

# COMPANY PROFILE

บริษัท เท็น คอนซัลแตนท์ จำกัด

*Geotechnical Engineering Service*



*Topographic Survey & Mapping Service*



*Design and Construction Supervision*

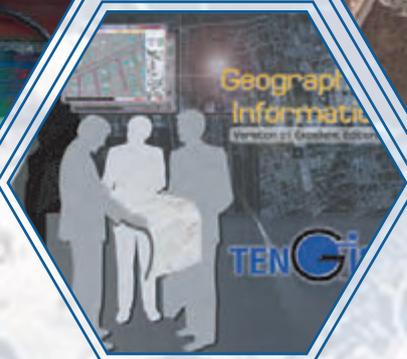


**TEN CONSULTANTS CO.,LTD**  
บริษัท เท็น คอนซัลแตนท์ จำกัด



*Environmental Engineering Service*

*Building Audits & Structural Strength Test & In Situ Test*



*MIS & GIS Service*

**Project Description**

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# Company Profile

TEN Consultants Co., Ltd. was established since May, 1994 by the incorporated group of engineers, geologists and scientists. With 12 million Baht registered capital we have encountered consulting business providing services in geotechnical engineering, topographic survey and mapping, project studies, environmental management, engineering design, construction supervision and management, MIS/GIS, and IT solution.

TEN Consultants Co., Ltd. is a registered consulting firm with the Ministry of finance of Thailand with registration number 846. TEN has a record of capability cover seven sectors as follow;

- (1) Agriculture and Rural Development
- (2) Construction Industry Development
- (3) Energy
- (4) Telecommunication
- (5) Transportation
- (6) Urban Development
- (7) Water supply and Sanitation



**TEN Consultants Co., Ltd.** has a Head-Office Established in Bangkok for more than 10 years. In Order to enhance the Quality of our productivity, TEN also has had a tremendous Laboratory Offices and an immense storage located adjacent to the Head-Office, Currently, more than 70 of our staff are working on a wide range of consulting and investigation field in order to fulfill client's objectives.



## HEAD-OFFICE

TEN CONSULTANTS CO., LTD.

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## Chairman



Sumrit Tangtreerat  
Chairman  
B. Sc. (Geology)  
Born 1949

Sumrit is a professional geologist and geotechnical He has more than 35 years experience in the soil boring and ground investigation, mineral resource exploration, rock coring and deep geotechnical investigation, construction material testing for heavy infrastructure construction, soil properties laboratory and testing, groundwater exploration, sampling, testing and modelling.

He had involved in a number of survey and mapping projects, Khong She Moon mapping project covering 85% of area in Northeastern region, shoreline and mapping investigation the exposition and corrosion at Mab Ta Phut Industrial Sea Port project, Natural Gas Pipeline route survey for PTT, Utilities pipeline route survey for Foster Wheeler, Marine Bathymetry survey for Laem Chabang Deep Sea Port project stage 3, and geologic mapping for mineral exploration survey services.

He had conducted services for almost every kind of infrastructure development such as Underground Mass Rapid Transit, Highway, Expressway, Dam and Irrigation canal, Liquid Petroleum Gas Pipeline, Marine Port and Jetty, Cellular Telephone Tower Station, Flood Protection along river bank, Water Supply and Wastewater Treatment Plant and Transmission pipeline, Thermal Power Plant and High Voltage Transmission line, groundwater resource survey, Aerial Photogrammetry and Geographical Information System service, and etc.

He is the company founder and bring Ten Consultants Co., Ltd. to be one of the leading firm in this business.

## Managing Director



Jirasak Ratanaphaithun

Managing Director

Chartered Civil Engineer

Wor Yor 1740 Chartered

Environmental Engineer

Wor Sor 61 B.B.A., B.Eng.,

M.Eng. Thai, Born 1959

Jirasak is professional civil and environmental engineer and is responsible as project director, project manager and engineer for a number of projects. He is also having a proven successful record of managerial skill for several companies since the company establishment up to the sustainable of the organization.

He has more than twenty years experience in project management, environmental, infrastructure, structural and civil work projects.

Working as civil engineering works, he has track record on project management of both design and construction supervision for major infrastructures, projects, factories and buildings. The works include the feasibility study and design of elevated expressway, water supply treatment plant and water distribution leakage control, geographical information system (GIS), Cellular telecommunication station, and etc.

Working in the environmental sector involves environmental impact assessment for infrastructures, water quality study and action planning to improve the water quality both for river water and seawater, environmental monitoring and recommendation of mitigation measures, engineering design works for the environmental protectionsuch as wastewater treatment system both domestic and industries and solid waste disposal system.

He has traveled more than 20 countries mostly in Europe and Asia. Ten times visiting to England during working with Mouchel (a British firm) for business meeting. He has no objection for the travelling in the country. As his work has taken through the Southern most Betong, Yala, Northern most Maesai, Chianrai, Western most Karnchanaburi and Tak, and the Eastern most Ubonratchathani. Also visiting to neighbour countries such as Lao PDR, and Cambodia both leisure and business.

## Project Director

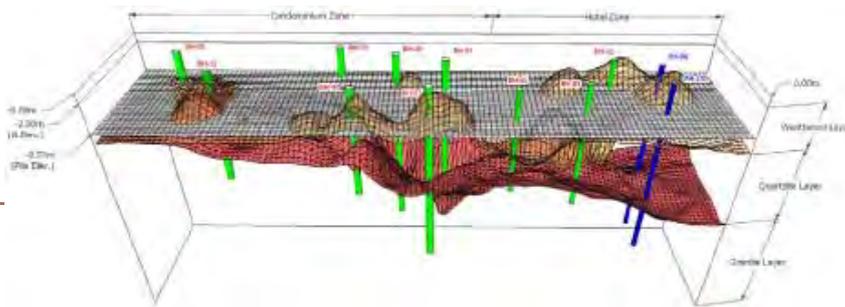


Prawit Pengcharoen Project  
Director

B.Eng. (Irrigation Engineering/Civil  
Engineering, Program on Project  
Planning and Design)

Prawit is a professional Irrigation and Civil Engineering. He has 40 years extensive experience in Project Management, Master Planning, Feasibility Study, Engineering Design, Construction Planning, Cost Estimation and Tender Documentation of Water Resources Development Project, Water Transmission and Distribution System (Open Channel and Pipelines), Wastewater Collection System, Flood Protection and Drainage System, as well as Topographical Survey and Mapping of over 3,300 sq.km. and Geotechnical/Geophysical Investigation and Assessment for several projects in energy and industrial sectors such as Phu Horm Gas Development Project, the 6th Gas Separation Plant of PPCL, PPCL Phenol Plant Project, PPCL Dehydrogeneration Project, etc.

## DESIGN & CONSTRUCTION SUPERVISION



### SCOPE OF WORKS

- Preliminary Design
- Design Development Drawing
- Detailed Design Phase
- Architectural Work
- Structural & Civil Work
- Electrical & Communication System
- Mechanical Work
- Sanitary Work
- As built Drawing Services



## Project Description



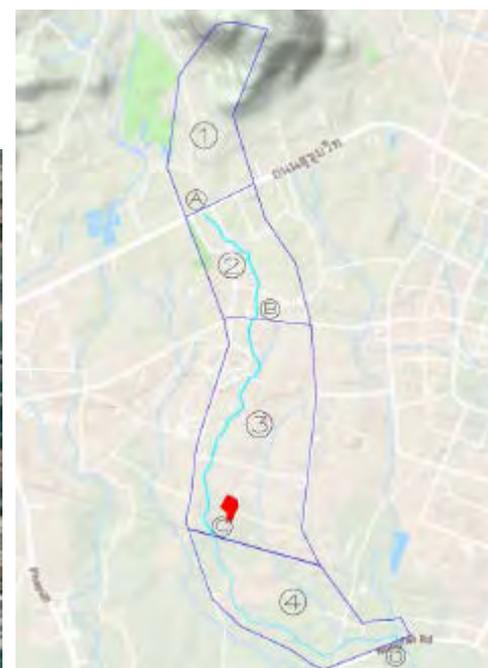
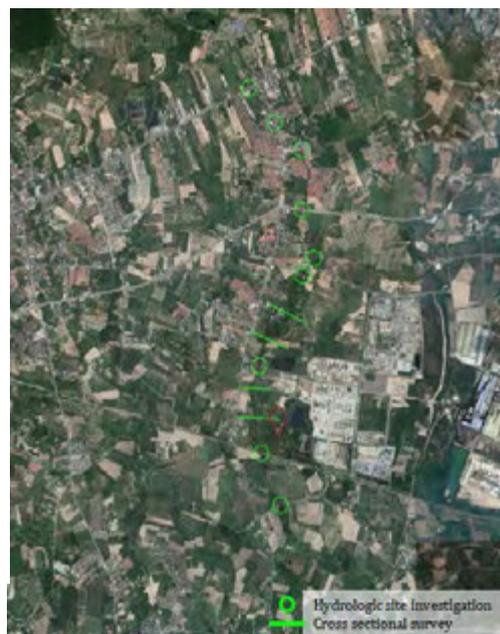
This booklet outlines the proposed flood study of a new power plant called "Glow SPP1 Project" (herein also called "PROJECT"). The content in this document is including the scope of work, approaches, workforces, work schedule, time frame, and financial proposal for the flood study and related activities.

The PROJECT is situated Asia Industrial Estate (AIEMTP). The industrial estate is located in Banchang Subdistrict Municipality, Banchang District of Rayong Province as the location shown in Figure 1.

### Proposed Activities

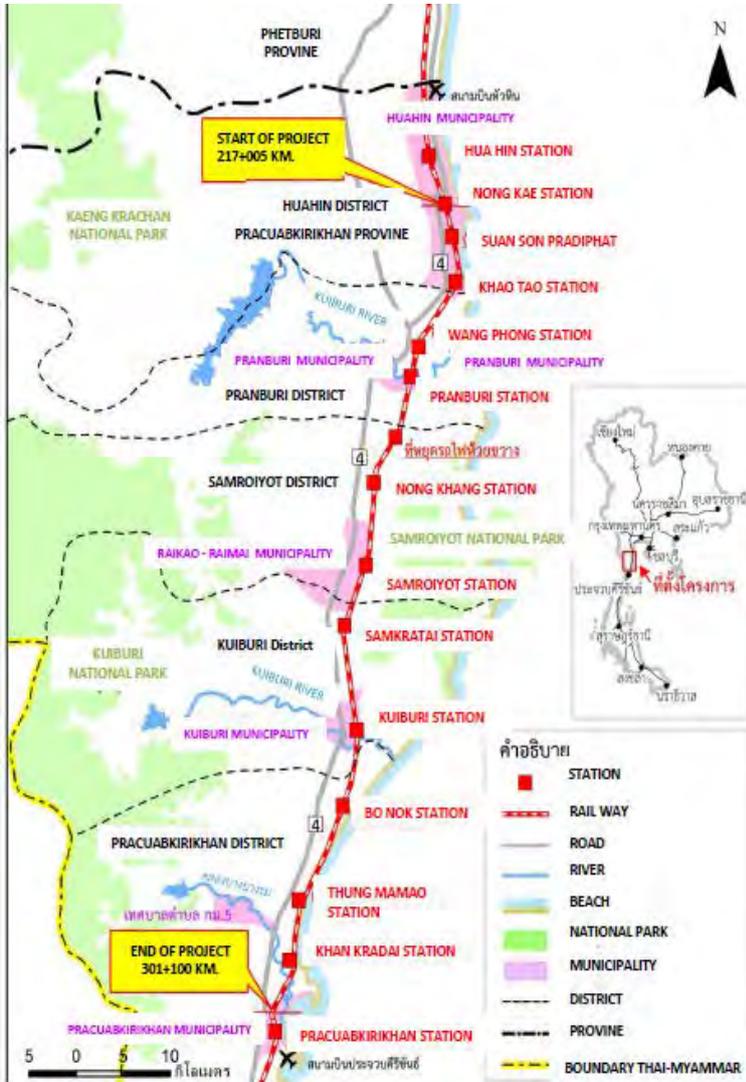
As there is none of physical features, hydrologic information, and previous flood study of proposed study watershed available, therefore the following activities are proposed to be performed :

- (1) Data collection including topographic survey and mapping, hydrologic data collection survey data, geographic data, geotechnical data, historic flood level, flooding period, etc.
- (2) Perform flood study over the proposed watershed and the project area and its surroundings.
- (3) Perform three (3) alternatives of flood protection scheme and conceptual design of flood protection and drainage system for the PROJECT site.
- (4) Preparation study report and conceptual design drawings on flood protection and drainage system for the Project.
- (5) Support the Owner for additional information of the flood study as requested by PROJECT's Lender and insurer.



Study Watershed and Divided Catchment

# Project Description



Planning and Development briefs of the dual track rail transport infrastructure was approved to accelerate the implementation of the 6-route railway project for Thailand. Total distance is 887 kilometers and the estimated total cost of 127,472 Million Baht. One of the 6 route of the dual track is Hua Hin - Prachuap Khiri Khan. This project has a distance of 86 kilometers.

Scope of works:

1. Feasibility Study: Topographical Survey, Aerial mapping, Route selection, Economic & Financial return, Necessary infrastructure arrangement
2. Engineering Detailed Design work: Railway Track work, Bridge work, Embankment and Earth work, Station Design, Road crossing overpass and underpass, Signaling system, Drainage work, Project Cost estimation, Work Specification, Bidding Document and etc.
3. Environmental Impact Assessment (EIA) in accordance with standards of the office of Natural Resources and Environmental Policy and Planning.

### APPOINTMENT

TEN Consultants Co., Ltd. is a member in Joint Venture Consulting Group consist of Tesco Co., Ltd., Chulalongkorn University Research Institute, Dorsch Consultant Co., Ltd., ACT Consultant Co., Ltd., and Bangkok Planner Consultant Co., Ltd. who was appointed by the State of Railway of Thailand (SRT) to provide the service. The project was started in 2015 which duration of 10 months. SRT plans to implement the construction project in the year 2017.



**Design & Construction Supervision Service  
Triple Tree Beach Resort, Cha-Am**

**Project Description**



TTT Biz Group Co., Ltd. wishes to manage and develop the empty land in his jurisdiction about 57 Rai or 91,200 sq.m. where situated along with the beach in Cha-Am District, Petchaburi Province, Thailand.

Ten Consultant Co., Ltd. was appointed by TTT to provide Design service of Private Beach Resort, the designated area of project is about 6 Rai or 9,600 sq.m. The construction budget is 76 million Bath.

**The scope of Design & Construction Supervision service was comprised of 9 units of 3 type villas with Lobby building, seaside restaurant, swimming pool and utility building.**

The project was executed carefully to fulfill requirements of the owner and to ensure that the visitors of the resort would enjoy with the true beauty of nature and relaxing in a peaceful private place where can fulfill their experience with all necessities, comfortabilities, favorable and memorable.





Engineering Design Elevated Water Storage Tank, Waste Management Room and Weir

Project Description

Ten Consultant Co., Ltd. has provided service of Engineering Design to solve the periodical flooding and river bank erosion at the YBAT 3 Center. Diversion dam and box culvert were adopted and constructed for sustainable problem solution. Also the design storage room were provided to The Young Buddhists Association of Thailand under Royal Patronage or YBAT' Suanprapaitham Center where located on 19.8 Acres or 80,127 sq. m. plot of land in Tha Sae District, Chumporn, Thailand.

YBAT' Suanprapaitham Center aims to teach the Four Foundations of Mindfulness to local people in the upper southern region of Thailand.



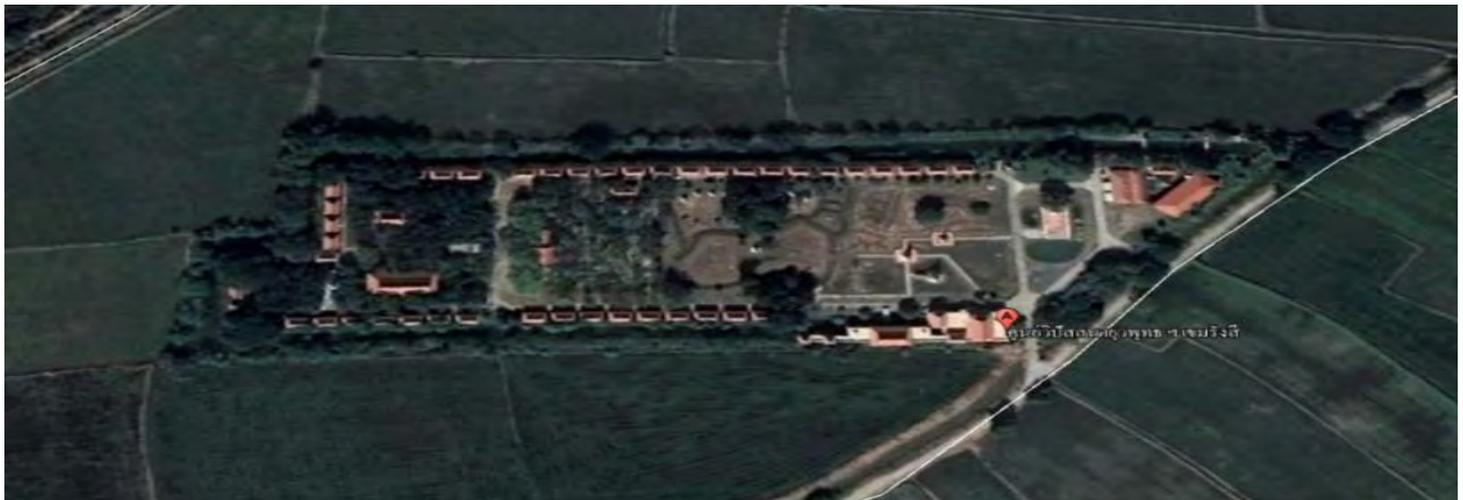


# Project Description



**Ten Consultant Co., Ltd.** was appointed by The Young Buddhists Association of Thailand under Royal Patronage or YBAT to provide service of Detailed Design of Flood Protection System, Side Slope Protection System, Fencing and Internal Road Work at YBAT's Khemarangsri Center located in Ban-sung, Nakhon luang, Ayutthaya, Thailand. The total area of the project is about 39 Rai or 62,400 sq.m.

**TEN** carried out all the Design work in conformity with the owner's requirement in project period 2 months, started from February 2018 and completed the project in April 2018.



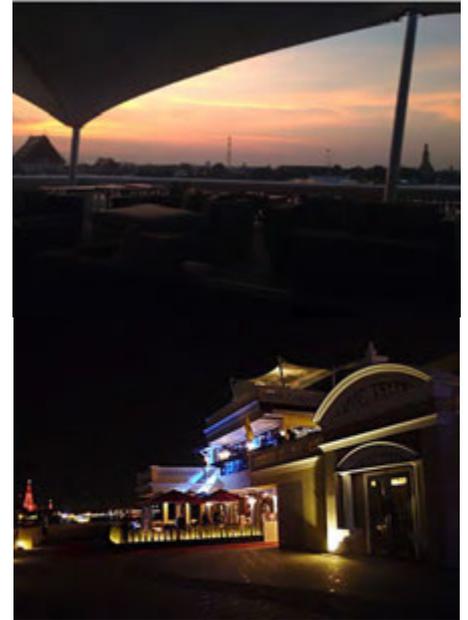
**DESIGN & CONSTRUCTION SUPERVISION SERVICE**

## Project Description



MANGO TREE is Premium Thai cuisine restaurant of Coca Suki Group established for over twenty years. The newest branch of the year 2015 is Mango Tree on the river situated at Yodpimarn River Walk which is one of the best scene of consists of roof top bistro bar (4th floor), 3rd floor pub, 2nd floor cuisine restaurant, and ground floor cooking area and take away service.

TEN provided a service of construction supervision and management to fulfill the interior fit out over the project cost of 30 Million Baht. Main contractor was awarded to Tharn Tham Thai Co., Ltd. Interior designer is Mr. Ryan Phanphensophon. The project started in October 2014 and completed in February 2015.



**DESIGN & CONSTRUCTION SUPERVISION SERVICE**



TEN conducted the construction supervision for auditorium construction of Engineering and Industrial Technology Faculty, Silpakorn University where located in Praprathomchedi, Nakornprathom province.

Architectural design by Tonsilp Architect Co., Ltd. and the contractor was awarded to Saengchaichok Co., Ltd. with construction value of 18,600,000 Baht and construction period 240 days.



## Project Description



### Feasibility Study and Detailed Design of the Flood Protection System

From the big flooding over Central Region of Thailand in the year 2011, there were 7 industrial estates been flooded to the level of water height up to 2.5-4.0 meters. The disaster created enormous damage to all the factories in these 7 estates. Flood protection system is necessary for key organizations in the risk area such as power plant in order to prevent the enormous impact. **Ratchaburi World Cogeneration Company Limited** generates electricity and steam in Thailand. The company operates two SPP cogeneration projects with capacity of 112 megawatts each. Ratchaburi World Cogeneration Company Limited is based in Potharam district, Ratchaburi province, Thailand.



TEN was appointed by Ratchaburi World Cogeneration Co., Ltd. conducted the Feasibility Study and Detailed Design of Flood Protection System for power plant. TEN recommendation was underground soil cement column wall diameter of 0.60 meter 6.00 meters depth all plant perimeter of 1,300 meters under existing ground level can resist of underground water seepage. For the above existing ground concrete wall protect lateral load of water level up to +6.50m. (MSL) was adopted. Provision of drainage system (Sub-drain) was designed to reduce the pressure of the water table (Uplift pressure) and drained all the seepage underground water out of the plant.

## Project Description



### Design and Construction Supervision of the Cold Storage 3,000 Tons Building Project.

Unicord Public Company Limited established in 1980 and dedicated it salt to product development.

Unicord's canned tuna, pouch tuna, and frozen products are well-accepted throughout the word under more than 350 brand names. The human food products range from canned tuna, sardines, mackerel, pilchard and pouch tuna etc.

Unicord wishes to Renovation cold storage 3,000 Tons building to keep capacity more raw materials. The storage would ensure the security of raw material of the manufacturing process continuity.



Ten consultants Co., Ltd has provided recommendation and design as follow;

- Piling Work: Bore Pile Wet Process Diameter 0.60 meters and 29.00 meters depth with safe Load 80 tons per pile
- Structural Work: Slab has designed for live load. Not less than 5 tons per square meter. And the roof structure is a steel frame.
- Architecture Work: Wall and Ceiling use Sandwich Panel Polyurethane (PU) 6 inch at cold storage room inside temperature -20 °C.

## Project Description



Summit Keylex (Thailand) Co., Ltd a joint venture between Summit Corporation Co., Ltd and Japan-based Keylex Corporation established to produce and dynamic automotive market with top-quality automobile and assembly parts. Sited on a land area of more than 20,000 square meters is strategically located in Hemaraj Eastern Seaboard Industrial Estate, Rayong. The project consists of Factory Buildings (Assembly Factory, Press Factory, 2 Storey Office, Switch Gear Room, Transformer yard, Air Compressor room, Cat Walk), Canteen & Locker buildings, etc.

Ten consultants Co., Ltd. was appointed by Summit Keylex (Thailand) Co., Ltd. to conduct of Construction Supervision and management of the factory and building since beginning until the project handing over. The Main Contractor of Structural, Architectural and Sanitary works by Channakorn Engineering Co., Ltd. CH. KarnChang PCL. was awarded the construction contract for earthwork. And MEC Co., Ltd. was awarded the Electrical and Mechanical contract works. Total project budget cost of Baht 380 Million and the project period was 12 months started in July 2013 and completed in June 2014.

# Sport Authority of Thailand (SAT) Construction Supervision of Stadium

## Project Description

8 Provinces



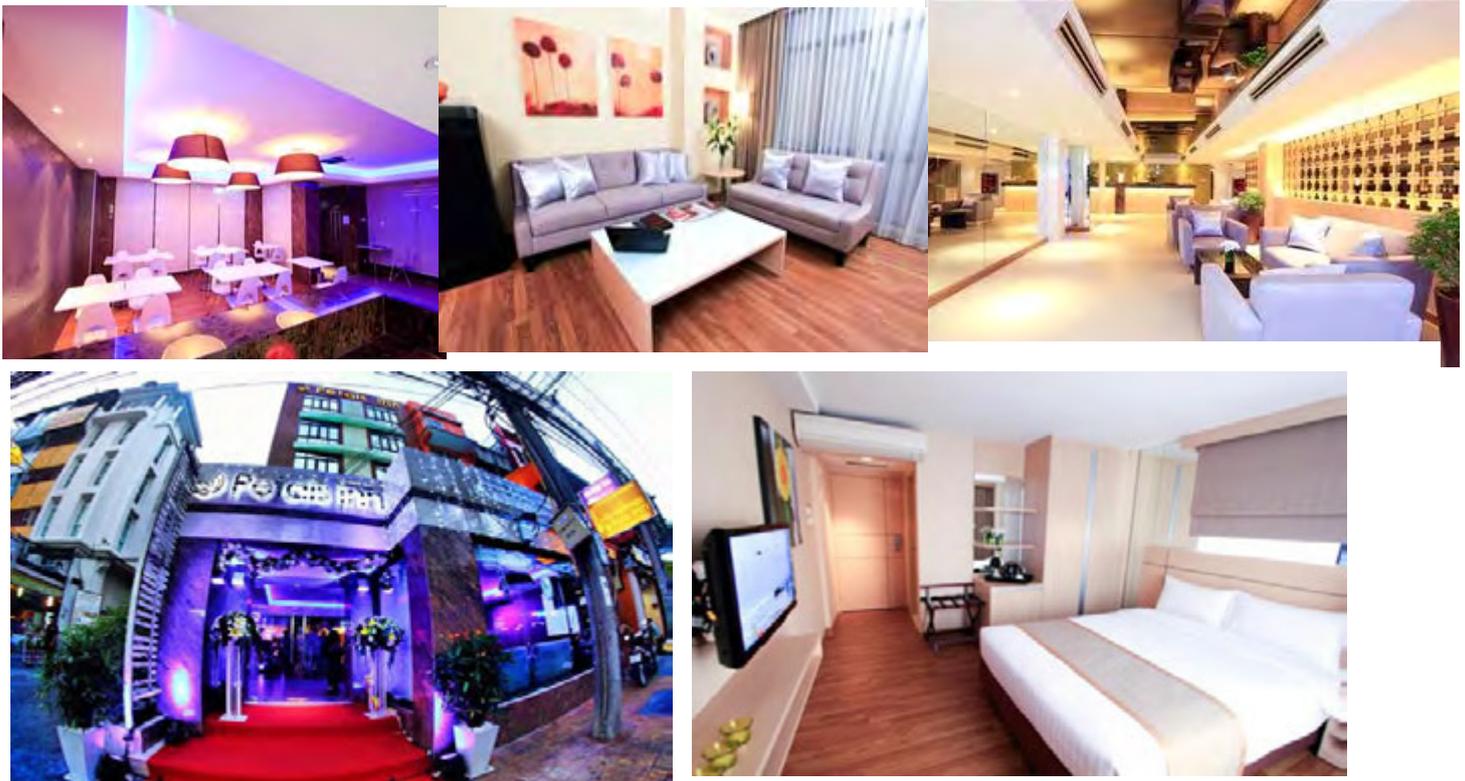
Ten Consultants Co., Ltd. in association with PPA Co., Ltd. were appointed by Sport Authority of Thailand (SAT), for construction supervision of 8 provinces which are Sa-Keaw, Mahasarakham, Sakonnakorn, Samutprakarn, Amnartcharoen, Petchaboon, Narathiwat, and Saraburi.

Scope of Construction supervision are 1,000 seats soccer stadium, field, athletics track synthetic field, and utilities concerned. Sport Authority of Thailand (SAT) appointed Armed Forces Development Command of Royal Thai Army to conduct all 8 provinces project.

## **DESIGN & CONSTRUCTION SUPERVISION SERVICE**

## Project Description

### DESIGN & CONSTRUCTION SUPERVISION AND PROJECT MANAGEMENT OF BUSINESS HOTEL IN THE CENTER OF BANGKOK CBD



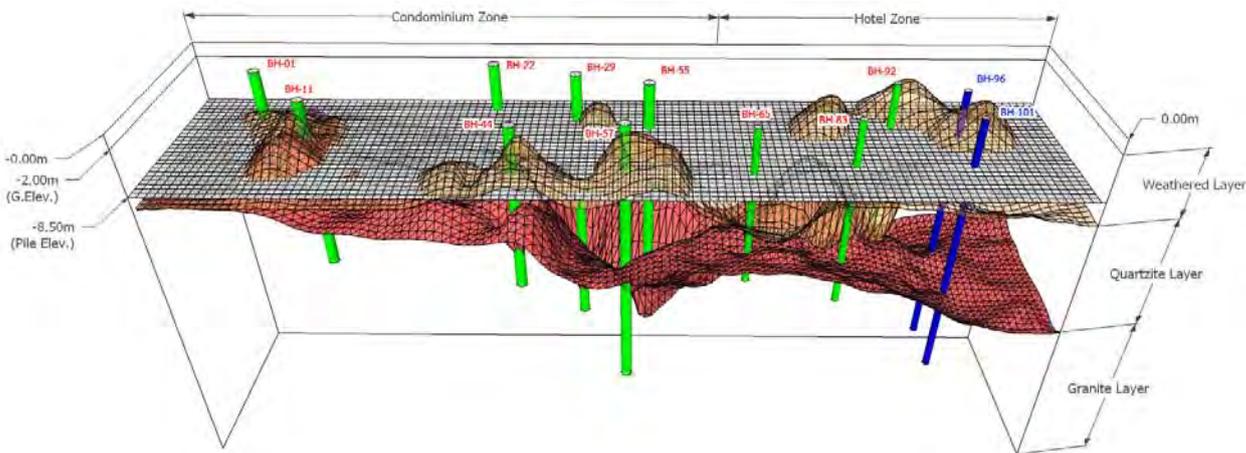
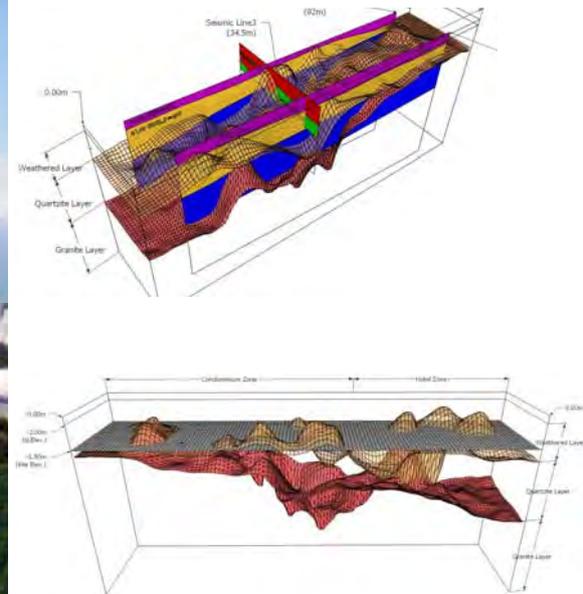
#### PROJECT DESCRIPTION

*T. Choithram & Sons (Thailand) Co., Ltd.* an international trading firm base in Dubai, United Arab Emirates having business investment and trading in more than 20 countries in 4 continents had long term developing business in Thailand over 15 years. *T. Choithram & Sons* had decided to renovate own trading contact office in the Sukhumvit 4 (South Nana), Sukhumvit Road in the prime area of Central Business District in Bangkok Metropolitan.

#### RESPONSE

*TEN Consultants Co., Ltd.* had been appointed to Design by modify from the existing building. Difficulty is the limited of available area of the project and operating time for the construction. Architectural, Structural, Civil, Mechanical, Electrical, Sanitary, Environmental Works fulfillment from Design, Specification, Construction Cost Estimation, Contractor Bidding and Construction Supervision and Management.

Project Description



Value Engineering for the Foundation Engineering Design Alternative of High Rise Building standing on Rock Cliff beyond Pattaya Beach

Ten Consultants Co., Ltd. was appointed to conduct the Value Engineering for the Foundation Engineering Investigation and Design alternatives. Original Foundation Design was obviously costly and seriously construction technique concerned.

Assignment:

Works are including the rock coring, seismic subsurface investigation, rock material testing, geotechnical analysis, recommend the optimum type of foundation design and practical construction means. Detail of Geological strata and earth characteristic was conducted and propose the optimum arrangement of the new design.

## Project Description



### PROJECT DESCRIPTION

By *Bangkok Synthetics Co., Ltd.(BST)* and *BST Elastomers Co., Ltd.(BSTE)* :- BST and BSTE's plant at Map ta Phut Industrial Estate consists of two production units, for BR (Butadiene Rubber) and SBR (Styrene Butadiene Rubber).

This production capacity will be able to supply and support a diversity of downstream industries manufacturing vehicle tires, shoes, plastic, auto part and other rubber products. And this, we believe, is the contribution BSTE can dedicate to

### RESPONSE

*TEN Consultants Co., Ltd.* had been appointed to provide engineering service on Construction Supervision and Management including the design check all of the building in the project scheme starting from the production manufacturing process leading the overall design concept. Architectural, Structural, Civil, Mechanical, Electrical, Sanitary, Environmental Works fulfillment from Design and Specification check, Construction Cost Estimation, Construction Supervision and Management. Samsung Engineering was the main contractor of this project.

# Project Description



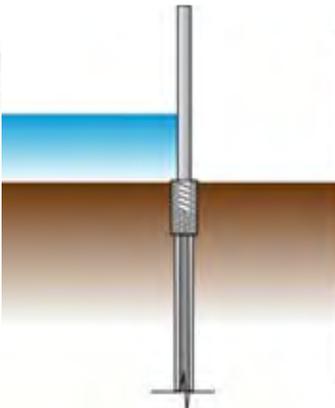
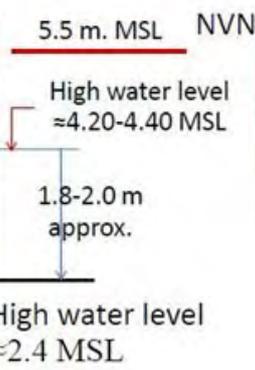
*Feasibility Study and Detailed Design of the Flood Protection System of Integrated Circuit Manufacturing Plant in Navanakorn Industrial Estate, Pathumthani province.*

Ten Consultants Co., Ltd. was appointed by Belton Technology Co., Ltd. to conduct the Feasibility Study and Detailed Design of Flood Protection System for the factory. The site is situated in Navanakorn Industrial Estate, Rangsit, Pathumthani province.

From the big flooding over Central Region of Thailand in the year 2011, there were 7 industrial estates been flooded to the level of water height up to 2.5-4.0 meters. The disaster created enormous damage to all the factories in these 7 estates.

With the experience of factory operators, simple earth berm or above ground reinforce concrete wall over the height of water depth could not protect the flood. Water pressure penetrates through the soft soil under the earth berm or R/C wall and burst inside the wall boundary resulting the wall failure and flooding over.

By the study of subsoil strata and design of soil cement column underground wall as well as above ground R/C wall was implemented. The construction cost of the project was 54 Millions Baht for the linear length of factory boundary of 640 meters. On situ test of underground wall water tightness had been conducted and certified to wellness result.





Ten Consultants Co., Ltd. in association with Building Audit Co., Ltd. were appointed by Sport Authority of Thailand (SAT), to conducted the Structural Engineering Aspects and Architectural of the building in order to improvement and repair planning. Building are reinforced concrete building and were built over a decade. There are 6 buildings in this project as following;

- |   |  |
|---|--|
| 1. Rajamangala National Studium             | 2. Shooting Range Building (10,15,20 meters) |
| 3. 4 Storey of Athletes Building (200 beds) | 4. 17 Storey of Athletes Building (300 beds) |
| 5. Sport Science Centre Building            | 6. Existing Office Building                  |

The inspector uses the cameras and advanced imaging technology to inspect the physicals characteristic of the structure and architecture. Furthermore, TEN also designed for repairing works and improvements of the damage point of buildings.



Amphoe Banglane, Nakornpathom Province

Agfour Industrial Park

TEN Consultants Co., Ltd. had been appointed to Design of all the buildings in the project which including 5 buildings of 4 companies situated in central holding company – Agfour Co., Ltd.

Works are including Architectural, Structural, Civil, Mechanical, Electrical, Sanitary Engineering Design, Specification, Construction Cost Estimation, and Construction Supervision and Management.



**AMAX INTER** บริษัท เอแม็กซ์ อินเตอร์ จำกัด  
Amax Inter Co.,Ltd.



Intercrop Building 1



**BF@CT INTER** บริษัท บีแฟค อินเตอร์  
Bfact Inter Co.,Ltd.



Intercrop Building 2



**CPACE INTER** บริษัท ซีเพช อินเตอร์ จำกัด  
Cpace Inter Co.,Ltd.

## Project Description



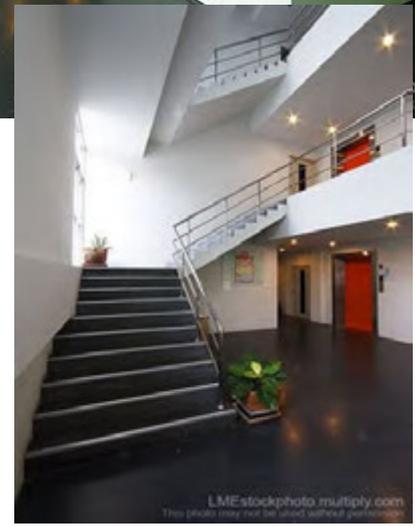
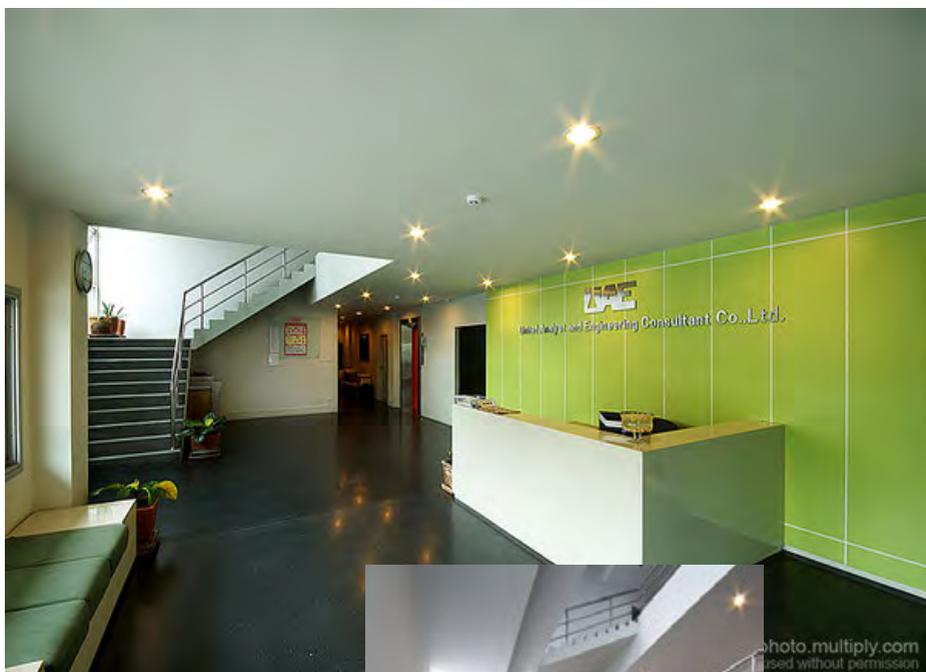
**Feasibility Study and Detailed Design of the first Dioxin Analytical Laboratory Building for Environmental Technology Research Center (ETRC), Ministry of Science and Technology.**

Ten Consultants Co., Ltd. associated with United Analytical Engineering and Consultant Co., Ltd. (UAE) was appointed to conduct the Feasibility Study and Detailed Design of the first Dioxin Analytical Laboratory Building in Thailand. The site is situated at the Scientific Park, Klong 6, Rangsit – Ongkaruk Highway, Pathumthani province. Construction Contract was awarded to **Hyatt Construction Co., Ltd.** at the budget of **97.0 Million Baht.**

The construction work was completed in September 2011.

Dioxin is a very dangerous chemical compound generated from uncompleted polychlorinated (such as plastic and PVC ) combustion. The substance is a kind of cancer stipulated agent. With very small amount, the substance may cause severe injure and sharp effect. Internationally environmental protection agency and World Food Organization announce Dioxin as one of the most prohibit substance of any contamination. Establishment of the Dioxin Facility though is the necessary requirement for the country. Every design elements and criteria need to consider in every cautious components. Also wastewater treatment system of the facility is also one of the most modern chemical waste treatment concept for this type of laboratory.

# Project Description



TEN Consultants Co., Ltd. was appointed by United Analyst and Engineering Consultant Co., Ltd. (UAE) to conduct the Design and Construction Management of the Office and Laboratory building project at Udomsuk Road, Sukhumvit 103, Bangkok. The building has 4 storey (provided for 7 storey expansion) with total gross area of 2,000 square meters situated in a 400 square wah land area. Excellent Architectural Design by *Dr.Rujiroj Anambutr* and *Dr.Tonkao Panin* from *Silpakorn University* to endeavor the chemical laboratory function and also office of engineering and scientist study and research work to the ISO 17025 Standard.

TEN carried on the design of all the engineering works fulfill the owner's requirement and architectural concept. Credence Construction and Design Co.,Ltd was awarded the construction contract. Total construction cost is Baht 35 Million (Excluding interior and furniture work). Project started in 2005 and completed in 2006



## Project Description

### DESIGN AND CONSTRUCTION SUPERVISION OF MODERNEST PACKING TECHNOLOGY IN THAILAND



#### PROJECT DESCRIPTION

Triwall Packaging (Thai) Co., Ltd. a joint investment of major international leader of packaging business worldwide invest in the third manufacturing plant in Thailand to be the most modern packaging technology in South East Asia. The project consists of Production building, Raw and Finish Product Warehouse, Utility Building, Office building which would be the center of training center worldwide of the group and facility support.

#### RESPONSE

TEN Consultants Co., Ltd. had been appointed to Design of all the building in the project scheme starting from the production manufacturing process leading the overall design concept. Architectural, Structural, Civil, Mechanical, Electrical, Sanitary, Environmental Works fulfillment from Design, Specification, Construction Cost Estimation, Contractor Bidding and Construction Supervision and Management.

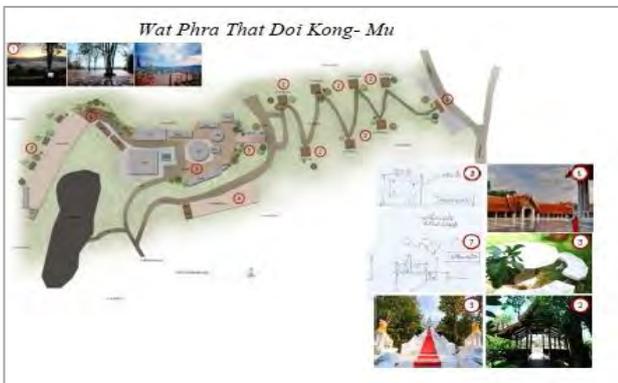


# The project on building up and shaping up local identity four provinces of the northern

## Project Description

The upper northern region 1 grants its authorization to carry out the activities on distinguishing tourism identities of each area in the province group which is comprised of Mae Hong Son, Lamphun, Lampang and Chiang Mai. The project on building up and shaping up local identities for year 2014. The project is deliberated by Cultural office under the consultancy of the Ten Consultant Co., Ltd. The activities are purposed as followed;

1. Discover and specify province's identities such as Wat Pra That Doi Kong-Mu, Wat Baan Pang, Wat Mon Chum Sin, Wat Chai Mong Kol (Jong Ka) and Sla – A specialist in handicrafts and arts.-
2. Develop identities of tourism promotion. For instance, Improve temple landscape by plant more tree, Insert a sculpture and Construction of new Imitation Ancient wall.
3. Conceptual Design for tourism landscape improvement of each province and improve website in dual languages (Thai/English)
4. Facility improvement for tourism such as road, toilet, parking area.



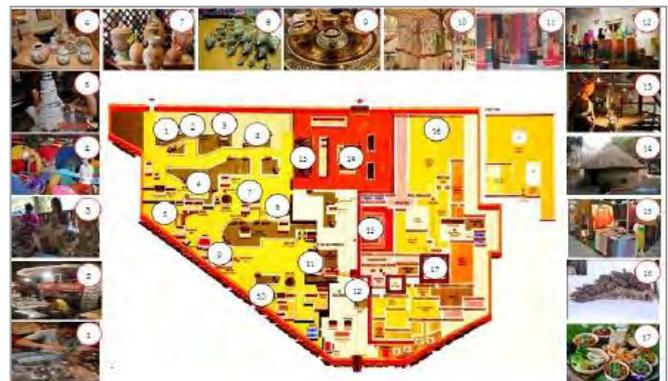
The conceptual design for landscape improvement of Wat Phra That Doi Kong-Mu in Mae Hong Son province.



The conceptual design for landscape improvement of Wat Baan Pang in Lamphun province.



The conceptual design for landscape improvement of Wat Mon Chum Sin and Wat Chai Mong Kol (Jong Ka) in Lampang province.



The conceptual design for museum in Chiang Mai province.

## Project Description

Thong Pha Phoom plantation located in H uaikhayeng Distric, Thong Pha Phoom Kanchanaburi on approximately area of 18723.16 hectares. The plantation area was classified as promotion environmental management and the social return which comprise of;

- Nature Education Center, 71 acres
- Teak plantation areas of 13182.74 hectares.
- Arboretums and seed areas of 76 acres.
- Ecotourism area of 219 hectares.
- Other areas (the stones, wooden sleepers, the inspector’s way) 275 acres.
- Total 13823.74 acres

TEN provided a service of Revise Master Planning and Detailed Design of the project area in order to improve the concept of Physical Development of Thong Pha Phoom Forestry Park for better Tourism area.



Accessible Homes



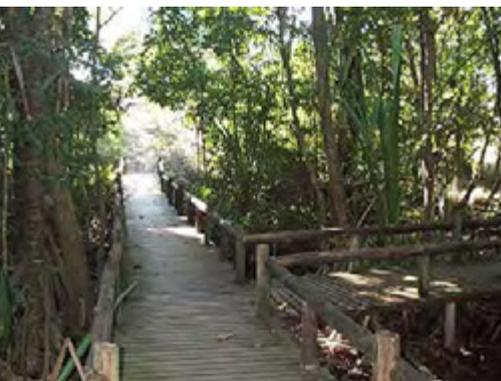
Parking area paving with compacted crushed rock



Camp Area



House beside reservoir



Swamp Nature Park education



The wooden bridge spanning the canal from the dining room to the file Camp

## Hot spring Exploration and Development Project

### Project Description



### Project Description

Hot Spring is a wonderful geology of the BayTong district and the most popular natural attractions of the local people and tourists, both Thais and foreigners. The hot spring is the rest, place for nature appreciation and that includes the activities of people Baytong.

Development of hot spring will make the result in maximum utility. Moreover the hot spring enhances tourism activity to local job creation and to recreational quality of local people and tourists.

### Services

Ten Consultants Co., Ltd. has been engaged as the operator of the survey mapping, using aerial photographs of the operation and studying the development of hot spring with basic design elements. Study covering about 1328 square kilometers and a design area of about 60 rai.



## Project Description

**Location :** Wang Thong district, Phitsanulok province.

**Owner :** Forest Conservation and Development Office,  
Phitsanulok

**Scope of services :** survey study of landscape  
improvement.



### Objectives of the

Tourism services in the plantation such as accommodation, seminar rooms, camping places, Nature Study Activity Arboretum cycle by engaging with members Forest Village, Food and beverage service, Rafting and massage. Encourage greater use from the output from the forest and eco-tourism by Local communities as appropriate.



### Services

- Improvement of landscape and landscape.
- Nature Trail and Nature Interpretation.
- Road Improvement and the Forest Park Water Treatment Plant Electrical System.
- Tourist Information Center and the Center of a product associated farmers.
- Parking space camp clean public toilets.

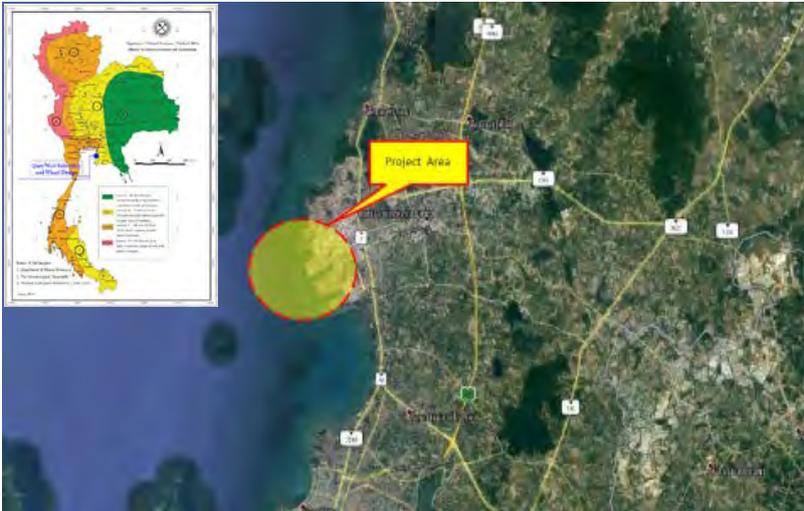
## GEOTECHNICAL SERVICES

### Scope Of Our Services

- Soil and Material Survey
- Soil investigation for the design of any kind of Building and Structural Foundation
- Soil improvement by cement stabilized, sand cement stabilized, etc.
- Geological Investigation along the dam axis and relating structures
- Power and Water Transmission Line Investigation
- Mineral resource Investigation
- Concrete/Rock Coring and Testing
- Field testing
- Quality Assurance



## Project Description



**UNITED THAI SHIPPING CROP LIMITED.,** of **Ten Consultants Co., Ltd.,** hereinafter called “TEN” to provide geotechnical investigation for the **Quay Wall Extension and Wharf Design Project** was performed since 23rd February 2019 and all field activities on 31st March 2019. Afterwards, the soil samples collected from investigated boreholes were delivered to laboratory and tested for their mechanical properties.

The scope of this geotechnical investigation comprises of the following:

- (1) Boring investigation of 16 boreholes (8 boreholes for quay wall, 3 for wharf, and 5 for jetty) to the designated depth of 5 m.
- (2) Standard Penetration Tests or SPTs and disturbed soil sampling by split-barrel sampler shall be performed at 0.50 m, interval.
- (3) Undisturbed soil sampling by thin-walled tube shall be performed where soft clay encountered.
- (4) Laboratory testing including:
  - Physical properties tests of soil samples including water content, unit weight, grain size analysis, specific gravity, and Atterberg limits. The estimated total soil samples for the physical property tests are 141 samples;
  - Unconfined compressive strength test of undisturbed soil samples (if any);
  - Direct shear test of available undisturbed soil samples (if any);
  - Consolidation test of available undisturbed soil samples (if any);
- (5) Reporting containing factual report and interpretative report including with geotechnical aspect recommendation for site works and foundations.



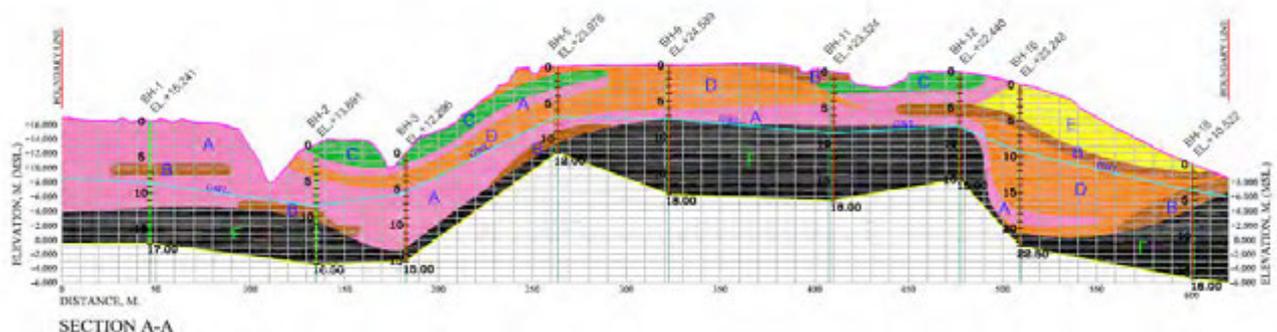
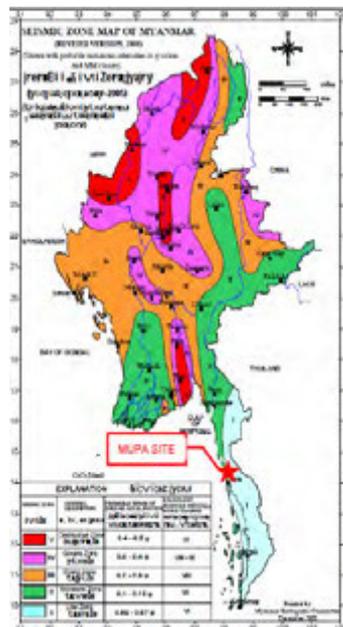
## Project Description



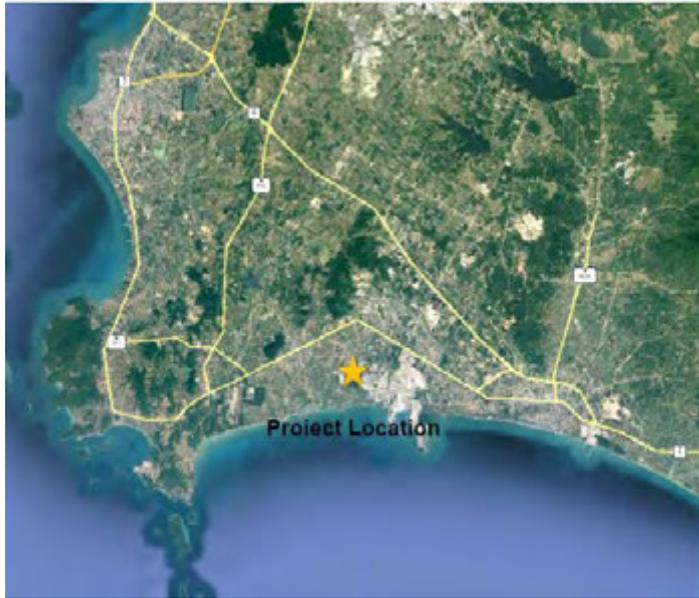
Myanmar UPA Company Limited, herein also called “MUPA” engaged the services of Ten Consultants Co., Ltd., herein also called “TEN” to provide geotechnical investigation services for the MUPA1 200MW CCPP Project. TEN had mobilized equipment and crew to the project site on 19th March 2016 and commenced field investigation since 20th March and finished the operation on the project site on 16th April 2017.

The scope of this geotechnical investigation works for this project comprises of the following:

- 1) Boring investigation of 18 boreholes of 20.00 meter depth.
- 2) Conduct standard penetration test or SPTs and disturbed soil sampling by split-barrel sampler at 0.50m interval to the depth of 3.00m and at 1.50m interval thereafter.
- 3) Laboratory tests.



Project Description



**CTCI Corporation** hereinafter called “CTCI” has engaged the service of **Ten Consultants Co., Ltd** hereinafter called “TEN” to provide geotechnical investigation for the **GPSC CUP 4 Phase 1 Project**. TEN has performed his assignment since 26th December 2017 and all field activities on 18th January 2018. Afterwards, the soil samples collected from investigated boreholes were delivered to TEN’s laboratory and tested for their mechanical properties. As well, the surveyed topographic information was processed for topographic map and drawings.

**The scope of this soil investigation for CUP 4 Project comprises of the following:**

1. Boring investigation of 21 boreholes inside the CUP 4 Project site. The designated investigated depth of the borehole is expected to be 15.00 m.
2. Standard Penetration Tests or SPTs and disturbed soil sampling by split-barrel sampler with liner shall be performed at 1.00 m interval to the depth of 6.00 m and at 1.50 m thereafter.
3. Installation of 2 groundwater observation well with piezometer for long term groundwater measurement;
4. Laboratory testing.



**The scope of topographical survey work comprises of the following activities:**

1. Establishment of permanent monuments to tie the project grid system to AIE grid system and elevation to AIE datum.
2. Horizontal and vertical control survey to establish a survey baseline tied to the established monuments in 1).
3. Detailed topographical survey of planimetric and height information.
4. Topographic mapping and presentation of survey information.



# SIPCO POWER II CCPP PROJECT

## Soil Investigation & Topographic Survey

### Project Description



SC Engineering Co., Ltd., herein also called “SC” engaged the services of Ten Consultants Co., Ltd., herein also called “TEN” to provide Topographic Survey for the SIPCO Power II CCPP Project (hereinafter called SIPCO II Project). TEN commenced his services since 13th December 2017 and finished field investigation on 26th December 2017.

**The scope of this soil investigation for this project comprises of the following:**

1. Boring investigation of 20 boreholes inside the Project site. The designated investigated depth of the borehole is 25m max.
2. Standard Penetration Tests or SPTs and disturbed soil sampling by split-barrel sampler shall be performed at 1.00 m interval to the depth of 6.00 m and at 1.50 m thereafter.
3. Electrical resistivity test at 4 designated locations;
4. Laboratory testing.



**The scope of topographical survey work comprises of the following activities:**

1. Establishment of permanent monuments to tie the project grid system to UTM WGS84 datum and elevation to mean sea level.
2. Horizontal and vertical control survey to establish a survey baseline tied to the established monuments in 1
3. Detailed topographical survey of planimetric and height information.
4. Topographic mapping and presentation of survey information.



## Project Description



TEN was engaged by MBA Engineering & Construction (CAMBODIA) Co., Ltd to provide a service of Soil Investigation service the project area in Kampot Tanker Terminal (PAPA OIL) located in the gulf of Thailand in Kampot province, Cambodia.

**Scope of work** is Soil boring investigation of 3 boreholes with 30.00 m. depth or where the last 3 consecutive standard penetration tests which exceed 50 blow/foot, and carrying out engineering property and physical property tests together.

The project started in November 2015 and completed in January 2016



## Project Description



Nippon Koei Co., Ltd. under the JICA’s grant fund engaged the services to Ten Consultants Co.,Ltd. to provide Soil Thermal Resistivity & Electrical Soil Resistivity Test for Underground Power Transmission Cable Line and Distribution System Expansion Project in Phnom Penh, Cambodia.

### Scope of Work

- Soil thermal resistivity measurements were conducted In-Situ during March 2016. Each location, a test pit was prepared at the depth of 1.20 m.  
The soil thermal resistivity measurement was conducted by the a thermal probe. Each depth, the measurement was performed 3 times to get 3 records to achieve the average value of soil thermal resistivity at the measured depth.
- Field electrical soil resistivity tests were carried out for determining the resistivity of the soil by Wenner Configuration Method. The procedure used is in accordance with ASTM G57 entitled “Standard Method for Field Measurement for Soil Resistivity Using the Wenner Four-Electrode Method”. Testing result would be used for the design of underground power cable transmission system of the Phnom Penh Power Transmission and Distribution Expansion Project.



**Project Description**

**Soil Thermal Resistivity Test**

**CHEANG ENGINEERING CONSULTANTS CO., LTD.** engaged the service to Ten Consultants Co., Ltd. to provide Soil Thermal Resistivity Test Report for Phnom Penh City Transmission Cable line and Distribution System Expansion Project PHASE 2.

**TEN** carried out the field test from the 31<sup>st</sup> of January to the 2<sup>nd</sup> of February 2018 by performed 5 sets of Soil Thermal Measurements at 5 designated locations where located in Phnom Penh, Cambodia. At each location, a test pit was prepared by manual digging to the depth of 2.00 m. The soil thermal resistivity measurement was then conducted at the depth of 1.00, 1.20, 1.50, 2.00 m. by a handheld thermal probe KD2, product of Decagon Inc., Ltd. USA.

At each depth, the measurement was performed 3 times to get 3 records to achieve the average value which will be representative of soil thermal resistivity value at the measured depth.

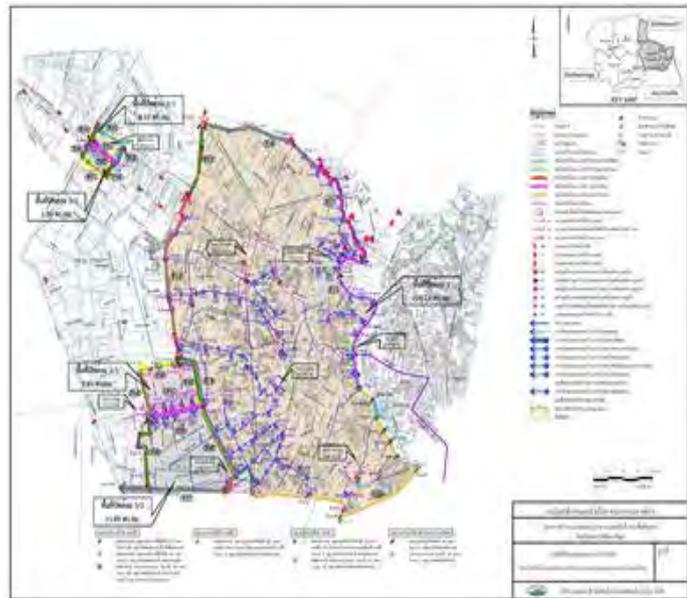


# Project Description



Department of Public Works and Town & Country Planning would have awarded contract of Survey and Detailed Design of Flood protection on the west bank of Nonthaburi province to Water Development Co., Ltd. (WDC). The project value of 44,920,000 Baht.

WDC appointed TEN to conduct the geotechnical investigation by the soil boring of 104 boreholes and laboratory testing for physical and engineering properties, field vane shear test of 106 boreholes and recommend foundation design. Assignment was completed in January 2015.



## Project Description



Process Engineering Services Company Limited engaged the services of Ten Consultants Co., Ltd. to provide Geotechnical Investigation Work for Yanhee Solar Power Project that a new solar farm to produce the solar energy for generating the electricity.

Yanhee Solar Power Project is located on the route no. 4022 in Banglane District, Nakhon Pathom province, Thailand about 70 Kms from Bangkok.

There are many site including Sai Yai Nha site, Sai Manow site, Sai Pudsa site, Sai Luang 1site, and Sena 2 site. This the project, Ten Consultants Co. Ltd. have made geotechnical investigation by the soil boring of 38 boreholes and laboratory testing for physical, engineering properties, and recommend foundation which completed in March 2015.

## Project Description

Italthai Engineering Company Limited, herein also called “ITE” engaged the services of Ten Consultants Co., Ltd., to provide Geotechnical Investigation Services for Chaiyaphum Wind Farm Project where located in Sap Yai district at Chaiyaphum province. TEN commenced his services by performing his field operation since 9th June 2014 and finished drilling operation on 19th June 2014.



### SCOPE OF WORK

- Six (6) boreholes between 5.70m to 10.00 m. depth
- Conduct rotary drill in materials in soil or rock obtain cores of 100 mm diameter existing ground level.
- Laboratory testing including Unconfined Compression Tests (Uniaxial Compression Tests) for rock cores samples
- Interpreting and reporting
- Soil Drilling and Samplings

Gypsum mineral exploration by 2D Imaging Resistivity & Sample boring

Project Description

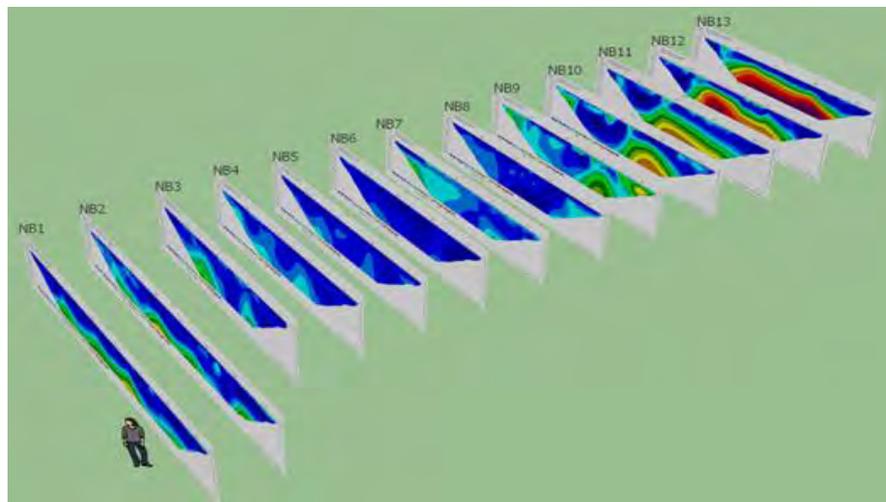
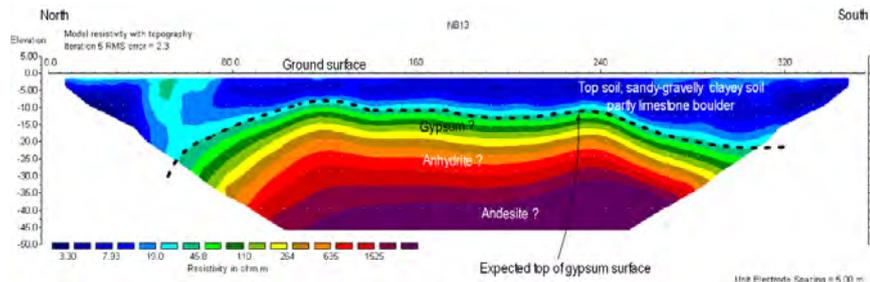
TEN was appointed from Sahachart Sethakit Company Limited to provide the Gypsum mineral exploration by 2D Imaging Resistivity & In situ Sample boring for comparison. Project site is at Nongbua, Nakhonsawan province.



Sahachart Sethakit Co., Ltd.

The scope of work is Resistivity Imaging (Dipole-dipole) survey in a field with 13 Lines and a length of 350 to 580 meters and total length of 5,010 meters. The geophysical survey methods to explore gypsum was use the Resistivity meter (Resistivity Imaging, 2D) by placing the electrodes as dipole - dipole configuration. Soil resistivity measurements are made by injecting current into the earth between two outer electrodes and measuring the resulting voltage between two potential probes placed along a straight line between the current-injection electrodes.

From the contains data specific electrical resistance result and the report of In situ sample boring of 14 boreholes, comparison of resistivity results conform more than 95 confidentiality. Amount of mineral investigated were calculated for further mining design and commercial estimation.

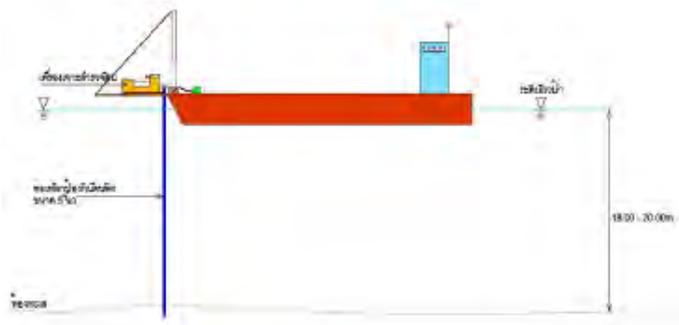
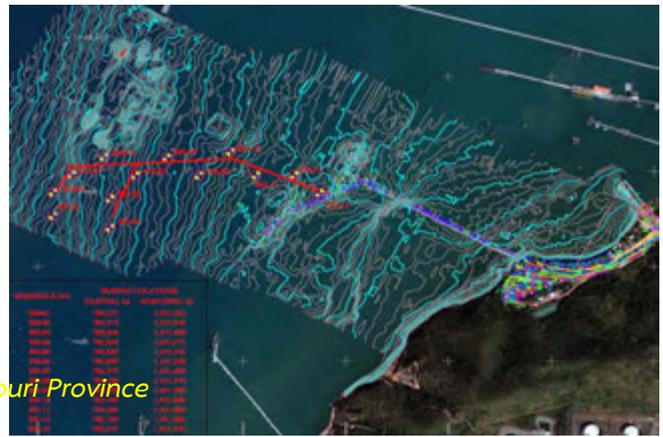




# Project Description



Project site area at Sriracha Port, Chonburi Province



### Our Diving Crew in operation to verify drilling spot free of any submarine cable and gas pipeline

Ten Consultants Co., Ltd. was appointed by Thaioil Public Company Limited to conduct the subsurface seabed investigation service. This new petroleum jetty number 7 and 8 would be constructed to serve for the Roll-in & Roll-out of Petroleum Tanker size 3,000-50,000 Dry Weight Tonnage (DWT). The seabed soil investigation would be the information for the design of the jetty foundation. The location of the 13 boreholes are approximately apart from the existing jetty 3 kilometers.

### Response:

Equipment in operation are consisted of 40 feet sea-barge, pilot ship, 6 wheel truck, Rotary drilling machine, Undisturbed sampling thin wall tube with microcrystalline coating, verification of subsurface pipeline/cable diving crew and etc. All equipment and operation crew have to be certified for all the method statement, safety procedure, standard practice and equipment certification with Thaioil's supervision before commencement.

## Project Description

*Subsoil investigation for foundation design of 24 Bridges crossing major rivers*



Solomon Islands, an independent state islands in the Pacific Ocean, North-east of Australia with majority Melanesian peoples had been granted by **Asian Development Bank** for the development of major road on the capital island of the country.

*TEN Consultants Co., Ltd.* was awarded contract by *The Seaboard Holding Co., Ltd.* to carry on the subsoil investigation for foundation design of 24 Bridges crossing major rivers. TEN had mobilized both machine and man-power to execute work in the island during first quarter of 2011. The assignment had been conducted successfully.

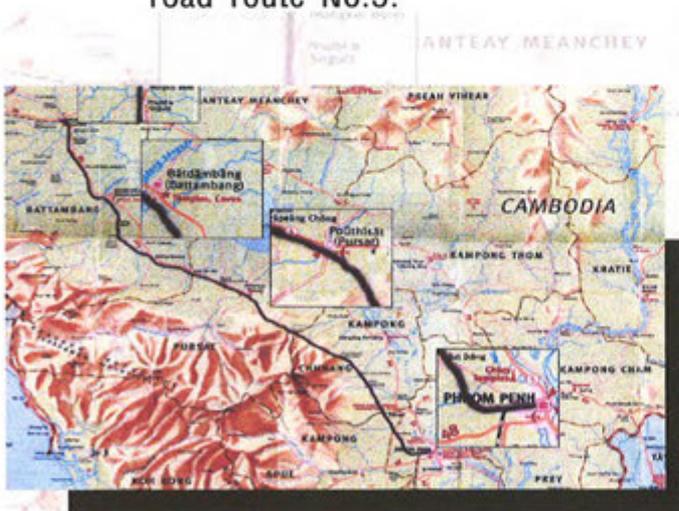
## Project Description

The Ministry of Public Work and Transport (Cambodia) has authorized Nawarat Patanakarn Public Co., Ltd. to commission the Primary Roads Restoration Project, Contract No. 5B (Kampong Chhnang-Pouthisat) and 5C (Pouthisat-Batdambang). The distance of the program is approximately 315 kilometers in total, which consist of 42 bridges located inside the route. The idea of the program is to rebuild all bridges located inside the route and also resurfacing the primary road route No.5.



## Our Provision

Ten Consultants Co., Ltd. has been appointed as a Sub-Contractor from Nawarat Patanakarn Public Co., Ltd. to carry on the task of Soil Investigation for this project. The main purpose of this task is to efficiently investigate the soil conditions encountered at the site and subsequently use these results as the guideline for the development of the project (Design and Construction of new bridges)



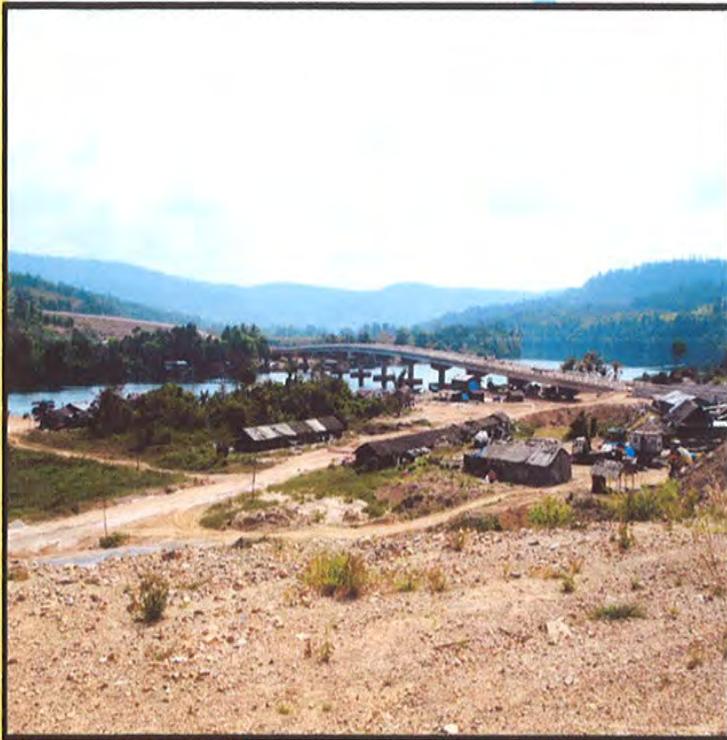
## Project Description

### National Highway Route 48 Koh Kong – SreAmbel, CAMBODIA

Subsail investigation for foundation design of 4 Long Span Bridges crossing major rivers. Dowel bar shear key to rock layer installation for bridge caisson foundation



National Highway Route 48 Koh Kong – SreAmbel, CABODIA is a grant financial project from Royal Thai Government (RTG) to The Kingdom of Cambodia to design and built of 380 kilometers interconnection between koh Kong province and SreAmbel province on the western cost of Cambodia. The highway is major economic corridor between the eastern part of Thailand at Trad province and new economic zone of Cambodia. The route consists of 4 long span bridges to be constructed. TEN Consultants Co., Ltd was awarded contract by Nawarat Patanakarn Public Co., Ltd. to carry on the subsoil investigation for foundation design of 4 Long Span Bridges crossing major rivers and support the bridge construction on installation of dowel bar shear key to rock layer for bridge caisson foundation.



# Project Description

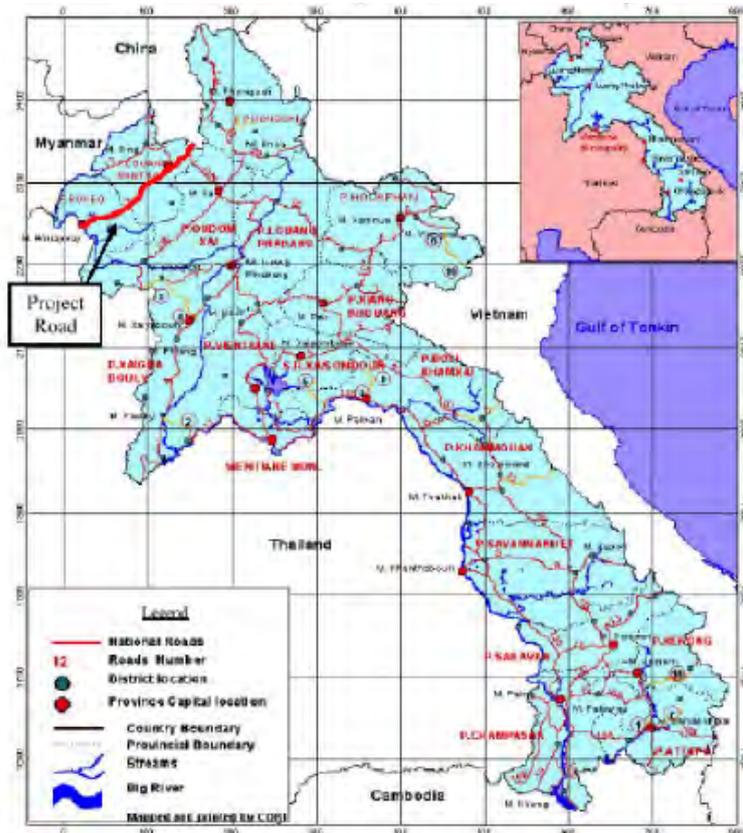
## North Economic Corridor Project : National Highway

### 3 ( Houay Xay – Boten ) LAO PDR

Soil investigation for design and construction of National Highway 3 contract package B from Km 84+000 to Km 160.8 (Ban Sod to Nam Lung).

### PROJECT DESCRIPTION

LAO P.D.R. had granted from three source of fund i.e. Asian Development Bank (ADB), Royal Thai Government (PRC) to renovate the international highway link between Southern of China, Yunnan State – Northern LAO P.D.R. and Northern Thailand at Chiangrai Province. The project is so called Northern Economic Corridor National Highway 3 ( Houay Xay – Boten )



The highway route is approximately 240 kilometer long laying over and along the hilly of one of the world heritage forest (categorized as river basin type 1 A – most fertile reserved forest) Three sections were awarded to three different Contractors from three source of funding. TEN Consultants Co., Ltd. Was awarded the contract from Design and built Contractor the Soil Investigation for bridge design work for the mid-section from Wieng - phuka to Luangnamtha which is the most fertile section of the project.



## Project Description

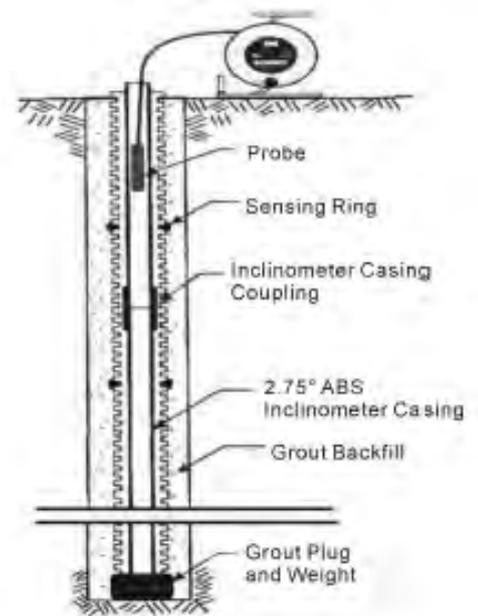


### The Project

The Construction Contract of the first Underground Mass Rapid Transit in Thailand was divided into two major contracts i.e. The Northern Line and the Southern Line. The Southern Line was awarded contract to BMCL led by Ch.Karnchang Public Co., Ltd. The Southern Line consists of the station from Hua-Lamphong Station to Bankai Station.

### Our Provision

Leo Jovian Co., Ltd. who was responsible on the Geotechnical Investigation and Measurement during the construction of Southern Blue Line Mass Rapid Transit Metro Tunnel in order to indicate the above ground and underground soil movement was appointed TEN Consultants Co., Ltd. to conduct the installation of Instrumentations. Activities included the installation of Extensometer, Inclinator, Vibrating Wire Piezometer, and Heave Indicator.



Magnetic Extensometer Installation

## Project Description



**A**merada Hess (Thailand) Limited (AHT) plans to develop the Phu Horm gas field in Petroleum Concession Blocks E5N and EU-1 in Udonthani province in Northeastern Thailand. The key objective is to supply natural gas via pipeline to the Electricity Generating Authority of Thailand (EGAT) Nam Phong Power Plant. The operation is schedule to come on stream in late 2005 with a production capacity of 135 million standard cubic feet of gas per day (MMscfd) which may be further increased in later years to 260 MMscfd depending on reservoir performance and gas demand.



## Our Provision

**T**en Consultants Co., Ltd. has been retained by AHT to provide international standard geotechnical and geophysical survey services at Well Sites, Gas Processing Plant, and along 60 km pipeline routes to find out engineering properties of subsoil. The total of 150 boreholes of 3m up to 120m deep soil and rock drilling has to be carried out. Along with soil and rock drillings, 30 trial pits, cone penetration tests, soil and rock samplings and testing for both physical and chemical are to be conducted. For geophysical investigation programs, 250 locations on pipeline routes are to be tested for soil resistivity by Wenner-Four-Electrodes method for the study of soil corrositivity. Additional 8 locations are to be investigated soil thermal conductivity and temperature profiles for a year. The services have been commenced since December 2004 and expected to be completed by year 2005.



## SURVEY & MAPPING SERVICES



### SCOPE OF OUR SERVICES

- Topographical Survey
- Project Mapping
- Project Contouring
- Aerial Photographic Survey and Interpretation
- Global Positioning System (GPS) Survey for GIS



**TOPOGRAPHICAL SURVEY & MAPPING SERVICE**

# TOPOGRAPHICAL SURVEY REPORT on PTT BAN RONG PO LPG TERMINAL PROJECT

## Project Description

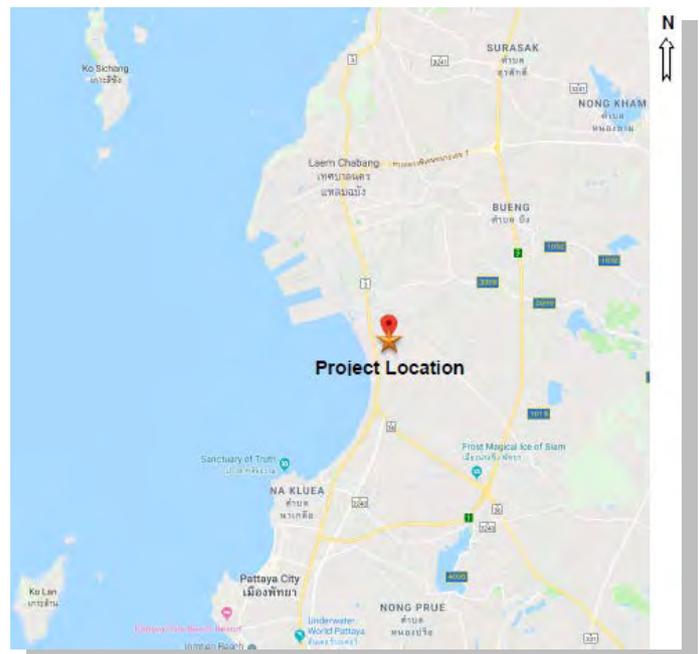


PTT Public Company Limited, herein also called “PTT” engaged the services of Ten Consultants Co., Ltd., herein also called “TEN” to provide Topographical Survey for the PTT BAN RONG PO LPG TERMINAL PROJECT located in Banglamung, Chonburi, Thailand. TEN commenced his services since 23rd April 2019 and finished field topographical survey on 7th May 2019 Topographical survey was conducted to cover the Project Area of about 166,700 sq.m.(104 rai)



The scope of topographical survey work comprises of the following activities:

1. Detailed topographical survey of planimetric and height information with leveling ground.
2. Installation of four (4) new permanent monument.
3. Topographic mapping of survey information.



# TOPOGRAPHICAL SURVEY REPORT on AVX MEGA PLANT, NAKORN RATCHASIMA PROJECT

## Project Description

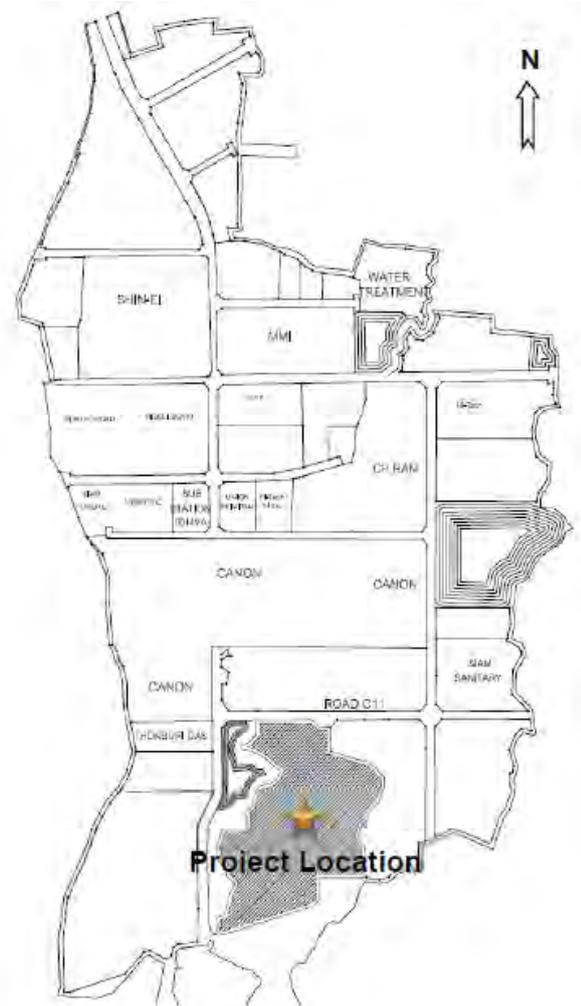
VITA TEAM CONSULTANT CO., LTD., herein also called "VITA" engaged the services of Ten Consultants Co., Ltd., herein also called "TEN" to provide Topographical Survey for the AVX MEGA PLANT, NAKORN RATCHASIMA PROJECT located in Nava Nakorn Nakorn Ratchasima Industrial Zone, BOI Zone 3, Thailand. TEN commenced his services since 2nd August 2019 and finished field topographical survey on 4th August 2019.



The AVX Mega Plant Project at Land plot 6, 7, 8, 9, 10, 11, 12, 13,14 and part of 16 Phase 3, Road C 11/ C12, total area 111-3-43.6 Rai

**The scope of topographical survey work comprises of the following activities:**

1. Detailed topographical survey of planimetric and height information with leveling ground.
2. Installation of four (4) new permanent monument.
3. Topographic mapping of survey information.

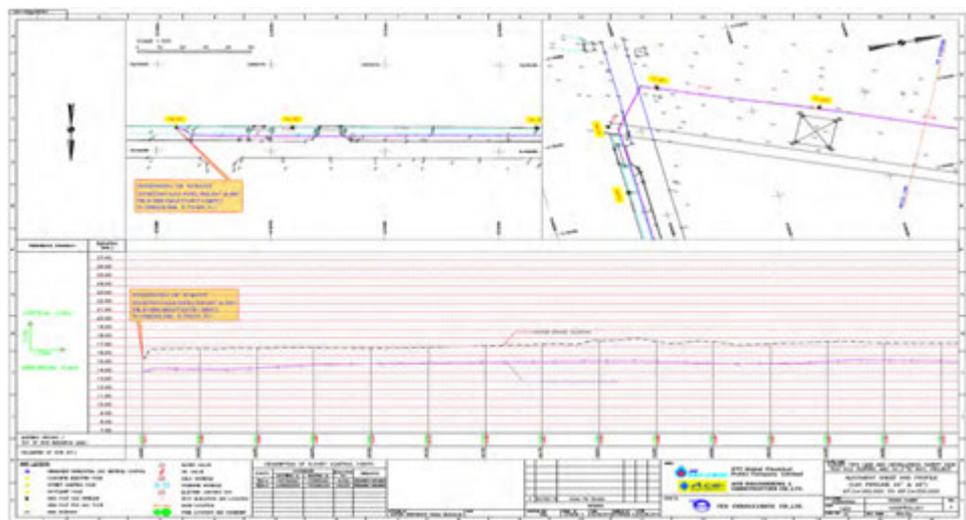
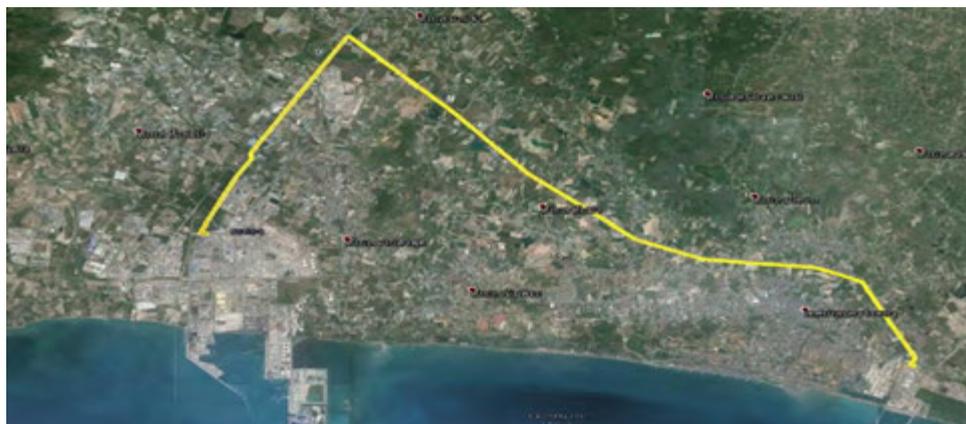


## Project Description

As PTT Global Chemical Public Company Limited (PTTGC) has planned to rehabilitate its safety signs along the existing gas pipeline from its facilities in Map Ta Phut to Integrate Refinery & Petrochemical Complex (IRPC) in Rayong for a distance of about 30 kilometers, a detailed survey of the exact pipeline alignment buried underground and its crossing locations was required to be drawn on to the as-built maps and drawings.

TEN was assigned to provide PTTGC such detailed survey and prepared the as-built maps and drawings. The service had started from January 2015 and completed in May 2015.

Instruments used in this detailed survey of existing underground gas pipeline comprise of GPS sets, electronic total stations, automatic levels, and especially for RIDGIT "Pipe Locator", an instrument used in investigation of buried gas pipeline.



# Shell Update Plot Plan Project: 5 Terminals Topographic Survey

## Project Description

Ten Consultants Co., Ltd. was engaged by Foster Wheeler (Thailand) Limited to provide Topographic Survey for 5 terminals of Shell Update Plot Plan Project, the assigned terminals are followings;

1. Chongnonsi (CNS),
2. Khonkaen (KKN),
3. Lampang (LMP),
4. Suratthani (BND) and
5. Samut Songkhram (SSK).

The topographic survey activity was included Topography and Utilities Survey, Ground Elevation Survey and topographic mapping covering whole designated areas of the project for further project plot planning, construction phase and engineering design.

**The scope of work was comprised of:**

- 1) Establishment of permanent monuments which would be the reference survey points and for further project construction phase.
- 2) Horizontal and vertical control survey to establish a survey baseline tied to the established monuments.
- 3) Detailed topographical survey of planimetric and height information.
- 4) Topographic mapping and presentation of survey information.

The project started since the 26<sup>th</sup> of December 2017 and finished field topographic survey on the 17<sup>th</sup> of January 2018.



## TOPOGRAPHICAL SURVEY & MAPPING SERVICE

# TOPOGRAPHICAL SURVEY CFP-CRUDE OIL TANKS PROJECT (C-COT)

## Project Description



Foster Wheeler (Thailand) Limited engaged the service of “TEN” to provide a Topographic Survey for the CFP-CRUDE OIL TANKS PROJECT (C-COT) which is the Project of Thai Oil Public Company Limited, located in Thai Oil Refinery, Sriracha district, Chonburi province, Thailand.

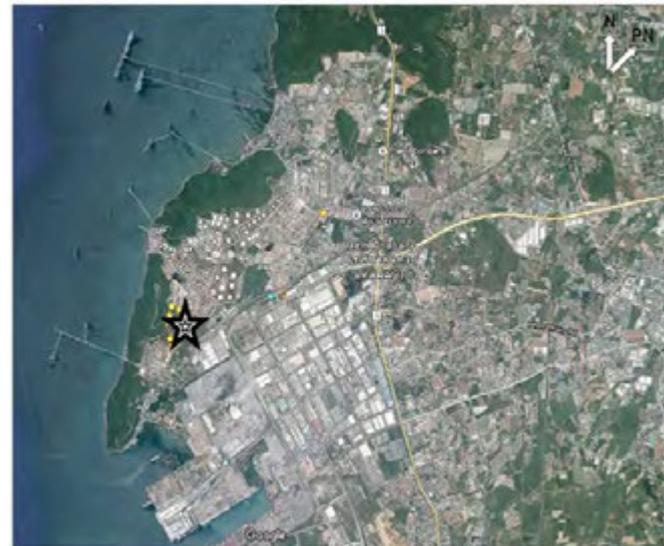
TEN performed the Topographic survey activities and prepared topographic map covering the C-COT Project for further project plot planning and engineering design, the designated project area is about 153 Rai or 244,800 sq.m. (In total area of C-COT+T-COT about 200 Rai or 320,000 sq.m.)

The scope of work comprises of the following activities:

- 1) Horizontal and vertical control survey referring to TOC Datum.
- 2) Detailed topographical survey of planimetric and height information.
- 3) Topographic mapping of survey information.

Topographical Survey for C-COT is complied with Royal Thai Survey Department Standard and in accordance with Foster Wheeler Contract. The Survey was carried out referring to reference survey points: BM-A68 and BM-A69 of C-COT and A71-N2, A71-1A and A71-2A of T-COT Site area. These permanent monuments are made of concrete with stainless name plate on the shallow foundation.

TEN commenced the services since the 15<sup>th</sup> of February 2018 and finished field topographic survey on the 15<sup>th</sup> of March 2018.



# Project Description



PTT Maintenance and Engineering Company Limited “PTTME” engaged the services of TEN to provide site survey (detailed topographic survey) and soil investigation services for the Water Crisis Project located in Map Taphut, Rayong province, Thailand.

The project has been separated into 2 parts. The first part is a main part composes of a proposed pipeline main route starting from SWRO area passing through LLDPE area and LDPE area then ending at PTTPE area (top right). The distance of the route is about 2 km. The second part is a minor line located at Pond #16 on Highway #36 (lower right).

The services were started on October 6th, 2014 and completed on November 8th, 2014.



Proposed Main Pipeline Route of Water Crisis Project



Water Crisis Project Location



Proposed Pipeline Route at Pond #16

## Project Description

### Topographic Survey and Class Location Survey

TEN conducted a topographic survey for the PTT Public Company Limited 30" gas pipeline from Block Valve # 10 in Ratchaburi province to RA#6 station in Nonthaburi province (so called "RRPP Project" for the distance of 120 kilometers for further engineering design and environmental impact assessment (by other).

Scope of topographic survey comprises of: establishment of 80 control survey monuments; pipeline alignment survey; crossing survey (highways, roads, railways, rivers, and canals) for about 300 crossings; and orthophoto mapping and class location survey covering a 400 easement of pipeline route.

This topographical survey was executed by ground survey method using GPS sets, electronic total stations, automatic levels, digital levels, and echo sounders for hydrographic survey across water bodies.



### Geotechnical Investigation

As well as topographic survey, TEN also conducted a geotechnical investigation for the RRPP Project. The scope of work is including, 35 of 3 m shallow hole boring investigation for pipeline installation and open cut design, 48 of 30 m deep hole boring investigation for HDD design and construction at crossings, 35 soil resistivity measurement, and 35 soil samplings and chemical tests of pH, sulphate & chloride contents for design and construction of cathodic protection system.



# Project Description

## CFP PROJECT at Thai Oil Refinery



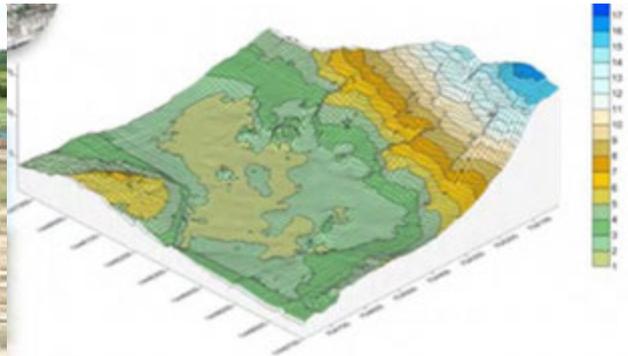
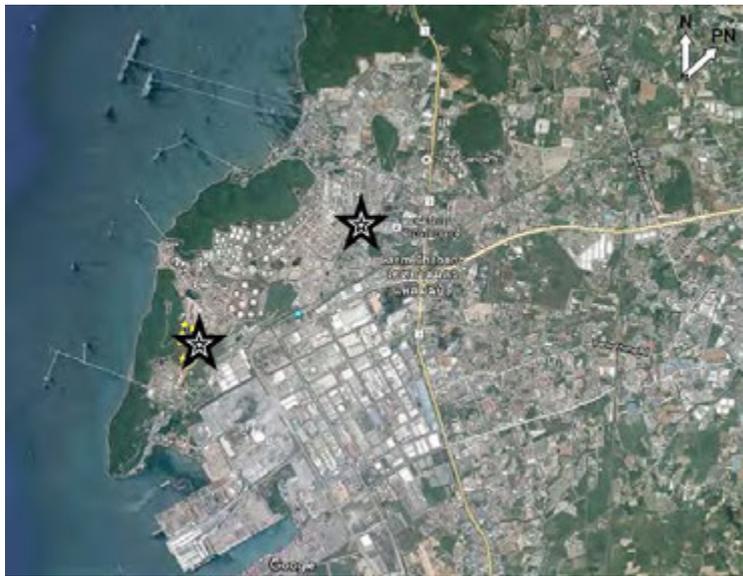
“TEN” provided a service of Topographic Survey of the Clean Fuel "CFP" Project for Thai Oil located in Thai Oil Refinery, Sriracha district, Chonburi province. There are 2 areas were conducted the first one is Area A covering an area of 200 Rai and the second is Area B covering an area of 118 Rai with Alternate Route as the boundary and route.

The scope of topographical survey work comprises of the following activities:

- 1) Horizontal and vertical control survey referring to TOC Datum.
- 2) Detailed topographical survey of plan metric and height information.
- 3) Installation of ten (10) new permanent monuments.
- 4) Topographic mapping and Alignment Plan Profile of survey information.

The result of survey has been prepared to present the topographic survey activities and topographic map covering the CFP Project for further project plot planning and engineering design.

The project started since 20<sup>th</sup> May 2015 and finished field topographic survey on 16<sup>th</sup> July 2015.



# Project Description

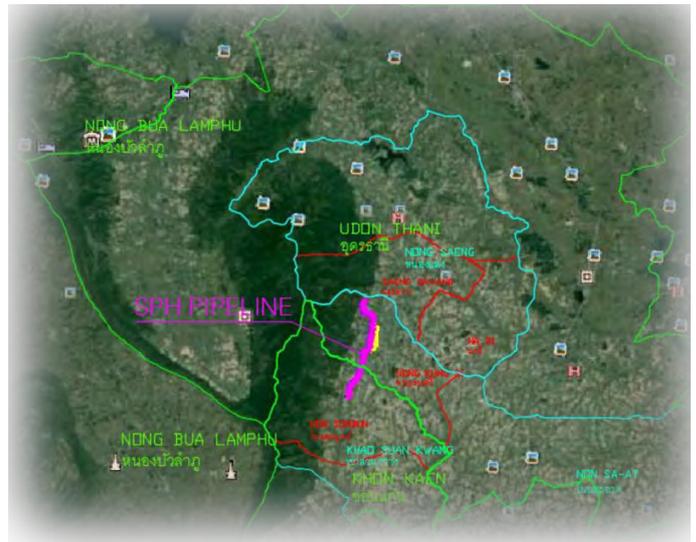


TEN was engage by APICO (Khorat) Limited to provide land property map and MOU preparation and topographic survey 10.5 km at tie-in site of L15 pipeline tie-in of Sin Phu Horm Gas Development Project where located in Undonthani province of THAILAND

The scope of work consists of;

- ✓ Establishment of control survey monuments & GPS survey
- ✓ Land Property Map Preparation
- ✓ Easement Survey & MOU Preparation along 10.5 km gas pipeline
- ✓ Topographic Survey of Tie-In Station

The project was started from September 2015 and completed in October 2015



# Project Description

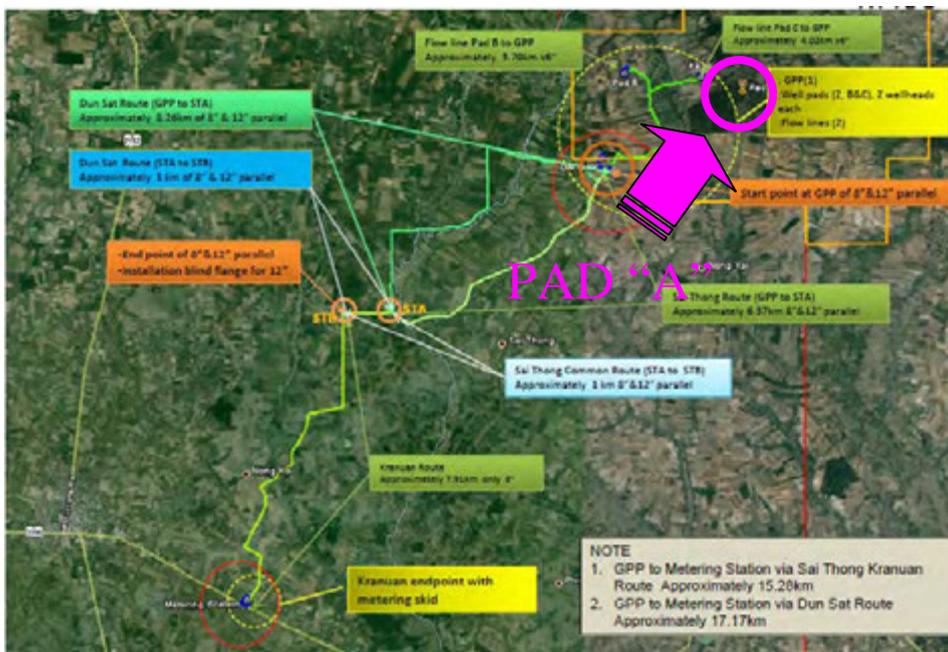
pipeline route of 2.7 km.



TEN was engaged by APICO (Khorat) Limited to provide topographic survey including with land property map & MOU preparation along gas pipeline route of 2.7 km from PAD A well site to the proposed gas preparation plant (GPP) of Don Mun Gas Development Project where located in Kalasin province of THAILAND

The scope of work consists of ;

- Topographic Survey Along Pipeline Route (Alignment Survey)
- Topographic Survey of Flow Line Route from PAD A to tie-point with PAD B-GPP Infiled Pipeline 2.7 km.
- Land Property Map Preparation
- Easement Survey & MOU Preparation 2.7 km



# Project Description

## Our Provision

Ten Consultants Co., Ltd. had provided topographical detailed survey services for AHT carrying out (1) topographical map of facilities sites including 3 well sites, 4 block valve stations, and one gas processing plant (2) detailed survey of access roads, gathering pipelines, and power lines of 18 kilometers in distance (3) detailed survey of 63 kilometers of Phu Horm-Nam Phong export gas pipeline (4) hydrographic survey of water courses along the Gas Pipeline and Lam Nam Phong River (5) detailed easement or right-of-way survey of 420 land blocks including preparation of documents to be used in land and properties compensation along the pipeline route.

Amerada Hess (Thailand) Limited (AHT) plans to develop the Phu Horm gas field in Petroleum Concession Blocks E5N and EU-1 in Udonthani province in Northeastern Thailand. The key objective is to supply natural gas via pipeline to the Electricity Generating Authority of Thailand (EGAT) Nam Phong Power Plant. The operation is schedule to come on stream in late 2005 with a production capacity of 135 million standard cubic feet of gas per day (MMscfd) which may be further increased in later years to 260 MMscfd depending on reservoir performance and gas demand.



## Project Description

**P**henol is mostly used in the production of certain plastic auto parts. Its demand is currently around 150,000 tons a year with annual demand growth of 6%. As the increase in domestic demand of phenol, PTT Phenol Co., Ltd. is established to be the producer of phenol. The PTT Phenol plant will be situated on the land in Eastern Industrial Estate in Mab Ta Phut, Rayong Province. The plant is planned to produce 200,000 tons of phenol per year and is scheduled to operate in the second quarter of the year 2007.

In the establishment of the PTT Phenol Plant, Foster Wheeler International Corporation has been awarded the project management contract including engineering design of plant facilities. By early of the year 2005 basic engineering design on the project is due to be finished.



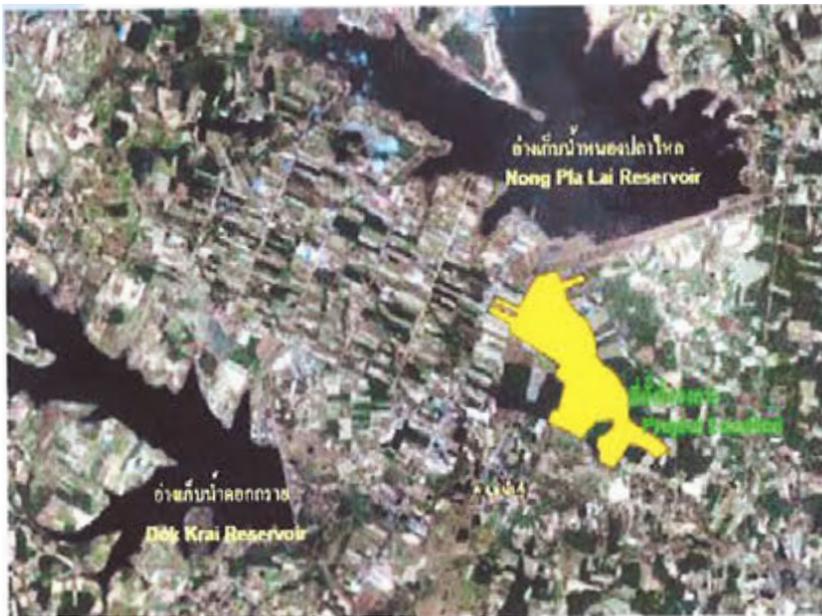
## Our Provision

**T**en Consultants Co., Ltd. was appointed by Foster Wheeler International Corporation to provide geotechnical investigation and topographical survey services on the Project Area of 134 rai (~21.5 ha). Twenty five (25) boreholes drilling each of 25m in depth, 5 test pits excavation, soil sampling and laboratory testing for engineering properties, 25 resistivity measurements for soil corrositivity, 3 groundwater piezometer installations, and soil contamination baseline survey were conducted and including with the investigation report in which comments and recommendations concerning geotechnical and foundation engineering were prepared. For topographical survey, full ground survey using precision electronic total stations and levels were carried out for the Project Site topographical map preparation. The Project topographical map was presented in digital AutoCAD and Intergraph Microstation format. The services had been performed since November 2004 and completed in March 2005.

## Project Description

### Miniblast of Yuan Industrial Estate

#### Basic Engineering data collection for Project Master Planning



The Miniblast Project Area is located on a hill of the difference of high and low ground elevations is about 30 meters. The highest point of the area is on the north nearby East Water Booster Station. The elevation around the place is about +77.000 m above mean sea level.

The subsoil of the project area is mostly composed of medium dense to very dense clayey sand and hard to very stiff sandy clay. However, loose materials are also found in same areas. Groundwater level is found at 2.47 meters to 12.30 meters below ground surface. The direction of groundwater flows are considerably in the west-east direction

#### SCOPE OF WORK Topographical Survey and Mapping

The scope of Topographical Survey and Mapping comprises of the followings :

- (1) Topographic Survey to cover the project area of about 2,264 rai.
- (2) Horizontal or plan metric control survey and Vertical Control Survey tied to nearby the government references. Six(6) permanent points shall be established for future extension of works.
- (3) Ground spot height survey by Electronic Total Station with grid line of 100 - 200 m. spacing. Ground elevation on grid line shall be 50-100m interval.
- (4) Detailed topographical survey.
- (5) Accuracy of horizontal control survey shall be 1 to 50,000 or better. Accuracy of vertical control survey shall be in accordance with class 3 survey work.



## TOPOGRAPHICAL SURVEY & MAPPING SERVICE

## Project Description

# Building Audit & Structural Strength Services



# Project Description

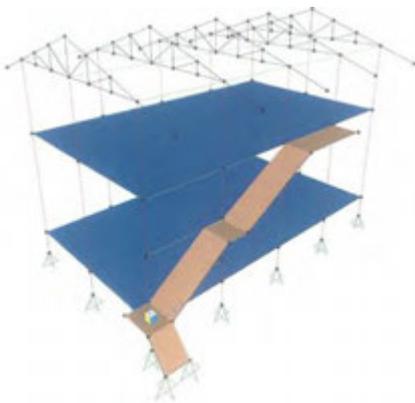
The Engineering Inspector of 7 buildings for Thong Thai Textile (Myanmar) Co., Ltd., Yangon, Myanmar. All buildings are in the good condition and able to perform the manufacturing operation for many years. All the inspection and audit had conducted by referring to the following code of conduct;

1. US Building Code
2. Myanmar Building Code
3. Engineering Institute of Thailand- Recommendation for Earthquake Provision
4. ASCE (American Society of Civil Engineer) Standard
5. ACI (American Civil Institute) Standard

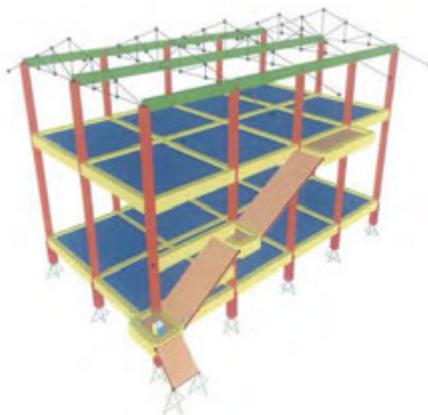


As – Built of Architectural and Structural Drawing of 7 buildings had been executed in accordance with the existing condition and actual measurement from site.

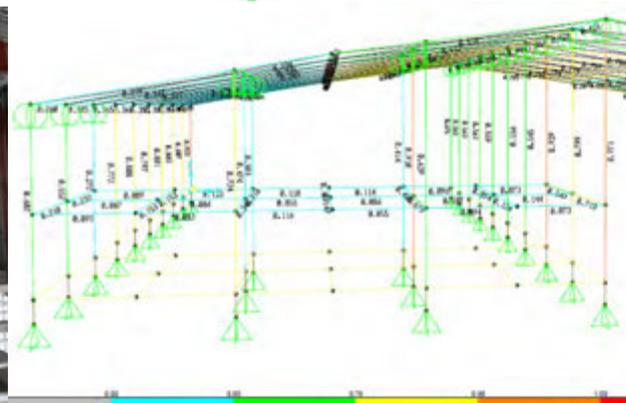
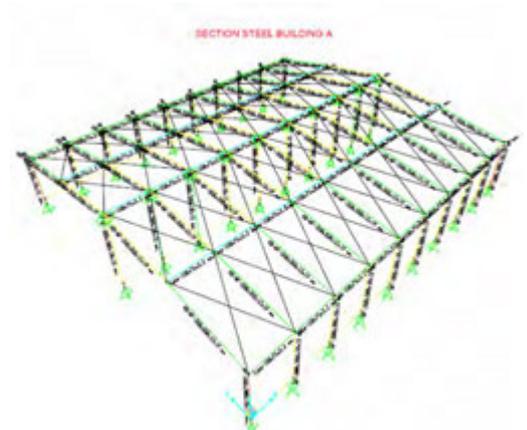
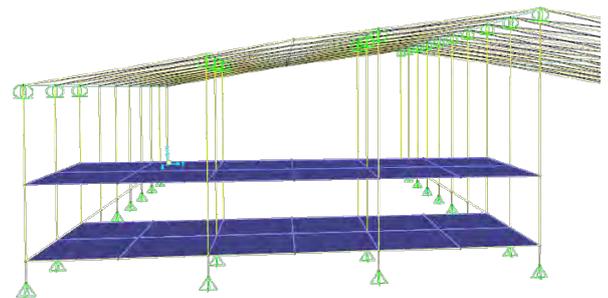
Structural Engineering Calculation from the 7 existing buildings from the site had been executed follow to the above code and standard to check and certify the structural stability and performance of existing buildings.



3D VIME BUILDING E



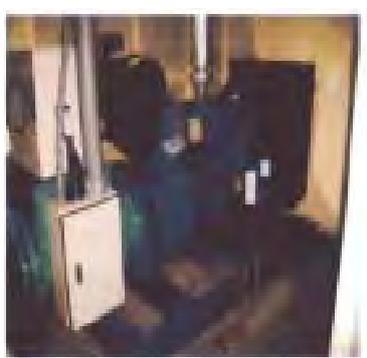
3D VIME BUILDING E



# Project Description

## Project Description

Audit, 32 Storey of Condominium and 50 hotel rooms located on Sukhumvit 61 Rd Klongtoey Bangkok, which rises 23 meters, must be examined by the Ministerial Regulation.



## Project Description

### STATIC LOAD TEST FOR LOADING CAPACITY VERIFICATION



#### PROJECT DESCRIPTION

Summit Windmill Golf Course has planned to modify an unfinished 9 storey 5 tower building which were designed to be service apartment to turn into 5 star hotel. With this assignment, the requirement of the Static Load Capacity Test of the unfinished constructed building need to be conducted conform for the modification of the existing structure before continue construction.

#### RESPONSE

TEN Consultants Co., Ltd. Had been appointed to carry on the static load test verification by turning water in layer as load distribution over the floor area of the existing structure. By installation of deflection dial gauge under all beams and slab of the structure and record actual deflection behavior to the extent limit of loading required. Plotting of deflection graph and certification of structural strength report had been submitted.

## IN SITU TESTS

Seismic Integrity Test



Soil Resistivity Testing



Plate Load Test



Dynamic Load Test



Static Load Test

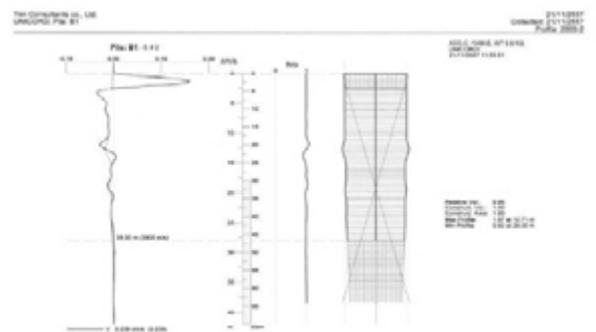
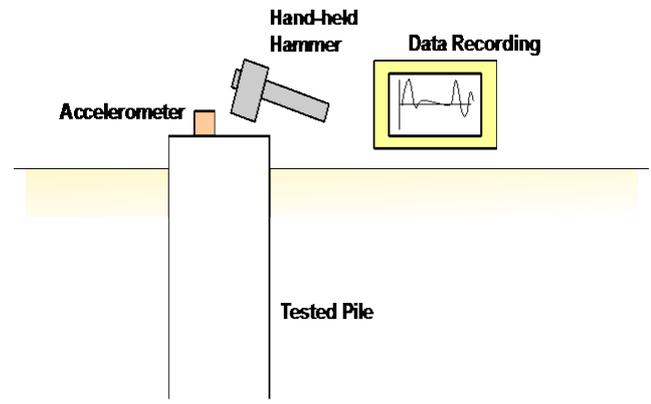


Sonic Logging Test



Service Description

Pile Integrity Tester (PIT), also known as Sonic Echo or Pulse Echo methods is used for the low strain integrity testing. The PIT may be used for auger cast-in-place piles, bored shafts, driven concrete piles and concrete filled pipes. It detects potential defects such as major cracks, necking, soil inclusions or voids and, in some situations, the method can determine unknown lengths of piles.



Service Description



PTT PMMA PROJECT



TLB New Wax Tank Project (Thai Lube)

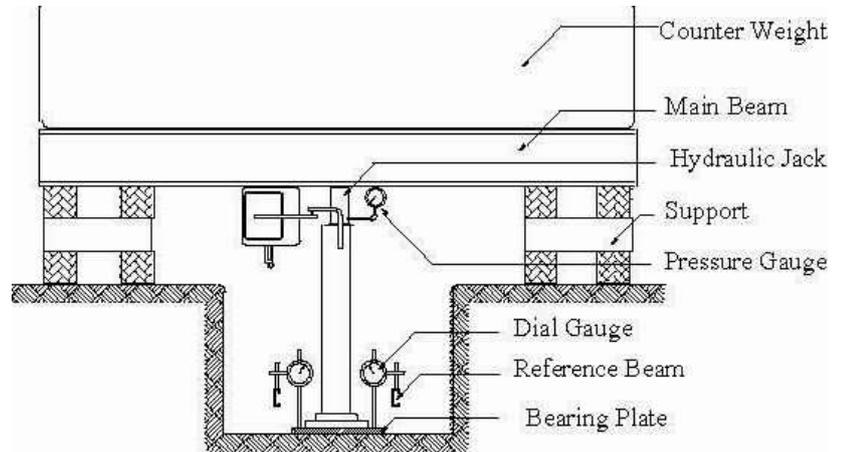


SOLARCO SOLAR POWER PROJECT -SAI PHET 1

*A soil resistivity measurement has a threefold purpose.*

First, data is used to make sub-surface geophysical surveys as an aid in identifying are locations, depth to bedrock and other geological phenomena and second resistivity has a direct impact on the degree of corrosion in underground pipelines. A decrease in resistivity relates to an increase in corrosion activity and therefore dictates the protective treatment to be used. Third, soil resistivity directly affects the design of a grounding system, and it is to that task that this discussion is directed. When designing an extensive grounding system, it is advisable to locate the area of lowest soil resistivity in order to achieve the most economical grounding installation.

Service Description



The Plate Bearing Test (or Plate Loading Test) is an in situ site used for determining the ultimate bearing capacity of the ground and the likely settlement under a given load.

While site investigations for most projects consider ground conditions at depth, the strength and variability of the near surface ground is critical for the design and operation of working platforms. The Plate Bearing Test is typically used in the design of temporary working structures such as working platforms for piling rigs or pads for crane outriggers. Approximate equivalent CBR values can be derived from the Modulus of sub grade reaction by use of mathematical relationship.

The Plate Bearing Test is carried out in accordance with **BS 1377 Part 9: 1990**. It basically consists of loading a steel plate of known diameter and recording the settlements corresponding to each load increment. The test load is gradually increased till the plate starts to settle at a rapid rate. The total value of load on the plate divided by the area of the steel plate gives the value of the ultimate bearing capacity of soil. A factor of safety is applied to give the safe bearing capacity of soil.



Service Description



Burapha University, Chonburi

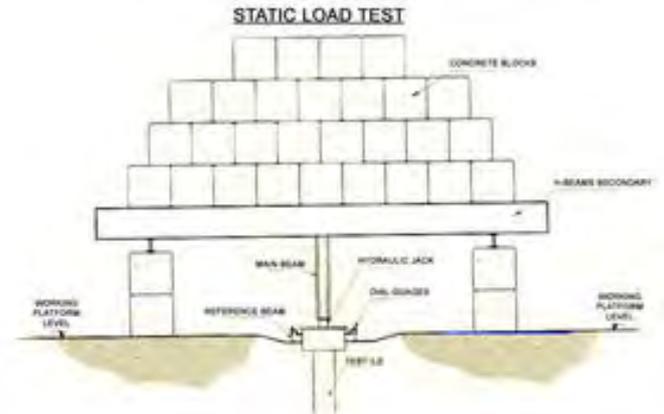
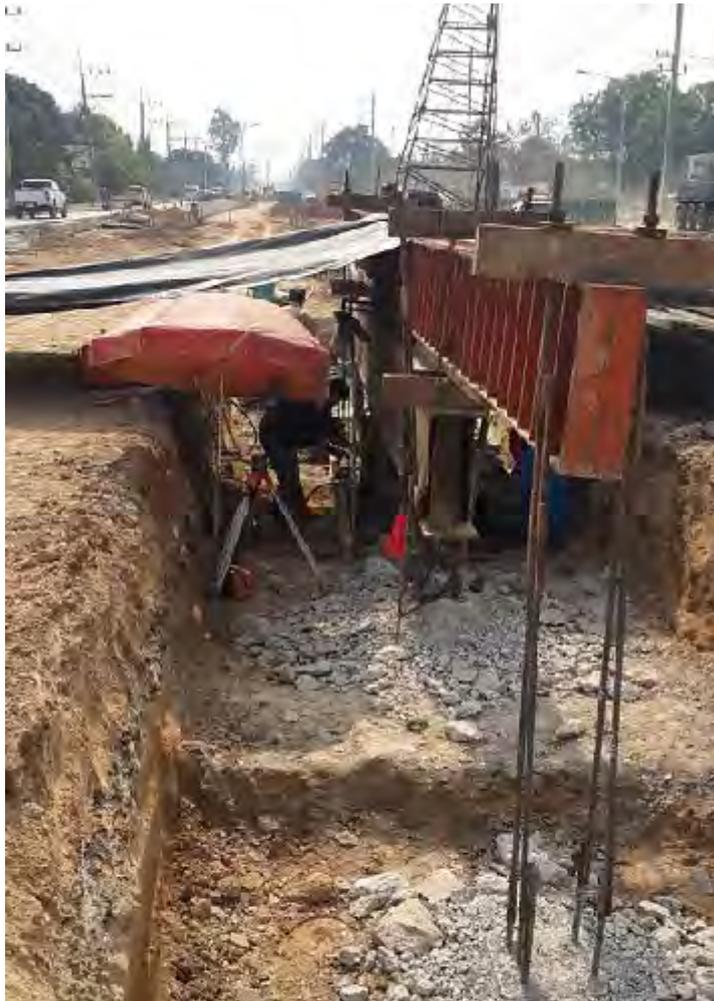


Dynamic Load Testing (DLT) is a quick method to evaluate the bearing capacity of a pile for loads similar to the design load. It can be used for prefabricated piles, cast-in-place concrete piles steel piles and wooden piles. DLT is considerably faster than static tests and at a fraction of the cost.

To apply a load, an impact ram or a heavy mass (for instance a drop hammer) is dropped onto the prepared pile head. The generated compression wave travels down the pile and reflects upwards. This reflected wave contains information about the shaft friction, toe resistance and possible pile defects. The measured signals are processed and automatically stored by the Profound PDA/DLT monitoring system. The data can be easily retrieved for further review, graphical presentations or reporting.



Service Description

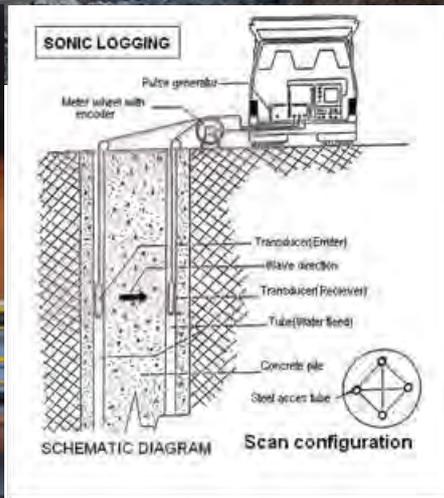


The static load test is the most accurate and reliable method to determine the bearing capacity of the pile tip, the shaft friction and deformation behavior of a pile.

Over the pile which will be test loaded an assembly is placed to determine the reaction force. If desired, secondary piles or for instance grout anchors can be used. Also, in the case of load tests of thrust piles, a ballast system can be used. The ballast can consist of stackable material like concrete or steel blocks. The load is transferred to the pile head by means of a jack in which the load which is delivered to the pile head is being measured with an electronic pressure box. The settlement of the pile head and pile tip can be regularly measured with the aid of a precision spirit level apparatus or measuring devices. The piles can also be instrumented by installing various extension and pressure gauges at various depths.



Service Description



Crosshole Sonic Logging (CSL), also known as cross sonic logging or the sonic logging test is the most accurate and reliable technique for assessing the integrity of deep foundation elements such as newly placed concrete drilled shafts and slurry walls, particularly when drilling below groundwater level. Considering the number of issues which can threaten the integrity of deep foundation elements during construction, it is essential to adopt a high level of quality control and assurance. The CSL testing procedure can detect anomalies inside concrete within just minutes.

Crosshole Tomography (CT) is a higher resolution analysis which can be used for further investigations after CSL has detected a flaw. Pile tomography delivers unmatched accuracy for defining the size, shape, severity and location of defects. CSL and CT analysis can eliminate the questions and concerns associated with problematic concrete pours



Mae Rim underpass, Changmai

## ENVIRONMENTAL ENGINEERING SERVICES

### Scope of Our Services

- Installation Hydro geotechnical (Monitoring well)
- Hydrogeology investigation and studies
- Physical, chemical and biology studies
- Environment impact assessment

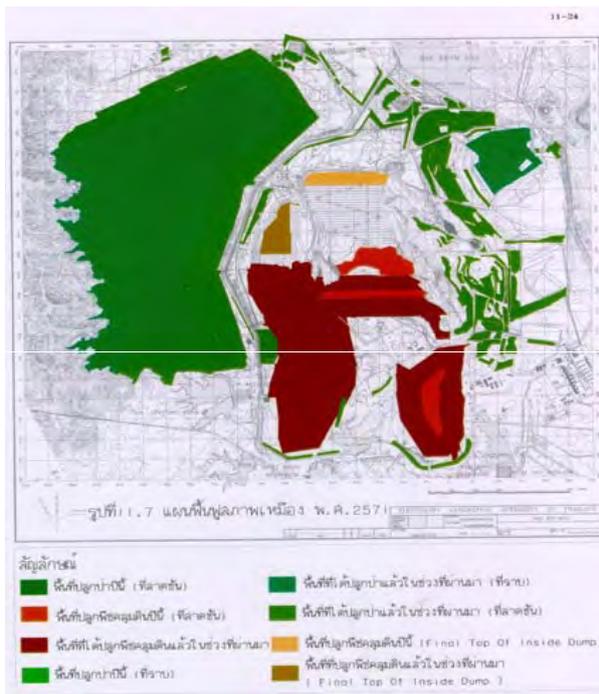


# Project Description

Electricity Generating Authority of Thailand (EGAT) appointed Ten Consultants Co., Ltd. and Asian Environmental Protection Co., Ltd. to conduct impact environmental Protection Co., Ltd. to conduct impact environmental assessment of lignite mining at Mae Moh, Lampang province. The project of environmental impact studies is including problems of physical environment of human beneficial usage and quality of life.



TEN CONSULTANTS CO., LTD. and ASIAN ENVIRONMENTAL PROTECTION CO., LTD. has processed the environmental impact assessment problems studies for the submission to office of environmental Protection and Planning (OEPP) for approval. Scope of project study are also including present environmental problems environment assessment and environmental impact remediation.



## Project Description

One of the most luxury 4 Star 320 rooms Hotel on Rattanathibet Road Nonthaburi Province

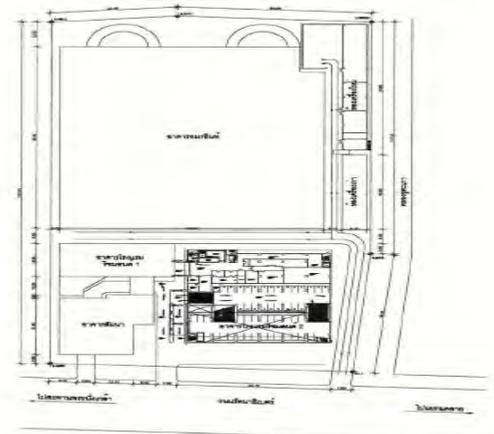


### Project Description

As Nonthaburi province is the closest province to Bangkok Metropolitan and frequently adopted as representative of Provincial Administration Organization and Tambon Administration Organization (Or Bor Jor and Or Bor Tor), several meetings and seminars are arranged here and require well organized functional meeting rooms and accommodations. Amornpinthip Co., Ltd., fulfill the program by construct a new 4 star 320 room hotel on one of the best plot of land close to the Nonthaburi administration office quarter on Rattanathibet road, Nonthaburi Province. The project is so called Richmond Hotel and become one of the most luxury and most modernize in Nonthaburi province.

### SERVICES

TEN Consultants Co., ltd. associated with Enrich Consultants Co., ltd. was selected to responsible for the study and conduct Environmental Impact Assessment (EIA) report to submit to the Office of Environmental Policy and Planning (OEPP). The study covers the impact assessment of the hotel both during the construction phase and operational.



## Project Description



**G**ulf Cogeneration Company Limited has planned to extend its thermal power plant namely "Kaeng Khoi 2 Power Plant" in Kaeng Khoi district, Saraburi province. In implementation, ALSTOM Power (Thailand) Limited has been awarded project management contract including engineering design of plant facilities. In the operation, the plant is planned to extract water from Pasak River for its cooling water system and utilities for the quantity of approximately 21 million cubic meters per year. To ensuring that amount of water in the Pasak river is available enough for the plant extraction and its water quality is appropriate for the usage, an investigation and study in the Pasak River at the proposed water intake structure would be conducted.



## Our Provision

**T**en Consultants Co., Ltd. was appointed by ALSTOM Power (Thailand) Limited to provide the detailed measuring and analysis program in Pasak River at proposed water intake station. The program comprises of 3 sub-program namely hydrological, physical and chemical, and biological studies. Water flows, water stages, water availability, and sedimentation are carried out by desk study of secondary data supported by Royal Irrigation Department and additional in-field flow measurement and river bed deposit composition survey. Water samples grabbed from the river were brought to laboratory for physical and chemical analysis such as chlorine consumption, conductivity, pH, BOD, TDS, etc. Aquacultures i.e. Phytoplankton, Zooplankton, and Arthropoda were sampled by plankton net and Petersen grab and were analyzed in laboratory. The services had been performed since January and completed in March 2005.

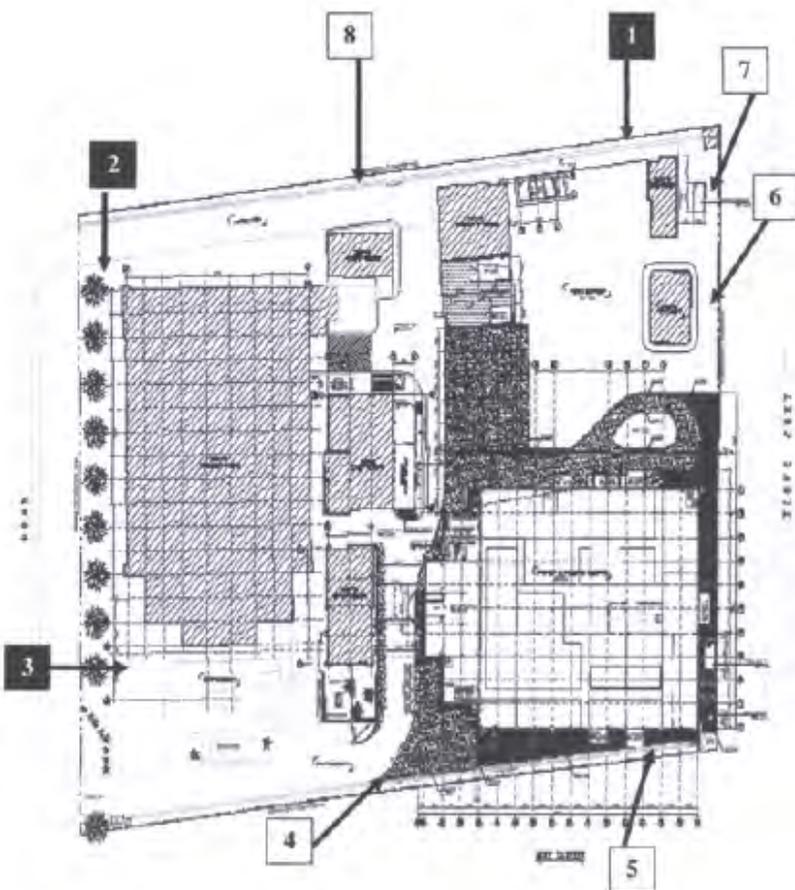
## Project Description

Chromalloy (Thailand) Limited  
Groundwater Monitoring Well  
Construction & Instrumentation



### Installation

- According to the 8 existing monitoring wells established inside Chromalloy(Thailand) Limited have no elevation information so that Ten Consultants Co., Ltd . (TEN) has been requested to carry out leveling survey for those 8 monitoring wells as well as to investigate groundwater flow direction.



### SCOPE OF WORK

- Scope of Monitoring Well Leveling Survey and Groundwater Flow Investigation comprises of the followings;
  - (1) Leveling survey for 8 monitoring wells
  - (2) Monitoring wells clean up
  - (3) Groundwater level metering, and
  - (4) Determination of groundwater flow direction

# VOC Elimination System for Environmental Improvement Project

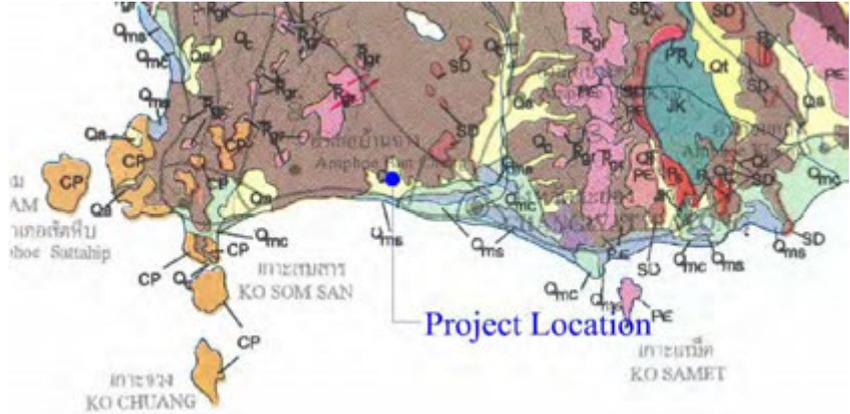
## Project Description



GC Maintenance and Engineering Company Limited has engaged the service of Ten Consultants Co., Ltd hereinafter called “TEN” to provide soil investigation and site topographic survey for VOC Elimination System for Environmental Improvement Project. TEN has performed his assignment since 22nd January 2019 and completed all field activities on 3rd February 2019.

The scope of this soil investigation comprises of the following:

- (1) Boring investigation of 4 boreholes.
- (2) Standard Penetration Tests for SPOTs and disturbed soil sampling.
- (3) Undisturbed soil sampling by thin-walled tube shall be performed where clayey soil encountered.
- (4) Groundwater observation at 4 investigated boreholes
- (5) CBR test at 1 designated locations;
- (6) Laboratory testing



# Capability on MIS & GIS Management Information System

## Project Description

Management Information System Service. The program was development by Visual Studio with Access database specification capacity 2GB. The program can import additional required data and PDF File or JPEG File for easy and convenient searching. As well as being able to open the reference file directly from the program. Resulting in efficient and rapid asset management.



- **Unicord Public Company Limited.** Asset Expert Management of production line and utility system project in order to have a sufficient database of assets of each building in accordance with the conditions and needs. By compiling And record in the details of the property.



- **Sport Authority of Thailand** Structural and architectural renovation project by surveying and collecting data into the database.

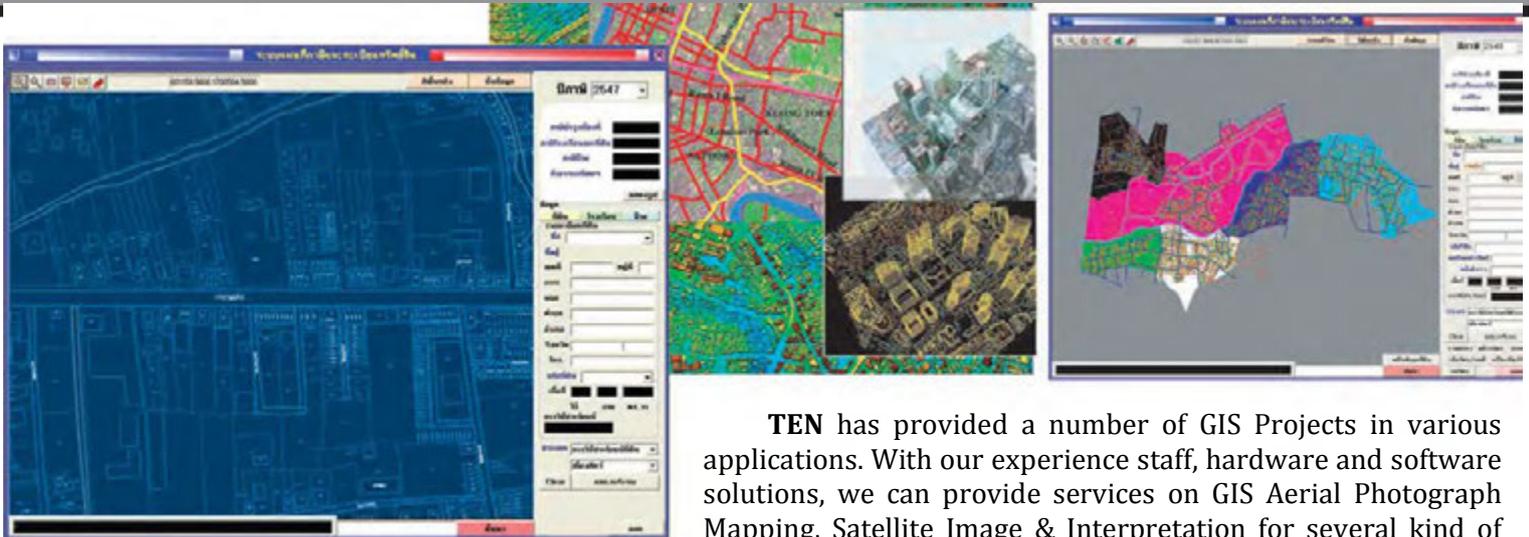
The screenshot displays the search results for a specific building structure. It includes a header with the UNICORD P.L.C. logo and project information. Below the header, there are several sections: a search criteria section with checkboxes for 'โครงสร้าง' (Structure), 'เสาเข็ม' (Pile), 'คาน' (Beam), 'โถงเหล็กคาน' (Steel beam), 'พื้น' (Floor), 'บันได' (Staircase), 'หลังคาเหล็ก' (Steel roof), and 'อื่นๆ' (Other); a section for 'สภาพปัจจุบัน' (Current condition) with checkboxes for 'สมบูรณ์' (Complete), 'ชำรุดเล็กน้อย' (Slightly damaged), 'ชำรุดปานกลาง' (Moderately damaged), 'ชำรุดเสียหาย' (Severely damaged), and 'โครงสร้างถูกแทนที่' (Structure replaced); and a section for 'รายละเอียดของการตรวจสอบความเสียหาย' (Details of damage inspection) with checkboxes for 'สำรวจด้วยสายตา' (Visual inspection), 'สำรวจด้วยเครื่องมือ' (Instrument inspection), and 'โครงสร้างมีความเสียหาย' (Structure has damage). The search results are displayed in a grid of four images: two photographs of the building's interior structure with red circles highlighting specific areas, and two technical drawings labeled 'TRUSS' and 'KEY PLAN' with red boxes highlighting specific components.

The screenshot shows the search criteria form and the resulting table. The form has four main steps: 1. Choose building (selected: อาคารที่ทำการเดิม), 2. Choose floor (selected: F1), 3. Choose category (selected: งานโครงสร้าง), and 4. Choose job type (selected: โครงสร้างเสา). The table below shows the search results:

เลขที่เอกสาร	รหัสอาคาร	ชื่ออาคาร	ชั้น	รหัสหน่วยงาน	หมวดงานสำรวจ	รหัสประเภท	ประเภทงานสำรวจ
b1f1b4sc10	B1	อาคารที่ทำการเดิม	F1	s	งานโครงสร้าง	c	โครงสร้างเสา
b1f1c4sc19	B1	อาคารที่ทำการเดิม	F1	s	งานโครงสร้าง	c	โครงสร้างเสา
b1f1c6sc15	B1	อาคารที่ทำการเดิม	F1	s	งานโครงสร้าง	c	โครงสร้างเสา
b1f1c7sc14	B1	อาคารที่ทำการเดิม	F1	s	งานโครงสร้าง	c	โครงสร้างเสา

A callout box at the bottom states: "Users can choose to view the details of the survey by Double Click the desired document number, for example b1f1c6sc15."

## Project Description



TEN has provided a number of GIS Projects in various applications. With our experience staff, hardware and software solutions, we can provide services on GIS Aerial Photograph Mapping, Satellite Image & Interpretation for several kind of project applications Anti-virus and Hacker extruder were designed and installed.

**Aerial Photomontage** for the Liquid Natural Gas (LNG) pipeline layout and subsurface investigation location supplementary to the Petroleum Exploration and Production Company for their usage of land leasing and detailed engineer design information.

**Area Planning Services** which applied for community planning, environmental Planning, Travelling Planning, Urban Planning, and Infrastructure Planning.

**Subsurface Mineral Resource Survey & Investigation** by the application of the satellite image interpretation and field survey and subsurface investigation to obtain the information for Feasibility Project viable for commercial development.

**Municipality and Sub-district Administration Organization Household and Land Tax Mapping** by the using scale of 1:1,000 Aerial Photograph covert into GIS map with Global Positioning System (GPS) survey on site and land title deed information input into computer database linking with mapping by our own Tax Mapping software to overcome a very efficiency Tax collection tool for Municipality and Sub-district Administration Organization. There are Five Sub-districts which TEN was appointed to execute the work, details as below:

1. Thepkrasattri Sub-district, Talang District, Phuket Province
2. Thap Khlo Sub-district, Muang District, Phichit Province
3. Chengthalay Sub-district, Talang District, Phuket Province
4. Satengnok Sub-district, Muang District, Yala Province
5. Kheex Sub-district, Mae Rim District, Chiang Mai Province

## TEN's LABORATORY & WORKSHOP FACILITY

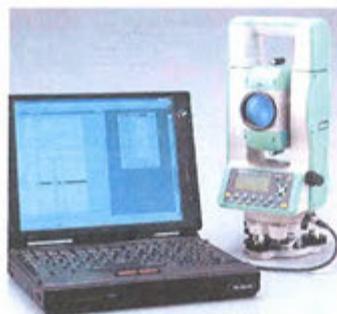
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### Analytical Parameter Service Provision

- Direct Shear Test
  - Compaction Test
  - California Bearing Ratio (CBR) Swell Test
  - Chemical Test of Soils and Groundwater - pH, Sulphate, Chloride, Alkalinity, Nitrate, Phosphate, Heavy Metals Content
  - Soundness Test
  - Los Angeles Abrasion
  - Absorption
  - Organic Impurity
  - Etc.,
- Natural Moisture content
  - Sieve Analysis
  - Hydrometer Analysis
  - Atterberg limit (liquid limit, - plastic limit, shrinkage limit)
  - Bulk and dry density
  - Specific Gravity
  - Unconfined Compression Test
  - Consolidation Test
  - Triaxial Test

## EQUIPMENTS & TOOLS



# & EQUIPMENTS & TOOLS

## Project Description

There are 3 types of Boring & Coring Equipment which TEN use to operate onsite, details as below:

### 1. Shallow and Deep Soil Boring Equipment.

This equipment is Thailand made to order Percussion and Rotary Drilling Rig. The equipment which is light weight unit, can be easily to move to remote areas or cramped location. Fairleads and guides are utilized for winching the drill under its own power.

**Specifications:** Power Driven Sliding Base, Power Unit NISSAN 35 HP 220 RPM / KUBOTA 11 HP, Hydraulic Feed Head System 24 inch Stroke, Drilling Capacity 80-120 m., Split spoon Tube Sampler for standard penetration test, Thin Wall Tube with piston sampler, Drill Rod AW Steel 3.0 m. long, and Centrifugal Water Pump KATO 350 US. GPM Head 70 Ft. 2000 RPM, Power Unit HONDA 11 HP.



### 2. ACKER- Drill ACE Diamond Core/Rock and Soil Sampling Drill

The ACE is designed for operation virtually anywhere. This unit has a low center of gravity, light weight; can be easily to relocate.

**Specifications:** Power Driven Sliding Base, Power Unit Deutz 2L-411D 22 HP 2200 RPM, Hydraulic Feed System 24 inch Stroke, NQ Wire Line System 150m Capacity, Hand Chuck, NQ wire line Diamond Core Bit, NQ wire line Core Barrel 3 m. long, NQ Drilling Casing 3 m. long, Triplex Piston Pump BEAN Royal 420-11 Engine Driven KUBOTA 11 HP, Centrifugal Water Pump KATO 350 US. GPM Head 70 Ft. 2000 RPM, Power Unit HONDA 13 HP



### 3. Shallow Rock Coring Equipment Diamond Core/Rock and Soil Sampling Drill.

**Specifications:** Power Driven Sliding Base, Power Unit NISSAN LD 20, 85 HP 250 RPM, Hydraulic Feed System 24 inch Stroke, Drilling Capacity 100 m., NMLC Diamond Core Bit, Huddy, South Africa, NMLC Triple Tube Core Barrel, length 1.50-3.00 m., ASAHI, Australia, NMLC Reaming Shell, Core Spring, Lifter Case, ASAHI, Australia, Drill Rod BW Steel 3.0 m. long, Triplex Piston Pump, Engine Driven KUBOTA 11 HP, Centrifugal Water Pump KATO 350 US. GPM Head 70 Ft. 2000 RPM, Power Unit HONDA 13 HP.



### Diamond Core Bit and Miscellaneous Equipment



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