

GEOTECHNICAL INSTRUMENTATION FOR ASAHAN NO. 3 HYDROELECTRIC POWER PLANT, INDONESIA



Figure 1 – PLTA Asahan No. 3 Entrance

BACKGROUND

The PT PLN (Persero) on behalf of Government of Indonesia is undertaking the Asahan III Hydroelectric Power Plant project in North Sumatra, Indonesia. The project involves the construction of a hydroelectric power plant with a total power generation capacity of 174MW. The project will feature two units of 87MW capacity.

Nippon Koei Co Ltd of Japan was appointed as the design and supervising consultant for the project. The plant is being developed by a joint venture between Japanese engineering firm Shimizu Corp and Indonesian state-owned construction firm PT Adhi Karya.

One of the major components of this project is to construct an underground powerhouse to house turbines, which requires a reliable instrumentation safety monitoring system. HMA Geotechnical/PT HMA were contracted to supply instrumentation and design a datalogging system to suit the customer's requirements.

OBJECTIVE

- Supply instruments for underground powerhouse, consist of:
 - 2 x 2 MPa Vibrating Wire (VW) Piezometers
 - 50 x New Austrian Tunnelling Method (NATM) style stress cells
 - 40 x Multipoint Borehole Extensometers (MPBX)
 - 20 x 75 Ton VW load cells.
- Design and supply a datalogging system capable of reading all instruments remotely and send the data periodically to a dedicated FTP server
- Provide instrument monitoring during early stages of construction
- Supervision of the instrumentation installation

CHALLENGES

- Heavy equipment operating in the immediate area
- Blast-rock potential present, especially in the early stages of construction
- Highly sensitive project area – Data to be kept on site
- Radio communication limited due to construction works



Figure 2 – MPBX installation

SOLUTION AND OUTCOME

Instrumentation installation was supervised by HMA engineers based in the HMA Indonesian office (Jakarta). Our engineers provided on-site training and were an invaluable resource for our customer, enabling the project to commence on schedule. A datalogging system utilising high quality protected enclosures has been designed, to transmit instrument readings from multiple instrument locations to a site office with no loss of data. The datalogger is programmable and can be accessed remotely, so the customer can download the data, check its status and can make quick adjustments without having to physically visit the datalogger.

The instruments work together with the datalogger providing high quality and reliable data to assist the

customer in making critical decisions during the construction of the powerhouse and tunnel.

PT HMA GROUP INDONESIA STATEMENT

PT HMA Group based in Jakarta, Indonesia represent a number of high-quality brands and products across all PT HMA Group divisions – Instrumentation, Power Generation, Materials Handling, Wear Solutions, Flow & Industrial, and Geotechnical.

Our office is staffed by highly trained engineers who can provide customised solutions across all industries, with over 50 years of combined experience in various industries in the engineering field.

PT HMA Group is available to supply, assist on, project manage and install a large number of products across Indonesia and South-East Asia.

HMA GEOTECHNICAL STATEMENT

HMA Geotechnical have supplied bespoke monitoring systems and instrumentation to over 100 mines across Australia and the world, combining over 120 years of accumulated experience and has operated for over 35 years to deliver the right solution for our customers.

As an employee-owned company, we take pride in our work.

Given our experience, workshop facilities and product range, we can supply the following options:

- Custom enclosures and frames to suit any application or condition manufactured in Australia where possible to decrease lead-times.
- Integration with multiple software packages/protocols to suit any on-site requirement. Output can be via a range of industrial protocols (Modbus, DNP3, SFTP, others).
- Flexibility to supply and install globally.