Bureau of Indian Standards, New Delhi
STANDARDIZATION CONTEST
Shaping Tomorrow's Sustainability Standards"
Form for Submission of Entries

Name of Applicant: **Mr. Jeetendra Singh Khichad**

Age as on 01 Jan 2024: **26 years 10 months 0 days** ***(DOB: March 1st, 1997)***

Copy of 10th certificate/ Passport/ Date of Birth Certificate as applicable: **Attached below** ***(Roll No.: 0371779)***

क्रमांक 0034277
Serial No.:

माध्यमिक शिक्षा बोर्ड, राजस्थान
Board of Secondary Education, Rajasthan

प्रमाण-पत्र अंकतालिका सहित
Certificate with Mark-Sheet

माध्यमिक परीक्षा - 2010
Secondary Examination - 2010

नामांक Roll No.	जिला District	नियमित/स्वयंपाठी Regular/Private	श्रेणी Category	संदर्भ संख्या Ref. No.
0371779	JAIPUR	REGULAR	1	360830

प्रमाणित किया जाता है कि
This is to certify that JEETENDRA SINGH KHICHAD
पिता का नाम
Father's Name JHABAR SINGH JAT
माता का नाम
Mother's Name MANJU DEVI
जन्म दिनांक
Date of Birth 01-03-97 FIRST MARCH -NINETEEN NINETY SEVEN
ने माह मार्च/अप्रेल 2010 में आयोजित माध्यमिक परीक्षा
has appeared in March/April 2010 at the Secondary Examination from
121674- BHAWANI VIDHYA NIKETAN SEC SCH,ASHTIKALAN-GOVINDGARH(JAIPUR)
से प्रविष्ट होकर निम्नांकित विषयों में दर्शाये गये अंको सहित उत्तीर्ण की :
and was declared Pass with subject-wise marks mentioned below :

विषय एवं पूर्णांक/न्यूनतम उत्तीर्णांक (Sub. & Total/Min. Pass Marks)	हिन्दी (Hindi) 100/33 I	सत्रांक (Sess.)	योग (Total)	अंग्रेजी (English) 100/33 I	सत्रांक (Sess.)	योग (Total)	विज्ञान (Science) 100/33 I	II	सत्रांक (Sess.)	योग (Total)
प्राप्तांक (Marks Obtained)	50	20	70	47	20	67	30	28	20	78D

विषय एवं पूर्णांक/न्यूनतम उत्तीर्णांक (Sub. & Total/Min. Pass Marks)	सामाजिक विज्ञान 100/33 (Social Science) I	II	सत्रांक (Sess.)	योग (Total)	गणित 100/33 (Maths) I	II	सत्रांक (Sess.)	योग (Total)	तृतीय भाषा 100/33 (Third Language)	I	सत्रांक (Sess.)	योग (Total)
प्राप्तांक (Marks Obtained)	23	21	20	64	38	18	20	76D	SANSKRIT	48	20	68

कुल पूर्णांक 600
Total Max. Marks
कुल प्राप्तांक 423 70.50%
Total Marks Obtained
परिणाम FIRST DIVISION
Result

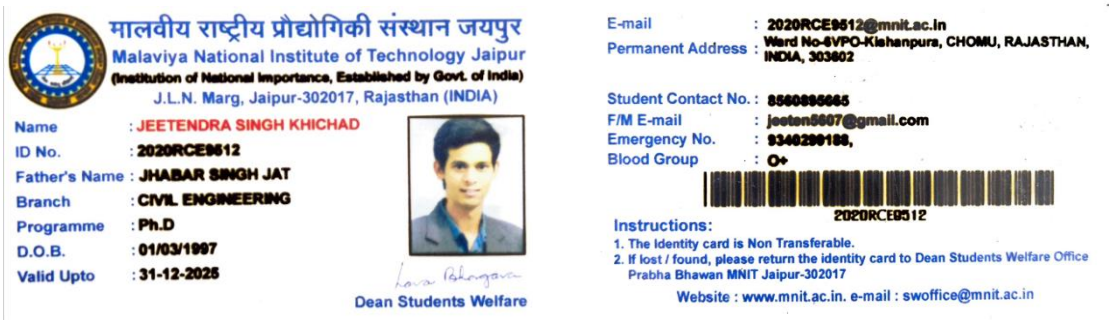
विषय एवं पूर्णांक Subject & Max. Marks	पर्यावरण शिक्षा Environmental Education	कम्प्यूटर साक्षरता Computer Literacy 100	शारीरिक एवं स्वास्थ्य शिक्षा Physical & Health Education 100	उपयोगी उत्पादक कार्य एवं उत्पादन शिक्षा (S.U.P.W. & C.S.)	कला शिक्षा Art Education
प्राप्तांक एवं ग्रेडिंग Marks obtained & Grading	A	90	94	A	A

अजमेर
AJMER
दिनांक
DATE 25TH JUNE, 2010
(एम. आर. शर्मा)
(M. R. Sharma)
सचिव
Secretary
(विशेष विवरण हेतु कृपया पृष्ठ उलटिए)

Copy of PAN Card: **Attached below** ***(PAN Number: FOAPK8378J)***

Name of Institute Wherein Applicant is Enrolled: **Malaviya National Institute of Technology Jaipur, JLN Marg, Jaipur, Rajasthan-302017. https://mnit.ac.in/**

Copy of Valid Student Identity-Card: **Attached below** ***(ID Number: 2020RCE9512)***



---

1. Issue Which is Sought to be Addressed (Problem Statement):

The construction industry significantly contributes to environmental degradation and climate change through high carbon emissions and excessive waste, including the underutilized marble waste. Efficiently incorporating marble waste into concrete can mitigate these impacts by reducing landfill waste and lowering carbon emissions associated with cement production.

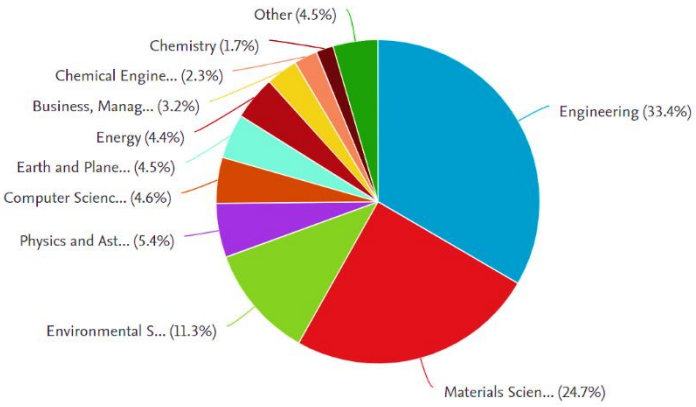
2. Title/Subject of Proposed Standard:

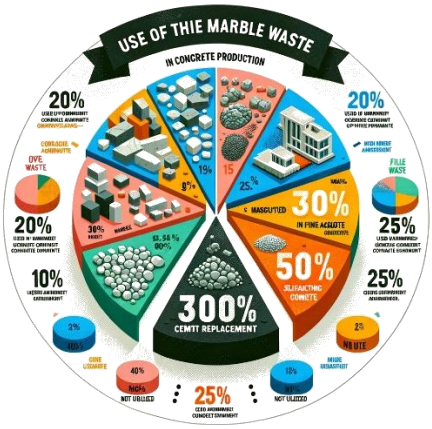
"Utilization of Marble Waste in Concrete Production for Sustainable Construction Practices"

3. Justification of Proposed Subject:

The justification for this standard lies in the multifaceted benefits of using marble waste in concrete. Beyond the environmental advantages of reducing landfill waste and conserving natural resources, marble waste can improve the mechanical properties of concrete, such as compressive strength, durability, and surface finish, due to its fine particles and chemical

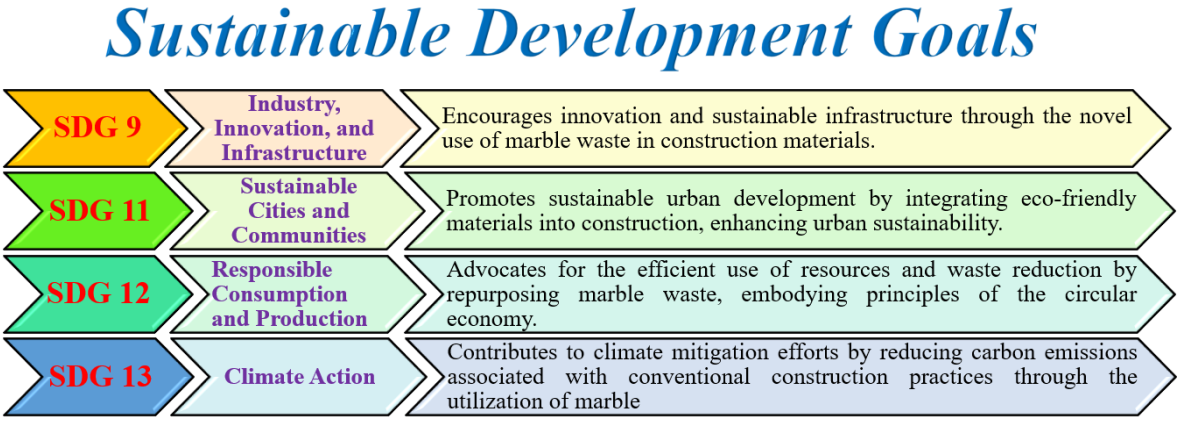
composition. This approach aligns with the circular economy concept, promoting waste minimization and resource efficiency in the construction sector.





4. Related UN SDG(s) Proposed to be Addressed:

The proposed standard for incorporating marble waste into concrete aligns with and supports several United Nations Sustainable Development Goals (SDGs), effectively contributing to global sustainability objectives. Here's how it addresses specific SDGs:



This approach underscores the potential of sustainable material use in achieving broader environmental and societal goals, highlighting the interconnectedness of innovation in construction practices with global sustainability efforts.

5. Likely Users of the Standard:

Construction companies, concrete manufacturers, environmental agencies, urban planners, and researchers in building materials will find this standard particularly useful for developing sustainable and durable construction materials.

6. Bearing with Government Legislation/Regulation, etc.:

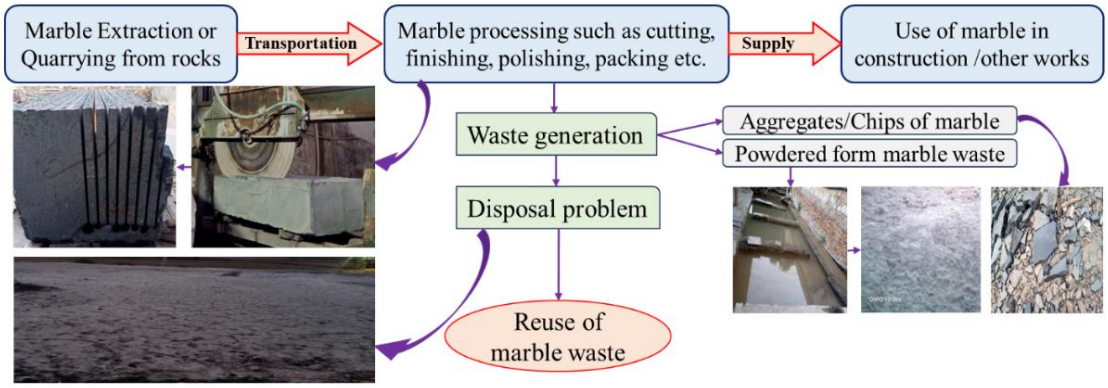
This standard supports environmental legislation aimed at waste reduction, recycling, and sustainable development. It aligns with policies encouraging the construction industry to adopt greener practices and materials, contributing to national and international environmental targets.

7. Status of the Industry in the Country:

The construction industry is a significant contributor to the national economy, constantly seeking innovative, cost-effective, and environmentally friendly materials and methods. The utilization of industrial by-products like marble waste is emerging as a focus area for sustainable construction practices.

8. Write-up Detailing the Issue and How the Proposed Standard Shall Address the Same:

The construction sector's environmental impact, highlighted by its substantial waste generation and carbon footprint, necessitates innovative approaches to sustainability. Marble waste, a by-product of the marble industry, represents a significant environmental challenge due to its disposal issues and the space it occupies in landfills. Generation of marble waste is shown below:

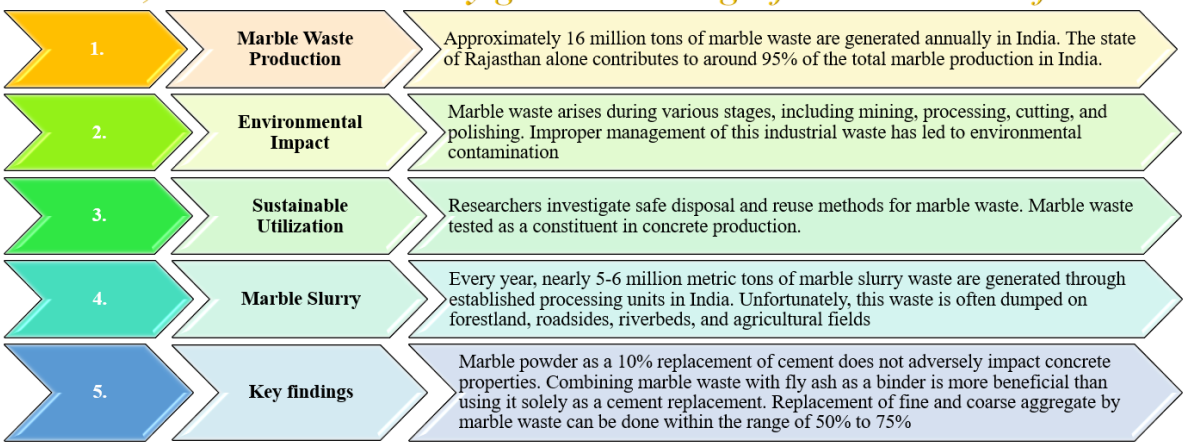


The proposed standard aims to address these challenges by standardizing the use of marble waste in concrete. This approach not only helps in managing marble waste more effectively but also in reducing the consumption of virgin materials, such as aggregates and cement, in concrete production. The substitution of cement or aggregates with marble waste can lead to a reduction in carbon emissions associated with cement manufacturing, one of the primary sources of CO_2 emissions in the construction industry.

Incorporating marble waste into concrete has the potential to enhance the mechanical properties of concrete, including increased compressive strength and durability, depending on the proportion and particle size of the marble waste used. The proposed standard will detail the appropriate methodologies for processing marble waste, the optimal mix designs, and the environmental and economic benefits of using marble waste in concrete.

The adoption of this standard will encourage the construction industry to move towards more sustainable practices, aligning with global sustainability goals and contributing to the fight against climate change. It will also promote innovation in construction materials, potentially leading to improved material properties and construction techniques.

In India, the marble industry generates a significant amount of waste.



The design standards for incorporating marble waste in concrete are essential for promoting sustainable construction practices. Collaboration among industry stakeholders, researchers, and policymakers is crucial to establish comprehensive guidelines. These standards facilitate widespread adoption of sustainable practices and optimize the utilization of marble waste in concrete through further research. Addressing marble waste not only enhances environmental sustainability by reducing waste and promoting recycling but also creates economic opportunities and material innovation in construction. Design standards ensure efficient utilization of marble waste, leading to both environmental and economic benefits, ultimately fostering sustainable development in the construction industry.

Important References:

[1] Sudarshan D. Kore, A. K. Vyas & Syed Ahmed Kabeer K.I. (2020) A brief review on sustainable utilisation of marble waste in concrete, International Journal of Sustainable Engineering, 13:4, 264-279, https://doi.org/10.1080/19397038.2019.1703151

[2] Arel, H. Ş. (2016). Recyclability of waste marble in concrete production. Journal of Cleaner Production, 131, 179-188. https://doi.org/10.1016/j.jclepro.2016.05.052

[3] Yifru, B. W., & Mitikie, B. B. (2020). Partial replacement of sand with marble waste and scoria for normal strength concrete production. SN Applied Sciences, 2, 1-11.

[4] IRC:121-2017, Guidelines for use of construction and demolition waste in road sector. Indian Roads Congress.

[5] Aliabdo, A. A., Abd Elmoaty, M., & Auda, E. M. (2014). Re-use of waste marble dust in the production of cement and concrete. Construction and building materials, 50, 28-41. https://doi.org/10.1016/j.conbuildmat.2013.09.005

[6] Indian Minerals Yearbook 2016 – IBM. https://ibm.gov.in/writereaddata/files/05152018165102Marble2016.pdf

[7] Tunc, E. T. (2019). Recycling of marble waste: A review based on strength of concrete containing marble waste. Journal of environmental management, 231, 86-97. https://doi.org/10.1016/j.jenvman.2018.10.034

[8] Arel, H. Ş. (2016). Recyclability of waste marble in concrete production. Journal of Cleaner Production, 131, 179-188. https://doi.org/10.1016/j.jclepro.2016.05.052

[9] Uygunoğlu, T., Topçu, İ. B., & Çelik, A. G. (2014). Use of waste marble and recycled aggregates in self-compacting concrete for environmental sustainability. Journal of cleaner production, 84, 691-700. https://doi.org/10.1016/j.jclepro.2014.06.019

****