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In This Issue

Research in Progress

Demolition Wastes as Raw Materials for Sustainable Construction Products

In India, projections for building material requirement of housing sector indicates a shortage of aggregates by up to 55000 million cubic meters (TIFAC ED 2003). Studies have showed that the concrete portion of the demolition waste constitutes of about 65-70% by volume of natural aggregate and 30-35% of cement. Recycling of aggregates from demolition waste may bridge this gap between supply and demand. Fig. 1 shows a general composition of C&D waste in India. Proper recycling and management of demolition wastes can generate a high quantity of recycled aggregates which can be used further in structural concrete and building components such as bricks, blocks and tiles.

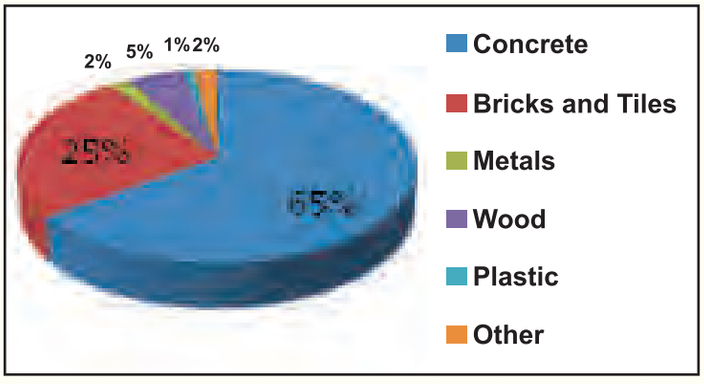

Fig. 1: Composition of Construction and Demolition waste in India

Therefore the present work is focused for reuse of demolition waste in concrete paver blocks by converting it into recycled coarse aggregate (RCA).

The combined physical and mechanical properties of aggregates of size passing 10 μ IS sieve and retained over 4.75μ IS sieve determined as per IS:2386-1963 by replacing 25, 50, 75 and 100% natural aggregate with unwashed and washed recycled aggregates are given in Table 1. The results show that properties of blended aggregates complied the requirements as specified in IS: 383-1970.

The data clearly indicate declination in properties like crushing value, impact value, water absorption etc. with replacement of natural to recycled aggregate. The properties of blended natural and washed recycled aggregates enhanced as compared to blended natural and unwashed recycled aggregates. The improvement in properties of natural and washed recycled aggregates are due to the removal of the cement mortar adhered to the surface of aggregates.

Preparation of Concrete Paver Blocks

The cement concrete paver blocks of Grade M-30 and size 200 x 160 x 75 mm have been prepared by compaction technique using different proportions of cement, sand and natural aggregate (size passing 10μ IS sieve and retained over 4.75μ IS sieve). The natural aggregate was replaced by 0, 25, 50, 75 and 100% unwashed and washed recycled aggregate designated as Mix A, B, C, D, E respectively.

Table 1: Combined Properties of Natural and Recycled Coarse Aggregate (Before and after washing)

Parameters	Natural	Recycled (%)							
		Before washing				After washing			
		25	50	75	100	25	50	75	100
Flakiness Index (%)	13.7	5.1	4.6	4.30	4.23	6.6	6.0	5.8	4.5
Crushing value (%)	17.7	22.0	23.5	27.3	30.56	19.0	20.0	22.6	28.0
Impact Value (%)	17.0	16.2	24.2	25.8	32.24	16.0	17.6	21.0	23.0
Water Absorption (%)	0.6	1.6	2.8	3.6	5.20	1.0	1.6	2.1	4.0
Specific Gravity	2.63	2.53	2.47	2.42	2.11	2.5	2.45	2.43	2.27
Loose BD (kg/l)	1.45	1.37	1.35	1.32	1.24	1.37	1.35	1.3	1.26
Compact BD (kg/l)	1.53	1.5	1.47	1.43	1.32	1.50	1.48	1.43	1.39

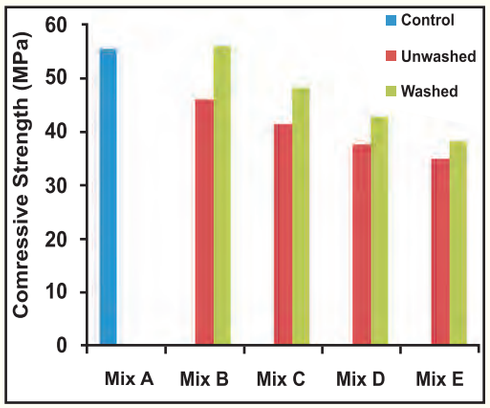

Fig.2: Compressive Strength of concrete paver blocks prepared with different compositions

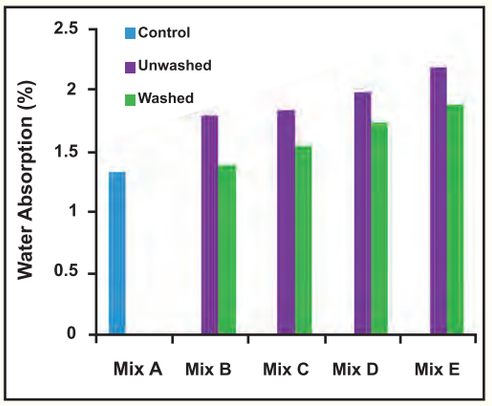

Fig.4 : Water absorption of concrete paver blocks prepared with different compositions

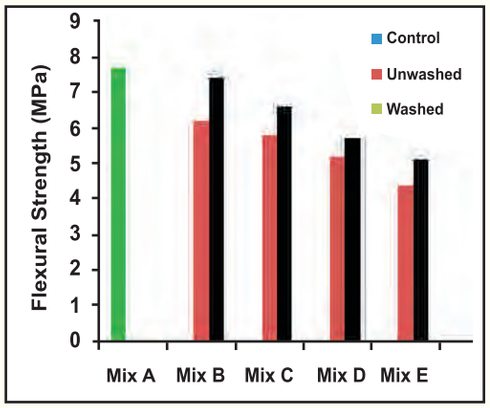

Fig.3 : Flexural Strength of concrete paver blocks prepared with different compositions

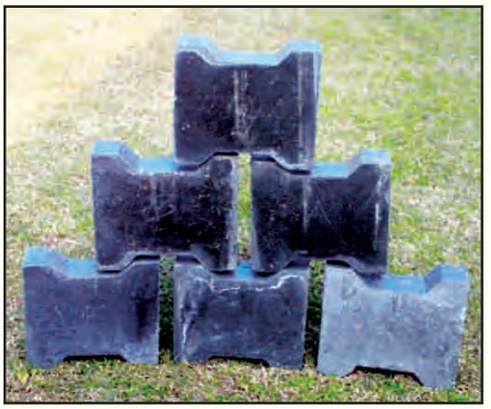

Fig.5 Concrete Paver Blocks

The paver blocks of size 200 x 160 x 75 mm were cast and after 24 hrs were immersed in water for a period of 28 days and then tested for physical properties as per the methods prescribed in IS 15658 - 2006. The results are shown in Figs.2-4. The durability behavior of concrete blocks are under progress.

It can be seen that the compressive strength and flexural strength of concrete blocks decreased with replacement of natural aggregate and water absorption of the blocks increased with an increase in the content of recycled aggregate. Moreover, an appreciable enhancement in strength of paver blocks i.e. 20% were observed with 100 % washed recycled aggregate as compared to unwashed aggregate and water absorption reduced up to 9% (Mix E). The typical photograph of concrete blocks are shown in Fig. 5.

Prof. S.K. Bhattacharyya, A.K. Minocha, Mridul Garg, Jaswinder Singh, Neeraj Jain, S. Maiti & S.K. Singh,
GAP0072 (DST Project)

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44th SSBMT (Indoor) Finals held at CSIR-CBRI

44th Shanti Swarup Bhatnagar Memorial Tournament (Indoor) Finals was inaugurated by Padamshree Shri Zafar Iqbal, Former Indian International Hockey player on 5th April 2013 at CSIR-CBRI, Roorkee. Addressing the gathering Padamshree Shri Zafar Iqbal shared his experiences and created the cheerful atmosphere and infused enthusiasm among the participants during inauguration.

Prof S K Bhattacharyya, Director CSIR-CBRI, Dr A K Minocha, Vice President, CSIR-CBRI staff club, Dr Suvir Singh, Organizing Secretary, Dr. M. Mohan Rao, Member of CSIR Sports Promotion Board were also present on this occasion.

During the three days tournament, five indoor games Badminton, Table Tennis, Carom, Bridge and Chess were played and about 180 participants from various CSIR Laboratories have participated. During the tournament the participants demonstrated qualities of team work, competitiveness, leadership and the zeal to excel against the odds.

Team and Individual events were organised for Badminton, Carrom and Table Tennis. For Bridge, team event for men and for Chess,

individual event for men were played. The results were declared in the Valedictory function held on 7th April 2013.

While addressing, Prof Vani Brahmachari, Chief Guest of the function appreciated the efforts made in organizing the tournament and also gave away the prizes to the winners.

Prof S K Brahmachari, Director General, CSIR and Guest of Honour addressed the gathering which was stirring, truly insightful, encouraging and direction giving.

Prof S K Bhattacharyya, Director, CSIR-CBRI delivered the welcome address. Prof R C Budhani, Director, CSIR-NPL, New Delhi and President Sport Promotion Board also addressed to the participants. Dr A K Minocha introduced the Chief Guest. Dr Suvir Singh, Organizing Secretary, presented a brief of the sports event and proposed a vote of thanks. .

During the function, Dr M O Garg, Director CSIR-IIP, Shri D S Bedi, Secretary SPB, Members of the SPB, Distinguished invitees, guests, participants from different CSIR Labs, members of CSIR-CBRI family were also present.

Earlier, Prof SK Brahmachari, Director General, CSIR visited the laboratories of CSIR-CBRI, Roorkee and also inaugurated Main Gate & Various Laboratories of the Institute.

CSIR-CBRI Newsletter

National Technology Day

CSIR-Central Building Research Institute, Roorkee celebrated National Technology Day on 10th May, 2013. Prof. S.P. Gupta Dy Director, IIT, Roorkee graced the occasion as Chief Guest and delivered a special lecture on National Technology Day. He highlighted various scientific achievements and motivated the S&T staff for taking interest in understanding the principles and practical applications of science so that the future of our country may be shined. The Chief Guest further stressed that science should be explored for the benefit of the mankind so as to improve health, income and living standard of the common masses.

Prof. S.K. Bhattacharyya, Director CSIR-CBRI, Roorkee in his Presidential address briefed on the importance of National Technology Day to the gathering. He remarked that May 11 is annually observed as National Technology Day all over India to commemorate technological breakthroughs like mastering of nuclear weapons technology (Pokharan II) through a series of controlled tests at Pokharan, test firing of the indigenously developed Trishul missile and test flight of the indigenous aircraft Hansa-3. These achievements of Indian technology got a further boost with the test firing of indigenously developed Trishul, Agni and Prithvi missile. The day, which proved the technical prowess of Indian scientists, is marked as the National Technology Day to inspire young minds to achieve high goals and excel at innovations. He also highlighted R&D achievements of CSIR and it's contribution in improvement of economy, health and living standard of the masses.

A Technology on "Fire Extinguish-ments" was transferred to M/s Aska Equipments Ltd. New Delhi. Sri Rajeev Ragav, Chief Marketing Officer have also delivered a Technical presentation. Dr Suvir Singh Sr Principal Scientist gave a Technical presentation on Cable Penetration Seal System (Cable Fire Stop) who received Diamond Jubliee Technology Award. Shri R S Chimote, Chief Scientist gave a Live Demonstration on Fire Extinguishment Techniques. Dr Achal Mittal, Principal Scientist, introduced the Chief Guest and proposed a vote of thanks.

World Environment Day

The CSIR-Central Building Research Institute (CBRI) Roorkee, celebrated the World Environment Day 2013 on June 5, 2013 to promote awareness on the importance of preserving our biodiversity, the need to identify problems related to the environment and ways to take corrective action. The theme for this year World Environment Day celebrations is Think, Eat, Save. Think, Eat & Save is an anti-food waste and food loss campaign that encourages us to reduce our food print. According to the UN Food and Agriculture Organization (FAO), every year 1.3 billion tonnes of food is wasted. At the same time, 1 in every 7 people in the world go to bed hungry and more than 20,000 children under the age of 5 die daily from hunger. Given this enormous imbalance in lifestyles and the resultant devastating effects on the environment, this year theme encourages us to become more aware of the environmental impact of the food choices we make and

empowers us to make informed decisions.

Dr. Neelima Jerath, Executive Director, Punjab State Council for Science and Technology, Chandigarh, Prof. S.K. Bhattacharyya, Director CSIR-CBRI and Prof. B.R. Gurjar Chairman IE(I), RLC planted trees in CSIR-CBRI Campus as a gesture of harmonious living with Nature.

Dr. Neelima Jerath, Executive Director, Punjab State Council for Science and Technology, Chandigarh, delivering her speech as Chief Guest expressed her happiness to be amongst the distinguished scientists and mentioned that every human being should contribute a little in their own personal way to protect the environment and in this connection she appreciated the initiatives taken by CSIR-CBRI for taking environmental issues seriously and also proposed that both CBRI and PSCST can have joint projects on environmental problem of the Uttarakhand.

Prof. S.K. Bhattacharyya, Director, mentioned that CSIR-CBRI will continue its activity to develop environment-friendly technologies and pursue research to protect the environment and work for conservation of biodiversity of the region. On this occasion, CBRI Publications i.e. Newsletter and Bhavnika were also released by the dignitaries.

Prof. B.R. Gurjar, Chairman IE(I), Roorkee Local Centre addressed the gathering about the World Environment Day. Dr. A.K.Minocha, Chief Scientist, in his introductory address pointed out that World Environment Day is an annual event that is aimed at being the biggest and most widely celebrated global day for positive environmental action. The programme ended with a vote of thanks presented by Dr. Shishir Sinha, Hon. Secretary, IE(I), RLC, Roorkee.

Staff News

Promotion

Dr B. Singh	Chief Scientist	04.01.2012
Sh. R.S. Chimote	Chief Scientist	01.01.2013
Sh. Narender Kumar	Principal Technical Officer	24.05.2011
Dr. B.M. Suman	Principal Technical Officer	05.10.2011
Sh. Rajesh Kumar	Principal Technical Officer	11.11.2011
Sh. Ajay Dwivedi	Technical Officer Gr.III (3)	21.07.2010
Smt. Gayatri Devi	Technical Officer Gr.III (3)	08.09.2010
Sh. Sameer	Technical Officer Gr.III (3)	01.06.2011
Sh. Anil Kumar Sharma	Sr. Technician 2	18.06.2011
Sh. Rajeev Bansal	Sr. Technician 1	24.09.2011
Sh. Shiv Prakash Tyagi	Sr. Technician 1	24.09.2011
Sh. B.S. Bisht	Sr. Technician 1	24.09.2011
Sh. Pradeep Kr. Kapooria	Sr. Technician 1	17.10.2011
Sh. Arvind Saini	Sr. Technician 1	29.10.2011
Sh. Ashwini Kr. Mishra	Sr. Technician 1	29.12.2011
Sh. Harish Kumar	Sr. Technician 1	29.12.2011
Sh. Sukhbeer Sharma	Sr. Technician 1	29.12.2011
Sh. D.K.Chopra (Retd.)	Sr. Technician 1	24.09.2011

Congratulations!

Transfer

Sh. R. K. Manjhiwal	F.&.A.O.	18.04.2013
(CSIR Hqrs., New Delhi to CSIR-CBRI, Roorkee)		
Sh. Parag Saxena	A.O.	03.06.2013
(CSIR-IMTECH, Chandigarh to CSIR-CBRI, Roorkee)		
Sh. Amarjeet	S.O.	31.05.2013
(CSIR-CBRI, Roorkee to CSIR-IHBT, Palampur)		

Superannuation

Sh. Jaipal Singh	Technician	31.05.2013
Dr. P.K. Bhargava	Chief Scientist	31.05.2013
Sh. S.K. Jain	Principal Scientist	30.06.2013
Sh. Sita Ram	Technician	30.06.2013
Sh. S.K. Gupta	Ex. Engineer	30.06.2013

We wish a peaceful & happy retired life!

Editor
Dr Atul Kumar Agarwal
Senior Principal Scientist

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