Review Form 3

Journal Name:	**Journal of Engineering Research and Reports**
Manuscript Number:	**Ms_JERR_120927**
Title of the Manuscript:	**Research Progress on the Mechanical Properties and Frost Resistance of Ultrafine Fly Ash Concrete**
Type of the Article	**Review Article**

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PART 1: Review Comments

Compulsory REVISION comments	**Reviewer's comment**	**Author's Feedback** *(Please correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)*
Please write a few sentences regarding the importance of this manuscript for the scientific community. Why do you like (or dislike) this manuscript? A minimum of 3-4 sentences may be required for this part.	This manuscript is significant for the scientific community as it explores the potential of ultrafine fly ash to enhance the mechanical properties and frost resistance of concrete. By transforming waste material into a valuable additive, it contributes to environmental sustainability and advances green building technologies. The detailed analysis of ultrafine fly ash's physical and chemical properties, along with its impact on concrete performance, provides a solid foundation for further research and practical applications. I appreciate the manuscript's comprehensive approach and its potential to drive innovation in construction materials. However major concerns should be addressed first.	
Is the title of the article suitable? **(If not please suggest an alternative title)**	The current title, **"Research Progress on the Mechanical Properties and Frost Resistance of Ultrafine Fly Ash Concrete,"** is quite descriptive and informative. However, a more concise and engaging title could be considered: **"Enhancing Concrete with Ultrafine Fly Ash: Mechanical Strength and Frost Resistance"** This alternative title captures the essence of the research while being more succinct.	
Is the abstract of the article comprehensive? Do you suggest the addition (or deletion) of some points in this section? Please write your suggestions here.	The abstract of the article is quite comprehensive, covering the key aspects of the research on ultrafine fly ash concrete. However, here are a few suggestions for improvement: • **Highlight Key Findings**: Mention specific improvements in mechanical properties and frost resistance due to ultrafine fly ash. • **Quantify Benefits**: Include quantitative data, such as percentage improvements or specific values, to provide a clearer picture of the benefits. • **Clarify Limitations**: Briefly mention any limitations or challenges associated with using ultrafine fly ash in concrete. • **Future Research**: Suggest areas for future research to give readers an idea of the next steps in this field. These additions can make the abstract more informative and engaging for readers.	
Are subsections and structure of the manuscript appropriate?	Here are some key points: • **Abstract**: Provides a concise summary of the research, highlighting the significance and findings. • **Introduction**: Introduces the topic, importance of fly ash, and sets the stage for the research. • **Characteristics of Ultrafine Fly Ash: Detailed discussion on physical properties, chemical composition, and fineness** • **Impact on Concrete**: Explores the mechanical properties and frost resistance of ultrafine fly ash concrete. • **Conclusion**: Summarizes the findings and emphasizes the potential applications and future research directions.	
Please write a few sentences regarding the scientific correctness of this manuscript. Why do you think that this manuscript is scientifically robust and technically sound? A minimum of 3-4 sentences may be required for this part.	• **Environmental Impact**: While the article highlights the environmental benefits of using fly ash in concrete, it glosses over the significant environmental and health risks associated with fly ash disposal and its potential toxicity. • **Early Strength and Durability: The article acknowledges that incorporating fly ash can decrease the early strength and durability of concrete but fails to provide a comprehensive analysis of the long-term implications and potential structural risks.** • **Research Gaps**: Despite discussing the benefits of ultrafine fly ash, the article does not adequately address the existing research gaps and the need for more extensive studies to validate the claimed improvements in mechanical properties and frost resistance. • **Practical Application**: The article's optimistic view on the practical application of ultrafine fly	

	ash in concrete overlooks the challenges and limitations in large-scale implementation, such as cost, availability, and consistency in quality.	
Are the references sufficient and recent? If you have suggestions of additional references, please mention them in the review form. -	**There is major concrete material studies that must be reviewed:** 1. Owais, Mahmoud, and Lamiaa K. Idriss. "Modeling green recycled aggregate concrete using machine learning and variance-based sensitivity analysis." *Construction and Building Materials* 440 (2024): 137393. 2. Idriss, Lamiaa K., and Mahmoud Owais. "Global sensitivity analysis for seismic performance of shear wall with high-strength steel bars and recycled aggregate concrete." *Construction and Building Materials* 411 (2024): 134498. 3. Owais, Mahmoud, and Ghada S. Moussa. "Global sensitivity analysis for studying hot-mix asphalt dynamic modulus parameters." *Construction and Building Materials* 413 (2024): 134775.	
Minor REVISION comments **Is the language/English quality of the article suitable for scholarly communications?**	No **Simplify Complex Sentences**: • Original: "Fly ash, a fine residue captured from the flue gas of coal combustion, can be incorporated into concrete to transform waste into valuable material, achieving environmental benefits such as energy savings and emission reductions."1 • Suggested: “Fly ash, a fine residue from coal combustion, can be added to concrete, turning waste into a valuable material and providing environmental benefits like energy savings and emission reductions.” **Clarify Technical Terms**: • Original: "By mechanically grinding raw fly ash, ultrafine fly ash with finer particles and a larger specific surface area can be produced, exhibiting improved morphology and reactivity."2 • Suggested: “Grinding raw fly ash produces ultrafine fly ash with smaller particles and a larger surface area, which improves its shape and reactivity.” **Improve Flow and Coherence**: • Original: "Consequently, the activity and micro-aggregate effects of ultrafine fly ash can be fully utilized, forming denser C-S-H gel, optimizing the concrete microstructure, and significantly enhancing the mechanical properties and frost resistance of concrete."3 • Suggested: “As a result, ultrafine fly ash fully utilizes its activity and micro-aggregate effects, forming denser C-S-H gel, optimizing the concrete’s microstructure, and significantly enhancing its mechanical properties and frost resistance.” **Avoid Redundancy**: • Original: "This provides a foundation for further research on the application of ultrafine fly ash in concrete."4 • Suggested: “This lays the groundwork for further research on using ultrafine fly ash in concrete.” • These changes aim to make the abstract more concise and easier to understand. Let me know if you need further assistance!	
Optional/General comments	None.	

PART 2:

	Reviewer’s comment	**Author’s comment** *(if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)*
Are there ethical issues in this manuscript?	*(If yes, Kindly please write down the ethical issues here in details)*	

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