



AADHARSHILA

An Annual Newsletter of the Department of Civil Engineering
Assam Engineering College

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Principal's Message

It gives me immense pleasure to learn that the Civil Engineering Department, Assam Engineering College is coming up with its second issue of the Annual Departmental Newsletter titled AADHARSHILA. I hope it will help in creating a healthy environment for the students. I wish them all the success for the future issues to come.

Dr. Atul Bora
Principal
Assam Engineering College

Message from the Head, Civil Engineering Department, AEC

I am pleased to inform you that the Civil Engineering Department of Assam Engineering College, Guwahati is going to publish the 2nd issue of the Departmental Newsletter 'AADHARSHILA' on 25th January 2014. I, hereby extend my best wishes for the occasion and request all concerned to make it a success.

Dr. P.J. Hazarika
Professor & Head
Civil Engineering Department
Assam Engineering College



A view of Assam Engineering College



Editorial

At the very beginning, we, on behalf of the civil engineering department, Assam Engineering College, would like to extend our heartiest greetings to all. We, as the editors of the departmental newsletter, 'AADHARSHILA' feel very fortunate to carry out the legacy of publishing the 'mirror' of our department for the second time, for the academic year 2014.

With the birth of Assam Engineering College in the year 1955, the civil engineering department has also come to existence the same year and it has been the spectator of many milestone and technical melioration. It has also always been a pioneer when it comes to any new development in the field of education and technology in the entire region. And realizing the knowhow of the pioneering department of this prestigious institution, a 'mirror' in the form of a newsletter reflecting the activities, achievements and departmental portfolio, was the need of the hour. Hence, AADHARSHILA (foundation stone) which was started as a dream of the students and faculty of civil engineering department was first published on 25th January, 2013. And with the combined effort of all, we are proud to bring the second issue of AADHARSHILA before you.

Here, we would like to express our heartfelt gratitude to the people who are directly and indirectly related to the newsletter. First of all, we would like to express our sincere gratitude to Dr. Atul Bora, the Principal of Assam Engineering College and Dr. Palash Jyoti Hazarika, Head of the Department of Civil Engineering, Assam Engineering College. Then we would like to thank Dr. Bibhash Sarma and Dr. Malaya Chetia, professors-in-charge of AADHARSHILA whose valuable instructions and motivations moulded the newsletter to the present state. Then we would like to thank all the respected faculty members and also the member of the non-teaching staff of the department, who always supported, motivated and inspired us in every step. Lastly, we would like to express our thanks to all the members of the editorial board and students of civil engineering department who helped us in this endeavor.

The second issue in a nutshell, primarily focuses on the departmental activities and milestones, achievements of faculty and student and opportunities for students which will definitely boost up the epitome of the civil engineering department and provide a unique platform of research and development culture among the students.

We hope our efforts have been fruitful in providing an overview of the department and with prayer for its success we would like to present the 2nd issue of AADHARSHILA to one and all.

**Kuldeep Kaushik
&
Ritukesh Bharali**

The prime objectives of the newsletter are-

- i. To showcase the illustrious history of the Civil Engineering Department.
- ii. To highlight the recent developments and events of the Department.
- iii. To develop and encourage an interest in the research field among students of the Department.
- iv. To introduce the students to better opportunities and prospects in national and international platforms.
- v. To connect with the alumni and make them a part of the greater Civil fraternity of A.E.C.



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AEC Delegation Visits NORSAR HQ at Kjeller, Norway

Dr. Jayanta Pathak
Professor
Civil Engineering Department
Assam Engineering College

A delegation from AEC led by Dr. Atul Bora, Principal visited NORSAR HQ at Kjeller, Norway as part of EQRisk project visits during 27th Oct - 31st Oct. The delegation led by Dr. Bora, comprised of Dr. Jayanta Pathak (Professor, Civil Engg. Dept, AEC & Coordinator), Mr. Islahuz J Ahmed (Project Asstt. and Ex-Student of AEC) and Mr. Santanu Pathak (7th Semester student, Civil Engg. Dept, AEC). The delegation was received on 28th October, 2013 morning at NORSAR office by Dr. Dominik Lang, project coordinator of EQRisk and the various infrastructures and facilities developed by NORSAR were explained and shown to the delegation from AEC. After the initial pleasantries and introductions among various members of both the institutions, Dr. Bora had detailed discussion with NORSAR official regarding EQRisk Project. Dr. Lang made a detailed presentation on the project and discussed the timeline of various deliverables. Dr. Bora stressed upon the need to expand the project to cover geotechnical investigations and site response analysis of Guwahati city for a complete earthquake risk mapping.

The project so far has made considerable progress and the Building Typology Documentation has been released already after sample site survey and analysis of Building inventory generated by the team at AEC. The Building Classification Scheme for the City of Guwahati, Assam Report No.13-012, authored by Dr. Pathak and Dr. Lang, Kjeller (Norway) - Guwahati (India) was published in September 2013, in the official website of EQRisk Project www.eqrisk.info and can be openly ac-



The delegation in front of the NORSAR H.Q. Kjeller



Dr. Dominik Lang project coordinator of EQRisk flanked by Dr. Atul Bora, Principal & Admin Head of EQRisk-AEC (left) and Dr. Jayanta Pathak, EQRisk project Co-ordinator (right)

cessed.

As a part of the project several knowledge transfer workshops are planned during the project duration till 2016. Mr. I.J. Ahmed, Project Asstt. and Mr. S. Pathak, the student member in the delegation stayed in Kjeller till 9th Nov 2013 to have hands-on training on SelenaRise, an open source software for risk assessment and loss estimation of built environment. During the visit,

there were presentations and tutorials on tectonic studies, attenuation relationships, building typology classification, capacity design methods, earthquake scenario modeling and risk assessment and loss estimation. A comprehensive workshop for students of AEC is planned during May 2014 to provide larger benefit of the collaboration between AEC and NORSAR.

Landslide in City Hill Areas- Common Causes and Remedial Measures- With a Special Reference to Guwahati City

Diganta Goswami (Phd, MIGS, MISTE, MASET)
Associate Professor, Civil Engineering Department
Assam Engineering College

RF/Amchang RF, (xvi) Garbhanga, (xvii) Maligaon, (xviii) Santipur and (xix) Kahilipara. A recent RVS (rapid visual screening) conducted by the author and a group of students from Assam Engineering College, in all the 19 hillocks of Guwahati identified 366 sites as vulnerable to landslide. The study also revealed some shocking findings some of which are discussed here. Out of the 366 vulnerable sites, 95% are man-made and 93% of the slopes have an inclination more than 60 degrees. Figure 1 shows a man-made steep slope in refinery colony area. The photograph speaks itself about the degree of susceptibility to failure.

The problem is aggravated by the fact that huge overload in the form of building weight exist very near to the slope at top and dwelling houses (easily susceptible to crushing under slope material falling onto it) also exist very near to the slope at bottom. Another important finding of the survey is that good drainage network does not exist in the hill areas of the city. Rain water or even the liquid wastes generated from the households in the city hill areas do not find a proper path in its way to the downstream plain areas of the city. This is a serious triggering factor for slope failure and erosion. Figure 2 Depicts such a situation where a slope failure occurred in Shantipur Hill area due to water constantly falling on it from a house hold at top of a slope. It is worth mentioning here that water in a slope increases the weight of soil (creating increased disturbing/ driving force) and at the same time decreasing the shearing strength of the slope material (decreasing the resisting capacity of the slope material) and thus making the slope prone to failure.

These two factors, namely anthropogenic activity of creating very steep unstable slope and absence of drainage network in city hill areas are thought to be the most common and important causes for landslide and erosion. As a remedial measure to this evergrowing problem, concerned authority must take some im-



Fig-1: A Man Made Slope in Refinery Colony Area

There has been increasing cases of landslide related casualties and damages to property in Guwahati, a form of disaster, which was almost not heard of before three decades. As more and more people have started to live in the hill areas of Guwahati, by constructing either semi-permanent or permanent houses, more landslide related accidents have resulted. Though, these two factors, namely, (i) people constructing their houses in hill areas and (ii) number of landslide cases, should not be directly proportional, this has become true in Guwahati, primarily due to unscientific methods of construction being followed in these areas. Unscientific construction practice in hill areas not only makes a slope vulnerable to failure, but also has

lot many implications carried over to the plain areas of the city as well. For a sustainable growth, Guwahati must adopt a scientific approach, especially for hill area development, which till now is non-existent.

First part of the discussion is intended to address various triggering factors, to be followed by some remedial measures for a sustainable hill area development of Guwahati, in the second part.

Guwahati has 19 hillocks, namely, (i)Jalukbari/ Lankeshwar, (ii) Fatasil , (iii) Gotanagar, (iv) Kharghuli, (v) Nabagraha, (vi) Noonmati, (vii) Kamakhya/ Nilachal, (viii) Kalapahar, (ix) Narengi, (x) Hengarabari, (xi) Sarania, (xii) Narakashur, (xiii) Sunsali, (xiv) Kainadhara Hills, (xv) Khanapara

mediate proactive measures rather than various response-centric measures only. A Hill Area Drainage Network consisting of main drains, feeder drains and contour drains based on a total watershed management approach (based on rainfall- runoff study) is required to be implemented in all the hill areas of Guwahati. A Special Building Hill Area Bye Law, appropriate for hill area development should be formulated and strictly implemented. It is important from stability point of view that any building to be constructed near either a soil slope or a rock slope should satisfy certain set back norms, which is not the same as that for plain area. The hill area building bye law should make people, wanting to do construction activity in hill areas, binding to prepare, submit and get approval of a detailed plan for development including Earthwork Calculation for cutting and filling, Rain Water Harvesting, provision of Dry Sump, for ground water recharge, of volume appropriate for the entire plot area, Silt Fence to contain silt, if any, within the plot prior to the actual construction. Where ever, cutting is found to be more than



Fig-2: Landslide Caused due to Water Falling in Slope in Absence of Proper Drainage System (Shantipur Hill Side)

2.0 metre, submission of design calculation for stability of the slope should be made mandatory. Concept of Reinforced Earth Technique should be encouraged over traditional retaining wall practice, as Guwahati being in Seismic Zone V, ductile behavior of earth retaining structures are to be taken into consideration for their effective performance during earthquake. With retrofitting of all the existing vulnerable sites and strict implementation of a scientific approach in all further hill area development work, will not only stop landslide in Guwahati, but also will help in reducing erosion from hill areas and thus in tackling the artificial flash flood menace of Guwahati.

Face of the Issue: An Interview with Dr. Madan Mohan Das

Ritukesh Bharali
Preetish Kakoty
Students, 8th and 6th semester,
Civil Engineering, AEC



Interviewee Dr Madan Mohan Das.

Dr. Madan Mohan Das, is a noted academician, a skilled civil engineer and a researcher who has been associated in the field of civil engineering for almost half a century. Dr. Das completed his graduation in Civil Engineering from Assam Engineering College in 1965, being the topper of the batch. He then joined AEC as a lecturer in 1965 itself. He pursued his M.S. from Cornell University, USA and Phd degree from Royal College of Science and Technology, Glasgow (Now University of Strathclyde), U.K. in the year 1969 and 1978 respectively. In 1981, Dr. Das along with Professor Emeritus Barr received the coveted Telford Premium Award by ICE, London for their paper "Numerical simulation of dam burst and reflections with verification against laboratory data." In 1986, Dr. Das published a paper titled "Direct Solution of Normal Depth using Manning's Equation", in the ICE London journal, which eventually led to the development of Barr and Das formula. Dr. Das has his research interests in hydrodynamics and has authored several books in this field along with a number of research papers in National and International Journals.

Ritukesh: How did your journey in the field of civil engineering start?

Dr. Das: My journey in this branch of engineering started in the year 1961 just after my Intermediate Science (I.Sc.)

from Cotton College. At that time, demand of Civil engineers was very high throughout the whole country and therefore, I preferred this branch.

Preetish: How would you describe

your journey from a student to a professor at AEC?

Dr. Das: AEC was fully residential at that time and I was a boarder of hostel 2. I enjoyed my long four years student life



in AEC with my friends. At that time, I was very much interested in the teaching profession and had a plan to join AEC as a lecturer if my final result is upto my level of expectation. Joining AEC as Lecturer in the civil engineering (CE) department within 7 days of my results, was a dream come true for me. Thus, my journey of teaching started. After 2 years of teaching, I was awarded the state overseas scholarship to do my M.S. in Hydraulic Engineering in the USA and in January, 1968, I joined Cornell University for graduate studies and returned to AEC in September, 1969. Again in 1975, I was the recipient of the same state overseas scholarship for completion of my PhD degree in hydrodynamics at Royal College of Science and Technology, Glasgow (Now University of Strathclyde), U.K and on completion, returned after the Ph.D. again to AEC. Soon I was transferred to JEC on promotion. I spent long 8 years in JEC. In 1986, I came back to AEC and was promoted to Professor in 1989. Since then I started guiding research in the dissertations of M.E. and Ph.D.

Ritukesh: How do you think will develop the research awareness & interest among the undergraduate students & what are the various scopes of research?

Dr. Das: Nowadays the students in AEC have to do two projects in 7th and 8th semester. The faculties in all the Departments are highly qualified having lot of research experiences. Computer facilities in these days are a boon. The students can discuss with their guides on research oriented projects. It is not mandatory that an 8th semester project should be "design of a tall building". That knowledge is present in coursework itself. I sincerely feel that research awareness and interest depend on the faculties and the concerned students. If anyone of you has an interest in a

particular topic, you can explore yourself the work done so far through internet.

Preetish: You had been the Director of Technical Education, Govt. of Assam & also an emeritus fellow of AICTE. What improvements do you think, need to be brought about in the technical education scenario of Assam, or in general North-East India?

Dr. Das: A sea change has been observed in the growth of technical education in this country. Assam and North-East are also a part of it, though the rate of development is slow as compared to the rest of India. There was a time (1977), when graduate course (M.E.) was introduced only in CE department in AEC. The CE department started guiding Ph.D. thesis in the nineties. The first Ph.D. in engineering stream under Gauhati University was conferred in CE in the year 1998. I have guided 30 M.E. dissertations and 8 Ph.D. thesis (3 ongoing PhDs) during my tenure as a Professor, D.T.E and Emeritus Fellow of AICTE and superannuated periods. An awareness of research guidance has prevailed in AEC now as all the faculties are highly qualified. As a sign of development, few private technical institutes such as GIMT, NITS MIRZA, RESET, SIMT, RIST and private Universities such as Assam downtown with engineering and paramedical, USTM at namile, Meghalaya, Royal University (upcoming) and a State Govt. university STUA may be mentioned.

Ritukesh: Coming from North-East India, we face a lot of limitations for pursuing research at an international level. How can these limitations be overcome?

Dr. Das: I would advise the students to complete their undergraduate degree with strong fundamentals. Students, who have an interest for pursuing research at an international level, can compete for GATE, GRE to pave your way to the

centres of excellence in India itself or anywhere in the world. If you can achieve that, you will find the scope to compete in study and research at international level.

Preetish: How can the future civil engineers of Assam contribute to the development of the state?

Dr. Das: The scope of engineers to contribute to the development in the state is limited, at present but the concept of globalization prevails everywhere. The whole world is in your hand. Think about contributing to the society, human needs anywhere on this planet. Do not confine yourself to your state. Contribution anywhere is a service to the humanity.

Ritukesh: What is your message to all the budding civil engineers of AEC?

Dr. Das: I want you all to be sincere, hardworking, honest and punctual in your duty keeping a positive mind, in order to succeed in life. I hope you to lead a happy, healthy and prosperous life.

Sustainable Accommodation through Feedback Evaluation (SAFE): A Model for Determining Urban Carrying Capacity

**Prof. Arup Kumar Sarma
B.P.Chaliha**

Chair Professor and Head
Civil Engineering Department
Indian Institute of Technology
Guwahati

Concept of Carrying Capacity

The urban carrying capacity concept is defined as the level of human activities, population growth, land use, physical development, which can be sustained by the urban environment without causing serious degradation and irreversible damage (Oh et al., 2002).

Carrying capacity concept can be uti-



lized in planning and development of urban areas to keep a balance between built environment and natural environment, which is currently a challenging task in the face of rapid urbanization. Under prevailing socio-economic conditions, the application of Carrying Capacity concept enables to determine the optimum population that can be supported within a given area with adequate infrastructure facilities so that development is environmentally hazard free and sustainable. The carrying capacity is not constant; it can be increased by application of improved technology depending upon the level of economy of a country.

Methodology for determining Carrying Capacity

Different investigators have proposed different methods for determining carrying capacity. We have proposed a new method, which aims at estimating maximum population that can be accommodated in an eco-friendly manner in a hilly watershed to avoid human induced environmental hazards. We have named this method as Sustainable Accommodation through Feedback Evaluation (SAFE). Although the method was developed for hilly area, it is applicable to plain area as well. Following are the steps of SAFE model to determine the carrying capacity.

Step 1: Delineate the area for which carrying capacity need to be calculated.

Step 2: Based on the physical features of the watershed/watersheds of the area and provision of different statutes, non-developable areas such as land with steep slope, reserved forest area, water bodies, stream, drainage channels, springs, rocky area and depression storage area are demarcated.

Step 3: Area required for different infrastructure and facilities, which may include, water-treatment plants, sewerage

treatment plants, drainage network provisions and so on are determined. It may also include area required for other facilities like commercial, health, educational, recreational etc. regional planning approach is necessary for providing the area for utility services. For example, an urban centre with a population of 1,000 may not need a sewage treatment plant. Similarly, it is not necessary to consider area requirement for a specialized hospital under health facility if such a hospital is located in the region. It is important to note that area required for infrastructure is also a function of population and therefore, carrying capacity, i.e., the permissible maximum population, in this method is determined iteratively.

Step 4: Net area available for residential development can be calculated from the calculations made in the previous steps.

Step 5: Based on socio-economic status of the perspective residents of the developable hilly area an average floor area required for each person is determined. For example, in case of a middle-income group, with present existing economic condition of Assam, a floor area of 20sqm can be considered adequate per person.

Step 6: Based on the above calculations carrying capacity of the study area may be determined iteratively as stated below.

$$CC = (AH - (ANDA + AIF)) \times FAR / S$$

Where,

AH=Hilly area (as per step 1)

ANDA=Non developable area
(as per step 2)

AIF (as a function of CC)=Area reqd. for infrastructure and facility (as per step 3)

FAR = Floor area ratio as prescribed in Master Plan, Building Bye-law etc.

S=Floor area per person (as per step 5)

(FAR=Total built up area on all floors/Plot area)

Note: the term FAR is synonymous with Floor Space Index (F.S.I.)

Step7: In the carrying Capacity (population) calculation in step 6, we have not considered the effect of the habitation on the environment, which we can termed as feedback of accommodated population. Depending on the need of feedback assessment, different models are applied. For example, to see how the water and sediment yield will increase because of habitation, we can apply water yield and sediment yield model. If sediment yield and water yield exceed the permissible limit, then we need to apply Ecological Management Practices (EMP) to lower these values to bring them within permissible limit. In case, even after applying EMP, we cannot bring these down to a manageable quantity, then we need reduce the carrying capacity. Thus, after technical intervention, the feedback evaluation is done and the procedure is repeated until an acceptable carrying capacity is reached.

Conclusion

Considering the alarming rate of urban development, a proper urban planning to have a hazard free urban area is need of the hour. As civil engineers play an important role in the developmental activities, having basic understanding of carrying capacity is very much important for a civil engineer. This article has just introduced the concept and a methodology suitable for this region. Interested reader may read the document "Urban Carrying Capacity: Concept and Calculation" published by the CoE ILPWRM at IIT Guwahati (<http://www.iitg.ernet.in/coeiitg/>).

A Success Story of River Bank Protection

Dr. Bibhash Sarma
Associate Professor
Civil Engineering Department
Assam Engineering College

Introduction

Since the 1950 earthquake, major morphological changes started to occur in the plan form of the Brahmaputra and along with floods, erosion has been a constant threat to the people of Assam. As a result of these changes, one of the most endangered places has become Rohmoria, in the Dibrugarh district of Assam. Rohmoria once happened to be a rich hub of diverse natural resources - fertile land in the bank of the mighty Brahmaputra, wonderful agricultural production, natural water bodies, forest resources, mineral resources, and the people - basically cultivators - with compatible strength of leading a self-sufficient agro-based economy, which had become a vulnerable spot with an ever alarming rate of erosion. A huge residential area, agricultural land, land with forest resources, grazing land, some valuable sites of anthropological-archaeological importance with Neolithic treasure, natural water bodies, various other common property resources, etc. just wiped away by Brahmaputra leaving the remaining land and its people amidst potential threats of merging with the river. In the last three decades, erosion in Rohmoria has made the lives and livelihoods of the affected people highly vulnerable. Erosion in the area has so far snatched away 38 revenue villages, a part of Dibru-Saikhowa National Park, one sericulture farm, four tea gardens, at least 50 small tea growers' plantations, more than 10 schools, one police station, six tea estates, one PWD road, some centre of agro-based and allied activities (official records, Chabua revenue Circle, Dibrugarh). With the ongoing rate of erosion, important establishments such

as Dibrugarh Airport, Dinjan Military Station, Chabua Air Force Base, Regional Medical Research Centre (RMRC) in Lahowal, the Assam Medical College and Hospital in Dibrugarh etc. were no longer remained safe.

Figure 1 shows migration of river bank from 1915 to 2005 and corresponding reduction in Rohmoria area from 236.54 km² to 74.57 km². The figure also shows how the D.R.T Road that used to be the main life line for the place was gradually eaten up by the rapidly shifting bankline of the Brahmaputra River and the area ultimately becomes a hinterland.

Bank Protection Measures

The scheme "Emergent measures for Protection of Rohmoria area in Dibrugarh District" was taken up by Dibrugarh Water Resources Division, Govt. of Assam. The initial estimated total project cost was Rs. 59, 81, 65,000.00 (Rupees Fifty Nine Crores Eighty One Lakhs Sixty Five thousand) only. The salient feature of the scheme includes:

i) Construction of 14 (fourteen) numbers of RCC/PSC porcupine screens including additional guide screens as per site requirement at different sites for a reach length of 6.40 km. Recoupment and strengthening of the 14 major screens with provision of 2 numbers of addition major screens upstream of screen no 1 to divert the flow away from the bank by inducing siltation. Additional provisions of screens of different length at suitable

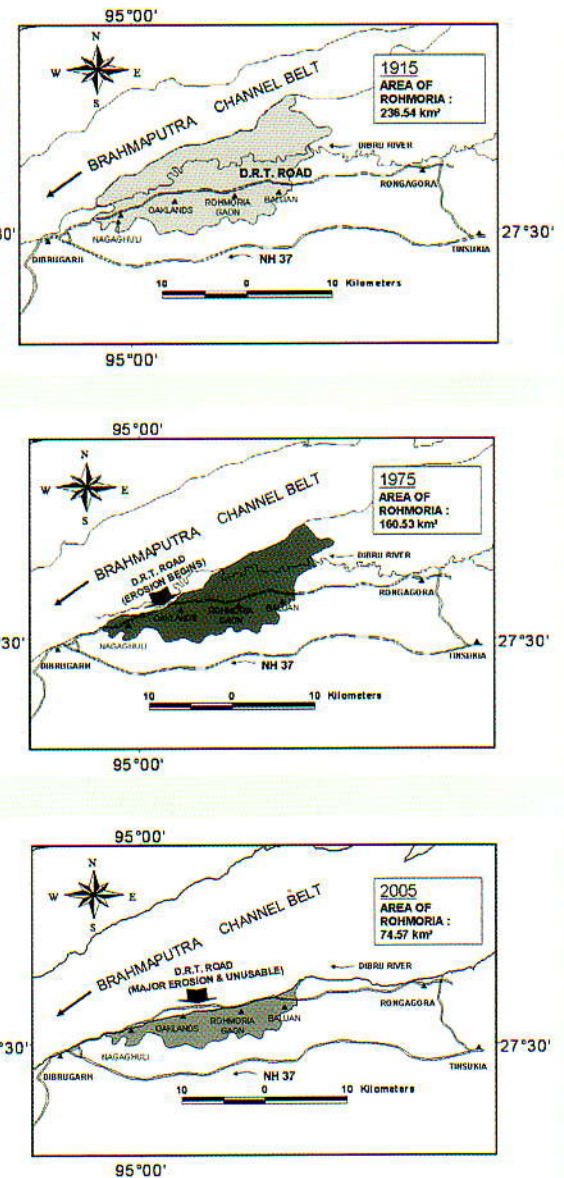


Fig:1 Migration of river bank from 1915 to 2005

interval in between screen no 2 and 3 where the gap between the screens is more. This was necessary as per the positively changed river configuration in upstream reaches.

ii) Providing geo-bag apron and re-vestment for a length of 2600M in the most affected reaches in Kachuan-

Garpara area near downstream of screen no.12.

However, in course of time from its initial execution to its final completion some modification and revision of the works provision were made as per the site requirements based on changing river configuration. The implementation of the works under the Rohmorja emergent works started in February 2011 and was physically completed in March 2012.

Implementation of the Scheme

The work commenced from 1st week of February 2011 with construction of the major porcupine screens. The location of the porcupine screens were identified after detail study of the latest satellite map and existing river configuration.

The launching of the porcupine for construction of the 12 numbers of screens commenced from the 1st week of February 2011 and the work were executed as per the schedule. By April 2011 some of the major screens at the strategic locations have already been completed. The result of the construction of the screens were encouraging as the silt deposition along the bank at the erosion affected reaches of Rohmorja area has been observed by around 2.5M to 9.50M. The channel depth was gradually migrating away from the bank. The intensity of the flow current along the bank was observed to be decreasing with reducing velocity along the bank. The porcupine works continued during the months of June & July also (during flood period) with effective result. Similar results were also observed during execution of porcupine works at worst erosion affected Nagaghuli area in the flood period of 2010. However, after the cross sectional survey data conducted before launching of porcupine screens and after initial launching has shown that at few locations sediment deposition were not encouraging due to sinking of porcupine screens. Recoupment and strengthening of these screens were taken up as per site condition.

One of the protection schemes for anti-erosion works was with geotextile bags. The scheme was provided to protect bed and bank. Launching apron followed by a key was a part of bed protection works. This was followed by well-dressed bank slope at an inclination of 1V:3H. The height of slope was approximately 5.5M. The bank and bed protection were carried with Geotextile bags placed on geotextile filter layer. Strips of Steel Gabion and PP rope gabions filled with geotextile bags were placed at regular intervals to impart further stability to the scour protection measure.

The execution of the geo bag protection works for the length of 2600M was commenced from February 2011 with the earth work in bank trimming. The initial bank trimming work for entire length was planned in phased manner of 1:1, 1:2 and finally to 1:3 slope. The river bank was given a smooth curve shape for systematic dumping of geobags. The dumping work was started in the lean period i.e. month of October 2011. The geobag quality was tested in the accredited laboratory i.e. BATRA, Mumbai and CSMRS, New Delhi.

Initially geotextile bags were fabricated of required sizes from rolls of geotextiles. These bags were then filled with sand to the specified height. At a stretch, number of bags were filled and stacked properly for checking and verifying. After ensuring geotextile bags are filled to required height, mouth of bag was closed by stitching. Stitched bags were manually loaded on boats for further transportation to the location of in-



The group of engineers (AEC alumni) who successfully completed Rohmorja river bank protection works

stallation. The sequence followed for construction was: 1. placing of bags for launching apron, 2. key construction and 3. placement of bags on the bank of river. Construction of launching apron and key was majorly carried out underwater. The river bank was dressed to the inclination of 1V:3H and over this a layer of non-woven geotextile as filter media was laid. After placement of geotextile filter, bags were placed. Strips of gabions filled with bags were introduced at specific intervals.

On an average, 500-600 labors were deployed filling, stitching, loading and placing of geo-bags. Around 45 numbers of boats were used to transport filled geobags from filling area to installation location. Total quantum of geo-bags for the protection works was around 8,00,000 numbers and these were placed at the rate of 4,000 numbers of bags per day. The work was completed in 6 months from October 2011 to April 2012, with an average placement of 1,25,000 number of bags per month. The laying of geobag filled polypropylene gabion as key was completed by January 2012. The revetment work was constructed with three layers of earth filled geo bags with chambers formed by horizontal and vertical ribs of PVC coated W/Netting gabion at



25 M intervals. The works were physically completed in all respect on 20th March 2012.

Results

The project has faced 2011 flood during execution, very high flood in the year 2012 and 2013 flood. In June 2012, the flood situation in Assam deteriorated as more than 1,000 villages were affected after an embankment of river Brahmaputra in worst affected Dhemaji district was breached. More than 80,000 people were estimated as affected by the flood. About 300 houses were completely submerged in Panbari and Oakland village. Water level in other villages was about five feet high. In Rohmoriam area alone, about 1200 families were displaced. The anti-erosion work constructed in April 2012 was totally submerged under water. In some part of the river bank, flood water passed over the protection work. The erosion protection measures constructed with geobags sur-

vived the flood and protected the banks. After flood, considerable amount of silt deposits was noted on bags. Siltation on geobags indicates the success of anti-erosion works along the river banks. The geobags have also successfully protected the banks during 2013 flood. It is also to be mentioned that the geobags have added to the aesthetics of the river bank. Rohmoriam is a successful example of river bank protection works with the use of geobags.

Conclusion

Erosion borne hazard in the Brahmaputra valley is much more serious of all types of frequent natural disasters, unlike the all India scenario.

The traditional conventional methods of river bank protection may not be successful in extreme cases as in Rohmoriam. Rohmoriam was facing the extreme severity of erosion for many decades. Purpose of any bank protection system should be to withstand the flow energy, to protect

the bank soil against erosion and it itself must be stable. The project 'Emergent protection measures for protection of Rohmoriam area in Dibrugarh District' showed that the bank protected by geosynthetics has: (a) withstand the hydro-dynamic forces during three consecutive flood seasons including that of 2012 high flood; (b) protected the bank even when it was completely submerged under water; and (c) there is no observed damages to the structures. Thus it is a case of success.

The success of the project shows that the new technologies and methods are capable of dealing with problems like Rohmoriam. Geo-bag aprons, geotextile as filter media, geobag filled polypropylene gabions and porcupines can be used for river bank protection in Brahmaputra basin where river bank soil is poor in strength and binding. Proper design and maintaining proper specifications for the materials are prerequisite to success.

Experience at the German Aerospace Center (DLR)

I spent the summer after graduation (2013) at the Institute of Transportation Systems of the German Aerospace Center (DLR) working with the Rail Human Factors research group. The German Aerospace Center (German: Deutsches Zentrum für Luft- und Raumfahrt) is a government organisation with functions quite similar to our ISRO, working on various R&D projects funded by the German government. My project was in the field of "human factors in transportation"-primarily encompassing travel behavior, travel demand management, dynamics in travel decisions and spatial analysis of travel patterns. I worked on an experiment to

analyse how waiting time of people are affected by external factors. I designed the experiment and wrote a code to compare the perception time vis-a-vis the actual time of waiting for a control group, and made a statistical record of how perception time can be decreased. The sheer magnitude of variables that can affect the decision making process and how they can be modeled to our benefit kept the freshness and excitement alive. Simultaneously, I co-authored a paper with my supervisor titled "Form follows vision: user-centred interface design for rail traffic controllers' workplace", concerning the interface of work panels in the Deutsche Bahn (German railways).

Abhinav Bhattacharyya

2013 Graduate

Civil Engineering Department

Assam Engineering College

The paper was recently presented and well received at the 3rd IFAC Symposium for Telematics Applications in Seoul.

The independent work culture in Germany that allows more creativity and space came to me as a pleasant surprise. The interdisciplinary and applied nature of the work was very intriguing to me: my supervisor has a double major in civil engineering and psychology and in our research team we had people with backgrounds in computer science, cognitive neuroscience and transportation engineering! The flexible work timing is again something that I found very comfortable. Since it was summer time and sunlight usually stays

till 10 pm in Germany during summers, the office remained open for 12 hours from 7am to 7pm and the employees could punch in any time of the day as per their convenience. A ballpark of 40 working hours per week was set for me and as long as that criterion was met, there was no problem. The basic motive was to get the work done and not waste energy on trivial things: there is no office dress code and most people usually came in shorts to work; there is also no custom of addressing someone senior as 'Sir' or 'Madam', everyone is addressed by first name.

On thursdays we had group progress meetings where we provided updates on the work completed through the week and a discussion on the same followed. This was tricky for me as not everyone was proficient in English and since I did not know German, I had to often sit there clueless. But there were co-workers who were kind enough to translate the key points of the discussion allowing me to catch the gist of it. We also had barbecue Mondays every fortnight where all members of our group lunched together, each bringing their own food.

The Germans are very hardworking people; they believe in having a healthy work life balance and encourage a policy of no work on weekends. Sundays are kept for church and family, and all shops are closed that day. They are also very fond of cycling- most of the employees cycle to work even if they have their own private cars. The fact that there are perfect cycling lanes all through the town and people follow traffic rules to the dot makes cycling easier. German food, in general, is very bland and after a while I started missing the burst of spices that our Indian food so generously provides. I started cooking myself thereafter and that took care of it.

As with any other Indian traveling abroad for the first time, I too faced my moments of culture shock. Of them, the dignity of labour is something that impressed me a lot. People held any work with equal respect and did not let ego or prejudice come in the way. The gatekeeper at my office was a young boy in his early twenties who worked there part time to fund himself through college. Once when the cleaning lady had not come to office, the scientists started cleaning their office rooms themselves. Humility, punctuality and dignity of labour are certainly things we can learn from the Germans.

Europe is pretty compact and travelling across many countries in a short span of time is very easy. The weekend culture, a strong transportation system and an efficient chain of youth hostels helped me plan my travels hassle free. Visiting places like Paris, Prague, Geneva, Zurich that I had only heard and read about till now was indeed a refreshing experience. It was both amusing and helpful to find that the distance between countries in Europe is even lesser than that between states in India. For example, the train ride from Berlin to Zurich all across Germany to Switzerland took me all of 6 hours, the same time it takes for me to reach Jorhat from Guwahati!! I realized that no words, no pictures can do justice to being in the moment. There are things that one just has to experience for himself. I found traveling solo to be tremendously liberating - to walk on foreign streets where I did not speak the language, with only a map in hand to get lost in the streets. There is nothing that compares to feeling inconsequential in front of the towering Swiss Alps, being overwhelmed at walking the same path a great emperor once took back to his capital upon victory, being marveled by feats of human engineering and architecture or just simply sharing a bite with a roadside bread seller.

All in all, it was a very enriching three months spent working at DLR. I gained not only technical expertise and professional skills but also made the most of the travel options to obtain a wholesome experience. I encourage all the students of AEC to apply to such opportunities and leave a good name of our college abroad.



Author at DLR, Germany



International Workshop on Wind Engineering in collaboration with ISWE on 23rd February 2013 at Guwahati.

Dr. Jayanta Pathak

Professor

Civil Engineering Department
Assam Engineering College

The Department of Civil Engineering and Mechanical Engineering jointly organised an International Workshop on Wind Engineering on 'Prospects and Challenges of Wind Engineering' on 23rd February 2013 at NEDFi House, Guwahati in collaboration with Indian Society for Wind Engineering (ISWE). Internationally acclaimed research scientists and engineers from Japan, USA, Germany and Italy participated in the workshop. The inaugural session was presided over by Dr. Atul Bora, Principal, AEC & Director, Technical Education, Assam.

The workshop was started with 'Saraswati Vandana' by students and faculty of AEC followed by a welcome address by Dr. Kalyan Kumar Das, Assoc. Prof. (Mechanical Engineering.) and organising secretary of the workshop. The workshop sessions were smoothly conducted by Dr. Amrita Ganguly, Assoc.

Prof (Electrical Engineering.). The Chief Guest of the inaugural session was Dr. Yukio Tamura, Director, Global COE Program "New Frontier of Education and Research in Wind Engineering", Tokyo Polytechnic University & President, International Association for Wind Engineering. Dr. Tamura later delivered the keynote on numerical wind flow analysis of tall buildings. Dr. Pradyut Goswami, Vice Chancellor, Assam Science and Technology University, and Sjt. Hemanga Kishore Sarma Commissioner and Secretary, Higher Education, Govt. of Assam spoke on the occasion as guest of honour. Sjt. H. K. Sarma stressed upon the need to develop infrastructure and capacity to test and measure wind flow pressure on structural models. Dr. Prem Krishna, Founder President ISWE, Ex-Prof, IIT Roorkee, India, delivered keynote lecture on development of wind engineering in India. The technical sessions were graced by international eminent speaker Dr. Douglass Smith, Texas Tech University, USA ; Dr. M. Kesperskey, Ruhr University, Bokham, Germany; Dr. Maria P Repetto, University of Genova, Italy and Dr. K.P. Sinha Mahapatra, Aerospace Engineering Department, IIT Kharagpur. The workshop came to an end with a closing remark by Dr. A.K.Ghose, Ex-Professor, IIT Kharagpur. The session ended with vote of thanks by Dr. Jayanta Pathak,



Inaugural session- unveiling the souvenir at ICWA workshop



Prof Y. Tamura, President IAWWE

Professor (Civil Engineering.) & organising secretary of the workshop. The workshop was entirely sponsored by Star Cement and the organising committee presented a memento to the company representatives of Start Cement in gratitude. The workshop gave an opportunity to the participating students and faculty members to have insight to the state-of-the-art in wind engineering generated considerable interest among students and faculty to take up wind engineering as a subject of research and career.

MOMENTS



Farewell to 2013 Civil batch



Survey camp moment



Vishwakarma puja held in the department

Interactive Lecture by Professor A.Sridharan

Professor A.Sridharan, (Formerly Deputy Director & Advisor, IISc; Honorary Professor and INSA Senior Scientist Department of Civil Engineering) Indian Institute of Science, Bangalore was invited to Assam Engineering college by IGS Guwahati Chapter (N.E.) and Civil Engineering Department, Assam Engineering College. Professor Sridharan was invited for delivering a lecture to students and faculties of the Civil Engineering Department, Assam Engineering College on 26th March, 2013.

Professor Sridharan gave a very well-illustrated talk on the leaning tower of Pisa. The leaning Tower of Pisa is a classic settlement case history. He presented a brief review of the tower and the probable reasons for the settlements. Two primary causes were pointed out for the Pisa tower's inclination: the difference in soil characteristics along North-South directions and the significant difference in contact pressures as a consequence of the induced eccentricity of the load. The remedial measures envisaged/being attempted for its rectification were discussed.

Professor Sridharan also discussed about remedial measures to a ten storied building in Chennai built on a subsoil of an onshore marine soil, which was subjected to differential settlement. To arrest further increase in differential settlement, he suggested micropiling in the zone of higher settlement and additional loading and lowering of water table in the zone of lower settlement as remedial measures. Controlled removal of the silty soil from below the foundation in the low settlement zone also reduced the differential settlement.

Dr. Binu Sharma
Professor
Civil Engineering Department
Assam Engineering College



Prof A Sridharan delivering the talk



Dr. Binu Sharma, Prof A Sridharan and Dr. Palash J Hazarika



Students presenting technical papers in digital conference

The Department of Civil Engineering of Assam Engineering College, in association with the Department of Chemical Engineering organized the first "NDSU-AEC Undergraduate Digital Conference" on April 25, 2013, where undergraduate researchers from North Dakota State University (NDSU), U.S.A.

1st NDSU-AEC Undergraduate Digital Conference

and Assam Engineering College exchanged research experiences via live audio and video.

The conference was organized as a part of the department's efforts to introduce the students and faculty to international collaborations and global exchange of ideas through the GlobalKonnnect program. The program was coordinated by the students of 6th and 4th semesters of Civil Engineering and Chemical Engineering Departments on behalf of AEC and by Dr. Achintya Bezbaruah, Assistant Professor of Civil Engineering on be-

half of NDSU.

The conference started off with the introduction of North Dakota and the NDSU Civil Engineering Department to the audience at AEC by Civil Engineering graduate student of NDSU, Mary Pate while Rimjhim Kashyap, a 4th semester Civil Engineering student of AEC, gave a detailed introduction to the North-East Indian state of Assam and Assam Engineering College. NDSU undergraduate students Laura Clarens and Amanda Grosz from the Nanoenvirology Research Group presented their research to the

Rimjhim Kashyap
6th Semester
Civil Engineering Department
Assam Engineering College



Moments from NDSU-AEC digital conference audience at both institutions. Clarens, an NDSU sophomore, presented her National Science Foundation supported project on "Surface Modification of Iron Nanoparticles for Groundwater Remediation," and Grosz, an NDSU junior, presented "Allium Studies to Evaluate Toxicity of Engineered Nanoparticles." Grosz's research is sup-

ported by National Institute of Food and Agriculture of the United States Department of Agriculture. Students from the Assam Engineering College, Meenakshi Gohain and Bhanupriya Das of 6th semester, Chemical Engineering and Abhinav Bhattacharyya and Chinmoy Pathak Choudhury of 8th semester, Civil Engineering also presented their research works. Meenakshi and Bhanupriya's research was entitled "Acid Treated Bamboo Biomass as a Potential Adsorbent for the Removal of Methyl Violet Dye" while Abhinav and Chinmoy's research work was on "Goodness of Fit Test for a Few Probability Distribution Functions with Reference to River Pagladia in Assam."

On behalf of NDSU, Dr. G.

Padmanabhan, Professor and Director of Civil Engineering, Dr. Dinesh Katti, Professor of Civil Engineering and Dr. Bezbaruah spoke on possible academic and research collaborations with Assam Engineering College, and faculty from Assam Engineering College expressed a willingness to work on collaborative projects. Finally, all events of the evening were rounded off by a Vote of Thanks by Dr. Palash Jyoti Hazarika, Head of the Department, Civil Engineering Department, Assam Engineering College. After the successful organisation of the Digital Conference with NDSU, AEC Civil Engineering Department plans to reach out to other institutions to exchange ideas and begin collaborations.

North East Students Geo-Congress - 2013

Dr. Binu Sharma

Professor
Civil Engineering Department
Assam Engineering College



Mr. Zarir Hussain, Chief Guest addressing the audience



Audience present during the conference

The Indian Geotechnical society, Guwahati Chapter (N.E.), in association with the Civil Engineering Department, Assam Engineering College, organized a one day North East Student level conference on Geotechnical Engineering on 28th of September, 2013 under the Chairmanship of Dr. Binu Sharma and Secretary Dr. Utpal Kr. Baruah in Assam Engineering College. The conference was called the North East Students GEO-CONGRESS and on the theme "Advances in Geotechnical Engineering". For the first time such a student level conference was held in the Engineering stream covering the entire North Eastern Region. Students from B.E./B.Tech. including post graduate students of Technical Institutions from North Eastern Region participated in the conference. Altogether, 25 technical research papers by students under the guidance of eminent academicians were presented highlighting the issues related to landslides, disaster mitigation and risk management, soil structure interaction analysis, geotechnical investigation through GIS mapping etc. The sponsors

of the conference were the Indian Geotechnical Society, Civil Engineering Department of Assam Engineering College (AEC), Assam State Disaster Management Authority (ASDMA), Dalmia Bharat Cement and Wellmount Engineers. Competitions were held amongst the students for the technical paper presentations. The conference also included a cultural programme by the students and faculty of Assam Engineering College after which the prizes were announced and distributed. The 1st prize was given to Mr. Nabin Kumar of IIT Guwahati, 2nd prize to Supratim Kaushik and Mr. Partha Pratim Goswami of AEC, 3rd prize to Miss Ananya Baruah and Mr. Rupamjyoti Bez of Tezpur University. Three consolation prizes were given to Miss Priyanka Deka and Miss Sandhyrani Kalita of AEC, Mr. Sankar Kumar of IIT Guwahati and Mr. Rupam Saikia of AEC. Award on best innovative work was given by Dalmia Bharat Cement to Miss Ananya Baruah and Mr. Rupamjyoti Bez of Tezpur University.

The Chief Guest of the inaugural



function of the conference was Mr. Zarir Hussain, Managing Editor, News Live, Guwahati. The welcome address was given by Dr. Binu Sharma, Chairperson of IGS Guwahati Chapter (N.E.) and vote of thanks was given by Dr. Utpal Baruah, Secretary IGS Guwahati chapter (N.E.).

There were in total 62 student delegates who presented the 25 technical papers and 270 students who attended the conference. The student delegates were from Assam Engineering College, IIT Guwahati, Tezpur University, Jorhat Engineering College, Royal School of Engineering and Technology, Guwahati and also from NERIST, Arunachal Pradesh.

Accolades

Publications:

1. Dr. Palash Jyoti Hazarika (Professor and H.O.D) and Dr. Utpal Kumar Nath (Assistant Professor)

- Nath, U.K. and Hazarika, P.J., "Lateral resistance of pile cap - an experimental investigation," International Journal of Geotechnical Engineering, 2013, Vol 7, No-3, pp.266-272.
- Nath, U.K. and Hazarika, P.J., "Parametric study of pile cap lateral resistance: finite element analysis," International Journal of Geotechnical Engineering, 2013, Vol 7, No-3, pp.273-281.

2. Dr. (Mrs) Binu Sharma (Professor)

- Sharma, B. and Hazarika, P.J., "Assessment of liquefaction potential of Guwahati city- A case study," International Journal of Geotechnical and Geological Eng, Springer, 2013 Vol.31, issue5, pp1437-1452.
- Sharma, B., Rahman, S.K. and Saikia, B.D., "Use of GIS based maps for preliminary assessment of subsoil of Guwahati City", 2013. Published in the proceedings of the Indian Geotechnical conference, Vol.2, Roorkee.
- Sharma, B., Rahman, S.K. and Saikia, B.D., "Use of contour maps for preliminary assessment of subsoil of Guwahati City", 2013. Published in the proceedings of the Indian Geotechnical Conference, Vol.2.Roorkee.
- Sharma, B., Kaushik, K., Bharali, R. and Sharma, B., "A study of CBR properties of soil reinforced with jute geo textile with reference to road construction in Assam", 2013. Published in the proceedings of the Indian Geotechnical Conference, Vol.1.

Roorkee.

- Sharma, B. and Buragohain, P., "Behavior of micro pile groups under oblique pull out loads in sand", 2013. Indian Geotechnical Journal, DOI 10, 1007/s 40.098-013-0091-1.
- Sharma, B., Zaheer, S. and Hussain, Z., "An experimental model for studying the performance of vertical and batter micro piles", 2013. Accepted for publication in the Proceedings of the International conference of Geo-Characterization and Modeling for Sustainability. Geo Congress 2014. Atlanta, U.S.A.
- Das, N., Sharma, B., Singh, S. and Sutradhar, B.B., "Comparison in un drained shear strength between low and high liquid limit soils", 2013, International Journal of Engineering Research & Technology, Vol. 2 Issue 1, January- 2013 ISSN: 2278-0181.

3. Dr. Mrinal Kumar Borah (Associate Professor):

- Chakma, S., Kumar, S.R. and Borah, M.K., "Infiltration studies on Kulsi river sub-basin", Assam Water Conference, Water resource department, Assam 2013.

4. Dr. Diganta Goswami (Associate Professor):

- Goswami, D., "Chemical characteristics of leachate contaminated lateritic soil", Journal of Innovative Research in Science, Engineering and Technology, Vol.2, Issue 4, April 2013.
- Goswami, D., "A design chart for estimation of horizontal displacement in municipal landfills", International Journal of Innovative Research & Development, Vol.2, Issue 5, May 2013, pp. 987- 1016.

- Goswami, D., "Atterberg's limit and shear strength characteristics of leachate contaminated Lateritic Soil", Paripex- Indian Journal of Research. Vol.3. issue 4, May 2013, pp.11-13.

5. Dr. Bibhash Sarma (Associate Professor):

- Sarma, B., Das, K.K., Patwari, N. N., "Sizing of kulsri reservoir system using non-linear optimization and simulation", 2013, Proc. of Assam International Water Conference-2013, 21-22 February, 2013, Guwahati, Pg1-13.
- Sarma, B., "An improved multi reservoir multi yield preliminary screening model", 2014, International Journal of Innovative Technology and Adaptive Management, (ISSN 2347-3622), December, 2013.
- Sarma, B., Das, K.K., Sharma, S.K., "Sizing of A Multi-Purpose Reservoir System Using Combined Optimization-Simulation Model", 2013, Asian Academic Research Journal of Multidisciplinary, (ISSN: 2319 - 2801), accepted for publication in February 2014 issue.
- Sarma, B. and Srivastava, D.K., "Dynamic programming models for inter-basin water transfer," 2013, In: Singh, V.P. and Yadava, R.N. edited book "Water and Environment Water Resources System Operation", Allied Publishers Pvt Ltd., Mumbai (ISBN 81-7764-548-X)
- Sarma, B. and Srivastava, D.K., "Modeling Approach for Inter-Basin Water Transfer", 2013, Souvenir on World Water Day 2013, The Institution of Engineers (India), Assam State Centre, 22nd March.

6. Dr. Utpal Kumar Misra (Associate Professor):



- Misra, U., "Improvement of Water Supply Scheme in Rural Areas of Meghalaya: a Case Study", 2013, World Water Day, 2013, Institution of Engineers (India), Assam State Centre.
- 7. Dr. Malaya Chetia** (Assistant Professor):
- Malaya, C. and Sreedeeep, S. (2013). "A study on unsaturated hydraulic conductivity of hill soil of north-east India", *ISH Journal of Hydraulic Engineering*, Taylor & Francis, London, UK, Vol. 19, No. 3, pp. 276-281.
 - Abhijit, D., Malaya, C., and Sreedeeep, S. (2013). "A study on tensiometer measurements in salt laden soil used for irrigation scheduling", *Journal of Geotechnical and Geological Engineering*, Springer, Vol.31, No. 4, pp. 1349-1357.
 - Malaya, C. and Sreedeeep, S. (2014). "A study on the influence of fly ash addition on water retention characteristics of soil", *Geo-Congress, Atlanta, Georgia*.
 - Malaya, C. and Sreedeeep, S. (2014). "Influence of range of suction measurement on soil-water characteristic curve", *Geo-Congress, Atlanta, Georgia*.
 - Koustuvee, K., Malaya, C. and Sridharan, A. (2014). "An investigation on the influence of grain shape and size on the shear strength of cohesionless soils", *Geo-Congress, Atlanta, Georgia*.
 - Malaya, C., Ankit, G. and Sreedeeep, S. (2013). "Influence of drying and wetting soil-water characteristic curves on seepage modeling of soil", *Hydro 2013 International, IIT Madras, India*.
 - Rupam, S. and Malaya, C. (2013). "Critical review on the parameters influencing liquefaction of soils", *National Conference on Recent Advances in Civil Engineering, North Eastern Regional Institute of Science and Technology, Arunachal Pradesh, India*.
 - Koustuvee, K., Sridharan, A. and Malaya, C. (2013). "Shear strength behavior of quarry dust-sand mix", *Indian Geotechnical Conference, Roorkee, India*.
 - Koustuvee, K., Sridharan, A., Chinmoy, K., Rahul, D. and Malaya, C. (2013). "A study on the influence of particle characteristics on shear strength behavior of quarry dust", *Indian Geotechnical Conference, Roorkee, India*.
 - Chinumani, C. and Malaya, C. (2013). "A study on hygroscopic water content and residual water content of soils", *Indian Geotechnical Conference, Roorkee, India*.
- 8. Mrs. Puspanjali Sonowal** (Assistant Professor):
- Sonowal, P., Dhamodharan, K., Khwairakpam, M., Kalamdhad, A.S., 2013, "Feasibility of vermi composting of dewatered sludge from paper mill using perionyx excavates", *European Journal of Environmental Sciences*, 3(1), 17-26.
 - Sonowal, P., Khwairakpam, M., Kalamdhad, A.S., 2013, "Stability analysis of dewatered sludge of pulp and paper mill during vermi composting", *Waste and Biomass Valorization*, (Online published).
- 9. Dr. Girindra Deka** (Associate Professor):
- Deka, G. (2013), "Water bearing properties of some common rocks and rock-materials with reference to N.E. India", *Souvenir, Institution of Engineers, India, Guwahati*.

Activities

Faculty:

- 1. Dr. Palash Jyoti Hazarika** took over as the head of the Department, civil engineering, Assam Engineering College on 12th February, 2013.
- 2. Dr. Binu Sharma** had received the IGS-Prof. Dinesh Mohan Biannual Award for best paper on "Pile Foundation" published through the Indian Geotechnical Society. The award was presented during the inaugural session of Indian Geotechnical Conference, 2013, held in IIT Roorkee.
- 3. Dr. Jayanta Pathak** was
 - Nominated as a member by Guwahati development department, to the committee - for review of Guwahati Master Plan 2025 and 'Delineation of new areas and proposed revision of building bye law' (March 2013).
 - Authored Report no.13-012 'Building classification scheme for the city of Guwahati, Assam' along with Dr. Dominik H. Lang, NORSAR, Kjeller, Norway in September 2013 under EQRisk project, a collaboration project funded by the Royal Norwegian Embassy to India, New Delhi. The report can be openly accessed on the EQRisk webpage at www.eqrisk.info.
 - Invited as resource person to deliver lecture on 'Standards and its impact in positive change' on World Standard Day celebration by Bureau of Indian Standards at Guwahati.' (October 2013).
 - Invited as resource person to deliver lecture on 'Earthquake disaster miti-



gation' in National workshop organized by Academic Staff College, sponsored by UGC.(December 2013)

- Authored the draft of 'Best practice document for status survey of school and hospital buildings for structural and nonstructural vulnerability to earthquake, wind, flood & fire' (December 2013) on behalf of Assam State Disaster Management Authority (ASDMA) and AEC for final submission to Govt. of India.

4. Dr. Diganta Goswami was

- Invited to deliver a lecture on "Landslide in city hill areas- common causes and appropriate remedial measures with a special reference to Guwahati city", Regional Workshop on Landslide Disaster management organized by GSI, North Eastern Region, at Nongrim Hills, Shillong, 22-23rd Novemver- 2013.
- Invited to deliver a lecture on " Geotechnical aspects of earthquake engineering" for Short term training program on "Introduction to soil dynamics and earthquake engineering" organized by National Institute of Technical Teachers Training and Research, Kolkata held at NITTTR Extension Centre, Guwahati. 28 October- 3 November 2013.
- Undergone a project on "Rapid visual screening of landslide vulnerable areas of Guwahati" on behalf of District Disaster Management Authority, Kamrup.
- Released an audio album, voice rendered by Dr. Diganta Goswami and Mrs. Gayatree Sarma of New Jersey, USA, containing eight songs six of which were penned down and composed by Diganta Goswami

5. Dr. Bipul Talukdar has

- Conducted a refresher course on "Hydrology and hydraulic engineering", from 4th June, 2013 to 14th June, 2013, sponsored by DHI (India) , Water and Environment Pvt Ltd, New Delhi.

6. Dr. Bibhash Sarma has

- Acted as member of the technical committee to review and to suggest

roadmap for implementation of the project "Flood damage mitigation measures for Barak valley in south Assam including effect of climate change" by National Institute of Technology, Silchar

- Member of the HRVA technical sub-committee to review the project report "Remote sensing and GIS based inputs for hazard risk vulnerability assessment of Guwahati city, Silchar, Dibrugarh towns and Dhemaji districts, Assam" by North Eastern Space Applications Centre, Govt. of India, Dept. of Space, Umiam, Meghalaya
- Visited erosion affected area upstream of Pancharatna river bridge (Jogighopa) on 5th December, 2013 as a part of the Technical advisory committee (Govt. of Assam) and suggested solution measures.
- Acted as resource person in the TEQIP-II short term course on "Hydrological modeling: recent advances", by Department of civil engineering, National Institute of Technology, Silchar, 22-26 July, 2013
- Participated in the review meetings on the projects "Flood & erosion risk mitigation planning in Assam" and "Disaster risk reduction including climate change adaption of Guwahati in the context of dynamic growth" carried out by Columbia University in collaboration with Assam State Disaster Management Authority, 25th July, 2nd August, 2013 & 3rd January 2014.
- Visited flood affected area of Sadiya on 7th and 8th Sept, 2013 as a part of the technical advisory committee (Govt. of Assam) and prepared report giving suggestions and instructions.
- Acted as member of selection committee for selection of engineering consultant for Assam State Disaster Management Authority, 7th January, 2014
- Acted as resource person in the "Refresher course On hydrology and hydraulic engineering" for working engineers of Water Resources Depart-

ment, Govt. of Assam, 4th June to 14th June, 2014, AEC

- Participated in the seminar cum workshop on "Outcome based curriculum development for practicing student - centred learning" at AEC on 4th April, 2013, conducted by IIT, Kharagpur under National Mission of Education (NME) sponsored by MHRD.

7. Dr. Utpal Kumar Misra has

- Delivered lectures in the DHI (I) Water & Environment Pvt. Ltd. sponsored refresher course on hydrology and hydraulic engineering in Assam Engineering College.

8. Mr. Bhaskar Jyoti Das was

- Appointed as member of State Technical Agency (STA) under National Rural Roads Development Agency(NRRDA), Ministry of Rural Development, Government of India for scrutiny of DPRs of rural roads of Assam.
- Participated in the Training programme on scrutiny of DPRs of roads & bridges for STAs organized by Indian Academy of Highway Engineers (IAHE) from 23rd to 27th December, 2013 under NRRDA, Ministry of Rural Development, Government of India.

9. Dr. Malaya Chetia has

- Attended a QIP Short Term Course on "Geotechnical Engineering Practices & Developments" (GEPD 2014), 6-10 January 2014, IIT Guwahati, Assam, India.
- Acted as a reviewer for Geo-Congress 2014, 23-26 February, Atlanta, Georgia, U.S.A.

10. Mr. Abinash Mahanta has been elected as a Council Member of the Governing body of Indian Road Congress for the session 2014-15 in the council election of 74th Annual Session held in Guwahati. He is the youngest Council member in the history of IRC till date.

11. Dr. Girindra Deka has

- Delivered lecture as a 'resource person' in the 'refresher course' on land-



slide hazard conducted by Academic Staff College, Gauhati University, Guwahati.

STUDENTS:

1. **Navanita Choudhury**, 4th semester, Master of Engineering, has presented a paper on "Development of Intensity Duration Frequency (IDF) curve for precipitation in Puthimari Basin, Assm", at krishi sanskriti international conference at JNU, New Delhi on 5th and 6th June, 2013
2. **Mayuri Deka, Farheena Firdousi and Shafi Kamal Rehman**, 4th semester, Master of Engineering, has presented a paper on " Mapping of penetration resistance property of soil using remote sensing and GIS", in NES Geo-congress, 2013 held at Assam Engineering College.
3. **Susrut Baman**, 2nd semester, Master of Engineering was invited as an evaluator at the State Level Congress of the 21st National Children's Science Congress (NCSC) which was held at Dhemaji College during 23-26th, October, 2013 with the focal theme "Energy: Explore, harness and conserve".
4. **Kuldeep Kaushik and Ritukesh Bharali**, students of 8th semester have
 - Presented and received the best paper award on hydraulics engineering at the 5th National Civil Engineering Students Symposium organized by IIT Bombay on 8th March, 2013.
 - Presented a technical paper titled "A Study of CBR properties of soil reinforced with jute geo-textile with reference to road construction in Assam." at Indian Geotechnical Conference 2013 held at IIT Roorkee from 22nd-24th December 2013 .
 - Attended a symposium on 'Solid Waste Management' organized by the Deptt of Civil Engineering along with the Prakriti Club of IIT-G on 6th april, 2013.
 - Attended a workshop on 'Seismic design of Earth and Rock filled dams' at IIT Gandhinagar, from 15th-18th October, 2013 along with Preetish Kakoty and Mriganka Sekhar Borah of 6th semester.
5. **Rahul Das and Partha Protim Goswami**, students of 8th semester have
 - Won the 1st prize model bridge building competition in IITG, techniche 2013.
 - Won the 1st prize in technical paper presentation in RIST and ISTE, Guwahati Chapter.
 - Won 7 prizes in different robotics competition held at the technical fests in Guwhati along with Sanjeeb Das.
6. **Supratim Kaushik and Partha Protim Goswami**, students of 8th semester have presented a paper and won the 2nd prize in North East Students Geo Congress held at Assam Engineering College on 28th September, 2013.
7. **Priyanka Deka and Sandhya Rani Kalita**, students of 8th semester have presented a paper and won the 3rd prize in North East Students Geo Congress held at Assam Engineering College on 28th September, 2013.
8. **Rupam Saikia, Bhargob Deka and Amit Ranjan Barman**, students of 8th semester have presented a paper and won the 2nd prize in Megalith 2013, a technical fest held at IIT Kharagpur, 2013.
9. **Rupam Saikia**, student of 8th semester has presented a paper in the conference of Recent Advances in Civil Engineering (NCRACE-2013) and the paper is under review for International Journal of Innovative Research in Science and Technology (IJIRSET).
10. **Rahul Das and Chinmoy Kalita**, students of 8th semester have presented a technical paper titled "A study on the influence of particle characteristics on shear strength behavior of quarry dust", at Indian Geotechnical Conference 2013 held at IIT Roorkee from 22nd-24th December 2013.
11. **Priyanka Kotoky, Mriganka Shekher Saikia and Manisha Chetry** students of 6th semester have
 - Won the 3rd prize in the national level event 'Easel' (a structure designing competition) organized during the technical festival Techniche-2013, held at Indian Institute of Technology, Guwahati.
 - Won the 2nd prize in the regional level event 'X-Construction' (a structure designing competition) organized during the annual techno-management festival Consensio-2013, held at Royal Group of Institutions, Guwahati.
12. **Debashish Dutta**, student of 6th semester, has won All Assam Inter District Chess Championship, 2013, Nagaon.
13. **Kritartha Neog Kahyap and Jyoti Taparia**, students of 6th semester, have won the BosQuiz, 2013 annual inter institutional quiz of DBCET.
14. **Preetish Kakoty and Nauman Ali**, students of 6th semester have won
 - 1st prize in RKB Memorial All Assam inter institutional quiz competition.
 - 1st prize in Crazy Brain All Assam inter institutional quiz competition, by Junior Doctors' Association, GMCH.
 - 2nd prize in All Assam prize money inter institutional quiz by Guwahati college.
 - 2nd prize in Techniche quiz, annual quiz of IIT-G.
15. **Tania Choudhury**, student of 2nd semester has won
 - Gold medal in womens' singles in state lawn ball rankings from 21-25th November, 2013.
 - Gold medal in womens' singles in lawn ball nationals from 12-17th December, 2013, Kolkata. (National Rank 1)
 - Bronze medal in womens' triples in lawn ball nationals from 12-17th December, 2013, Kolkata.
 - Most valuable women player (nationals) of the year 2013 in lawn ball.

Destinations for Training

1. **P.W.D. (Roads)**
Chandmari, Guwahati-3
2. **P.W.D. (Building)**
Guwahati Building Division-I
Guwahati-1
3. **Road Research Laboratory, P.W.D. (Roads)**
Ambari Fatashil, Guwahati-25
4. **Bogibeel Bridge Project**
N.F. Railway, Dibrugarh
5. **Brahmaputra Board**
Basistha, Guwahati-29
6. **Oil India Limited**
Pipeline Department
Pipeline Headquarters
P.O. Udayan Vihar
Narangi, Guwahati-11
Fax: 0361 2643686
E-mail: oilght@sancharnet.in
7. **CSIR-North-East Institute of Science & Technology**
Jorhat 785006, Assam
Tel: 0376 2372291
Fax: 0376 2370011, 2372291
E-mail: nathl@rrljorhat.res.in
Websites: www.rrljorhat.res.in,
www.neist.res.in
8. **NTPC Bhel Power Project Limited**
1x100 MW NRPC Site
Namrup, Assam
Pin-786622
9. **North-Eastern Electric Power Corporation Ltd.**
Brookland Compound, Lower New Colony
Shillong-793003, Meghalaya
Fax: 0364 2223790
E-mail: nkmeitei@neepco.gov.in
Website: www.neepco.gov.in
10. **North Eastern Coalfields**
Coal India Limited
P.O. Margherita-786181, Assam
Phone: 03751 220329
Fax: 03751 2211354
E-mail: gmmrg@sancharnet.in
11. **Water Resources (W.R.) Department**
Guwahati West E & D Division
Bharalumukh, Guwahati-9
12. **National Building Construction Company Ltd.**
Bye-Lane No-8, Rajgarh Road
Guwahati-781003
13. **Airport Authority of India**
Lokpriya Gopinath Bordoloi International Airport
Guwahati-781015
Ph: 0361 2840223
Fax: 0361 2840042
E-mail: redner@aai.aero
14. **Guwahati Metropolitan Development Authority**
3rd Floor, Staffed Building
GMCH Road, Bhangagarh
Guwahati-781005
Ph: 0361 2529824, 2529650
Fax: 0361 2529991
15. **National Highway Authority of India**
Project Implementation Unit
House No-1, 1st Floor, Dilip Huzuri Path
Near Bagheswari Mandir, Sorumotoria
Dispur, Guwahati-781006
Ph: 0361 2233207
Fax: 0361 2233209
E-mail: guw@nhai.org
16. **Gammon India Limited**
New Brahmaputra Bridge Project
Sadilapur, Ward#1, Near Jalukbari
Guwahati-781012, Assam
17. **Lakwa Thermal Power Station**
P.O. Maibella, Sibsagar, Assam
18. **Assam Roofing Limited**
Bonda, Narengi
Guwahati-26, Assam
19. **Mott MacDonald (P) Ltd.**
1st Floor, H/O Mr. Ramendra Baishya
Padumbari, NH 37 Bye-pass, Guwahati-14
Ph. No. 99547-08713
20. **Stup Consultants Pvt. Ltd.**
Pragati Nursing Home
1st Floor, Hajo Road, Nalbari
Near Nalbari Police Station
Fax: 03624 220563
21. **Mumbai Railway Vikas Corporation Ltd.**
2nd Floor, Churchgate Station Building
Mumbai 400 020
Phone: 022-2201 4623
Fax: 022-2209 6972
Website: www.mrvv.indianrailways.gov.in
22. **Shree Gautam Construction Company Limited**
4th Floor, Amaze Shopping Mall
A.T. Road, Opp. Pan Bazar Over Bridge,
Beat No. 14
Paltan Bazar, Guwahati-781001, Assam,
India
Ph: 0361 2734058
23. **Punj Lloyd Ltd.**
Shepti, Near Army Base Camp
P.O. Rangia, District-Kamrup, Assam
Pin-781354
Website: www.punjilloyd.com
24. **Punj Lloyd Ltd.**
Silchar-Balachera Road Project
Hatichera Tea Estate
P.O. Hatichera, Via Udharbond
District-Cachar, Assam
Pin-788030
Ph: 03842 218782
Website: www.punjilloyd.com
25. **North Eastern Power Corporation Limited**
Pare Hydroelectric Project
Doimukh, Arunachal Pradesh
26. **North Eastern Power Corporation Limited**
Ranganadi Hydroelectric Project
Yazali, Arunachal Pradesh
27. **North Eastern Power Corporation Limited**
Kopili Hydroelectric Project
Umrongso, N.C. Hills, Assam
Pin-788931



Students under going industrial training at Doimukh, NEEPCO Pvt. Ltd. Arunachal Pradesh



Excursion of 2013 batch to Meghalaya



Students' Speak

DEPARTMENTAL PROFILE

Topic: Being a Civil Engineer, what will be your steps and measures to deal with the flash flood scenario in Guwahati?

JyotishmanLahkar, 8th Semester

One of the most common problems that the citizens of Guwahati have to face in the recent times is the problem of flash floods. Flash floods occur due to various reasons and the most important of them is the improper planning system. Another important reason of this occurrence of this is the unscientific method of disposal of garbage in the drains. As civil engineers, we can deal with this problem in an effective way by planning a proper drainage system which will help in the proper flow of the water. Also, proper methods of the disposal of waste should be implemented. The household waste should always be disposed off in dustbins rather than throwing it away in the drains. Finally, with the help of proper survey, the roads can be integrated with proper drainage system which will prove to be an effective measure in the reduction of the occurrence of the flash floods.

RishirajBasumatary, 6th Semester

With the advancement of technology prevailing all around the country, Guwahati is also witnessing development in each and every corner; but there are problems which are hindering the rate of development, out of which, the problem of flash floods is the most prominent. Floods generally occur because of heavy rainfall, but in Guwahati, a small drizzle can fill the roads with water which causes problems to the pedestrians and the vehicles plying on the roads. This poses a serious concern for the civil engineers and hence devising a proper solution to the problem is a must. Wide drains should

be constructed along the road in flood prone areas. The concerned authorities should ensure that people are leaving decent amount of space for drainage purposes before constructing boundary walls. Construction of small reservoir or dam is necessary along the slope of the hills to retain decent amount of water during rainfall. It is also necessary to plan out a proper garbage disposal plan. Garbage, especially plastic bags, should be properly disposed as they can block the drain outlets if thrown carelessly.

Manjit Kumar, 4th Semester

Flash flood is generally becoming a growing concern, wreaking havoc among the citizens of Guwahati. A short spell of rain inundates the roads of Guwahati city throwing the city life out of gear. The problem is aggravating with every passing year. Being civil engineers, we should work out a scientific plan to solve the water-logging problem of the city. For this, proper surveying of the city is to be done. A standard drainage system is to be incurred to tackle flash floods. While dealing with flash floods, we should always have the proper infrastructural equipments and management systems to clear the drain blockades and pump out the flood waters from the flood-affected areas to provide relief to the stranded citizens. Again during the dry season, the drains should be cleaned at regular intervals which help in controlling the flash flood to a large extent. Thus by the above measures, we can overcome the rain-induced ravages upto a certain extent.

The department of Civil Engineering was established in the year 1956, the first branch to be introduced in this college. The department has highly qualified faculty members and well-equipped laboratories for field work. The laboratory facilities include the laboratories of Soil mechanics, Hydraulics, Strength of material, Transportation, Environmental, Geology, Survey store and the CAD center. The annual intake capacity is 90 students per semester in B.E. degree course and 36 students in the M.E. degree course. This department also offers Ph.D. degree courses.

The department also offers consultancy services in all disciplines of civil engineering.

Faculty list of the civil engineering department, Assam Engineering College

- Dr. Palash Jyoti Hazarika (HOD)
- Prof. Nripendra Nath Patwari
- Dr. Binu Sharma
- Dr. Jayanta Pathak
- Prof. Sunit Kumar Bhagawati
- Dr. Mrinal Kumar Borah
- Dr. Diganta Goswami
- Dr. Bipul Talukdar
- Dr. Bibhash Sarma
- Dr. Utpal Kumar Misra
- Prof. Bhaskar Jyoti Das
- Dr. Utpal Kumar Nath
- Dr. Malaya Chetia
- Mr. Pankaj Goswami
- Mrs. Bharati Medhi Das
- Mrs. Pushpanjali Sonowal
- Mrs. Rupjyoti Bordoloi
- Mr. Abinash Mahanta
- Mr. Sasanka Borah
- Dr. Girindra Deka (Geology)
- Mrs. Indira Baruah Gogoi (Geology)