

1.0 INTRODUCTION

1.1 General

ENPLAN GROUP submits this Statement of Capability and Experience to express our interest in offering required Consultancy Services and to associate in the implementation of EIAs and SIAs.

The Firm has expertise in climate change, environmental assessment/audits, environmental engineering, Institutional Development and Capacity Building, sociological assessment Computer Analysis, Training and Manpower Development, Information Technology, Geographic Information System (GIS), Community Development, etc.

ENPLAN GROUP is one of the most experienced indigenous consultancy firms in the country. Since inception, the Firm has been involved in the Environmental Studies, Sociological Assessment, Public Health assessment, Environmental Protection, Sanitation, Community Development and Feasibility Studies as well as Mitigation measures.

ENPLAN GROUP also specializes in environmental mitigation of major projects. The experience gained previously on similar projects would be useful in the handling of the Project.

ENPLAN GROUP has grown since its establishment in 1970 to occupy the present position as the leading indigenous firm of Environmentalists. It has a professional practice embracing the full range of activities in the fields of climate change and environmental mitigation. It uses the most modern approaches including systems analysis for solving engineering and planning problems.

1.2 Documentation

The information contained in this Pre-Qualification Document is presented in a systematic format as streamlined below:

- Chapter 1 - **Introduction**
- Chapter 2 - **Organisational/Management Structure:** This Chapter outlines the firm's Particulars including the Background and Profile of Enplan Group, organizational/management structure, capabilities and experience of the firm, as well as the firm's Registration & Accreditation matters, Offices/Resources, and Laboratory Facilities. It gives all the critical indications to certify the Consultant's capacities to undertake this challenging assignment.
- Chapter 3 - **Technical Competence & Relevant Experience:** This chapter on the other hand outlines the Relevant & Previous Experience and Capabilities of the Consultant, Technical Competence, including the firm's experience in working with HSE Systems. An Organogram for executing environmental studies is also provided.
- Chapter 4 - **Professional & Human Resources:** This Chapter deals with the professional and Human Resources endowment of the Consultant firm and some selected abridged CVs.
- Chapter 5 - **HSE Management:** This Chapter gives information on the firm's HSE & CA Policies.

1.3 Enplan Group's Merit Awards

As a testimony to **Enplan Group's** commitment to quality and good service, **Enplan Group** was recently given a World Quality Commitment award QC 100 (QCK). Enplan Group's dedication to quality is further buttressed by the following awards:

1. *World Quality Commitment International Platinum Award by Business Initiative Directions (Switzerland 2006).*
2. *World Quality Commitment International Star Award in the Gold Category by Business Initiative Directions (Paris 2004).*
3. *Sterling Enterprise Award (2003).*
4. *Council for the Regulation of Engineers in Nigeria, COREN's Merit Award for excellence for distinguished service to technology.*
5. *West Africa's Best Technology Engineering Consultancy Service Company of the Year Award (2001).*
6. *Market Driven Best Engineering Consultancy Company of the Year Award for 1999 and 2000.*

Enplan Group is a solution provider and major Distributor for the leading Architecture, Engineering and Construction AEC Software (Eagle Point) for Nigeria and some parts of Africa.



2.0 PROFILE OF ENPLAN GROUP

2.1 Introduction

Enplan Group was set up by quality driven professionals who pooled their resources together in 1970. Since then, it has maintained a standard of excellence in all fields of development making it one of the leading consultancy firms in the country.

Enplan Group is one of the most experienced indigenous consultancy firms in Nigeria with the basic motivation of providing the best expertise to Nigeria in all scopes of development with particular emphasis on the environmental engineering, water resources engineering and in general Port development, marine and river works. Since inception in 1970, **Enplan Group** has been actively involved in the studies, surveys, designs and construction supervision, project management, community participation, environmental and sociological impact assessment studies as well as development of appropriate technology in rural development related projects all over the country.

Considering the relevant professional resources, facilities and the wealth of experience available to **Enplan Group**, the client is assured of the ability of the Consultant to undertake the consultancy services contract efficiently, mobilise in the shortest of time and perform to the highest of standards. Mobilisation and performance would be enhanced by our extensive understanding and experience in the sector.

Enplan Group is committed to ensure that work is completed on schedule, within budget and meet specifications and standard.

2.2 General Information on Enplan Group

Type of Organization:	<i>Limited Liability Company</i>
Incorporated under Companies & Allied Matters Act:	941088
Telephone:	+234 803 305 9606
Facsimile (FAX):	+234 805 801 2349
E-mail:	eg.abj@enplan.org
Website:	www.enplangroup.org

Staff Strength:	<i>Full Time:</i>	150	<i>Part Time:</i>	75
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2.3 Mission Statements

AIM: To create a widely based Nigerian Organization, embracing persons of different background as an employee owner firm.

SERVICE: To provide excellent services at standards acceptable worldwide.

TECHNOLOGY: To provide appropriate techniques and tradition indigenous to this country. The greatness of Nigeria would depend most especially on the ability of her indigenes to develop her technology to benefit the people of Nigeria whilst preserving the country's environment and ecological systems. It is in this that Nigeria can earn the respect she deserves.

2.2 Background of Enplan Group

Enplan Group is a firm of indigenous Consultants, Planners & Environmentalists established in 1970 with a professional practice embracing the full range of activities in Community Development, Integrated Environmental Studies Transportation Engineering, Port Development & Marine Works, Civil/Structural Engineering, Water Resources Engineering, and Contract Administration, Construction Supervision, Engineering Economics and Project Management.

The firm also has expertise in Environmental Engineering, Institutional Development and Capacity Building, Computer Analysis, Training and Manpower Development, Information Technology, Geographic Information System (GIS).

The firm had been involved in the feasibility studies, planning and designs, construction supervision, project management of various complex Development and engineering projects where an Environmental Impact Assessment is paramount to the Project being developed. Enplan Group has also carried out EIAs and SIAs on other projects for the Federal Government, State Governments, Federal Agencies and Parastatals, Companies, Tertiary Institutions and the private sector in the country.

Enplan Group draws its experience, potential and personnel from qualified university graduates and Technical staff with expertise gained by experience achieved through years of involvement on the field in many varied projects. The coupling together of theoretical experience and the practical ensures quality for solutions of major planning problems and allows the provision of optimal results.

The firm is organised in ten main divisions, which have various departments under them. They include:

- Environmental Engineering
- Water Supply Development
- Water Resources Engineering
- Electrical/Mechanical Engineering
- Oil & Gas Development
- Highways/Transportation
- Structural Engineering
- Planning/Architectural
- Finance and Economics
- Community Development and General Services

With its Head Office in Lagos, **Enplan Group** has a fully established and operational Regional Headquarters in Abuja, Zonal Headquarters in Enugu, maintains liaison offices at Kano and Port Harcourt. **Enplan Group** also has project site offices in various places all over the country including Sokoto, Maiduguri and Makurdi.

2.3 Enplan Group's Facilities

Enplan Group has a full range of facilities at her Abuja Regional Office and also distributed around its zonal offices and amongst the various associates of the firm. These facilities can be used or transferred to one of its offices as the need arise, though the firm's commitment is to have these full range of facilities available at each of its offices. Furthermore, it has access to other facilities in associates' offices abroad.

Enplan Group is in co-operation with leading consultants, engineers and scientists in the local and international Universities and Research Institutes and has a number of engineers on research in various fields. This has enabled **Enplan Group** to have access to research facilities located in these institutions to back up its own in-house facilities.

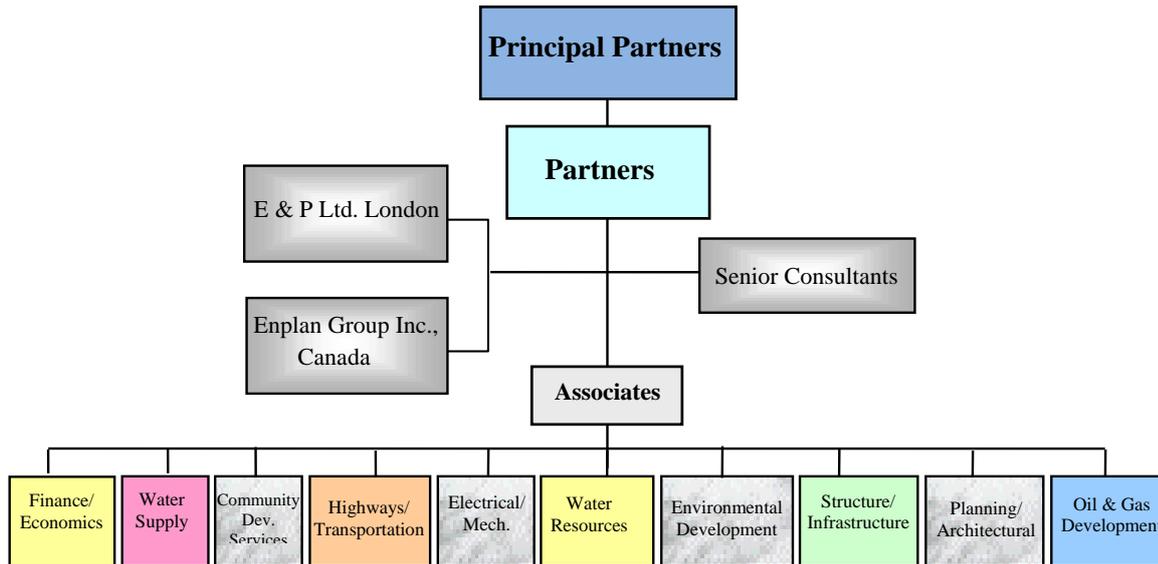


Fig 1 Enplan Group's Organizational Chart

2.4 Registration with Relevant Authorities

Enplan Group is currently registered with the African Development Bank (ADB), International Bank for Reconstruction and Development (World Bank), United Nations Development Programme (UNDP), Association of Consulting Engineers of Nigeria (ACEN), The Food and Agriculture Organisation of the United Nations (FAO), Federation of African Consultant (FEAC).

Enplan Group is a COREN registered engineering firm with Reg. No. EF 00013, the firm is certified by the Federal Ministry of Environment (FMEnv) to carry out environmental related projects in Nigeria (Reg. No. R1390/2000) **Enplan Group** is a member of Association of Consulting Engineers of Nigeria (ACEN).

Enplan Group is also registered with the department of Petroleum Resources (DPR) of the NNPC as an Oil & Gas Industry Service Company with Registration No.R2052 in the following category.

- Civil Engineering
- Environmental Management, and
- Computer Applications

Enplan Group is able to provide Consultancy service in the following fields:

2.5 International Background of Firm

Enplan Group's subsidiary firms - **E & P (Engineers and Planners) Limited**, UK and **Enplan Group Inc. Canada** - provide to the Group, specialist staff and facilities as and when required.

These International firms provide to **Enplan Group**:

- Backup technical support;
- Specialists and expert staff as and when required;
- Advisory services including solicitation to carry out international projects;
- Procurement services for supply of necessary equipment;
- Co-ordination for overseas training (for Client staff).

Enplan Group also maintains effective association with other leading international firms such as Atkins International UK, Haskoning B.V. The Netherlands; Mott Macdonald Group, U.K; GKW Mannheim, Germany; and Gibbs & Partners, Reading, UK; for specific projects. **Enplan Group** can therefore receive, when necessary, back-up support from these associate firms for major projects at both local and international levels. Consequently, it is able to mobilise a high calibre team of Nigerians and expatriate specialists most appropriate to undertake and carry out any specific assignment to a very high standard.

2.6 Co-operate Affiliation and Certification

Enplan Group is currently registered with the African Development Bank (**ADB**), International Bank for Reconstruction and Development (**World Bank**), United Nations Development Programme (**UNDP**), Federations Internationals Des Ingenieurs – Conseils (**FIDIC**), Association of Consulting Engineers of Nigeria (**ACEN**), African Development Experts (**ADEX**), Council for the Regulation of Engineering in Nigeria (**COREN**), Federation of African Consultant (**FEAC**), and other international and local organisations.

2.7 Scope of Services of the Firm

Enplan Group offers a range of consulting engineering services from Environmental Studies & pre-investment studies through planning, designs, management, operation and maintenance of completed projects and personnel training, institutional strengthening and development, capacity building, computer analyses, mapping/GIS, Economic Studies, Audit/Tariff Studies, Feasibility Studies, Planning. We are also involved in community Development and the environment and gender issues.

2.8 Enplan Group's Offices

Head Office:

Enplan Group
2nd Floor, 18, Johnson Street, Ilupeju
P. O. Box 4177, Marina,
Lagos, Nigeria.
Tel: +234 805 511 7570
Fax: +234 805 801 2349
E-mail: eg.los@enplan.org

Abuja Regional Office:

Enplan Group
No. 16 Durban Street, Wuse II
P.M.B. 5009 Wuse P.O.
Abuja, Nigeria.
Tel: +234 803 305 9606
Fax: +234 805 801 2349
E-mail: eg.abj@enplan.org

Enugu Zonal Headquarters:

Enplan Group,
2, Eku Terrace, GRA
P.M.B. 01200 Enugu
Tel: +234 803 312 1890
Fax: +234 805 801 2349
E-mail: eg.enu@enplan.org

Enplan Group is experienced in the use of CAD programmes especially AutoCAD for mapping related works as well as for structural and engineering designs.

➤ Survey and Field Investigations Facilities

For an engineering firm that has been in existence for more than three decades, there is the need to continually display engineering excellence. This has necessitated the firm to equip her survey department to meet up with current standards. **Enplan Group** has a number of survey, soils and Geotechnical equipment including Total Stations, distomats, theodolites, levels, staff, Geographic Positioning System (GPS) and associated software, auger, CBR, Proctor testing, permeameters, etc. With the use of sophisticated computer software, data collected from the field can be processed and plotted immediately. The firm also has a field water quality testing capability to carry out site testing.

The firm has access to other wide varieties of more sophisticated equipment from its associates.

Enplan Group also makes use of Digital Cameras and Cam-corders for both visual and audio-visual recording of field investigations activities thus enhancing her data acquisition capabilities.

➤ Geographical Information Acquisition and Production Facilities

Enplan Group has increased its scope of works in the physical surveys, data processing analysis and interpretation by the use of Geographical Information Systems (GIS) and Geographical Positioning Systems (GPS), which give satellite, controlled topographic elevation and locational co-ordinates among other data.

Also extensive use of the computers and our installed Internet facility allows easy access to a larger network of information subsequently seeing projects in a larger perspective.

The collection of data is in both digital and analogue form, which is transformed into appropriate standardised format for entry into GIS. For map conversion, the firm uses its digitizing tablets and scanners.



The firm employs automated cartographic techniques to produce graphical outputs from GIS and use its own large scale plotters, ink jet and laser printers as well as screen copiers for traditional map production.

Enplan Group also harmonises the use of Satellite Imagery and the Geographical Information System (GIS) in the monitoring soil state and its changes. Information so obtained has always proved very essential in the formulation of environmental protection policies in most developing countries.

Enplan Group engages the use of satellite imagery in its damage assessment procedure hence overcoming the problems associated with the ground-based techniques. Although satellite imagery gives a quick first assessment of damage, the detailed image analysis by high resolution can assess the damage to natural resources, building stock and infrastructure and evaluate the investment needed for reconstruction and new development.

➤ **Laboratory Equipment and Facilities**

Enplan Group operates a soils laboratory where limited test are carried out in its Katsina Office and plans are underway to open up soils Laboratory in its Enugu Office.

The firm has access to chemical laboratories at the Obafemi Awolowo University, Ile-Ife and the University of Lagos. The firm also has associates with laboratories at Warri and Port Harcourt.

We have access to the following major research equipment for monitoring and analysis of pollutants and conducting impact assessment. Most of our analyses shall be carried out at the laboratories of the African Regional Aquaculture Centre, of Nigerian Institute for Oceanography and Marine Research, Aluu, Port Harcourt. We also have access facilities at Obafemi Awolowo University, Ile-Ife, and the University of Lagos.

The list of available Laboratory equipment at our disposal is as reproduced here below

1. Water Pollution (General Inorganics and Toxic Inorganics)

- ❖ Atomic Absorption Spectrometer (AAS)
- ❖ Energy Dispersive ray Fluorescence Spectrometer (XRF)
- ❖ High Performance Liquid Chromatograph with UV & visible detectors (HPLC) for Sulphate, Nitrite, Chloride, Fluoride and some other ions
- ❖ Colorimeters
- ❖ Flame Analysers
- ❖ X-Ray Diffractometer (XRD)
- ❖ Neutron Generator (S, N, O determination)

2. Toxic Organics

- ❖ Gas Chromatograph (GC)
- ❖ High Performance Liquid Chromatograph (NPLC)
- ❖ UV/Visible Spectrometer
- ❖ Infra-Red Spectrophotometer
- ❖ Nuclear Magnetic Resonance Spectrometer (HMR)

3. Soil

- ❖ Atterberg Limit Equipment
- ❖ Tensionmeters, Hydraulic
- ❖ Conductivity Meter, Centrifuge
- ❖ Digestion Assembly, etc.

4. Geotechnical

- ❖ Tenanmeter, Electrodes, Hardware

5. Air Pollution (Particular, Fibres Aerosols)

- ❖ Portable Aztec Air Samplers
 - ❖ Andersen High Volume Air Samplers with Cascade Impactors
 - ❖ Draeger Tubes
- 6 Volatile Organics**
- ❖ Anderson Evacuated Air Samplers for Organics
- 7 Carbon (Particulate)**
- ❖ Acthelometers
- 8 Ambient Air**
- ❖ **Stationary Monitoring Stations with CO/CO, SO, NO, O and HC**
 - ❖ Analysers
 - ❖ Draeger Tubes
 - ❖ High Volume air Samplers
- 9 Turbidity**
- ❖ Turbidimeter
- 10 Dry-wet Precipitation**
- ❖ Thisis Automatic Dry &Wet Precipitation Sampler
- 11 Meteorology**
- ❖ Complete Meteorological Station
- 12 Microbial**
- ❖ Portable Water Laboratory
 - ❖ Fa-cal colt-from field kit
 - ❖ Portable MF-Millipore petri dish incubator
 - ❖ Stereomicroscope
 - ❖ M 20-EB Research Microscope
 - ❖ Freeze-Drier
 - ❖ Refrigerated Centrifuge
- 13 Conductivity**
- ❖ Conductivity Meters with pH and temperature probes
- 14 Samplers**
- ❖ Automatic Water Samplers
 - ❖ Dissolved Oxygen Meters
 - ❖ Draft Sampler
 - ❖ Petersen-type Grab (Eckman model)
- 5. Other Laboratory Equipment**
- ❖ Kjeldal apparatus
 - ❖ Refractometer
 - ❖ Muffle furnace
 - ❖ Sensitive weighing balance
 - ❖ Autoclave

The firm also maintains a specimen sample examinations and general analyses laboratory in the provision of the following services:

- Water and Wastewater Quality Monitoring
- Monitoring Effluent Limitations and Standards.

3.0 TECHNICAL COMPETENCE & RELEVANT EXPERIENCE/CAPABILITIES

3.1 Relevant Experience

ENPLAN GROUP since its establishment has successfully carried out many Institutional Development Projects, Customer Enumeration, Mapping/Survey, Audit/Tariff Studies, Economic Studies, Community Development Projects, Training, etc., for the Federal Ministry of Water Resources, States Water Boards, River Basin Authorities, FCDA and a host of others. The Firm has also carried out engineering and planning projects for the Shell Petroleum Development Company of Nigeria Limited (SPDC), National Inland Waterways Authority (NIWA), Federal Agencies & Parastatals, Federal and State governments of Nigeria and other Countries as well as for private establishments and foreign organizations. The firm has also executed a good number of Environmental Engineering & Planning projects.

The scope of our services includes studies, consultation, mapping, enumeration, investigations, surveys, planning, design, preparation of contract documents and tender appraisal, estimates, construction supervision and project management.

The firm has also been involved in training of Client's staff (on-and-off job training) providing advisory staff to give information on various modes of operation and maintenance of projects.

The main objective of **ENPLAN GROUP** is to provide constant excellent Environmental and Civil Engineering Services indigenous to Nigeria at standards acceptable internationally.

The greatness of Nigeria would never depend only on public relations and her administrators, managers, diplomats, etc., but also and most especially on the ability of her indigenes to develop her technology and engineering as well as preserve her environmental and ecological system. It is in this that Nigeria can earn the respect she deserves.

The relevant and previous experience and capabilities of **Enplan Group** are as outlined below in some selected Institutional Development/Mapping/Survey, Economic Studies, environmental, planning and engineering fields of the Firm.

3.1.1 Environmental Impact Assessment

All development projects whether large or small will have some effects both positive and negative, on the environment. These effects should be assessed not only at the planning stage but also at the implementation stages and throughout the life of the project.

ENPLAN GROUP has expanded its services to cover assessment of environmental elements in projects at any of the stages of formulation, planning, design, construction and post-construction operations. The Firm has been involved in carrying out environmental impact assessments as an integral part of some project assignments. In addition, the Firm has carried out environmental impact assessments as a project on its own.

With the recent emphasis on Environmental and Ecological Protection, **ENPLAN GROUP** created an Ecological Section from its existing Agriculture and Water Division. This Section has gained considerable experience from the numerous erosion control flood alleviation, soil conservation and urban drainage and land reclamation projects it has handled in the recent past.

The Division as a whole has undertaken master planning, pre-investment and feasibility studies and detailed designs for a number of water resources, urban drainage and ecological protection related projects in Nigeria, Ghana and also for the member countries of the Lake Chad Basin Commission. The studies have included the review of existing development proposals and identification of new development options, data requirements, project

evaluation and methodologies to achieve desired results. Development and planning studies have been carried out for whole basis, inter-basis and small catchments area at pre-feasibility levels, covering all types of water related development, including water supply, irrigated agriculture, power generation, flood alleviation, drainage, navigation, erosion protection, soil conservation, urban drainage and land reclamation.

The Firm has been involved in many water resources, water development plans and ecological protection studies, either as self contained projects or in support of the wider engineering services provided by the Firm.

A wide range of hydrological services is available covering general resources and development studies in addition to more specific services including:

- Data collection
- Training
- Flood investigations
- Water quality studies
- Urban drainage studies
- Soil erosion
- Sediment transport
- Catchments modeling
- Modeling of water resource systems

Social and environmental factors form an important part of urban development and of the needs of those involved and affected by major projects have always been carefully considered during our planning/feasibility studies, with particular regards to erosion and flood control projects with large environmental and ecological changes.

The Firm is qualified to produce an effective study of environmental and ecological phenomena, through data collection and investigations to realize the causes. The Firm's method of study involves a thorough investigation by co-coordinated work carried out by experts of different specializations so that a workable solution is provided which is simple and affordable without introducing expensive practices.

Within this framework of multi-disciplinary approach to problems, **ENPLAN GROUP** plays the role of translating into quantitative analysis all the information gathered by the experts. Our fundamental approach is to:

- Single out the physical mechanism which has produced or is likely to produce severe environmental ecological changes in the are under construction;
- Evaluate the present rate of development of the erosion process;
- Assess the measures to prevent further negative effects;
- Recommend necessary works for alleviating the negative environmental effects.

Selected list Enplan Group's Experience in Environmental Impact Assessment include:-

- **Environmental and Social Management Plan (ESMP) for Jebba and Kainji Hydro-Electro electric Power Projects.**
- **Pre-Feasibility Studies of the Middle Gurara Hydro Power Dam**
- **Environmental Impact Assessment of the Wannune Earth Dam Project in Benue State.**
- **Environmental Impact Assessment of the Review of Public Sector Irrigation Projects In Nigeria for the UTF/FAO & the FMWR.**
- **Community participation of Jada Dam Project using theatres.**

- **Public Health Impact Assessment of Jada Dam**
- **Environmental Impact Assessment** of the proposed Gwagwaiye dam **for the Funtua Water Supply Extension** in Funtua Local Government. Assessment of environmental effects of the dam on the populace, plants and animals.
- **The Environmental Sanitation Component** of the **Katsina First Multi-State Water Supply Project**.
- **Community Mobilization Awareness on Jare Dam.**
- **Environmental Impact Assessment** of the **Argungu Flood Protection Project**, Argungu, Kebbi State.
- **Environmental Impact Assessment** of the **Dutsi-Ma Flood Protection Project**, Katsina State.
- **Environmental Impact Assessment** of the **Dutse Flood Protection Project**, Dutse, Jigawa State
- **Environmental Impact Assessment** of the **Sabke Project**, Katsina State
- Gender participation in the Sabke Project
- **Environmental Impact Assessment** of the **Lake Geriyo Irrigation & Flood Protection Project**, Yola, Adamawa State.
- **Hygiene Promotion and Education Activities** for Katsina State under the **First Multi-State Water Supply Project**.
- **Study of Role of Women on the proposed Irrigation Development Scheme in Jere-Bowl.** The study includes the social structure as it affects women (marriage, ethnic origin, inter-ethnic marriage, educational background, child birth, care and mortality, etc.); occupation and economic status; women, participation in agriculture; role of women in water and sanitation in the Jere-Bowl.
- **Sociological and environmental studies of the Onitsha Storm Drainage** as part of the design and construction supervision of the Onitsha Storm Drainage.
- **Environmental impact assessment of the Funtua Dam Project** – Gwagwaiye Option for the Funtua Water Supply Extension Project, Katsina State.
- **Environmental impact assessment of the Jere Bowl Irrigation Project**, Borno State.
- **Sociological and environmental studies of the Flood Alleviation Scheme for Fago Town**, Katsina State.
- **Sociological and environmental studies of the Flood Alleviation Scheme** for Hadejia Town, Jigawa State.
- **Sociological and Environmental studies of the Flood Alleviation Scheme** for Jibiya Town, Katsina State.
- **Environmental Impact Assessment of Hadejia Valley Irrigation Project** (largest Fadama in Nigeria), Auyo, Jigawa State.

3.2 Firm's Experience In Working with Health Safety Environment (HSE) Systems

3.2.1 Health, Safety and Environmental (HSE) Policy

1.1 General Obligations of Enplan Group Staff Members

The sensitive and confidential nature of much of our work requires of staff a high degree of integrity and concern for interests of the Firm and the Client. Moreover, all staff members have a special responsibility to ensure health, safety and protection of the environment at all times, avoid situations and activities in their operations that can be dangerous to health, safety and the environment and that can lead to real or apparent conflicts of interest. Therefore, staff members are required to:

- Discharge their duties solely with the interest and objectives of the Client in view and in so doing shall adhere to the health and safety policy of the Client, the public and the Government at all times.
- Prevent occupational accidents that may result in injury of, or endanger the health and safety of themselves, other employees, representatives of the clients and sub-contractors, as well as members of the public.
- Minimize the deleterious impacts of the Firm's activities on the environment.
- Promote and propagate safety and environmental awareness.
- The essence of this policy must be incorporated into the daily schedule and activities of every staff of **Enplan Group**. Any activity or assignment the execution of which will contravene the provision of this policy must be suspended and the concerned employee must report this immediately to the appropriate officer for remedial actions.

Observe the utmost discretion in regard to all matters relating to the firm both during their tenure of members of staff or as consultants to Enplan Group and after their service with the firm has ended. They shall avoid the disclosure, whether direct or indirect, of information related to any projects handled by the firm.

3.2.2 H.S.E. Policy

The H.S.E. Policy of Enplan Group as embodied in this article are designed to ensure that staff carry out their assignments both in the office and in the field in a conducive and safe atmosphere as to guarantee the safety of staff and other workers in such a manner to prevent accidents and injuries.

Furthermore, Enplan Group mode of operation ensures the protection of all persons with whom our employees may have association during work activities while observation and compilation with all statutory provisions, requirements of Clients and additional measures to ensure safety onsite work is of paramount importance.

The safety of the firm's documents (reports, plans, maps, etc) equipment and machinery and general safety of our Client Staff and equipment when we interact with each other in the course of our projects are also covered in this document. It is the policy of the firm to review these objectives from time to time in the light of changing circumstances. In this regard, the staff are encouraged to submit their memoranda on this issue to the Partners for the consideration of management during such reviews. All employees of Enplan Group also abide by the Health and Safety Policies of companies, private and Government organizations doing



business with Enplan Group. This document containing the HSE Policy of Enplan Group is issued to every member of staff free of charge.

3.3.3 Office Work, Office Equipment and Machinery

All office blocks must be adequately walled and gate installed at the entrances. Trained security men should man the gates in general, vehicles belonging to visitors should part outside the gates. Staff and visitors allowed into the premises should subject themselves to search by the security officials. Telephone must be installed in all gate houses and visitors notebook duly signed by visitors. All office blocks must be structurally sound and adequate ventilation assured in their design. To ensure a conducive working environment, all rooms within the office blocks should be air-conditioned and fans (standing, table, etc.) kept in all rooms.

Fire extinguishers must be kept within the reach of staff and emergency exits should be provided in all office blocks. No staff or Client's Staff should be allowed to use a machine unless he or she fully understands it and has had the appropriate instruction. Each zonal office and site office must have First Aid Box with necessary drugs and equipments. For all projects a pre-mobilization meeting will be held with client. In such meetings, aspects of the work which may not be covered in the agreement but which the firm considers necessary will be highlighted and remedies discussed. Any accident or injury to an employee during the course of his (or her) employment must be reported at once to the management no matter how slight the accident or injury maybe so that appropriate first aid or measures maybe taken. In the interest of the employee and firm, workers must take the greater care to prevent the occurrence of accidents.

3.3.4 Safety of Official Documents and Equipment

All documents including reports, drawings, map, book etc., entrusted to members of staff or borrowed from client are considered confidential and must be kept safe. No unauthorized person may use or gain access to any document entrusted to staff. All such documents sold normally be stored in conducive places depending on their nature. All equipment including computers, survey equipment, testing machines, laboratory equipment, typewriters, binding machine, printing and photocopy machines, etc., to be manned by component personnel. All equipment which should be stored in conducive places must be tested before being used in any project. This is designed to ensure that high standard of efficiency is maintained and readings recorded from such equipment are devoid of errors. Periodic maintenance of sophisticated equipment such as computer, Photostat machines, etc., will be carried out by the manufacturer's representatives.

3.3.5 Effective Training

In line with the management commitment to HSE policy, training of Employees is carried out in the areas of safety management, first aid auditing, construction management, etc. employees are also sponsored by the company to attend HSE training programmes in other establishments.

Lists of safety courses for which our Employees have been involved within the past years are:

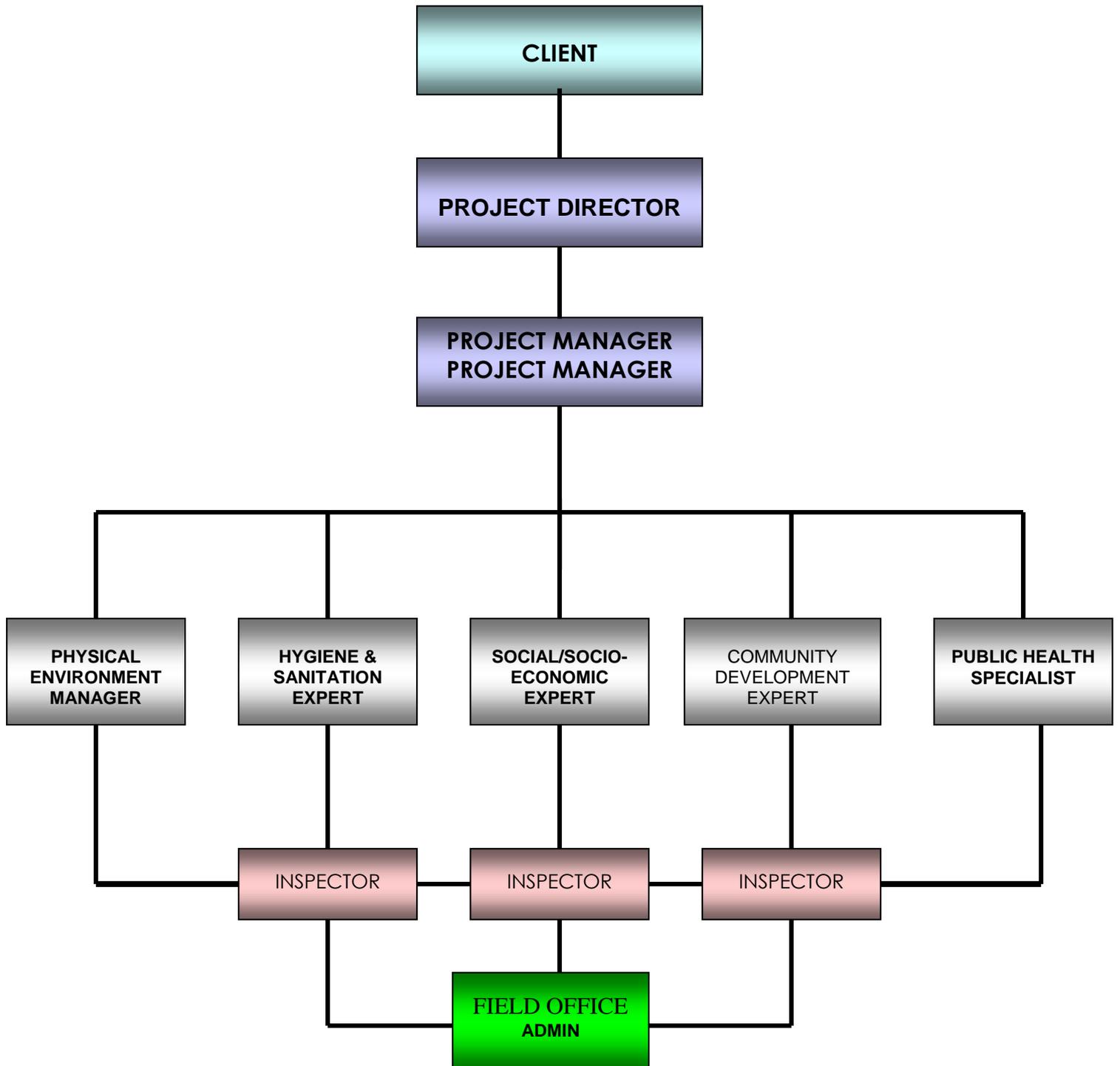
- Hazardous Waste Management
- Solid/domestic Waste Management
- Environmental Health Engineering
- Risk Assessment Management
- Groundwater Pollution Control
- ISO-14001 Awareness
- Environmental Awareness Training
- First Aid Safety Course
- Health Risk Assessment

- Environmental Risk Management
- Policy Safety Drivers
- Training
- Community Development Impact Techniques
- Water Supply Safety Management
- The Faith of Chemicals in the Environment
- Dust & Noise Exposure Control

❖ **SAFETY PERFORMANCE and PERSONNEL**

Employees of Enplan Group who show high performance in the attainment of safety goals and objectives inline with the firm's policy are normally rewarded by the company's management. Realistic targets which are high enough to be challenging but also low enough to be attainable are normally set on an annual basis. Before commencing work in any project involving site work, the company prepares HSE plan specially tailored to the task to be performed. This is prepared after carrying out a hazard analysis for each step of the job.

Organogram for the Execution of the Environmental Studies



3.4 Other Previous Experience

3.4.1 Erosion and Flood Control

ENPLAN GROUP Agricultural and Water Division has a wide range of experience in erosion control and protection with major projects which have often necessitated the need to arrest erosion.

In **ENPLAN GROUP** surface erosion is dealt with by the agricultural engineers responsible for cropland conservation; which is particularly important in river training, is in the province of hydraulic engineering, slope stability, related to soil erosion by mass movement, is dealt with by the Geotechnical engineers.

ENPLAN GROUP's own experience in erosion control projects and other water resources developments such as dams, irrigation and water supply projects includes:

- **Erosion Protection at Ibeno and Opobo Town** - surveys study and preliminary design of alternative solutions of the protection works (in association with Haskoning, NEDECO B.V.)
- **Development of the River Nigeria for Navigation.** Preliminary design (in association with NEDECO and Royal Bos Kalis Westminster Group).
- **Erosion Control at Patani.** Review of preliminary studies, further studies, field measurements and soil investigations to determine the erosion process and causes; establishment of a guage station, detailed design of control measures, (in association with Holdfelder Plan).
- **Erosion Control at Burutu.** Review of preliminary studies; further studies, field measurements, soil investigations, establishment of a guage station, detailed design of control measures (in association with Holdfelder Plan).
- **Erosion Control at Ogulaha.** Review of Preliminary studies; further studies, field measurements, soil investigations, establishment of guage station and detailed design of control measures (in association with Holfelder Plan)
- **Stubb and Widenham Creeks:** Field measurements and investigations, studies and designs of works.
- **Oguta Port Development – Access Navigation Channel:** Relevant aspects of the project involved studies and design of flood protection measures at the River Niger entrance bay to the Navigation Channel.
- **Ajaokuta River Port Development:** (in association with Haskoning B.V.); Studies and design for flood protection at the site of the commercial port on the River Niger at Ajaokuta. The influence of the port on the regime of the river and the effects on the nearby bridge was studied and integrated into the design.
- **Ibi River Port Development** (in association with Haskoning B.V.), studies and design for the flood protection at the site of the commercial port on the River Benue at Ibi.
- **Erosion Control at Bomadi:** Review of preliminary studies, further studies, field measurements and oil investigations to determine the erosion process and causes, establishment of a guage station, detailed design of control measures.

- **Argungu Flood Protection Project**, Argungu, Kebbi State.
- **Dutsi-Ma Flood Protection Project**, Katsina State.
- **Dutse Flood Protection Project**, Dutse, Jigawa State
- **Lake Geriyo Irrigation & Flood Protection Project**, Yola, Adamawa State.
- **Feasibility Study and Preliminary Engineering for Ukwa Land Reclamation and Irrigation Project (10,000 hectares) in Imo State.** The study involved field survey, Geotechnical Investigation, Hydrological study and preliminary design of up to 4m high dykes (and a total length of about 17km) as flood protection banks in the Imo Flood Plains for the Anambra-Imo River Basin Development Authority.
- **The Construction Supervision of the Jibiya Dam, Irrigation and Water Supply Project** involving the complete design review, and construction supervision of the Project for the Sokoto Rima River Basin Development Authority. It also included the supervision of investigation, and river training works on the River Farfaru one of the tributaries of the Gada River.
- **Protection of Onitsha Drainage** for the Anambra State Ministry of Works, Enugu.
- **Erosion Control at Enugu-Ukwu**, Anambra State for Anambra-Imo River Basin Development Authority.
- **Coastal Erosion Control at Iwopin, Ogun State** for the Federal Ministry of Works and Housing.
- **River Diversion and Land Reclamation at Ekulu**, Anambra State for the Anambra-Imo River Basin Development Authority.
- **Nnobi gully Erosion Controlling Anambra State** for the Anambra-Imo River Basin Development Authority.
- **Erosion and Flood Control at Olumbanasa, Anambra State** for the Task Force.
- **Coastal Erosion Control at Badagry, Lagos State** for the Federal Ministry of Works and Housing.
- **Feasibility Study and Final Engineering Design** of the Flood Alleviation Scheme for Lake Geriyo Irrigation Project for the Upper Benue Basin Development Authority.

Other services carried out in this field include:

- Soils and other investigation conducted;
- Hydrological studies;
- Hydraulic measurements;
- Preparation of masterplan for the development of the River Niger (Lokoja-Warri);
- Recommendations on short term, medium term and long term developments;
- Preliminary design of river improvement works at specific reaches (flood control schemes, bank protection works, water level, regulation works, channel regulation works, etc.)

3.4.2 Oil and Gas Sector Development

For most countries such as Nigeria where there is a high level of dependence on the availability of crude oil as a major source of foreign exchange, developmental programmes are always embarked upon from time-to-time in the oil sector. Most of these programmes are usually tied to the process of extraction of the crude oil, refining and sale of the refined production addition to the exportation of the crude oil. Recently, in Nigeria, more emphasis is being placed on harnessing, more effectively, the by-products of the refining process.

Pipeline transfer and tank storage of oil, gas and other petroleum products has assumed strategic importance for energy planning and management in Nigeria today.

ENPLAN GROUP has created an oil and gas pipeline sub-section out of the existing hydraulics section of the Water and/Agricultural Division of the Firm. The hydraulics section has gained considerable experience from execution of the numerous Water Resources projects.

For execution of oil and gas projects, which could range from pipelines to heavy oil mega projects, **ENPLAN GROUP** will bring into play experience acquired on other related hydraulics projects.

The Firm's experience in the planning, design and construction supervision of extensive water supply schemes which includes transmission mains, pumping stations, reservoirs, treatment plants, power houses, etc., is always quite useful in the provision of various civil engineering consultancy services for the following aspects of the oil sector:

- ❖ Intra-state, inter-state and/or inter-regional oil or gas pipelines and pumping stations
- ❖ Infrastructure design and/or rehabilitation for refineries. These include:
 - Foundations for Distillate Hydro-processing unit
 - Control building
 - Compressor shelters
 - Sub-stations
 - Cooling water pump house and basin
 - Storage tanks
 - Pipeline and tank storage cathodic protection

The hydraulic analysis of pipe flow and distribution mains network often requires the solution of a number of flow equations in order to simulate the behaviour of the flow system. **ENPLAN GROUP's** computer library is equipped with the state-of-the-art network programmes that model networks and simulate their behaviours under a wide range of operating conditions.

ENPLAN GROUP also harmonizes the use of Satellite Imagery and the Geographical Information System (GIS) in the monitoring of soil state and its changes. Information so obtained has always proved very essential in the formulation of environmental protection policies in most developing countries.

Furthermore, oil slicks, industrial accidents, war and ecological aggressions of all types lay waste whole regions of the earth every year. Traditional ground-based damage estimates are gradually becoming obsolete as the analysis takes time and only cover a fraction of the area.

ENPLAN GROUP engages the use of satellite imagery in its damage assessment procedure hence overcoming the problems associated with the ground-based techniques. Although satellite imagery gives a quick first assessment of the damage, the detailed image analysis by high resolution can assess the damage to natural resources, building stock and infrastructure and evaluate the investment needed for reconstruction and new development.

Some of the projects carried out for Joint Venture Companies in the Oil & Gas Industry are as outlined below.

- ✓ **Design Services for the Shore Protection Sheet Pile Walling for 50KW LNG Gas Plant** for the SPDC, Port Harcourt.
- ✓ **Design Review Services for the Industrial Area Development Projects and Annexes (I. A .D)** for the SPDC, Port Harcourt.
- ✓ **Investigations on the Impact of Shell Development on Third Party Building** for the SPDC, Port Harcourt
- ✓ **Re-Design of Office Blocks 3&4** for the SPDC, Port Harcourt.
- ✓ **Construction Supervision of the Industrial Area Development Projects (I. A .D)** for the SPDC, Port Harcourt.
- ✓ Design of **Bonny Terminal Armoury Room** for the SPDC, Port Harcourt.
- ✓ **Engineering Studies & Detailed Design of new 2-Storey PC Lab/ EXPE Offices** for the SPDC, Port Harcourt.
- ✓ **Structural Integrity checks on Access Bridges** for the SPDC, Port Harcourt.
- ✓ **Survey & Design Services of the I A Access Old Aba Road Junction** for the SPDC, Port Harcourt.
- ✓ **Structural Checks/Design for the Swamp Flow Stream Telecom Shelters Platforms** for the SPDC, Port Harcourt.
- ✓ **Design of External Works for Office Blocks 3 & 4** for the SPDC, Port Harcourt.
- ✓ **Upgrade of Kidney Island Facilities** for the SPDC, Port Harcourt.
- ✓ **Design of Additional Accommodation Facilities Upgrade for Bonny Terminal, Mbiama** for the SPDC, Port Harcourt.
- ✓ **Design of Old Aba Road - Expressway Bye-Pass** for the SPDC, Port Harcourt.
- ✓ **Design of Oguta - Egbema West Link Road** for the SPDC, Port Harcourt.
- ✓ **Costs Escalation Surveys** for the SPDC, Port Harcourt.
- ✓ **Quantity Survey Services** for the SPDC, Port Harcourt.
- ✓ **Design of New Electrical Systems for Computer Suite at I A Development Projects** for the SPDC, Port Harcourt

3.4.3 Water Resources Development/Water Supply

ENPLAN GROUP's Water Division has undertaken master planning, pre-investment and feasibility studies and detailed designs for a number of water resources related projects in Nigeria and also for the member countries of the Lake Chad Basin Commission. The studies included review of existing development proposals, and identification of new development options and data requirements.

Development and planning studies have been carried out for whole basins, inter-basin and small catchment areas at pre-feasibility and feasibility levels, covering all types of water

related development, including dams, water supply, irrigated agriculture, power generation, flood alleviation, drainage and navigation.

The Firm has been involved in many water resources and water development studies, either as self contained projects or in support of the wider engineering service provided by the Firm. A wide range of hydrological services is available covering general resources and development studies in addition to more specific services including:

- Data collection and processing services
- Training
- Flood investigations
- Water quality studies
- Sediment and soil erosion
- Catchment modeling
- Modeling of water resources systems

The Firm has wide experience in the design, establishment and operation of hydrometric networks and also in the collection and interpretation of hydro-metrological data. Rapid processing of the data is facilitated by the use of our in-house micro-computer systems.

The Water Resources Department of the Firm plays a key role in identifying and evaluating reliable water sources, examining options for transfer of water to demand centers and assessing existing and future water requirements. Much of this work relates to situations where data are scarce, and the department's experience in the use of stochastic and deterministic methods to extrapolate and interpolate hydrological data is very valuable.

The Firm is well qualified to produce water demand forecasts to various planning horizons for agricultural, domestic, institutional, industrial, and hydro-electric requirements and to carry out economic studies to compare alternative developments. Reliable estimates of demand are essential for efficient water resource development.

These are generally based on studies of past and existing consumption, population growth, and socio-economic development.

A number of simulation studies have been carried out for complex water resource systems using the in-house micro-computer systems and a library of programs especially developed to study the operation of single and multiple sources (conjunctive use) to meet forecast demands at pre-defined levels of reliability.

Social and environmental factors form an important part of regional development and so the needs of those involved and affected by major projects have always been carefully considered during our planning/feasibility studies.

The Firm has gained extensive experience in economic and financial project appraisal. This has included the ranking and selection of development alternatives for a particular project, and also nationally between projects so as to help in the allocation of inherently scarce national resources and maximize the net benefit to the nation while satisfying its set objectives.

The Water Division of the firm has grown steadily and the division is supported by the Hydrology and Hydraulics Department.

❖ Hydraulics

The Firm's involvement in water resources projects and studies has made it one of the most experienced Consulting Firms in Nigeria particularly in the study and design of hydraulic problems and structures respectively.

The Firm's experience in hydraulics includes the design of irrigation distribution systems and drainage networks. Major irrigation projects have often necessitated the provision of river diversion structures like weirs, river control and river training structures.

The Firm has been involved in the detailed design and construction supervision of canal systems for a large variety of soils requiring different supply systems from unlined canals, through clay lining and concrete linings to pipe systems. Also various manual and automated control structures for canal network has been designed to suit different requirements in order to facilitate efficient distribution and management systems.

The Firm was involve din the construction supervision of 300 ha (net) Jibiya Irrigation Project and the redesign of the 8000 ha (net) Zobe Irrigation Project.

The Jibiya project involved the provision of an irrigation system for a gross area of 3500 ka using trapezoidal and parabolic canals. The project involves the construction of 192km of concrete lined canal network, and 114km of drains. The dam incorporates a 140m long concrete spillway with a discharge capacity of 2170 m³/s.

The Zobe project involved the modification of an irrigation system covering over 500 ha by gravity. The scope includes the realignment/amendment of the layout of canals and drains, design of hydraulic structures and other features to reduce the overall cost of canals, number of special structures, etc., to optimum limits to eliminate unnecessary structures and components and avoiding specialized fabrication and construction techniques in order to lower the cost yet maintaining a functionally adequate system.

❖ Hydrological Analysis

The Firm has a library of computer programmes for the processing of hydrological data for water resources development planning. The Firm's Hydrologists make extensive use of computer programmes including statistical test for data reliability, frequency analysis, synthesis of stream flow, rainfall and evaporation data, planning and modeling of water resources systems, filling in of missing data and analytical and planning techniques, with results expressed in both physical and economic terms.

The Firm's data bank has Hydrometeorological data that covers the whole country and are within easy reach at the touch of a button.

❖ Water Supply

From its inception, ENPLAN GROUP has been associated with water supply development in the country. The Firm provides comprehensive consultancy services in all aspects of water supply. The Firm believes that an improved water supply will have a significant impact on public health and economic development. Therefore, for the development of water supply systems, **ENPLAN GROUP** applies a multidisciplinary approach.

The Firm has been involved in the investigation, survey and engineering of a number of water supply and sewage schemes. The scope of work carried out has included:

- Water resources investigation and development
- Population studies and demand forecasting
- Engineering and Geotechnical surveys
- Engineering design of intake works, treatment works, transmission and distribution systems, storage works and pumping stations

- Planning and design of sewage schemes
- Studies of existing systems on operation and maintenance, financial administrative legal and training aspects

The Firm has wide experience in the collection and interpretation of data. Rapid processing of data is facilitated by the use of micro-computer systems. The Firm has developed a comprehensive set of programmes for the evaluation, analysis and modeling of water supply systems.

ENPLAN GROUP has also been involved in many groundwater development projects. The Firm has helped in advancing groundwater development, in practically all groundwater zones of Nigeria.

The firm has been involved in:

- The interpretation of geophysical surveys
- Groundwater development planning
- Water sampling
- Hydrogeological data collection and mapping
- Lithological logging of boreholes
- Recommendations on selection and/or phasing of projects
- Economic and financial analysis

Enplan Group's experience in some selected water supply development and other similar works are as given below

- **National Water Rehabilitation Project**, Institutional Development Component (Technical and Financial Management Services) for Ogun and Edo States.
- The supervision and design of **Zobe Water Supply Project** – a 3,100m³/hr treatment plant, reservoirs, water towers and over 120km of pipeline covering 24 villages.
- Feasibility Studies and Final Engineering Design of the 6,000m³/day **Sabke Water Supply Project in Daura** for the Petroleum (Special) Trust Fund.
- Data collection, collation and processing of water resources data for **the National Water Resources Inventory Survey of the National Water Resources Master Plan** for the North Western part of the country covering Kebbi, Zamfara, Sokoto, Katsina, Kaduna, Niger, Kwara and the FCT, Abuja.
- **Preliminary and Final Engineering Design** of the 14m high, 700m long **Sabke Dam** with an active storage capacity of 25m cum for water supply to dams and environs and also for 100 ha irrigation development.
- Design review and construction supervision of the **Jibiya Dam, Irrigation cum Water Supply Project, Jibiya Local Government**. The dam is 21.0m high 3.68km long with an active storage capacity of 121 million cu.m and involved 2.3 million cubic meters of homogeneous sand fill.
- **Monitoring and Management of Hydrometeorological Stations, Boreholes and Wells in Anambra and Imo River Basins** involving data collection and processing; design of meteorological data collection forms; data tabulation and analysis including the development of various programs and models.
- Supervision of construction of the **New Lagos Water Supply Primary Trunk Mains**.



- **Gboko Yandev Water Supply Project.** Design review and preparation of tender documents and supervision of construction on behalf of the Nigerian Society of Engineers Consultancy Unit (NSEPREM).
- **Water Supply to 14 towns** in Gongola State.
- **Underground Water Studies for the Water Supply** of Adamawa and Taraba States.
- **Kafanchan Water Supply.** Feasibility studies final engineering design.
- **Turo Dam and Water Supply Project.** Engineering and design of remedial works to Turo Dam at Malumfashi. This dam provides raw water supply system covering Malumfashi and the surrounding villages, this was completed in 1988.
- **Design of relocation works for Katsina Metropolis Water Distribution Network** for and on behalf of Hydroworks Ltd.
- **Design of Water Supply Scheme to Gwagwalada** town comprising a 100m long 5m high concrete weir, 50,000m³/day commercial water treatment plant, reinforced concrete ground reservoirs, transmission mains and raw water intake for Hydroworks Ltd.
- **Design of 38 Small Earth Dams** for Water Supply located in all the local government areas in Katsina State to alleviate the hardship of the rural populace.
- **Feasibility Study and Final Engineering Design of a 22m high earth dam and irrigation system for the Ibu River Project** in Imo State for the Anambra-Imo River Basin Development Authority. The study also included assessment of the reservoir impact on villages upstream of the stream, the dam's impounding reservoir is also to be used as a recreation centre, with different parts of the Large designated for various activities.
- **The Environmental Sanitation Component** of the Katsina First Multi-State Water Supply Project.
- Hygiene Promotion and Education Activities for Katsina State under the **First Multi-State Water Supply Project**.
- **Study of the Role of Women on the proposed Irrigation Development Scheme in Jere-Bowl.** The study includes the social structure as it affects women (marriage, ethnic origin, inter-ethnic marriage, educational background, child birth, care and mortality, etc.), occupation and economic status; Women participation in Agriculture; Role of Women in Water and Sanitation in the Jere-Bowl.
- **Environmental Impact Assessment** of the Funtua Dam Project – Gwagwaiye Option for the Funtua Water Supply Extension Project of the Katsina First Multi-State Water Supply Project, Katsina State.
- **Environmental Impact Assessment** of the **Sabke Dam, Irrigation and Water Supply Project** including a Land Tenure Survey.

❖ **Water Rehabilitation Projects**

ENPLAN GROUP has been associated with the Water Rehabilitation Projects in the country.



The Firm has carried series of Water Rehabilitation Projects in different states of the federation including Abuja (Federal Capital Territory). The aim of the project is to rehabilitate, select urban water supply system in other to allow the Water Cooperation and Bureau of Rural Development provide adequate, effective and efficient service. In addition, it also generates enough funds to allow self-sustaining research and development. The scope of consultancy services include:

- Customer Enumeration and Mapping
- Water Audit and Tariff Studies
- Operation and Maintenance Improvement

Our Mapping result, Enumeration data and GIS software was utilized to translate the water distribution system into a Real-Time Information System. Projects carried out includes:

- ✓ **Ogun State Institutional Development Component** – Water Rehabilitation Projects
- ✓ **Kebbi State Institutional Development Component** – Water Rehabilitation Projects
- ✓ **Edo State Institutional Development Component** – Water Rehabilitation Projects

3.4.4 Port Development and Marine Works

ENPLAN GROUP has had considerable involvement in river studies, ports development and coastal works. Since its inception the Firm has also provided expert services for the development of river and seaports, navigation canals, and other marine works. Some of such assignments include but not limited to the following projects

Summarized below are some of the port development projects and marine works executed by Enplan Group.

✓ **Federal Ocean Terminal Onne**

In association with Coode Blizzard Ltd services carried out includes Hydrologic Survey, Assets Inventory, Design Review, Final Engineering, Preparation of Tender Documents and Evaluation of Tenders for the Nigeria Ports Authority.

✓ **Development of The River Niger for Navigation**

Preliminary design (in association with NEDECO and Royal Bos Kalis Westminster Group) for the Federal Ministry of Transport. The project involves a comprehensive study of the River Niger from Lokoja to Warri for Navigation Development.

The services provided in 1978-79 included a new hydrographic survey of the Niger (Lokoja – Warri).

Stubb and Widenham Creeks

Client: Inland Waterways Division, Federal Ministry of Transport.

The assignment that was carried out in 1976 included:

- Field measurements and investigations;
- Studies and designs of works (flood control and channel regulation to improve navigation in the creeks)

✓ **Oguta Port Development – Access Navigation Channel**

(In association with Haskoning B.V.)

Client: Inland Waterways Department, Federal Ministry of Transport.

The services, which were completed in 1983 involved:

Studies and design of flood protection measures at the River Niger entrance bay to the Navigation Channel.

✓ **Ajaokuta River Port Development**

(In association with Haskoning B.V.)

Client: Inland Waterways Department, Federal Ministry of Transport.

The assignment that was carried out in 1976 included:

Studies and design for flood protection at the site of the commercial port on the River Niger at Ajaokuta. The influence of the port on the regime of the river and the effects on the near-by bridge was studied and integrated into the design.

✓ **Ibi River Port Development**

(In association with Haskoning B.V.)

Client: Inland Waterways Department – Federal Ministry of Transport.

Services involved included:

Studies and design for flood protection at the site of the commercial port of the River Benue at Ibi. The influence of the port on the regime of the river and the effects on the near-by bridge was studied and integrated into the design.

✓ **Warri Port Development**

In Association with SNC, Canada and Danish Hydraulic Institute, Denmark

The project involves the planning and studies, geotechnical investigations and final engineering for the Nigeria Port Authority (SPDC).

✓ **Development of Naval Base, NNS Akaso**

Services carried out includes feasibility studies, preliminary and final engineering and masterplan development for the Ministry of Defence (MOD).

✓ **Ferry Services to Federal Secretariat, Lagos**

The project involves planning and studies geotechnical engineering and final engineering for the Federal Ministry of Works.

✓ **Victoria Island Jetty**

The project involved Hydrologic survey, geotechnical investigations and final engineering for the Federal Department of Fisheries.

✓ **Oron Fish Landing Jetty**

Services carried out includes Hydrologic survey, geotechnical investigations and final engineering for the Cross River State Ministry of Agriculture.

✓ **Jetties at Onitsha and Warri**

Services carried out includes Hydrologic survey, geotechnical investigations and final engineering for CWTC – Onitsha.

✓ **Customs Jetties at Oron, Ikan and Calabar**

The project involves hydrologic survey, geotechnical investigations and final engineering for the Board of Customs (FMF).

✓ **Upgrading of Kidney Island Slipway**

The project involves final engineering for the Shell Petroleum Development company Limited, Port Harcourt.

✓ **Rehabilitation of Apapa Petroleum Products Jetties**

Preparation of design philosophies and detailed engineering designs for the rehabilitation works for the NWPC jetties at Apapa Lagos.

3.4.5 Structural Engineering

The Firm's structural division has the capability and experience to carry out all forms of structural engineering design and construction including steelwork, prestressed and reinforced concrete and timber. As far back as 1970, **ENPLAN GROUP** has used computer programmes for the analysis of complex structures. The firm has its own geo-technical section which carries out field and laboratory investigation to establish foundation requirements and materials for pavements, buildings, roads and other major structures.

ENPLAN GROUP's experience in the structural field is very wide ranging from the design of small residential buildings to the design of complex buildings involving large portals, gantries and space decks applicable to factories and workshops.

The Firm has gained extensive experience in economic and financial project appraisal. This has included the ranking and selection of development alternatives for a particular project and also nationally between projects so as to help in the allocation of inherently scarce national resources and maximize the net benefit of the nation while satisfying its objects.

Social and environmental factors form an important part of regional development and so the needs of those involved and affected by major projects have always been carefully considered during our planning/feasibility studies.

Field experience gained by supervising construction of various structural engineering projects allows confident planning and designs of institutional, office, industrial, domestic buildings, markets and stadia.

ENPLAN GROUP has the necessary programs and software to carry out analysis in Structural Engineering. These analyses include:

a. Construction Management

- Critical Path Network Analyses;
- Bill of Quantities Database Control;
- Preparation of Monthly Certificates;
- Preparation of Progress Reports
- Estimation of Quantities

b. Soil Engineering

- Load Analysis for Piles and Piers
- Settlement Analysis
- Stability Analysis
- Retaining Wall analysis
- Earthwork quantities

c. Structural Engineering (Analysis of Members)

- Beam Analysis
- Slab Analysis
- Column Analysis and footing Analysis

Details of some selected projects are listed below, viz:-

- Preliminary engineering, final design and the construction supervision of the **Enugu Station**.
- Preliminary and final structural engineering designs, for the **Multi Storied Ward Blocks, OPD and Nurses Hostel for the Diobu Specialist Hospital Complex**.
- Masterplan and preliminary engineering and the final designs and the supervision of construction of the **University of Ilorin and the Federal University of Technology, Owerri**.
- Planning, structural engineering designs, roads, drainage and water supply for the **International Agricultural Training Institute, Ngala, in Borno State for Lake Chad Basin Commission**.
- Final Engineering design for the **Terminal and the Technical Buildings for the Kano International Airport**.

❖ Office and Residential Buildings

The Company has been involved in the design of many different and varied structures in this field. The firm deals mainly with the analysis and solution of framed structures and bearing sandcrete walls in this field.

Details of some of the selected projects are listed below, viz:-

- Preliminary and final design of the **National Universities Commission Office** in Lagos;
- Preliminary engineering and final structural engineering designs for 4 Nos. **Eleven Stories Block of Flats, Shopping Center, Packing Structure** in Lagos for the Lagos State Government.
- Preliminary and final structural engineering designs of **New Central Officer for P&T, 26 Storied Main Block plus 100ft Transmitter Tower**;
- Preliminary and final engineering designs of the **National Bank, Kaduna**;
- Preliminary and final engineering designs of the **Katsina State Secretariat Complex**;
- Preliminary and final engineering designs of the **14 Storey Office Block of the Star Finance**.

❖ Industrial Buildings

In this field the firm has been mainly involved in structural steel design of large portals, gantries and space decks for application in industry and large warehouse and covered open spaces.

Some of the projects for which the firm has been commissioned include:

- The **Maiduguri Four Mills** involving the structural steel design of the 34m high head house and other associated structures.
- The **Federal Saw Mill Training Center Benin** involving the preliminary and final structural engineering designs;
- **Mechanical Workshops and Fire Station at the Ajaokuta Port**. Preliminary and final engineering design of a gable frame structure for servicing river vessels.



- **Sheet and Coil Galvanizing Company Abeokuta.** Preliminary and final engineering design of main factory building based on a series of portal and gable frames with provision for compound stanchions.
- Preliminary engineering and final structural designs for the **Calabar Market.**
- Preliminary engineering and final structural designs for the **Vegetable Oil Factory, Onitsha.**

❖ **Institutional Buildings**

This involves structural analyses and construction supervision of buildings, they are generally medium rise structures but with specialized area requiring special treatment. Enplan has over the years developed expertise in this field and undertaken numerous conventional and complex assignments. Some of these include:

- **Federal Government Colleges Buildings at Ikoṭ-Ekpene, Jos, Maiduguri, Odogbolu, Enugu, Owerri and Okigwe**
- **Government Secondary School at Afaha Eket.**
- **Lecture Theatre, University of Nigeria, Nsukka IBRD** Second Education Port Harcourt.
- **Lagos University Teaching Hospital.**
- **Academic Buildings University of Ilorin.**
- **Federal Sawmill Training Centre.**
- **Secondary Schools, Bauchi State.**
- **University of Technology, Bauchi.**
- **International Agricultural Training Centre, Ngada.**
- **Academic Buildings 1st Phase FUTO** (with Haskoning B.V., The Netherlands)
- **Health Centre, FUT, Owerri.**
- **Library Building, University of Agric. Abeokuta.**

❖ Public and Residential Buildings

This involves all categories of public buildings namely hotels, office blocks, hospitals, mosques, churches, markets, shops, restaurants and different types of developments from projects or concept planning, site investigation and budget estimates through design to construction supervision. Some of Enplan Group's numerous assignment in this field are:

- **Television House** Rehabilitation, Enugu
- Office Block for **Teachers Service Commission**
- **Diobu Specialist Hospital Complex**, Rivers State.
- **Teaching Hospital**, Port Harcourt
- Standard Design, **Post Offices, Port Harcourt**
- **National Bank Building**, Kaduna

- **General Post Office Building** Port Harcourt
- **MIA Motel** Kaduna
- **Parliament Complex**
- **Government Printing Press Building**, Makurdi
- **Federal Government Press Building**, Apapa
- **Ministry of Justice, Abuja** – Preliminary Stage
- **Hospital Complex Police Headquarters**, Abuja
- **Central Mosque, Aiyeye**
- **Finance House Building** Lagos
- **NUC Office Block**, Victoria Island, Lagos
- **Ogun State Secretariat Complex**, Abeokuta
- **Katsina State Secretariat** Complex, Katsina
- **14-Storey Office Block**, Lagos
- **10-Storey Consortium House for the ABC Merchant Bank**, Victoria Island
- **Ministry of Defense**, Abuja.

❖ **University Planning**

Education, research and service to the community play an important role in developing a nation. University education improves human attitudes, develops talents increases and explores knowledge, creates responsibility etc, In view of the above the Federal Government has placed emphasis on University Education since the past decades.

Enplan Group is aware of this important role in our society and has therefore maintained a wide national involvement in the planning, design, and supervision of construction of Universities and institutions of higher learning in Nigeria. The firm has undertaken major masterplanning works, design and construction supervision of the infrastructures of the following Universities and Institutions of higher learning:

- ✓ **University of Ilorin**
Masterplan of the whole University as well as the design and supervision of the Facilities of Engineering and Science.
- ✓ **Federal University of Technology Owerri**
Masterplan, of the whole University including the Design and Supervision of the Bridge and some Roads, School of Agriculture, Engineering and Science Hostels, Administrative, some Hospital Structures.
- ✓ **Ngala Agricultural Training Centre**
Feasibility Studies, Masterplan, Design of all the Buildings.
- ✓ **University of Agriculture, Abeokuta**

Design and Supervision of the Library.

✓ **University of Uyo**

Project Management, Design and Supervision of the Faculties of Engineering and Environmental Studies.

✓ **Crescent University, Abeokuta**

Masterplan of the whole University recently awarded.

3.3.6 Roads and Bridges/Drainage Works

ENPLAN GROUP has been associated with the development of transportation in the country. The Firm provides a comprehensive consultancy service in all forms of transportation systems – such as in land and water. The Firm had gained experience and developed expertise in transportation studies, planning and design. The Firm also has its own Geotechnical section which carries out field and laboratory investigations to establish foundation requirements and materials for pavements, buildings, roads and other major structures.

The Firm has been involved in many studies for Airports, Roads, Bridges and Water Transportation, either as self-contained projects or in support of the wider engineering services provided by the Firm.

The Firm has wealth of experience in the collection and interpretation of data. Rapid processing of data is facilitated by the use of the micro-computer systems. It has developed a comprehensive set of library programs for the evaluation, analysis and modeling of transportation systems. The computer is also used for the geometric design of roads and airport pavements.

Social environmental factors form an important part of regional development and so the needs of those involved and affected by major projects have always been carefully considered during our planning/feasibility studies.

Field experience gained by supervising construction of various transportation projects allow confident planning and designs of airports, roads, bridges, navigation systems and associated structures.

❖ **Some of these selected projects include:**

- **Katsina Township Roads**, Katsina State Location Survey, Engineering design and Construction Supervision of about 30km of dual carriage way and associated structures.
- **Mashi-Mani-Ingawa Road**, Katsina State, Location Survey and Engineering design of about 48km of road including bridges.
- Supervision of construction of the **Hunkuyi-Malumfashi-Dabai-Bakori Road**.
- Planning, investigation and preliminary design of the **Abakaliki-Imom-Cameroun Border Highway** including the design of 20 bridges (in association with Gannet Fleming Cordry & Carpenters, USA).
- Preliminary and final engineering design and construction supervision of road networks for **22 Federal Government Colleges**.
- Feasibility Studies for the **Seme Pogi-Cotonou Road in the Republic of Benin** for the Federal Ministry of Works.

- Location Survey and final Engineering design for **23km Benisheik-Damboa-Uba Road**, including bridges.
- Planning, final engineering and project supervision for the **Imo River Bridge**, Port Harcourt-Aba Road.
- Location survey and Engineering Design on the **Dan Gulbi-Chafe Roads** in Sokoto State.
- Survey and Engineering Design on the **Mayo Belwa Townships Roads** in Adamawa State.
- Survey and Engineering Design on the **Ganye Townships Roads in Adamawa State**.
- Supervision of road construction for the **Damboa-Maiduguri-Bama, Biu Damboa Roads**.

❖ **Laterite Roads**

Enplan Group has provided comprehensive Consultancy services for the development of large number of irrigated agricultural projects in Nigeria. Laterite/earth service roads have been incorporated as an integral part of most of these schemes. Our Transport, Roads and Bridges Division has been involved with the location survey, design and construction supervision of a number of laterite/earth roads, all over the country.

❖ **A list of these selected projects is given here below:**

- Hadejia Valley Irrigation Project; Hadejia Jama're River Basin and Rural Development Authority, **Design and Supervision of Construction of 255km of Laterite Roads and Associated Culverts, Ford, etc.**
- **Jibiya Irrigation cum Water Supply Project:** Sokoto Rima Basin Development Authority **Design and supervision of construction of 150km of laterite roads and associated road and drainage structures.**
- **Zobe, Irrigation Project: Design of about 290km of laterite roads** and associated culverts.
- Savannah Sugar Irrigation Project: Adamawa State. **Design and supervision of construction of 320km of laterite roads associated culverts, fords, etc.**
- Kangimi Irrigation Scheme, Kaduna State. **Design of 110km of laterite roads and associated culverts, fords, etc.**
- Oramirukwa Irrigation Scheme, Imo State. **Design of 105km of laterite roads and associated structures.**
- Ibu Irrigation Project, Imo State. **Design of 170km of laterite roads and associated structures.**
- Kampe Irrigation Project, Kwara State. **Design of 80km of laterite roads and associated culverts.**
- Ukwa Land Reclamation/Irrigation Project, Imo State. **Design of 270km of laterite roads and associated culverts.**
- Cross River Basin Irrigation Projects, Cross River State. **Design of a total of 145km of laterite roads and associated culverts.**

❖ Estate Roads

The Planning Division has been involved in the development of estate roads both under urban and regional planning, residential complex planning or university planning.

Some of the projects include:

- Katsina State Secretariat
- Ogun State Secretariat
- Ungwan-Rana Residential Scheme, Kaduna
- Federal University of Technology, Owerri

❖ Bridges

The Firm has undertaken the design and construction supervision of many bridges either as separate projects or in combination with a road project. Notable projects that the firm has undertaken in this field include:

- **Final engineering design and supervision of construction of the 8km section of the third Axial Road (third mainland Bridge)** into Lagos (Maroko to Oworonsoki) of which 5km is elevated above the Lagos Lagoon including the five bridges of the Oworonsoki Interchange (in association with NIDAN Consult).
- **Final engineering design of the 3rd Road Bridge over the River Kaduna.** It comprises of 2 bridges each of 300m long dual carriageway (in association in the NIDAN Consult).
- **Final engineering design of the 225m long pre-stressed concrete bridge** over the Cross River on the Udi-Ugep Road.
- **Planning, final engineering and supervision of construction of the 150m long Imo River Bridge** on the Port-Harcourt to Aba Road. Design was based on the Cantilever and Drop-in concept.
- **The survey and final engineering design for the Bridges between Oguta I and III** for the Imo State Government.

❖ Drainage Works

- Survey, Planning and studies, final engineering, and preparation of contract documents, Project supervision of **Storm Water Drainage, Onitsha.**
- Survey, planning and studies, final engineering, and preparation of contract documents of **Erosion Control at Olumbanasa.**
- Feasibility studies for **Erosion and Flood Control at Nnewi.**
- Hydrological Survey, studies, survey, final engineering and preparation of contract documents for **Flood Alleviation Scheme Geriyo Lake Irrigation Project.**
- Hydrological survey, studies, survey, final engineering and preparation of contract documents for **Fago Town Flood Alleviation and Erosion Control project.**
- Hydrological survey, studies, topographic survey, final engineering and preparation of contract documents for **Hadejia Township Flood Control Project.**
- Hydrological survey, studies, survey, final engineering and preparation of contract documents for **Jibiya Flood Control Project.**

3.3.7 Previous Experience in Other African Countries

Notable international projects carried out by the Firm in developing countries in Africa include the following:

- Coastal Erosion Protection Project, Accra, Ghana
- International Highway Seme Pogbi-Cotonou Road, Benin
- Pre-Feasibility Assessment of the International Basin Water Transfer, Nigeria/Niger
- Study of the Morphology of the Sabke River Beyond Nigeria-Niger Boarder
- Assessment of the Faro and Logone River System on the Flooding of the River Benue, Cameroon

3.4.8 Previous Experience of Enplan Group in Executing Projects Funded by Bilateral and Multilateral Donors Including the World Bank

- Institutional Development Component of the National Water Rehabilitation Project (NWRP) for Ogun State (IBRD).
- Institutional Development Component of the National Water Rehabilitation Project (NWRP) for Edo State (IBRD).
- Environmental Sanitation Component of the First Multi-State Water Supply Project, Katsina (IBRD).
- Feasibility Study for the completion of Jere Bowl Irrigation System (IBRD).
- Environmental Impact Assessment of the Alau Dam (IBRD).
- 38 Small Earth Dams, Katsina – Design and Construction Supervision (IBRD).
- Hadejia Valley Project (Bilateral).
- National Water Inventory Survey of the National Water Resources Masterplan (JICA).
- Tertiary Design for the Wurno Irrigation Project (EEC).
- Environmental Impact Assessment of the Jere Bowl Irrigation Project (IBRD).
- Federal Trunk Road Studies Phase II (IBRD).
- Anti-Salinity Weir on Ogun River for Lagos State Water Corporation (IBRD).
- Onitsha Storm Water Drainage (IBRD).
- Jibiya Irrigation cum Water Supply Project (Bilateral).

3.5 On-going Projects

ENPLAN GROUP is currently handling the Planning, Design, Project Administration, Contract Management, and Construction Supervision of the following selected projects:

- **14 Storey Office Building** on Victoria Island, for the Star Finance Company Ltd., Lagos.
- **Environmental Impact Assessment of the Review of Public Sector Irrigation Projects In Nigeria** for the UTF/FAO & the FMWR
- **University of Uyo** – Project Management , Design and Construction Supervision of Faculties of Engineering and Environmental Studies.
- **Royal Gardens Estates Development**, Lekki, Victoria Island, for the Trojans Estates Ltd., Lagos – Land and Topographical Survey, Physical planning, Project Management, Design and Construction Supervision.
- **Jada Multipurpose Dam Project**, Yola, for the Federal Ministry of Water Resources, Abuja – Consultancy Services, Review & Construction Supervision.
- **Spillway Rehabilitation of Alau Dam Auxiliary**, Maiduguri, for Federal Ministry of Water Resources, Abuja – Consultancy Services, Design Review and Construction Supervision.
- **Review of the public Irrigation Sector in Nigeria** for the Food and Agriculture Organization/United Nations and the FMWR, Abuja.
- **Civil Works for Sewage Treatment Plant** at Main Office Area (MOA) for Shell Petroleum Development Company (SAPDC) Warri.
- **100 Meter Concrete Sheet Piling Sea Front Wall** for Oceanic Bank – Victoria Island.
- **Subsoil Investigation** for Econet Communication Tower Sites – Victoria Island.
- **Design and Certification of Roof Top Communication Tower Sites** for Econet at Tejuoso, Lagos State.
- **Design Review of the Jare River Basin Project – Dam Component**
- **Sector Centre C Road Project, Abuja for the FCDA**– Preliminary Masterplanning, Infrastructural Development and Design Services
- **Ogbunike Erosion Project for the AIRBDA** – Design Review and Construction Supervision.
- **Water Supply and Distribution to Nnamdi Azikiwe University** – Awka Campus – Study, Survey and Design.
- **Review of the Masterplan for the Federal University of Technology, Owerri.**
- **Ilushi – Ega Oriarrigation Scheme, 5,000 ha** for the Benin Owena River Basin Dev Authority – Final Engineering Design.
- **Preparation of Design Specification** for Shell Petroleum Development Company.

- **Design of Engineered Landfill for Nestoil, Warri including Access Roads and Infrastructure.**
- **Masterplan /Design of Awka Capital Territory.**

ENPLAN GROUP is also currently handling the civil works related to Mast Foundation Works for Econet Wireless (Nigeria) Limited, MTN Nigeria Ltd and Nitel Plc either directly or through Messrs L.M. Ericsson Nigeria Limited, in cities across the country, some of which include Lagos, Abuja, Uyo, Port Harcourt Ibadan and Benin. Others are Enugu, Asaba, Onitsha, Eket, Calabar, Kano and Kaduna.

4.0 PROFESSIONAL AND HUMAN RESOURCES

4.1 Professional Expertise and General Qualifications

Enplan Group has professional teams with experience in multi-disciplinary fields, which largely accounts for the standards of technical excellence exhibited by the firm over the years. Many of our senior staff and consultants are internationally acclaimed experts in the fields of Institutional Development, Customer Enumeration, Audit & Financial Studies, Mapping/Survey, Community Development, Training, environmental engineering & planning, Civil/Structural engineering, Port Development and Marine Works, Contract Administration/ Management, Construction Supervision, Project Management, geotechnical engineering, groundwater engineering, Water resources, as well as in sustainable development, and capacity building of the Clients observation.

Apart from the experience acquired in various aspects of Institutional Development environmental, planning and engineering, as enumerated above both locally and overseas, almost all our professional staff and consultants have Fellowship or Corporate Member status in international and national professional institutions such as the Nigerian Society of Engineers (**NSE**), Association of Consulting Engineers of Nigeria (**ACEN**), Institution of Civil Engineers (**ICE**), UK, Institution of Electrical Engineers (IEE), UK, American Society of Civil Engineers (**ASCE**), American Water Resources Association (**AWRA**), International Water Resources Association (**IWRA**), American Geophysical Union (**AGU**), Association of Geoscientists for International Development (**AGID**), Nigerian Mining and Geosciences Society (**NMGS**) and the Nigerian Association of Hydro geologists (**NAH**).

Our current professional, technical staff and consultants exceed 200 including engineers, hydrologists, geologists, hydro-geologists, environmentalists, urban and regional planners, scientists of various disciplines, sociologists, lawyers, computer and database experts, GIS specialists, financial experts and management specialists located throughout the country.

Enplan Group owns its own subsidiary firms in the UK. and Canada to source and provide technical back-up support as and at when needed.

Enplan Group also maintains effective association with other international firms including firms such as the Mott MacDonald Group, UK, GWK, Germany and Haskoning BV, The Netherlands for specific projects.

The most successful projects are based on the Client and Consultant working hand-in-hand. We place great emphasis on building close relationships with our Clients in order to understand their needs and to find new and better ways to serve them. We also believe and have adopted the Community Participatory approach to most of our new projects, which have enabled sustainability.

This approach ensures that every aspect of a project is handled in the most appropriate way. At the onset, we assign a director or co-ordinator whose role is to pull together the right team of experts and to ensure the technical quality and prompt completion of the project. A project manager is assigned to supervise the input and performance of the technical team, steer progress and keep our Client and the community fully informed through regular communication and formal progress reviews.

Our policy of exchanging information and ideas between professional teams throughout our network of offices provide Clients with the benefit of access to a local service backed up by additional support from the resources and capabilities of the entire **Enplan Group**.



We believe our role goes beyond completing projects on time and within budget. We aim to provide a responsive service before, during and after each project.

Our people are talented, highly qualified professionals, and dedicated to delivering outstanding standards of service. They work within the framework of a formal quality management system certified to the international standard **BS EN ISO 9001**.

Over the years, we have created a culture, which stresses reliability, depth of technical knowledge and close communication with Clients. Over 80% of our new business now come from existing Clients, the best endorsement of our approach we could have.

4.2 Staff Strategy

The Consultancy Services for the execution of the LEEMP's Projects is considered as a project of national importance, and as such, the professional team for the assignment of this magnitude should be of high caliber professionals and tested known experts.

Our selected list of professionals comprises full time members of the Enplan Group and a few Consultants, These Consultants and staff are chosen for their wide experience in working on projects of similar complexity and working on a multi-disciplinary team such as are needed for this project. Our specialists with their Nigerian and International experience will ensure that the work is executed in accordance with the most recent codes of international practice.

List of some selected Professional Staff

S/No.	Name of Staff	Specialized Field	Years of Experience
1	Engr. Femi A. Sonuga	Project Co-Ordinator/EIA and Computer Expert	30
2	Prof. E.A. Olofin	Environmental Planning Specialist	35
3	Prof. J.O. Ajayi	Hydrogeologist/Environmental	40
4	Engr. K.K. Chikwendu	Civil Eng/Environmental Mgt Specialist	20
5	Engr. Obiorah P. Aliboh	Contracts Admin/Coastal Erosion Expert	32
6	Engr. Dr. David A. Oloke	Water Supply/Hydrologist	18
7	Fehintola Momoh	Environmental/Social Expert	19
8	Dr. Martins Eduvie	Hydro geologist	26
9	Engr. A.A. Onigbanjo	Water Resources and Roads	30
10	Engr. Dr. V. M. Chiwuzie	Structural/Management	38
11	Engr. O.O. Adebowale	Water Resources	28
12	Engr. N. A. Ndukwe	Road/Pavement Engineer	38
13	Engr. Razak O. Quadri	Highway Engineer	40
14	Engr. E.O. Williams	Consultant - Civil Engr/Town Planner	40
15	I.B. Adesina	Computer Expert	28
16	Toyin Aloba	Cost Estimator and Infrastructures	18
17	Bayo Abolarin	Soils and Materials	34
18	Abel Adebayo	Sociology/Socio-Economics	28
19	Tanwa Koya	Legal Adviser	
20	Chike Morah	Ports and Infrastructure	40
21	Okoli Kenechukwu	Water Resources	2
22	Chinedu Umolu	Dams and Water Resources	4
23	Dan Enaholo	Water Resources	24

5.0 HSE MANAGEMENT

5.1 Signed Company HSE Policy

❖ HSE & CA Policies

The Consultants Health, Safety & Environment and Community Affairs and Security Policies are as given here below:

5.1.1 Overall Objective

The Consultants' overall safety, environment and security (CASHES) objective is the prevention of any accident that could otherwise result in pains, disabilities, damage to properties (plant and equipment), death as well as damage to animal and plant life within the environment we operate. Thus, our CASHES objective is the prevention of any accident that could otherwise result in pains, disabilities, damage to properties (plant and equipment), death as well as damage to animal and plant life within the environment we operate. Thus, our CASHES programs are designed to achieve the following:

- (a) Sustained Management's commitment to community relations, health, safety and environmental protection.
- (b) Increase the level of awareness among all employees.
- (c) Provide healthy and safe working conditions for all employees.
- (d) Ensure security of life and property at all work sites.

5.1.2 Policy Statement On Community Affairs, Health, Safety, Environment And Security (Cashes)

In executing our jobs, our main objective is to operate in most safe and economic manner without antagonizing or alienating the local communities. This will be achieved by ensuring that all statutory and other relevant regulations relating to safety and welfare of our personnel that may be affected in the course of our work are paramount while maintaining excellent and mutually beneficial relationship with our host communities.

We also views with great concern the ecological implication of her job on the environment and the community inhabiting the work location. In order to prevent accidents and friction with the local communities, proper attitude to safety rules and community relationship are encouraged in all ramifications. Our overall objective is to ensure cordial relationship with host communities, prevent accidents, which could otherwise result in pains, disabilities, damages to property (plant and equipment). Death as well as damage to animal life within the environment and security (CASHES) programmes are designed to achieve the following:

- (a) Sustain Management's commitment to community affairs, safety, health, environmental protection and security.
- (b) Increase the level of CASHES awareness among all employees.
- (c) Provide healthy and safe working environment for all employees and the local communities.
- (d) Ensure security of life and property at all work sites.

5.1.3 Community Affairs Policy

ENPLAN GROUP Limited is a corporate body whose dealings with communities are guided by the following policy:

"We shall continue to render services to our clients at their various locations while maintaining an excellent relationship with the local communities".

In order to achieve this, the following strategies are adopted.

- (a) Discharge acceptable social responsibilities to the communities.
- (b) Respect the local customs, laws and traditions of the communities.
- (c) Maintain religious secularity and political neutrality.

This policy will be brought to the notice of all personnel and will be renewed from time to time.

5.1.4 Safety Policy

It is the policy of our company to carry out our activities in such a way that the life of all our employees and other people who may be connected with our operations are safeguarded. The company makes adequate provision for personal protective equipment (PPE) and insists on observance of all safety precautions necessary for operational work site. To maintain a high safety standard in all her operations, the company conscientiously educates her employees on her CASHES policy through series of enlightenment programmes.

There is reward in the form of prizes and promotion for excellence in achieving the set safety standards while negative attitudes are reprimanded and corrected. Site management teams are always encouraged to actively promote safety awareness and safe working practices in all their operations.

In order to ensure a high safety standard, the following strategies are adopted:

- (a) The continuous identification of likely caused of accident inherent in any job.
- (b) The control of caused in "1" above.
- (c) The minimization of accidental losses.

This policy will be brought to the notice of all employees. It is also subject to review when the need arises.

5.1.5 Health Policy

ENPLAN GROUP is responsible for the health of her employees and will therefore conduct an active policy to attain this. The objectives of this policy is to reduce or limit, as much as possible, risks that can result in injury, sickness, death, property damage or there forms of loss. It is necessary that early recognition of health hazards is established, assessed and brought under control. The company retains the services of good clinics to take care of the worker. Much emphasis is placed on the promotion of the total health concept and protection of the worker.

The company also retains the services of reputable insurance companies to provide insurance cover for staff. The company holds workmen compensation, group life assurance and group personal accident policies to cater adequately for employees.

5.1.6 Environmental Policy

Every employee of **ENPLAN GROUP** is expected to live and operate in a healthy and conducive environment both at home and at work must comply with the statutory requirement of Federal Environmental Protection Agency (FEPA).

In recent years, the Federal government of Nigeria has shown a more than ordinary interest in the protection/preservation of the environment. The Government-directed monthly environmental cleaning is already a nation-wide exercise aimed at ensuring a clean and healthy environment for the citizenry. **ENPLAN GROUP** is similarly committed to ensuring clean and healthy environment especially in the course of work. Environmental sanitation programme is a serious issue in our company. Physical factors in the environment do influence



health at work. These are lighting, ventilation, humidity and effects of temperature extremes. Serious efforts will be geared towards minimization of dust released during the course of work. Use and disposal of injurious chemicals should be structured. Efforts are to be made towards reducing noise and fume generated during operations.

5.1.7 Security Policy

ENPLAN GROUP is responsible for the security of her employees and other assets within company premises (including client's property in our care). The company shall continue to provide appropriate mechanism for the security of lives and property.

It is the duty of employees to protect company property in their possession. No company property (including records and sensitive information) shall be given to third parties without prior written authorization from Management.

5.1.8 The Company's Commitment To Cashes Policy

In principle, the prevention of all accidents and promotion of good community relationship will start with the active commitment of our Management and all our personnel to the following standards:

1.
 - (i) Follow approved codes of work especially with regard to the standards and codes applicable to our engineering, procurement, construction and maintenance jobs.
 - ii) Operate the Permit-To-Work System effectively such that operational hazards are identified at their early stages and addressed.
 - iii) Use safe tools- both electrically operated and manual tools will be of such standard that their potential to cause harm will be greatly reduced.
 - iv) Report unsafe acts, conditions and incidents before they cause accidents. Unsafe acts will include infringement on general health requirements with regard to the ecological implication of the job.
2. The maintenance of high degree of personal health standards, on-and-off the job must be taken into account for each project. The areas to be addressed include:
 - i) (Provision of potable drinking water and a constant drive to ensure that proper quality standards are adhered to.
 - ii) Following good feeding habit and the avoidance of harmful drugs and alcohol while in the company or client controlled area.
3. The protection of the environment and efforts to get all staff to co-operate with such measures must continue for all projects and the following shall apply:
 - ii) Advanced planning for the controlled generation and handling of waste products. Such products will be separated and appropriate action taken especially for toxic/radioactive wastes.
 - iii) Where it is inevitable to use chemicals the selection shall be such that toxic and dangerous chemicals are substituted with known mild or relatively safe substitutes. Importation and handling of chemicals shall be in accordance with statutory regulations.
 - iv) For all site, waste receptacle will be put in place to reduce emission.
 - v) We shall endeavour to report all near misses and all accidents.
4. There is no way forward in our stride to maintain enviable CASHES programmes without visible commitment. To further emphasize this are the company will pursue the following programmes:
 - ii) Install a high level of security and safety consciousness beginning with the introduction and orientation of staff as they join the company. Reading,



understanding and implementing on a personal and collective basis, the guidelines of the policy and objectives which the company aims at.

- iii) As much as possible, seek nomination and placement for safety course, and put in place structured safety meetings.
 - iv) Train all employees so they can swim to personal survival level as part of the drive to keep the company in competitive position to vie for work anywhere.
 - v) It is the duty of every employee to co-operate with the guidelines and show commitment by making efforts to wear personal protective equipment. It is hoped that the employee will not willfully interfere with any provision of the CASHES programme.
 - vi) Quick detection of deteriorating conditions of work, morale and skills will be included in the unsafe act auditing drive. Since this programme is action centered and will be carried out by our staff, it will further provide a learning process.
 - vii) The greatest visible commitment to CASHES is by showing good example. CASHES Officers and charge heads are therefore accountable for the unruly behavior of personnel under their charge where their faults are traceable to insufficient CASHES awareness.
 - viii) It is the duty of every personnel to show commitment by making efforts to respect local custom, tradition and laws of community in which we work.
 - ix) Liaise continuously with the communities in order to identify and familiarize with the communities, as this will go a long way in building the needed cordial relationship between us and the communities and enhance security.
5. No work, no matter how urgent, is to commence without first ensuring that all necessary safety systems are in place. To this end, the project personnel must follow a structured system, which will ensure that:
- ii) Lock out systems are in place and necessary facilities are available to make the system workable.
 - iii) The Permit-To-Work System is implemented and that all the necessary clearance and permission have been sought and all staff engaged in the work are made aware of all the dangers.
 - iv) At work site and its surroundings, adequate means of warning to non-company staff must be effectively maintained. Safety information and warning signs must be located in strategic areas. Wordings of such information should be in clear English and to convey their meanings quite easily.
 - v) All drawings incidental to the work including as-built modifications, and those planned for the future are received and studied as to eliminate chance of error.
 - vi) **ENPLAN GROUP** will continue to use competent persons to man its projects; such men at the time of engagement must possess adequate knowledge and skills, together with commitment to CASHES goals of the company. Meetings serve useful purpose when their planning, organization and decision making process is properly informed and kept in the hands of honest and hardworking staff. The periods and agenda of meetings must therefore be circulated in advance in



order to give every staff the opportunity to hear others contribute their quota and also be heard. The structure of meetings is as follows:

- vii) **ENPLAN GROUP** will continue to use competent persons to man its projects; such men at the time of engagement must possess adequate knowledge and skills, together with commitment to CASHES goals of the company. Meetings serve useful purpose when their planning, organization and decision making process is properly informed and kept in the hands of honest and hardworking staff. The periods and agenda of meetings must therefore be circulated in advance in order to give every staff the opportunity to hear others contribute their quota and also be heard. The structure of meetings is as follows:

Daily tool box meetings lasting between 10-15 minutes at the work site will be held at site with the site safety officer leading the talk.

(Weekly site meetings will center on work progress, problems and milestones achieved. Site supervisor in charge of works shall preside over this meeting. He shall copy the minutes of such meetings to his area manager. Such meetings should include the review of Job Hazard Analysis (JHA) to accommodate new developments.

Monthly Company Progress meetings will hold and co-ordinate all the reports from the various sectors. The aims will be to take decisions, apportion resources and have final authority for discipline. The company Chief Executive Officer will chair this meeting will all heads of department and area managers in attendance. The copies of minutes of meeting will be read to all staff or posted on notice boards for their future reading.

The agenda for all meetings must include CASHES. The agenda need not be tool long so that adequate time will be made available to deal with it.

Engr. Femi Sonuga
Principal Partner

Signed

Date: _____



UNDERSTANDING OF CASHES REQUIREMENTS DECLARATION

Subject to the provisions of the CONTRACT, and without prejudice thereto, we confirm that we have read and understood Section 35 of the SHELL Standard Construction Specifications concerning CONTRACTORS safety and the SHELL Waste Disposal Procedure Guidelines respectively.

We hereby declare that we agree to abide by the requirements set out therein.

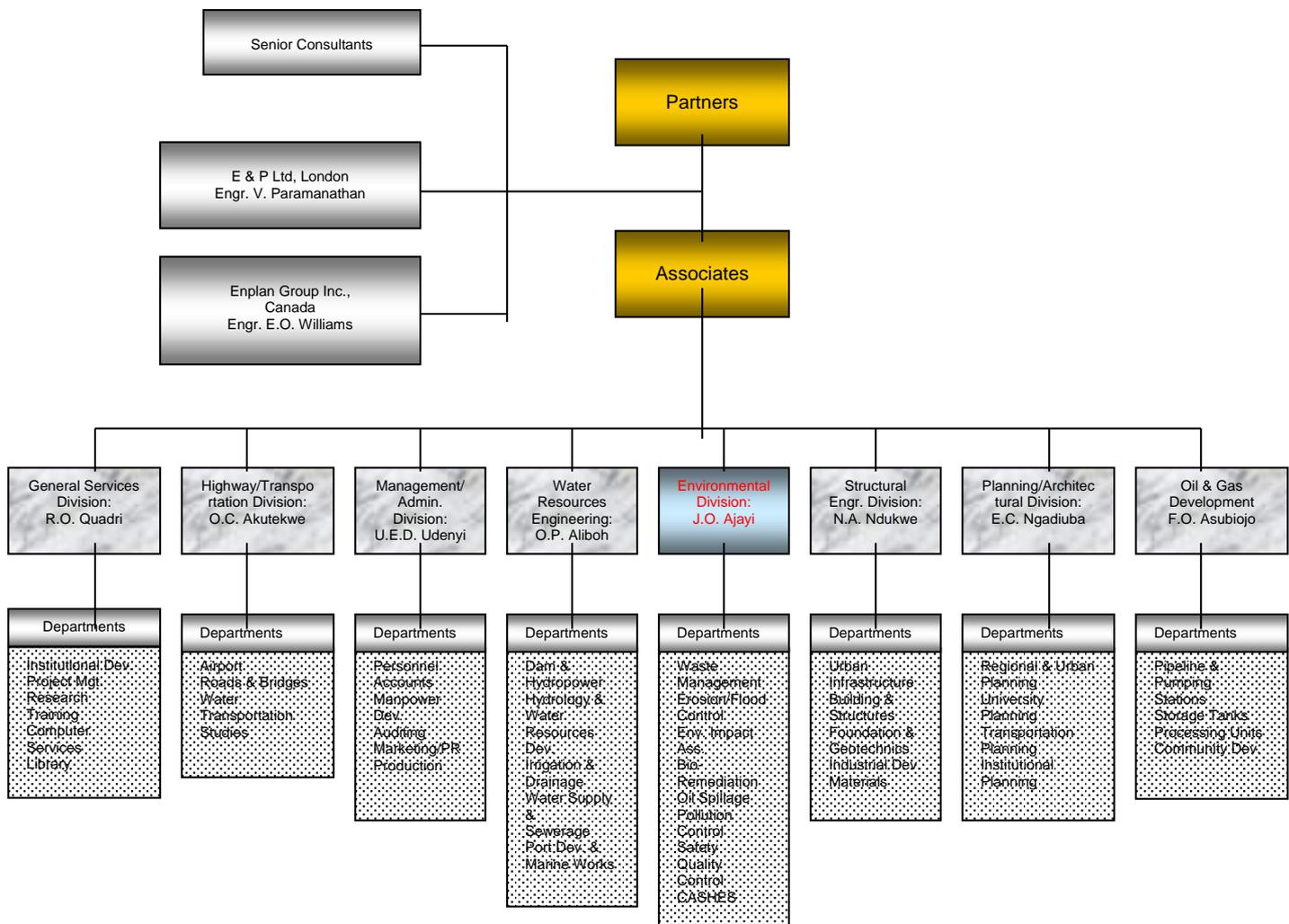
We hereby appoint:

Name: **Prof. J.O. Ajayi**

As our Safety Officer who will be responsible for ensuring that acceptable CASHES practices are observed during the execution of the CONTRACT.

5.2 Health, Safety and Environment Management System (HSE-MS)

Enplan Group's Organisational Chart



The overall responsibility for ensuring smooth implementation of all HSE affairs is vested in the Principal Partner of the Company.

Further responsibility rests on the Senior Resident Engineers (SRE) for effective management of all HSE functions in office and field operations. The SRE shall furthermore delegate daily HSE matters to the HSE coordinator who is responsible for the direct implementation of safety affairs in the office and field respectively. He shall ensure that the office and field Employees adhere to and follow strictly all laid down safety rules, guidelines and procedures for the safe running of daily activities in their various job description on the construction project site.

The HSE coordinator shall ensure that hazards associated with all work activities are identified, analysed and effectively managed. He shall also ensure, through the Inspectors that all construction work activities are executed in accordance with the statutory requirement and codes of safe working practice of the client.

❖ SAFETY MANAGEMENT SYSTEM

Safety Management in Enplan Group is the responsibility of the Resident Partners in their various operational zones – joint as they are responsible for the management of company's business in their respective zones.

To this end, management of Enplan Group demonstrates a strong commitment to Health Safety and Environmental (HSE) by making resources available, discussing HSE with Employees, originating and attending safety meetings and ensuring that the company safety policy is being followed.

Periodic in-house audits are normally carried out to ensure that laid down procedures are actually being implemented as intended and are adequate for their purpose.

❖ SAFETY RESPONSIBILITY

Safety Responsibility on the project location lies in every member of staff of Enplan Group both office and construction locations. Working safely is an activity that involves everyone and requires all personnel to consider safety positively and actively at all times.

All members of staff have a responsibility to the company, their fellow staff, contractors, third parties, environment and to the safety of equipment and assets of the company within their areas of responsibility.

❖ INCIDENT REPORTING

HSE management will ensure that all staff reports incidents, however minor to the HSE coordinator for documentation. The reason for this is to review incidents for learning purpose to find out why they occurred and to prevent future reoccurrence and to check the hazard associated with such incident.

Near misses and Lost Time Injuries shall be reported promptly, investigated, recommendations made, implemented and monitored against future reoccurrence.

❖ HSE MEETINGS

HSE management shall ensure during the construction phase that employees shall hold weekly safety meetings to highlight all hazards, incidents and unsafe conditions associated with the field project tasks and camp for review, field hazards shall be held at the appropriate time and their minutes shall be documented for drawing learning points and for future references.

❖ **SAFETY BRIEFING/PEP TALKS**

As a further boost of the safety standards, HSE management shall put in place daily safety briefings and pep talks to increase the safety awareness to her staff. This will be a daily activity both in the construction site and in the office. It shall therefore be mandatory that before commencement of the day's activities either in the construction site or in the office, pep talks carried out shall be documented and cascaded to the client and any other related departments.

❖ **SECURITY ON SITE**

The management, in accordance with the HSE and security policies, shall ensure appropriate security plans for staff, third parties and equipment during the execution of the projects tasks. This shall be made possible through HSE department generating proper safety planning for field works and construction project. Every project and environment shall be created distinctively.

The management shall ensure monitoring and implementation of the information security policy thus staff shall maintain high security standard of company operations both in the field and office.

In the office and field, management shall ensure that security guards are employed in accordance to security policy for implementation of access control policy. HSE management shall ensure adherence for the safety and security of personnel and equipment.

❖ **INFORMATION SECURITY**

All Enplan Group activities shall be conducted in such a manner that any information given out shall be appropriate only for that purpose. In achieving this:

- All documented information shall remaining safe custody of the firm and the client.
- Unauthorized dissemination of information shall not be allowed or encouraged.
- Enforcement of high information security standard shall be maintained
- Construction field personnel shall ensure that all visitors or strangers are reported to the appropriate authority and all office staff are expected to refer strangers and visitors to the HSE coordinator or Senior resident Engineer.
- Maintenance of high security of acquired field data and information collected from client for the execution of project awarded shall be strictly adhered to.

❖ **HEALTH/MEDICAL WELFARE AND MEDICAL EMERGENCY PLAN**

Enplan Group regards the health of her personnel as a veritable instrument in achieving its business objectives. To this end, the company shall ensure that the health of all personnel involved in its operations are adequately taken care of in line with the company's health policy.

In achieving this, all hazardous threats to staff health associated with project tasks and job descriptions shall identified, analysed, properly managed and adequately supported with efficient plans on recovery measures. However, Enplan Group shall be responsible for the health and medical welfare of her staff in the execution of their various tasks on the projects while it is assumed that the Contractor will make provisions for the staff and the third parties in their HSE program plan.

❖ **HOSPITAL RETAINERSHIP**



In compliance with HSE policy in the area of health, Enplan Group believes it is the responsibility of the Contractor to engage the services of retainership hospital for her personnel and the Consultant (Enplan Group). The hospital shall be in-charge of caring for the health condition of company personnel on the job for effective competence in rendering services.

The retainership hospital shall through regular medical checks, ensure the fitness of staff before engagement and during work operation.

A nurse in the retainership hospital shall also organize health lectures and in-house refresher courses on First Aid for all members of staff of the company and shall also carry out audits on all first aid boxes in base office or in the construction site and camp.

❖ **MEDICAL CERTIFICATION**

The company shall carry out medical certification on office and field staff in all their operations. This shall be made possible through the retainership hospital as the situation requires. Enplan Group shall ensure that all personnel are sent to the retainership hospital for regular medical check up to ascertain their fitness to work.

A pre-swimming medial examination shall also be required from the retainership hospital before swimming tests can be carried out on staff.

❖ **CERTIFICATION OF STAFF**

It is mandatory that every personnel shall be medically certified fit physically and mentally. Such certification shall be done by a recognized medical doctor either from retainership clinics or from any Government approved hospital.

All medical certificates of staff shall be prepared and endorsed by the appropriate qualified officers for documentation and future reference.

All such certificate shall be field and photocopies shall be submitted to sponsor departments for reference.

❖ **COMMUNICATION PLAN**

Enplan Group appreciates the vital role effective communication plays in any organization especially in field operations. Its importance with reference to safety of men and material is such that no operational planning can be deemed to have been complete without proper communication plan built into such a project. It is in recognition of this peculiar importance and role of communication that Enplan Group is requesting that the contractor should put an adequate communication plan into all its operations in the HSE plan. The communication plan shall include long-range (SSB) radios as well as walkie-talkies for all its field and office staff. In addition, well-trained and dedicated personnel shall be made to man the various radios whether in the field, camp or in office.

Communication between Enplan Group, Contractor and Clients shall be by mobile SSB radio both in the various camps and construction locations and through telephone services.

The HSE coordinator shall be responsible for communication during office and field operations and shall ensure efficient flow of information for onward progress of job activities.

Communication plan shall be incorporated into the HSE plan for every project task and all field staff shall be intimated to the plan adopted for every project task. The modes of communication adopted by the company for all her project shall be short-range hand held

and long-range radio, telephone, fax machines and e-mails. All communication made through the radio must be properly logged.

The HSE department shall ensure that field staff are acquainted with codes of communication and are furnished with the appropriate frequencies and telephone numbers adopted for the project.

❖ **OFFICE/FIELD/.CAMP COMMUNICATION**

The HSE coordinator shall ensure that communication plans are incorporated in all project tasks during planning and all field staff are aware of such plan.

Long-range radios shall be installed in the base office and all field camps for effective contact between field staff and site office. Where communication is not possible by radio, all field staff shall contact site office by telephone through and clients.

All field staff shall maintain constant communication with the site office for daily information on the statistics of job progress and other requirements for the job. There shall also be communication between field staff and the client representatives where the need arises.

❖ **WORK PERFORMANCE STANDARDS**

Management shall ensure that all office and field staff adheres to the Quality Performance and Performance Improvement Policies in technical and HSE operations. Management shall review company standards when the need arises, as a means of performance measurement and evaluation for monitoring office and field activities. This shall also identify and check deficiencies in the execution of all site operations.

Resident Engineer shall be responsible for the implementation of quality standard monitoring compliance and advising the technical and HSE departments on any inaccuracies or impracticalities and obtaining approval for documentation of any deviations.

All staff shall be responsible for the specification, maintenance and compliance to the appropriate standards relevant to company's HSE management system (HSE-MS) and for specifying their scope and application. They shall also work, as a team, towards achieving an improved standard for technical and HSE affairs.

❖ **CONTINGENCY PLANS**

Management shall ensure that the policy on emergency response is followed strictly during the execution of the Construction work. The HSE coordinator shall make available emergency response procedures to all office and field staff in the execution of various jobs. The procedures shall be prepared to cover all foreseeable emergency situations in the office, site and camps with all key facilities identified in the procedures.

Contingency plans shall include but not limited to: MEDEVAC, Fire emergency, Security, Natural disaster and Environmental hazards. All contingency plans shall be documented and distributed to office and field staff.

▪ **EMERGENCY PLANNING AND ORGANISATION**

- a) The prime response to any emergency shall be directed by the SRE and HSE coordinator. They shall be responsible for defining, initiating and supervising the company's emergency procedures and ensuring that all such procedures interface with those of the client. They shall have the authority to take whatever safe measures necessary to meet the demands of the emergency and shall report to client for necessary actions.

- b) The organization of emergency response, the actions to be taken in the event of an emergency and emergency duties are indicated in the emergency procedure set up before the commencement of any project task.
- c) The HSE coordinator shall be responsible for verifying that the emergency procedure is in place with an effective chain of command demonstrated. Such procedures must meet the company and client standard to deal with emergencies. The Senior Resident Engineer shall be liable to interface company emergency communications and procedures with those of the clients in the field.
- d) The HSE coordinator shall be responsible for establishing, maintaining and updating emergency procedures for all operations when the need arises or as specified by clients.

These shall include emergency response to community attacks, health, environment, third party hazards to office, employee housing, company visitors and other related activities.

❖ **EMERGENCY PROCEDURES**

- i) The SRE, HSE coordinator, Site Engineer and Base Nurse shall be responsible for originating the medical evacuation (MEDEVAC) for company employees and visitors in line with that of the client. They shall also contact the client where assistance is used during emergencies.
- ii) All Resident Engineers shall ensure that emergency procedures are made known to all relevant staff and that response facilities and materials, as specified in the procedures, are available and fit for such purpose at all times.

b) HSE PLANS

The management shall ensure that all plans are put in place during the execution of all project tasks in the area of Community Affairs, Safety, Health, Environmental and Security. The company's HSE Plan the utmost policy in the execution of all construction projects. By implementation of the HSE policies, all operations are planned and executed to maintain and boost the health, safety and security of employees, assets, environment and corporate image of the company.

All such HSE plans made by the company shall be in accordance to clients' specification. There shall be proper documentation of all plans made for the execution of all projects, which shall be submitted, to clients for record purpose.

❖ **JOB SPECIFIC HSE PLAN**

The HSE coordinator shall ensure that Project Specific HSE Plan is prepared for all project tasks to enable safe execution of the jobs. The job specific HSE plan shall consist of all safe technical administration, journey management, accommodation of field staff, emergency response plans, employment and induction, incident reporting, identification, analysis and management of potential hazards and emergency situations as well as logistics required for the job according to client's specification. These shall vary with various project tasks and different field operations.

The HSE coordinator will ensure that all field staff are acquainted with the plans and that strict adherence is supervised by the site engineer and inspectors.

❖ **JOB HAZARD ANALYSIS (JHA)**



Prior to the commencement of any project, there shall be field visits to identify potential hazards associated with the project. These shall cover hazards associated with transportation, terrain condition and vegetation, feeding, community affairs, weather conditions, armed robbery, piracy, saboteur, wild animals and the technical aspect of the project tasks.

❖ **PERFORMANCE MONITORING**

In accordance with the policy on Quality Performance, management shall put in place tools to check and improve the standard of production of the company. Staff performance shall be monitored in the following ways:

- The primary HSE performance criteria
- Collection of health and safety data and computation of statistics
- Review of performance through comparison of projected against achieved targets

❖ **SAFETY SUGGESTIONS**

In pursuance of a successful monitoring performance, management shall encourage safety suggestions from office and site staff highlighting weak-links and deficiencies in quality performance of the technical and HSE standards of the company.

Management shall study all such suggestions for implementation and improved pattern in the execution of all her projects. The best suggestion shall be adequately rewarded through incentives.

❖ **AUDITS and COMPLIANCE**

The management shall ensure that audits are conducted at regular scheduled intervals in the office, site and camps; all such reports shall be submitted to the HSE coordinator. All recommendations from such audits shall be considered by management for implementation.

Management shall ensure full compliance of audit recommendation is by site and office staff for the improvement of performance standards in the following:

- Health, Safety, Environment and Security audit process
- Safety Case Audit: functional audit and management review processes
- Incident investigation and reporting
- Corrective action or recommended procedures

(b) HEALTH, SAFETY, ENVIRONMENT AND SECURITY AUDITS

1. The objectives of health, safety, environment and security audits:

- To inform management of revision of health, safety, environment and security standard during work operations.
- To assist management in updating hazard management strategies
- To assist management to identify deficiencies in safety and environmental activities during operations
- To assist management to control and administer recovery remedies on control failures.

2. Organization

The audit plan shall form part of the company annual audit and review plan set up with the annual HSE plan and programme documentation. The HSE coordinator shall compile the audit



plan, and in consultation with other departmental heads, HSE committee and the Resident Partner shall review and assess such audit plan. The staff, site engineer and HSE coordinator shall be responsible for implementing the audit plan in the office and site respectively.

3. Composition of the Audit Team

Audits shall be conducted in accordance with company and clients' audit plan and operational checklists. The audit team shall depend on the type, size and/or complexity of the audit but shall consist of management staff appointed by the HSE committee.

Office audit team shall constitute office staff headed by a team leader, the Site Engineer shall head site audit and departmental heads shall head sectional audits. K all such audits shall be conducted at regulated intervals as indicated in the audit schedule.

4. Auditing Management HSE Standard

Clients shall audit the general safety standard of management system at schedule intervals. These shall comprise management facilities, site and camp audits for increased safety standards during project activities.

All audits shall be documented and submitted to the appropriate offices for follow-up on the implementation of recommendations. The audit reports shall contain audit items, time schedule with action parties. Recommendations and follow up actions shall be the responsibility of the audit committee.

(c) HSE CASE AUDIT

The department heads shall coordinate and verify audits during the start up of any major operation requiring HSE case. The HSE audit shall involve reviewing the company's HSE case to make sure all issues and hazards associated with the job operations are identified, analysed, managed and documented.

❖ INCIDENT INVESTIGATION AND REPORT

1. The Objectives:

- To investigate thoroughly all hazardous incidents for prompt reporting within 24 hours.
- To study reports and take appropriate action in order to prevent the recurrence of such an incident or other similar ones.
- To communicate the findings and recommendations of the incident investigations to personnel for correction and prevention.
- To identify trends in a timely fashion and initiate preventive and recovery measures.

2. Procedure/Guidelines Documentation:

The company shall ensure that office and site staff adhere and follow strictly the procedures set out in the company HSE guidelines for investigating, reporting and follow up of incidents.

(d) CORRECTION AND AUDIT IMPLEMENTATION

1. All audit recommendation (Audit Actions):



Where the audited and the auditor cannot agree on corrective actions, resolution shall be sought with the HSE committee. Progress on all corrective actions shall be reported at interval to the Resident Partner and the HSE committee until all recommendations are closed.

2. Incident Report Recommendation (Incident Report Action):

Target dates for completion of the corrective actions are agreed with the field inspectors and a subsequent follow up. Only the HSE coordinator shall have the right to overrule a proposed corrective action or to place it on hold after considering or managing the hazard. The HSE committee shall monitor the status of corrective actions adopted.

3. HSE Case Recommendations (HSE Case Action):

Remedial actions from the preparation of HSE case shall arise in three ways:

- Deviation from company standards identified in preparing the safety case
- Action arising as a result of individual studies (Fire Risk Analysis, Smoke ingress analysis, Escape route accessibility, Evaluation and Rescue analysis, Emergency systems and survival analysis)
- Action arising from an integrated operation hazards analysis.

In each case, action to be taken as registered with the HSE committee and action plan shall be drawn up by the relevant department heads in cooperation with the field inspectors for approval by HSE committee. Reasons for the rejection of any safety improvement action shall be well documented.

❖ INCENTIVES

Management shall put in place incentives in accordance to the Performance Improvement policy as a means to enhance the performance of employees of the company. These shall comprise bonuses and awards to encourage staff performance in technical and HSE operations.

A committee shall be constituted to map and carry out all that is necessary for a successful award scheme.

❖ MANAGEMENT REVIEW and IMPROVEMENT PROCESS

The management in her dynamic bid to improve standards in technical and HSE operations shall ensure the following:

- The development and maintenance of quality technical and HSE standards and the corporate image and reputation of the company through HSE and departmental programmes
- The review of the effectiveness of Community Affairs, Health Safety, Environmental and Security plans, the HSE Management System and the HSE Case.
- The improvement strategy through the revision of the Community Affairs, Health, Safety, Environment and Security (HSE) plan, the HSE Management System and the HSE Case.

(a) Development and Maintenance of HSE Plan

1. Annual HSE Objectives and Targets:



The Resident Partner, HSE coordinator and the heads of departments shall prepare the annual projections for HSE objectives and targets.

2. Purpose of the Annual HSE Objectives and Targets:

- To set annual targets for achieving the long-term objectives
- To detail activities to be performed for achieving the targets
- To create an understanding in staff of the HSE policy and to give it a common direction
- To focus on key elements of HSE management with the objective of systematically eliminating or controlling potential hazards of accidents or conflicts

3. Principles:

The annual plan for Hse objectives and target shall be based on principles set out in the HSE quality management guide of the company.

4. Content:

The annual HSE Objectives and Target shall have the following:

- Review of the HSE Objectives and Target projected for the previous year
- Review of the HSE Objectives and Targets for the year at bi-annual intervals.
- Department programme for the objective period.

5. Set Targets

The annual HSE Objectives and Targets shall set goals for all levels of operations of the company which shall guide office and field staff in safe execution of projects. This shall also form statistics to check trends of potential hazards associated with project execution.

(b) Review of performance/efficacy of HSE Objectives and Targets, HSE-MS and Case

1. HSE Objectives and Targets:

- The head of HSE departmental shall be responsible for the implementation and monitoring of their programmes in accordance with the projected objectives and targets planning for the year.
- A regular review of the effectiveness of the HSE Objectives and Targets shall be carried out bi-annually or spontaneously, depending on the high potential severity of the projected item on the plan. The HSE steering committee shall be responsible for this review which must be approved by the Resident Partner. Results and recommendations shall reflect in the following year's projections of HSE Objectives and Targets.

2. HSE Management System (HSE-MS)

Enplan Group shall draw up HSE Management System highlighting activity catalogue. HSE deficiencies, critical activities with risk areas and their controls personnel competence, tasks, accountability and hazard register as well as remedial action plans for safe enhancement of her operations.

- Adherence to specific elements of the HSE-MS implementation shall be ensured in all technical and HSE audits.

- A plan for review and improvement of the HSE-MS shall be put in place in conjunction with the HSE plan. The HSE-MS review plan shall incorporate a one-year rolling programme, which shall be amended as a result of experience gained within the years. As part of the programme the HSE-MS custodian shall review the effectiveness of safety management as laid out in the activity catalogue and shall advise the Resident Partner on any revision or improvement. The review shall consider HSE-MSA audit findings, checks of the accuracy of the activity catalogue and attempt to identify any lapses or deficiencies in the safety management objectives.

3. HSE Case

- The safety case shall be reviewed and submitted every year or ahead of any major modification to operations on the contracts awarded.
- Between the period of the re-submission, changes to the HSE case shall be recorded by way of variations, which shall be appended to the HSE case. These variations shall be incorporated in the safety case text at each review period.

(c) Improvement Strategy and Plan Revision

1. HSE Objectives and Targets:

- The HSE improvement strategy shall be set against the long-term target of zero injury, zero lost time injury hour and zero fatality. To this end, three years reducing targets (if applicable to the duration of the contract) are set for Lost Time Injuries by the departments and these are reviewed annually.
- The improvement strategy shall be based on the identification of key elements of HSE management with the objective of systematically eliminating the root causes of accidents or friction.

2. HSE Management System (HSE-MS)

The HSE management system shall be updated to clients specification and conventional safety standard and thus the HSE-MS manual shall be subject to a three-year rolling review and improvement programme under the chairmanship of the partner.

New corrections discovered from lapses and deficiencies shall be made and included in the HSE management system manual.

3. HSE Case:

The HSE case shall be reviewed and re-submitted every year or ahead of any major modification to the operation of project tasks, review and improvement programme under the chairmanship of the Resident Partner.

More activities shall be included from various gigantic projects awarded from clients, which shall make room for more studies management. This shall also create more scope and shall be appended to the HSE management system for studies and implementation.