

**Jobbnorge ID:** 297596  
**Deadline:** 4/5/2026  
**Website:** <http://www.ntnu.no>  
**Scope:** Fulltime  
**Duration:** Temporary

The Department of Structural Engineering has a vacancy for a

## PhD in Durability of Airport Concrete under Frost, De-icing Salts, and Impact Loading

### This is NTNU

NTNU is a broad-based university with a technical-scientific profile and a focus in professional education. The university is located in three cities with headquarters in Trondheim.

At NTNU, 9,000 employees and 43,000 students work to create knowledge for a better world.

You will find more information about working at NTNU and the application process [here](#).

Video: <https://youtu.be/Xt-yHCN5QS0>

### About the position

We have a vacancy for a PhD Candidate in Concrete Materials Science at the Department of Structural Engineering. The position is part of a multidisciplinary research environment involving materials science, structural engineering, and mechanics. The PhD project, titled "Airport Concrete Exposed to Frost, De-icing Salts, and Impact Loading", will be carried out in collaboration between the Concrete research group and SIMLab.

The Concrete group is a team of enthusiastic scientists dedicated to the study of all aspects of concrete. Our research interests range from the material to the structural level and are based on theoretical, numerical, and experimental investigations.

The PhD candidate will be supervised by Professor Stefan Jacobsen and Professor Tore Børvik at NTNU, in collaboration with Dr. Sumita Dey from the Norwegian Defence Estates Agency.

### About the project

Durability of concrete infrastructure is important for safe transport, more sustainable use of resources etc. In winter climates, freeze-thaw cycles and de-icing salts is a severe exposure condition. Achieving reliable frost resistance is therefore important for infrastructure, like roads, bridges, airfields, offshore installations, hydropower dams etc.

The project investigates and develops new methods for producing unreinforced airport pavements made of low-carbon concrete that are resistant to exposure to salt-frost conditions and impact loading. The project will be carried out through experimental work in the institute's laboratories, in addition to some work in other laboratories (for example CT scanning at the Department of Physics).

The new methods include various alternatives to traditional air-entrainment in the form of so-called "solid air voids," such as superabsorbent polymers, microspheres (solid air, master air, etc.), cork powder, and soft and/or porous fibers. Other approaches include gas formation in fresh concrete before hardening, preventing ice formation in the concrete's pore system (PEG-PVA, producing concrete with very low porosity consisting only of gel pores, i.e., high-strength concrete).

The laboratory investigations include material characterization, studies of fresh, young, and hardened concrete (including hydration), determination of the size distribution of air/macropores, capillary pores, and gel pores using CT scanning, sorption measurements and characterization of the moisture state, modelling of freezable water, frost exposure testing, and mechanical characterization including strength, DIC, dynamic loading (gas gun, shock tube, or similar). There is also the possibility of full-scale experiments, including trial production of airport pavement slabs in collaboration with, for example, project owner, contractor, material producers, and equipment suppliers.

### Duties of the position

- Complete the doctoral education until obtaining a doctorate
- Carry out research of good quality within the framework described above
- Academic publications and popular science dissemination
- Participate in the [Concrete research group](#)

- Participate in international activities such as conferences and research stays abroad
- Teaching
- Other career-promoting work

Be prepared for changes to your work duties after employment.

## Required selection criteria

- You must have a relevant Master's degree in Structural Engineering or equivalent. Your course of study must correspond to a five-year Norwegian course, where 120 credits have been obtained at master's level
- You must have a strong academic background from your previous studies and have an average grade from your Master's degree study, or equivalent education, which is equal to B or better compared to [NTNU's grading scale](#). If you do not have letter grades from previous studies, you must have an equally good academic foundation. If you have a weaker grade background, you may be considered if you can document that you are particularly suitable for a PhD education
- You must meet the requirements for admission to the faculty's [Doctoral Programme in Engineering](#).
- You must be fluent in spoken and written English

PLEASE NOTE: For detailed information about what the application must contain, see paragraph "About the application".

The appointment is to be made in accordance with [NTNUs guidelines for recruitment positions](#) and [Regulations for the degrees philosophiae doctor \(ph.d.\) and philosophiae doctor \(ph.d.\) in artistic development work at the Norwegian University of Science and Technology \(NTNU\)](#) for general criteria for the position.

## Preferred selection criteria

- Experience with concrete materials, cementitious materials, or construction materials
- Experience with experimental laboratory work and material characterization
- Knowledge of concrete durability, particularly related to freeze-thaw or salt-frost exposure
- Experience from full scale production in the civil engineering industry
- Experience with mechanical testing and data analysis of materials
- Interest in conducting field experiments

## Personal characteristics

To complete a doctoral degree (PhD), it is important that you are able to:

- Work independently
- Work in a structured way, set goals and make plans to achieve them
- Present and discuss your research with other professionals
- Get involved and contribute constructively with feedback
- Work constructively under pressure or in the face of adversity
- Show curiosity and a strong motivation for the subject
- Analyze data, assess different perspectives and draw well-founded conclusions
- Be flexible and open to adjusting the plan for the project as needed

Emphasis will be placed on personal qualities.

## We offer

- An exciting job with an important [mission](#) in society
- Developing tasks in a strong and international professional environment
- Career guidance and [follow-up during the PhD period](#)
- Open and inclusive working environment with committed colleagues
- [Mentor programme](#) as a [new employee at NTNU](#)
- Favorable terms as a member of the [Norwegian Public Service Pension Fund \(SPK\)](#)
- Free Norwegian language training at a basic level ([A2](#)).

As a PhD Candidate at NTNU, you will have access to [employee benefits](#).

## Diversity

Diversity is a strength, and at NTNU we aim to be an employer that reflects the diversity in society and that makes use of the potential of the population's collective skills. Our vision is [Knowledge for a better world](#) and [our values are creative, critical, constructive and respectful](#). We believe that an organization that is equal, diverse and gender-balanced is essential for us to achieve our goals.

We strive to attract employees with different skills, life experiences and perspectives to contribute to even better problem solving of our societal mission in research and education.

If you think this position is relevant and interesting, we encourage you to apply, regardless of gender, functional ability and cultural background, or whether you have been out of work for a period of time.

At NTNU we want to increase the proportion of women in scientific positions. We have a number of [measures](#) to promote equality.

## Salary and conditions

In the position of PhD Candidate, code 1017, your gross salary will normally be NOK 550 800,-per annum depending on qualifications and seniority. A 2% statutory contribution to the State Pension Fund is deducted from the salary.

The employment period is 3 years.

For employment as a PhD Candidate, it is a prerequisite that you gain admission to the [PhD programme in Engineering](#) within three months of your employment contract start date, and that you participate in an organized doctoral programme through out the period of employment.

As an employee at NTNU, it is important that you keep yourself up to date with academic and organizational changes and adapt to them.

For the necessary professional and social interaction, it is a prerequisite that you are physically present and available to the institution on a daily basis.

The engagement is to be made in accordance with the regulations in force concerning [State Employees and Civil Servants](#), and the acts relating to [Control of the Export of Strategic Goods, Services and Technology](#). Candidates who by assessment of the application and attachment are seen to conflict with the criteria in the latter law will be prohibited from recruitment to NTNU. Please note that the candidate holding the announced position is expected to work with critical infrastructure and areas affected by control of the export of strategic goods, services and technology. Candidates with the potential of not fulfilling requirement for security clearance, access clearance and authorization as described in the Act Relating to National Security, The Export Control Act and Act on the Implementation of International Sanctions (Sanctions Act) cannot be considered for the position.

## About the application

The attachments (including a description of your scientific work) must accompany the application as these documents form the basis of the application assessment. The documents must be in Norwegian/a Scandinavian language or English.

Please note: the application will only be assessed on the basis of the information we have received by the application deadline. Therefore, make sure that your application clearly shows how your skills and experience meet the criteria described above. The application and all attachments must be sent electronically via [Jobbnorge.no](#). If you are invited to an interview, you must bring certified copies of certificates and diplomas upon request.

The application must include:

- Transcripts and diplomas for Bachelor's and Master's degrees
- CV
- Copy of Master's thesis. If you have recently submitted your Master's thesis, you can attach a draft of the thesis. Documentation of a completed Master's degree must be presented before taking up the position.
- Short letter of motivation (400 words/1 page)
- Possibly publications etc. other relevant research work
- Names and contact information of three relevant referees

If all, or parts, of your education has been taken abroad, we also ask you to attach documentation of the scope and quality of your entire education, both Bachelor's and Master's education, in addition to other higher education. If your institution uses "diploma supplement" (normal for most European institutions), you must attach this. A description of the documentation required can also be found [here](#). If you already have a statement from [Norwegian Directorate for Higher Education and Skills \(HK-dir\)](#), please attach this as well.

Joint work will be considered. If it is difficult to identify your contribution to joint work, you must attach a brief description of your participation.

When assessing the best qualified, we emphasize necessary qualifications such as education, experience and personal suitability. Motivation for the position, ambitions, and potential for research will also count when assessing the candidates.

NTNU recognizes a wide range of academic contributions and has committed itself to [The San Francisco Declaration on Research Assessment](#) and [CoARA](#) (responsible assessment of research and recognition of a greater breadth of academic contributions in accordance with NTNU's social mission).

## General information

A public list of applicants with name, age, job title and municipality of residence is prepared after the application deadline. If you wish to be exempt from entry on the public applicant list, this must be justified. Assessment will be made in accordance with [current legislation](#). You will be notified if the exemption is not granted.

If you think this position looks interesting and in line with your qualifications, you are welcome to apply.

If you have any questions about the position, please contact professor Stefan Jacobsen, telephone +47 [97666987](#), email: [stefan.jacobsen@ntnu.no](mailto:stefan.jacobsen@ntnu.no).

If you have any questions about the recruitment process, please contact HR Consultant June Hovde, e-mail: [june.b.hovde@ntnu.no](mailto:june.b.hovde@ntnu.no).

**Application deadline: 07.04.2026**

-----

For practical information about [working at NTNU, please visit this webpage.](#)

[The city of Trondheim](#) is a modern European city with a rich cultural scene. [Trondheim is the tech capital of Norway](#) with a population of 200,000. The Norwegian welfare state, including healthcare, schools, kindergartens and overall equality, is probably the best of its kind in the world. Professional subsidized day-care for children is easily available. Furthermore, Trondheim offers great opportunities for education (including international schools) and possibilities to enjoy nature, culture and family life and has low crime rates and clean air quality.

# NTNU - knowledge for a better world

## NTNU - knowledge for a better world

The Norwegian University of Science and Technology (NTNU) creates knowledge for a better world and solutions that can change everyday life.

### Department of Structural Engineering

We teach mechanical engineering, engineering and ICT, and civil and environmental engineering. The Department conducts internationally leading research and participates in several large national research projects. [The Department of Structural Engineering](#) is one of eight departments in [the Faculty of Engineering](#).

### Additional information

#### Place of service:

Høgskoleringen 1 7491 Trondheim (Trondheim Municipality)