UNIVERSITY of GREENWICH

Information on Postgraduate Research Scholarship - Ref: Eng-PhD-16-25			
Faculty:	Engineering and Science	**Department:**	School of Engineering
Lead Supervisor:	Professor CD Hills		
Project Title:	Autogenous Digenesis (cold sintering) of calcareous waste		
Project Description: (maximum 500 words)	The aim of this doctoral studentship is to develop a novel method to solidify calcareous process waste fines, such as those generated from quarrying activities. The solid products arising from a managed process that replicated diagenesis (lithification), are expected to be suitable for use in construction. The replication of diagenesis in a managed 'step' in anthropogenic timescales, has potential to add value to troublesome wastes that would otherwise end up in landfill. Further, is envisaged that it will be possible to design the physical and mineralogical properties of the product(s). There are several 'drivers' for this work, including sustainable use of waste resources, and that fine industrial process wastes are soon to be subject to the higher rate of UK landfill tax. A process that imparts value to a 'negative'-value waste is timely. The student will investigate the chemical and physical environment(s) pertaining to diagenesis and use this knowledge to replicate the diagenetic process in a managed setting. Solid monolithic products with desirable/designed engineering properties will be manufactured. Potential feedstock materials include Ca-rich industrial process wastes, limestone quarry fines and 'difficult' calcareous virgin materials. A managed step, as described, will impart value and enable a more sustainable approach to the management of difficult waste and a design-approach to the production of alternative construction products. Objectives are to: 1. Define the natural conditions under which calcareous sediments are lithified 2. Modify a reactor vessel to replicate the key conditions 3. Obtain and investigate fine waste/sediments suitable for processing to define the process boundaries 4. Produce solidified products for assessment using appropriate materials standards 5. Conduct a LCA and business case for the process derived. The approach to be explored involves the managed replication of the action of pore waters in nature. Calcareous materials will be partially solubilised and then precipitated in a managed way that causes the material of interest to become solidified.		

	Materials and process variables will be explored including pressure/temperature relationships, sample pre-compaction, grading and surface area and whether catalysts can be used to enhance the chemical process involved. The solidified products will be characterised for their chemical, mineralogical and engineering properties. The process will be subject to an LCA and TEA to support potential scale-up/commercialisation. This scholarship is awarded competitively, and all applications are carefully reviewed. While we cannot guarantee an offer, we encourage strong candidates to apply.
Duration:	3 years, Full-Time Study or 6 years, Part-Time Study

Support available (subject to satisfactory performance):

A successful Home candidate will receive:

- A Full tuition fee waiver at the university Home-student rate for the specified duration of the scholarship

A successful International candidate will receive:

- A tuition fee waiver for 50% of the International-student rate for the specified duration of the scholarship.

Tuition fees are subject to annual increases.

This scholarship does not include funding for living expenses.

Person Specification of Essential (E) or Desirable (D) requirements:	
Criteria:	**E or D**
Education and Training:	
• 1st Class or 2nd class, First Division (Upper Second Class) honours degree or a taught master's degree with a minimum average of 60% in all areas of assessment (UK or UK equivalent) in a relevant area to the proposed research project	**E**
• For those whose first language is not English and/or if from a country where English is not the majority spoken language (as recognised by the UKBA), a language proficiency score of at least IELTS 6.5 (in all elements of the test) or an equivalent UK VISA and Immigration secure English Language Test is required, if your programme falls within the faculty of Engineering and Science a language proficiency score of at least IELTS 6.5 overall with a minimum of 6.0 in all elements of the test or an equivalent UK VISA and Immigration secure English Language Test is required. Unless the degree above was taught in English **and** obtained in a majority English speaking country, e.g. UK, USA, Australia, New Zealand, etc, as recognised by the UKBA.	**E**
Experience & Skills:	
• Demonstrable experience of undertaking laboratory research (e.g. at undergraduate or taught master's dissertation level)	**E**
• Experience of mineralogical and microstructural analysis using e.g., XRD, SEM and TG.	**D**

• A good understanding of relevant chemistry/materials science.	**E**
• Experience in technical/scientific report writing.	**D**
• Experience in safe handling of laboratory chemicals/reagents	**D**
Personal Attributes:	
• Understands the fundamental differences between a taught degree and a research degree in terms of approach and personal discipline/motivation	**E**
• Able to, under guidance, complete independent work successfully	**E**
Other Requirements:	
• This scholarship may require Academic Technology Approval Scheme approval for the successful candidate if from outside of the EU/EEA	**E**
• The scholarship must commence before 15th July 2026 (offers will be withdrawn if this condition is not met)	**E**
Closing date for applications:	***midnight UTC on 20th February 2026***
For further information contact:	***Prof. CD Hills; E: hc34@gre.ac.uk T:+44 208 331 9800***

Making an application:

Please read this information before making an application. Information on the application process is available at: https://www.gre.ac.uk/research/study/apply/application-process. Applications need to be made online via this link. **No other form of application will be considered**.

All applications **must include** the following information. **Applications not containing these documents will not be considered.**

- **Scholarship Reference Number (*insert reference*)**– included in the personal statement section together with your personal statement as to why you are applying
- **a CV including 2 referees** *
- **academic qualification certificates/transcripts and IELTs/English Language certificate if you are an international applicant or if English is not your first language or you are from a country where English is not the majority spoken language as defined by the UK Border Agency** *

**upload to the qualification section of the application form. Attachments must be a PDF format.*

Before submitting your application, you are encouraged to liaise with the Lead Supervisor on the details above.