



The Nigerian Society of Engineers

PORT HARCOURT BRANCH

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website: www.nseph.org

e-mail: info@nseph.org

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INTERACTION WITH ENGR. ENOCH GEORGE (FNSE) ON THE EFFECT OF GEOTECHNICAL ENGINEERING ON NATIONAL DEVELOPMENT PLANNING

E-Newsletter: Good morning sir. We want to interact with you on the effect of geotechnical engineering on national development planning. Before we go into details, it will interest our reading audience to know you and your contributions to engineering profession.

Engr. Enoch George: My name is Enoch George. I think am one of those people who had scholarship to study civil engineering in 1956. I was later sent to Ghana for a short course before I left for England, where I did my first and second degrees. I was involved in engineering practices in England, where I rose to be a senior engineer. After staying there for about



Engr. Enoch George (FNSE)

sixteen years I decided to come home. When I came home I was in College of Science and Technology, Port Harcourt now Rivers State University of Science & Technology and I was the chief engineer there in 1973. I left them in 1979 and started ENOCH GEORGE ASSOCIATES. The company is into Geotechnical Engineering. Really I got into Geotechnical engineering by accident. When I was a student I was interested in becoming either a structural or marine engineer. Geotechnic or soil mechanics used to be something like witchcraft. You don't understand any word about it that is Geotechnic. Even now some people have that belief on the subject.. I was not so much interested in soil mechanics or foundation engineering, one day our lecturer came to me and said "You come and work for me, I will do something for you" and I said "look, I don't like soil mechanics so I don't want to work for you". He said "look, I want to go into private practice, will you come and do some work for me?" and I said "no" He said "alright go, but if you can work for me in every day you put in I give you 10 shillings". That was very attractive those days. So I accepted. We started in a garage. I started doing some tests for him, soil classification tests and so on. As the days went by, I became curious about what I was doing. So I started reading to get more ideas about the thing I was doing for him. So the interest started going. When I finished my first degree, I was to go for the second degree, so I intended to move towards soil. My thesis in Master's degree, I did it on soil. That was how I got involved in Geotechnic but in college of science and technology I was just in the department of works, I was the chief engineer there, I never liked the six years I spent there. The only thing that made me happy was when I started supervising projects. But all the time I was there I had in mind to set up a business and start working for myself because I had a lot of experience while I was in England. This is how I started working for myself.

E-Newsletter: What are the Elements that are found in this subject, Geotechnics?

Engr Enoch George: Geotechnics is the most recent branch of civil engineering. It was started by Professor Des-Haggy, from Austria who was fully a mechanical engineer. He started testing soil because of some failures. Most of the disasters in the world are from the soil, earthquake, collapse of buildings and so on started from the soil and people don't understand much about soil. The soil has been put there by nature after millions of years and it is in equilibrium unless we try to change something then it reacts either in a wrong or right way. Immediately you put a building, it is a load on it, so it has to adjust itself but if it cannot take the load it collapses. That is how the soil is. When we put load, whether it is a road, building, or any structure on soil that is in equilibrium it tries to behave in a certain way. We consider the behavior of such load if it is put on it. Will it be that this soil will say yes I will tolerate it and put it in such a way that will be acceptable?

That is what we call serviceability. This is what the geotechnical engineers try to find out and tell the client the optimum way to set up a structure.

E-Newsletter: Thank you very much sir. Let us now consider the importance of this discourse from your explanation of what geotechnics is all about. What are the effects of Geotechnical engineering on National Development Plan?

Engr Enoch George: Without geotechnics all these things would not stay. They have already said that there is no glory in foundation. You dig the ground, you put the foundation and cover it, and nobody sees what has happened. So there is no glory comparing it to the big buildings, the sky scrapers and so on, people glorify what they see with their eyes not the foundation. Now because of that according to Des-Haggy foundations are treated like a step-child. Step children are not treated well by the step mothers. But unfortunately when the step son becomes stubborn, it is very embarrassing. When the soil becomes stubborn, it is very embarrassing. I have seen so many times where soil becomes stubborn that your entire superstructures are nothing. Shell realized that. We worked for Shell from 1982 to 2003 nonstop. Before that time Shell used to go to drilling location with two drilling platforms. Their intention was that when one collapsed, the second one would be used. So they were told the best thing to do was to carry out some sub-soil investigations. Try to know whether the soil can take the load or not. It wouldn't take you much money. Try to see whether the soil can take the load you are putting on it; try to get every thing in details that will save cost than building two platforms. And they did that. Today Shell can not put up anything without carrying out a soil test. The roads they build in this place I don't know whether people sit down to think about it. I don't see how you will build a road without knowing how the soil will behave, because you are loading the ground. The best way to know what load you are putting on the ground is to go under a bridge that is carrying traffic on top. The man under such bridge will feel the vibration; you will know that in deed there is a load. Here in this country nobody monitors our land. I don't know whether they do investigation in this country. You can see that the roads, rail ways, buildings, sky scrapers and so on experience failures. National development planning cannot do without structural consideration. Therefore geotechnical activity should be brought into focus.

E-Newsletter: Let us consider Rivers State now. The present government is talking about Greater Port Harcourt, we want to know, whether you have contributed in any way towards the development. Because if development actually will take place in any environment, housing, structures etc will take place, then geotechnical engineering has to be taken seriously. So what do you think can be done in this direction?

Engr Enoch George: The government may have geotechnical people they can consult. What I feel is that they should use geotechnical engineers who have the experience. There is a job which we just concluded and we are writing a report on it now. This company has not used any indigenous company to do any geotechnical investigation for them off shore. All the geotechnical investigations that were done off shore were

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done by foreigners. Recently in 2008 this company asked us whether we can be trusted in geotechnics because we have been doing a lot for them on land operations. Reluctantly we agreed. We consented with fear because we are going into something that is new. We have been in operation for nearly thirty years, we have not gone off shore but I knew within me that if it is in geotechnical work, we are up to it but the logistic of doing that job is terrifying. We quoted for the job, with other two foreign companies. When our quotation got to France, the board in France said that the job should be given to a white company but for some reasons the job was given to us. Though we had some problems along the line but we did a perfect job. The head of geotechnical department came down from France to see us. Jobs have been given to us directly from Texas, USA. These people realized that there is a man here who can do this job but our people do not recognize that. I don't blame them so I don't bother about it. I have been in geotechnical engineering for forty-six years. I don't want to talk much about it.

E-Newsletter: Thank you very much. Let us look in the area of water in the coastal areas. What do you think Geotechnical engineering can do in order to identify the Aquifer for us to get potable one? Because government just gives out the contract without making sure that they get the required aquifer. Besides, structures associated with water activities might require reinforcement so what do you advise the water sector?

Engr Enoch George: I am a fellow of the geological society of London. I will say that I don't really know much about water in a way, but when it comes to something that will retain the water, when it comes to something like structures that will do something for the water then a geotechnical man comes in to say this is how you are to do it to retain your water. I have seen the research into this. We have wells everywhere. Even houses everywhere, they have pumps, they are pumping water for everybody. That is a bit dangerous to structures. As you build the structure and it is staying there, it has to settle a bit. The settlement is by touch it down, the load the water underneath that is carrying the structure will try to dissipate. By dissipating, the soil compresses. In the way of compressing, the building settles. What we are trying to say is that the settlement will not be much so that the building if it will settle at all will be even. This will come to equilibrium sometimes and stay. But when you start pumping water around the structure, you are removing water from there because the laterite is very permeable; the laterite from our own experiment is about two feet a day of water moving. The more you pump the water to give to people they are removing the water underneath most of the buildings will start settling. And when it starts settling it starts cracking. In a way by pumping water everywhere we are trying to bring down the structure. The best thing to do is to see a way that we can connect all these water and put them in reservoirs and distribute from there. There should be research into these things. The point is that we don't even have time to research into this thing. There are pot-holes every where, nobody sit down to ask why we have these pot-holes, there is no roads that we build here that last up to three to six month. Why? In England when we build road, we used to give a life span forward, we use to give a lifespan for a bridge, a road well built in England is given a life span of twenty years and there was no repair on that road till after twenty years. That will tell you what type of material, what type of soil grade it will be, what type of base material it will be, what type of bearing cost it will be. First of all the time for the road, the span, walking down there and getting the material and so on, tells you what kind of materials is required to use in building the roads to meet up the life span you've given to the road. I don't know if they do that here. What is the life span of our roads, does the life span has anything to do with the materials we use for the roads? These are the problems, so you have it in everything, there must be sitting down, thinking what to do, how do we do it, what is the engineering input in what we are doing? These are what engineers should do.

E-Newsletter: Thank you very much for the period we had with you, it has

been a nice time. Now that you have raised thought provoking questions that will make engineers sit up especially those in government to be serious with what we do in this country because most of our facilities, infrastructure are not standing the taste of time and it seems as if nobody cares about what is happening, nobody is following procedure again. Once again we thank you very much for the period you have given to us.

Engr Enoch George: Thank you very much. Lastly, when the president of Nigerian Society of Engineer, Engr. Ali came here last year, I raised one point; I told him that a Nigerian engineer should be more interested in off shore engineering operations. If they want to get something out of the oil exploration off shore, they should empower their geotechnical engineer. And the geotechnical engineer in this country should really develop to a point where they can get involved. We were paying a company \$15,000 everyday, why don't the governments establish something that they can give people to hire so that the money will remain here. Why don't we get involved? The Indian did it. The India government empowered their engineers, sent them to countries where they can learn. The Indians don't have oil in their country. It is the Indian Ocean now that they are trying to get something from. They empowered the people. Most of the things the white people did, the Indians are now doing it themselves. I don't know why we don't get involved in these things. It tends to make engineers serious and know what to do. Still today the company we did an off shore job for is still asking for a part of the design. Now there was a test to be done what we call a cycling strength test because of the wave trying to have effect on the soil. It tries to bring down some degradation, how will it go down and all that. There is a cycling test which we don't have the equipment here and in England I don't think they have up to three laboratories that can do it. We got a company, Fuburu to carry out the test. When they finished in their reply to us they wrote 'we hope you will understand what we have done'. We want to send two of our engineers to the company so that they can put them through, do you know what they wrote to us? "If they are coming they should be there for only one day". What do they want them to understand within the period of one day? They don't want them to understand. They even said in their reply that there no is need for them coming because their workers won't have that time to teach them. It just shows you that if it is the question of stealing their technology, let us steal it because they will not want to give you for the fear that you will spoil their market.

I don't know what these young engineers are feeling; to me I enjoy engineering because it makes me get involved in the creating of things that I use and other individual use also. In all aspect you see engineering; you see the joy of engineering. Then you that are involved in engineering should thank your God that you are involved. It is not the money. It is the joy of your being fulfilled.

E-Newsletter: Thank you very much.

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