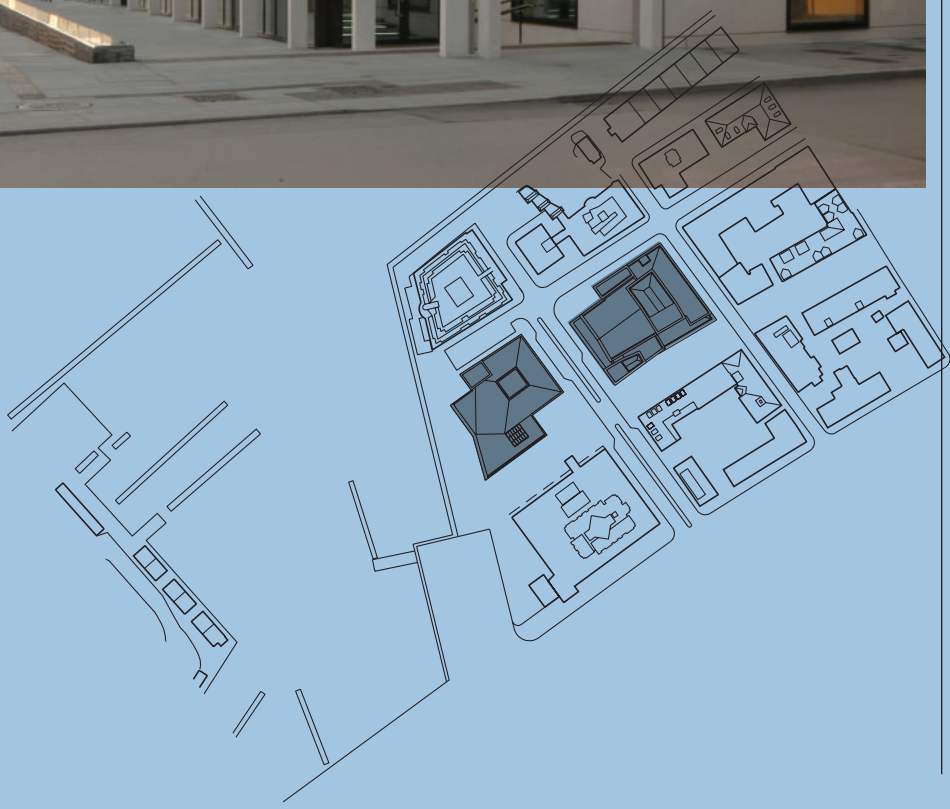
BUILDING STUDY
STORMEN CONCERT HALL AND LIBRARY, BODØ, NORWAY
DRDH ARCHITECTS





Architect's brief

Stormen is a landmark project to create a new cultural quarter for the city of Bodø, Norway, comprising two buildings by DRDH Architects: a 6,300m² library and an 11,200m² three-auditorium concert hall.

DRDH was awarded the design of the project in 2009 through an invited international competition. The invitation to compete followed a previous open competition win for the masterplan of the city's Cultural Quarter in 2008.

Both buildings respond to the particularities of their context between city and landscape, while maintaining a familial relationship that creates an urban ensemble. Externally, both facades display a trabeated construction of precast concrete with an aggregate of local white stone.

Forms rhyme between them. Roofs and towers speak to one another and the library establishes a horizon, across which the concert hall surveys the dramatic landscape of sea and mountains.

DRDH Architects has been responsible for the complete architectural design of the two buildings and cost quantification and analysis, and worked with Arup London on acoustic and theatre design.

Throughout the detailed design stages, the project has been co-ordinated through extensive use of building information modelling (BIM).

Procured through a form of construction management, the contracts have been tendered on full production information produced in London.

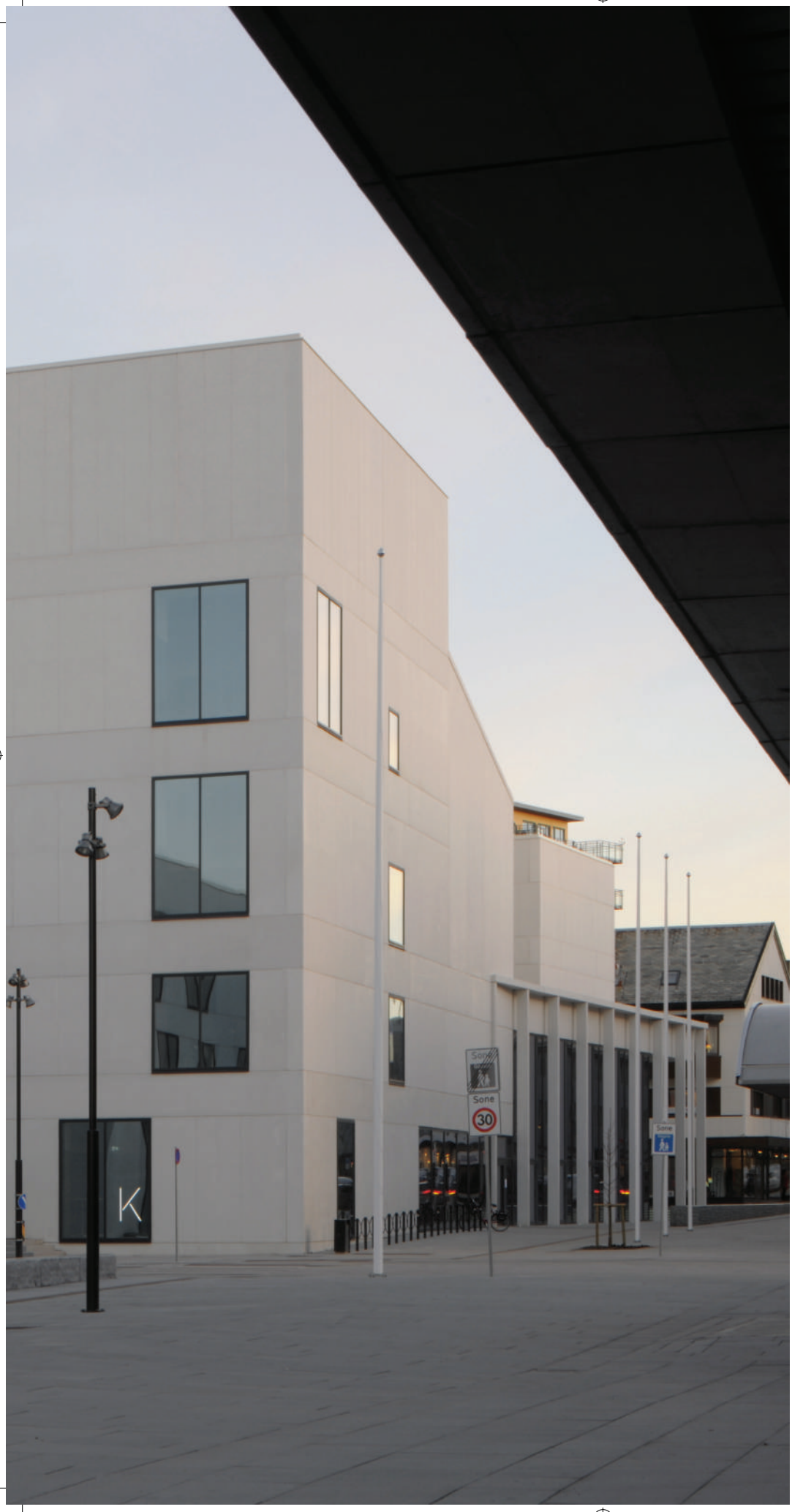
DRDH Architects has also delivered the furniture, fixings and equipment across both buildings and developed the wayfinding and signage strategy together with Oslo-based design practice Neue.

DRDH Architects

Data

Start on site December 2012
Completion November 2014
Gross internal floor area 17,500m²
Procurement Invited competition
Construction cost NOK1.18 billion (£10.3 million)
Construction cost/m² NOK674,286 (£58,723)
Architect DRDH Architects
Client (library) Bodø Kommune; Library Services University of Nordland
Client (concert hall) Bodø Kulturhus; Nordland Symphony Orchestra; Nordnorsk Opera; Bodø Sinfonietta; Sinus Rythmic Centre Music Venue
Structural/M&E/fire/lighting Norconsult/Arup
Regulation/landscapes Dark Arkitekter, Oslo
Acoustic consultant Arup Acoustics/Brekke Strand
Theatre consultant Arup Venue
Facade engineer Ramboll Facades
Cost consultant Bygganalyse, Oslo
Site management Byggteam/Sweco Norge/Ramboll
Project manager Rambøll Norge, Trondheim
Contractor Gunvald Johansen, Bodø





APPRAISAL

By Rory Olcayto
Photography by David Grandorge

There are two very old rocks in Stormen, DRDH Architects' two buildings for the Norwegian city of Bodø. Artist AK Dolmen has placed them there: one, a 19-stone lichen-covered boulder in the lobby outside a small music venue in the basement of the concert hall; the other, a five-tonne glacial grit-stone in the rooftop courtyard of the library.

They are part of Dolmen's broader art project for the landmark buildings, which encompasses landscape paintings, a talking lamppost and an enlarged photograph of native Sami people. These works draw upon local history and culture, so it's tempting to think of the boulders as the artist's way of connecting Stormen with the spectacular mountains that surround the city, but which are largely obscured from view by Bodø's introverted townscape.

Yet DRDH's cubist ensemble, monumental and integrative like a mountain, embodies this idea (and many others too) unadorned. Like the people of Bodø, Stormen is hospitable and talkative: to the hidden landscape beyond the streets outside, but to the buildings alongside it as well, to the harbour, and to citizens and visitors alike. Strange as it may sound, its off-white concrete walls and columns, its room-like staircases and lofty reading rooms, its cosy bars, and basement clubs and its regal theatre-cum-concert hall, all

painstakingly calibrated, all exquisitely constructed, exude a kind of intelligence. Poetry is useful here, so let's reach: like Byron's high mountains, Stormen, is a feeling. And that feeling is Bodø itself. Stormen is the feeling of a town.

There's no magic at play in Bodø's new buildings. Stormen feels like a living thing entirely because of science; because of relentless, empirical study. DRDH's relationship with Bodø began in March 2008 when the London-based studio won a masterplan competition to locate a new library and concert hall. Every detail of Bodø's built environment and how it is used was forensically analysed: the colour, texture and dimensions of the timber panels covering the Swedish kit houses that line the streets around the suburban airport (it's a 10-minute walk from the centre); the thickness of the stone cladding on the towering Radisson Hotel; the width of the streets; the depth of the kerbs; roof pitches; signage; vistas; teenage hotspots; the pros and cons of the covered mall. The best restaurants. The busiest pubs. Intimate moments. Collective moments. Everything that makes a place. DRDH's trick – call it architecture – has been to encode this knowledge into Stormen's fabric.

> The masterplan contest presented a choice: to regenerate or consolidate

What of Bodø's bigger story? It is the capital of Nordland, a huge county in Arctic Norway. When it was founded in 1816 as a trading post, just 55 people lived there (all men, the records show). By 1870 herring fishing had taken off and its population began to grow. In 1940, a German bombing raid left most of the town in ruins and two-thirds of its 6,000 residents homeless. Today, it plays host to Norway's civil aviation authority and the University of Nordland, and has a population of 50,000. Stormen is very much Bodø's next chapter: the newly-formed Arctic Philharmonic Orchestra is based there, and politically, it represents Norway's commitment to the wider polar region, the next emerging global market.

Much of the city today is the result of a post-war rebuild: prefabricated lightweight housing and stone-clad commercial buildings. Most are unremarkable. Some are downright terrible. But there are some exceptions. One, a civic ensemble dating from the 1950s, deserves credit: a cathedral, town hall and bandstand by Gudolf Blakstad and Herman Munthe-Kaas, that, like Stormen, was the result of an architectural competition. Its shared qualities – concrete construction, freestanding towers, and the dialogue they have with the public park they face – would be remembered by DRDH when it came to submitting its masterplan. Notably too, much of the city was laid out on a grid, albeit one muted by its low-rise profile.

DRDH founder Daniel Rosbottom says the masterplan contest presented a choice: to regenerate or consolidate. Regeneration suggested an iconic statement of some kind on a plot on the far side of the harbour, where Bodø begins to fray. This was a popular approach among contestants swayed by the popular appeal of the landmark silhouette. Yet DRDH was rightly concerned that any gains would be compromised by the longer walks to and from the site – stormy weather is not uncommon in Bodø. Consolidation on the other hand – developing a defiantly urban plot at the city centre's edge – appealed to the architect. DRDH divined an opportunity: to add to the grid, to enhance its presence, with two interdependent monumental structures addressing the harbour and town. Bodø's grandees agreed, and in March 2009 launched competitions for each building on the proposed site. For Rosbottom it was a case of 'double or quits', so DRDH entered both contests – and won.

The result is two buildings as indicated by the architect's masterplan. Freestanding, distinct – and legibly so – they are also clearly a deliberate pair: 'living rooms' for the whole of Bodø. Both buildings, for example, have columnar facades directed towards the sea. As Rosbottom explains, the forms of the library and the concert hall are dynamic; shifting and responding to the scale of the immediate context. The concert hall especially transmits monumentality and intimacy simultaneously, breaking down its bulk into a collective of smaller



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1. (*previous spread*) Concert hall with library in foreground
2. *San Giorgio Maggiore, Early Morning*, Joseph Mallord Turner, 1819
3. View of library from across Bodø's harbour
4. Main concert hall foyer on opening night
5. The auditorium can seat up to 944 people



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elements clustered around the fly tower. Each building has inflected rooflines that rhyme together, like man-made mountains. However, the pairing equally recalls both a humble harbour-side shed and a temple. When viewed from across the harbour, suggests Rosbottom, it could be an Arctic remix of St Georgio Maggiore as depicted by Turner from across the Venetian lagoon, a painting that has been an inspiration since the outset of the project. And Stormen holds the light. In the winter sun, the prefabricated panel facades take on a pinkish hue with direct light revealing a subtle two-tone texture: polished at street level, brushed above head height.

Internally the buildings have contrasting characters, despite sharing the same palette of materials, which complement and, on occasion, mimic the external expression. Each surface is made of pressed or bonded elements: ply, for example, or calcium sulphate panels.

The Concert Hall has three auditoriums compactly placed east to west across the site, with a processional route, punctuated by corner bars and long viewing galleries, leading to the central main auditorium, which seats close to a thousand people.

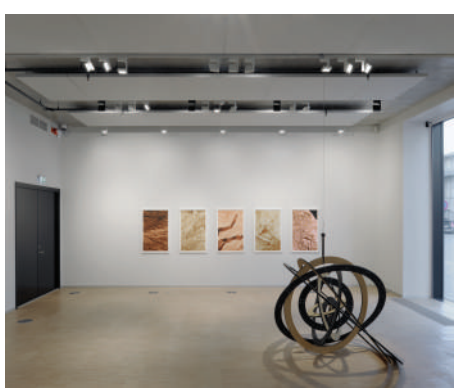
The library, conversely, is dominated by the main reading room: it is a cavernous volume overlooking the harbour and apportioned by a thunderous timber staircase and capacious, tent-like roof. It does have intimate spaces: a corner art gallery at street level and a charming top-floor children's library arranged around a courtyard. Yet the muscular reading room lingers in the mind. Rosbottom remembers watching a storm break one night, a little awestruck as sheet lightning lit up the room around him. That, in essence, is Stormen's secret: it lets the outside in.



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ENGINEER'S VIEW

The 950-capacity main hall required a variable acoustic, accommodating performances ranging from theatre with a reverberation time (RT) of about 1 sec, through to symphonic works with an RT of at least 1.8sec. This required a hall 18m wide and high, with 11,000m³ of volume.

The space is transformed in theatre mode by exposing the flytower and deploying a unique system of acoustic wall panels covering half of the side and rear walls, reducing the RT as required. In orchestral mode, these slide into enclosures behind the timber linings. Laboratory testing ensured that, when parked, these provide defined and precise limited low-frequency absorption.

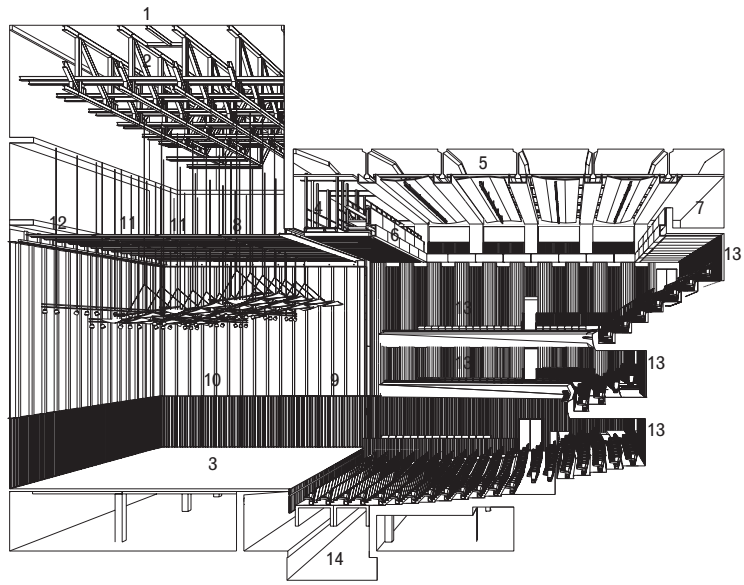
To prevent orchestral sound being lost into the flytower, the conventional compromise is a shell, aligned to the proscenium header about 10m from the stage. For a purpose-built orchestral hall, more volume is required. A unique transformation system was developed; the proscenium header and sides fold back to continue the width and height of the auditorium into the stage. Three ceiling panels are flown and hinged into place. A track system allows one person to deploy 14m-high side panels, changing the room to a proportion with the required acoustic.

Ian Knowles, director, Arup Acoustics; Patrick Haymann, project architect, main hall, DRDH Architects

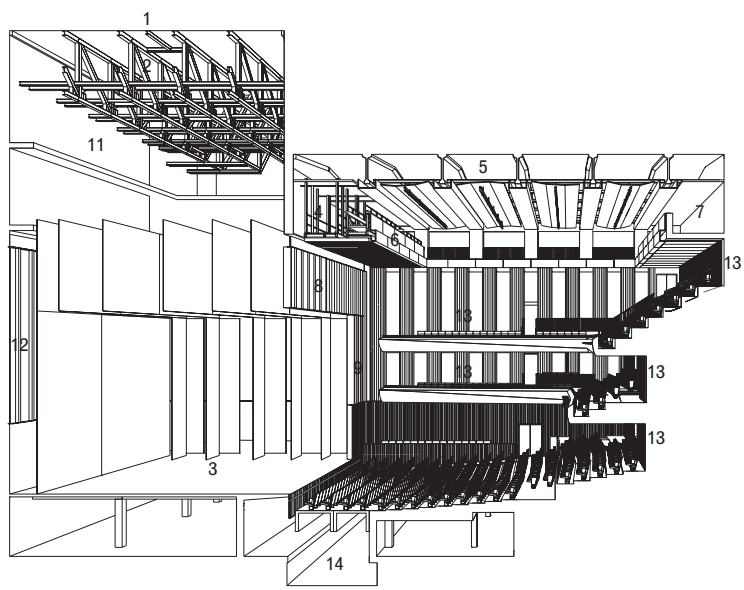


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Concert mode



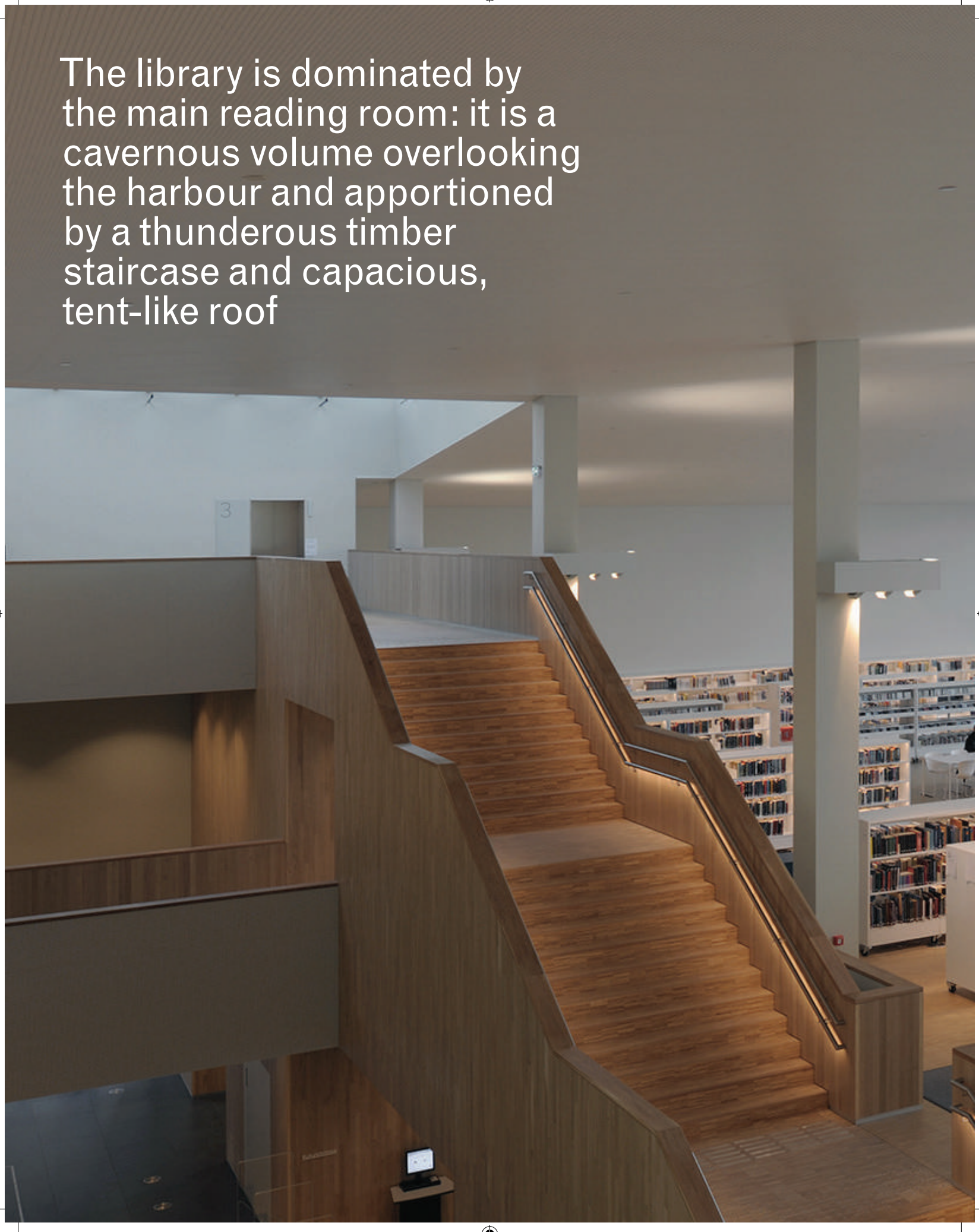
Theatre mode



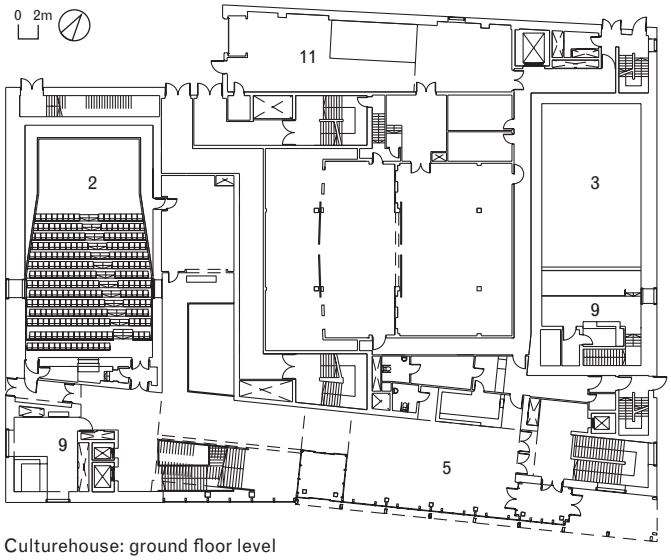
1. Flytower
2. Grid
3. Stage
4. Forestage grid and reflector
5. Ceiling Reflectors
6. Movable rigging bridge
7. Follow spot gallery
8. Hinged proscenium header
9. Hinged proscenium wall panel
10. Sliding side-wall panels
11. Flown ceiling panel
12. Hinged ceiling panel
13. Sliding absorbing wall panels
14. Orchestra pit with two orchestra lifts

6. Enclosed staircase leading from concert hall entrance foyer
7. Gallery space on library ground floor
8. Ground floor corner bar in concert hall
9. The auditorium stage configured for an orchestral performance

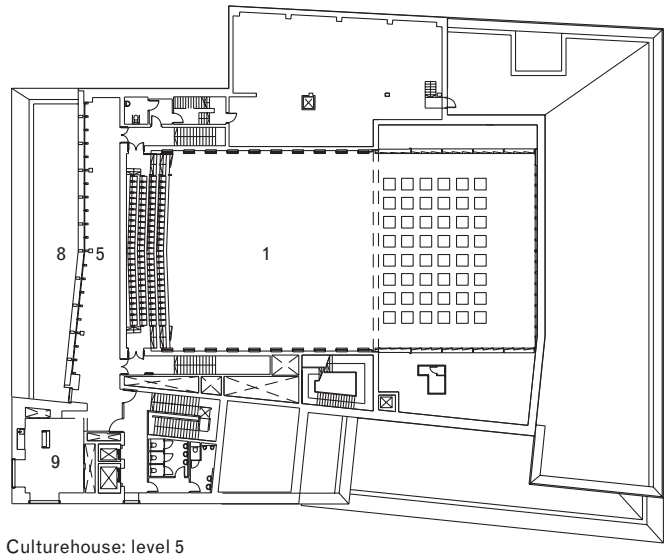
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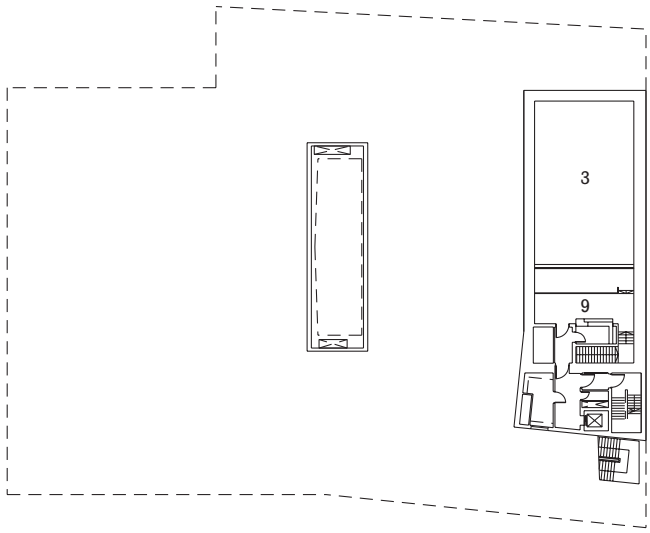




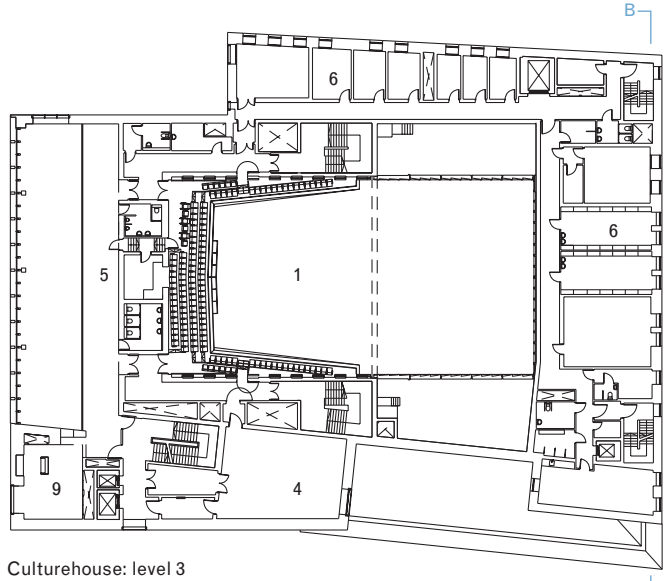
Culturehouse: ground floor level



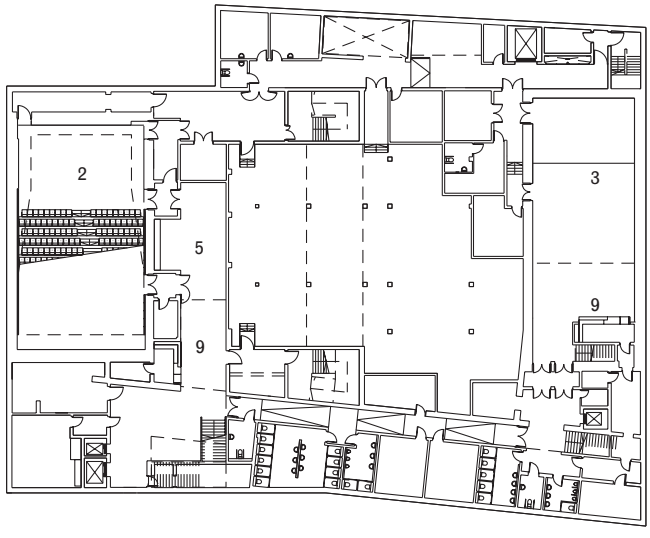
Culturehouse: level 5



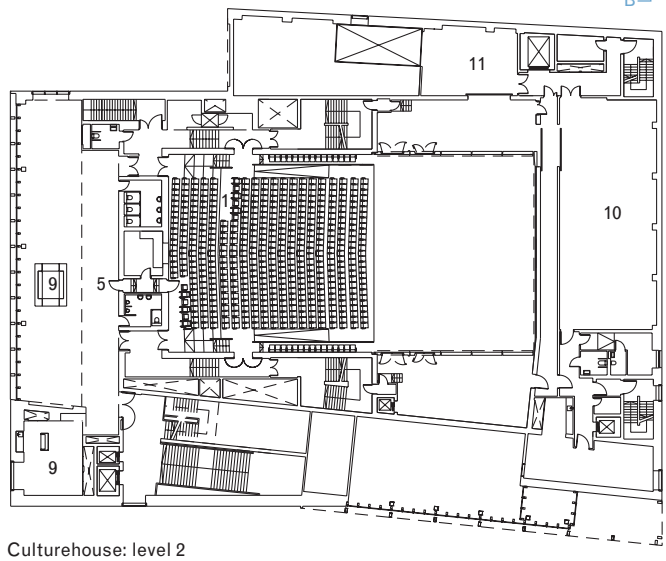
Culturehouse: basement mezzanine level



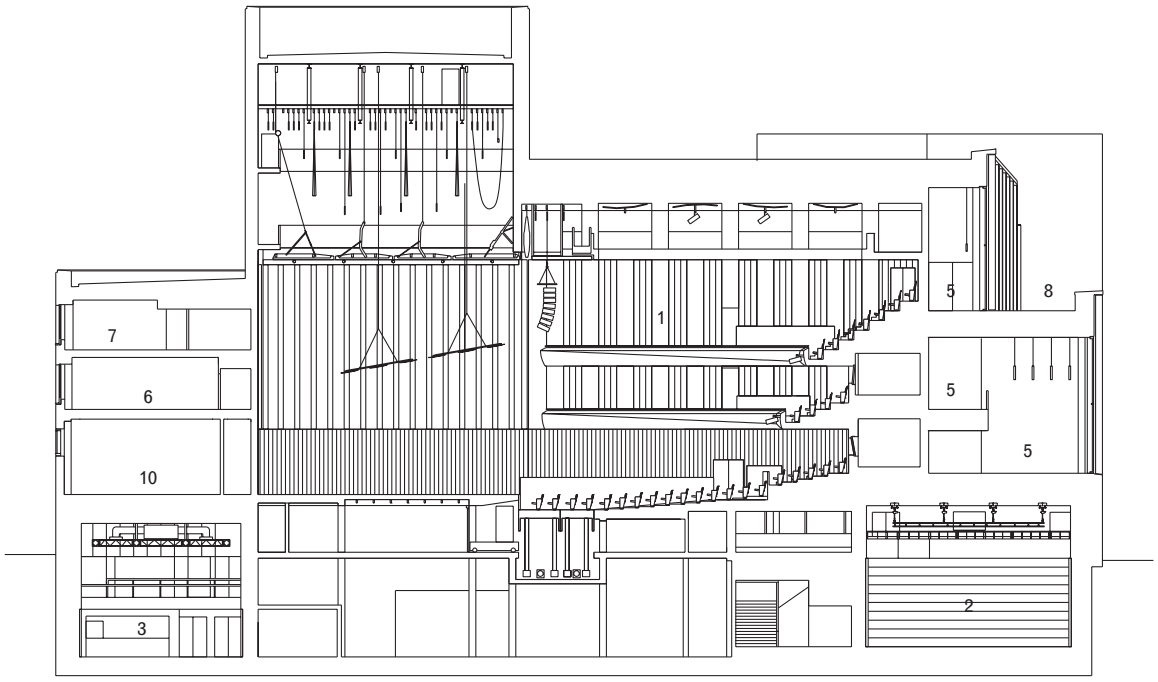
Culturehouse: level 3



Culturehouse: basement level

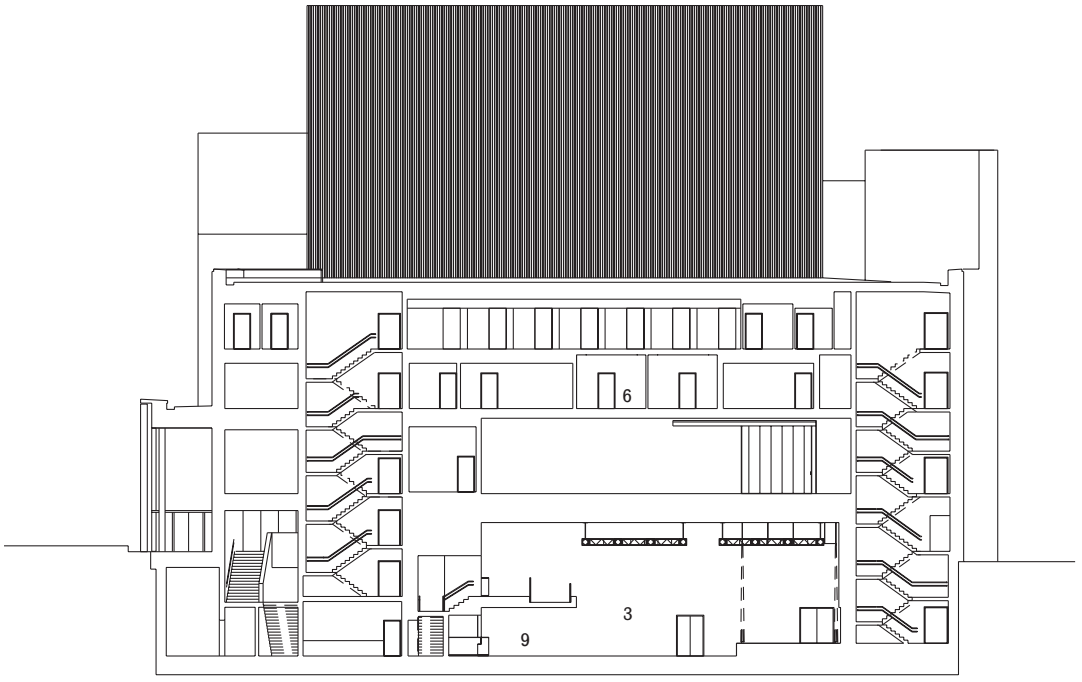


Culturehouse: level 2



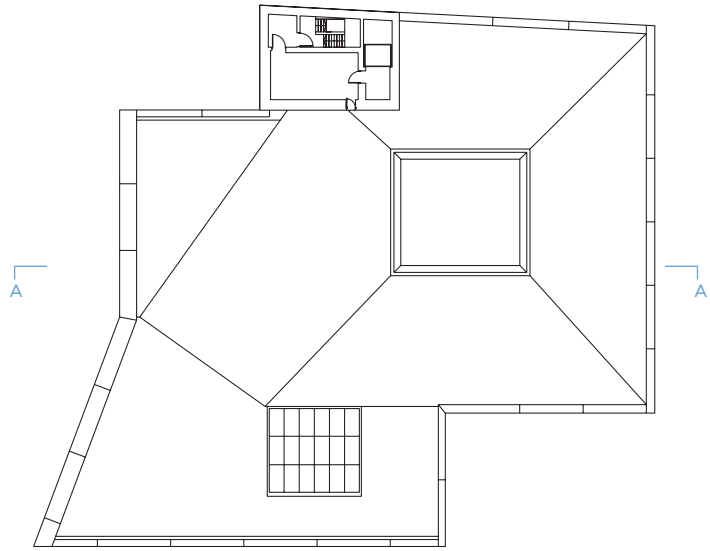
1. Main hall
2. Small hall
3. Sinus Rhythmic Centre
4. Kammersal
5. Foyer
6. Artists' area/ rehearsal room
7. Office
8. Terrace
9. Bar
10. Workshop
11. Truck loading bay

Culturehouse: section A-A

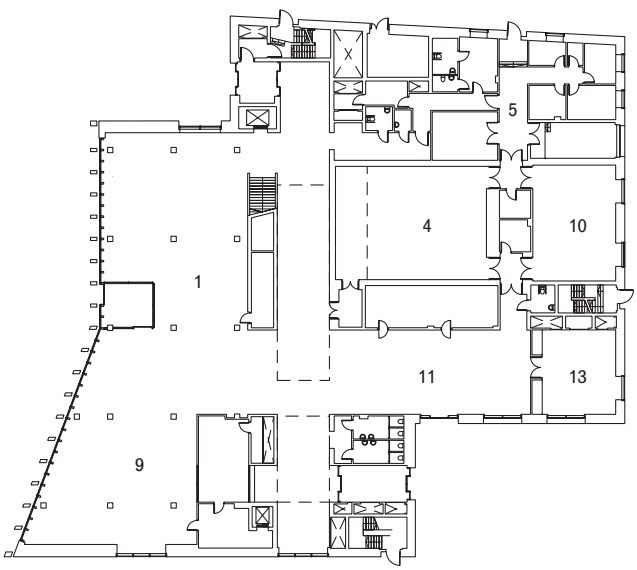


Culturehouse: section B-B

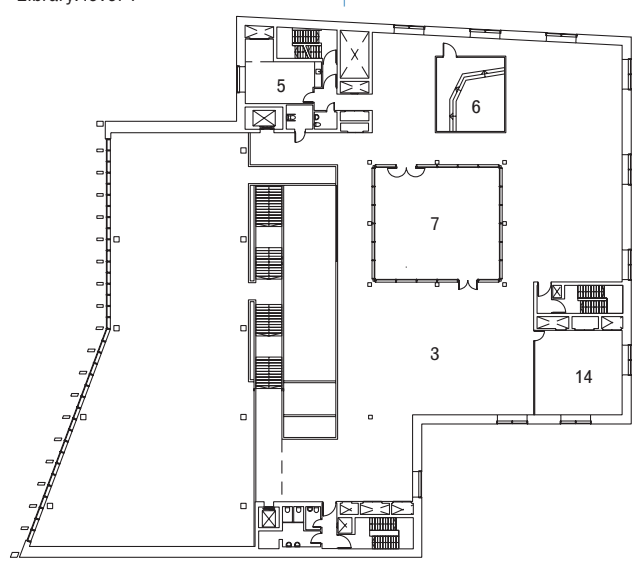
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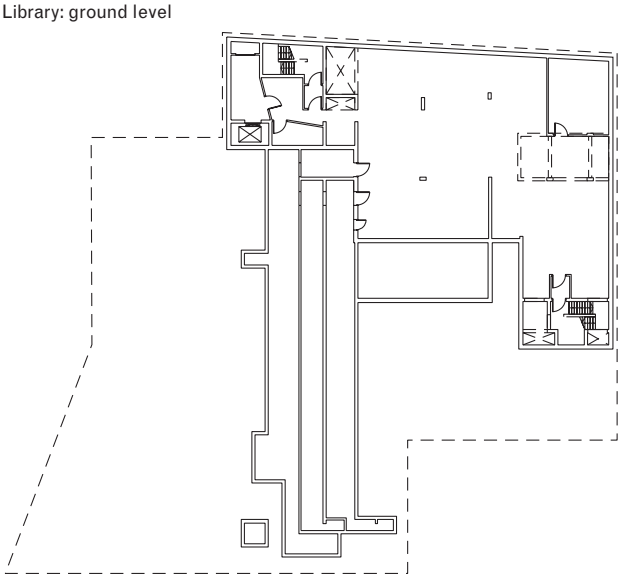
Library: level 4



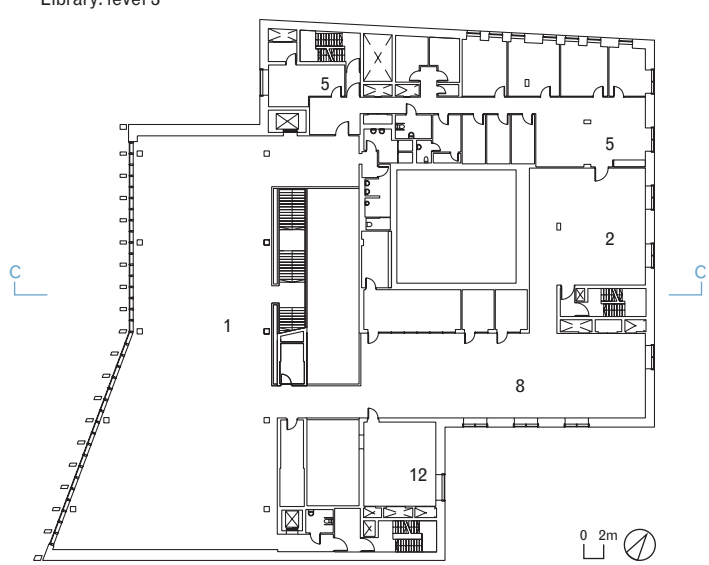
Library: ground level



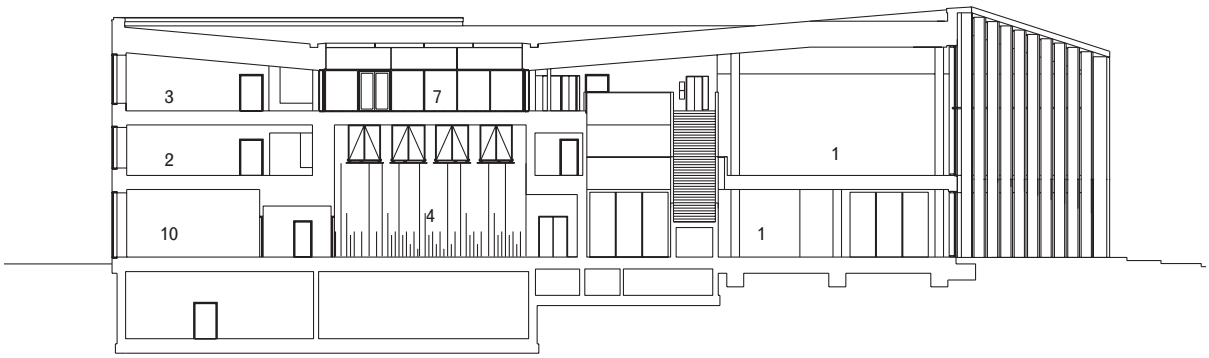
Library: level 3



Library: basement level

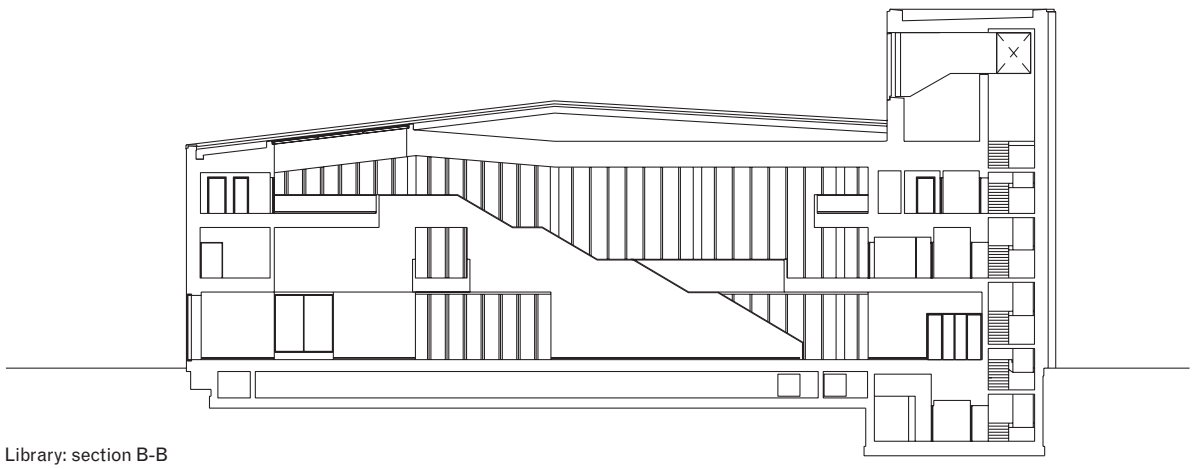


Library: level 2

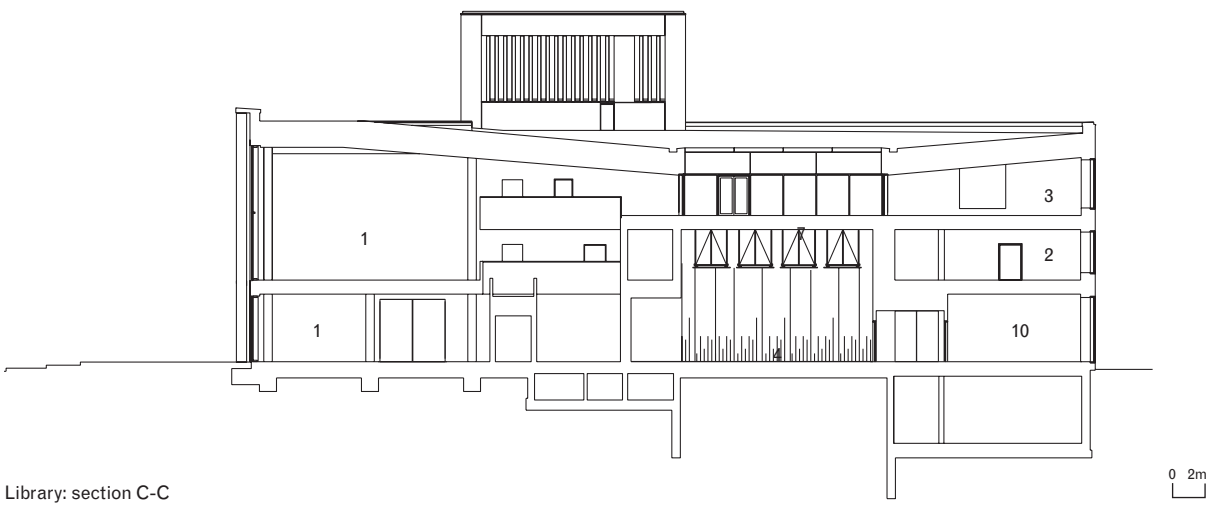


1. Adult library
2. Youth library
3. Children's library
4. Community studio
5. Staff office
6. Storytelling room
7. Courtyard
8. Media library
9. Newspapers
10. Gallery
11. Café
12. Meeting room
13. Multifunction room
14. Activity room

Library: section A-A



Library: section B-B



Library: section C-C

WORKING DETAIL

The load-bearing, precast concrete facade of the concert hall and library was fabricated in white cement with a white marble aggregate. We sought a single material that would allow the buildings to read as a coherent ensemble while suggesting the solidity, longevity and scale of more archaic masonry constructions.

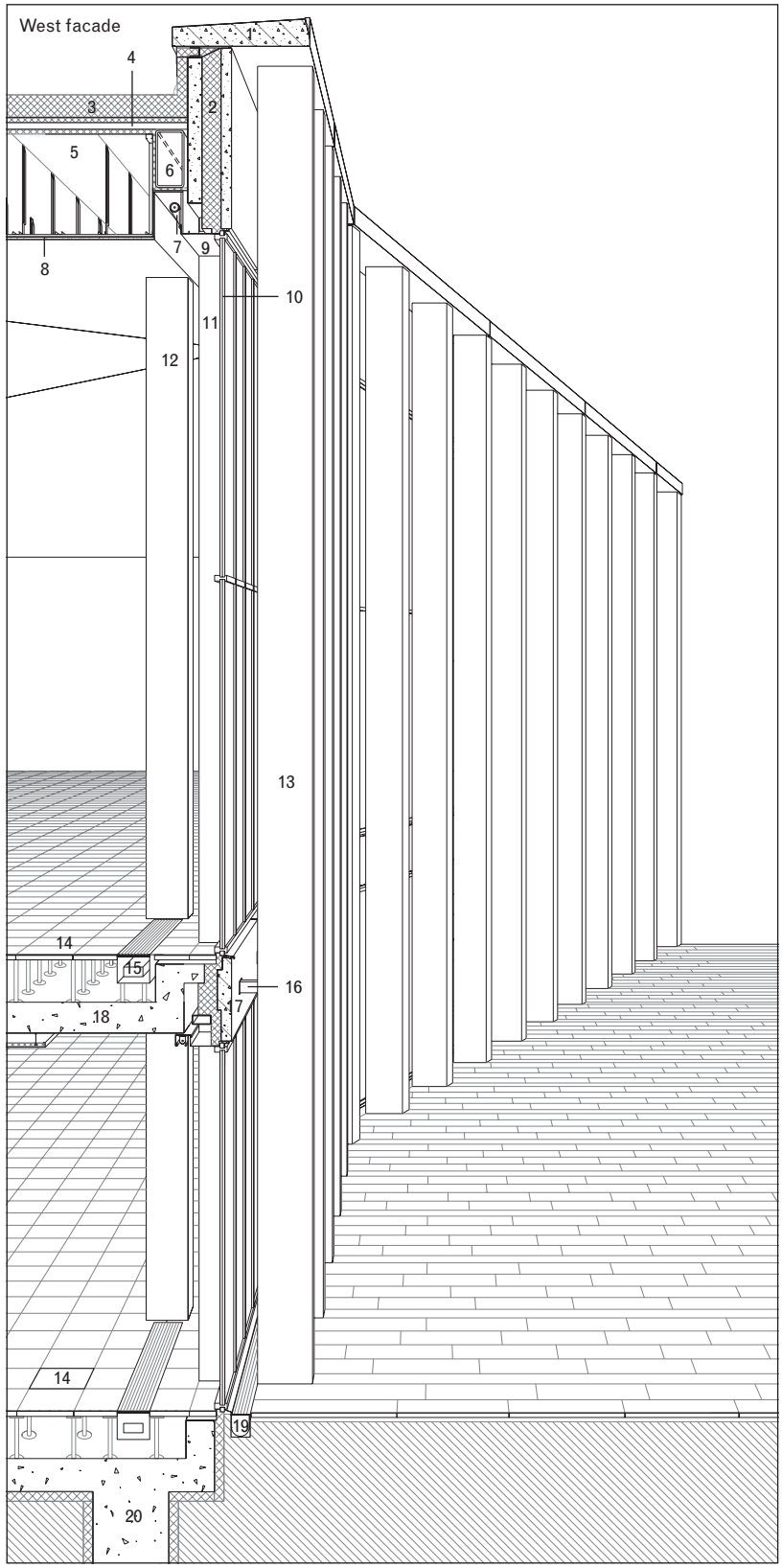
We also needed a material that could form both solid walls and slender, self-supporting fins. The fins sit in front of the curtain walling, providing solar shade, and are restrained at the top by concrete copings. Monolithic walls are formed from 460mm-thick precast sandwich panels; horizontal spandrel panels at each floor anchor the facade back to the structure, and are in-filled with larger panels or full-height glazing.

At street level the walls are polished, a treatment which continues up the face of each tower and fin, while elsewhere, a brushed finish creates a soft sheen. Recessed joints add scale and grain, while the ribbing of the fly tower recalls the timber cladding of traditional Norwegian houses. The client required us to meet SINTEF (Norwegian BRE) recommendations. Our bespoke design, developed with advice from Ramboll Facades, includes double-sealed drained cavities at all panel junctions and at interfaces with the glazing and roof.

Richard Marks, project architect, library; Ewan Stone, project architect, concert hall

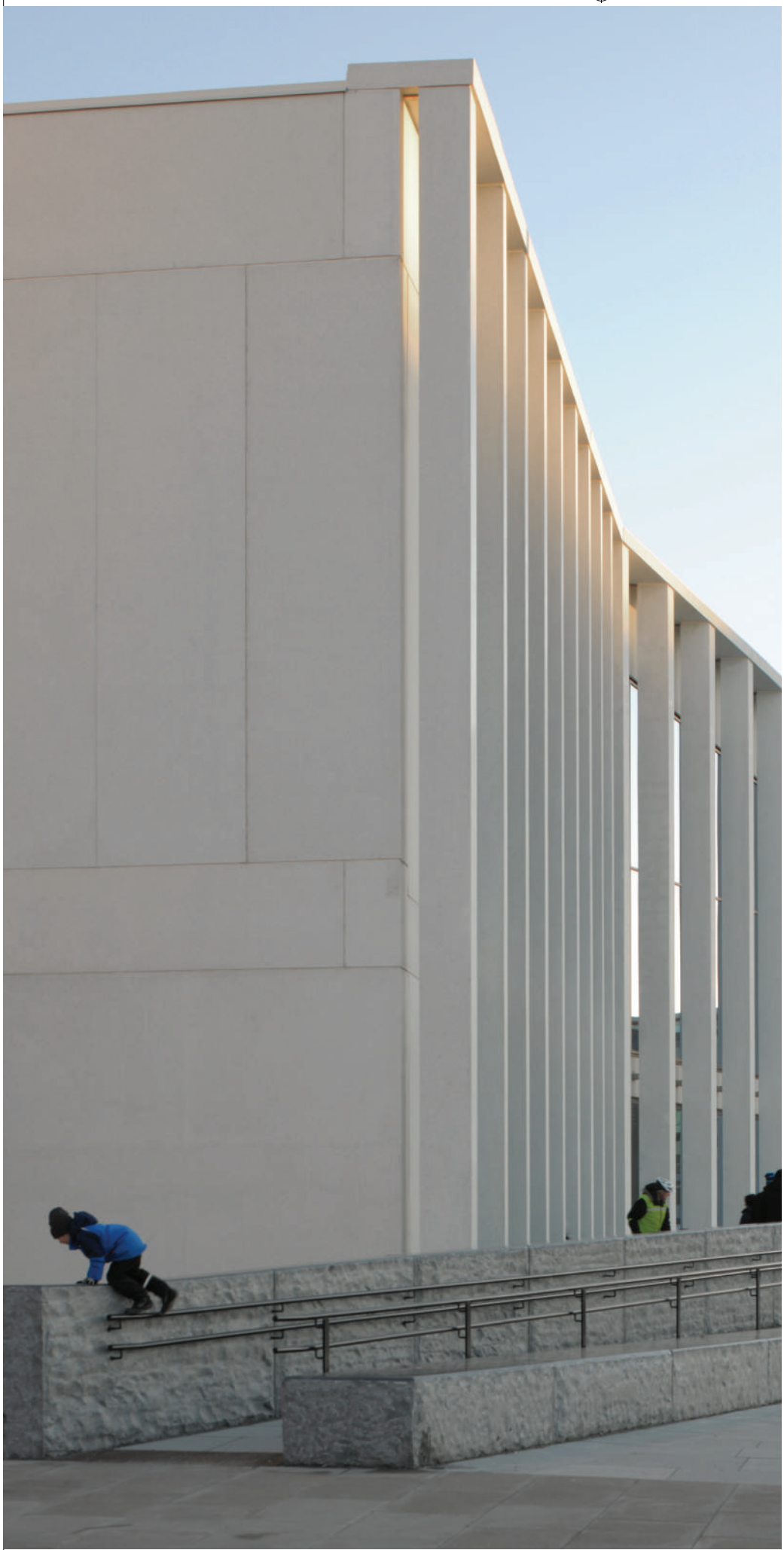


10



1. Precast concrete coping
2. Double-skin precast concrete facade panel with 200mm EPS insulation
3. Single-ply roof
4. Profiled steel sheet
5. Fire insulation
6. Primary steel frame
7. Roller blind
8. Perforated acoustic plasterboard
9. Aluminium flashing to match glazing
10. Triple-glazed, argon-filled aluminium curtain wall system
11. Steel curtain wall carrier frame mullion
12. Concrete column
13. Precast concrete fin, 300x600mm
14. Raised access floor with parquet finish
15. Trench heater
16. Stainless steel fin bracket
17. Single-skin precast concrete facade panel with 200mm EPS insulation
18. Concrete floor slab
19. External drain
20. Ground floor slab

10. View to west facade with fly tower above
11. (*opposite*) View to west facade



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