भारतीय राष्ट्रीय राजमार्ग प्राधिकरण
(सड़क परिवहन और राजमार्ग मंत्रालय)
National Highways Authority of India
(Ministry of Road Transport and Highways)
जी-5 एवं 6, सेक्टर-10, द्वारका, नई दिल्ली - 110 075
G-5 & 6, Sector-10, Dwarka, New Delhi-110075

दूरभाष / Phone : 91-11-25074100/25074200
फैक्स / Fax : 91-11-25093507 / 25093514
एक्स. / Extn.: 2223 / 2318 / 2468 / 2553

NHAI/TIC/R&D/1/2016/91614

28th November'16

To,

ALL NHAI

Sub : Instruction regarding Design Mix for constructions of Rigid Pavements.

Sir,

MoRT&H vide specification for Road & Brides (fifth revision) has issued the guidelines for concrete pavements and has suggested the use of chemical Admixtures, Silica fumes & Fibre in order to avoid the shrinkage cracks, early deterioration of the concrete pavements and to meet the serviceability of Rigid Pavement during design life. The same are specified as under :

602.2.3 Chemical Admixtures

Admixtures conforming to IS : 9103 and IS : 6925 shall be permitted to improve workability of the concrete and / or extension of setting time, on satisfactory evidence that they will not have any adverse effect on the properties of concrete with respect to strength, volume change, durability and have no deleterious effect on steel bars. The particulars of the admixture and the quantity to be used, must be furnished to the Engineer in advance to obtain his approval before use. Satisfactory performance of the admixtures should be proved both on the laboratory concrete trial mixes and the trial length paving. If air entraining admixture is used, the total quantity of air shall be 5±1.5 percent for 31.5 mm maximum nominal size aggregate (in air-entrained concrete as a percentage of the volume of the mix).

602.02.4 Silica Fumes

Silica fume conforming to a standard approved by the Engineer may be used as an admixture in the proportion of 3 to 10 percent of cement. Silica fume shall be comply with the requirements given in IS: 15388-2003, IS: 456-2000, IRC : SP:76 and IRC : 44-2008 and IRC : 15-2011.

602.2.5Fibres

Fibres may be used subject to the provision in the design / approval by the Engineer to reduce the shrinkage cracking and post – cracking. The fibers may be steel fiber as per IRC: SP: 46 or polymeric Synthetic Fibers within the following range of specifications :

Effective Diameter	10 micron—100 micron
Length	6-48 mm
Specific gravity	More than 1.0
Suggested dosage	0.6-2.0 kg / cu.m (0.2 – 0.6 % by weight of cement in mix) Usage will be regulated as stipulated in IRC : 44/IS:456
Water absorption	Less than 0.45 percent
Melting point of this fibre shall not be less than 160^0 C.	
The aspect ratio generally varies from 200 to 2000.	
These synthetic fibres will have good alkali and UV light resistance.	

- When fibers are used, the mix shall be so designed that the slump of concrete at paving site is 25±15 mm

2. The instructions are hereby issued to advice the Concessionaire/ Authority Engineer & Independent Engineer to review the design taking in consideration the above guidelines in order to maintain proper standards & quality

3. Please note that above guidelines for Chemical Admixtures, Silica fumes and Fibres as mentioned above deserve to be given due considerations and are already as per provisions of Contract (Schedule –D) ; therefore, no extra cost to be asked for, from NHAI. In case, any discrepancy or deviation is observed, then the concerned Authority Engineer & Independent Engineer will be held responsible for the lapse.

4. The updated accredited list of New material / Technology / Equipment and Product by IRC is also attached herewith at **Annexure-I** for applicable / feasible usage in terms of improved / enhanced performance to encourage use of emerging technologies for new projects as also in on-going projects within the existing contact conditions. The performance of such applications may be kept under observation and reported for feedback for future applications.

5. This issues with the approval of the Competent Authority.

Yours faithfully,

Sabharwal 28/11/16

(Ajay Kumar Sabharwal)
GM (T)—SRD&Q

Encl : a/a