



An Inter-faculty Initiative Of NED University Bringing Academia- industry Linkages



Presenter
DR. UNEB GAZDER
SECRETARY CMRG
Assistant Professor
Department of Urban & Infrastructure
Engineering
NED University

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Need



- Construction materials are integral part of infrastructure development all over the globe.
- For sustainable economic growth it has become imperative now to explore new materials and enhance the understanding of existing material in terms of quality, demand, and their on-site performance.
- **Construction Materials Research Group (CMRG) at NED University:**
 - To bring these issues scientifically under one umbrella,
 - research group consisting of expertise in related fields of specialization

Objectives



- To service the construction material sector of the industry
- To develop better understanding of the properties of the construction materials
- To develop a materials characterization relational database that will include pertinent information including quality, demand and availability aspects
- To develop innovative construction materials and explore applications
- To explore the use of recycled materials in all aspects of new as well as existing construction
- To address maintenance and service life aspects of constructed facilities

Team Members



Civil Engg.

Prof. Sarosh Lodi

- Prof. Asad Ur Rehman Khan
- Prof. Rizwan Ul Haq Farooqi
- Prof. Aman Ullah Marri
- Engr. Amir Nizam

Urban Engg.

Prof. Mir Shabbar Ali

- Dr. Uneb Gazder
- Dr. Nida Azhar
- Mr. Muhammad Ahmed
- Engr. Sajjad Ali

Earthquake Engg.

Prof. Masood Rafi

Petroleum Engg.

Prof. Abid Murtaza Khan

Polymer Engg.

Dr. Syed Imran Ali

Textile Engg.

Dr. Sheraz Hussain Siddique

Electronic Engg.

Dr. Usman Ali Shah

Industry Partners



Indus Associated Consultants (Pvt.) Ltd	Amerili Steel
Eagle Star Estate	Soilmat Engineers
Halcrow	CWHR
Pakistan National RCC	SBCA
UNABTECH	FWO
Halcrow	Amerili Steel
DIPL	Atif Nazar Associates
Lucky Cement Limited	PSQCA
The Peak	Razaque Steels Pvt Ltd
National RCC Pipe Work	Engineering Design Consultants
M/s Izhar Construction	United Bank Limited
Engro	M/S Izhar Construction
LOGIC PM	Miltray Engineer Services. (Navy).
EA Consulting Pvt Ltd.	Amerili Steel
Lucky Cement Limited	BASF Chemicals & Polymers Pakistan (Pvt.) Ltd
Arif and Associates	Karachi Electric Supply Company Ltd.

Material Testing Services



- State-of-the-art facilities
- Qualified and experienced laboratory supervisors
- Testing facilities for
 - Aggregate samples
 - Soil
 - Concrete
 - Structural members
- Tests can be performed for:
 - Material strength
 - Classification
 - Workability
 - Etc.



Test and equipment details

S/No	Utilization	Equipment Title	Capacity
1	Concrete/Multiple Materials	Compression Testing Machine	2000 kN
2	Sewerage/Drainage Pipes Upto 36 inches Diameter	Universal Pipe Tester	300 kN
3	Coarse Aggregates	Los Angles Abrasion Machine	Standard
4	Tensile/Compression Metallic/Multiple Products	Universal Testing Machines	300 to 2000 kN
5	Tensile test of thin wires	Portable Wire Testing Machine	15 Kg
6	Sieve Analysis of Aggregates	Sieve Shaker	---
7	Mixing of Concrete	Concrete Mixer	2 Cft
8	Impact testing of Metals	Izods Impact Testing Machine	Standard
9	Torsion testing of Metals	Torsion Testing Machine	Standard
10	Consistency of Concrete	Vebe Consistency meter	Standard
11	Concrete Compaction	Compacting Factor Apparatus	Standard
12	Entrapped Air in Concrete	Air Entrainment Meter	Standard
13	Coarse Aggregates	Aggregate Impact Testing Apparatus	Standard
14	Soundness of Cement	Cement Autoclave	Standard
15	Calibration of Machines	Load Calibration Device	3000 kN
16	Steel Reinforcing bars	Bar Bending Machine	Standard
17	Hardness of Metals	Vicher Hardness Tester	50 kgf
18	Modulus of Elasticity of Concrete	Poisson Ratio Apparatus	Standard
19	Ultrasonic testing of Concrete	Pundit Pulse Tester	Standard
20	Strength evaluation of concrete	Windsor Pin System	Standard

21	Consistency of concrete	Slump Cone	Standard
22	Flow in cement	Flow Table	Standard
23	Deformation of Concrete	Creep Apparatus	Standard
24	Strain Monitoring of concrete	Multi Position Strain Gauges	Standard
25	Measurement of concrete cracks	Crack Detection Microscope	---
26	Fineness of Cement	Blain Air Permeability Apparatus	Standard
27	Specific gravity of Aggregates	Buoyancy Apparatus	Standard
28	Specific gravity of fine aggregates	Sand Absorption Cone	Standard
29	Strength evaluation of concrete	Digital Test Hammer	Standard
30	Permeability of concrete	Concrete Permeability Apparatus	Standard
31	Extraction of Concrete cores	Portable Core Drill Machine	Standard
32	Expansion--- shrinkage of concrete	Length Change Comparator	Standard
33	Setting time of cement	Vicat Apparatus	Standard
34	Grinding of Rocks and Concrete	Diamond Wheel Grinding Machine	---
35	Cutting of Rocks	Diamond Abrasive Cutting Machine	2850 rpm
36	Grinding and finishing of thin rock Sections	Thin Section Cutting and Grinding	3000 rpm
37	Microscopic Study of rock s	Polarizing Microscope	---
38	Grinding of Fossil	Fossil Grinders	1400 rpm
39	Splitting and crushing of Rocks	Rock Splitting and Crushing Machine	---

40		Drilling of Rocks and Concrete	Diamond Impregnated Drilling Machine	4260 rpm
41		Cutting of Rocks into Thin Section	Single Spindle Lapping Machine	---
42		Cutting of Large rock Specimen	Large Rock Cutting Machine	---
43		To determine the Specific Gravity	Specific Gravity test Apparatus	6Kg
44		To determine the impact test of coarse aggregate	Impact testing Apparatus	1000gm,14 lb
45		To determine the abrasion value	Los Angles abrasion testing Apparatus	10kg
46		To determine the length gauge of coarse aggregate	Length gauge test Apparatus	---
47		To determine skid of road aggregate	Skid resistance test Apparatus	---
48		To determine the absorption of coarse aggregate	Absorption of coarse Aggregate	---
49		To determine strength of aggregate.	Crushing value test Apparatus	40Kn
50		To determine the quantity of asphalt	Extraction Testing Machine	1500gm,3000rpm
51		To determine the Softening Point of asphalt.	Softening Point testing Apparatus	---
52		To determine the Penetration grade of asphalt .	Penetration test Apparatus	100gm
53		Consistency of asphalt.	Float Test	---
54		To Distillate the cut back asphalt.	Distillation of cut back asphalt	---
55		To Find out of asphalt quality and fire point.	Flash and fire point Apparatus	---
56		Determine the rutting in asphalt	Wheel Tracking Device	

Research Projects



Research Project



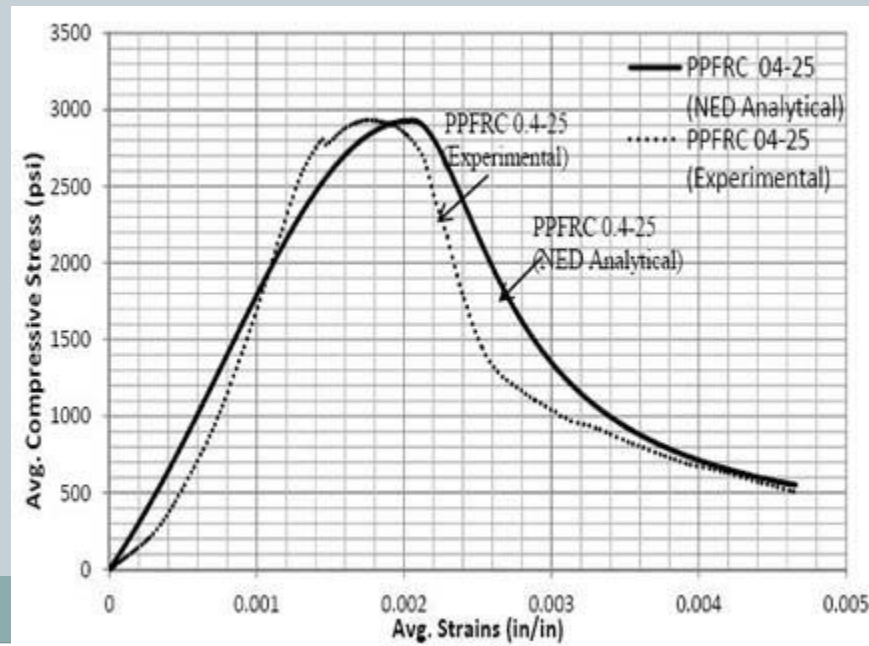
Project	Resource Person	Industry Partner
Comparative study of composition and strength related Properties of Cements	Prof. Dr. Masood Rafi	M/s Lucky Cement



Research Project



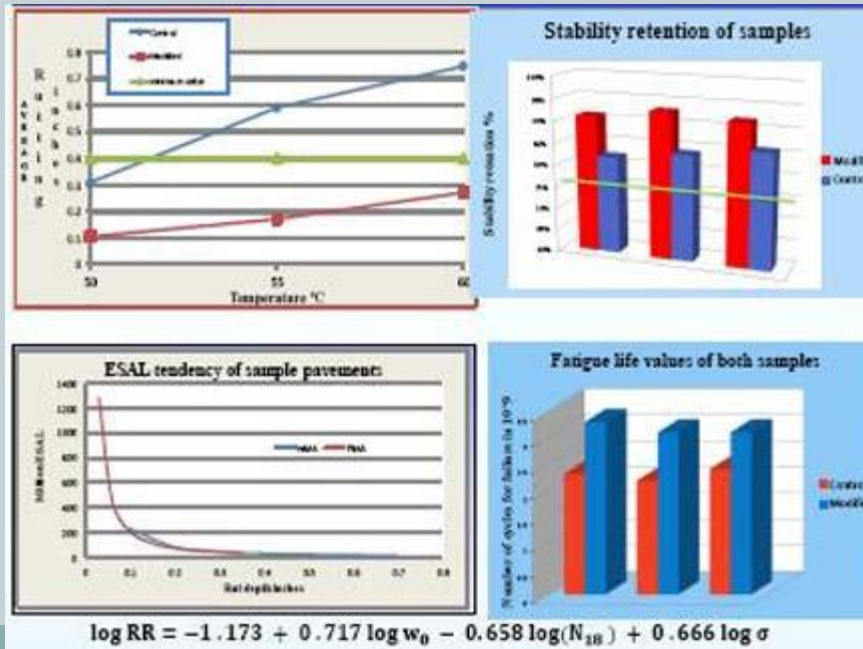
Project	Resource Person	Industry Partner
Mechanical properties of Polypropylene fibre reinforced Concrete (PPFRC) and structural Applications	Dr. Shoaib Haroon	M/s Matrixx



Research Project



Project	Resource Person	Industry Partner
Use of Polypropylene fibers for control of asphalt pavement rutting in Pakistan	Prof. Adnan Qadir	M/s Frontier Works Organization

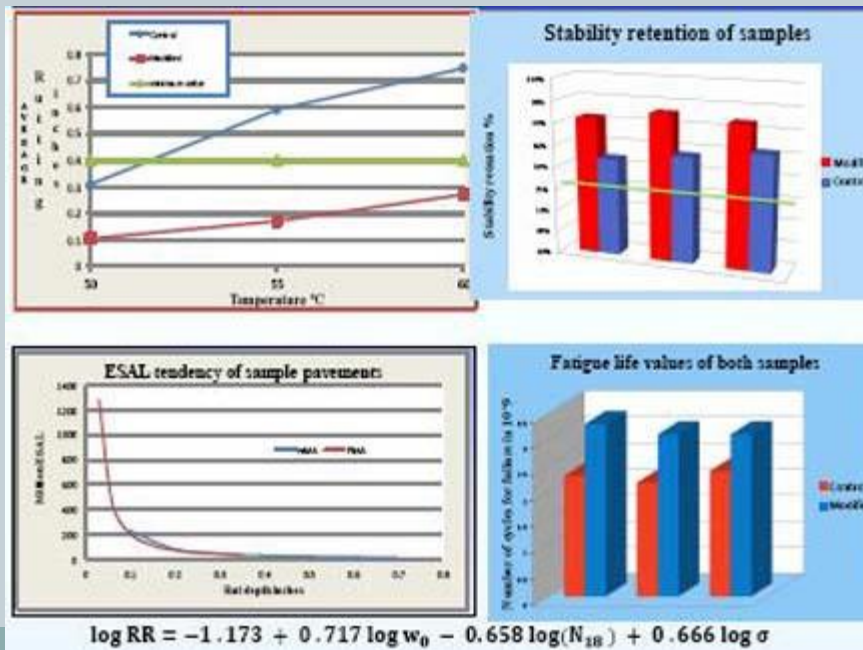


$$\log RR = -1.173 + 0.717 \log w_0 - 0.658 \log(N_{18}) + 0.666 \log \sigma$$

Research Project



Project	Resource Person	Industry Partner
Application of polymer modified asphalt in highway pavements	Prof. Adnan Qadir	M/s Pak Hy – Oils Ltd.



Worskshops/Conferences



Workshops



- Since its inception in 2009, CMRG has been active in developing and sharing knowledge regarding construction materials with a view for application in civil infrastructure
- The First National Workshop was held in November 2010 which was attended by over 100 professionals of the construction industry representing the academia, government officials, consulting firms, contractors, materials manufactures and suppliers and aggregate industry

Since the First National Workshop, two more successful and well attended National Workshops were held in 2011 and 2013 with the objectives to highlight some of the work accomplished, in progress and share industry perspectives.



International Workshop



- Fourth International Workshop on Construction Materials (June 2014) was held with the aim of:
 - “ Reducing the Impact Gap for Academia- Industry Collaboration ”
- The workshop speakers included national and international experts from industry and academia



Aggregate Information System



AIS



- To collect the information about the natural quarries supplying coarse and fine aggregate for construction.
- To compile the data of engineering properties of coarse and fine aggregate by conducting standard tests.
- To study the properties of inherent rock by petrographic studies.
- To prepare a GIS based imagery depicting the information of aggregate availability and their significant properties for each quarry

AIS Methodology



Sample Collection

- Identification of Quarries and Crushers
- Collection of inherent and crushed rock samples
- Locating the position of quarry and crushers

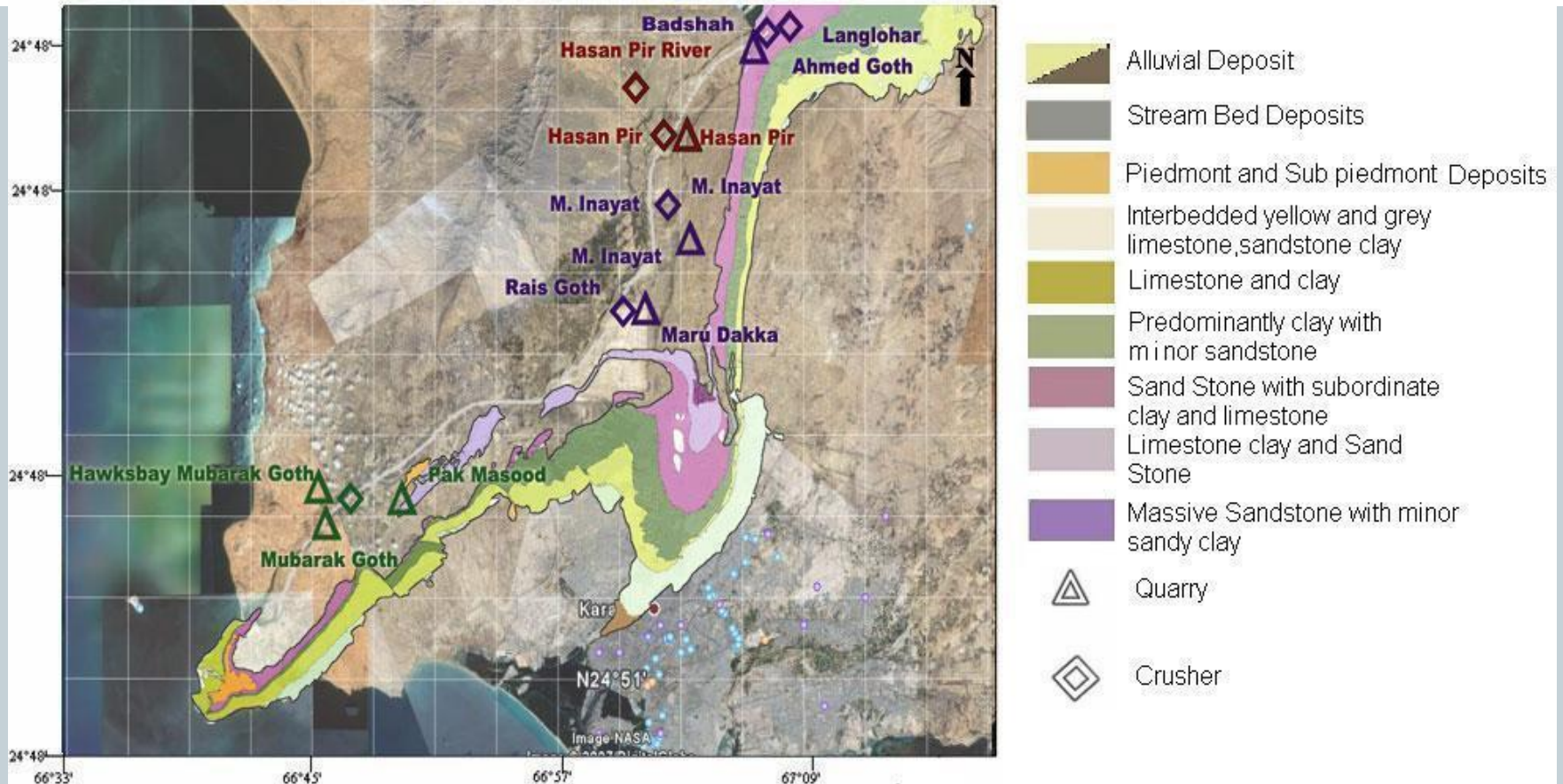
Aggregate Testing

- Execution of Tests for Coarse and Fine Aggregates
 - Evaluation of engineering properties
 - Petrographic Studies

Development of GIS Imagery

- Plotting the Location of Quarries and Crusher
- Uploading the aggregate properties

CMRG outputs



Geo-referenced Aggregate resource map of Hub River basin area

Outputs



- Geographically referenced List of Quarries and Crushers
- Geographically referenced List of Test for Coarse and Fine Aggregates
- Identification of Quarries(supplying aggregates) and their crushers by GPS(Latitude & Longitude)
- Collection of Coarse and Fine Aggregates from Crushers
- Sampling of Coarse and Fine Aggregates for respective engineering test
- Execution of Tests for Coarse and Fine Aggregates

Services Offered by CMRG



- Testing of construction materials for quality assurance and development of design standards
- Resource mapping of construction materials' sources to enable efficient procurement management
- Research to address and solve industry related problems
- Consultancy on projects involving manufacturing, specifications and procurement of construction materials

Links & Contacts



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Construction Materials Research Group (CMRG)

NED University of Engineering & Technology

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[Read More](#)

cmrg.neduet.edu.pk/index.html#

Department of Urban & Infrastructure Engineering NED University of Engineering & Technology University Road, Karachi - 75270, Pakistan

+92-21-99052354

cmrg@neduet.edu.pk

cmrg.nedut.edu.pk

Thanks for Patient Listening