



## Job Description

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| <b>Job title</b>         | Research Associate in Civil Engineering  |
| <b>Department/School</b> | Architecture and Civil Engineering   |
| <b>Job family</b>        | Education and Research   |
| <b>Grade</b>             | 7  |
| <b>Reporting to</b>      | Dr Kevin Paine (PI)  |
| <b>Responsible for</b>   | There may be a requirement for:<br>day to day co-supervision of doctoral or undergraduate students |
| <b>Location</b>          | University of Bath premises  |

### Background and context

Microcracking of concrete is commonplace and can lead to rapid deterioration of our civil infrastructure due to the ingress of harmful compounds. The University of Bath has been working with collaborators to develop concrete with a self-healing capability that closes microcracks as they appear. The approach at Bath is to utilise bacteria to induce the precipitation of calcite within the cracks. Whilst the approach works well at laboratory scale using unreinforced mortars, there are a number of challenges with regard to its application in structural concrete. Some of these challenges relate to how the material is used (where and where it is needed in structural concrete), while other challenges are related to the conditions experienced in some structures (cyclic damage, effect on concrete durability and effects on reinforcement corrosion).

### Job purpose

The purpose of the position is to provide research expertise and to undertake research work to overcome application issues relating to the use of bacteria-based self-healing concrete in structures and buildings. The research will form part of the EPSRC Resilient Materials for Life (RM4L) programme grant ([www.rm4l.com](http://www.rm4l.com)). A central aspect will be close collaboration with our collaborators at Cardiff, Cambridge and Bradford universities in providing appropriate solutions.

This particular work will be carried out under the supervision of Dr Kevin Paine (PI) and Professor Andrew Heath (co-I) within the Department of Architecture and Civil Engineering. Assistance with microbiology, where required, will be provided by the

RM4L team in Bath's Biology and Biochemistry department led by Dr Susanne Gebhard (co-I).

| <b>Main duties and responsibilities</b> |   |
|---|---|
| <b>1</b>                                | Conduct collaborative research to overcome and understand application issues relating to the use of bacteria-based self-healing concrete. Contribute to the design and execution of the project e.g. timetabling and meeting project milestones; participating in regular discussions with collaborative partners. Generate, collect and analyse existing data related to the project using qualitative and/or quantitative techniques. |
| <b>2</b>                                | Writing up results of research and contributing to the publication of results in high-quality peer-reviewed academic literature.  |
| <b>3</b>                                | Disseminating results of research project as appropriate to the discipline through activities such as <ul style="list-style-type: none"> <li>• overseas research visits</li> <li>• conference presentations</li> <li>• public engagement activities</li> </ul>  |
| <b>4</b>                                | Participate in departmental/group meetings and prepare and deliver presentations/seminars to project team, internal and external stakeholders or funders.   |
| <b>5</b>                                | Assist with the supervision of postgraduate students and undergraduate project students and the assessment of student knowledge.  |
| <b>6</b>                                | Continually update knowledge and understanding in field or specialism to inform research activity.  |
| <b>7</b>                                | Identify sources of funding and provide assistance with preparing bids to funding bodies. Develop ability to secure own funding e.g. travel grants.   |
| <b>8</b>                                | Contribute to the development of research objectives and proposals for own or joint research projects, with assistance of a mentor, if required.  |
| <b>9</b>                                | Disseminate knowledge of research advances to inform departmental teaching.   |
|   | You will from time to time be required to undertake other duties of a similar nature as reasonably required by your line manager. You are required to follow all University policies and procedures at all times and take account of University guidance.   |

## Person Specification

| Criteria   | Essential | Desirable |
|--|-----------|-----------|
| <b>Qualifications</b>  |           |           |
| A PhD degree in civil engineering, or equivalent significant relevant experience and professional qualification  | √         |           |
| <b>Experience/Knowledge</b>  |           |           |
| Post doctoral experience   |           | √         |
| Demonstrated significant depth and breadth of specialist knowledge of subject matter to contribute to research programmes and to the development of departmental research activities | √         |           |
| Demonstrated awareness of latest developments in the field of research and in research design  | √         |           |
| Demonstrated potential to publish in high quality, peer reviewed journals  | √         |           |
| <b>Skills</b>  |           |           |
| Ability to prepare research proposals, to conduct individual research work and to disseminate results  |           | √         |
| Ability to organise and prioritise own workload to meet required deadlines   | √         |           |
| Ability to write research reports and to effectively disseminate outcomes  | √         |           |
| Excellent oral, interpersonal and written communication skills   | √         |           |
| Proficiency in appropriate techniques (as appropriate to discipline)   | √         |           |
| Proficiency in IT skills (as appropriate to discipline)  | √         |           |
| <b>Attributes</b>  |           |           |
| Commitment to working within professional and ethical codes of conduct   | √         |           |
| Innovation and developing creative solutions   | √         |           |
| Commitment to excellence in research   | √         |           |

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|---|---|--|
| Enthusiasm and self-motivation  | √ |  |
| Tenacity – working to achieve own and team objectives and to overcome obstacles | √ |  |
| Ability to be an effective team worker  | √ |  |
| Commitment to safe working practices  | √ |  |