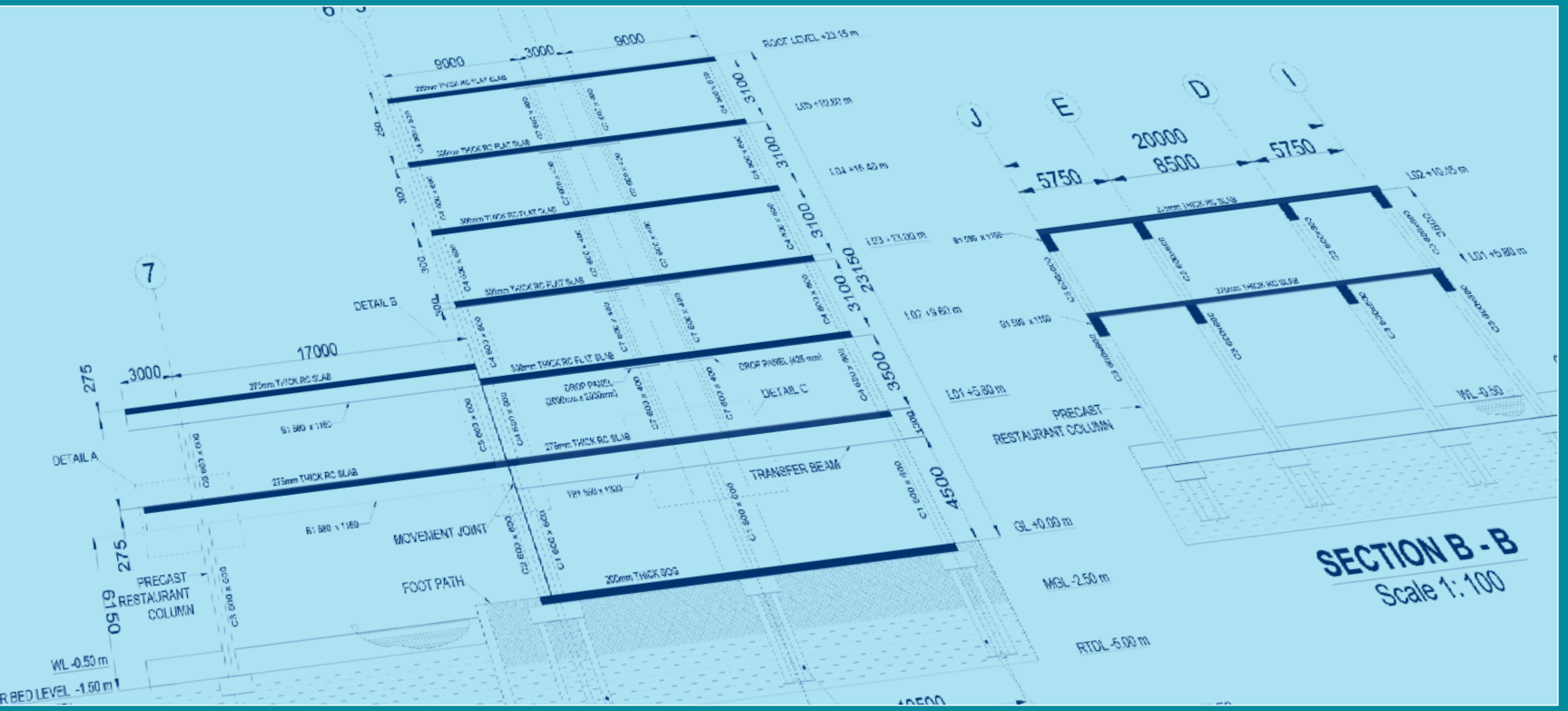
Structural Concrete 2026



The Concrete Centre Student Structural Competition

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mpa The Concrete Centre

The Concrete Centre provides material, design and construction guidance. Its aim is to enable all those involved in the design, use and performance of concrete to realise the potential of the material as a long lasting and sustainable choice. The Concrete Centre provides published guidance, seminars, courses, online resources and industry research to the design and academic communities. For more information on The Concrete Centre visit **www.concretecentre.com**.

The Concrete Centre is part of the Mineral Products Association, the trade association for the aggregates, asphalt, cement, concrete, dimension stone, lime, mortar and industrial sand industries.

CARES

CARES is the leading independent international constructional steels product certification body delivering confidence in the performance, provenance and quality of safety-critical reinforcement products entering the construction supply chain. With a proud track record of providing assurance to users, designers, consultants and specifiers spanning four decades, CARES' data-led inspection and certification services provide valuable transparency into the provenance and sustainability characteristics of constructional steels moving across complex global supply chains.

Clients and specifiers can specify CARES-approved reinforcement suppliers with confidence that the product will comply with the relevant product standard without the need for costly, on-site testing.

For further information please go to the CARES website:
www.carescertification.com

Introduction

Structural Concrete 2026 sets a demanding challenge for all students studying structural design as part of UK University BEng, MEng and MSc degree courses in Civil and / or Structural Engineering.

The competition aims to encourage interest and raise competence in designing with concrete. It offers a stimulating challenge to students, while supporting the curricula of Civil and Structural Engineering Departments of UK Universities. The main benefit for a student is in being able to present his/her work to prospective employers, some of whom are involved in setting and judging the competition. The national winners will be presented with their prizes at a ceremony in London where their award winning entries will be presented to the audience.

There will also be a sustainability award for the student who demonstrates the best understanding of this subject in their submission.

These awards reflect a significant commitment from the judges who, together with The Concrete Centre, have carefully developed this year's competition. Initiative, creativity, aesthetic appreciation and accuracy are called for, and will be assessed by the judges. Above all, this competition has been designed to stretch the technical competence of the students taking part.

Because it is so flexible, Structural Concrete 2026 can easily be incorporated into existing university curricula, with a content that reflects an independent project, a group project or a module assessment run over the first, second or both semesters of the academic year.

DOWNLOAD ENTRY FORM

This year's challenge…

The 2026 project is to design a luxury residential building forming part of an extensive redevelopment of a former industrial site close to the centre of a large UK town.

The client, a property developer, has commissioned an initial structural design for the development, to be known as Portland House, from a firm of consulting engineers. The building includes an underground basement with private car parking, a leisure development on the ground floor, and a further four floors of luxury residential accommodation. Entrants must respond as though they are the structural engineer responsible within the consultant's team.

Hoola residential development, London. A concrete core forms the structural backbone of each tower, and this supports oval, in-situ concrete floor plates and the glazed facade at their perimeter, along with the distinctive precast concrete balconies. Image: Jack Hobhouse.

1. Project brief: Portland House

Portland House forms part of an extensive redevelopment of a former industrial site close to the centre of a large UK town. The new building comprises an underground basement, a private leisure development on the ground floor, and a further four floors of luxury residential accommodation. The client, a property developer, has commissioned an initial structural design from a firm of consulting engineers.

The new building is to be developed on the corner site shown in Figure 1 (for all figures see pages 6 and 7). The client wishes to maximise the number of apartments on the plot so there is little space on the site outside the building plan. The construction method chosen for the scheme should therefore minimise the requirement for layout space on site. The building plan and site boundaries are shown in the drawings.

Underground car parking will be provided for some of the residents, with surface parking for other residents. Staff and clients of the leisure complex use a surface car park to the south shared with an adjacent and already completed part of the development.

Vehicle access to the basement car park will be via a ramp at the east end of the building. The vehicle ramp does not have to be designed at the present time. The layout of parking spaces and access to use the available space to best advantage has already been determined: see Figure 2. Columns may be located only between bays or behind the bays. A floor to soffit height of 2.4m is required throughout the basement. Stairs lead from the basement to the ground floor.

The ground floor will provide space for luxury leisure facilities. The intended ground floor layout is shown in Figure 3. The floor to soffit height of the ground floor is 3.75m, which includes an appropriate allowance for services. While the client does not wish to be prescriptive about the structural arrangement, positioning of vertical structural elements within units should be avoided as far as is reasonable. Access from the ground floor to the residential floors is via lift or stairs in the tower located on the north elevation of the building.

Above the leisure facilities, four floors of luxury residential accommodation are to be constructed. A typical residential floor layout is shown in Figure 4. The floor to soffit height is 2.75m, including an appropriate allowance for services. Access will be via stairs or lift in the tower. To enable internal fitting out of apartments to suit individual customer requirements, the client requires that internal columns/walls be located only along the line of party walls, while internal columns within the apartments are not permitted. The location of two service routes is shown, and requires a void in the floor slab of 0.75m x 2.4m within each zone.

At roof level, all servicing plant including water tanks, heating boilers and lift mechanism are to be located on top of the stair/lift tower and screened by a 3.0m high enclosure on external faces. The enclosure screen itself does not have to be designed.

Planning considerations dictate the use of faced precast concrete cladding panels on the façade. Because the high quality cladding forms a significant component of the cost of the building, the depth of floor construction plus services should be as small as practicable to minimise the overall height of the building.

The client would prefer a construction solution which would minimise the time taken on site and would welcome proposals from the structural engineer that might enhance the visual appeal of the building, which is being targeted at the luxury end of the housing market

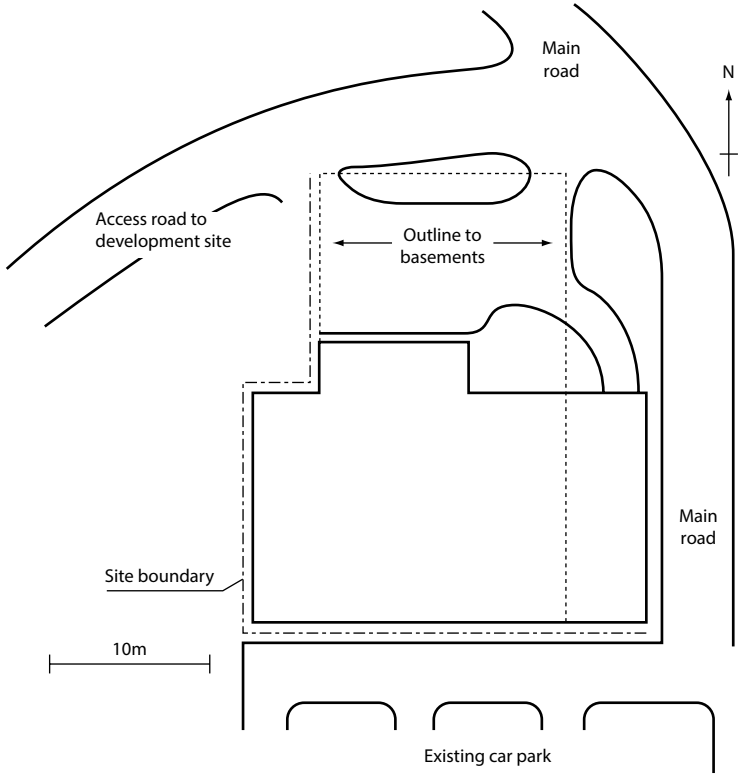

Figure 1
Site Plan

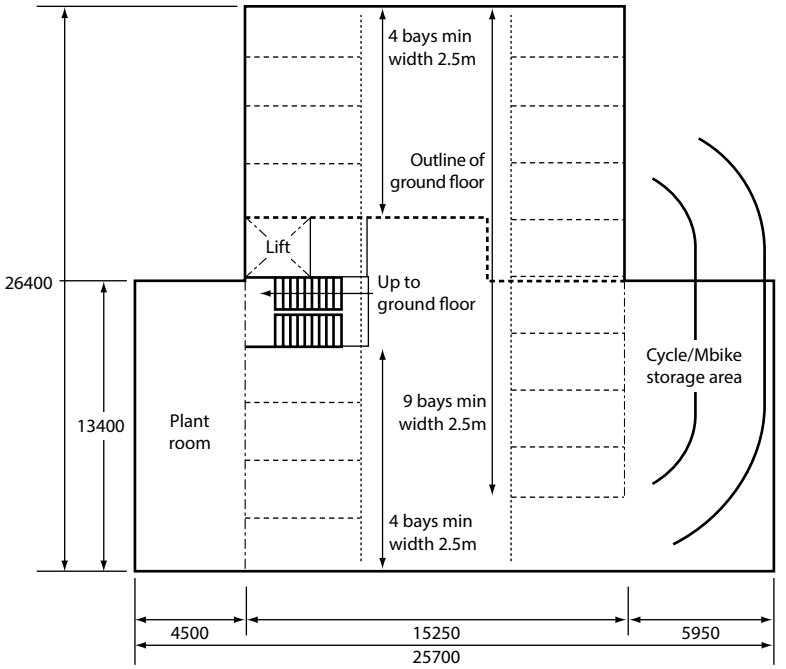

Figure 2
Basement Level - General Arrangement

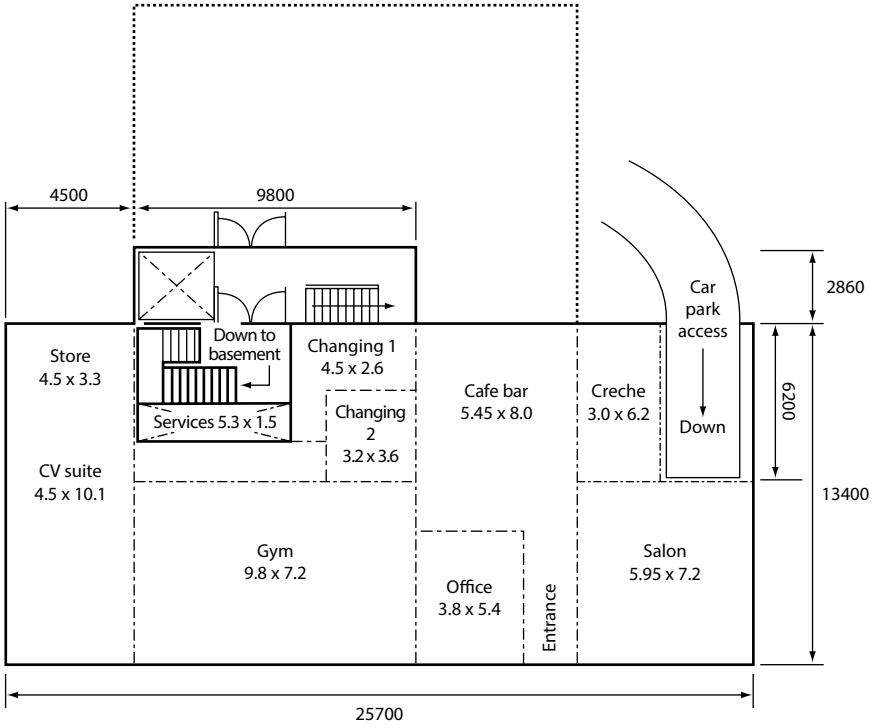

Figure 3
General Arrangement - Ground Floor Plan

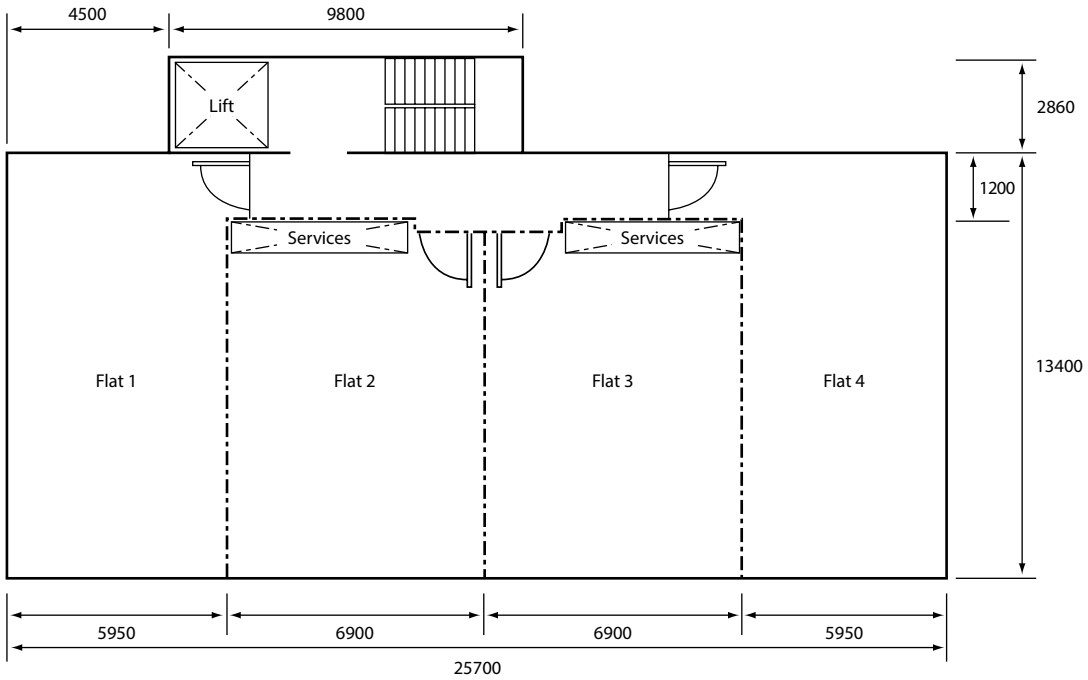

Figure 4
General Arrangement - Typical Residential Floor Plan

2. Design data

Verification of structural viability should be carried out in accordance with Eurocodes. Entrants should clearly state in their submission which documents have been used in their calculations. Materials specifications should be defined to the current British Standards. Fire resistance of 90 minutes is required.

2.1 Loadings

2.1.1 Dead loads

Dead loads of structural elements: as found.

Cladding: an average value of 2.4kN/m^2 of elevation may be taken.

2.1.2 Imposed loadings

Plant room (including roof)	7.5kN/m^2
Other areas of roof not zoned for plant	0.75kN/m^2
Residential floors (including allowance for internal partitions but not party walls)	2.5kN/m^2
Corridors and stairs	3.0kN/m^2
Party walls	4.3kN/m^2 on elevation
Ground floor	4.0kN/m^2
Basement	2.5kN/m^2

These loadings include an allowance for raised floors, ceilings and services.

To the north of the building, the basement roof is required to carry vehicular traffic. This area should be designed for an imposed loading of 10kN/m^2

All values are characteristic values.

2.2 The site

2.2.1 Exposure conditions

The site is level, situated near the centre of a large town. The principal axis of the building superstructure is oriented in an east-west direction.

The fundamental basic wind speed should be taken as 22m/sec (based on the 10 minute mean wind speed as given in BS EN 1991-1-4:2005).

Snow loading may be neglected.

2.2.2 Ground conditions

Description	Depths below ground level	Soil data
Made ground	GL to 3.4m	
River terrace deposits (sand and gravels)	From 3.4m to 9.8m	N=20 Density 1940kg/m^3
Stiff clay	From 9.8m to 35.7m	Cu=150KPa
Bedrock	Below 35.7m	

Ground water was encountered in sample boreholes at approximately 2.4m. There may be seasonal variations in groundwater level, but monitoring of one standpipe over the period Oct-April shows a maximum groundwater level of 2.0m.

3. Submission requirements

The submission is to comprise four components:

i. A conceptual design report

ii. Appendix 1 containing calculations for the selected scheme

iii. Appendix 2 containing the drawings for the selected scheme

iv. Appendix 3 containing a sustainability appraisal.

The submission must not exceed 60 single sided A4 pages and three A3 size drawings.

3.1 Conceptual design report

A maximum of 30 pages, of either 1.5 line spaced text in a maximum 11pt font, or neatly hand written in black ink, which should include:

i. An appraisal of two distinct and viable design solutions in structural concrete for the building, together with their associated slab, beam, column, wall and roof layouts. The appraisals should comprise sketches of typical bays with supporting notes, outlining the intended load paths, framing and stability functions, and some brief notes on construction methodology. The appraisal should include consideration of any uplift forces on the structure.

ii. An evaluation of the merits and disadvantages of the two solutions. The evaluation should identify significant differences such as cost, buildability and material efficiency between the two alternatives, and make a recommendation in favour of one solution.

iii. A description of the foundation scheme adopted for the preferred solution, with a rationale for the selection. A fully detailed design for the foundation scheme is not required.

iv. An outline specification for concrete and reinforcing materials.

v. A method statement for a safe construction procedure for the building.

vi. A statement of how robustness to avoid disproportionate collapse is satisfied.

3.2 Verification of structural viability

The verification of structural viability of the selected scheme should be demonstrated in Appendices to the conceptual design report to make up the balance of the report. (The maximum total length of the design report, sustainability appraisal plus Appendix is 60 pages A4. This does not include references or title pages.)

The Appendices should contain sufficient design calculations by hand to establish the form and size of all structural elements for the chosen scheme. Entrants should decide how best to convey this information within the space constraints imposed.

Calculations for individual elements should enable a checker to understand clearly their contribution to the strength and stability of the whole structure, and the load paths assumed. Hence, if computer output is presented, validation by (approximate) hand calculations is also required. Consideration should be given to performance at both Serviceability and Ultimate Limit States.

Note: Calculations are not required for stairs.

3.3 Drawings

A total of three A3 drawings should be included. Drawings may be prepared using appropriate CAD software, or by hand. In either case, notes and dimensions should not be smaller than the equivalent of an 11pt font. These drawings need not be counted in the 60-page limit.

Two of the A3 drawings should be used to present general arrangements, sections and elevations of the building to show the layout, disposition and dimensions of structural elements for estimation purposes. Drawings should be to an appropriate scale and must be dimensioned. Reinforcement details should not be shown on these two drawings.

The third drawing should show clearly annotated sketches of the following construction details:

i. The method of support for the precast cladding panels.

ii. A section through the basement wall, including the junction with basement and ground floors, and including waterproofing/tanking arrangements.

iii. A connection between the ground floor and a ground to 1st floor column, including outline reinforcement details.

3.4 Sustainability plan

The client wishes to promote the sustainability aspects of the apartments to future purchasers. Prepare a short report (maximum 3 single sided pages) discussing how your design promotes various sustainability criteria, including, but not limited to, whole life carbon, acoustics, fire protection and durability. The report should also include suggestions to the client for what might be changed within the brief to improve the sustainability aspects.

4. Assessment criteria

4.1 University

The competition will operate on two levels. Firstly, all submissions made at each university will be judged by the academic tutor(s) involved with the project. The winning submission from each university should then be entered for the national level of the competition by the tutor or a member of the team.

Only one entry from each university can go forward for final judging at a national level and the entry form must be signed by the appropriate tutor.

4.2 National

The winning entry from each participating university will be judged at national level using the following generic assessment criteria:

- Compliance with the project brief
- Safety, function, stability and robustness
- Buildability, constructability and maintainability
- Speed of construction and cost effectiveness
- Imagination, flair, aesthetic appreciation and innovation

The interpretation of the above criteria by the award judging panel will be final and feedback will not be provided.

5. Awards

5.1 University level

The winning entry from each university will receive a prize of £250. This entry will go forward to compete at national level.

5.2 National level

The winner(s) of the national competition will receive a certificate(s) and a prize of £1,250. Runner(s) up will also receive a certificate(s) and a prize of £750. The judges may decide on joint prizes in which case the above prize money will be divided up by the judging panel at its discretion. A special commendation, certificate and prize of £250 will be available for the best sustainability report. The prize-winners' universities will also receive certificates.

5.3 Presentation

The winners will be announced in a webinar to be held in August 2026. The prizes and certificates will then be presented to the winner(s), runner(s) up and winner(s) of the special commendation at an awards ceremony in London. This will be part of a seminar for practising engineers who will be able to review the winning entries. The prize-winners will be notified of further details.

5.4 Eligibility

Structural Concrete 2026 is open only to students studying for a degree at a UK university. Entries can be single, joint, or from teams of up to four students. Although the competition is aimed at students in their final years of study, entries from any other appropriate undergraduate and/or postgraduate stages will also be considered at the discretion of the academic tutor(s).

6. Rules

I. To enter the competition the university academic tutor(s) should register the university's intention to participate by either filling in the online form at www.concretecentre.com/competition or emailing The Concrete Centre at competitions@concretecentre.com. Registration will enable The Concrete Centre to provide supplementary information and/or assistance if needed.

II. The completed entry form naming the local winner should reach The Concrete Centre by either submitting online or email by Friday 12th June 2026. On receipt, The Concrete Centre will issue each competitor with a unique entry reference number.

III. Complete design entries must be received by email or into The Concrete Centre Dropbox (details will be provided to those submitting an entry), by the final deadline of 4pm on Friday 10th July 2026. The entry reference number should be clearly marked on all items forming the design entry. No other form of identification or distinguishing mark should appear on any part of the submission.

IV. A successful competitor may be required to satisfy the judges that he or she is the bona fide author of the design that he or she has submitted.

V. Any entry shall be excluded from the competition if:

- The competitor does not meet the eligibility requirements detailed in Section 5.4
- The entry is received after the competition closing date in rule III above
- The competitor discloses his or her identity, or that of the university, in the submission
- The competitor attempts to influence either directly or indirectly the decision of the award judging panel

Entry Form

Structural Concrete Student Design Competition 2026

To be submitted by no later than Friday 12th June 2026. This form is to be completed only for the entry which has been marked and selected by the academic tutor(s) for submission to the national competition. Only one entry will be permitted from each university.

University	
Name and email address of Academic Tutor(s)	

1. *I/We have complied with and accepted the rules which apply to this competition
2. *I/We agree to accept the decision of the judges as final, and agree to permit free publication and exhibition of *my/our work
3. *I/we declare that the design is *my/our work and that the drawings have been prepared by *myself/ourselves.
4. *I/we agree that any part of this work may be reproduced in publicity or other materials by The Concrete Centre as required.

*Delete as applicable

Signature student(s): .....

Signature academic tutor(s) .....

This form is to be completed by the competitor(s) and academic tutor(s) and submitted online or via email to competitions@concretecentre.com. An entry reference number will then be given, which should be marked clearly on all items forming the design entry. **No other form of identification or distinguishing mark should appear on any part of the submission**.

Please return to:
competitions@concretecentre.com

The following student or student team (maximum of four students per team) will represent the university:

Student Name			
Home Address			
Email			
Phone		Year	

Student Name			
Home Address			
Email			
Phone		Year	

Student Name			
Home Address			
Email			
Phone		Year	

Student Name			
Home Address			
Email			
Phone		Year	

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The Concrete Centre

1st Floor,
297 Euston Road
London
NW1 3AD

www.concretecentre.com

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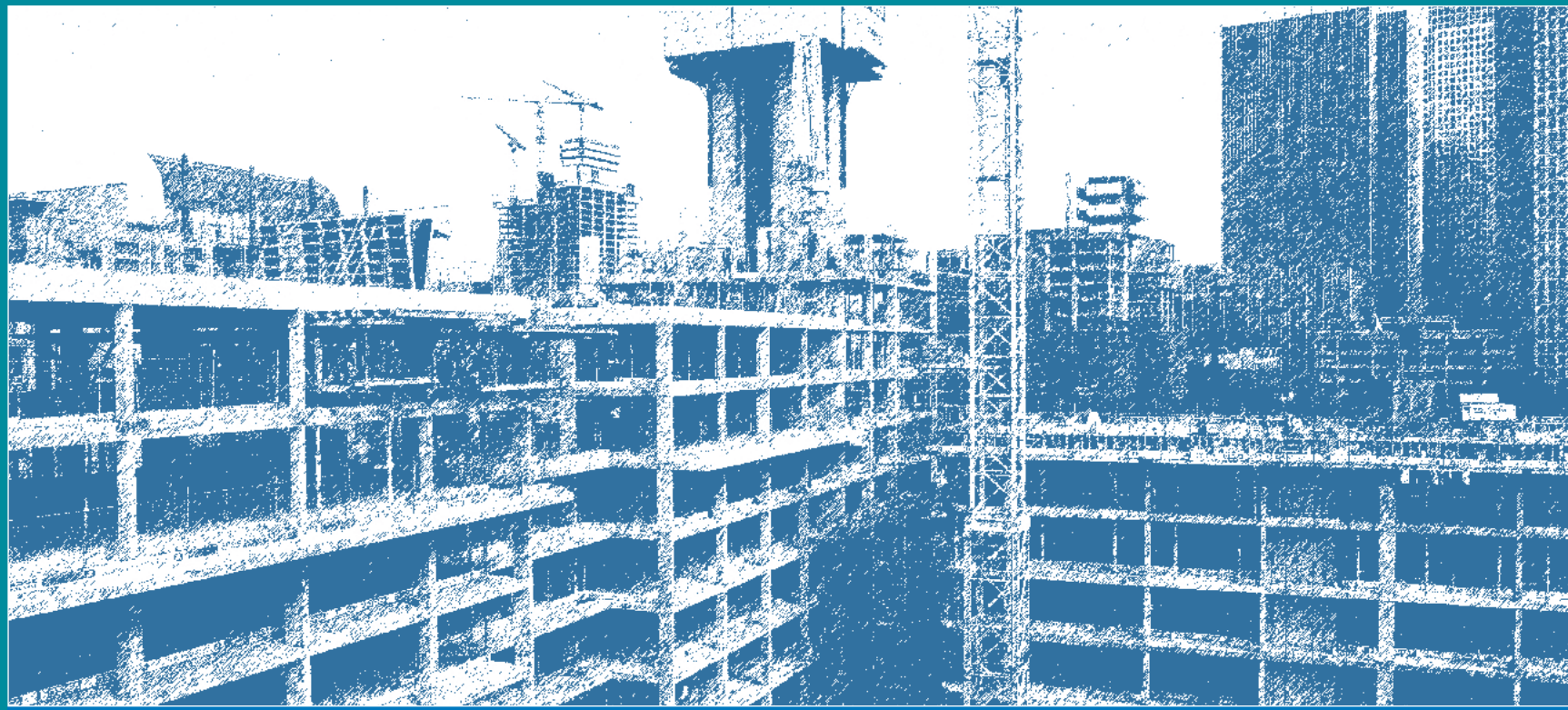
www.mineralproducts.org



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