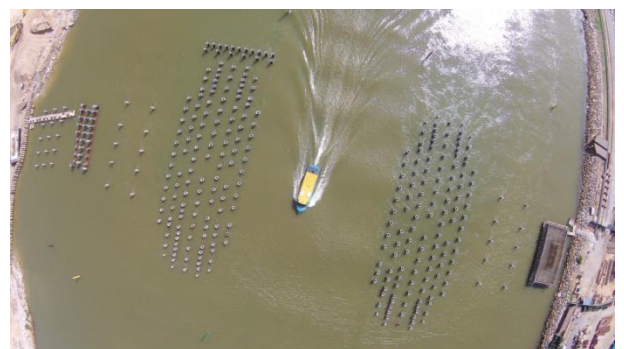


Figure 3: Overall Piling Condition

Design Methodology

Pile Group Analysis

- ❖ Pile group analysis was carried out using PIGLET software (soil-structure interaction software for pile group analysis developed by M.F.Randolph)
- ❖ Design loads were provided by bridge engineer with all the load cases in service limit state (SLS) and ultimate limit state (ULS).
- ❖ Design Pile working capacity for 1m diameter precast spun pile is 5500kN
- ❖ Design Lateral working load for 1m diameter precast spun pile is 135kN.

Pile Cap Analysis

- ❖ Pile cap Structural analysis was carried out using SAFE version 12



Figure 4: During Preparation of Statnamic Test

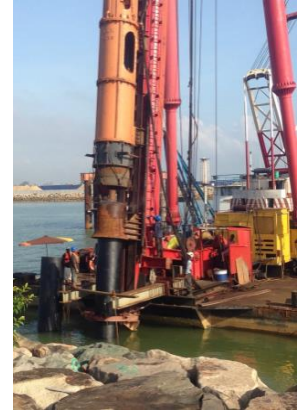


Figure 5: During Installation of Raked Pile

Preliminary Pile Test

Maintained Load Test

- ❖ The average settlement for 100% working load is 8.98mm which satisfies the design criteria.

Lateral Pile Load Test

- ❖ Non-linear yielding behavior of the pile deflection is observed during lateral pile load test on site.
- ❖ Back analysis based on lateral pile load test concluded that the actual subsoil shear modulus is lower than the value adopted in the design assumption. Thus, pile group re-analysis was carried out based on the updated subsoil shear modulus.



Figure 6: Site Preparation for Lateral Pile Load Test

Summary of Alternative Design

- ❖ Original design of 15 nos. of 1000mm diameter bored pile for Pier P3 was replaced with alternative design of 28 nos. 1000mm precast spun pile (combination of vertical and raked piles)
- ❖ Original design of 55 nos. of 1500mm diameter bored pile for Pier P4 and P5 were replaced with alternative design of:
 - 118 Nos. 1m dia. precast spun pile (combination of vertical and raked piles)
 - 86 Nos. vertical pile.
 - 32 Nos. raked pile
 - Pile length = 30m - 36m
 - Pile cap area = 1932m²
 - Pile cap volume = 7025m³
- ❖ Initial design of 15 nos. of 1000mm diameter bored pile for Pier P6 was replaced with alternative design of 24 nos. 1000mm precast spun pile (combination of vertical and raked piles).



Figure 7: During Preparation for Pile Cap Casting

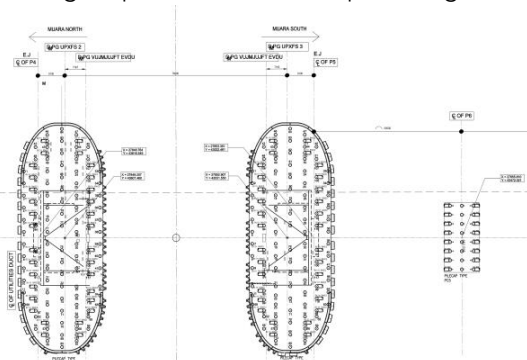


Figure 8: Piling Layout Plan



Figure 9: Aerial View

& AWARDS NIGHT

Prime Mover in Nation Building

6 April 2016 • G&P Group Convention Centre, Sunway Resort Hotel & Spa

Y.B. DATO'
Minister

LIC TIONG LAI
Malaysia

NEWS FLASH @ G&P

Ir. Tan Yean Chin's Appointment as IEM President 2016/17

The 57th IEM Annual Dinner and Awards Night 2016 welcomed the newly elected IEM President for the 2016-2017 session, Ir. Tan Yean Chin.

"As one of the largest professional body in the country, IEM needs to be 'rejuvenated' to continue to grow and stay relevant for long term sustainability, due to impending changes and development of more engineering disciplines", said Ir. Tan Y.C.

As the new president of IEM, he addressed that IEM would target those engineers working in new and non-traditional engineering sectors for membership, cater to their needs and open up opportunities for them to participate actively in IEM. He believes, with collective efforts, IEM will continue to excel in excellent tradition that has been laid down in the past while rejuvenating to face new challenges ahead.

Ir. Tan Y.C also mentioned about the importance of promoting science, technology, engineering and mathematics (STEM), especially in a developing country like Malaysia, where without the STEM fields, the numbers of engineering graduates in Malaysia will severely decline which may further reduce potential IEM members in the future.

Do You Know?

Apart from Ir. Tan Yean Chin, G&P Group CEO and Managing Director, Dato' Ir. Dr. Gue See Sew was the first IEM President representative from G&P Group and he has taken the helm of IEM for two consecutive session (2001-2003).



Christmas Party 2015

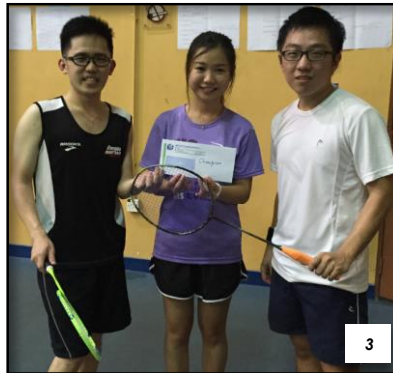
Christmas Party being a G&P annual event was held on 18th December 2015. Some of the highlights were caroling, mini games, lucky draw as well as a memorable gift exchange session. The event was full of joy, fun, cheerful and exciting moments.



1 GPIS Group Photo
2 Lucky Draw Session

G&P Olympics 2016

G&P Olympics is a yearly affair in the group. This year we have our staff participating in various games including bowling, badminton, basketball, table tennis, etc.



3 Badminton Matches - Men's Double Champion
4 Badminton Matches - Women's Double Champion
5 Basketball Matches - Champion Group

6 Basketball Matches - 1st Runner Up Group
7 Bowling Matches - Champion Group
8 Bowling Matches - 1st Runner Up Group

G&P's 16th ANNIVERSARY DINNER



WORDS FROM OUR CEO

Dato' Ir. Dr. Gue See Sew:

Y. Bhg. Tan Sri Dato' Ir. Jamilus Hussein (our Chairman), fellow Directors, colleagues, and the families, I wish you all a warm welcome to G&P's 16th Anniversary Dinner. We are now 16 years old since we started G&P on 15th September 1999.

G&P Professionals Group was originally known as Gue & Partners Sdn. Bhd. where Tan, Liew, and I founded the company mainly to provide geotechnical and geo-environmental consultant services. Due to the increasing demand from our clients, Gue & Partners Sdn. Bhd. evolved into G&P Professionals Group and now we provide one-stop engineering consultancy services. Currently we have staff strength of 335 and it is still growing.

Some of the major projects we have secured over a year are:

- MRT Line 2
- TRX Detailed Design
- Melaka Gateway
- Klang Mall
- Autocity
- Nilai Impian 2
- Damansara Uptown Phase 2
- Radia Bukit Jelutong

Dear colleagues, I believe one of the main reasons of G&P becoming prominent and getting many mega projects is our four core values :

- Structured QA/QC
- Structured Training
- Structured R&D
- Structured Sharing

These core values allow us to improve. For a similar project, we do better with more value engineering for our clients.

We need to continue to polish our core values and make it a habit of our work. On the zero-in zero-out model of G&P, G&P Sarawak is the next company in the group that will implement the scheme.

Last but not least, I would like to express my thanks and gratitude to the organizing chairman, Ryan Low and his sports club committee members for putting in lots of effort and working tirelessly to make tonight's occasion a huge success and memorable.

Thank you and have an enjoyable evening.



CORPORATE PROFILE

G&P Professionals Group consists of the following specialist engineering consulting firms that provide a wide range of quality engineering services:

- G&P Geotechnics Sdn. Bhd.
- G&P Structures Sdn. Bhd.
- G&P Infra Sdn. Bhd.
- G&P Claims & Contracts Sdn. Bhd.
- G&P Project Management Sdn. Bhd.
- G&P Water & Maritime Sdn. Bhd.
- G&P R International (Cambodia) Co. Ltd.
- G&P Highways & Transportation Sdn. Bhd.
- G&P Dams & Water Services Sdn. Bhd.
- G&P Professionals (Sarawak) Sdn. Bhd.
- NGI - G&P Sdn. Bhd.
- G&P Water (Singapore) Pte. Ltd.
- G&P - AA International Consultant Joint Stock Company, Vietnam
- G&P Professional (Sabah) Sdn. Bhd.
- G&P R&D Sdn. Bhd.
- G&P M&E Sdn. Bhd.
- G&P Special Structures Sdn. Bhd.

The Group has a fast expanding pool of highly qualified and experienced Geotechnical, Civil & Structural, Mechanical & Electrical, Infrastructure, Maritime, Water, Highways, Railways & Transportation and Dams Engineers, Engineering Geologists and technical support staff.

The Group has several associated organisations overseas where value added is further enhanced. The project activities are handled by the specialists within the Group who explore innovative and economical solutions tailored to the needs of the projects. Our research and development culture has ensured that our services are always at the forefront of world trends.

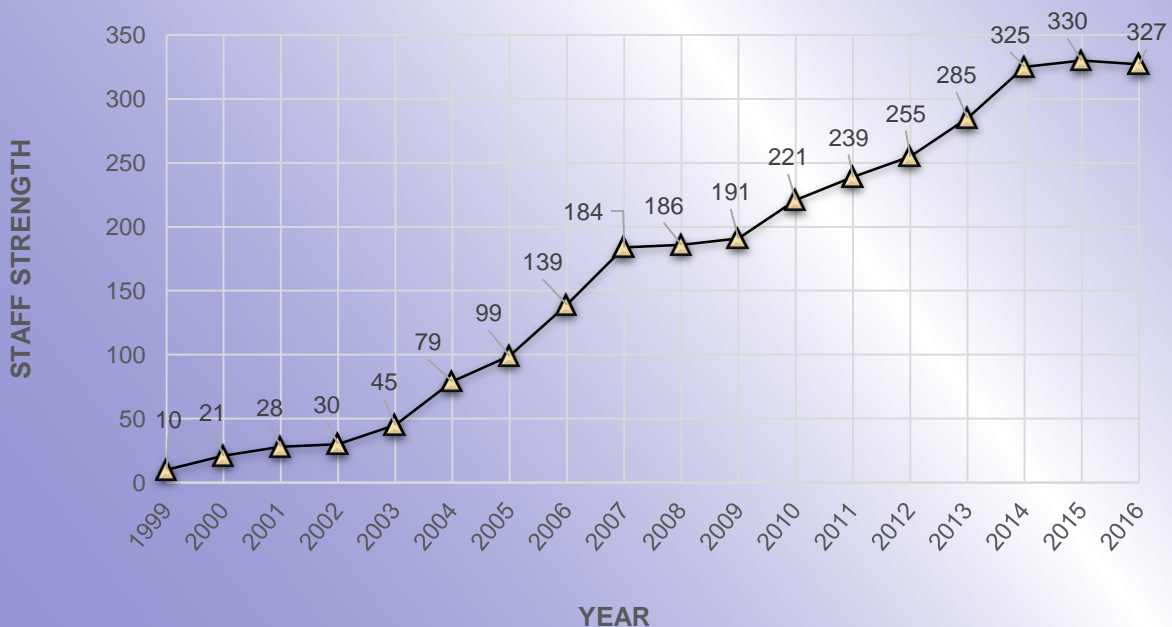
Associated Organisation



G&P Professionals Sdn Bhd

Learn more about G&P Professionals through our official website by scanning the QR code provided.

STAFF STRENGTH (Year 1999 - 2016)



G&P Professionals Sdn Bhd

Wisma G&P
39-5, Jalan Tasik Selatan 3,
Bandar Tasik Selatan, 57000 Kuala Lumpur, Malaysia.
Tel : 60(3) – 9054 1612 /9059 5396 Fax : 60(3) – 9059 5869
Email: gnp@gnpgroup.com.my

www.gnpgroup.com.my