BUREAU OF INDIAN STANDARDS

Minutes for Twentieth Meeting

Stones Sectional Committee, CED 6 : Twentieth Meeting

Tuesday, 28 November 2023 :1100 h to 1600 h

Hybrid Meeting

From (Blue room) , Manak Bhawan Bureau of Indian Standards, 9, Bahadur Shah Zafar Marg, New Delhi -110002
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CHAIRMAN : Dr Shashank Bishnoi, IITD **MEMBER SECRETARY :** Ms Divya S

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Members Present

AIMIL Limited, New Delhi	Shri Rohitash Barua
Central Soil and Materials Research Station, New Delhi	Shri U. S. Vidyarthi
Centre for Development of Stones, Jaipur	Shri Mukul Rastogi
In personal capacity	Shri Kota Sitaramanjaneyulu
Central Public Works Department, New Delhi	Shri K.P. Singh, (SE, Jodhpur)
Directorate of Geology and Mining, Lucknow	Shri Ram Pravesh Singh DGM UP
Geological Survey of India, Kolkata	Dr D Chakraborty
Indian Institute of Technology Delhi, New Delhi	Shri Amit Kumar
Indian Institute of Technology Madras	Dr. Manu Santhanam
Indian Institute of Technology Bombay, Mumbai	Dr. Swathy Manohar
National Institute of Technology Calicut, Kozhikode	Dr. Madhavan K Dr Jayachandran K
NCCBM Ballabgarh	Shri Richa Mazumder
School of Planning and Architecture, New Delhi	Shri Shuvojit Sarkar Shri Mehar Kumar Kandipilli
Shriram Institute for Industrial Research, Delhi	Dr Mukesh Garg Shri Raman Dhyani Dr. Laxmi Rawat
Stone Technology Centre, Jaipur	Shri K. Vikram Rastogi
Tamil Nadu Minerals Limited, Chennai	Shri S. Thangapandian Shri Henry Robert
Unique Geocivil Services Pvt. Ltd., Surat	Shri Hitesh Desai

Members present by virtue of contribution for this meeting.

In personal capacity	Dr Rajni Lakhani

Item 0 OPENING REMARKS BY THE Chairman

The Chairman welcomed all the members to the 20th meeting of the Stones Sectional Committee. The Chairman commented that substantial work has taken place after the last meeting of the Committee and appreciated the members for the hard work involved. Before opening the forum for the technical discussion, he briefed the members about the recent initiatives and decisions at the BIS secretariat level which will affect the working of the Committee. He drew attention the recent letter issued by DG BIS which has already been circulated to all the members vide email dated 29.09.2023. He requested continued regular participation and contribution from all the members and suggested that the Agenda may be taken up item wise.

Item 1 CONFIRMATION OF THE MINUTES OF THE LAST MEETING

The minutes of the last (Nineteenth) meetings of the Stones Sectional Committee, CED 6 held on 01 August 2023, circulated to members vide BISDG letter No. CED 06/A-2.19 dated 25 September 2023 was confirmed.

Item 2 REVIEW OF COMPOSITION OF SECTIONAL COMMITTEE, SUBCOMMITTEES AND PANEL

2.1 Composition of the Sectional Committee

2.1.1 The Committee noted the present composition of the Sectional Committee as reviewed by the Civil Engineering Division Council, CEDC in its last (27th) meeting held on 21 July 2023 is given at **Annex 1** as well as the participation details of the members.

The Committee noted that the following participants had neither attended 2 consecutive Committee meetings in the year nor expressed their interest to be a part of the Committee through contribution nor had they responded to any of the letters from BIS. They had also not contributed to the work of the committee through correspondence. In line with the recent decisions of BIS secretariat level, it was recommended that the following organizations may be dropped. It was also decided that letters regarding this may be send to these organizations; which will provide them the opportunity to approach the Committee if they wish to be a part of the Committee later.

	NAME OF THE ORGANISATION	**REPRESENTED BY**
1)	CSIR - Central Building Research Institute, Roorkee	Achal Mittal Rajesh Kumar M. Vinoth Debdutta Ghosh
2)	CSIR - Central Road Research Institute, New Delhi	**Nomination awaited**
3)	Indian Bureau of Mines, Nagpur	J. R. Chaudhari G. C. Meena
4)	Gujarat Engineering Research Institute, Vadodara	R.K. Chauhan R.M.Patel

5)	National Institute of Rock Mechanics, Bengaluru	Dr A. Rajan Babu G.C. Naveen
6)	The Institution of Engineers (India), Kolkata	V. K. Gupta Dr. A. Goel
7)	Engineer India Limited, New Delhi	Samir Das Shobha
8)	The Indian Institute of Architects, Mumbai	Divya Kush Ajay Puri
9)	Malaviya National Institute of Technology, Jaipur	Dr A. K. Vyas Dr R. C. Gupta
10)	IN PERSONAL CAPACITY	Bhawna Dandona

ITEM 3 WORKING DRAFTS UNDER CIRCULATION

3.1 Working Draft Indian Standard Specification For Marble (Blocks , Slabs And Tiles) (First Revision of IS 1130) CED 06(0258) WD

The Committee examined the draft revision of IS 1130 and thanked the working group for the same. A few comments were received on the document after the Agenda was issued, which were discussed in the meeting and are tabulated below:

Abbreviated from	**Commentator**
GSI	Dr. D. Chakraborty/ GSI
Geocivil	Hitesh Desai & Nehal Desai Unique Geocivil Services Pvt. Ltd.(Formarly Unique Engineering & Testing & Advisory Services)

Sl. No.	**Clause/Para/ Table/Figure No. commented**	**Commentator**	**Comments/Modified Wordings**	**Justification of Proposed Change**	**Decision of the committee**
1)	Foreword	GSI	Necessary changes made in text. IS code no. may be checked.	For clarity of understanding, few words have been replaced in text.	The committee noted that the suggested modifications were editorial in nature and authorized the BIS secretariat to make the necessary modifications as may be required.
2)	3.1.1 Honed Finish	GSI	Buffing stage	Buffing stage may be briefly explained	The Committee agreed to the suggestion. Shri

				under Note or as a footnote.	Amit Kumar, IITD, offered the following note as the explanation for buffing: *rubbing the surface of a metal, wood, stone, etc., with a lightly abrasive material like brush (manual or mechanical) or cloth to make it smooth.* The Committee agreed to the same.
3)	4.3 Marble Classification	GSI	Point b) may be deleted	Geologically, metamorphism of Ultrabasic rocks do not lead to marble formation.	The Committee agreed to the suggestion, however, considering that ultrabasic rocks are also sold as marble in the market, it was decided to modify the title as marble and similar rocks and to include the details of other rocks as an annex. [S1]
4)	7 Tolerance	Geocivil	Tiles Linear Dimensions ~~(+ 4)~~ ± 1 Difference between Linear dimensions max. 1		The Committee decided that the modification was not required at present.
5)	Sr. No ii and iv Sr. No 6 Sr. No 7	Geocivil	True Specific Gravity should be higher than the apparent Specific Gravity When IS 1706 is available (Method for determination of resistance to wear by abrasion of natural building stones) why to use test method as per IS 1237. Abrasion resistance can also be for dry and wet condition.	Actually there is no need to include true Sp. Gr. as in practice it is rarely used.	The Committee decided that the test for true specific gravity may be made an optional test. The Committee agreed that IS 1706 may be referred to for the test for abrasion testing. Additionally, the Committee noted that the range of values for apparent specific gravity, true specific gravity and abrasion

					resistance were too vast and requested that CDOS may confirm these values once again.
6)	Cl. 8.1	Geocivil	Add : For the block transverse strength test and for slabs and tiles compressive strength test shall not be performed.		The Committee decided that we may add a note under the table stating that for transverse strength test for blocks and compressive strength test for slabs and tiles need not be performed.
7)	Cl. 11.4	Geocivil	the subsample shall be tested for Water absorption, ~~hardness~~ compressive / transverse strength and specific gravity.		The committee agreed to the suggestion. Further, the Committee examined the suggestion on table 2 (reproduced below) and agreed to the same.
8)	12.1	GSI	Necessary changes made in text.	---	The committee noted that the suggested modifications were editorial in nature and authorized the BIS secretariat to make the necessary modifications as may be required.
9)	A-1.1	GSI	Necessary changes made in text	---	The committee noted that the suggested modifications were editorial in nature and authorized the BIS secretariat to make the necessary modifications as may be required.

TABLE 2 SAMPLE SIZE AND CRITERIA FOR CONFORMITY

(Clauses **11.2 11.3** and **11.4***)*

Number or blocks / slabs / tiles in the lot	Number or blocks / slabs / tiles to be selected in sample	Permissible number of defectives	Sub-sample size in numbers
(1)	(2)	(3)	(4)
~~Up to 25~~	~~3~~	~~0~~	~~2~~
~~26 100~~	~~5~~	~~0~~	~~2~~
~~101 200~~	~~8~~	~~0~~	~~3~~
Upto 100	5	0	1 set of 5
101 to 500	1~~3~~0	0	~~4~~ 1 set of 5
501-1000	20	1	~~5~~ 2 sets of 5
1000 - 2000	30	2	3 Sets of 5

The Committee noted that a number of major modifications have been proposed in the draft and hence decided that the modified draft may be recirculated as a **working draft** for a period of 3 weeks for the comments of the members.

3.2 Working Draft Indian Standard Determination of Resistance to Wear by Abrasion of Natural Building Stones — Method of test (First Revision of IS 1706) CED 06(0259) WD

The Committee examined the draft revision of IS 1706 and thanked the working group for the same. A few comments were received on the document after the Agenda was issued, which were discussed in the meeting and are tabulated below:

Abbreviated from	Commentator
GSI	Dr. D. Chakraborty/ GSI
SIIR	Raman Dhyani, Scientist 'C' (Shriram Institute for Industrial Research
Geocivil	Hitesh Desai & Nehal Desai Unique Geocivil Services Pvt. Ltd. (Formarly Unique Engineering & Testing & Advisory Services)

Sl. No.	Clause/Para/ Table/Figure No. commented	Commentator	Comments/Modified Wordings	Justification of Proposed Change	Decision of the Committee
1)	Clause 3 , page 5	SIIR	<u>Test pieces</u> Cut five No. of square specimen of size (70.6 x 70.6) mm ±2% from five different stones from available thickness. (both the proper sides of square specimen to be tested).	It is very difficult to get stone samples with higher thickness blocks for testing purpose. It is also observed that stones between 18 mm to 40 mm are used for	It was decided to add in the draft that wherever large sample was available, the procedure mentioned in the draft may be followed and in case of tiles/slabs, job thickness may be

				flooring.	used for testing with a minimum of three samples tested.
2)	Clause 3	Geocivil	3 nos. of square test ~~specimens~~ subsamples - - - The ~~specimen~~ subsample shall be obtained - - - All the faces of the ~~specimen~~ subsamples shall be made - - -		The Committee agreed to the suggestion.
3)	4.1	GSI	Table 1 – Figs in % by Mass may be modified	Mass % (for different Abradant sizes) when added is not 100%	The committee decided to specify that corundum of grit size 60 may be used as abradant. The committee also decided that the relevant table from 3178 may be cited in the standard.
4)		Geocivil	Size of cut sample shall be ~~76~~ 70.6 mm. (Cutting the test ~~specimen~~ subsample from cube sample)		The committee agreed to the suggestion.
5)	5.1	Geocivil	The abrasion of ~~specimen~~ subsample shall be carried out - - - ~~Delete 5.3~~		The committee agreed to the suggestion. The committee decided that the information under clause 5.3 may be added under the test procedure, after modifying that the procedure may be repeated for a total 16 times on the possible wearing side of the subsample.
6)		Geocivil	The ~~specimen~~ subsample shall be dried - - - - - Para 1 add at end : Thickness of each subsample shall be		The committee agreed to the suggestion.

			recorded nearest to 0.1 mm		
7)		Geocivil	Thus repeat the procedure for ~~each square face of sample for~~ total 8 times. Repeat the procedure for other square face of the subsample also. After the abrasion is over, the ~~specimen~~ subsample shall be reweighed. Repeat the procedure for each subsample.		The committee noted that the decision regarding the same has already been taken above.
8)		Geocivil	The wear shall be determined from the difference in readings obtained by the measuring instrument before and after the abrasion of the specimen for each ~~specimen~~ subsamples. Average of wear of subsamples (A, B and C) or tiles/slab specimens shall be calculated for both specimen. ~~Average loss in thickness for each selected cube samples is calculated (Average of 3 sections A, B & C)~~ . The value shall be checked up with the ~~average~~ loss in thickness of the specimen obtained by the following formula: $t\ (loss) = \frac{(W_1 - W_2)\ t}{W_1}$ $t\ (loss)$ = loss in thickness in mm, W_1 = initial weighting of the ~~specimen~~ subsample,	Modify and add	The committee agreed to the suggestion.

			W_2 = final weighting of the abraded ~~specimen~~ subsample ~~V_1 = initial volume in cm^3 of the specimen, and A = surface area in cm^2 of the specimen.~~ t = Average initial thickness of subsample.		
9)		Geocivil	Report average and individual loss in thickness for each cube/specimen set ~~samples~~ selected, in mm, up to one decimal.	Modify and add.	The committee agreed with the suggestion.
10	Report	GSI	Kindly mention acceptable value of difference in t for passing this test or relevant IS Code may be referred	For Interpretation of test result	The committee noted that the acceptable values may be provided in the relevant specification standards and need not be provided with the test method.

With the above modifications, the committee decided to issue the draft in **WIDE CIRCULATION** for a period of 1 month for eliciting public comments.

3.3 Working Draft Indian Standard Determination of permeability of natural building stones — Method of test (Second Revision of IS 4348) CED 06(0260) WD

The Committee examined the draft revision of IS 4348 and thanked the Shri Desai for the same. Comments received from Dr. Chakraborty, GSI, on the document, including those received after the Agenda was circulated, were discussed in the meeting and are tabled below:

Sl No.	Clause/Sub clause/Para No.	Comments/Suggestions	Decision of the Committee

1	3.2	What is Bleeding?	The committee decided that bleeding may be defined in the glossary standard. Shri Amit volunteered to provide a note explaining bleeding which may be added in this draft.
2	5.2 fig 1	What will be the porous stone ring made of?	Shri Hitesh Desai suggested that an alternative to using a porous stone ring will be to use an unfinished specimen for testing. It was suggested that instead of a porous ring, a proving ring of the required size may be used, and the related Indian standard for proving ring may be referred to if required.
3	7.2	What is caulked? If sealed is synonymous then may be it is better to use a more common term like sealed.	The Committee decided to replace caulked with packed.
4	7.7(b)	How much in percent?	The Committee decided to modify the line to mention that the water should be deaired and free of air bubbles.
	9.1	Any interpretation on permeability range may be given along with test result of specimen?	The Committee clarified that the interpretation will be provided in the respective specification standards.

With the above modifications, the committee decided to issue the draft in **WIDE CIRCULATION** for a period of 1 month for eliciting public comments.

Item 4 ISSUES ARISING OUT OF THE PREVIOUS MEETING

4.1 Based on the discussions and decisions in the previous two meeting of the Committee, various works regarding preparation of drafts on new subjects or review of standards for amendment/revision were allocated to members as given below:

Sl No.	Subject	Current composition of the WG	Committee decision
2.	IS 1121 (Part 4) Determination of strength properties of natural building stones — Methods of test: Part 4 Shear strength	a) Shri Hitesh Desai (Convener) b) CDOS, Jaipur c) MNIT, Jaipur d) Shriram Institute, Delhi e) Shri Rajan, NIRM	Shri Hitesh Desai agreed to provide a draft by the next meeting.
3.	IS 1123:1975 Identification of Natural Building Stones	a) CDOS, Jaipur(Convener) b) GSI, Hyderabad c) Shri Henry, TAMIN, Chennai d) Shri Rajan, NIRM, Kolar e) Shri Amitosh Verma, DGM UP	CDOS agreed to provide a draft by the next meeting.

		f) Shri Pradeep Agarwal g) Ms Smita Makhija	
4.	IS 1127:1970 Dimensions & workmanship of stones	a) Prof Shuvojit Sarkar, SPA, New Delhi (Convener) b) CPWD, New Delhi c) TSERL, Hyderabad d) ASI, New Delhi e) Shri Sanjay Dhar, DRONA	The Committee felt that no updates have come yet and we may open up this topic for ToR after confirming the same with SPA as well.
5.	IS 1128:1974 Specification for Limestone	a) Shri Mukul Rastogi, CDOS, Jaipur (Convener) b) CSIR-CBRI, Roorkee c) Shri Hitesh Desai d) Shri S. C. Agarwal e) Shri Pradeep Agarwal	Shri Rastogi informed that they would need more time to complete the project.
6.	IS 3316:1974 Specification for Structural Granite	a) Dr Shirole, IIT Delhi (convener) b) Shri V. K. Rastogi, Stone tech c) FIGSI d) Shri Girish, IITD	Dr Shirole informed that extensive retesting is needed to validate the result values in the standard. It was suggested that a small R&D project for this may be suggested. Dr Shirole was requested to submit the request for the same.
8.	IS 8759:1977 Code of practice for maintenance and preservation of stones in building	a) Dr Arun Menon, IITM b) Dr Swati, IITG c) Ms Smita Makhija	Dr Arun and Dr Swati informed that the draft was ready except for glossary. They informed that the completed draft will be submitted within the month. The Committee decided to issue the same as a WD for getting

			comments from the members.
9.	New Standard on polished marble (as Part 2 of IS 14223)	a) CDOS, Jaipur (Convener) b) R.K. Marble, Udaipur c) Stone Technology Centre, Jaipur d) Anna University (Geology & Mining) e) FIGSI, Bangalore f) Shri Pradeep Agarwal.	The Committee requested the WD to provide a list of tests specified o polished marble. It was decided that we may hold this project till the we develop those test methods.
10.	Review of IS 7779 Schedule of properties and availability of stones for construction purposes	a) IIT Madras (Convener) b) NIT, Calicut	IITM and TAMIN had a discussion and TAMIN agreed to provide the requisite data to IITM for preparing the revision of the standard.
11.	IS 8381:1977 Recommended Practice For Quarrying Natural Stones For Construction Purposes	a) Shri Mukul Rastogi, CDOS Jaipur b) Shri S.C. Agarwal c) Gem Granites, Chennai d) FIGSI, Bangalore e) NIRM, Kolar f) IBM, Nagpur g) Department of Mines & Geology, Jaipur	The Committee noted that a TOR for this project has been prepared and approved the same.
12.	IS 3622:1977 Specification for Sandstone (slabs And Tiles)	a) CPWD Delhi b) PWD, Jaipur c) PWD, New Delhi d) ASI, New Delhi e) DRONAH, Gurugram f) GSI, Hyderabad	The Committee noted that a TOR for this project has been prepared and approved the same.
13.	Method of test for determination of Compressive Strength of Agglomerated stones	a) Shri Hitesh Desai (Convener) b) CDOS, Jaipur c) MNIT, Jaipur d) Shriram Institute, Delhi e) Shri Rajan, NIRM	The Committee decided that we may compare these drafts with the related parts of IS 1121. The similar clauses may be cross referred and the special clauses
14	Test for determination of Flexural Strength of Agglomerated stones.		

			alone may be retained.
15	Method of test for determination of Resistance to fixing(dowel hole)	IITM	The Committee requested the members to expedite the work on these standards.
16	Method of test for determination of Freeze and Thaw Resistance in Agglomerated stones		
17	Determination of resistance to abrasion of Agglomerated stone products	Shri Hitesh Desai	
18	Method of test for determination of Water Absorption and apparent Density		
19	Agglomerated stone — Modular tiles for flooring and stairs (internal and external)	Dr Shirole, IITD	
20	Agglomerated stone - Slabs and cut-to-size products for vanity and kitchen tops.		
21	Agglomerated stone — Slabs and tiles for wall finishes (internal and external)		
24	IS 5218:1969 Method of test for toughness of natural buildingstones		The WG informed the committee that they need a diagram in order to complete the draft. IITM/IITD informed that they have the apparatus for this test, and offered to provide the required details.
25	IS 9394:1979 Specification for stone lintels	Shri Hitesh, Dr Arun Menon and Dr Swati volunteered to work on the preparation of a draft revision of the standard.	Shri Hitesh informed that the draft is still relevant and does not need any modifications. The Committee decided that the references in the draft may be updated and it may be **WIDE CIRCULATED** to check for eliciting public comments.

Item 5 INTERNATIONAL STANDARDIZATION

5.1 ISO/TC 327 Natural Stones

5.1.1 The Committee noted the information under the Agenda item.

5.1.2 ISO/TC 327 Natural Stones

The Committee noted the information under the Agenda item.

5.2 ISO/TC 328 Engineered Stones

5.2.1 The Committee noted the information under the Agenda item.

5.2.2 The Committee noted the details of the meeting and decided that the following delegation shall represent India in the meeting.

1) Dr Shashank Bishnoi, IITD (Leader of delegation)
2) Shri Hitesh Desai
3) Shri Amit Kumar
4) Dr Manu Santhanam, IITM (*Dr Manu subsequently informed that he will not be able to join the delegation)*

Item 6 PROGRESS OF WORK

6.1 Programme of Work

The Committee discussed the programme of work enclosed with the Agenda. It was noted that the revision of a good number of standards were underway and decided that we may archive the other pre 2000 standards so that they may be taken up for revision as we close the existing projects.

Item 7 RESOLUTIONS OF THE MEETING

The resolutions of the meeting were prepared and circulated on the same day of the meeting and is attached as Annex A.

Item 8 ANY OTHER BUSINESS

8.1 The date of the next meeting was fixed as Feb 27, 2024.

8.2 There being no other business, the meeting ended with a hearty round of thanks to the Chair and the members.