<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Main Topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Water Management</td>
</tr>
<tr>
<td></td>
<td>Papers</td>
</tr>
</tbody>
</table>
|         | Impact of hurricane van on Grenada water supply  
|         | E. J. Peters |
|         | Inorganic profiles of chemical phosphorus removal sludge  
|         | C. Carliell. Marquet, J Smith, I. Oikonomidis and A. Wheatley |
|         | Conditionally averaged turbulent structures in 2D channel flow  
|         | S. Q. Yang |
|         | Comparison of three coagulants by online turbidity monitoring  
|         | W. P. Chanh, Y. P. Kao and R. F. Yu |
|         | Volume 163 ● Issue WM2 February 2010 |
| 2       | Management, Procurement and Law |
|         | Briefing |
|         | Dividing up risk on UK defence estate work  
|         | J. V. H. Dye and Y. M. Simpson |
|         | Papers |
|         | MRI suites and residual design risk from static magnetic fields  
|         | T. Price, S. Wamuziri and N Gupta |
|         | Security of payment for Hong Kong construction industry  
|         | T. Cheng, G. Soo, M Kumaraswamy and W Jin |
|         | The mediation of construction disputes: recent research  
|         | N. Gould and C king |
|         | Volume 163 ● Issue MP1 February 2010 |
| 3       | Waste and Resource Management |
|         | Papers |
|         | Sustainability in the bio/agro industry: a case study  
|         | D. Engelhardt |
|         | Modelling effects of mangroves on tsunamis  
|         | F. Y. Teo, R. A. Falconer and B. Lin |
|         | Applications of state waste material in the UK  
|         | J. E Otij, J. M Kinuthia and J Bai |
|         | Crushed brick blends with crushed rock for pavement systems  
|         | T. Aatheesan, A. Arulrajah, M. W. Bo, Vuong, and J. Wilson |
|         | Using recycled waste tyres in concrete paving blocks  
|         | T. C. Ling, H. M. Nor and S. K. Lim |
|         | Volume 163 ● Issue WR1 February 2010 |
| 4       | Construction Materials |
|         | Briefing |
|         | New materials – some recent research  
|         | J. H. Bungey |
- Papers
  Research on new applications for granulated rubber in concrete
  K. A. Pane and R. K. Dhir
  Long term strength of rubberised concrete paving blocks
  T. Cling, H. M. Nor, M. R. Hainin and S. K. Lim
  Behaviour of latex-modified concrete under cyclic loading
  B. K. Parasad, U Gupta and U. P. Choubey
  Testing concrete durability in sewer environment
  P. Soroushian, R. U. D. Nassar, H. Chaudhary and Ghabrab
  Cracked permeability of hybrid fibre-reinforced concrete
  A. Sivakumar and M. Santhanam

5 Energy

- Briefing
  10 MW Triton - a breakthrough in tidal stream power
  J. Armstrong

- Papers
  Coal gasification and ICCC Technology: a brief primer
  K. S. Well
  South west wave energy hub: coastal impact and wave energy
  B. Li and M. Philips
  Combined heat and power in a carbon constrained world
  R. Lee

6 Structures and Buildings

- Papers
  Behaviour of drystone retaining structures
  C. Mundell, P. McCombie, A. Heath, J. Harkness and P. Walker
  Frictional effects of steel grating on I-beams
  M. Gohnert and H. Sithole
  Tension stiffening in concrete beams. Part 1: FE analysis
  P. L. Ng, J. Y. K. Lam and A. K. H. Kwan
  Tension stiffening in concrete beams. Part 2: member analysis
  J. Y. K. Lam, P. L. Ng and A. K. H. Kwan
  Analysis of a semi rigid connection for precast concrete
  M. K. El Debs, A. M. Miotto and A. L. H. C. El Debs
  Design of a simple steel truss
  J. Heyman

7 Engineering History and Heritage

- Papers
  The safety of masonry buttresses
  S. Huetra
  Shear assessment of Delta Vittoria stadium, Bari, Italy
  D. Foti, M. Mongelli and V. Paparella
  A review of the 1892 water demand forecast for Birmingham
  W. Bradford, J. Bridgeman and M. Gatewell
  Conway and Britannia tubular bridges: Stephenson’s team
8 Ground Improvement

- Papers
  - Assessing recycled/secondary materials as pavement bases
    S. Saride, A. J. Puppala and R. Williammee
  - Lightweight recycled geomaterials reinforced with geogrids
    P. Voottipruex, D. T. Bergado and T. Tanchaisawat
  - Soft ground improvement with solar powered drainage
    C. Pothiraksanon, J. Saowapakpiboon, D. T. Bergado, P. Voottipruex and H. M. Abuel Nago
  - Sustainable soil improvement via vacuum preloading
    B. Indraratna, C. Rujikiatkamjom, R. Kelly and H Buys
  - Stabilisation of an erodible soil using a chemical admixture
    J. S. Vinod, B. Indraratna and M. A. A. Mahamud
  - Sustainable binders for soil stabilization
    S. Jegandan, M. Liska, A. A. M. Osman and A. Al-Tabbaa
  - Demonstrating environmental benefits of ground improvements
    D. Egan and B. C. Slocombe
  - Emissions assessment related to vibrostone columns

9 Geotechnical Engineering

- Papers
  - Track displacement and energy loss in a railway embankment
    M. Hendry, D. A. Hughes, L. Barbour
  - Field investigation of base resistance of pipe piles in clay
    P. Doherty, K. Gavin, D. Gallagher
  - Shear strength properties of water treatment residues
    B. C. O'Kelly, M. E. Quille
  - Elasto-plastic analysis in conventional tunnelling excavation
    A. Fahimifar, A. R. Hedayat

10 Transport

- Papers
  - Bus travel-time prediction based on bus speed
    B. Yu, Z. Z. Yang and J. Wang
  - Probabilistic modeling of pavement joint opening
    S. W. Lee, J. H. Jeong and B. J. Chon
  - Developing a model for prioritizing high crash road segments
    A. M. Boroujerdian, M. Saffarzadeh and V. Abolhasannejad
  - Roundabout capacity in adverse weather and light conditions
    G. Tenekeci F. Montgomery and S. Wainaina
  - Heavy Vehicle age and road safety
    Z. D. Christoforou, M. G. Karlaftis and G. Yannis

11 Urban Design and Planning
• Briefings
  Making massive small change
  K. Campbell

  A Burns night for planners
  L. Hillman

• Papers
  What now for urban regeneration?
  R. Granger
  Informing an Urban design process by way of a practical example
  C. T. Boyko, R. Cooper, C. L. Davey and A. B. Wootten
  Gated Communities: definitions, causes and consequences
  S. Roitman
  Urban design and planning challenges and opportunities Urbanwords
  R. Cowan

Volume-163 ● Issue DP1 March 2010

12 Water Management

• Papers
  Heavy metal contamination of river sediments in Vietnam
  N. T. L. Huong, O. Masami, L. Li, T. Higashi and N. Kanayama
  Investigation of detention pond outflow characteristics
  P. D. Prohaska, A. Akhan and N. B. Kaye
  Media size optimization in BAF’s treating citrus waste
  F. Osorio, J. C. Torres and E. Hontoria
  Assessing activated sludge morphology by laser and image analysis
  J. Wu and A. Wheatley
  Field studies on defluoridation using magnesium oxide

Volume-163 ● Issue WM3 March 2010

13 Maritime Engineering

• Papers
  The time evaluation of scour around offshore structures
  J. M. Harris, R. J. S. Whitehouse and T. Benson
  Modelling wave deformation due to submerged breakwaters
  E. Kriezi, and T. Karambas
  A review of coastal risk management in the UK.
  I. Ponette and A. Porsons

Volume-163 ● Issue MA1 March 2010

14 Structures and Buildings

• Papers
  Spatial and temporal correlations of wind speeds
  M. Sterling; J. S. Owen
  New developments in rain–wind-induced vibrations of cables
  I. J. Taylor; A. C. Robertson; S. K. Wilson, B. R. Duffy; J. M. Sullivan
  Control of wind oscillations of Rio-Niterói bridge, Brazil
  R. C. Battista, M. S. Pfeil
  Wind effects on the world’s tallest reinforced concrete building
  Q. S. Li, J. R. Wu, J. Y. Fu, Z. N. Li, Y. Q. Xiao
  Intrinsic and supplementary damping in tall buildings
R. Smith, R. Merello, M. Willford
Adventures in architectural aerodynamics
S. Cammelli; D. Azagra, V. Buttgereit, C. Fussell, M. Grey, Y. Kaneko, G. Knapp,
R. Marshall, A. Scotti
Measurements of the performance of a wind-driven ventilation terminal
A. D. Shea, A. P. Robertson, G. J. Levermore, N. M. Rideout

Aerodynamic, hydro-aerodynamic and destructive testing
A. Gan Chowdhury, G. Bitsuamlak, E. Simu

Volume-163 ● Issue SB2 April 2010

15 Construction Materials

- Briefing
  How to research and publish new concrete ingredients
  P. Claisse, M. Tyrer, S. Coupe

- Papers
  Study on the effect of granite powder on concrete properties
  F. K. Thomas; P. Partheeban
  Effects of w/c ratio on Portland limestone cement concrete
  A. Pourkhorshidi, M. Jamshidi, M. Najimi
  Genetic algorithm rheological equations for cement paste
  Al-Martini, M. Nehdi
  Sustainable masonry mortar for brick joint and plaster in the UK
  Jonathan E Oti, J. K. Kinuthia, J. Bai
  Effect of steel corrosion pattern on RC beam performance
  R. J. Zhang, A. Castel, R. François
  Durability of light steel framing in residential applications
  R. M. Lawson, S. O. Popo-Ola, A. Way, T. Heatley, R. Pedreschi

Volume-163 ● Issue TR2 May 2010

16 Waste and Resource Management

- Papers
  Recycling as a construction waste management technique
  B. A. D. S. Wimalasena, H. L. S. P. Madanayake, I. P. T. R. Weerasinghe,
  J. Y. Ruwanpura, J. P. A. Hettiaratchi
  Paintcrete leachability in fresh water and marine environments
  M. L. Nehdi, A. S. M. Arif
  Development and evaluation of a phase relationship for MSW
  B. Zhang, N. Dixon, A. El-Hamalawi
  Underground carbon dioxide storage in saline formations
  S. Garcia, S. Kaminska, M. Mercedes Maroto-Valer

Volume-163 ● Issue WR2 May 2010

17 Management, Procurement and Law

- Briefing
  Extension of time claims
  Albert Lester

- Papers
  The security consultant in the design process: a risk-led approach
  Chris Tomlinson; Bill Nelson
  Producing a programme under the NEC form of contract
Glenn Hide
Increasing ‘local content’ in infrastructure procurement. Part 1
Jill Wells, John Hawkins
Increasing ‘local content’ in infrastructure procurement. Part 2
Jill Wells, John Hawkins
HKU’s double profession civil engineering and law programme
Albert T. Yeung, S. Thomas Ng, L. George Tham, Peter K. K. Lee
Volume-163 ● Issue MP2 May 2010

18 Water Management

- Papers
  Water balance modelling in Glasgow and Beijing
  M. Mansell; S. Wang
  Evaluating shallow water assumptions in dam-break flows
  D. Liang
  Adjusting soil infiltration coefficients for groundwater level
  J. R. Blake
  Discharge estimation in small irregular river using LSPIV
  Numerical modelling of flood flows over irregular topography
  X. Wang, Z. Cao, G. Pender, S. Neelz
Volume-163 ● Issue WM5 May2010

19 Ground Improvement

- Papers
  Cementation liquefaction remediation for existing buildings
  H. Mitrani, S. P. G. Madabhushi
  Lightweight fill using sand, polystyrene beads and cement
  G. E. Abdelrahman
  On settlement of stone column foundation by Priebe’s method
  S. Ellouze, M. Bouassida, L. Hazzar, H. Mroueh
  Settlement prediction for soft ground improved by columns
  J. C. Chai, N. Miura, T. Kirekawa, T. Hino
  Using reinforced soil systems in hammer foundations
  Heidari, M. H. El Naggar
Volume-163 ● Issue GI2 May 2010

20 Engineering History and Heritage

- Papers
  The Antrim Coast Road – a civil engineering legacy
  D. M. Orr
  Highway design by highwaymen
  C. McKay
  Two pioneering American roadways
  J. P. Harshbarger
  Autostrada : the Italian interwar achievement
  M. Chrimes
  Documenting New York’s Bronx River Parkway, USA
  T. Davis
  Preston By-pass: the first motorway in the UK
  H. L. Yeadan
  The M1 : Britain’s first inter-urban motorway
  R. H. Soper
21 Transport

- Papers
  Travel behaviour response to UK road user charging
  T. J. Ryley
  Technologies to measure indicators for road user charging
  W. Y. Ochieng, M. A. Quddus, R. J. North, R. B. Noland

Central London congestion charging: understanding its impacts
C. Buckingham, A. R. Doherty, D. C. L. Hawkett, S. Vitouladiti
Reliability of congestion measures: Stockholm's case
C. Morán; K. L. Bang
Road user charging in rural areas: Upper Derwent valley, UK
N. Thomopoulos, T. Takama

22 Energy from Waste

- Briefings
  GHG emissions reduced by managing land fills gas
  G. Pearson
  Energy from municipal solid waste
  D. S. Stephens

- Papers
  Sheffield energy recovery facility Pre-construction works
  D. S. Stephens, D. Duval
  Sheffield energy recovery facility and district energy network
  R. Kirkman, D. Duval, D. S. Stephens
  Waste to energy in the UK : Policy and institutional issues
  T. Jamasd, R. Nepal, H. Kiamil

23 Urban Design and Planning

- Briefings
  Is urban design just bollards?
  R. Simmons
  Adapting to changing climate
  K. Henderson

- Papers
  Seeking Common Ground : three perspectives on public space
  L. Neal
  Mapping knowledge flow during sustainability assessment methods
  A. Colantonio
  Urbanwords
  R. Cowan

24 Water Management

- Papers
  Modelling the hydraulics of the Carlisle 2005 flood event
  M. S. Horritt, P. D. Bates, T. J. Fewtrell, D. C. Mason and M. D. Wilson
  Numerical modeling of the capacity for a complex spillway
J. Jacobsen and N. R. B. Olsen
**Numerical simulation of air water flow in great tunnels**

M. R. Najafi and A. R. Zarrati
**Geomorphic dam-break flows. Part I : conceptual model**

J. G. A. B. Leal, R. M. L. Ferreira and A. H. Cardoso
**Geomorphic dam-break flows. Part II : numerical simulation**

J. G. A. B. Leal, R. M. L. Ferreira and A. H. Cardoso
**Willingness to pay for water on the Guyana east coast**

E. J. Peters and Z. Mohamed

Volume-163 • Issue WM6 June 2010

---

25 **Geotechnical Engineering**

- **Papers**
  - **Risk Analysis for tunneling ground movement assessments**
    M. Devriendt
  - **Optical fibre strain measurement for tunnel lining monitoring**
    L. L. K. Cheung, K. Soga, P. J. Bennett, Y. Kobayashi, B. Amatya and P. Wright
  - **Displacement of tunnels from a basement excavation in London**
    M. Devriendt, L. Doughty, P. Morrison and A. Pillai
  - **Wireless sensor network for monitoring transport tunnels**
    P. J. Bennett, Y. Kobayashi, K. Soga and P. Wright
  - **Using tunnel boring data to augment the geological model**
  - **Low-volume loss tunneling for London’s ring main extension**
    B. D. Jones

Volume-163 • Issue GE3 June 2010

---

26 **Engineering and Computational Mechanics**

- **Papers**
  - **Solving boundary value problems of deformable systems**
    A. G. Razdolsky
  - **Numerical solution of crack problems in gradient elasticity**
    S. A. Papanicolopulos; A. Zervos
  - **Modelling the mechanical efficiency of a spur gear system**
    F. Chaari; G. Kantchev; M. Haddar
  - **Influence of bracings on the stability of a truss**
    R. F. Vieira, J. A. V. Requena
  - **Adaptive quadtree simulation of sediment transport**
    J. Huang, A. G. L. Borthwick, R. L. Soulsby
  - **Strategic asset management modelling of infrastructure assets**
    D. Stratford, T. Stevens, M. Hamilton, A. Dray

Volume-163 • Issue EM2 June 2010
Dear Members

Assalam-o-Alaikum!

Hope and Pray that you will be in fine spirits and would continue to encourage us by participating in the activities of the congress. By the time, this issue will be in your hands, you would have gone through the articles on diverse subjects contained in Golden Jubilee edition (October – December 2009 period). Your views to up-grade, the quality of the Journal would be most welcome. Also keenly awaited will be your contribution of papers for publication to facilitate issuance of the Journal on time with improved contents.

It will be heartening and matter of interest that the congress library besides being equipped with necessary paraphernalia is undergoing up-gradation. It has been allotted ISBM Number 978-969-9460 by national library, Islamabad

All library collections have been classified on the “Dewy Decimal Classification” scheme enabling the user to easily indentify and retrieve the desired book. Process of automation and collection of the books is under-way. Your proposals for adding new books & journals would be most welcome. Present working hours of the library are from 12:00 PM to 9:00 PM. However, the library will now be open from 9:00 AM to 9:00 PM. It is now for the engineers including students of engineering disciplines to eke-out maximum benefit from the library.

With best regards,

Yours sincerely

(Engr. Husnain Ahmad)
President
The World Water Day was celebrated by Pakistan Engineering Congress on 22nd March 2010 at Mashhadi Hall, Congress Headquarter Building, Liberty Market, Gulberg-III, Lahore on the theme of:

“Communicating Water Quality Challenges and Opportunities”

The Chief Guest was Mr. Shakil Durrani, Chairman, WAPDA.

The proceedings of the day started with recitation from Holy Quran. Eng. Husnain Ahmad, President Pakistan Engineering Congress, while presenting his welcome address quoted numerous verses of the Holy Quran that emphasise the immense significance and the critical role of water in the socio-economic sphere of mankind & other living beings. He said that Environmental experts have visualized that unless the present levels of “Carbon emissions” are drastically reduced; there will be earth-shattering 2-Degree Celsius increase in global temperatures by 2025, a matter of serious concern.

i. Most parts of Amazon rain forest will stand dried, burnt throwing-out millions of tons of extra dioxide.

ii. Greenland’s ice will melt away thereby raising the sea levels by as much as seven (7) meters submerging low lying coastal areas, uprooting millions of people with devastating economic fall-out, altogether disappearance of some of the islands.

iii. Accelerated Himalayan Glaciers melt. The Himalayas Glaciers (12000 to 15000) occupying 500,000 Sq. Km) are receding fast.
   - A study involving 1387 selected glaciers reveals 16% reduction in area since 1962. (over a 48-year period).
   - Another study including Pindari, Gangotri & Dokriani glaciers show the annual retreat by 5-49 meters.

He further elaborated that, the Himalayan Glaciers are the source of sweet water to Asia’s seven (7) river systems including:

- Indus
- Yangtze
- Mekong
- Ganga
- Brahmaputra

However, a critical study of the data reveals that if stringent measures are not put in force to check the expected temperature increase visualized at 3 to 3.2 degree Celsius by 2100 (next 90 years).Himalayan glaciers would disappear by 2300. The crux of the matter is that the catastrophic consequences of global warming are manifestly imminent in the shape of:
• Flooding
• Drastic reduction in river in-flows resulting in food shortages, Famines, Starvation
• Prolonged electricity outages & the consequent falling living standards.
• Agricultural yields would stand drastically reduced in global terms especially creating food shortages, starvation and throwing millions below poverty lines.

Quoting Dr. Zafar Adeel who is an eminent scholar and a member of United Nations Think Tank Team on water President PEC stated:

“The impact of climate change on water resources was quite central for a country like Pakistan. The general public as well as the political & policy leadership needs to be fully aware of the challenges, being imposed on Pakistan due to climate change”.

He went on to say, Water is one of the most precious commodities for sustenance of life. Whilst abundant water is available around us, fresh water resources have depleted at an alarming rate. Changes in weather patterns are adding more challenges to our experts of water resources management. Pakistan is rapidly becoming a water deficient country.

It is ironical that whereas Pakistan ranks amongst lowest greenhouse gas emitters on the world (135th), but in terms of impacts / vulnerability it ranks in the top 20 category.

Excessive ground water exploitation (the number of tubewells is touching 1-million mark) by industry and agricultural sectors have forced untreated industrial and municipal waste water into our fresh water resources. Care free attitude towards water by everyday rising population need comprehensive measures and awareness about water re-use and re-circulation. Non-availability
The drinking water quality in Punjab is a case in Point:

- Predominantly Water Scarce Barani Districts 3 Nos
- Predominantly Brackish Districts 11
- Sweet Water Districts 13
- Mixed (Brackish Barani) Districts 7

4 Nos

Here Eng. Husnain Ahmad proposed following steps to meet the water shortage:

- There is no substitute of big dams for conservation of water and these need to be completed timely.

- Presently drinking water availability is about 4.5 MAF. If MDG goals are to be met and drinking water made available to the urban / rural population, water supply would have to be augmented by additional 4 MAF.

- Small dams (no substitute for big dams irrespective of the numbers built) need to be constructed.

- Direct supply of water from the ground through tubewells is open to serious health hazards. It should be through “overhead” water tanks and supplied after chlorination to ensure assured supply of safe drinking water in adequate quantities and at a price that at least covers the cost.
• For conservation of water metered supply should be resorted to in all cases.

• Experts have suggested adoption of certain measures to avoid wasteful use of water; Hotel industry be encouraged to install ultra-low flow toilets; High efficiency washing machines be introduced, Planting of low water / drought resistant plants in lawns / gardens.

• Underground water levels have gone down alarmingly due to over-pumping of water by tubewells as well as the set-back to the recharging of underground aquifer. The installation of tubewells need to be regulated.

The Chief Guest Mr. Shakil Durrani highlighted that Water has a pivotal position in all development activities for its enormous importance in food security, livelihood, environment, economics, power generation and in fact life itself. However, the quality of water whether for use in agriculture, municipalities, drinking, household and in industry acts like a quality multiplier. So it is not only the quantity but the utility which determines the levels a society or a country reaches. This can be appreciated from the fact that out of total available water on the earth, only about 3 percent is directly usable. And of the fresh water, 69 percent is locked up in ice caps and glaciers primarily in Antarctica and Greenlands, 30 percent is stored in ground water reservoirs and only a tiny quantity is available in fresh water lakes, rivers and streams.

He further stated that in the years ahead we need to concentrate upon certain priorities for balanced growth and equity; Development of additional reservoirs; a) Increasing irrigation water efficiency through modern irrigation modes like drip and sprinkler system; b) Ensuring provision of clean drinking water; c) Treatment of saline water for use in agriculture and fishery and d) recycling of urban and industrial waste water for different uses. These priorities could be achieved efficiently if only we cost our irrigation and drinking water economically. Currently, for instance only about 25% of O&M charges for irrigation water are actually recovered as Abiana. This recovery does not include the capital costs of the storages and channels. No wonder we are so profligate. For providing drinking water to the disadvantaged sections, an element of intervention by the State in the form of subsidies would be required for some time. For the rest of the population and especially for the large farmer it is important that the real cost of water is recovered from them. The water channels pollution is frequently associated with the disposal of untreated effluents from municipal, industrial and agricultural wastes. The natural streams are always considered as an easy way to dispose off many kinds of effluents. The psychology behind this practice is that the wastes are washed away and are not visible at dumping sites. Besides this, indiscriminate pumping of groundwater is causing over mining which is enhancing salt water intrusion and polluting the groundwater.

Here Mr. Shakil Durrani proposed following steps to meet the water shortage:

• Impacts of low quality water for agriculture must be assessed particularly at the farm level as well as the regional level.

• Traditional surface irrigation methods should be altered / replaced by properly designed and managed micro sprinkler & trickle/drip irrigation systems.

• Disposal of industrial & sewerage effluents should be brought under strict legal frame work.

• We have no more time for sterile discussions and debates; now is the time to act. For managing water scarcity, adoption of high efficiency irrigation system in both public and private sectors is recommended.
Ten papers were presented by water resources experts and are under print in book form. The event was attended by over 150 engineers & scientists and was widely covered by electronic & print media.

**Glimpses of the Event**

Engr. Husnain Ahmed, President, Pakistan Engineering Congress presenting Welcome address
Glimpses of the Event

From left Engr. Husnain Ahmad President Pakistan Engineering Congress, Mr. Shakil Durrani Chairman Wapda, Engr. Ch. Ghulam Hussain Vice-President / Secretary of Pakistan Engineering Congress
Engr. Husnain Ahmad Presenting shield to the Chief Guest Mr. Shakil Durrani Chairman WAPDA

Glimpses of the Event

A view of the audience
A view of the audience
## LIST OF MISSING ISSUES OF ENGINEERING NEWS JOURNAL OF PAKISTAN ENGINEERING CONGRESS

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Volume</th>
<th>Issue Number</th>
<th>Year</th>
<th>Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Volume 1</td>
<td>No. 1</td>
<td>1956</td>
<td>January-March</td>
</tr>
<tr>
<td>2</td>
<td>Volume 5</td>
<td>All Numbers</td>
<td>1960</td>
<td>–</td>
</tr>
<tr>
<td>3</td>
<td>Volume 18</td>
<td>No. 1</td>
<td>1973</td>
<td>January-March</td>
</tr>
<tr>
<td>4</td>
<td>Volume 18</td>
<td>No. 3</td>
<td>1976</td>
<td>July-September</td>
</tr>
<tr>
<td>5</td>
<td>Volume 21</td>
<td>No. 2</td>
<td>1976</td>
<td>April-June</td>
</tr>
<tr>
<td>6</td>
<td>Volume 21</td>
<td>No. 3</td>
<td>1973</td>
<td>July-September</td>
</tr>
<tr>
<td>7</td>
<td>Volume 22</td>
<td>All Numbers</td>
<td>1978</td>
<td>–</td>
</tr>
<tr>
<td>8</td>
<td>Volume 23</td>
<td>All Numbers</td>
<td>1978</td>
<td>–</td>
</tr>
<tr>
<td>9</td>
<td>Volume 24</td>
<td>No. 1</td>
<td>1979</td>
<td>January-March</td>
</tr>
<tr>
<td>10</td>
<td>Volume 24</td>
<td>No. 2</td>
<td>1979</td>
<td>April-June</td>
</tr>
<tr>
<td>11</td>
<td>Volume 24</td>
<td>No. 3</td>
<td>1979</td>
<td>July-September</td>
</tr>
<tr>
<td>12</td>
<td>Volume 25</td>
<td>No. 1</td>
<td>1979</td>
<td>January-March</td>
</tr>
<tr>
<td>13</td>
<td>Volume 25</td>
<td>No. 2</td>
<td>1979</td>
<td>April-June</td>
</tr>
<tr>
<td>14</td>
<td>Volume 27</td>
<td>No. 3</td>
<td>1982</td>
<td>July-September</td>
</tr>
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NATIONAL DEVELOPMENT CONSULTANTS (PVT) LTD. (NDC) AWARDED CONSULTANCY SERVICES FOR A WORLD BANK FUNDED FLOOD PROTECTION PROJECT IN YEMEN


It is a World Bank funded Project awarded to National Development Consultants (NDC) through the International competitive process.

![Seat in the picture are Engr. Ch. Ghulam Hussain and Engr. Syed Mansoob Ali Zaidi](image1)

![From Left : Engr. Ch. Ghulam Hussain and Engr. Ibrahim Atham Project Director Taiz Municipal Corporation](image2)

**Background of the Project Area**

Greater IBB is one of the main cities of Yemen, located in the interior highlands at altitudes ranging between 1,800m and 2,200m (8000 ft) above sea level, on the foothills of Badaan Mountain. Ibb city’s population is about 240,000 inhabitants. Overall, agriculture, commercial and public sector activities are the principal sources of employment in the city and play a key role at the governorate level.

Greater IBB city (and governorate), the green governorate as often called, has an important touristic potential due to the Old Medina, an area with attractive traditional architecture and breathtaking landscapes, and its historic monuments including Jeblas historic city located at about 5 KM to the north west of the city, as well as the agricultural areas within and on the outskirts of the city. The city’s climate is moderate all the year round (cold in winters and moderate in summers).

![Overview of the City of IBB](image3)
IBB city suffers from severe storm water drainage problems due to its geographic location. The city has developed along the wadis and foothills of the surrounding mountain range. The rapid expansion of the city during the last two decades without due consideration to urban planning has permitted building construction on wadis thus destroying the natural drainage courses. This condition results in substantial flooding of residential areas and roads during the annual rainy season. There is continued pressure on expansion of the city due to the high urban population growth ranging from 5% to 7% per year over the next 15 years. This means that the city would continue to encroach on wadi channels and unstable the slopes of the surrounding mountains rapidly increasing its vulnerability to floods and landslides. However, local city officials face serious difficulties due to the lack of a master plan for development and lack of policy and regulations to manage the city’s rapid sprawl, and for providing and maintaining infrastructure services for the rapidly growing population. The absence of flood control structures and flash floods occurring periodically, wreak widespread havoc on much of the inner city’s roads and populated areas causing severe damage to public services and private properties.

Now, the Government of Yemen under the leadership of Ministry of Public Works and Highways with the assistance of Consultants has undertaken the Study which the World Bank has funded. The overall objectives of the Study is to prepare an integrated Storm Water Management for the Greater IBB city.
FOREWORD

By

Engr. Ch. Ghulam Hussain*

That the innate propensity imbued in the human beings tends them to formulate groups or say organizations of like minded people to-get-together frequently with a view to discussing common issues being faced by them, can neither be gainsaid nor over-emphasized. Such organizations are varied and encompass almost all walks of life such as, ethnical, ethical, social, economic, engineering and its diverse disciplines. All such organizations explore ways and means to achieve their objectives at their usual meetings.

It was with the urge of such an impulsion that a century age 90 engineers belonging to Irrigation, Buildings and Roads and Railways met on 3rd February 1912 at Lahore to establish Pakistan Engineering Congress as it is known today. Given the set-up of formations of these departments under the British rule then, 74 engineers of these 90 were British and 16 Indians including haplessly one Muslim.

The objectives of the Engineering Congress were then set-out to (i) promote profession of science and engineering ; (ii) promote well being of Departments by affording an opportunity of meeting annually to discuss subjects of professional or departmental interest and for social intercourse.

For quite some decades Technical Papers were presented and discussed at the Annual moots which continued to be published in the Proceedings. 27 volumes of Proceedings published till the creation of Pakistan contain a number of valuable papers on technical projects / matters by renowned legendary engineers which are often used as references. Unfortunately the activities of Engineering Congress remained dormant for about 5 years till 1949, due to political turmoil and rehabilitation of millions of refugees. Membership of the organization which had dropped to 231 in 1951 was duly boosted and in 1954 it was decided to start Engineering News Journal as well and arrange Seminars and Symposia on burning issues besetting the national economy with a view to accelerating the objective of promoting science and engineering.

Whereas numerous Seminars / Symposia have regularly been convened since then on various acute problems and recommendations of the Panels of engineers forwarded to the Governments for their consideration the volumes of technical papers presented and discussed there have also been made available to members and national libraries. The quarterly News Journal is also being issued regularly. Technical papers on Irrigation, Drainage, Dams, Highways, Public Health Engineering, Electrical, Mechanical, Railways and other Engineering disciplines have continuously been published in the Engineering News Journal.

It is heartening to observe that it is celebrating its Golden Jubilee this year which has been a source of adding another feather in the cap of the achievements of the Pakistan Engineering Congress in promoting the cause of the engineering profession.

*Secretary, Pakistan Engineering Congress & Managing Partner, National Development Consultants (Pvt.) Ltd.
While some very useful papers contributed by Volunteers are being made part of its issues, numerous illuminating technical achievements published in international magazines are also made its part courtesy these magazines which keep our readers abreast of modern energy of non fossil fuel oils research oriented achievements such as Corn Oil fuel, Solar and wind energy etc. Besides it contains absorbing discourses of guest speakers and snapshots of its projections at lectures on various topics delivered at the Engineering Congress Hall.

It also covers the visits of Congress delegates to the on-going Engineering Projects with elaborate details about their lay-out Plan, Design and Construction parameters and the economic benefits that are aimed at to accrue on their completion.

It regularly introduces new members and displays obituary news of those members who left our worldly association in the intervening period. It also displays newly elected office bearers, after conclusion of the Sessions, introduces the President elect and publishes end of the Session its Balance Sheets. In short it provides all the necessary information that the members would like to have.

The Management of the Congress as well as the Editorial Board deserve appreciations, on this laudable Diamond Jubilee issue.
THE WORLD'S LONGEST SEA BRIDGE

By

Tania Branigan

China has begun construction of the world's longest sea bridge – barely 18 months after opening the current record-holders. The Y-shaped link between Hong Kong, Macau and China will be around 50 Km long, 35 Km of which will span the sea, said the state news agency Xinhua.

Due to be completed by 2015, the 73 bn yuan cost of the bridge will be shared by the authorities in the three territories. The structure also includes a 5.5 Km underwater runnel with artificial islands to join it to bridges on each side. According to the engineering group Arup – which has helped with the design – it is the first major marine bridge-and-tunnel project in China. But the engineering firm described the structure as 38 Km in length; the reason for the disparity was unclear.

Work is expected to begin with land reclamation to create an artificial island of around 216 hectares off Zhuhai. This will become the customs point for those making the crossing.

But much of the structure will be prefabricated offsite, so, for example, the concrete deck sections can be produced at the same time as the foundations are laid. The tunnel will be made of precast sections – each 100 meters long.

“It is designed with a service life of 120 years. It can withstand the impact of a strong wind with a speed of 51 meters a second, or equal to a maximum Beaufort scale 16 (184 to 201 Kmph),” said Zhu Yongling, an official in charge of the project construction. “It can also resist the impact of a magnitude-8 earthquake and a 300,000-tonne vessel”.

Six lanes of traffic will pass across the bridge at a maximum speed of 100 Kmph, cutting driving time from Hong Kong to Zhuhai from four hours to one.

The bridge was first proposed in 1983 as a way of fostering economic ties between China, Hong Kong and Macau. But it will be particularly welcome as the Pearl River Delta – for many years the hub of China’s manufacturing – is buffeted by economic problems. The area’s attempt to move up the value chain, combined with the rise of the Yuan and the global economic crisis, has seen exports plummeting.

The bridge is one component in a plan issued in January by China’s top economic planning body, the National Development and Reform Commission, which aims to fuse the area and the two special administrative regions, Hong Kong and Macau, into one of the world’s most vibrant economic centers by 2020. In particular, the government hopes it will help to develop the western side of Guangdong province.

Hong Kong has said the bridge should generate $ HK 45 bn in economic benefits within the first two decades of use.

(The Guardian, London)


**Latest Addresses & Contact Numbers Are Required**

In order to update the record of the members of the congress we need the latest addresses and contact numbers in respect of the following members.

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