



Technical Visit to G-Cast Concrete Sdn Bhd (Advanced Jacking Pipe Systems and Manufacturing Technology)

By

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He is a committee member of TUSTD Session 2026/2027.

On Tuesday, 12 May 2026, the Tunnelling and Underground Space Technical Division (TUSTD), Institution of Engineers Malaysia (IEM), successfully organised a technical visit to the G-Cast Concrete Sdn Bhd factories at Serendah and Rawang (Ref. No.: IEM26/HQ/153/V, BEM Approved CPD Hours: 3). A total of 17 participants registered for the visit, comprising engineers and representatives from consulting firms, contractors, developers and local authorities, including members of IEM TUSTD. The visit aimed to give participants a better understanding of advanced jacking pipe systems and the manufacturing technology employed in the production of precast concrete jacking pipes.

To support trenchless infrastructure development and minimise surface disruption in congested urban areas, G-Cast Concrete Sdn Bhd specialises in the manufacturing of precast solutions for pipe jacking applications. Pipe jacking enables the installation of underground pipelines by hydraulically pushing prefabricated pipes through the ground without extensive surface excavation. G-Cast offers a range of jacking pipe systems designed to suit various site conditions and engineering requirements, including concrete-clad mild steel cement-lined jacking pipes for enhanced structural strength and high load-bearing capacity, as well as curve drive pipes that accommodate alignment deviations and allow installation around underground obstructions. The company's track record includes local projects such as Kota Setar (Kedah, Package A & C), IWK Section 26 Shah Alam, MMC Langat, D56 Jinjang Kepong, Papan 1 (Perak) and Tampin (Negeri Sembilan), as well as international supply to projects in Manila (Philippines), Singapore and Sri Lanka.

Participants assembled at Wisma IEM, Petaling Jaya at 8:00 am and were transported to the factory by chartered coach, arriving at approximately 8:50 am. Upon arrival, the group was welcomed by the G-Cast team and proceeded to the briefing room, where a safety briefing was conducted, followed by a company and product presentation. G-Cast Concrete is part of Chin Hin Group, a publicly listed company in Malaysia with four core business segments: Property Development, Construction & Engineering, Building Materials, and Home & Living. G-Cast operates within the Building Materials segment, manufacturing precast concrete products, including jacking pipes, box culverts, and precast architectural panels.



Figure 1: Participants at the entrance of the G-Cast factory



Figure 2: Participants gearing up with PPE before proceeding to the site



Figure 3: Company overview presentation by G-Cast Concrete, introducing Chin Hin Group's four business divisions

The presentation covered the specifications of G-Cast's jacking pipes, which are manufactured for a diameter range of 300mm to 4,800mm across multiple strength classes. The pipes are certified under SIRIM, SPAN, SETSCO and SLS, and comply with the approval requirements of both the Malaysia and Singapore sewerage authorities, following BS 5911-1:2002+A2:2010, BS 5911-1:2021 and SS 183. Three internal lining options are offered depending on project requirements: High Alumina Cement (HAC), High Density Polyethylene (HDPE), and sacrificial lining.

Product Specification

Diameter Range 300 - 4800mm

Strength Class X, Y, Z, Z-PLUS(1.5Z, 2Z, ETC) ; L, M, H, H-PLUS(1.5H, 2H, ETC)

The diagram illustrates the components of a jacking pipe. It shows a cross-section of the pipe with labels for 'PIPE OD' (Outer Diameter), 'PIPE ID' (Inner Diameter), 'PIPE EFFECTIVE LENGTH', 'LIFTING ANCHORS', 'Grading Part (same as standard)', 'RUBBER SEAL', 'CAST-IN STEEL COLLAR', and 'PIPE OVERALL LENGTH'. The brand name 'G-CAST' is also visible on the pipe body.

Strength Class	Nominal Diameter (mm)	Pipe ID (mm)	Pipe OD (mm)	Wall Thickness (mm)	Pipe Overall Length (Meter)	Pipe Effective Length (Meter)	Pipe Weight (Ton)	Allowable Jacking Force (Ton)
Z 1.5Z 2.0Z	300	300	520	110	3.050	2.960	1.03	120
	375	375	520	77.5	3.050	2.960	0.76	102
	450	450	610	80	3.050	2.960	0.97	142
	525	525	690	82.5	3.050	2.960	1.14	172
	600	600	775	87.5	3.050	2.960	1.36	213
	750	750	960	105	3.050	2.960	2.01	345
	900	900	1200	110	3.050	2.960	3.56	690
	1,050	1,050	1,210	100	3.050	2.960	2.60	457
	1,200	1,200	1,410	105	3.050	2.960	3.42	605
	1,350	1,350	1,600	125	3.050	2.960	4.17	757
H 1.5H 2.0H	1,500	1,500	1,780	140	3.050	2.960	5.30	964
	1,650	1,650	1,970	160	3.050	2.960	6.55	1,255
	1,800	1,800	2,160	170	3.050	2.960	7.58	1,472
	2,100	2,100	2,470	185	2.645	2.530	8.30	1,591
	2,400	2,400	2,730	195	2.645	2.530	8.31	1,555
	2,700	2,700	3,430	395	2.145	2.020	17.39	5,443
	3,000	3,000	3,730	398	2.145	2.020	19.27	6,061

Jacking Pipe Details

01

Certifications: SIRIM, SPAN, SETSCO & SLS

02

Approvals: Malaysia & Singapore Sewerage Authorities & followed standard:
BS 5911-1:2002+A2:2010
BS5911-1:2021
SS 183

03

Pipe Internal Lining:

1. High Alumina Cement (HAC)
2. HDPE
3. Sacrificial

G-CAST

Figure 4: Jacking pipe product specification and certification requirements

HDPE lining provides total resistance against chemical attack in sewer environments, with 330° coverage specified for Singapore projects and 270° coverage for Malaysia, at thicknesses of 2.5mm and 1.5mm respectively. HAC lining provides a 12mm thick layer at the internal diameter of the pipe, offering high resistance against chemical attack. Sacrificial lining works by increasing the concrete cover, which then serves as a sacrificial layer against corrosion — a more cost-effective option compared to the other two systems.



Figure 5: HDPE, HAC and sacrificial lining systems for jacking pipes

A case study on jacking pipe design for curve drive was also presented, referencing the “Guide to Best Practice for the Installation of Pipe Jacks and Microtunnels” (1st Edition, June 1995) published by the Pipe Jacking Association, UK. The case study was drawn from the Centralised Sewage Treatment Plant (CSTP) project at Sungai Langat, illustrating the relationship between allowable jacking load and angular deflection for a reinforced concrete jacking pipe of DN 1050 x 2.5m, and how measured deflection at site correlated with the design envelope.

Jacking Pipe for Curve Drive (CASE STUDY)

Design Reference :- Guide to best practice for the installation of pipe jacks and microtunnels-1st edition, June 1995" by the Pipe Jacking Association , UK

PROJECT :
CENTRALISED SEWAGE TREATMENT PLANT (CSTP AT SUNGAI LANGAT)

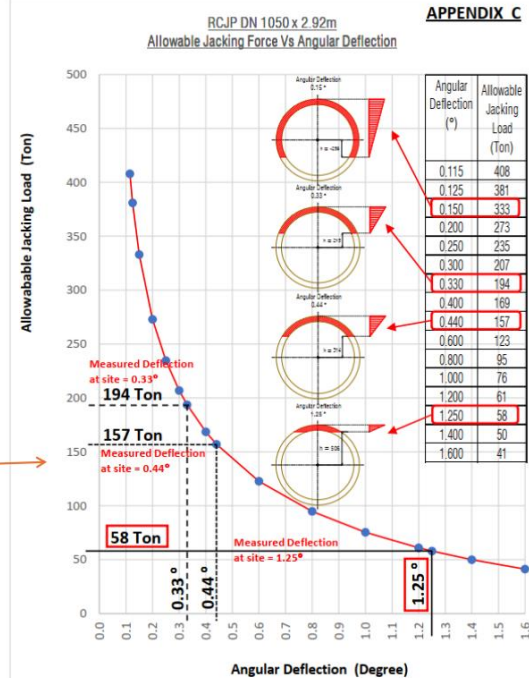
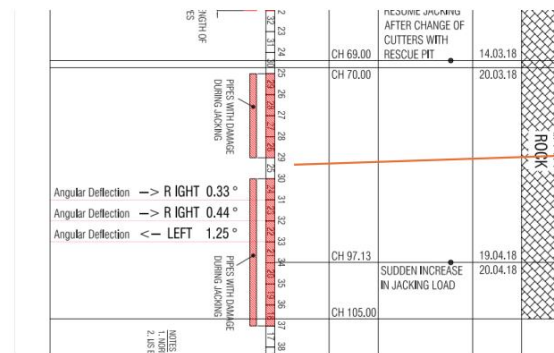


Figure 6: Case study — jacking pipe design for curve drive, CSTP Sungai Langat

Following the presentation, participants were brought on a factory tour covering the manufacturing process, including reinforcement fabrication, casting, curing and QA/QC practices, together with key engineering considerations such as load capacity, joint performance and lining applications. After that, the participants went to the production line to observe the finished Jacking Pipe Products by G-Cast.



Figure 7: Finished jacking pipes and reinforcement cages at the factory stockyard, served by overhead gantry cranes

Participants were also shown a sample roll of the HDPE lining sheet used in pipe manufacturing, complete with the manufacturer's identification label, as well as close-up details of the mounting vibrator that use for vibration purposes. This method will allow the concrete particles to move and settle closer together, while trapped air rises to the surface and escapes.



Figure 8: Sample roll of HDPE lining sheet with manufacturer's identification label



Figure 9: Close-up details of mounting vibrator.

The factory tour concluded with a Q&A session at approximately 11:30 am, during which active discussion took place between participants and the G-Cast team on pipe jacking operations, common challenges encountered on site and their corresponding solutions. The visit generated considerable interest amongst the participants, who gained valuable first-hand exposure to the design considerations, material specifications and manufacturing processes behind advanced jacking pipe systems, complementing the theoretical understanding gained through design guides and standards. The group departed the factory at around 12:00 pm and arrived back at Wisma IEM at approximately 1:00 pm. TUSTD wishes to record its appreciation to G-Cast Concrete Sdn Bhd for hosting the visit and for the technical insight generously shared by their presenters and site personnel.