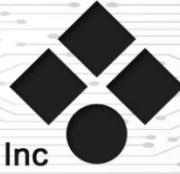




# Norconsult

Norconsult Management Services Phils., Inc



NMS (aka, Norconsult Phils.) actively participates in developing the society of tomorrow by combining engineering, architecture, and digital expertise. Following the tradition of our former mother company, Norconsult AS of Norway, our approach is based on local presence, interdisciplinary expertise, and collaboration. Through invention and innovation, and with our purpose **"Every day we improve everyday life"**, we constantly search for more sustainable, effective, and socially beneficial solutions.

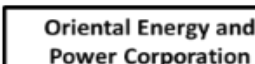


25 years of serving the  
Filipino people

Member:

- CECOPHIL • PhilGEPS
- PNBC • ANZCHAM Phils.

## Major Clients/Selected References





## Transport



## Buildings



## Renewable energy



## Industry



## Water



## Geo and environment



## Architecture



## Society and urban development

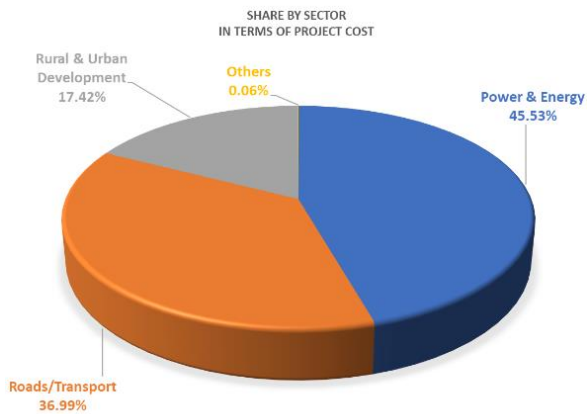


## Digitalisation



NMS took on the expertise of its former mother company, Norconsult AS, as a multi-disciplinary engineering and design consultancy company.

## Business Areas



Sectoral/Regional Planning

Institutional Development

Project Management/Planning

Construction Supervision/Owner's Engineer

Design Engineering

We deliver engineering and consulting services with quality technical expertise and integrity in all project phases.

## Priority Areas

RENEWABLE  
ENERGY

WATER SUPPLY &  
SEWERAGE

TRANSPORTATION

ENVIRONMENT &  
SOCIAL



## Our People



Currently 55+ employees and consultants deployed in central office and in various project locations:

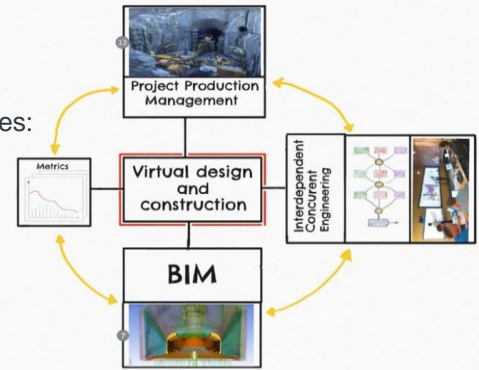
- Central Luzon
- Cordillera Administrative Region
- National Capital Region



## BIM and Other Construction Softwares

NMS has BIM-capable engineers who are fully trained in using BIM softwares:

- Revit Architecture
- Revit Structural
- Civil 3D, Road Design and Water Systems
- Navisworks Manage
- AutoCAD



# BIM

BUILDING INFORMATION MODELING

# STAAD

## 3D Structural Analysis And Design Software

# ORACLE

## Primavera Software







NMS provides first-rate multi-disciplinary services in the transport and RE sectors in the Philippines and Southeast Asia, leveraging on our highly skilled human capital, integrity, technical competence, and Scandinavian-based Quality Management Systems and Code of Ethics.



### Meaningful Vision

By 2030, a God-centered consulting firm in the Philippines and Southeast Asia deriving its strength from its harmony, integrity, competence and resiliency.



### Meaningful Mission

To be responsive to client's needs by building a high-level team spirit and pursuing financial stability, efficient administrative support, a supportive and engaged management, and forming meaningful and trust-based relationships.



### Our Expertise

Civil Engineers  
Mechanical Engineers  
Electronic & Communications Engineers  
Structural Engineers  
Tunnel Specialists  
Material Engineers  
Quantity Surveyors  
Drainage Engineers  
QA/QC Engineers  
Flood Control Engineers  
GIS Specialists  
Geodetic Engineers  
DED Specialists  
Program of Work (POW) Specialists

Municipal Engineers  
Rural Infrastructure Specialists  
Solid Waste Management Specialists  
IDC/ICE Services  
Contracts Managers  
Procurement Specialists  
Hydropower Engineers  
Electrical Engineers  
Renewable Energy Specialists  
Power Systems Engineering Experts  
Power Systems Planning Specialists  
Electro-Mechanical Specialists  
Electrical Works Design Specialists



Enterprise Development Specialists  
Marketing Specialists  
Economic and Financial Specialists  
Business Development Specialists  
Agribusiness Experts  
Commodity/Supply Value Chain Specialists  
Organizational Development Experts  
Local Development Planners  
Agricultural Engineers  
Community Organizers  
Internal Auditors (Operations)  
Financial and Economic Specialists  
Economic/Market Researchers  
International Trade Specialists  
Urban & Regional Planners  
Environmental Specialists  
Social Development Specialists  
Community Organizers  
CSR and Community Development Experts  
Document Management Experts  
Monitoring and Evaluation Specialists  
Training Specialists  
Capacity Development/Building Specialists  
Agricultural Economists  
Investment Modeling Specialists



## Power and Energy Portfolio



NMS, as a former subsidiary of Norconsult AS, has been at the forefront of hydropower development in the Philippines since the 90s. Today, our business includes the entire renewable energy industry, and we continue to collaborate with Norconsult AS in gathering the right experience and expertise for each project.

### OWNER'S ENGINEER ROLES

- 60MW Kapangan HPP in Benguet
- 8.4MW Maladugao HPP in Bukidnon
- 18MW Timbaban HPP in Aklan
- 5MW Janopol RoR Mini-HPP in Loboc, Bohol
- 105MW Ambuklao HPP and 125MW Binga HPP in Benguet



### Environmental, Social and Governance (ESG) Advisory Services for the 18MW Kiangnan Hydroelectric Project 2021-2024

Norconsult Phils. provides ESG advisory services to verify and monitor compliance with environmental and social safeguards applicable to the Project on behalf of Norfund as the lender and Kiangnan Mini-Hydro Corporation as the project owner and operator.



### DUE DILIGENCE & RESEARCH

- Technical Due Diligence for the 25MW Lake Mainit HEPP in Agusan del Sur 2022
- Conducted early phase assessment of offshore wind potential in the Philippines such as, identification of policies and regulations, potential sites, grid connection points, and infrastructure readiness of the country.
- Overview and Analysis of the Energy Sector Situation in the Philippines
- Investment Guide for Norwegian Investors interested to invest in the Philippines.





## Other Consultancy Services

2023 – **Detailed Engineering Design** of the Olongapo Solar Power Plant Access Road (Aboitiz Power)

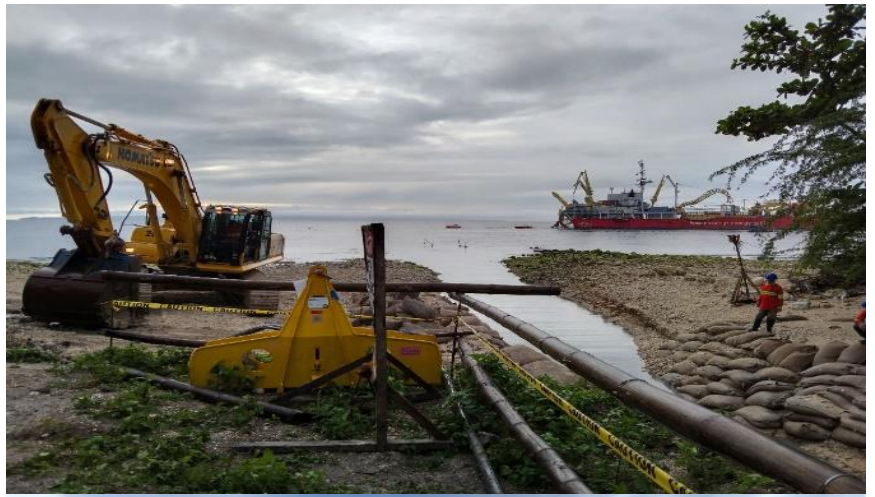
2021 – **Technical Assessment** of access roads and topo/geotech conditions of weir/powerhouse sites for a mini-hydro complex project in Ifugao (Norfund)

2019-2022 – **Project Site Administration & Management** (incl. HSE services) for the Cable Terminal Stations/Mindanao-Visayas Interconnection Project (CTS/MVIP) of NGCP (Nexans Norway):

- Santander (Cebu) Cable Terminal Station
- Dapitan City (Zamboanga Del Norte) Cable Terminal Station

2019 – **Pre-investment Adviser** of WeLead Group for its mini-hydro prospects in Palawan and North Luzon.

2020 – **Review of road design and cost of access road** for the Alimit HEP Project (Aboitiz Power)



## Some selected hydropower pump-turbine storage plant references of Norconsult AS

**Myruverkid II PSH** - Faroe Islands – 2017: ongoing

- Separate 40 MW turbine and 70 MW pumping capacity in one powerplant (separate units)
- + 30 MW turbine in downstream powerplant. Tender design
- Power system analysis of the entire Faroe Island.

**Duge PSH** – Norway – 2021:2022

- 2 x 100 MW Reversible Pump Turbine plant with head variations from 249 mWc down to 127 mWc
- Stability analysis, measurements and operational advice

**Nido Pumped Storage** – Chile - 2021

- 350 MW, 500 m head, 2 Reversible pump-turbines
- Prefeasibility study, CAPEX estimate and Execution Schedule + improvement of design, governing stability and operational safety

### Faroe Islands

- Norconsult is planning an upgrade of the island electrical supply system
- Goal 100% renewable by 2030 from 60% fossil fuel production
- Challenges:
  - ✓ Grid stability (island)
  - ✓ No seasonal water storage
  - ✓ Wind extremely variable
  - ✓ Summer: less wind and rainfall
- How to (almost) get there: pumped hydro, wind, solar & battery

**Undisclosed** – Eastern Europe –2020:2021

- 5 \* 300 MW, Design max head 640 mWc
- Feasibility study of the plant including civil, mechanical and electrical design including coarse cost estimates

**Undisclosed** – Spain – 2019:2020

- 900 MW pumped storage
- Cost reduction study by using unlined tunnels + improvement of plant design and governing stability

**Lysebotn II** – Norway – 2012:2019

- 2 x 185 MW Francis turbines with 686 mWc head
- Francis turbines with condenser mode (spinning in air), uploading from zero to maximum flow (load) within a minute
- Feasibility, tender and detail design of the entire plant
- including civil, mechanical and electrical design.





# Wind Energy

## Wind Farm

*We can provide assistance through all phases of wind farm planning, from feasibility studies and screening, through license applications and EIA to construction and operation.*

NMS Services for Wind Power in close collaboration with Norconsult AS:

- Screening for identification of suitable wind farm sites
- Feasibility studies
- Wind measurements and energy yield assessments
- Technical pre-design
- Impact assessments
- Permit applications
- Preparation of tender documents for various contract types
- Detailed design
- Contracting
- Project and construction management
- Analysis and forecast of risks
- Post construction production assessments
- Technical and environmental due diligence (DD) – advice on purchase or sale of wind farms

## Offshore Wind

*We can assist from early planning to operational analysis. We work across our market areas, performing both simple and complex analyses.*

## Measurements

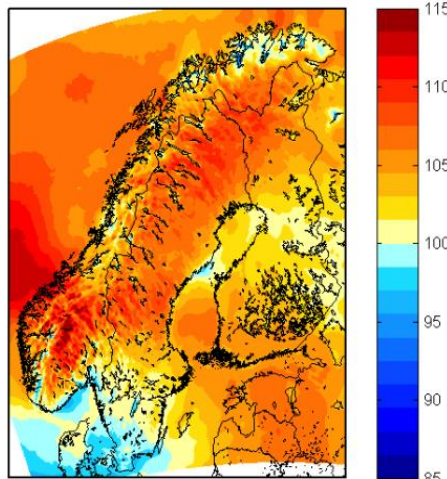
- Mast installations
- Heights up to 170m
- Planning, permits, installation, operations, decommissioning
- LIDAR measurements

## Stations, electrotechnical

- Onshore
  - Complete GIS and open-air insulated stations
- Offshore
  - Cable connections
  - Other services, like HVAC

## Pre-construction

- Meso-Scale modelling
  - Screening
  - Wind maps & Long-term reference data
- Layouts
- Energy Yield Assessment
  - Bankable reports
  - Consultancy support
- Wind farm icing
  - Ice Loss modelling: World leading expertise combined with operational experience
  - Icing Risk Modelling : Modelling the risk of Ice throw



## Analysis of operational wind farms

- Measurements
- Daily follow up of wind energy production
- Post Production Assessment
- Warranty Evaluation
- Wind and Ice Forecasting
- Course – Education of service personnel
- Technical due diligence



## Solar Power



Through continued cooperation with Norconsult AS of Norway, NMS can assist its customers from finding the best areas for solar power development and support in licensing and construction processes, through to ensuring that the facilities produce power as expected throughout their lifetime.

## Floating PV

- Feasibility studies
- Hybridization and sizing studies
- Energy yield assessments
- Financial assessments
- Mooring studies
- Hydrodynamic studies
- ESIA
- Extreme weather analysis
- Hydrological impact studies
- Ice impact analysis
- And more



Credit: Moz Outdoor Adventures

## Solar Services

Assistance in project development for a vast number of utility scale solar projects in the Nordics, and internationally with services such as:

- Solar resource assessments
- Climate analysis
- Site screening
- Feasibility studies
- Hybridization studies
- Environmental and social impact assessments
- Permit applications
- Procurement assistance
- Construction phase oversight
- Due diligence
- And more

We also provide equivalent services for floating solar power plants, hybrid wind and solar power projects, larger battery installations, micro grid systems, and more.

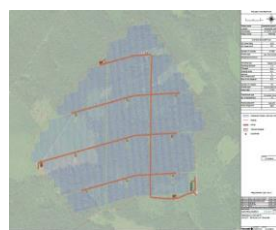
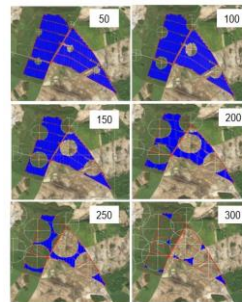
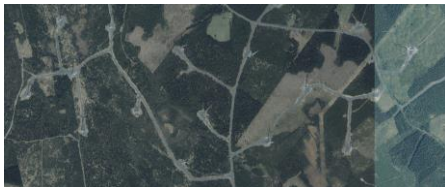
## Solar PV and Wind Hybridization

### Analysis

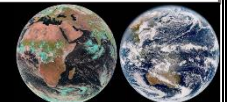
- Curtailment
- Ice throw risk and damage
- Shading and flickering
- Area utilization / Safety distance
- Sizing optimization
- Typical meteorological year for hybrid energy yield estimates
- ++

### Engineering

- Control strategy
- Switchgear planning
- ++



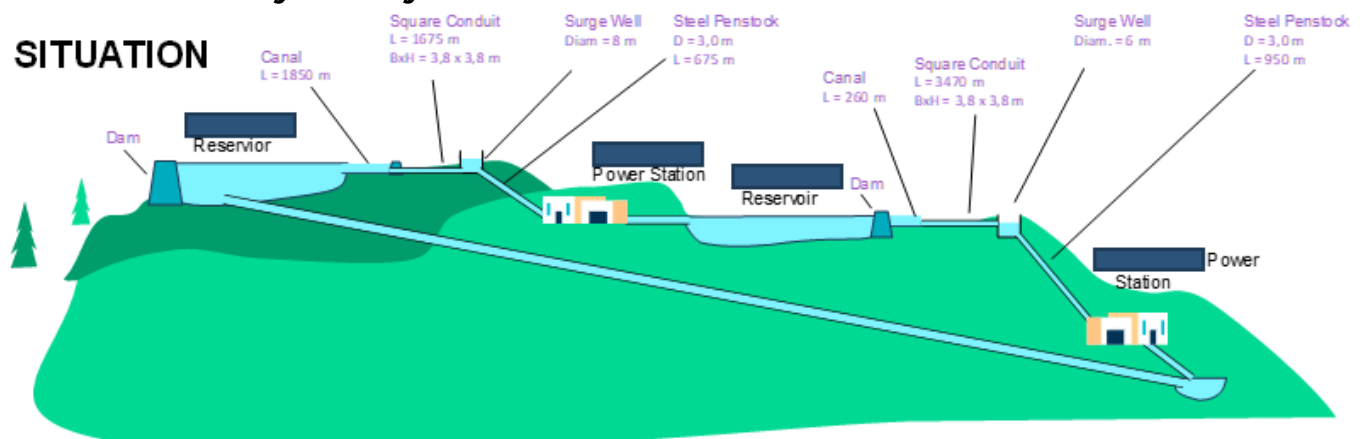
## Solar resource assessment



- Assessment of solar resource databases
  - Images from which satellite to use for South-East Asia?
  - Does the solar resource database have validation in close proximity to the sites?
  - Are there any measurement location nearby?
  - What uncertainties can be expected?
  - If measurements at site - Site-adaptation
- Other considerations
  - Assessment of transposition and decomposition methods
  - Wind and temperature assessment

## Solar PV and Hydro Hybridization

### SITUATION

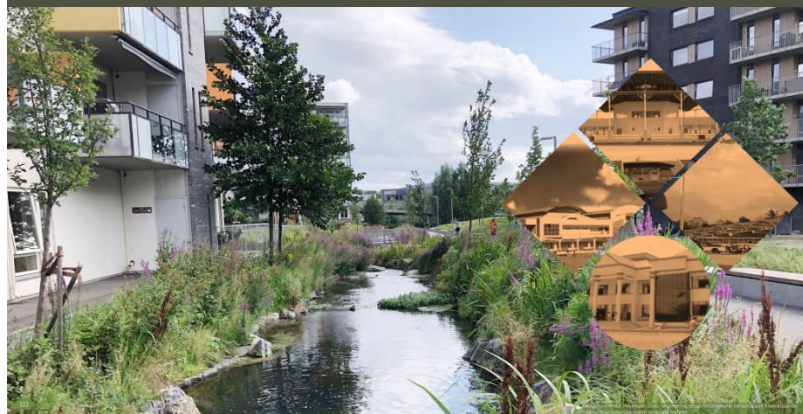




## Urban and Regional Development

NMS provides support for project development and management, Its services include the following:

- preparation of strategic local economic development plans
- feasibility studies for water supply system, wastewater management, solid waste management, flood control and embankment protection, urban roads and drainage.
- Prepares scope and framework for capacity development in:
  - project management,
  - procurement and financial management,
  - monitoring and evaluation
  - social and environmental safeguards.

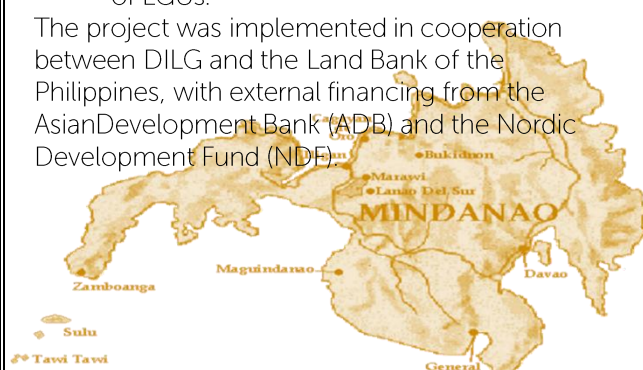


### Mindanao Basic Urban Services Sector Project (MBUSSP) 2003-2008

Engaged as Consultant by the Department of the Interior and Local Government (DILG) in cooperation with Norconsult AS

- provided support for project development and management
- sub-project preparation and implementation, including capacity building of LGUs.

The project was implemented in cooperation between DILG and the Land Bank of the Philippines, with external financing from the Asian Development Bank (ADB) and the Nordic Development Fund (NDF).



### Other ADB-Funded Projects

Greater Mekong Subregion (GMS) Corridor Towns Development Project – 2011 to 2013

Second Greater Mekong Subregion Tourism Infrastructure for Inclusive Growth Project – 2018



In 2014, NMS also provided expert to support Norconsult AS in the Thilawa Export Zone Project in Myanmar.



## Transport Portfolio

A major part of NMS's experience in the transportation sector is from roads and bridge projects, covering new construction, rehabilitation, upgrading and maintenance of existing ones.

NMS served as Independent Consultant for the Cebu Cordova Link Expressway Corporation (CCLEC), a subsidiary of Metro Pacific Tollways Corp.,

The Project is an 8.25-kilometer toll road connecting the main Cebu City Industrial area to Cordova and the Mactan Cebu International Airport in Mactan Island.

Construction started in January 2018 and the target completion date was June 2021 but was finally completed in July 2022 due to the Covid-19 pandemic.



**Cebu Cordova Link Expressway (CCLEX) Project**



The Candaba 3<sup>rd</sup> Viaduct Project involves the construction of a 5.3-kilometer bridge built between the two existing viaducts, creating a two-bound elevated roadway. The new viaduct aims at expanding the Candaba Viaduct into a three-lane per bound roadway with wide inner and outer shoulders.

Norconsult provided Independent Design Checker (IDC) and Independent Certification Engineer (ICE) services for the project.

## IDC and ICE Services for NLEX Segment 10 Project



May 2014

Construction of NLEX Segment 10 Project started in May 2014 – a 5.5-kilometer, 6-lane elevated highway, which starts at the end of Segment 9 going south and ends at C-3 Road.



Jan. 2018

Early works started on the 2.657-kilometer, 6-lane elevated highway, Segment 10 Exit Ramps (R 10) Project – a continuation of Segment 10 going westward to the seaport



2020

IDC for the Navotas Interchange Project (as Variation Order under Segment 10 Exit Ramp)



## Norconsult engagements 2017-2024



2015-2016 Cavite Laguna Expressway (CALAX) Project  
Technical Advisory Services - Pavement & Geotechnical

2015- IDC/ICE services for various *North Luzon Tollways Projects, Phases 1& 2*:

- ICE for Segment 8.1
- ICE for Segment 9
- IDC for Segment 10
- IDC for the NLEX-SCTEX integration
- IDC for Bocaue Toll Plaza Expansion
- IDC for Sta. Rita/San Simon Bridge Retrofitting

IDC for *Ciudad de Victoria (CDV) Interchange* to the Philippine Arena/INC Church with Bouwwerken, Inc. as the counterparty

1999-2014 - *North Luzon Tollways Projects, Phases 1& 2*

- Independent Design Checker and Independent Certification Engineer (IDC/ICE)
- Technical Study for MNTC on retrofitting the piles of the *Candaba Viaduct* and review of the *Heavy Maintenance Program* of SCTEX and Cavitetex.



- IDC/ICE for Sto. Tomas Interchange
- IDC for Segment 8.2 Section 1A
- ICE for 2024 NLEX Heavy Maintenance Program
- Pasig-Potrero Bridge Foundation Scouring Mitigating Project
- IDC for Various Segment 3 Improvements
- ICE/IDC for Segment 1 Localized Widening
- ICE for NLEX-SCTEX Enhancement Projects- Package 3
- *North Luzon Tollways Projects, Phases 1&2*
  - San Fernando Interchange Expansion Project
  - Rehabilitation of Burol Bridge Overpass
  - Removal and Construction of New Acceleration and Deceleration Lanes at Ciudad de Victoria
  - San Fernando North Bound Exit Enhancement Project
  - Bridge Retrofitting of Sta. Rita San Simon Overpass



## North South Commuter Railway Extension Project, South Commuter Section



Engaged as 3<sup>rd</sup> Party  
Verifier for civil  
engineering, tunnel &  
building works



## Subic Freeport Expressway (SFEX) Widening Project (2019-2022)

The Project has an approximate length of 8.8 kilometers involving road widening, construction of new bridges parallel to the existing ones (Argonaut and Jadjad Bridges) and a new tunnel with horseshoe shape.

Norconsult Phils. served as Independent Consultant for the Project to review the detailed engineering design (DED), program of works, quality control checks, review of cost of construction and issue Certificate of Construction upon completion of all works. Norconsult is also tasked to review the heavy maintenance program of the Contractor.



Norconsult AS, NMS's former mother company, was engaged by the then Department of Highways as the designer and construction supervisor of the Manila North Expressway Project (MNEP) from Burol to Dau back in 1971-1978. Its engagement continued until the Stage 2 of the project in 1978-1986 by the Philippine National Construction Corporation (PNCC). Due to its excellent performance, Norconsult AS was retained as independent consultant of all projects along the expressway (i.e., widening, expansion, etc.) until the creation of its Philippine subsidiary in 1998. Now that NMS is a wholly owned Philippine company, it continues to live up to its former mother company's high standards of competence and ethics.

## Manila North Expressway Extension (MNEE)



## Montclair (Porac) Interchange Project (2020-2023)



Engaged by Robinsons Land Inc. for the IDC/ICE role in the construction of interchange of Montclair Development Project in Porac, Pampanga.





We use our knowhow  
to enhance the world  
around us.

### ETHICS

All our behaviour shall be  
able to withstand public  
scrutiny.

### LEADERSHIP

Ambition  
Cooperation  
Transparency  
Trust  
Care  
Accountability

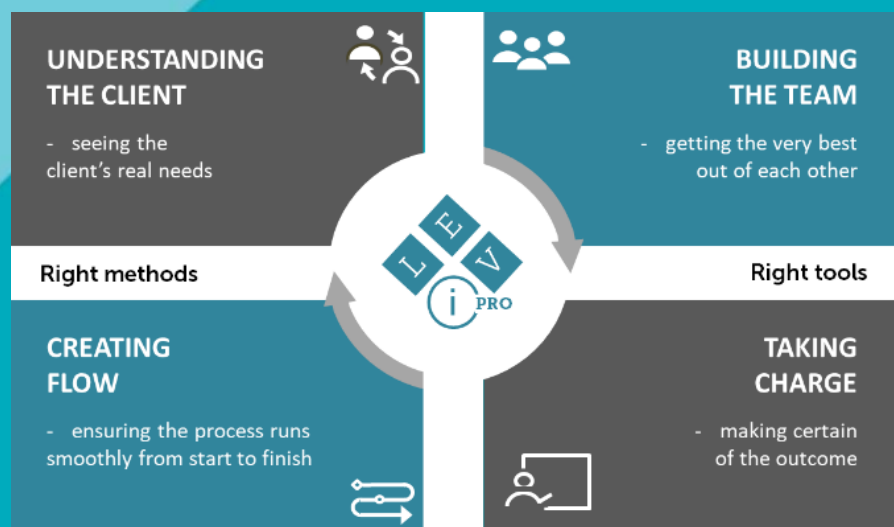


### VALUES

Honest  
Competent  
Inclusive  
Engaged

### Leadership, Values and Ethics (LiVE)

### LiVE PRO describes our actions








**Norconsult**   
Norconsult Management Services Phils., Inc.





## CONTACT INFORMATION


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