



## Museet for Danmarks Frihedskamp 1940-45

Museum of Danish Resistance 1940-45

Indbudt projektkonkurrence, København

Dommerbetækning, maj 2015

Restricted design competition, Copenhagen

Assessment panel report, May 2015

# Museet for Danmarks Frihedskamp 1940-45

**Museum of Danish Resistance 1940-45**

Indbudt projektkonkurrence, København

Dommerbetænkning, maj 2015

Restricted design competition, Copenhagen

Assessment panel report, May 2015

Redaktion:

Arkitektforeningens Konkurrenceafdeling

Grafisk tilrettelæggelse:

Styrelsen for Slotte- og Kulturejendomme

Forsideillustration: Lundgaard og Tranberg

Produktion:

Styrelsen for Slotte- og Kulturejendomme

Oplag: 100

Udgivelsesdato: 5. maj 2015

Edited by: The Competition Unit

of the Danish Architects' Association

Graphical layout: Danish Agency for

Palaces and Cultural Properties

Front page illustration: Lundgaard og Tranberg

Production:

Danish Agency for Palaces and Cultural Properties

Copies circulated: 100

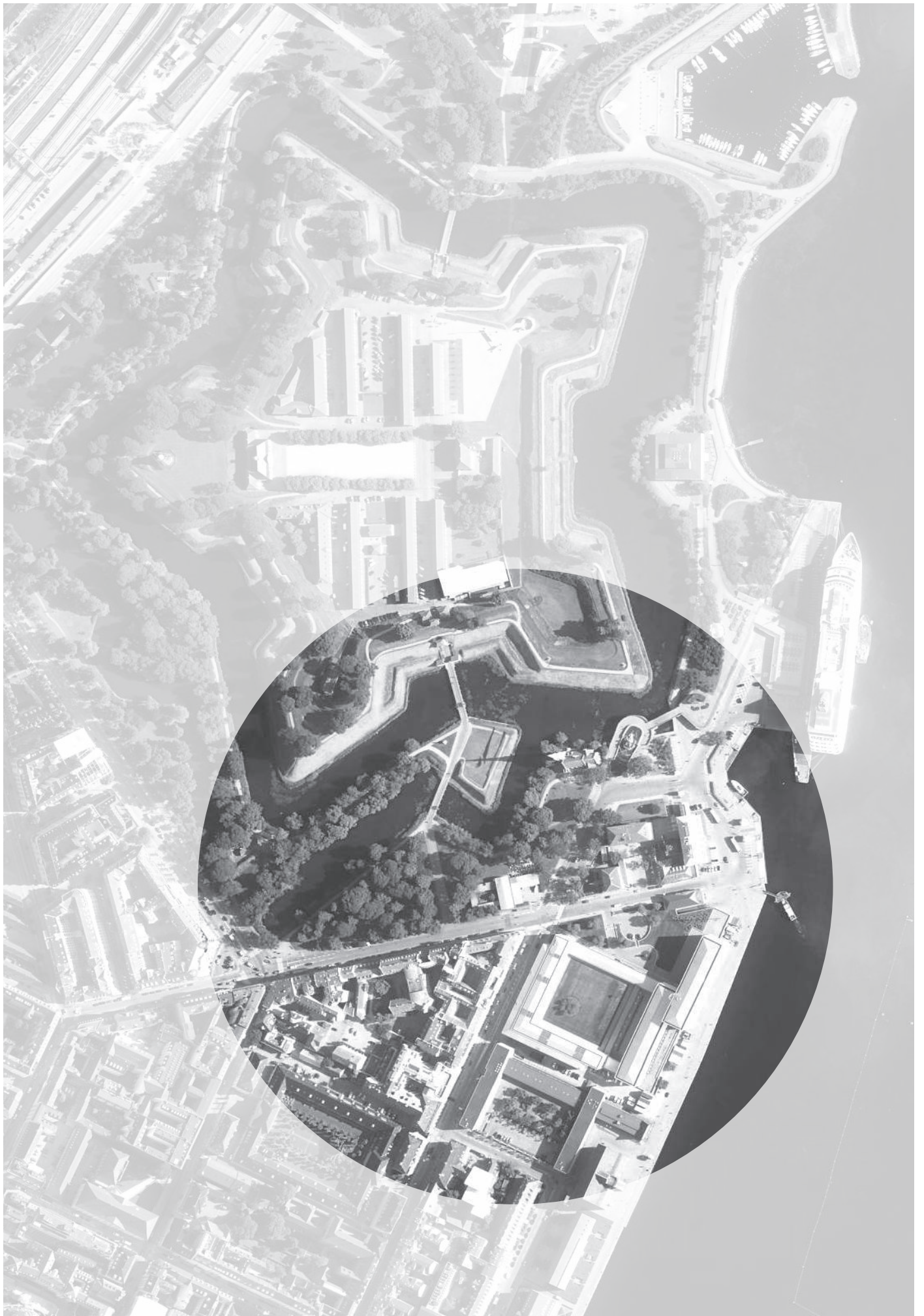
Date of publication: 5 May 2015



# Indhold

## Contents

<b>Indledning</b>	<b>5</b>
<b>Forslagene som helhed</b>	<b>11</b>
<b>Forslag 5/10946 - vinderforslag</b>	<b>16</b>
<b>Forslag 1/20130131</b>	<b>24</b>
<b>Forslag 2/28400</b>	<b>28</b>
<b>Forslag 3/68371</b>	<b>32</b>
<b>Forslag 4/74171</b>	<b>36</b>
<b>English</b>	<b>40</b>



Luffoto fra Københavnerkortet, Geodatastyrelsen  
Aerial photo from Map of Copenhagen, Danish Geodata Agency



# Indledning

## Opgaven

Arkitektkonkurrencen om et Museum for Danmarks Frihedskamp 1940 - 45 omhandler et nyt byggeri, som skal erstatte det tidligere Frihedsmuseum, der nedbrændte i april 2013. Det nye museum skal ligge på samme sted på Esplanaden ved Churchillparken i København og inden for fodaftrykket af det oprindelige museum.

Den nye museumsbygning skal indgå naturligt i de byarkitektoniske omgivelser med særlig vægt på Kastellet. Den nye museumsbygningens dimensioner, form, placering og materialer skal indgå i tæt samspil med omgivelserne. Museet skal indføj sig naturligt og respektfuldt i sine omgivelser som en bygning i parken.

Det nye Frihedsmuseum skal formidle modstandskampen. Museets areal ønskes disponeret inden for et bygningsvolumen med en variabel rumhøjde indvendigt over en eller flere etager for at give størst mulig udstillingsvolumen. Bygningen skal være rummelig, fleksibel og velegnet til sit formål. Der skal være mulighed for optimale udstillingsbetingelser, der rummer både faste og skiftende udstillinger.

Forslagsstillerne skal komme med ideer til en helhedsorienteret strategi for eksisterende beplantning samt fremtidig placering af konkurrenceområdet monumenter og mindesmærker. Forslagene skal holde sig inden for en samlet ramme for håndværkerudgifter som udgør 41,15 mio. kr. ekskl. moms.

Konkurrencen er udskrevet af Kulturministeriet som en projektkonkurrence med et begrænset antal deltagere i henhold til EU's udbudsdirektiv 2004/18/EF efter forudgående prækvalifikation jf. udbudsbekendtgørelse om projektkonkurrence nr. 2014/S 182-321888, og er bekendtgjort den 23. september 2014 i Den Europæiske Unions Tidende.

## Deltagere

Efter en prækvalifikation blev følgende fem deltagerhold inviteret til at deltage i konkurrencen:

**Totalrådgiver BIG - Bjarke Ingels Group A/S** i samarbejde med Søren Jensen Rådgivende Ingeniører A/S og Schønherr A/S

**Totalrådgiver Heneghan Peng Architects** i samarbejde med Ove Arup & Partners Ltd og Agence Ter

**Totalrådgiver Henning Larsen Architects** i samarbejde med Schul Landskabsarkitekter og HaCaFrø/Tyréns

**Totalrådgiver Lundgaard og Tranberg** i samarbejde med EKJ Rådgivende Ingeniører A/S, Esbensen Rådgivende Ingeniører A/S og ÅF Lightning - Hansen & Henneberg

**Totalrådgiver Polyform Arkitekter** i samarbejde med Search, Oluf Jørgensen og Cenergia

Vederlag til hvert hold udgjorde 200.000 kr. ekskl. moms.

Konkurrencematerialet blev udsendt til konkurrencedeltagerne den 15. december 2014 med afleveringsfrist den 24. februar 2015. Den 18. december blev der afholdt besigtigelse på konkurrenceområdet.

Som grundlag for dommerkomiteens bedømmelse blev der foretaget en funktionel, teknisk og økonomisk vurdering af forslagene.

Alle fem forslag blev rettidigt indleveret den 24. februar 2015.

## DOMMERKOMITÉ

### Dommerkomité

Marianne Jelved, kulturminister, formand for dommerkomitéen

Henrik Tvarnø, direktør, A.P. Møller Fonden

Per Kristian Madsen, museumsdirektør, Nationalmuseet

Steen Kyed, afdelingschef, Kulturministeriet

Jan Skamby Madsen, museumsdirektør, Moesgaard Museum

Sanne Houby-Nielsen, museumsdirektør, Nordiska Museet, Stockholm

Fagdommere udpeget af Akademisk Arkitektforening og Foreningen af Rådgivende Ingeniører, FRI:

Frank Maali, arkitekt MAA

Lisbeth Westergaard, landskabsarkitekt MAA, MDL

Bo Søgaard, civilingeniør FRI

### Rådgivere for dommerkomiteen

Nikolaj Jensen, teknisk direktør, Styrelsen for Slotte og Kulturejendomme

Ann-Pia Puggaard, chef for Projekter og Rådgivning, Styrelsen for Slotte og Kulturejendomme

Maria Miret, chefkonsulent, Styrelsen for Slotte og Kulturejendomme

Tina Saaby, stadsarkitekt, Københavns Kommune

Diddi Maja Thiemann, enhedschef, Byplan Indre, Københavns Kommune

Thomas Roland, konsulent, Kulturstyrelsen

Ulrik Abild, bygningschef, Nationalmuseet

Maruiska Solow, udstillingsarkitekt, Nationalmuseet

Poul Klenz, ph.d. seniorrådgiver, indeklimate og klimatisering, Nationalmuseet

Merete Brun Ejlertsen, kreativ leder, Arkitema Architects

### Konkurrencens sekretær

Bettina Mylin, arkitekt MAA, Arkitektforenings konkurrenceafdeling.



## BEDØMMELSESKRITERIER

Konkurrenceforslagene blev vurderet på: Arkitektoniske og rumlige kvaliteter, landskabs- og byarkitektonisk indpasning samt bæredygtighed og tekniske løsninger set i forhold til konkurrenceprogrammets ønsker og krav, og den i konkurrenceprogrammet udmeldte økonomiske ramme. Konkurrenceforslagene er blevet vurderet i forhold til, i hvor høj grad de opfylder de tre første bedømmelseskriterier og den i konkurrenceprogrammet udmeldte økonomiske ramme (fjerde bedømmelseskriterium).

### Uddybning af bedømmelseskriterier

#### 1. Arkitektoniske og rumlige kvaliteter:

En attraktiv bygning af høj arkitektonisk kvalitet såvel udefra som indefra. Indretningen understøtter optimale bevarings- og udstillingsforhold gennem et differentieret, stemningsskabende og rummeligt udstillingsområde.

Rumlige kvaliteter, der tilgodeser robusthed og fleksibilitet ved formidling af museets genstande. Overskuelige sammenhænge inde i bygningen samt i forholdet mellem ude og inde.

#### 2. Landskabs- og byarkitektonisk indpasning:

Hovedidé for konkurrenceområdet samlede fremtræden med henblik på bygning, udearealer, beplantning og monumenter. Et arkitektonisk formsprog indpasset i Churchillparken, der samlet styrker de historiske omgivelser, parken og byen.

#### 3. Bæredygtighed og tekniske løsninger:

Et miljømæssigt bæredygtigt byggeri, der bidrager til, at museet bliver energieffektivt og med lave driftsomkostninger. Tekniske løsninger, som understøtter, at bygningen bliver fleksibel samt optimalt klimatiseret og sikret.

#### 4. Økonomi:

At forslaget kan realiseres inden for den udmeldte økonomiske ramme, jf. afsnit 4.6 og bilag 08, således at forslagens valg af arkitektur og disponering af arealer med de tilhørende funktioner giver sikkerhed for, at forslaget i en videre bearbejdning kan projekteres og udføres uden overskridelser af den udmeldte økonomiske ramme.

### Bedømmelsesperiode

Bedømmelsesperioden påbegyndtes den 3. marts 2015, og dommerkomiteen afholdt i alt fire møder. På det afsluttende betænkningssmøde den 10. april 2015 besluttede et flertal i dommerkomiteen at udpege forslag 5/10946 som vinder af arkitektkonkurrencen.

Et mindretal i dommerkomiteen, Henrik Tvarnø, kan ikke støtte flertallets bedømmelse af forslag 5/10946.

Sign. dommerkomiteen,  
København den 10. april 2015

Marianne Jelved

Henrik Tvarnø

Per Kristian Madsen

Steen Kyed

Jan Skamby Madsen

Sanne Houby-Nielsen

Frank Maali

Lisbeth Westergaard

Bo Søgaard

## Dissens

Et mindretal i dommerkomiteen, Henrik Tvarnø, kan ikke støtte flertallets bedømmelse af forslag 5/10946. med følgende begrundelser: Det er generelt mindretallets vurdering, at økonomien næppe holder i nogle af de indsendte forslag. Priserne for byggeri under jord er væsentlig højere end over jord, og samtlige forslag rummer store arealer under jord. Det er mindretallets vurdering, at forslagene næppe kan rummes inden for den fastsatte økonomi.

Om forslag 5/10946 bemærker mindretallet, at forslaget forekommer tegnet for stort til at kunne realiseres til den angivne pris. Hvis forslaget skal gennemføres inden for den fastlagte økonomi, vil forslaget skulle reduceres og bearbejdes så meget, at der formentlig kan blive meget langt mellem konkurrenceforslag og realiseret byggeri. Ydermere synes der at være udgiftsposter, der ikke er medregnet i forslagens kalkulation.

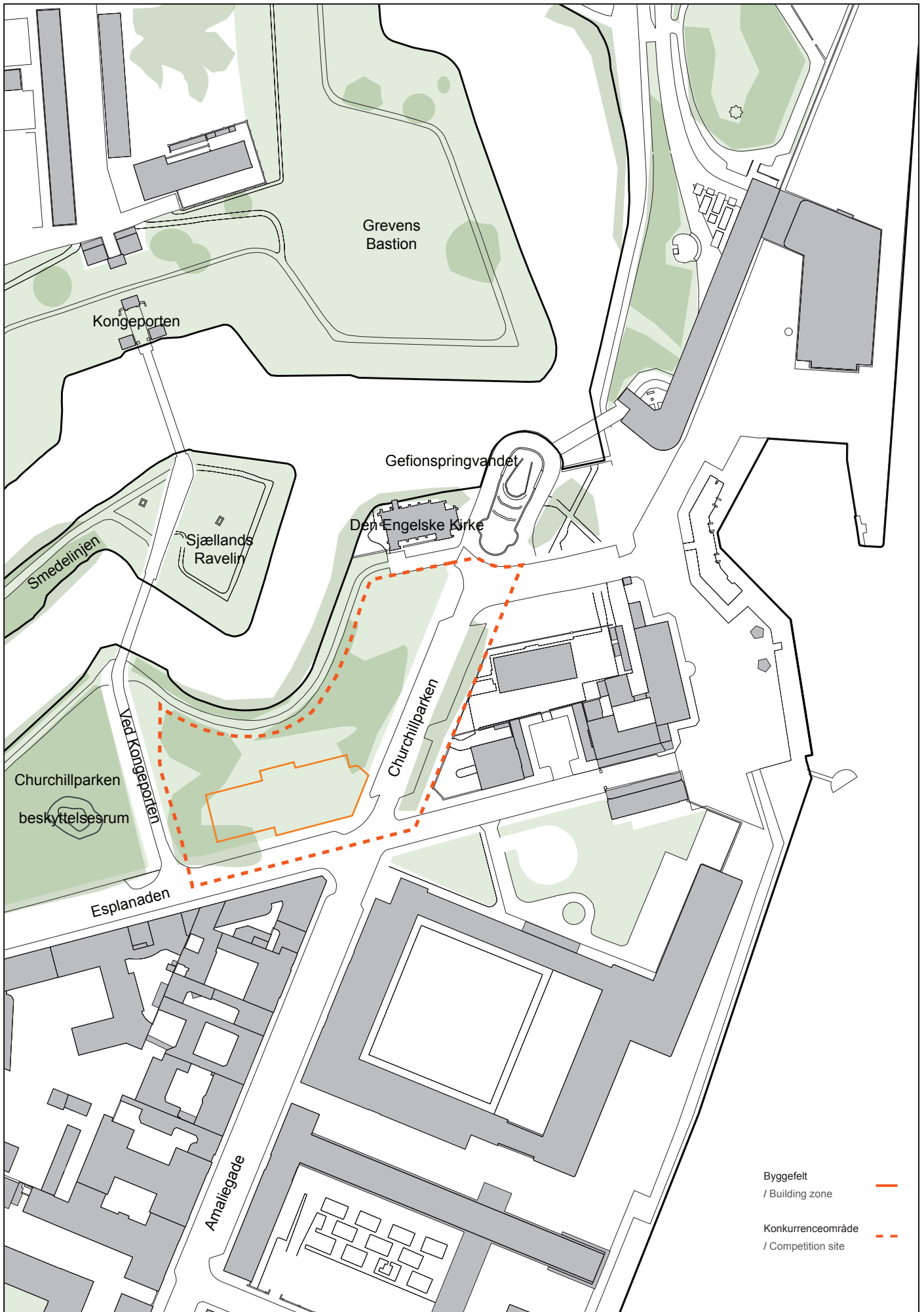
Som konkrete begrundelser for ikke at støtte flertallets bedømmelse af forslag 5/10946 bemærkes, at den bygningsmæssige tilstedeværelse over terræn forekommer meget ydmyg - måske en reaktion på den udfordrende arkitektoniske opgave, en bebyggelse på dette sted tilsyneladende betragtes som. Man opnår med dette forslag ikke et tilstrækkeligt inviterende og tydeligt signal i bybilledet, om at her findes

en museum om frihedskampen 1940-45. Mindretallet ser en risiko for, at signalværdien i stedet bliver, at vi helst gemmer mindet om frihedskampen væk. Ved en realisering af forslaget er der stort behov for at gennemtænke dette dilemma.

Husets ellipseform forekommer ikke forklaret i forhold til stedet og risikerer derfor at blive en floskel. Facaden fremstår mindre overbevisende og vil en stor del af året fremstå uden den begrønning, der vises på tegningerne. Grusbanen foran bygningen kan i sig selv være udmærket, men passer mindre godt til Churchill parken. Stedet er ofte forblæst og vil kun kunne bruges til udendørsophold få måneder om året - typisk uden for skoleåret, hvor de fleste gæster kommer. Det sænkede areal er byggeteknisk sårbart og stiller høje krav til vandtætning af byggeriet.

Bygningen over terræn er disponeret for småt til at fungere som en attraktiv entré til museet, og ankomstareal og rum til café er utilstrækkelige. Trapperne risikerer at virke klaustrofobiske og hele ankomstsituationen er komprimeret så tæt, at den samlet bliver funktionelt dårlig. Den vil ikke kunne betjene et større antal besøgende på én gang. Ankomsten til museet og den arkitektoniske forløsning fra gade til udstilling fremstår uforløst. Projektets stramme økonomi tillader næppe at forøge antallet af m<sup>2</sup> over terræn og dermed forbedre disse forhold.





Det kommende museums forhold til konteksten, kort 1: 2000  
 The future museum in its context, plan 1:2000







# Forslagene som helhed

Resultatet af arkitektkonkurrencen om et nyt Frihedsmuseum er yderst vigtig. Først og fremmest er der tale om et særligt sted med mange historiske og visuelle bindinger og relationer. Temaet i sig selv er en udfordring men også byggefeltet. Der er tale om en vanskelig men også spændende opgave, hvor et svar på samme tid skal favne mange tråde og evne at væve sig ind i et historisk og fredet parkbælte - mellem en strækning af Frederiksstadens nordre grænse, Esplanaden og Kastellets voldanlæg.

Museet får en unik beliggenhed, og skal formidle et interessant, lærerigt og relevant tema, nemlig Danmarks Frihedskamp 1940-1945. Det har vist sig som en krævende opgave at tilrettelægge museumsbygningen, med optimale udstillingsfaciliteter og med de krav Nationalmuseet stiller.

Konkurrenceområdet er delt i to felter. Det ene felt er byggefeltet, som er udlagt som et fodaftryk af det oprindelige museum. Dette felt kan ikke fraviges. Det andet er parkområdet inklusive køre- og parkeringsstracé, der fører op fra Esplanaden mod Gefionspringvandet og St. Alban's Church. Alle fem forslag holder sig inden for de afstukne rammer for bygningens placering.

Nationalmuseet har tilstræbt mulighed for fortolkning inden for de gældende og meget skarpe byggeretningslinjer. Deltagerne har således haft mulighed for at komme med bud på arealer og dermed museets endelige størrelse, idet funktionszonerne ikke var opgjort i eksakte

kvadratmetre. Derudover stod det frit for deltagerne at inddrage den eksisterende kælder i det kommende byggeri.

Rumprogrammet er bygget op omkring et service- og ankomstområde (zone 1) samt et udstillingsområde (zone 2). Fælles for alle fem forslag er, at udstillingsområdet (zone 2) placeres under jorden.

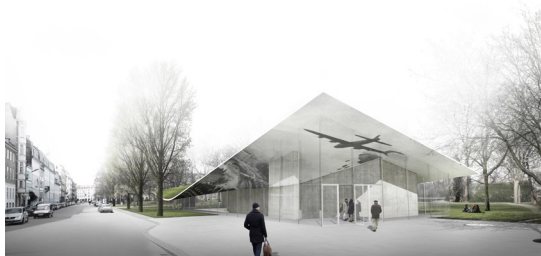
Spørgsmålet er, om det deraf følger som noget rent logisk at drosle byggeriet ned på alle fronter eller det kun delvist er tilfældet? To forslag anvender ekspressive virkemidler over jorden som f.eks. forslag 1/201130131 og 2/28400 med bygninger af en voluminøs fremtoning, mens forslag 3/68371 og 4/74171 foreslår solitære pavilloner. Alle fire forslag fremstår således med et markant arkitektonisk udtryk - og placerer udstillingsarealet under jorden. Der skabes dermed en slags dobbelthed. Et forslag skiller sig ud, nemlig forslag 5/10946, hvor kun en lille ankomstbygning står tilbage over jorden.

Forslag 1/201130131 og 2/28400 udnytter næsten hele byggefeltet, begge med bevægede/bølgende former samt relativt høje facader. Dommerkomiteen er tvivlende i forhold til den vredne form lige over for Kastellets voldanlæg.

Forslag 3/68371 og 4/74171 udnytter til dels byggefeltet, dog på forskellig vis, med forslag 3/68371 i en amorf konstellation af cirkler og forslag 4/74171 med en mere kubisk kompakthed. Begge fremstår som solitær pavillon.



Forslag 1/201130131



Forslag 2/28400



Forslag 3/68371



Forslag 4/74171



Forslag 5/10946

Forslag 5/10946 udnytter kun en begrænset del af byggefeltet over jorden mod til gengæld at tilrettelægge et åbent grusbelagt ankomstrum, der indgår som et imaginært rum til blandt andet formidling og eftertanke. Der er fladt tag med solceller på den lille ankomstbygning. Taget over udstillingssalen i plan -2 er teknisk set det forsænkede grusbelagte ankomstrum. Dette har dommerkomiteens alvorlige skepsis, når det gælder bortledning af vandmængder som følge af store regnskyl.

Forslag 1/201130131, 2/28400, 3/68371 og 4/74171 trækker dagslys ind og ned i udstillingssalen blandt andet for at skabe særlige stemninger. Dette er ikke optimalt for et fleksibelt udstillingsrum, hvor iscenesættelsen bør skabes af genstande og ikke af rummet. Dommerkomiteen har vurderet forslagene for løsninger for afskærmning og mørklægning. Det er konklusionen, at der i ovennævnte fire forslag skal ændringer til for at kunne leve op til et fleksibelt udstillingsrum. I forslag 5/10946 forekommer der ikke dagslys i udstillingsområdet, og rummet er helt neutralt.

Når det gælder forslagernes indre planløsning, har dommerkomiteen set på ankomstrummet og det flow, der vil være for museumsgæsten. Fælles for de fem forslag er, at den besøgende bevæger sig ovenfra og ned. Drøftelserne har været om bevægelsen skal ske hurtigt eller langsomt - skal man eller kan man udnytte det i formidlingen - stemningsskabende eller informativt? Forslag 2/28400 og 4/74171 har hver inkorporeret en fast indre kerne med funktioner og former således, at der opstår større trapeanlæg, som fører ned til udstillingssalen. Disse trapper er i begge forslag organiseret til ophold og eventuelt formidling. Dommerkomiteen er dog betænkelig ved trappernes funktion til ophold og ser et faremoment i, at disse vil være en stopklods for et glidende flow. Endvidere er trapperne ubrugelige i formidlingssammenhæng.

Forslag 1/201130131 og 3/68371 har begge fortrinsvis frie rum i stueetagen med et glidende flow fra en eller flere poler. Begge forslag tilføjer dagslys i udstillingsdelen. Forslag 1/201130131 er baseret på et meget stort åbent ankomstrum med to poler til bevægelse henholdsvis ned og op. Forslag 3/68371 er baseret på et transparent ankomstrum, som er udstyret med indre glasvægge og glasdøre, der tjener til adskillelse for det nedre udstillingsrum. Adgang til udstillingen sker ved en bevægelse ned af en svungen rampe. Denne er tænkt til at beskue fra. Dommerkomiteen vurderer, at den optager for meget plads og er uegnet til formidling.

Forslag 5/10946 har en klar zoneopdeling. Kommunikationen mellem de forskellige planer sker via trapper og elevator, der alene har transportfunktion i modsætning til opholds- eller formidlingsfunktioner. En bevægelse i et lukket rum - og så er man i udstillingen.

### **LANDSKABS- OG BYARKITEKTONISK INDPASNING**

Alle forslagsstillere er enige i at betragte den store fortælling fra Amaliegadeaksen til Gefionspringvandet som en vigtig visuel akse, hvor Churchillparken strammes op, og rummet mod Toldbolden inddrages i en grøn kontekst og bliver en del af det store parkrum. Nogle forslag gør ingenting i det eksisterende parkrum, mens andre forholdsvis nænsomt foreslår træer, løgplæner og mindre grusstier, som ledes rundt mellem mindesmærkerne.

Forskellen ligger i behandlingen af Churchillparken, hvor forslag 2/28400 foreslår en pladسدannelse mod Esplanaden og Amaliegade. Forslag 3/68371 foreslår en plads i den modsatte ende ved Gefionspringvandet, og forslag 4/74171 foreslår en bred promenade mellem de to punkter. Ens for dem alle er, at overgangen mellem by og park markeres tydeligere, end den er i dag.

Der er flere betragtninger af, hvordan man får placeret museet inden for byggefeltet. Forslag 3/68371 og 5/10946 placerer museet i parken. Forslag 2/28400 og 4/74171 placerer det på kanten mod byen, hvor det åbnes mod Esplanaden og Amaliegade og derfor kan ses på afstand. Forslag 1/201130131 er så stort, at det hverken bliver en del af parken eller en del af byen, men overtrumfer i stedet dem begge.

Der har i dommerkomiteen været en drøftelse af forslagernes evne til at tiltrække folks opmærksomhed, før man finder indenfor i museet. Forslag 1/201130131 lader indgå et større bænke- og siddearrangement. Forslag 2/28400 og 4/74171 lader indgå audiovisuel formidling med billedvisning eller film. Forslag 3/68371 søger med transparens at vise liv i pavillonen og i parken.

Det er dommerkomiteens vurdering, at forslag 5/10946 tilføjer en særlig atmosfære og forstærker den kulturhistoriske værdi. Betonrammen og det åbne ankomstrums sidde muligheder er inviterende, er synligt fra alle vinkler, og den rumdannelse, som grusfladen afføder, kan inddrages i fortællingen om frihedskampen. Forslaget skaber med en elegant gestus et nyt sted i byen, som ved at være underspillet faktisk er synligt.

### **BÆREDYGTIGHED OG TEKNISKE LØSNINGER**

Alle forslag angiver at være udviklet under hensyntagen til teknologisk bæredygtighed. Argumenterne for bæredygtighed varierer meget, hvor dog opfyldelse af kravene til BK2020 (flere forslag dog med tillæg af solceller i ikke nærmere defineret omfang) er det gennemgående argument for alle forslag, bortset fra forslag 1/201130131.

Forslag 1/201130131, 2/28400, 3/68371 og 4/74171 fremhæver de betydelige glasfacaders evne til passiv solopvarmning af zone 1. Forslag 1/201130131 og 4/74171 foreslår samtidig naturlig ventilation, men i bevidsthed om det heraf følgende varierende indeklima, foreslår de kompenserende tiltag for

lokal opvarmning omkring medarbejderne. De øvrige forslag baserer indeklimaet på traditionel opvarmning og ventilation. Dommerkomitéen har drøftet de energiøkonomiske og indeklimatiske udfordringer i de fire meget forskellige glasbygninger og finder, at forslag 5/10946 som kontrast hertil med sin velisolerede klimaskærm og tekniske redegørelse mest overbevisende dokumenterer muligheden for et stabilt, regulerbart indeklima under varierende driftsvilkår.

Netop de betydelige glasfacader i særligt forslag 1/201130131, 2/28400 og 4/74171 samt i mindre grad i forslag 3/68371 har givet dommerkomiteen anledning til overvejelser af driftsmæssig karakter. Forslag 5/10946 argumenterer specifikt for klimaskærmens robusthed og beskedne driftskonsekvenser, hvilket dommerkomitéen finder sympatisk.

Fælles for alle er den ufuldstændige formidling af forslag til installationer, hvor primært beskrivelse og tegninger divergerer, hvor konkrete fremgangsmåder er mindre gennemtænkte og hvor specifikt installationer i terræn - flere uden for byggelinjen - er uafklaret. Dommerkomitéen finder dog, at forslag 5/10946 med sine enkle bygnings- og installationsprincipper fremstår robust i forhold til endeligt valg af installationstekniske fremgangsmåder.

Alle forslag forholder sig til konkurrenceprogrammets krav til sikring af kælderkonstruktioner imod det højtliggende grundvand, om end af meget varierende karakter og kvalitet. Forslag 3/68371 og 5/10946 redegør her troværdigt for fremgangsmåder ved udførelse af dybe kældre og vandtætte konstruktioner, hvor dommerkomitéen i de øvrige forslag savner indikationen på den faglige forståelse og de forbundne risici. Netop de udførelsesmæssige risici ved arbejder, dybt under grundvandsniveau og de mulige konsekvenser for nabobygninger er en bekymringsfaktor, som har været drøftet i dommerkomitéen.

## **OVERHOLDELSE AF DEN ØKONOMISKE RAMME**

Det er dommerkomiteens skøn, at alle fem forslag kræver en bearbejdning, forinden de kan bringes til at overholde den økonomiske ramme. Forslagene skal, for at kunne overholde den økonomiske ramme, underkastes dels en bearbejdning i henseende til konstruktionsmetoder, funktion, teknik og indretning, dels en arealmæssig tilpasning. Det er dommerkomiteens skøn, at der vil kunne ske en bearbejdning og arealmæssig tilpasning af samtlige fem forslag i det videre projekteringsarbejde, uden at forslagenes bærende ideer går tabt.

Dommerkomiteen har, inden den endelige udpegning af forslag 5/10946 som vinder af konkurrencen, ladet forslaget underkaste en ekstern, uvildig analyse af forslagets risici, for så vidt angår de økonomiske og konstruktive forhold.

Analysen har bekræftet dommerkomiteens overordnede skøn og viser, at forslagets valg af arkitektur og disponering af arealer med de tilhørende funktioner giver fornøden sikkerhed for, at forslaget i en videre bearbejdning kan projekteres og udføres uden overskridelser af den udmeldte økonomiske ramme og at dette kan ske, uden at forslagets bærende ideer går tabt.

## **SAMMENFATNING**

Der er indkommet fem forskellige svar på opgaven. Formgivningen af det synlige bygningsudtryk over terræn spænder fra det forsigtige til det ekspressive. Endvidere består variationen i den store bygning mod den lille ankomstbygning, det rektangulære og det runde, det flade tag og det krumme - der er spændstighed og forskellighed.

Fælles for alle fem forslag er, at de i har udstillingsareal under jorden, hvilket udfordrer både de byggetekniske løsninger og den økonomiske ramme. Også hvad angår de funktionelle, tekniske og indretningsmæssige løsninger ses der udfordringer i alle fem forslag.



Et flertal i dommerkomiteen er nået frem til, at forslag 5/10946 tydeligt fremstår som det forslag, der i ét greb bedst forener sted og tema - dette har været udslagsgivende. Det samlede greb er et godt og gennemtænkt svar på disponering, placering, format, formidling, udstillingsrum, flow, genstandshåndtering og ikke mindst tema om Danmarks frihedskamp 1940-45.

Den samlede komposition tilfredsstillende i meget høj grad Nationalmuseets behov

og muligheder for at formidle historien og sætte fokus på fortællingen og udfolde sig med store såvel som små genstande.

Et flertal i dommerkomiteen vurderer, at forslag 5/10946, for at kunne blive realiseret, kræver en bearbejdning, så det indfrier forventningerne til opgavens løsning inden for den økonomiske ramme. Dette sammenholdt med, at det har den robusthed og fleksibilitet, som tillader den nødvendige redigering, der vil komme i det videre arbejde.



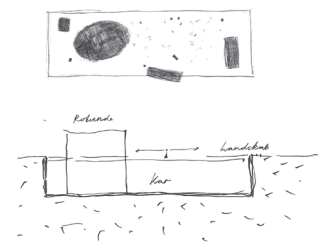
Byggefeltet set fra Sjællands Ravelin. I baggrunden ses facaderækken på Esplanaden.

The building zone viewed from Zealand's Ravelin. In the background, building facades on the Esplanade.



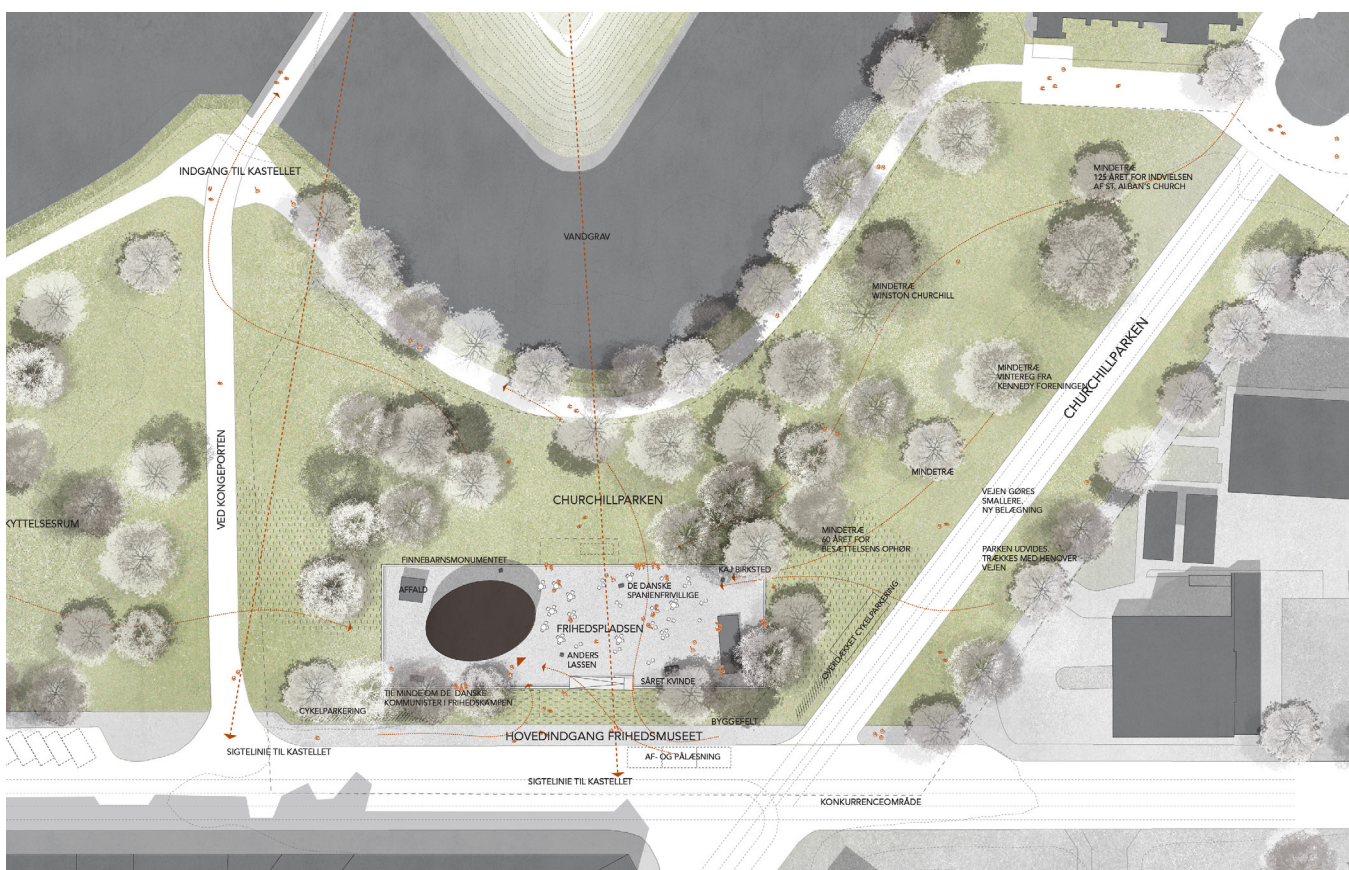
# Forslag 5/10946

## Udpeget som vinderforslag



Forslaget er udarbejdet af **Lundgaard & Tranberg Arkitekter** (ophavsret) i samarbejde med **EKJ Rådgivende Ingeniører**; **Esbensen Rådgivende Ingeniører** og **ÅF Lihting - Hansen og Henneberg**. Konsulenter: Steen Bo Mortensen, Gade og Mortensen Akustik; Steen Høyer, professor, arkitekt, konsulent landskab. Projektteam Lundgaard & Tranberg: Lene Tranberg; Peter Thorsen; Filip Heiberg; Jonathan M. Houser; Stine Nyegaard; Jens Jacob Juel Christensen.





## ARKITEKTONISKE OG RUMLIGE KVALITETER

Hovedgrebet består i en bygning, der minimeres og trækkes ind i parken og lader en verden udfolde sig, en underverden, der gemmer hele den historie, der skal fortælles.

Den overjordiske del er en elliptisk formet ankomstbygning, beskrevet som en rotunde, placeret i et let forsænket grusbeltet felt i parken - et åbent ankomstrum.

Den ellipsoformede ankomstbygning udstyres med et espalier således, at en beplantning tager del i parkens flora - og med dét bliver noget, der er i kontrast til Frederiksstadens bygninger. Endvidere forbindes over- og underverden fra det åbne ankomstrum til et skjul - hvor udstillingen udfoldes.

Ankomstbygningen foreslås muret, evt. med puds på den del der er over jorden og bag espalieret. Bag espalier er der vinduesåbninger til caféens opholdsniche og køkken.

Der beskrives generelt en rå materialekarakter.

Ankomstbygningen er meget beskeden, og forekommer efter dommerkomiteens vurdering trang og introvert i forhold til, at den skal fungere som en åben og attraktiv ankomst. Der er en bekymring for valget af espalier med rosenvekster, da de, trods det poetiske udtryk i blomst, en stor del af året vil stå afpillede og med visne blade.

### **Zone 1**

Ankomstbygningen har hovedindgang mod Esplanaden. Der er info, butik og café på dette indgangsniveau samt adgangsforhold til et øvre dæk, hvor der er flexrum, et panoramavindue samt personalefaciliteter. Trods ankomstbygningens beskedne størrelse tilvejebringes de funktioner der fordres, men det er dommerkomiteens vurdering, at indretningen har logistiske udfordringer. Flexrummet på plan +1 forekommer meget anvendeligt, men skal kunne betjenes fra café/køkken. Trappeforbindelserne gennem de forskellige etager virker som logiske og enkle forløb. Mellemetagen plan -1 med orienteringsområde, toiletter, garderobe mm. er løst på en enkel og naturlig måde. Herfra vil der være forbindelse til eksisterende kælder, som foreslås anvendt til særudstillinger.

### **Zone 2**

Plan -2 indeholder et udstillingsrum i selve rotunden samt et birum. Herfra træder man ud i en højloftet udstillingssal, der udnytter det meste af byggefeltet. Loftshøjden er her ca. 6 meter. Den store udstillingssal i plan -2 foreslås som en rå ramme, og her kan man fokusere på del og helhed i scenografi og fortællinger. Der er intet dagslys i udstillingsområdet.

Den viste elevator skal efter dommerkomiteens vurdering dimensioneres, så den kan klare grupper og genstande. I forslaget er vist, at transport af store og tunge udstillingsgenstande skal ske ved at åbne et dæksel i loftet over udstillingsrummet. Dette vurderer dommerkomiteen er en tilfredsstillende løsning, forudsat at der vil være den fornødne sikring mod indbrud og vandindtrængning.

Udstillingssalen fungerer som det, der er formålet: en sal eller hal hvor man bogstaveligt talt kan 'tumble sig', organisere og udstille på skiftende vis i forholdsvis store og frie rammer. Den rå karakter virker velvalgt. En undtagelse er det nedre udstillingsrum i rotunden med henrettelsespælene. Dette vil efter dommerkomiteens skøn ikke fungere som fortælling til både en start og en afslutning.

Disponering af eksisterende kælder skal overvejes nærmere. Nationalmuseet vurderer, at kælderen er uegnet til særudstillinger.

### **LANDSKABS- OG BYARKITEKTONISK INDPASNING**

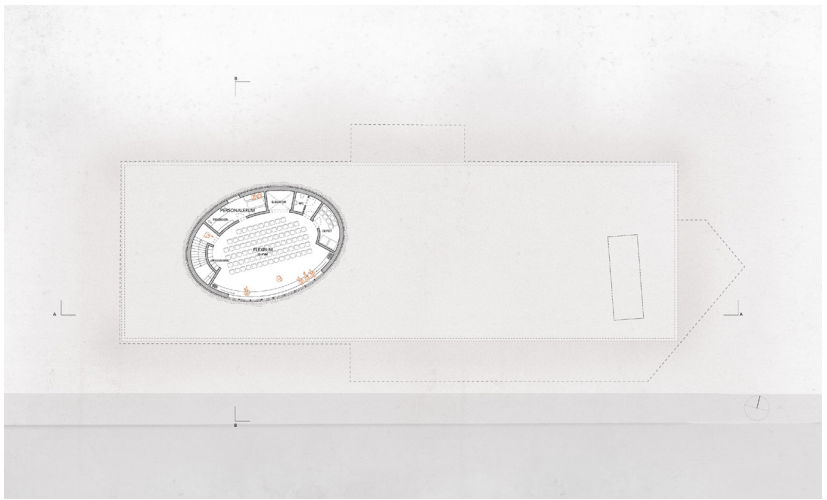
Et let forsænket grusbelagt felt med en rektangulær betonramme omgiver ankomstbygningen, og i ét tag bliver det åbne ankomstrum og ankomstbygning til ét samlet værk. Uderum og ankomstbygning fremhæver hinanden og kan ikke stå hver for sig.

Det grusbelagte ankomstrum er beregnet til ophold og caféens udeservering, eventuel udstilling af skulpturer og større museums-genstande. Op ad ankomstbygningen vokser der hvide roser på espalier.

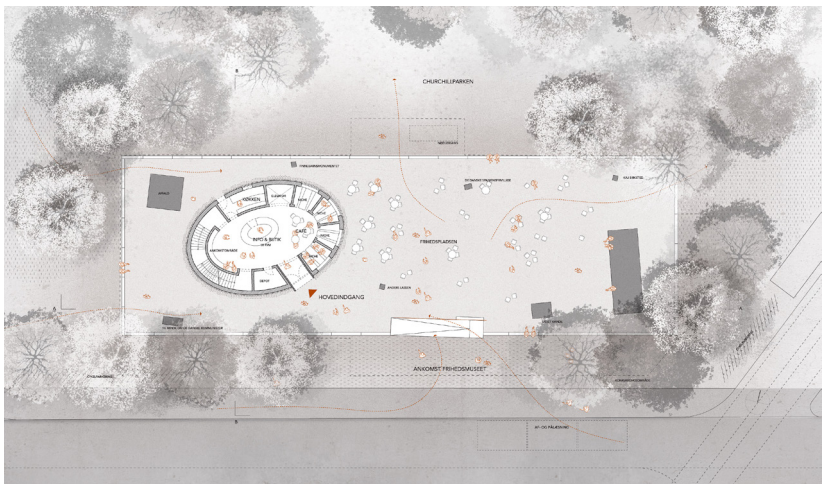




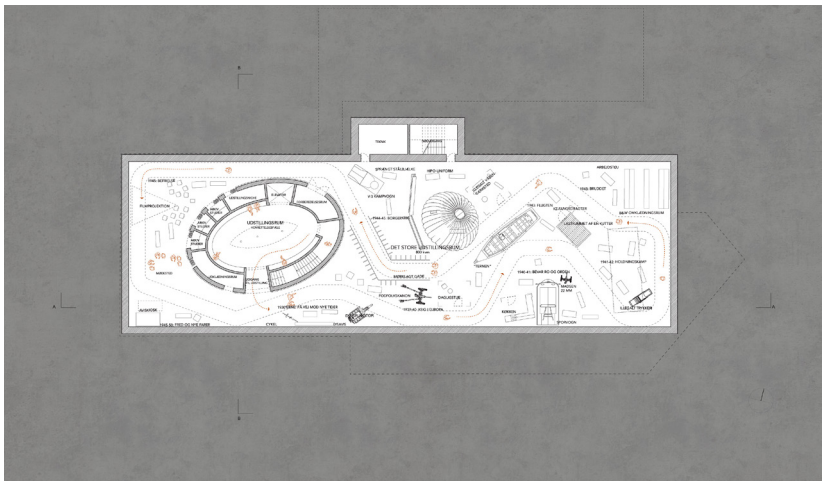
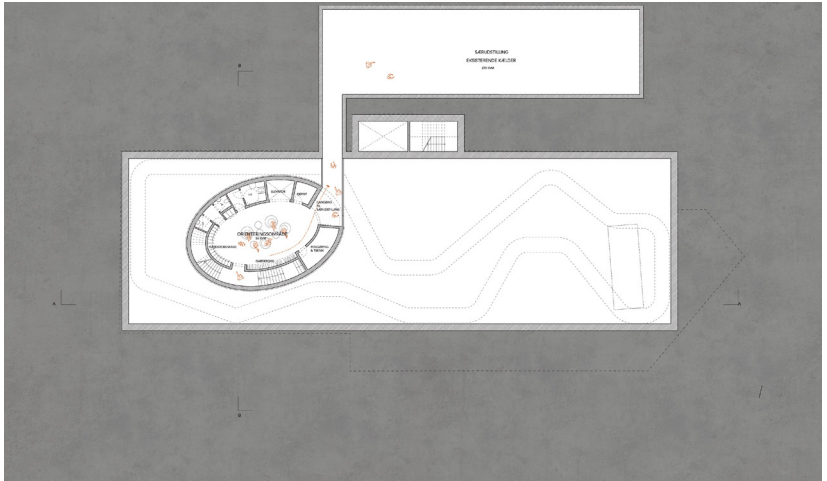




Plan 01



Plan 00



Plan -2





Betonrammen og det særligt bearbejdede ankomstrum skaber et smukt poetisk rum, som på én gang er synligt som et monument og dog alligevel beskedent tilbagetrukket. Det underordner sig omgivelserne og byder på muligheden for ophold, fordybelse og leg som en overgang til museets udstilling under jorden. Forslaget tilbyder med en elegant gestus et nyt sted i byen.

Hovedankomsten til museet sker via en rampe placeret mod Esplanaden. Rampen markeres ved et murforløb med navneinskriftion. Yderligere to ramper placeres, så der skabes tilgængelighed. Det er dog uklart, hvordan vareindlevering og affaldshåndtering sker via disse ramper. I en viderebearbejdning skal dette kvalificeres.

Affaldsrummet er vist som en selvstændig figur i plantegningen men er ikke nærmere beskrevet eller illustreret. Det ønskes belyst, hvordan figuren kan indgå i den enkle komposition mellem ankomstbygningen og rammen, og om det eventuelt er muligt, at det integreres i ankomstbygningen.

Cykelparkeringen er placeret mod Churchillparken og er delvis overdækket. Der skal tages højde for karakteren af overdækningen, så det frie kig ikke sløres, og cykelparkeringen skal tilpasses, så den foregår uden for offentligt areal.

Der er i dommerkomiteen bekymring for, at den sænkede grusflade vil virke som et vandkar ved ekstrem regn. I den videre bearbejdning skal det kvalificeres, hvordan rammen og fladen kan bearbejdes, så der ikke er risiko for indtrængning af vand. Bearbejdningen skal ske uden, at rammen mister sin unikke karakter og evne til at være både åben, inviterende og introvert på samme tid. Ankomstbygningens beplantning er en poetisk og smuk tanke. Der skal dog vælges en beplantning, som er robust nok over for vejrlig, og som kun kræver optag af naturligt regnvand, da det er påkrævet ikke at bruge vandingsystemer på facaden, som kan give risiko for vand i udstillingen under jorden.





## **BÆREDYGTIGHED OG TEKNISKE LØSNINGER**

### **Konstruktioner**

Ankomstbygningen vises opført som muret byggeri med pladsstøbt betondæk. Udstillingssalen under jorden er pladsstøbt med ydervægge og gulv som forankrede dobbeltkonstruktioner. Forslagsstiller foreslår en dyb, tæt spunsning til tætte lerlag for udførelse i tør byggegrube. Denne strategi reducerer risikoen for grundvandssænkning.

### **Installationer og indeklima**

Forslaget opererer med ét ventilationsaggregat for begge klimazoner med henblik på effektiv varmeveksling, hvorfor det noget beskedne teknikrum må antages udvidet i den videre bearbejdning. Føringsveje for installationerne er ikke vist, lige som det ikke oplyses, hvorledes vandbærende rør separeres fra udstillingen.

Udstillingen opvarmes ved indstøbt

gulvarme, hvor ankomstbygningens gulvarme er indbygget med varmfordelingsplader i trægulv. Alle rum ventileres behovsstyret efter VAV-princippet med synlig kanalføring.

Gulvarme og behovsstyret ventilation kan sikre et godt og tilpasset indeklima i begge zoner. Supplerende den mekaniske ventilation er rum over terræn forberedt for naturlig, individuel ventilation via oplukkelige vinduer.

Det konstruktive og installationstekniske layout muliggør god fleksibilitet i udstillingen. Hertil skal bemærkes at vandrør skal separeres fra udstillingen.

### **Bæredygtighed**

Byggeriet fremstår i sin kompakte form forberedt for lavt energiforbrug, hvilket dokumenteres ved den gennemførte Be10-beregning.

## **Drift**

Forslagsstillerne argumenterer for, at valg af standardkomponenter og robuste, langtidsholdbare materialer sikrer enkel service. Bygningen vurderes driftsvenlig, hvor dog opsplitning af servicearealerne (zone 1) i flere etager reducerer effektiviteten. Med direkte tilgang til alle vinduer i ankomstbygningen vil vinduer kunne pudses indefra uden brug af stiger. Flugtvejstrappen mod nord bør bearbejdes således, at der kan etableres direkte adgang til teknikummet

## **Brand**

Flugtvejsforhold og brandtekniske installationer er ikke beskrevet i en overordnet brandstrategi, og de viste flugtveje er ikke overbevisende i forhold til regler for forsamlingslokale med betydelig personlast. Forslagsstillerne medgiver da også, at de viste sikrings-, brand- og flugtvejsforhold ikke kan antages tilstrækkelige, men skal bearbejdes til en samlet risikostrategi, hvilket vurderes muligt.

## **ØKONOMI**

Forslagsstiller redegør for en kalkulation af håndværkerudgifter, der indikerer, at forslaget kan holde sig inden for den beskrevne økonomiske ramme i konkurrenceprogrammet på 41,15 mio. kr. ekskl. moms.

Dommerkomiteen har inden den endelige udpegning af forslaget som vinder af konkurrencen med henvisning til pkt. 5.10 i de konkurrencetekniske betingelser ladet forslaget underkaste en ekstern, uvildig analyse af forslagets risici, for så vidt angår de økonomiske og konstruktive forhold. Analysen har bekræftet dommerkomiteens skøn og viser, at forslagets valg af arkitektur og disponering af arealer med de tilhørende funktioner giver fornøden sikkerhed for, at forslaget i en videre bearbejdning kan projekteres og udføres uden overskridelser af den udmeldte økonomiske ramme og at dette kan ske, uden at forslagets bærende ideer går tabt.

Der henvises i øvrigt til bemærkningerne om økonomi i dommerkomiteens indledende kommentarer om forslagene som helhed.

## **SAMMENFATNING**

Forslaget er trods sit stille og rolige arkitektoniske udtryk en overraskende og spændende løsning, der på den ene side danner en funktionel bygning til Frihedsmuseet, på den anden side forener tema, park, sigtelinjer, sted og museum.

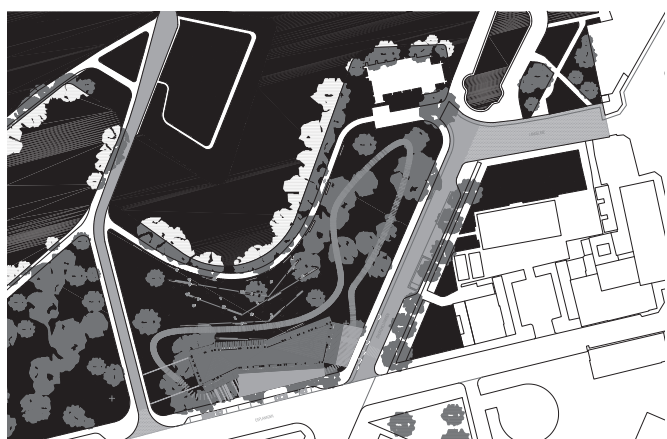
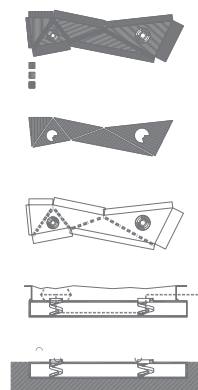
Forslagsstillerne løser museets behov på en unik måde, idet der både opstår et rum i parken og et underliggende rum, formet efter museets udstillings-specifikationer. Mellem de to rum er ankomstbygningen, der udover at stå som et virkningsfuldt bygningselement tillige blot tjener til adgang og lodret forbindelse mellem de forskellige etageplaner. Der er optimale udstillingsforhold, optimal sikkerhed, acceptabel genstandshåndtering samt en veldefineret adskillelse mellem zone 1 og 2. Med forslagets kompakte bygningsvolumen gives der desuden gode muligheder for at skabe et bærdygtigt og energibesparende byggeri.

Dommerkomiteen fastslår på baggrund af den økonomiske vurdering, at det i den videre bearbejdning vil være nødvendigt at reducere museumsarealet. Derudover ændringer i format og størrelse på ankomstbygningen, så ankomsten bliver åben, tillokkende og attraktiv. Det bør overvejes at gøre elevatoren til den primære forbindelse mellem etagerne.

Dommerkomiteen vurderer, at disse spørgsmål og flere til kan indgå i en udviklingsproces mellem forlagsstiller og brugere.



# Forslag 1/20130131



Forslaget er udarbejdet af **Heneghan Peng Architects**, IRL (ophavsret) i samarbejde med **Arup UK**; **Arup DK** samt **Agence Ter, FR**. Projektteam: Roisin Heneghan; Shih-Fu Peng; Doreen Adler; Patrick Conway; Amy Mc Keogh. Konsulenter: Luxigon, FR, visualiseringer; Andrew Ingham, UK, model.



## ARKITEKTONISKE OG RUMLIGE KVALITETER

Forslaget beskrives som en pavillon i parken, der kan invitere til brug, blandt andet ved bænke på inder- og ydersiden – den sidste med en overdækning fra et udkraget tag.

Bygningen er udlagt i en let zigzagform, der udtrykkes i planen på begge etager og i loft i stueplan. Bygningen søger med en opdeling i to verdener henholdsvis over og under jorden at opfylde museets ønsker. Bygningen fremstår i træ og med glasfacader i et transparent udtryk.

Forslaget påpeger, at zone 1 og zone 2 er modsatrettet i forhold til lys. Forslagets idé er således ladet med kontrast, og man vælger som følge heraf at dele funktioner og acceptere forskellene, så der opstår en lysfyldt verden over jorden og en lyskontrolleret verden under jorden. Konceptet med verdener oppe og nede bliver således et tema som vist i et snit, hvor man ser den overdækkede bæk i parken foran glasfacaden med det langsgående ovenlys i belægningen, som åbner for strejflys under jorden.

Bygningen søger at trække på nogle horisontale kig og relationer til omgivelserne – som et sted man beskuer fra. Den udformes som transparent og tiltænkes en rolle som et åbent element med en lethed. Bygningen beskrives som et gennemsigtigt filter og hævdes næsten ikke at være til stede. Bygningen udfylder næsten hele byggefeltet og er disponeret med indgang i det sydøstlige hjørne.

### Zone 1

Inde i museet opstår et større ankomstområde. Plandisponeringen udspringer af en sammenstilling af trekanten i varie-

rende størrelse, således at der opstår et mønster eller rytmik omkring to poler (to vindeltrapper), en i hver ende. Den første er ankomstzonen med butik, information mm, og her er en vindeltrappe, der fører ned til udstillingshallen. I den anden ende er en tilsvarende vindeltrappe, som man fra udstillingshallen føres op ad til café eller afslutning på besøget. Der er ikke elevator, men på et snit er vist en teleskopagtig platform opstillet i lysning til de to vindeltrapper.

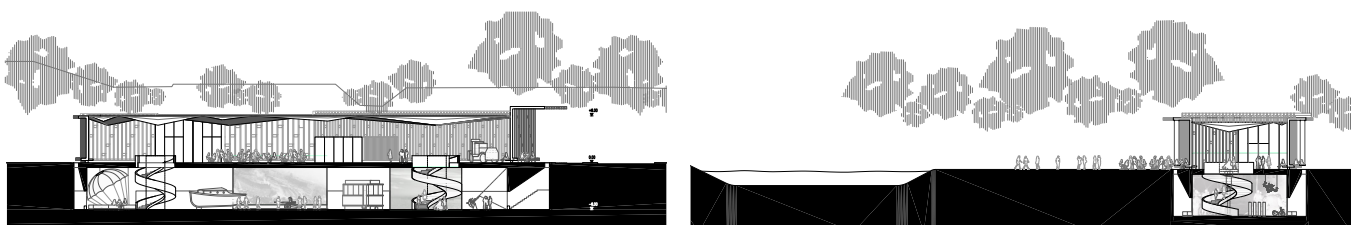
### Zone 2

Udstillingshallen under jorden er langstrakt og følger den zigzagform, bygningen har. De praktiske rum som garderobe og toiletter er placeret i underetagen. Disse funktioner har man ikke fundet plads til i den langt fra beskedne hal i stueetagen. Det er ligeledes uklart, om genstandshåndtering kan foretages fra teleskopplatforme. Loftshøjden er angivet til 6 m. Bænke langs facaden gentages også her, og det samme gælder for hele udstillingshallens perimeter.

Forslaget fremstår med et ekspressivt udtrykt i et forholdsvis stort volumen. Stueetagen udtrykkes i en zigzagform, men det er lidt uklart, om det er Kastellet's bastioner eller anden geometrisk reference, der har inspireret til zigzagformen og omsat disse bevægelser til en form for dynamik.

Det skønnes, at de to vindeltrapper vil trække en del trafik fra udstillingens besøgende og caféens gæster som følge af, at toiletterne er placeret i underetagen. I den forbindelse vil der forekomme uhensigtsmæssigt flow og bevægelse gennem udstillingen.

Dagslysprincippet langs siderne i det nedre udstillingsrum er ikke brugbart for museets udstillingsbehov. Der er loftshøjde til en





mørklægningsløsning, men man kunne også overveje at lade dagslysprincippet, der er nedfældet i belægning i terræn, udgå.

Det fremgår ikke helt klart, hvor personalet skal fungere fra. Det skønnes dog at være muligt at indrette plads i stueetagen.

## LANDSKABS -OG BYARKITEKTONISK INDPASNING

En enkel grussti snor sig gennem det store parkrum og formidler historien ved at forbinde de forskellige monumenter og mindetræer. Ved museumsbygningen bliver stien en del af ankomstpladsen og skaber en naturlig passage mellem parken og bygningen.

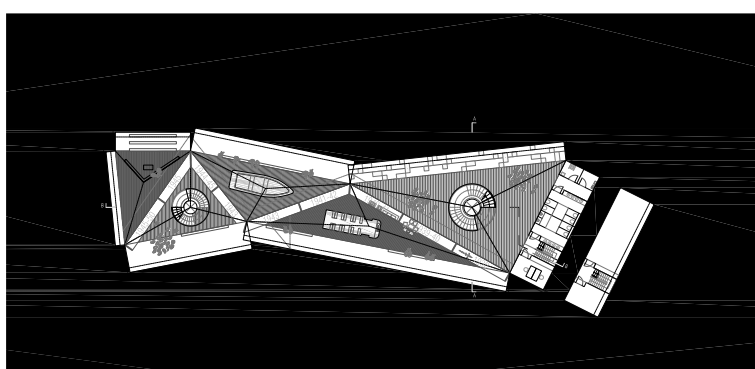
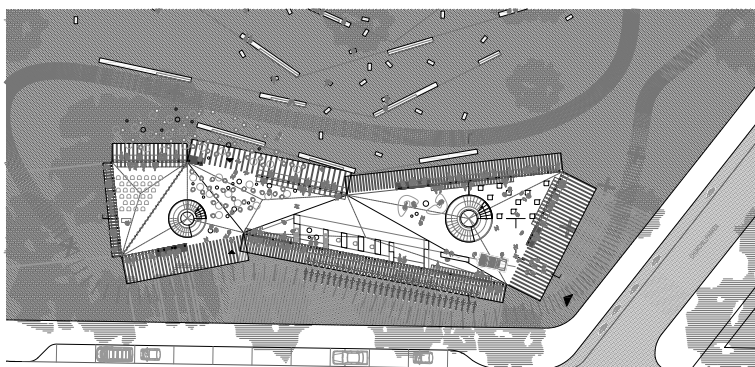
Ankomsten sker dels fra Churchillparken og dels fra Esplanaden, hvor belægningsfladen forbindes til fortovene og til et område til 'kiss and ride'. De to belægningskift angiver ikke en tydelig markering af hovedindgangen, og det virker uafklaret, hvordan vareindleveringen skal ske. Det manglende logiske hierarki mellem ankomsterne bliver en barriere for det naturlige flow af besøgende ind og ud af museet.

Mod Esplanaden, hvor der er stor eksponering af facaden, er der placeret en dobbelt række med cykelparkering, der delvis er integreret i facaden. Dette fremstår efter dommerkomiteens vurdering i et uskønt samspil.

Tanken om at bruge facaderne som et sid-

demøbel er et interessant bud på at gøre museet ekstrovert og til et uformelt mødested, som aktivt integrerer museet i byens sammenhæng og derved giver noget til byen. Dette lykkes dog ikke helt, da bygningens volumen og tyngde netop gør det modsatte og i stedet bliver en massiv væg, som ikke tager hensyn til stedets kontekst og de anviste sigtelinjer.

Den landskabelige bearbejdning er mangelfuldt beskrevet, og det fremgår ikke, hvilke materialer der er brugt på de forskellige overflader.



## **BÆREDYGTIGHED OG TEKNISKE LØSNINGER**

### **Konstruktion**

Bygningens træ søjler står som 'naturtræ' med fødderne i belægningen udenfor, uden tilstrækkelig konstruktiv beskyttelse, hvilket er holdbarhedsmæssige udfordringer, som skal bearbejdes. Kælderen tænkes opført med enkeltvægge, udvendigt vand- og varmeisoleret og forholder sig reelt ikke til udførelse under grundvandspejlet eller til opdrift. På disse områder skal forslaget bearbejdes.

### **Installationer og indeklima**

Installationerne er hverken vist eller beskrevet, hvor det kort anføres, at der etableres 'tværventilation' i begge etager med lokal klimatisering omkring medarbejdernes arbejdspladser. Om vinteren sikres indeklimaet i pavillonen ved medarbejdernes lokale klimaenheder. Dette er et koncept, som er utilstrækkelige til at imødekomme kravet om klimatisering af serviceområdet. Tilsvarende vurderes indeklimaet i sommerperioden utilstrækkelig.

### **Bæredygtighed**

Forslagsstiller fremhæver den tekniske bæredygtighed primært ved generel naturlig ventilation ved oplukkelige døre og fraværet af generel klimatisering i zone 1 mod til gengæld at opvarme helt lokal ved medarbejdernes arbejdsplads. Forslagsstiller argumenterer ikke for fremgangsmåden i hverken en energiøkonomisk eller indeklimatisk sammenhæng, hvilket dommerkomitéen finder utilfredsstillende.

### **Drift**

Dagligt renhold vurderes på normalt niveau, hvor dog pudsning af de mange høje og smalle vinduer vil være en løbende omkostning. Trækonstruktionerne forudses at skulle overfladebehandles hvert 3 - 5 år afhængig af behandlingens type.

### **Brand**

Besøgende fra udstillingsrummet kan flygte op i stueetagen ad de to spindeltrapper, godt hjulpet af effektiv, mekanisk røgventilation og museets medarbejdere. Herfra er der flugtmulighed til det fri. Der er ingen tvivl om, at den anførte brandstrategi er utilstrækkelig og skal suppleres med bl.a. flugtvæjstrappe til enten sikret areal eller direkte til det fri.

### **ØKONOMI**

Forslagsstiller redegør for en kalkulation af håndværkerudgifter, der indikerer, at forslaget kan holde sig inden for den beskrevne økonomiske ramme i konkurrenceprogrammet på 41,15 mio. kr. ekskl. moms.

Der henvises i øvrigt til bemærkningerne om økonomi i dommerkomiteens indledende kommentarer om forslagene som helhed.

### **SAMMENFATNING**

Det er dommerkomiteens vurdering, at forslaget ikke er i dialog med stedet, historien eller det tema, museet omhandler. Både ankomsten og disponering af uderummet vidner om en manglende forståelse for både stedet, de funktionelle behov og byens flow. Trekantformen samt de to trappeforløb låser udnyttelsesmulighederne og vil være kilde til et ukontrolleret flow op og ned med højrisiko for at udstillingen forstyrres. Dertil kommer, at bygningen ikke umiddelbart er egnet til klimatisk adskillelse af zoner.

Konklusionen er, at selv ved en neddrosling og modificering vil forslaget ikke tilnærme sig stedets og temaets præmisser.



# Forslag 2/28400

---

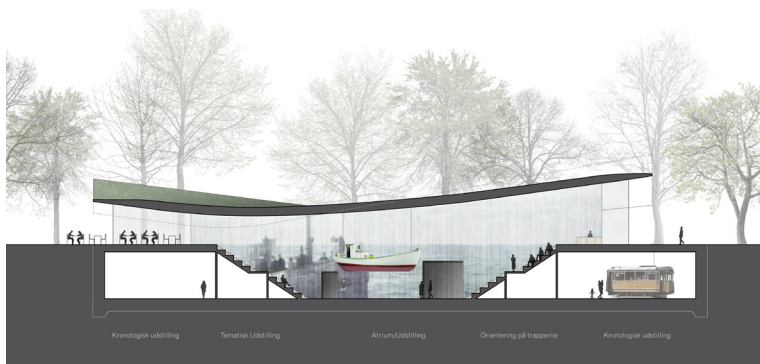


Forslaget er udarbejdet af **Polyform Arkitekter** i samarbejde med **SeArch**; **Oluf Jørgensen** og **Cenergia**. Polyform og SeARCH med delt ophavsret. Konsulenter: Igor Kolobaric, lyskonsulent; Palle Roslyng-Jensen, lektor KU, faglig konsulent. Projektteam Polyform: Thomas Kock; Jonas Sangberg; Rie Davidsen; Johannes Grove; Anne Strandgaard og Anna Navndrup. Projektteam SeARCH: Bjarne Mastenbroek og Andrea Verdecchia. Projektteam Oluf Jørgensen: Thomas Hansen og Jens Gandrup Jørgensen. Projektteam Cenergia: Ole Balslev-Olesen og Magdalena Stefanowicz

Forslaget tager afsæt i en bærende grundidé, et flyveblad med reference til besættelsestiden, et stykke papir, der ved opbukning tager en form. Denne form bliver taget på bygningen. Forfatterne skriver at: *"tagets form, inspireret af flyvebladet, åbner både museet op mod byen på den ene side og landskabet på den anden side."*

Der er således tale om et rektangulært bygningsvolumen, der er placeret parallelt med Esplanaden, med lodrette glasfacader omkring en indre kerne og en krum, græsklædt tagflade. Stemningskabende film og billeder kan projiceres på alle vægge, gulve og lofter i bygningen.

Forslaget, som opererer med konkurrencens absolut største volumen, er det forslag, der udfordrer byggefeltet og konteksten mest. Dette gælder såvel i stueplan med en arealmæssig udstrækning samt i højden på de opvippede tagformer - men også hvad angår de mange facadeglasfelter og den grønne tagflade.



### Zone 1

Over jorden er der placeret servicefunktioner i en aflang kerne med garderobe, toiletter, personalefunktioner samt café og museumsbutik i den nordvestlige ende, mens selve indgangen til museet og dets foyer er placeret i den sydøstlige ende. Placering af ankomst i den sydøstlige ende og en nordvestvendt café vil medføre behov for dobbeltbemanding, hvilket virker uheldigt.

Museumsgæsten modtages i et trappe rum, der betegnes som 'atrium'. 'Atriet', der har to brede ligeløbstrapper i hver sin

ende, tjener til fysisk kommunikation mellem de to plan og som den vej, man som besøgende følger, når man kommer, og når man forlader udstillingen. 'Atriet' indskrives som en del af flex- og ankomstzonen, hvorfor trapperne også er tænkt til ophold med siddepladser mm. Det er imidlertid dommerkomiteens vurdering, at atriumløsningen er et element, der ikke rigtigt kan udfolde sit potentiale hér. Blandingen af trafik ned ad og på tværs af trappen neden for denne vil forstyrre dem, som muligvis sidder på trinene. En funktion som foredragssted vil ikke kunne fungere, også fordi man ikke kan vise dias.

### Zone 2

Den kronologiske udstilling er arrangeret under jorden rundt om 'Atriet'. Der er således tale om et rum uden opdelinger men omkring trappekernen, som efter dommerkomiteens vurdering låser rumligheden og fleksibiliteten. For at maksimere pladsen under jorden følges byggefeltets perimeter. Frihøjden i dette udstillingsrum foreslås til 5 meter.



Dommerkomiteen vurderer, at glasset er et problem, idet der vil komme dagslys i zone 2, som vil hæmme fleksibilitet i udstillingen. Vedrørende genstandshåndtering foreslås det at anbringe en kraftig ankerblok, hvorfra man med et spil og fra slidsker kan nedfire tunge genstande ad den østlige trappe. Det vurderes rent arbejdsmæssigt ikke at være optimalt. Og hertil kommer, at enhver større og tung genstand skal drejes 90 grader ned for trappen på et sted, hvor det foreslåede spil ikke kan medvirke.





I en niche med ovenlys placeret mod øst opstilles de tre henrettelsespæle. Pælene er lysfølsomme genstande, hvorfor denne løsning ikke kan fungere.

Den eksisterende kælder foreslås anvendt til arkiv- og teknikrum. Hertil skal bemærkes, at der ikke skal være arkiv i det nye museum.

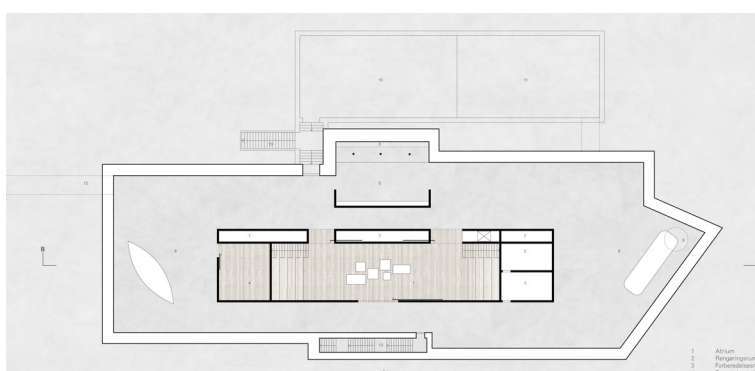
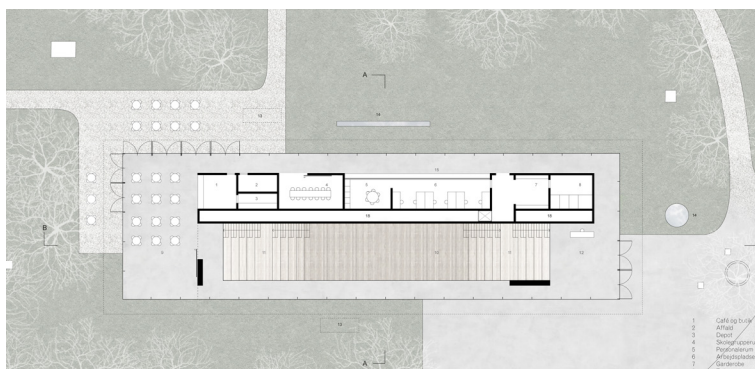
## LANDSKABS -OG BYARKITEKTONISK INDPASNING

Forslaget vil tilgodese samspillet mellem ude og inde og mellem byen og parken. I overgangen til byen skabes en ny pladsdannelse i krydset mellem Esplanaden, Churchillparken og Amaliegade. Pladsens overflade trækkes ind i museet og markeringen af indgangen fremstår klar og entydigt og kan ses på afstand. På pladsen placeres mindesmærkerne af Anders Lassen og Kaj Birksted, som endnu en markering af museets identitet. Dette er en sympatisk rumlig eksponering, som virker i grundplan, men som bliver dominerende ved den højt hævede tagflade og glasfacade. En rumlig disponering som på sin vis virker ufølsom for stedet og som trods tagets sænkede form i sigtelinjen virker markant.

I parkrummet placeres cafeens terrasse mod nordvest ud mod det smukke parkrum, som dog er delvist skyggefuldt i dagtimerne. Terrassen tilsluttes stier, som leder ud i parkrummet. En sympatisk tanke men i henhold til områdets fredninger, vil

det ikke være muligt, da det er disponeret uden for byggefeltet

Cykelparkeringen placeres mod Esplanaden og Churchillparken væk fra bygningen og på offentligt areal. Der er ikke anvist overdækket cykelparkering. Vareindlevering sker ved ankomstpladsen og kan både ske fra Esplanaden og Churchillparken. Der er placeret korttidsparkering mod Esplanaden og en handicap p-plads ved Churchillparken. Begge placeringer sikrer en kort afstand til indgangen.



## **BÆREDYGTIGHED OG TEKNISKE LØSNINGER**

### **Konstruktioner**

De arkitektoniske ambitioner om en relativ tynd, frit spændende tagflade med betydelige frie spænd og udkræninger vurderes ikke mulig uden supplerende konstruktioner. Udstillingskælderen beskrives som en vandtæt dobbeltkonstruktion, hvor snittegningen alene viser en enkelt bundplade, der sammen med bygningens egenvægt sikrer mod opdrift.

### **Installationer og indeklima**

Teknikrum etableres i eksisterende kælder med tilhørende ventilationsindtag og -afkast uden for byggelinjen. Føringsveje for installationer angives noget uklart gennem kælderydervæggene og ned under udstillingsrummets trægulv og frem til den centrale teknikskakt i bygningens centerlinje.

De installationstekniske udlæg tilgodeser i nogen grad fleksibilitet, hvor udstillinger må antages arrangeret i respekt for ventilationsristenes placering.

Opvarmning af udstillingen (zone 2) sker ved indblæsning via lavtsiddende riste i installationsvæggen. Princippet vil sandsynligvis kunne bringes til at opfylde de beskedne komfortkrav med supplerende indblæsningsaggregater. Om sommeren afkøles rummet med 'grundvandskøling'. Stueetagen opvarmes med gulvvarme i trægulvet og ventileres mekanisk.

### **Bæredygtighed**

Erklæret opfyldelse af BK2020, højeffektive og solafskærmende energiruder i facaderne, mulighed for grundvandskøling, termisk lagring i konstruktionen med videre er alle elementer med henblik på reduktion af energiforbruget for energimæssig bæredygtighed.

### **Drift**

Der er generelt anvendt robuste materialer med lang levetid, og bygningen vurderes enkel at vedligeholde. Løbende renhold af

de mange, delvist højtsiddende glasflader vurderes dog over 'gennemsnitligt'. Idéen med en central installationskerne er prisværdig, men den virker uhensigtsmæssig smal med hensyn til at udføre, fordele og drifte de tekniske anlæg, hvilket også antydes på snittegningen. Adgang til teknikskakten for servicering er hverken vist eller beskrevet

### **Brand**

Der er vist flugtveje på hver side af bygningen, hvor eksisterende udgang fra kælder benyttes mod nord, og en antydning, men ikke indtegnet ny trappe uden for bygningens sydlige facade. Flugtvejsforholdene er underdimensionerede, og trapperne er ikke placeret med henblik på flugtvejsdækning.

### **ØKONOMI**

Forslagsstiller redegør for en kalkulation af håndværkerudgifter, der indikerer, at forslaget kan holde sig inden for den beskrevne økonomiske ramme i konkurrenceprogrammet på 41,15 mio. kr. ekskl. moms.

Der henvises i øvrigt til bemærkningerne om økonomi i dommerkomiteens indledende kommentarer om forslagene som helhed.

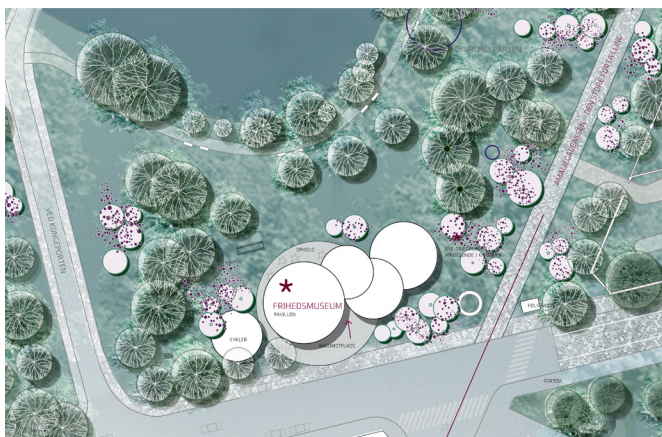
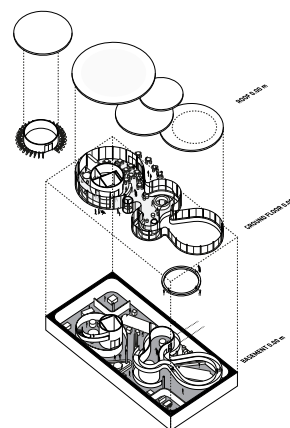
### **SAMMENFATNING**

Forslagets styrke er den skulpturelle effekt. Bygningen har en iøjnefaldende tiltrækningskraft og kan give sig til kende som museum bl.a. i kraft af projiceringerne på loft, vægge osv. Dommerkomiteen finder, at forslagens svaghed er proportionalt med dets volumen; det er for stort i forhold til såvel tema som tid og sted.

Bygningens disposition er forholdsvis enkel, men med uhensigtsmæssige placeringer af de forskellige funktioner. Kernen og 'atrium' låser for rumligheden og fleksibiliteten, ligesom orienteringsområdet på trapperne ikke anses for en brugbar løsning.



# Forslag 3/68371



Forslaget er udarbejdet af **BIG** (ophavsret) i samarbejde med **Søren Jensen Rådgivende Ingeniørfirma** og **Schönherr**. Konsulent: MerzMerz (HGMerz), udstillingskonsulent. Projektteam BIG: Bjarke Ingels; Andreas Klok; David Zahle; Frederik Lyng; Ole Elkær; Leonardo Nahuel Musso; Magnus Garvoll.

Forslagsstillerne når via en analyse til den konklusion, at man kan bygge meget under jorden og lidt over jorden. Der arbejdes således med det synlige og det usynlige, og dette bliver dermed en reference til besættelsestiden - en vekselvirkning der overføres til et formsprog og en disponering om det tunge og mørke og det lyse og frie.

Man dvæler ved denne dobbelthed, som forslagsstilleren har dyrket som bærende idé. Pavillonen er placeret på et sted i parken, der udfoldes inden for en geometrisk opdeling i fire cirkler og spiller op til trækroner og organiske former.

Forslaget dyrker dynamiske bevægelser, med fire cirkler der sammensættes og indskrives i hinanden, så der opstår en amorf omkreds. I denne form opstilles krumme termoglas, som facadeglas, så der opstår en sammenhængende pavillon. Cirkelformationerne fortsættes til affaldsrum og ankomstplads.

Taget har et let op-/nedskalerende forløb af spring på tagfladerne, som er plane og fremstår enten græsklædte eller med solceller.

### Zone 1

Ankomstområdet er vist som en sammenstilling af cirkulære rum med indgang fra Esplanaden i midten - og café og flexrum mod parken. Butik og garderobe indrettes som to store møbler. Via et svunget rampeforløb forbindes zone 1 med zone 2, som

er kælder og som rummer udstillingen. Dommerkomiteen vurderer, at rampen tager megen plads og hindrer fleksibilitet i udstillingen. Formidling på rampen vil modvirkes af trafikken og omvendt.

### Zone 2

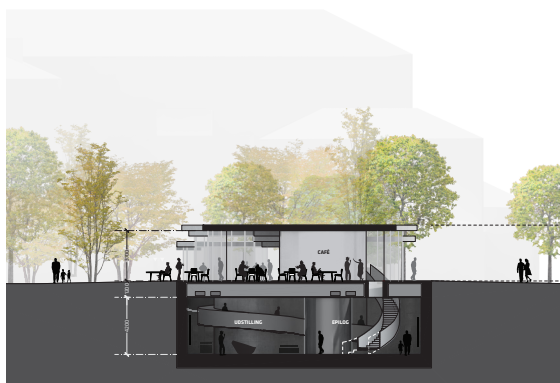
Rummet i underetagen er et rektangulært søjlebåret rum med afrundede hjørner, hvor to kerner føres ned oppefra: En elevatorkerne samt en kerne med forberedelsesrum, rengøring mm. Frihøjden i kælder er oplyst til 420 cm.

Vedrørende genstandshåndtering beskrives en tagkassette i den sydlige ende, som kan demonteres således, at man med kran kan hejse tunge genstande ind i udstillingen.

Den eksisterende kælder foreslås anvendt til arkivrum og teknik. Hertil skal bemærkes, at der ikke skal være arkiv i det nye museum.

Ser man indenfor, er der rigtigt nok mest under jorden - men i lysmæssig åben forbindelse til den glasklædte facade i stueetage. Dagslysindfald i zone 2 vil desværre hæmme udfoldelsen af udstillingen. Der er endvidere placeret et antal søjler i udstillingsarealet, og disse kommer i vejen for enhver udstillingsopbygning.

Udstillingssalen fremstår med svungne ramper, konkave hjørner, cylindrisk elevator og en krum trappe. En fortælling om besættelsestiden og modstandskampen 1940 - 45 har i sig selv megen dynamik og måske endnu mere dramatik, hvorfor







udstillingsrummet sandsynligvis bør fremstå roligt og lade fortællingerne dominere - ikke omvendt.

Publikumstoiletter er placeret i kælderen, hvilket medfører at f.eks. cafégæster skal bevæge sig ad den svungne rampe eller køre ned med elevator for efterfølgende at passere udstillingsarealet. Denne persontrafik kan muligvis virke forstyrrende på øvrige museumsgæster. Overflader, tekstur og materialitet forklares ikke helt og kan ikke aflæses på tegningerne.

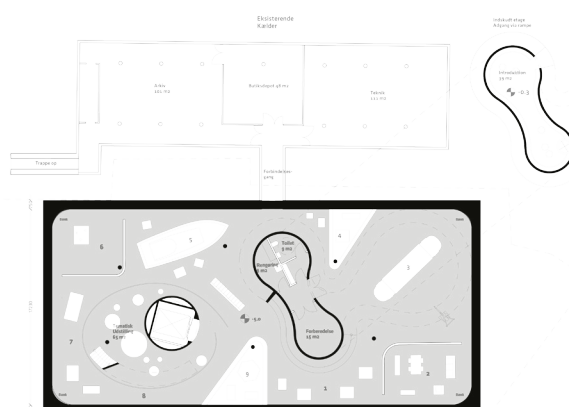
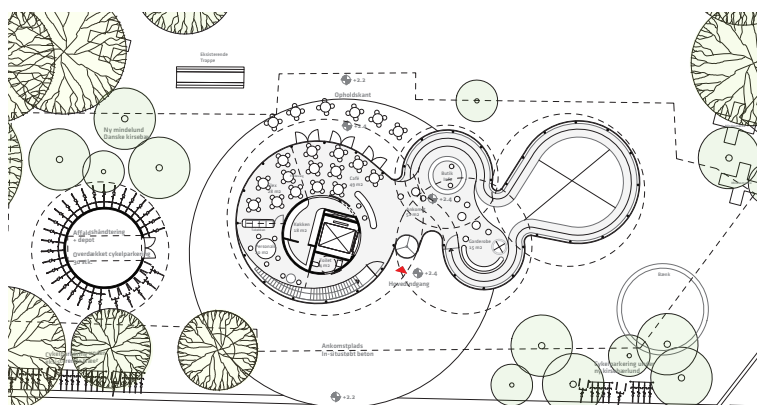
## LANDSKABS -OG BYARKITEKTONISK INDPASNING

Forslagsstillerne foreslår et museum, som nænsomt placeres i parken. Træerne, græsfladen og parkrummet tolkes som en poetisk landskabelig baggrund i samspil med facadens lette og transparente udtryk, der tilpasses den rumlige skala og derved underordner sig den kulturhistoriske kontekst. En smuk vision der dog efter dommerkomiteens vurdering ikke forløses i forslaget qua det valgte arkitektoniske udtryk for museet.

En cirkulær betonflade er på en gang ankomst, rum for udeservering og vareindlevering samt gulv i den indvendige del af museet. Ankomsten sker fra Esplanaden, hvor cirkelflader er centeret midt imellem Ved Kongeporten og Churchillparken. Mod parken danner den ramme for udeservering og er en siddekant i sig selv. Overdækket cykelparkering og affaldshåndtering er

integreret i en selvstændig cirkulær pavillon.

Forslaget skal fremhæves for at arbejde med at funktionerne ikke gemmes væk, men bliver en del af det arkitektoniske udtryk. Samtidigt kan det undre, at det er nødvendigt at gentage cirkelformen både i bygningens form, i belægningsfladerne og igen i pladdannelsen ved Gefionspringvandet. Cirkelns enkle og rene form bliver en diagrammatisk tolkning og ikke en rumlig læsning af de enkelte elementer og/eller stedets potentialer.



## **BÆREDYGTIGHED OG TEKNISKE LØSNINGER**

### **Konstruktioner**

Pavillonen står som en rammekonstruktion med stålsøjler indspændt i de runde tagflader og simpelt understøttet på udstillingskælderens etagedæk. Kælderen er udført med dobbelte væg- og bundkonstruktioner, og forslagsstillerne demonstrerer kendskab til udførelse af konstruktioner under grundvandsspejl. Det amorfe dæk over kælder er et 'paddehattedæk' båret på de to bygningskerner og et antal søjler, som må antages at skulle suppleres i den endelige udformning. Udstillinger må indordne sig søjler og bygningskerner.

### **Installationer og indeklima**

Teknikrum etableres i eksisterende kælder med ventilationsafkast uden for byggelinjerne. Føringsvejene er uklart beskrevet, hvor det i modstrid med diagrammerne angives, at vandførende rør dels indstøbes i kældergulvet dels føres over kælderdek. Hertil skal bemærkes at vandrør skal separeres fra udstillingen.

Ventilation og el føres i nedhængt loft i udstillingskælder med henblik på udstillingsmæssig fleksibilitet. Klimatisering af udstillingen (zone 2) sker med ventilation fra kanaler over nedhængt loft og fra bunden af adgangsrampen.

Pavillonen (zone 1) opvarmes med konvektorer og ventileres ved delvis naturligt, delvist mekanisk luftsifte fra eget anlæg i teknikrummet. Som udgangspunkt vurderes princip for opvarmning og ventilation velvalgte med henblik på godt indeklima. Der vil være dage med overtemperaturer i pavillonen, hvilket giver anledning til åbning af facaderne mod parken.

### **Bæredygtighed**

Der er angivet en Be10-beregning, som viser et meget lavt energiforbrug for den samlede bygning og dermed overholdelse af BK2020-kravene.

### **Drift**

Der er generelt anvendt robuste materialer med lang levetid, og som udgangspunkt vurderes bygningen enkel at vedligeholde og drifte. Glasfacader kræver løbende renholdelse, men det må antages, at udskiftning af ruder kræver særlige omkostninger.

### **Brand**

Der er udtænkt en brandteknisk flugtstrategi baseret på vertikal røgdaskillelse med anvendelse af bygningens adgangstrapper og ramper som flugtveje. Umiddelbart er denne strategi ikke i overensstemmelse med reglerne for sikring og flugtveje fra forsamlingslokaler. Det må derfor antages, at der skal suppleres med deciderede flugtvejstrapper til det fri.

### **ØKONOMI**

Forslagsstiller redegør for en kalkulation af håndværkerudgifter, der indikerer, at forslaget kan holde sig inden for den beskrevne økonomiske ramme i konkurrenceprogrammet på 41,15 mio. kr. ekskl. moms.

Der henvises i øvrigt til bemærkningerne om økonomi i dommerkomiteens indledende kommentarer om forslagene som helhed.

### **SAMMENFATNING**

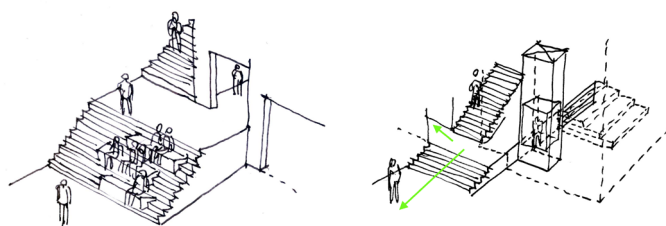
Forslaget skal fremhæves for den indledende analyse, om hvad man kan, og hvad man ikke kan på dette unikke sted.

Forslaget søger bevægelser fra cirkelslag der sammenbindes og et amorft forløb opstår. Det bliver til mangeformede linjer og disse bliver til glasfacader som efterlader et markant udtryk som fortsætter ned i udstillingen og her vil virke dominerende i forhold til anvendelsen.

Det er dommerkomiteens vurdering, at ved i samme greb at indpasse museum, løse en overdækket cykelparkering, affaldshåndtering, siddemuligheder, udeservering, vareindlevering, rampe, elevator alt i amorfe former forekommer disse geometriske flader og svungne linjer uden harmoni med sted og tema. Det er svært at identificere det arkitektoniske udtryk som et museum for Danmarks frihedskamp 1940-45.



# Forslag 4/74171



Forslaget er udarbejdet af **Henning Larsen Architects** (ophavsret) i samarbejde med **Schul Landskabsarkitekter** og **HaCaFrø/Tyrens**. Projektteam Henning Larsen: Torels Troelsen; Mikkel Bækgaard Breck; Manuel Cespedes. Projektteam Schul: Jonas Schul. Projektteam HaCaFrø/Tyrens: Per B. Sørensen; Martin Dagnæs; Martin Froderberg

Forslaget omhandler en let, delvis transparent, kubisk glaspavillon, solitært placeret i parken med en indre tung kerne, der forbinder ankomstniveau til to underliggende niveauer. Denne forbindelse udgøres af et trapeelement på den nordlige side samt dobbelt- og tredobbelt høje kig og forbindelse mellem etagerne på den sydvendte side.

Ankomsten er placeret ud mod Esplanaden i det sydøstlige hjørne. Den indre kerne står delvist frit som følge af et dobbelthøjt rum fra kælder langs Esplanaden samt en bred sidde trappe udlagt langs den nordlige facade. Kernen har et balkonniveau til personalefunktioner. Som følge af friholdelse af kernen kommer der fra facaden dagslys fra sydvest ned i udstillingsområdet, og dette træk benyttes som et invitationskort

### Zone 1

Kernen indeholder funktioner til ankomst, cafe, flexrum, personale mm. Café og ankomstfunktionerne udlægges som 'en integreret del af parken'. Forslaget dyrker interaktionen mellem zone 1 og 2. Dette ved at etablere en bred trappe der betegnes som 'amfitrappen'. Trappen har et mellemniveau, hvor der er garderobe og toiletter samt adgang til den øvre del af et indskudt auditorium, som er indbygget i glaspavillonens indre kerne. Endvidere er der indgang til et udstillingsrum i dele af den eksisterende kælder. Den øvrige del af den eksisterende kælder er udnyttet til teknikrum. Det nederste løb af 'amfitrappen' bliver bredere og inviterer til ophold, dette i selve hovedudstillingssalen.

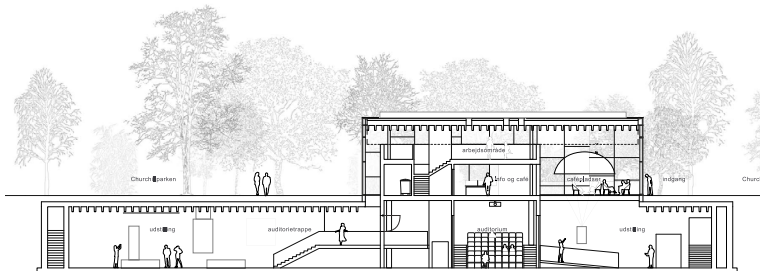
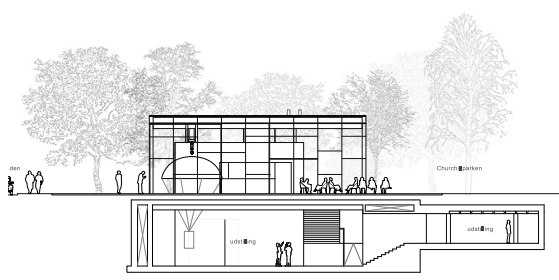
### Zone 2

Den kronologiske udstilling er udlagt som en søjlefri hal, der udnytter byggefeltets geometri, men i rektangulær form. Loftshøjden er ca. 4,3 m frihøjde. Der vises forskellige scenarier til opsætning af udstilling med skærme, podier eller afstemte zoner - der beskrives således en fleksibel udstillingsmulighed. Genstandshåndtering er beskrevet med brug af en mobilkran, der angiveligt kan manøvrere tunge genstande mellem bjælker og ned til udstillingsniveau gennem den store åbning, der er imellem etagerne i det sydøstlige hjørne.

Forslaget vurderes som en interessant bygning. Masser af dagslys, et større trappeanlæg, dobbelthøje rum, endda tredobbelt høje forbindelser fra kælder, lange sigtelinjer, lyse overflader og delikate eksklusive løsninger med de krystallinske glasformationer i facaderne som eksempel. Problemet her er, at der ikke er behov for dagslysskader, for dette vil hæmme fleksibilitet i udstillingen..

Den omtalte 'amfitrappe' er principielt set en bred ligeløbstrappe, der inviterer til ophold; denne kan dog virke som en prop for op- og nedstigende publikum. Endvidere vil det være vanskeligt at udstille i trapeområdet.

De mange synlige ribber fra elementkonstruktionen virker med en fast, stram takt, som der måske ikke er behov for. Der melder sig spørgsmålet om mørklægning for det glasareal, der er mellem ribberne. Det er et fint træk med det indskudte niveau og adgang til det lille auditorium.







## LANDSKABS -OG BYARKITEKTONISK INDPASNING

Bygningens kvadratiske form gentages i to udendørs belægningsflader, som indgår i en komposition med bygningens sokkelaftryk. Et enkelt arkitektonisk greb som samler bygning og udefunktioner og fremhæver museet som et selvstændigt objekt indpasset i byens sammenhænge og de anviste sigtelinjer. Museet placeres i parkrummet, som ellers behandles nænsomt kun ved at tilføje en løgplæne.

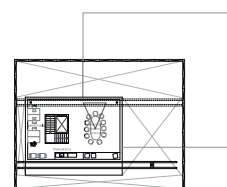
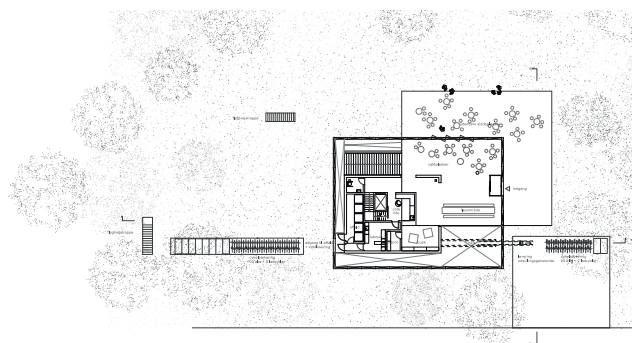
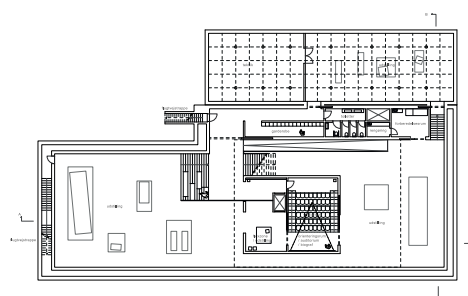
Den ene kvadrat er cafeens gulv, som skubbes ud i parkrummet til udeservering og afsluttes med en præcis kant mod græsfladen. Den andet kvadrat er ankomstrummet med adgang fra Esplanaden og Churchillparken.

I ankomstrummet placeres cykelparkering, og der er mulighed for levering af større udstillingsgenstande samt vareindlevering. Ankomstpladsens klart definerede felt anviser også en entydig markering af hovedindgangen til museet.

Svagheden opstår i mødet mellem den foreslåede promenade ved Churchillparken og den klart definerede ankomstplads, idet den ufuldstændige bearbejdning udviser det klare koncept. Der er vist forskellige bud på overgangene mellem Esplanaden og museet og forskellige muligheder for placering af cykelparkering - enten tæt på hovedindgangen eller langs facaden mod

Esplanaden. Væsentlig detaljer i forslaget, der burde være entydige, da det netop viser udtrykket for afslutningen af ankomstpladsen, Churchillparken og derved parkrummets kant mod byen.

Den overdækkede cykelparkering er placeret vest for bygningen bag en betonvæg med glastag. Belysningen ved terrasserne er nedgravningsarmaturer, som vil oplyse belægningsoverfladen og derved undgå det at sprede lys ud i parkrummet.



## **BÆREDYGTIGHED OG TEKNISKE LØSNINGER**

### **Konstruktioner**

Den centrale, pladsstøbte kerne bærer pavillonens 'svævende' tag af TT-dæk, hvor temaet med TT-dæk gentages i udstillingskælderens søjlefri arealer. Forslaget opererer med jordankre og dobbeltkonstruktioner, som udnyttes meget utraditionelt til både flugtvejsareal og installationer. Forslaget dokumenterer ikke overbevisende at udnytte det smalle og forventeligt fugtige hulrum.

### **Installationer og indeklima**

Vandfyldte installationer til café og toiletfunktioner anskues ført uden om udstilling i overensstemmelse med program. Ventilationskanaler og hovedkanaler for luftindtag føres den lange vej i kældervæggene med det argument, at der herved kan ske en årstidsbestemt temperaturkonditionering. Et argument hvis bæredygtighed skal verificeres. Udstillingsarealet har gulvarme og ventileres mekanisk, hvilket giver grundlag for godt og stabilt indeklima. Ventilationen køles på varme sommerdage fra jordkølingslanger udlagt i grundvandet.

Servicearealer over terræn (zone 1) opvarmes med både gulvarme og varmeslanger i pladsstøbte vægge. Arealet ventileres naturligt via oplukkelige elementer øverst i bygningens glasfacader, hvor der noget uklart beskrives naturligt luftindtag fra kanaler i kælderens dobbeltkonstruktion. Det er vurderingen, at indeklimaet i zone 1 vil være udfordret grundet de meget betydelige om end højt kvalificerede glasfacader og den direkte forbindelse til den reelt uopvarmede udstillingsetage.

### **Bæredygtighed**

Forslagsstillerne argumenterer for udnyttelse af lavtemperaturgulvarme og vægvarme, mulighed for natkøling og opfyldelse af krav til BK2020 som væsentligste elementer for bæredygtighed.

### **Drift**

Som udgangspunkt vurderes bygningen rengøringsvenlig, hvor dog de betydelige og eksponerede vinklede vinduesarealer stiller krav til

løbende pudsning. Det antages, at dette skal ske med lift både udendørs og indendørs.

Servicering af installationerne i de 0,5 - 0,6 m brede rum i kælderydervæggene er udfordret med hensyn til fremkommelighed og arbejdsmiljø. Konceptet med de indstøbte, vandbårne slanger i dæk og vægge er en driftsmæssig bekymringsfaktor med henblik på montage af udstillingsinventar og skal separeres helt fra udstillingsområdet.

### **Brand**

Der er ikke omtalt intentioner om mekanisk og naturlig røgventilation eller nogen egentlig brandstrategi bortset fra brandtrapperne, som endvidere ikke er defineret i terræn. Brandstrategien synes utilstrækkelig, og projektet må forventes tilpasset.

### **ØKONOMI**

Forslagsstiller redegør for en kalkulation af håndværkerudgifter, der indikerer, at forslaget kan holde sig inden for den beskrevne økonomiske ramme i konkurrenceprogrammet på 41,15 mio. kr. ekskl. moms.

Der henvises i øvrigt til bemærkningerne om økonomi i dommerkomiteens indledende kommentarer om forslagene som helhed.

### **SAMMENFATNING**

Den solitære pavillon optager et vist volumen og anvender ekspressive virkemidler i format og glasvariationer, såsom prismeformer og krystallinskbevægelse med bølger af ribbeender herover samt synlige bjælkeender, der kommer frem i tagfladen. Der er således tale om et arkitektonisk udtryk, der direkte viser konstruktioner og ikklædning.

Det samlede greb efterlader dog en tvivl om hvorvidt forslaget kan leve op til et bæredygtigt og energibesparende byggeri

Det indvendige er et rum med megen visuel kontakt og dagslysindfald gennem flere etageplaner. Der er opstået en atmosfære af noget særligt og fint, men dette fornemmes mere som et kunstmuseum eller et galleri frem for et temamuseum for frihedskampen 1940 - 45.



# Introduction

## The assignment

The competition for the design of a Museum of Danish Resistance 1940 - 45 concerns a new building to replace the former museum facilities that were destroyed by fire in April 2013. The new museum is to be erected at the site of the former museum at Esplanaden in Churchill Park in Copenhagen, within the footprint of the original museum.

The new museum building is to blend in naturally with the surrounding urban architecture, with a special focus on the Citadel. The dimensions, shape, location and materials of the new building are to interact closely with the surroundings, and the museum must adapt naturally and respectfully to the urban fabric that surrounds it, as a building in a park.

The new Museum of Danish Resistance is to interpret and communicate Danish resistance during the German occupation. The floor area of the museum is to be laid out within a building volume featuring varying room heights on the inside spread over one or more levels and in such a way that the largest possible exhibition area is achieved. The building is to be spacious, flexible and fit for its purpose. It is to provide optimal conditions for both permanent and temporary exhibitions.

Entrants were asked to present concepts for a holistic strategy for the existing planting scheme and the future location of monuments and memorials within the competition site. Entries were to stay within

an overall construction cost budget of DKK 41.15 million exclusive of VAT.

The competition was launched by the Danish Ministry of Culture as a restricted design competition in accordance with the EU Procurement Directive 2004/18/EC following prior prequalification; see EU contest notice 2014/S 182-321888, which was published in the Official Journal of the European Union on 23 September 2014.

## Participants

Following prequalification, the following five teams were shortlisted for participation in the competition:

### **Lead consultant BIG - Bjarke Ingels Group A/S**

in collaboration with Søren Jensen Rådgivende Ingeniører A/S and Schønherr A/S

### **Lead consultant Heneghan Peng Architects**

in collaboration with Ove Arup & Partners Ltd and Agence Ter

### **Lead consultant Henning Larsen Architects**

in collaboration with Schul Landskabsarkitekter and HaCaFrø/Tyréns

### **Lead consultant Lundgaard & Tranberg**

in collaboration with EKJ Rådgivende Ingeniører A/S, Esbensen Rådgivende Ingeniører A/S and ÅF Lighting - Hansen & Henneberg

### **Lead consultant Polyform Arkitekter**

in collaboration with Search, Oluf Jørgensen and Cenergia

The fee paid to each team was DKK 200,000 exclusive of VAT.

The competition material was sent to the participants on 15 December 2014 and the deadline for submission of entries was 24 February 2015. A visit to the competition site took place on 18 December 2014.

All five entries were submitted in time on 24 February 2015.

## ASSESSMENT PANEL

### Assessment panel

Marianne Jelved, Minister for Culture (chair)  
Henrik Tvarnø, CEO, A P Møller Foundation  
Per Kristian Madsen, Director General, National Museum of Denmark  
Steen Kyed, Assistant Permanent Secretary, Ministry of Culture  
Jan Skamby Madsen, Museum Director, Moesgaard Museum  
Sanne Houby-Nielsen, Director General, Nordiska Museet, Stockholm

Design professionals appointed by the Danish Architects' Association (AA)  
and the Danish Association of Consulting Engineers (FRI):

Frank Maali, Architect MAA  
Lisbeth Westergaard, Landscape Architect MAA MDL  
Bo Søgaard, MSc (engineering) FRI

### Advisers to the assessment panel

Nikolaj Jensen, Technical Director, Danish Agency for Palaces and Cultural Properties  
Ann-Pia Puggaard, Head of Projects and Advisory Services, Danish Agency  
for Palaces and Cultural Properties  
Maria Miret, Senior Consultant, Danish Agency for Palaces and Cultural Properties  
Tina Saaby, City Architect, City of Copenhagen  
Didi Maja Thiemann, Unit Manager, Inner City Urban Planning, City of Copenhagen  
Thomas Roland, Consultant, Danish Agency for Culture  
Ulrik Abild, Head of Building, National Museum of Denmark  
Maruiska Solow, Exhibition Architect, National Museum of Denmark  
Poul Klenz PhD, Senior Adviser on indoor environment and climate control,  
National Museum of Denmark  
Merete Brun Ejlers, Creative Manager, Arkitema Architects

### Competition secretary

Bettina Mylin, Architect MAA, Competition Unit of the Danish Architects' Association

For use in the panel's assessment, a functional, technical and financial assessment of the entries was made.

### ASSESSMENT CRITERIA

The competition entries were assessed on the basis of their architectural and spatial qualities, the incorporation of the proposed scheme into the landscape and the urban architecture, sustainability and technical solutions relative to the requirements and the budget set out in the competition brief. The entries were assessed on the basis of the degree to which they met the first three assessment criteria and remained within the budget specified in the competition brief (fourth assessment criterion).

### Further information

#### about the assessment criteria

##### 1. Architectural and spatial qualities

An attractive building of high architectural quality both on the outside and on the inside. A layout and organisation that is conducive to optimal storage and exhibition of objects within the framework of a differentiated, atmospheric and spacious exhibition area. Spatial qualities that ensure robustness and flexibility in the presentation and interpretation of the museum objects. Easily understandable relationships inside the buildings and between outdoors and indoors.



## 2. Incorporation into the landscape and urban architecture

The main concept proposed for the competition area as a whole in terms of building facilities, outdoor areas, planting schemes and monuments. An architectural idiom that fits into Churchill Park and adds value to the historic surroundings, the park and the city.

## 3. Sustainability and technical solutions

An environmentally sustainable building that helps make the museum energy-efficient and reduce operating costs. Technical solutions that are conducive to ensuring that the building will be flexible, have optimal climate control and be secure.

## 4. Costs

The possibility of realising the scheme proposed within the budgetary framework

defined (see 4.6 and Annex 08), with the architecture and the layout of floor areas and associated functions enabling further design development that will not lead to exceeding of the budget.

### The assessment period

The assessment period began on 3 March 2015, and the assessment panel held four meetings. At the concluding meeting on 10 April 2015, a majority of the panel decided to select Entry 5/10946 as the winning entry in the design competition.

A minority of the assessment panel, consisting of Henrik Tvarnø, does not support the majority's selection of Entry 5/10946.

Signed by the members of the assessment panel in Copenhagen on 10 April 2015

Marianne Jelved

Henrik Tvarnø

Per Kristian Madsen

Steen Kyed

Jan Skamby Madsen

Sanne Houby-Nielsen

Frank Maali

Lisbeth Westergaard

Bo Søgaard

## Dissent

A minority of the assessment panel, consisting of Henrik Tvarnø, does not support the majority's selection of Entry 5/10946 as the winning entry for the following reasons: The general assessment of the minority is that it is unlikely that any of the entries submitted would be able to comply with the financial budget for the museum. It is considerably more expensive to build below ground than above ground, and all the entries feature large below-ground areas. The assessment of the minority is that the entries probably could not be realised within the limits of the funding made available.

As regards Entry 5, the minority is of the opinion that the proposed scheme is too large to be realised within the budget defined. If this scheme was to be realised within budget, it would have to be reduced and modified to such an extent that there would probably be great differences between the building featured in the competition entry and the building that would actually be constructed. In addition, some cost items seem to have been left out of the entrant's calculations.

A specific reason for not supporting the majority's assessment of Entry 5 is that the presence of above-ground building elements would be very humble - which is perhaps a result of the challenging architectural assignment that a building at this site is deemed to be. The proposed scheme would not be a sufficiently inviting and outstanding element in the cityscape that would clearly communicate the exist-

ence of a Museum of Danish Resistance 1940-45 at the site. The minority sees a risk that it might instead signal a preference to suppress the memory of Danish resistance by hiding the museum away. In realisation of the entry there will be a definite need to take this dilemma into account.

The elliptic shape of the building does not appear to be in harmony with the site and thus risks becoming a cliché. The facade is not compelling and for many months of the year will be devoid of the vegetation illustrated. The gravelled area in front of the building may be fine on its own, but it does not fit well into Churchill Park. The site is often windy and can only be used for spending time outdoors during a few months of the year, typically in school holiday periods and thus not at peak visitor times. The sunken area is vulnerable from a construction point of view and will require extensive waterproofing of the building.

The above-ground building is too small to serve as an attractive entrance to the museum, and the arrival and café areas are inadequate. There is a risk that the stairs might seem claustrophobic, and the entire arrival setting is so compressed that arrival will not work well. It will not be possible to receive a large number of visitors simultaneously. Arrival at the museum and the architectural transition from street to exhibition appear to be unresolved. The tight project budget will probably not allow an increase in the number of square metres above ground, which could have remedied some of the shortcomings.



# General assessment of entries

The outcome of the competition for the design of a new Museum of Resistance is extremely important. First and foremost because the site is rich in historical and visual constraints and relationships. The theme in itself is a challenge, and so is the building zone. It is thus a difficult, but also interesting assignment. The schemes proposed in response to the brief had to embrace a multitude of aspects and weave into a historical, listed parkscape between the northern boundary of the Frederiksstad district, the Esplanade and the ramparts of the Citadel.

The new museum will have a unique location and is to communicate and interpret an interesting, educational and relevant subject: Danish Resistance 1940-1945. It has proved difficult for entrants to provide optimal museum facilities that comply with the requirements defined by the National Museum of Denmark.

The competition site is divided into two areas: the building zone which is the footprint of the original museum and cannot be deviated from, and the park area including roads and parking facilities from the Esplanade towards the Gefion Fountain and St Alban's Church. All entries stay within the boundaries defined in terms of the location of the proposed building.

The National Museum of Denmark would like to see some degree of interpretation within the framework of the current very stringent building guidelines. Entrants were

therefore allowed to present proposals for specific floor areas and thus the eventual size of the museum, as no exact floor areas were defined for the individual functional zones in the brief. In addition, entrants were free to include the existing basement in the future building facilities.

The required spaces were to be distributed between a service and arrival area (Zone 1) and an exhibition area (Zone 2). A common feature of all five entries is that they locate the exhibition area (Zone 2) below ground.

The question is whether a logical consequence of this layout is that the building is constrained in all respects or only partially. Two entries use expressive effects above ground, for example Entry 1/201130131 and Entry 2/28400 that feature high-volume buildings, whereas Entries 3/68371 and 4/74171 propose solitary pavilions. All four entries thus present distinctive architectural idioms and locate the competition spaces below ground, which creates a kind of duality. One proposal, Entry 5/10946, stands apart, as only a small entrance building is left above ground.

Entries 1/201130131 and 2/28400 occupy almost the entire building zone, and they both feature moving/waving shapes and relatively high facades. The assessment panel was sceptical about such twisted shapes immediately opposite the ramparts of the Citadel.

Entries 3/68371 and 4/74171 both use the building zone partially, albeit in different ways: Entry 3/68371 features an amorphous constellation of circles and Entry 4/74171 proposes cubic compactness. Both are designed as solitary pavilions.

Entry 5/10946 uses only a relatively small part of the building zone above ground, but features an open gravelled arrival area that also serves as an imaginary space for interpretation and reflection. The proposed scheme features a small entrance pavilion with a flat roof covered with solar cells, and technically the roof above the exhibition room on Level -2 constitutes the sunken gravelled arrival space. The assessment panel was highly sceptical about this design with regard to the removal of water in the event of torrential rain.

Entries 1/201130131, 2/28400, 3/68371 and 4/74171 draw natural light down into the exhibition space, one purpose being to create specific atmospheres. This is not an optimal solution in an exhibition space that should be flexible and where the staging should be created by the displays and not the space. The panel assessed the solutions presented for screening and blackout, and its conclusion was that the four entries mentioned above would require modification to be able to meet the requirements of a flexible exhibition space. Entry 5/10946 has no natural light in the exhibition area and the exhibition space is completely neutral.

With regard to the interior plan organisation of spaces, the assessment panel looked at the arrival area and the flows to be followed by museum visitors. A shared feature of all five entries is that visitors will move from the top down. The panel discussed whether they would move quickly or slowly, whether this flow could be used in the presentation and interpretation of exhibition displays, and whether it would serve to create certain atmospheres or would rather be used informatively. Both

Entry 2/28400 and Entry 4/74171 have a fixed inner core with a layout and functions that create a large stair structure leading down to the exhibition hall. In both entries the stairs are designed so that people can stop and stay on them for a while, and can possibly be used for the presentation of information. However, the assessment panel had concerns about the use of the stairs as a place to stop and stay and saw a risk that they could become bottlenecks that would prevent a smooth flow through the facilities. Moreover, the stairs are not at all suitable for the display of objects and presentation of information.

Both Entry 1/201130131 and Entry 3/68371 feature relatively unconstrained spaces on the ground floor, with seamless flows from one or more distribution points. In both entries, there is intake of natural light in the exhibition spaces. Entry 1/201130131 is based on a very large, open arrival space with two distribution points for movement up and down respectively. Entry 3/68371 is based on a transparent arrival space with interior glass walls and glass doors that separate the space from the lower exhibition areas. Access to the exhibition area is organised by movement down a curved ramp. The ramp is intended as a place where people can view the museum, but it takes up too much space and is not suitable for the display of objects or presentation of information.

Entry 5/10946 features a clear division into zones. The various levels are connected by stairs and lifts that exclusively serve the purpose of bringing people from one place to another and have no additional functions as places to stay or areas of presentation and interpretation. Movement in an enclosed space – and then visitors have arrived in the exhibition area.

## **ADAPTATION TO LANDSCAPE AND URBAN ARCHITECTURE**

All entrants consider the overall narrative of the area between the Amaliegade axis



and the Gefion Fountain an important visual axis that defines the boundaries of Churchill Park and includes the space towards Toldboden in a green context so that it becomes part of the greater parkscape. Some entries leave the existing park as it is, while others propose unobtrusive trees, lawns with bulbs and small gravelled paths between the memorials.

The difference between the entries lies in their treatment of Churchill Park: Entry 2/28400 proposes an open space towards Esplanaden and Amaliegade; Entry 3/68371 proposes an open square at the Gefion Fountain at the other end; and Entry 4/74171 proposes a wide promenade between those two points. Common to them all is that the transition between city and park is marked more clearly than it is now.

There are several approaches to the location of the museum within the building zone: Entries 3/68371 and 5/10946 locate the museum in the park; Entries 2/28400 and 4/74171 locate it on the edge towards the city, opening it up towards Esplanaden and Amaliegade and thus making it visible from a distance. Entry 1/201130131 is so large that it neither becomes part of the park nor part of the city, but overpowers both of them.

The assessment panel discussed the entries' ability to attract people's attention before they find their way into the museum. Entry 1/201130131 features a relatively large area with benches and seating. Entries 2/28400 and 4/74171 propose audiovisual communication in the form of the projection of pictures or films. Entry 3/68371 uses transparency to display activity inside the pavilion and in the park.

It is the panel's opinion that Entry 5/10946 adds a special atmosphere to the place and highlights the heritage assets. The concrete frame and the seating in the open arrival area that invite people into the

museum can be seen from all angles, and the space defined by the gravelled surface can be incorporated into the narrative about Danish resistance. Using an elegant gesture, this scheme creates a new place in the city that actually becomes visible while being understated.

## **SUSTAINABILITY AND TECHNICAL SOLUTIONS**

All entrants state that they have prepared their proposals with due consideration of technological sustainability. They present widely differing arguments to substantiate such sustainability, but compliance with the BK2020 requirements (in several entries with the addition of solar cells to an undefined extent) is the argument generally used in all entries with the exception of Entry 1/201130131.

Entries 1/201130131, 2/28400, 3/68371 and 4/74171 emphasise the ability of the extensive glazed facades to provide passive solar heating in Zone 1. Entries 1/201130131 and 4/74171 also suggest natural ventilation with various measures for local heating close to staff in order to compensate for ensuing variations in the indoor environment, whereas the other entries rely on conventional heating and ventilation with regard to the indoor environment. The assessment panel discussed challenges in terms of energy costs and indoor environment in the four very different glass buildings and found that, because of its well-insulated building envelope and its technical description, Entry 5/10946 most compellingly substantiates the possibility of ensuring a stable, adjustable indoor environment under different operating conditions.

The extensive glass facades, especially in Entries 1/201130131, 2/28400 and 4/74171 but also to a lesser extent Entry 3/68371, gave the assessment panel cause to consider various operating aspects of the entries. Entry 5/10946 presents specific arguments for the robustness of the

building envelope and its moderate impact on operation, towards which the panel is favourable.

A common feature of all the entries is that their illustration of proposed installations is incomplete, the primary problem being that there is discrepancy between descriptions and drawings, that specific methodologies are not fully thought through and that underground installations in particular – of which several are located outside the building line – remain unclear. However, it is the opinion of the assessment panel that Entry 5/10946, which features simple building and installation principles, is robust in terms of the final choice of installation principles.

All entries take the brief's requirement of protecting basement structures against the high groundwater level into account, albeit in very different ways and with differing levels of quality. Entries 3/68371 and 5/10946 explain very credibly the methods to be applied in the execution of deep basements and waterproof structures. In the other entries, the panel would like to have seen an indication of technical understanding of the issue and the risks associated with it. The risks involved in the execution of work far below the groundwater table and the potential consequences in relation to adjacent buildings is a reason for concern that was discussed by the assessment panel.

#### **COMPLIANCE WITH THE FINANCIAL FRAMEWORK**

The assessment panel finds that all five entries would need further work to comply with the financial framework defined for the project. In order to comply with the framework, entries would have to be worked on in greater detail in terms of their structural design, functionalities, technical installations and general layout, and it would be necessary to modify floor areas. It is the opinion of the assessment panel that all five entries could be adjusted and adapt-

ed in a continued design process without jeopardising the overall concept.

Before its final selection of Entry 5/10946 as the winning entry, the assessment panel had an external independent analysis made of the financial and structural risks presented by the scheme.

The analysis confirmed the overall assessment of the panel, showing that the architectural design and layout of floor areas and associated functions illustrated in the entry provide sufficient certainty that it would be possible to design and realise the scheme without exceeding the financial framework and without jeopardising its overall concept.

#### **SUMMARY**

Five different responses to the brief were submitted, ranging from a relatively cautious approach to the visual appearance above ground to designs featuring more expressive effects. Variation is generally seen in the juxtaposition of the large building and the small entrance building, and of rectangular and circular shapes, flat roofs and curved elements. The entries thus feature both resilience and diversity.

All five entries place the exhibition areas in the basement, which presents a challenge to the financial framework for the project. Likewise, the panel is of the opinion that all five entries present challenges as regards the functional and technical solutions proposed.

A majority of the assessment panel agreed that Entry 5/10946 clearly presents the scheme that combines place and theme best in a single overall concept, which led to the final decision concerning the winning entry. The overall concept illustrated in this scheme is a good and well thought-out response to the brief in terms of layout, location, format, interpretation, exhibition spaces, flows, the handling of objects and not least the theme of Danish resistance 1940-45.



The overall composition meets the requirements of the National Museum of Denmark to a very great extent and will make it possible for the museum to communicate and interpret the history and highlight the narrative through the display of both small and large objects.

A majority of the assessment panel is of the opinion that, in order to become realisable, Entry 5/10946 needs further work so that it will meet the expectations set out in the competition brief within the financial framework defined for the project. The scheme proposed is sufficiently robust and flexible to withstand the modifications introduced in the next stages.

# Entry 5/10946

---

## Winning entry

---

This entry was prepared by **Lundgaard & Tranberg Arkitekter** (copyright) in collaboration with **EKJ rådgivende Ingeniører**, **Esbensen Rådgivende Ingeniører** and **ÅF Lighting - Hansen og Henneberg**.

Consultants: Steen Bo Mortensen, Gade & Mortensen Akustik; Steen Høyer, professor, architect, landscape consultant.

Lundgaard & Tranberg design team: Lene Tranberg, Peter Thorsen, Filip Heiberg, Jonathan M Houser, Stine Nyegaard and Jens Jacob Juel Christensen.

### ARCHITECTURAL AND SPATIAL QUALITIES

The main concept of this entry is a building that is minimised and drawn into the park and allows a world to unfurl: an underworld that conceals all the history to be narrated. The above-ground part of the complex is an elliptic entrance building, which the entrant calls a rotunda, situated in a slightly sunken gravelled field in the park: an open arrival space.

The elliptic entrance building features trellises with plants that will become part of the flora of the park - and thus forms a contrast to the buildings in the Frederiksstad district. The world above ground is connected with the underworld in the open entrance space, from which visitors are taken down into a den where the exhibition unfurls.

The entrant proposes brickwork (possibly rendered brickwork) for the part of the entrance building that is above ground and

behind the trellis. Behind the trellis are windows to seating niches in the café and the kitchen. Generally the nature of the materials proposed is relatively rugged.

The entrance building is very modest, and the assessment panel found it cramped and introverted, considering that it is intended to be part of an open, attractive arrival zone. The panel was concerned about the use of trellises with climbing roses, as the roses may look very poetic when in bloom but will look leggy and have withered leaves in the winter months.

### **Zone 1**

The main entrance building faces Esplanaden and contains an information area, a shop and a café on the entrance level. It provides access to an upper deck with a multipurpose room, a panorama window and staff facilities. Despite its relatively small size, the entrance building has the functions required, but in the opinion of the assessment panel the layout presents some logistic challenges. The multipurpose room on Level +1 appears to be suitable for many uses, but it must be possible to serve it from the café and kitchen. The stairs between the levels appear logical and simple. Level -1 with a general wayfinding area, toilets, cloakroom, etc is laid out in a simple and natural way. From this level there is access to the existing basement, which the entrant suggests should be used for temporary exhibitions.

### **Zone 2**

Level -2 contains an exhibition space in the rotunda and a secondary room. From this space, visitors will enter a high-ceilinged exhibition gallery that occupies most of the building zone. The ceiling height is about 6 metres. The large exhibition gallery on Level -2 is illustrated as a rough framework within which the focus can be on detail and completeness in scenography and narrative. There is no natural light in the exhibition area.

In the opinion of the assessment panel, the lift illustrated should be dimensioned for groups and objects. The illustrations in the entry show that to transport large and heavy exhibition objects, a hatch in the ceiling above the exhibition space has to be opened to bring large and heavy exhibition objects in and out of the room. The panel considers this to be a satisfactory solution, provided all necessary anti-intrusion measures and measures preventing the ingress of water are taken.

The exhibition space is fit for purpose: a space or hall where it is literally possible to 'tumble around', organise and display in different ways within the relatively large and unconstrained space. The rugged nature of the room appears appropriate, one exception being the lower exhibition gallery in the rotunda where the execution posts are located. The opinion of the assessment panel is that this will not be a narrative that is appropriate as both a beginning and an end.

The proposed layout and use of the existing basement need further consideration, as the National Museum of Denmark does not find the basement suitable for temporary exhibitions.

## **ADAPTATION TO LANDSCAPE AND URBAN ARCHITECTURE**

A slightly sunken gravelled field defined by a rectangular concrete frame surrounds the entrance building, and the open space and the entrance building combine to form a single coherent work. The outdoor spaces and the entrance building highlight each other and neither could stand alone.

The gravelled arrival concourse is intended to make people linger briefly and for outdoor café service, possibly combined with the display of sculptures and large museum objects. White roses grow on trellises on the walls of the entrance building.

The concrete frame and the carefully designed arrival concourse create an

attractive, poetic space that is a visible, yet modestly withdrawn monument. This space plays a secondary role in relation to its surroundings and offers people a place to linger, reflect and play that is also a transition to the underground exhibition spaces inside the museum. In an elegant gesture, this scheme offers the city a new destination.

The main arrival route to the museum is along a ramp towards Esplanaden. The ramp is marked by a section of wall on which names are inscribed. Two additional ramps ensure accessibility. However, it is unclear how these ramps can be used for service deliveries and waste management, and these aspects need clarification in the future design process.

The waste room is shown as a separate figure on the plan but not otherwise described or illustrated. The panel would like to see how this figure can form part of the simple composition between the entrance building and the frame and whether it would be possible to integrate it in into the entrance building.

A partly covered bicycle parking area is located on the Churchill Park side. In the further design process, the nature of the roof above the bicycle parking must be reviewed so as to ensure that open sight-lines will not be broken, and it must be ensured that the bicycle parking is not located outside the public area.

The assessment panel was concerned that the sunken gravelled area may perhaps turn into a water basin in the event of torrential rain.

Further work must be done on the frame and the surface in future design phases so as to eliminate the risk of ingressing water. This should be done without depriving the frame of its uniqueness and its ability to be open, inviting and introverted at one and the same time. The plants proposed for the

entrance building are a poetic and pleasing element. However, the plants eventually used must be robust and able to withstand the weather conditions at the site. In addition, the plants should not need more than natural rainwater to grow, as no watering systems on the facades are allowed, since they involve a risk of water entering the underground exhibition spaces.

## **SUSTAINABILITY AND TECHNICAL SOLUTIONS**

### **Structures**

The entrance building is illustrated as a brickwork building with concrete slabs cast in situ. The below-ground exhibition hall is cast in situ and features outer walls and a floor designed as anchored double structures. The entrant proposes the use of deep sheet pile walls down to dense clay layers in a dry building pit, which is a strategy that will reduce the risk of groundwater lowering.

### **Technical installations and indoor environment**

The entry proposes a single ventilation system for both climate zones in order to ensure efficient heat exchange. It is very likely that the relatively small plant room will have to be made larger in the future design process. No ducts for the technical installations are illustrated, and the entrant does not state how water pipes will be kept separate from exhibition spaces.

The exhibition spaces will be heated by means of a heating system cast into the floors, while the entrance building has underfloor heating incorporated into heat distribution panels in the wooden floor. All rooms have demand-controlled ventilation based on the VAV principle, with visible ducts. Underfloor heating and demand-controlled ventilation can ensure an adequate, adapted indoor environment in both zones. To supplement the mechanical ventilation, above-ground rooms are prepared for natural individual ventilation in the form of openable windows. The



structural layout and the layout of technical installations make it possible to achieve a high level of flexibility in the exhibition area. It should be noted that water pipes must be separated from the exhibition spaces.

### **Sustainability**

In its compact form, the building is designed with low energy consumption in mind, which is documented in the Be10 calculation made by the entrant.

### **Operation**

The entrant states that standard components and robust, long-life materials should be chosen to ensure simple maintenance. The assessment panel is of the opinion that the building will be easy to operate, although the distribution of the service areas (Zone 1) on several levels reduces efficiency. As there is direct access to all windows in the entrance building, it will be possible to clean the windows from the inside without using ladders. The emergency staircase to the north should be modified so as to provide direct access to the plant room.

### **Fire safety**

Escape routes and fire protection installations are not described in an overall fire safety strategy, and the escape routes illustrated are not compelling in comparison with the rules applying to assembly rooms with considerable occupant loads. The entrant recognises that the security, fire safety and emergency measures illustrated are inadequate and will need further work in the form of an overall risk strategy, which the assessment panel believes would be possible.

### **COSTS**

The entrant outlines a calculation of construction costs that indicates compliance with the financial budget of DKK 41.15 million exclusive of VAT set out in the competition brief.

Before finally selecting this entry as the winner, the assessment panel submitted the pro-

posed scheme to independent external financial and structural risk analysis with reference to clause 5.10 of the competition regulations.

The analysis confirmed the assessment panel's estimate and showed that the architecture and layout of floor areas and functions proposed in the entry provide sufficient assurance that, after further work on the design, it will be possible to execute the scheme without exceeding the financial framework defined and without jeopardising the overall, defining ideas of the concept illustrated.

Reference is also made to the comments on costs in the panel's introductory remarks on the entries in general.

### **SUMMARY**

Despite its calm and quiet architectural idiom, the scheme proposed in this entry is a surprising and captivating response to the brief. On one hand, it provides a functional building for the Museum of Resistance; on the other, it combines the theme, park, sightlines, place and museum in an entity.

The entrant meets the needs of the museum in a unique way by creating both a space in the park and a space underneath it shaped to comply with the exhibition specifications provided by the museum. Between those two spaces is the entrance building which, in addition to being a distinctive building element, provides vertical connection between the various floor levels. The exhibition facilities and security conditions are optimal, the handling of objects is acceptable, and there is a well-defined separation of Zones 1 and 2. Because of the compact building volume illustrated, there are good opportunities to create a sustainable, low-energy building.

Based on its financial analysis, the assessment panel stresses that it will be necessary in the future design process to reduce the floor area of the museum. Likewise, the format and size of the entrance building

need to be changed to make the arrival area open, inviting and attractive, and consideration should be given to making the lift the primary connection between levels.

It is the opinion of the assessment panel that these and other matters can be dealt with in a development process involving the entrants and the future users of the building.

---

## Entry 1/20130131

This entry was prepared by **Heneghan Peng Architects** (copyright) in collaboration with **Arup UK, Arup DK** and **Agence Ter, FR**.

Design team: Roisin Heneghan, Shih-Fu Peng, Doreen Adler, Patrick Conway and Amy McKeogh

Consultants: Luxigon, FR (visualisations), Andrew Ingham, UK (model)

### ARCHITECTURAL AND SPATIAL QUALITIES

This entry features a pavilion in the park that invites people to engage with it, for example by using benches indoors or outdoors - the latter protected by a cantilevered roof.

The building is laid out in a zigzag design expressed in the plans of the two levels and in the ground floor ceiling. The entrant seeks to meet the museum's requirements by dividing the building into two worlds: one above ground and one below. The building is made of wood with glass facades, creating transparency.

The entrant points out that different approaches are applied in terms of light in Zone 1 and Zone 2. The concept proposed is thus characterised by contrast, which is reflected in the division of functions and acceptance of differences so that a luminous world is created above ground and a world with controlled light is laid out

below ground. The concept of upstairs and downstairs worlds is a theme that is evident from one of the sections submitted, which shows the covered bench in the park standing in front of the glass facade and the longitudinal skylight in the surfacing that lets glimpses of light into the areas underneath.

The building endeavours to draw on a number of horizontal views and relationships with the surroundings - thus becoming a place from which people observe the environs. It features a transparent design and is described as an open element characterised by lightness. It is also described as a transparent filter and claimed to be almost non-present at the site. The building by and large occupies the entire buildings zone and its entrance is located at the south-eastern corner.

#### Zone 1

Inside the museum there is a relatively large entrance area. The plan is composed of triangles of varying size that form a pattern or rhythm around two distribution points (two spiral staircases), one at either end of the room. The first staircase is in the arrival zone with the shop, information desk, etc. It provides access to the exhibition space on the floor below. A similar spiral staircase is located at the other end; it brings people from the exhibition space up to the café or to the exit at the end of their visit. There is no lift, but a kind of telescopic platform between the light intake apertures for the two spiral staircases is illustrated in a section.

#### Zone 2

The underground exhibition space is elongated and follows the zigzag shape of the building. Facilities such as a cloakroom and toilets are on the underground level and not in the otherwise far from modestly sized ground floor hall. It is not clear whether objects are to be moved using telescopic platforms. The ceiling height is stated to be 6 metres. Benches along the facades are also used here and in the entire perimeter of the exhibition space.

The entry features an expressive idiom within a relatively large volume. The ground floor has a zigzag shape, but the assessment panel failed to see whether it is the bastions of the Citadel or some other geometrical reference that has inspired the entrant to transform the zigzag movement into a kind of dynamics.

In the opinion of the assessment panel, the two spiral staircases will be used intensely by museum visitors and café guests, as the toilet facilities are on the underground level. This will create an undesirable flow and movement through the exhibition.

The intake of natural light along the sides of the lower exhibition spaces is not compatible with the museum's exhibition requirements. The ceiling height is sufficient to make room for a blackout system, but it would probably be a good idea to abandon the principle of intake of natural light through elements incorporated into the surfacing around the museum.

It is unclear where staff are supposed to work, but the assessment panel considers it possible to find room for staff facilities on the ground floor level.

### **ADAPTATION TO LANDSCAPE AND URBAN ARCHITECTURE**

A single gravelled path meanders through the large parkscape, communicating history by connecting monuments and memorial trees. At the museum building the path becomes part of the arrival area, thus creating a natural passage between the park and the building.

Arrival at the museum is from either Churchill Park or Esplanaden where the hard surfacing is connected with the pavements and to a kiss-and-ride area. The two shifts in the hard surfacing do not mark the main entrance sufficiently clearly, and no clear decision seems to have been made as regards the point where service deliveries are to take place. The lack of a logistic

hierarchy between the two arrival routes becomes a barrier to the natural flow of visitors going into and out of the museum.

Towards the Esplanade, where the facade is highly visible, double rows of bicycle parking racks are located, some of which are integrated into the facade. The opinion of the assessment panel is that this integration is not aesthetically pleasing.

The use of the facades as seating furniture is an interesting way of making the facades extroverted and the site an informal meeting place that actively integrates the museum into the greater urban context, thus adding value to the city. However, the proposed scheme is not 100% successful in doing so, as the volume and weight of the building actually create the opposite effect in that the building stands out as a massive wall that disregards the context and sightlines of the site.

The landscape design is inadequately described, and no information is given about the materials proposed for the various surfaces.

### **SUSTAINABILITY AND TECHNICAL SOLUTIONS**

#### **Structures**

The building's timber columns stand as 'natural wood' rooted in the outdoor paving, but the structure is inadequately protected. This maintenance issue needs to be addressed. The basement has single walls that are insulated and protected against the ingress of water on the outside, but the entrant does not present any thoughts about construction below the groundwater level or about buoyancy. The design needs further detailing in this respect.

#### **Technical installations and indoor environment**

No technical installations are illustrated or described. There is only a brief mention of 'cross-ventilation' on both levels and local climate control at staff workstations. In



the winter months, the appropriate indoor environment in the pavilion will be managed using local staff climate control units. This concept does not meet the requirement of climate control in the service area. In addition, the assessment panel is of the opinion that indoor climatic conditions in the summer months are inadequate.

### **Sustainability**

The entrant states that technological sustainability is primarily ensured through natural ventilation provided by doors that can be opened and the fact that there is no general automated climate control in Zone 1. Instead, heating is controlled locally at staff workstations. The entrant does not present any arguments in favour of this choice, either from the point of view of energy costs or from the point of view of indoor climate. The assessment panel is of the opinion that this is not a satisfactory response to the brief.

### **Operation**

The need for daily cleaning is considered to be normal, but cleaning the many tall and narrow windows will be an ongoing expense. The wooden structures will probably have to be surface-treated every three, four or five years, depending on the type of treatment chosen.

### **Fire safety**

Visitors to the exhibition space can escape to the ground floor along the two spiral staircases, easily facilitated by efficient mechanical smoke ventilation and museum staff. From the ground floor, they can escape to the open air. There is no doubt that the fire safety strategy described is inadequate and needs to be supplemented by at least an emergency staircase leading to a safe area or directly to the open air.

### **COSTS**

The entrant refers to a calculation of construction costs showing that the proposed scheme can be realised within the financial budget of DKK 41.15 million exclusive of VAT set out in the competition brief.

Reference is also made to the remarks on costs in the assessment panel's initial remarks on the entries in general.

### **SUMMARY**

The opinion of the assessment panel is that the scheme proposed is not in dialogue with the site, the history or the theme covered by the museum. Both arrival at the museum and the layout of outdoor spaces testify to lack of understanding of the site, the functional requirements and the flow of the city.

The triangular shape and the two staircases impose constraints on the utilisation of the facilities and will cause uncontrolled flows up and down, entailing a high risk of disturbance to the exhibition spaces. In addition, the building is not clearly suitable for climatic zone division.

The conclusion is that even if the scheme is toned down and modified, it will not come close to meeting the premises of the site and the theme.

---

## **Entry 2/28400**

This entry was prepared by **Polyform Arkitekter** in collaboration with **SeArch, Oluf Jørgensen** and **Cenergja**. Polyform and SeARCH share the copyright. Consultants: Igor Kolobaric, lighting; Palle Roslyng-Jensen, associate professor, Copenhagen University, technical consultant. Polyform design team: Thomas Kock, Jonas Sangberg, Rie Davidsen, Johannes Grove, Anne Strandgaard and Anna Navndrup. SeARCH design team: Bjarne Mastenbroek and Andrea Verdecchia. Oluf Jørgensen design team: Thomas Hansen and Jens Gandrup Jørgensen. Cenergja design team: Ole Balslev-Olesen and Magdalena Stefanowicz.

This entry is based on a fundamental pervading concept: a flyer with references to the time of the German occupation, a piece of paper that takes on a shape where it is

folded. This shape becomes the roof of the building. The entrant writes that *the shape of the roof, inspired by the flyer, opens the museum towards the city on one side and towards the landscape on the other.*

The proposed scheme thus features a rectangular building volume located parallel to Esplanaden, with vertical glass facades around an inner core and a curved grass roof. Atmosphere-creating films and pictures can be projected onto all walls, floors and ceilings in the building.

This entry presents the by far largest volume and is also the entry that challenges the building zone and its context most. This applies not only to the extent of the ground level and the height of the upward-pointing roof elements, but also to the many glazed panels in the facade and the green roof surface.

### **Zone 1**

The service functions are located above ground in an oblong core containing cloakroom, toilets, staff facilities, café and museum shop at the northwestern end, while the entrance to the museum and the entrance lobby are located to the southeast. Having the entrance to the southeast and the café to the northwest will require double staffing, which is unfortunate.

Museum visitors are received in a staircase space called an atrium in the entry. This atrium, which has two wide straight-flight staircases (one at each end), provides physical communication between the two levels and is also part of the route visitors will follow on arrival and when they leave the exhibition. The atrium is part of the arrival and multipurpose zone, and the stairs are therefore intended to serve as seating as well. In the opinion of the assessment panel the atrium solution proposed cannot really deploy its potential in this context. The mix of people going up and down the stairs and other people crossing the bottom of the stairs will disturb people who might be sitting on the steps. Likewise, the

use of the stairs as a lecture venue would not work, one reason being that it is not possible to project slides.

### **Zone 2**

The chronological exhibition is organised around the atrium on the below-ground level. The exhibition space has no physical divisions but is wrapped around the stair core, which in the opinion of the assessment panel imposes constraints on spatiality and flexibility. In order to maximise space below ground, the building follows the perimeter of the building zone. A clear height of 5 metres is proposed in this exhibition space.

The assessment panel is of the opinion that the glass presents a problem, as there will be intake of natural light in Zone 2, which will reduce flexibility in the exhibition space. For the handling of objects the entrant proposes a heavy anchor block from which heavy objects can be hoisted down or moved along slides on the eastern staircase. From a workload point of view, this solution is not optimal, added to which all large, heavy objects would have to be rotated through 90 degrees at the bottom of the staircase where the hoisting system suggested cannot be used.

Three execution posts are located in a skylit niche to the east. The posts are highly sensitive to light, and the proposed display is therefore not feasible.

The entrant proposes that the existent basement be used as archive and plant rooms. The assessment panel points out that no archives are needed in the new museum.

### **ADAPTATION TO LANDSCAPE AND URBAN ARCHITECTURE**

The entrant wishes to ensure good interplay between outdoors and indoors and between the city and the park. In the transition to the city a new urban space is created at the junction of Esplanaden, Churchill

Park and Amaliegade. The surface of this open space is drawn into the museum, the entrance being accentuated and clearly visible from a distance. The memorials to Anders Lassen and Kaj Birksted are placed in the open space as yet another way of communicating the identity of the museum. This is a fine spatial concept that works well as far as the ground plan is concerned, but becomes dominant because of the elevated roof and the glass facade. It is a spatial concept that in some way appears insensitive to the place and which, despite the lowering of the roof in the sightline, becomes obtrusive.

The café terrace is located in the park, facing northwest and overlooking the attractive parkscape, but will be partially shaded during the day. Paths leading out into the parkscape are connected to the terrace. The panel is favourably disposed to this idea but, because of the listing of various parts of the site, such a layout will not be possible as it extends beyond the building zone.

The bicycle parking area is located near Esplanaden and Churchill Park, away from the building and in a public space. No covered bicycle parking facilities are illustrated. Service deliveries are to take place in the open arrival area and will be possible both from Esplanaden and Churchill Park. Short-term parking is possible towards Esplanaden, and there is a disabled parking space at Churchill Park. From both locations it is only a short distance to the museum entrance.

## **SUSTAINABILITY AND TECHNICAL SOLUTIONS**

### **Structures**

The opinion of the assessment panel is that the architectural ambitions reflected in a relatively thin roof with several open spans and cantilevered elements cannot be realised without additional structures. The exhibition basement is described as a waterproof double structure, but the

section illustrates only a single bottom slab which, together with the building's own weight, prevents buoyancy.

### **Technical installations and indoor environment**

The technical rooms are located in the existing basement and the associated air intake and exhaust points are located outside the building line. The ducts for technical installations are, somewhat unclearly, shown to pass through the outer basement walls and down below the wooden floor of the exhibition space and from there to the central shaft for technical installations in the building's centre line.

The layout of technical installations provides some degree of flexibility, but it must be assumed that exhibition design will have to take the position of ventilation grilles into account.

Heating of the exhibition space (Zone 2) is provided by means of intake of hot air through grilles close to the floor in the installation wall. It would probably be possible to meet the modest comfort requirements defined on the basis of this principle if a number of supplementary air intake devices were installed. In the summertime, the space will be cooled by means of 'groundwater cooling'. On the ground floor there is underfloor heating in the wooden floor and mechanical ventilation

### **Sustainability**

The entrant states that the BK2020 requirements are met. Highly efficient, solar-screened energy windows are used in the facades, groundwater cooling is possible, and thermal storage in structures as well as other measures are intended to reduce energy consumption and ensure sustainable energy management.

### **Operation**

The entry generally features robust long-life materials and the opinion of the assessment panel is that the building would be



easy to maintain. However, regular cleaning of the many glass surfaces – many of which are high up – is considered to be 'above average'.

The concept of a central core for technical installations is laudable, but the core seems too narrow for the installation, distribution and operation of the technical systems, which is also suggested by the cross section of the core. The entry does not illustrate or describe any service and maintenance access points to the shaft for technical installations.

### **Fire safety**

Escape routes are illustrated on both sides of the building. The existing basement exit is used on the northern side, and a new staircase outside the southern facade is indicated but not illustrated. The dimensions of escape routes are inadequate and the stairs are not located where they can serve as escape routes.

### **COSTS**

The entrant refers to a calculation of construction costs which shows that the proposed scheme can be realised within the financial budget of DKK 41.15 million exclusive of VAT stated in the competition brief.

Reference is also made to the remarks on costs in the assessment panel's initial general remarks on the entries.

### **SUMMARY**

The strength of the proposed scheme is its sculptural effect. The building is clearly a point of attraction and identifies itself as a museum, for example by means of the pictures and films projected onto ceilings, walls, etc. In the opinion of the assessment panel, the weakness of the scheme is in proportion to its volume, which is too large in relation to both the theme and the time and place.

The building layout is fairly simple, but the location of the various functions is not

optimal. The core and the atrium impose constraints on spatiality and flexibility, and the general wayfinding area on the stairs is not considered to be a usable solution.

---

## **Entry 3/68371**

This entry was prepared by **BIG** (copyright) in collaboration with **Søren Jensen Rådgivende Ingeniørfirma** and **Schønher**. Consultant: MerzMerz (HGMerz), exhibition consultant.

BIG design team: Bjarke Ingels, Andreas Klok, David Zahle, Frederik Lyng, Ole Elkær, Leonardo Nahuel Musso and Magnus Garvoll

Through analysis, the entrant reaches the conclusion that a large part of the building should be below ground and only a small part above ground. The entrant focuses on visible versus invisible, referring in this way to the time of German occupation. This alternation between visible and invisible is translated into an idiom and a layout centred on heavy and dark elements versus light and free elements.

This duality that is the overall concept of the entry attracts lingering attention. The pavilion is located at a place in the park where it unfolds within a geometric pattern of four circles and interacts with the tree-tops and other organic shapes.

The entry focuses on dynamic movement, featuring four circles that are organised and intertwined in a way that creates an amorphous perimeter. Within this shape, curved double glazing is used to form a facade and a complete pavilion. The circle shapes are repeated in the waste disposal area and the arrival area.

The roof features a slightly up- and down-scaling flow of level differences in the even roof surfaces that are covered with either glass or solar cells.

## Zone 1

The arrival area is illustrated as a composition of circular spaces with a central entrance from Esplanaden and a café and multipurpose room towards the park. The shop and cloakroom are designed as two large pieces of furniture. A curved ramp connects Zone 1 with Zone 2 in the basement where the exhibition spaces are located. In the opinion of the assessment panel the ramp takes up too much space and reduces flexibility in the exhibition area. Exhibition activities and displays on the ramp will be disturbed by the movement of people on the ramp - and vice versa.

## Zone 2

The underground space is a rectangular room with columns and rounded corners in which two cores come down from the floor above: a lift core and a core with preparation room, cleaning room, etc. The entrant states that the clear ceiling height in the basement is 420 centimetres.

With regard to the handling of objects, the entry describes a box at the southern end of the roof that can be removed so that heavy objects can be hoisted down into the exhibition facilities.

The entrant proposes that the existent basement be used as archive and plant rooms. The assessment panel points out that no archives are needed in the new museum.

A look at the interior of the building shows that most facilities are certainly below ground, but there is an open light connection to the glass facade on the ground floor. Unfortunately, the intake of natural light in Zone 2 will impose constraints on the exhibition. In addition, a number of columns are located in the exhibition space, where they will be obstacles in any exhibition display.

The exhibition space features curved ramps, concave corners, a cylindrical lift

and a curved staircase. Any narrative of the time of German occupation and Danish resistance in 1940-45 will involve a great deal of dynamism and perhaps even more drama, and the exhibition space would therefore benefit from being unobtrusive so as to allow the stories to dominate - instead of being dominant itself.

Toilets for museum visitors are located in the basement, which means that café guests and others have to go down the curved ramp or use the lift and then cross the exhibition area. Such traffic may disturb other museum visitors. The entry provides no complete description of surfaces, textures and materiality, and this information cannot be found in the drawings.

## ADAPTATION TO LANDSCAPE AND URBAN ARCHITECTURE

The entrant suggests a museum that is unobtrusive in the parkscape. The trees, lawns and park space are interpreted as a poetic landscape background that interacts with the lightness and transparency of the facade, which is adapted to the spatial scale and thus subordinate to the cultural context. This is an attractive vision, but the opinion of the assessment panel is that it does not come to fruition in the entry because of the architectural idiom chosen for the museum.

A circular concrete surface serves simultaneously as an arrival area, a setting for an outdoor café, a service delivery area and the floor in the interior of the museum. People arrive at the museum from Esplanaden, where the circular area is centred between the King's Gate and Churchill Park. Towards the park, the area is used for an outdoor café and its structure provides seating facilities. A covered bicycle parking area and a waste management area are integrated into an independent circular pavilion.

This entry deserves special mention for not hiding functions but making them

part of the architectural idiom. However, the assessment panel wondered why the entrant felt it necessary to repeat the circular shape throughout the scheme: the building's shape, the surfacing and again in the open space at the Gefion Fountain. The simple, pure form of the circle becomes a schematic interpretation rather than spatial understanding of the individual elements and/or the potential of the site.

## **SUSTAINABILITY AND TECHNICAL SOLUTIONS**

### **Structures**

The pavilion is a framework structure with steel columns fixed to the circular roof surfaces and resting on the slab of the exhibition basement. The basement has double wall and base structures, and the entrant demonstrates knowledge of executing structures below groundwater level. The amorphous slab above the basement is a 'mushroom slab' resting on the two building cores and a number of columns which the panel assumes need to be supplemented in the final design. The design of exhibitions in this space will have to take the columns and building cores into account.

### **Technical installations and indoor environment**

The technical rooms are located in the existing basement, with exhaust points for the ventilation system outside the building lines. There is no clear description of ducts. Contrary to the schematic illustrations, water pipes are stated to be cast into the basement floor and located above the basement slab. The assessment panel points out that water pipes must be separate from exhibition areas.

Ventilation ducts and electrical ducts run in a suspended ceiling to provide flexibility in exhibition design. Climate control in the exhibition area (Zone 2) is in the form of ventilation from ducts installed above the suspended ceiling and from the bottom of the access ramp.

The pavilion (Zone 1) is heated by convective heaters and ventilated by means of partly natural, partly mechanical air exchange controlled by a separate system in the technical room. The assessment panel's opinion is that the heating and ventilation systems illustrated are basically appropriate in terms of ensuring a good indoor environment. There will be some days with excessive temperatures in the pavilion, which will make it necessary to open the facades towards the park.

### **Sustainability**

The entrant refers to a Be10 calculation that shows very low energy consumption in the building as a whole and thus compliance with the BK2020 requirements.

### **Operation**

Generally, robust materials with long lifetimes are used in this scheme, and the opinion of the assessment panel is that the building would be easy to maintain and operate. Glass facades require regular cleaning, and it must be assumed that the replacement of window panes will imply special costs.

### **Fire safety**

The entrant has devised a fire safety and escape strategy that is based on vertical smoke separation using the access staircases and ramps in the building as escape routes. This strategy is not fully in compliance with the rules applying to fire safety of and escape routes from assembly rooms. It must therefore be assumed that it will be necessary to supplement the design with specific escape stairs leading to the open air.

### **COSTS**

The entrant refers to a calculation of construction costs which shows that the proposed scheme can be realised within the financial budget of DKK 41.15 million exclusive of VAT stated in the competition brief.



Reference is also made to the remarks on costs in the assessment panel's general remarks on the entries.

## SUMMARY

This entry deserves special mention for its initial analysis of the possible dos and don'ts at the unique location of the museum.

It derives movement from circular shapes that are combined to form an amorphous flow, resulting in polymorphous lines, which again become glass facades that stand apart as distinctive elements and continue down into the exhibition space where they will appear dominant in relation to the purposes for which the space is used.

The opinion of the assessment panel is that the entry's focus on laying out the museum, provide a covered bicycle parking facility as well as a waste management area, seating, an outdoor café, a service delivery route, a ramp and a lift within the framework of a single concept, consistently using amorphous shapes, makes the geometrical surfaces and curved lines seem discordant with the place and the theme. It is difficult to identify the architectural idiom as a museum for Danish resistance in 1940-45.

---

## Entry 4/74171

This entry was prepared by **Henning Larsen Architects** (copyright) in consultation with **Schul Landskabsarkitekter** and **HaCaFrø/Tyrens**.

Henning Larsen design team: Troels Troelsen, Mikkel Bækgaard Breck and Manuel Cespedes.

Schul design team: Jonas Schul

HaCaFrø/Tyrens design team: Per B Sørensen, Martin Dagnæs and Martin Froderberg

This entry features a light, partially transparent cubic glass pavilion with a solitary location in the park. It has a heavy interior core that connects the arrival level with two underlying levels. The connection is provided by a stair element to the north and double- and triple-height views and connections between the levels to the south.

The entrance is located in the southeastern corner facing Esplanaden. The inner core is almost free-standing, which is made possible by a double-height room starting in the basement along Esplanaden and wide stairs that also serve as seating along the northern facade. The core includes a balcony level with staff functions. Because this core is kept free of other structures, natural light will enter the room through the facade to the southeast, which is used as an invitation card in this entry.

### Zone 1

The core contains an arrival area, a café, a multipurpose room, staff facilities, etc. The café and arrival functions are laid out as an 'integral part of the park'. The entry has a strong focus on the interaction between Zone 1 and Zone 2 and generates such interaction by means of a wide staircase called the 'amphistairs'. The staircase has an intermediate level with a cloakroom and toilets as well as access to the upper part of an inserted auditorium built into the inner core of the glass pavilion. There is also access to an exhibition space that occupies part of the existing basement. The rest of the existing basement is used for technical rooms. The lower flight of the 'amphistairs' in the main exhibition space is wider and invites people to stop and linger for a while.

### Zone 2

The space for the chronological exhibition is designed as a column-free hall that utilises the geometry of the building zone, but in a rectangular form. There is a clear ceiling height of about 4.3 metres. The entry shows different scenarios for the exhibition design featuring screens, podiums or matching

zones, thus describing the flexibility provided in terms of exhibition design.

For the handling of objects, the entrant proposes a mobile crane which, it is suggested, can move heavy objects between the beams and down to the exhibition level through the large opening between the levels in the southeastern corner of the building.

The assessment panel is of the opinion that this entry features an interesting building with considerable intake of natural light, a large staircase, double-height rooms and even triple-height connections from the basement, long sightlines, light-coloured surfaces and delicate, exclusive solutions such as the crystalline glass formation in the facades. The problem is that cascades of light are not desirable, as they would reduce exhibition flexibility.

In principle, the 'amphistairs' are a wide single-flight staircase that invites people to stop and linger. However, it might become a bottleneck for museum visitors wanting to go up or down. It also imposes constraints on exhibition design in areas close to the staircase.

The many visible ribs from the element-based structure create a fixed, rigid rhythm that may not be right for the museum. The assessment panel wondered how blackout of the room could be ensured in relation to the glass area. The inserted level that provides access to the small auditorium is an attractive element.

### **ADAPTATION TO LANDSCAPE AND URBAN ARCHITECTURE**

The square shape of the building is repeated in two areas with hard surfacing outside the building that form part of a composition together with the footprint of the building's base. This is an architectural feature that unites the building and the outdoor functions, making the museum stand out as an independent object in the urban context and sightlines. The museum is located in the park-space, which the entrant does not change greatly, adding only a lawn with bulbs.

One of the squares serves as the café floor. The floor continues into the parkscape where it is used as an outdoor café area with a sharply defined boundary towards the grass surface. The other square is the arrival concourse with access from Esplanaden and Churchill Park.

The arrival area includes bicycle parking and can also be used for the delivery of large museum objects and for general service deliveries. The clearly defined arrival concourse also clearly accentuates the main entrance to the museum.

The weakness of the design is the meeting between the proposed promenade at Churchill Park and the clearly defined arrival concourse, as the incompleteness of the design blurs the otherwise clear concept. The entry illustrates a number of possible transitions between Esplanaden and the museum as well as various possible locations of the bicycle parking area: either close to the main entrance or along the facade towards Esplanaden. These are important details that should have been unambiguously illustrated as they would have defined the end of the arrival concourse, Churchill Park and thus the edge of the park towards the city.

The covered bicycle parking area is located to the west of the building behind a concrete wall with a glass roof. Lighting at the terraces is provided by ground fixtures that light up the surface but do not spread light into the park.

### **SUSTAINABILITY AND TECHNICAL SOLUTIONS**

#### **Structures**

The central core, which is cast in situ, supports the pavilion's 'floating' roof of TT slabs. The TT slab theme is repeated in the column-free areas of the exhibition basement. The entry uses ground anchors and double structures in a highly unconventional way both for escape route areas and for technical installations, but it fails to use the narrow and probably damp cavity in a compelling way.

## **Technical installations and indoor environment**

Water-filled installations for the café and toilets are located in areas outside the exhibition areas as required in the competition brief. Ventilation ducts and main air intake ducts are incorporated along a long route in the basement wall, the argument being that seasonal adjustment of temperatures can thus be achieved. The sustainability of this solution needs verification. There is underfloor heating and mechanical ventilation in the exhibition area, which provides an adequate basis for a good, stable indoor environment. On hot summer days, cooling will be ensured by means of earth cooling tubes in the groundwater.

Heating in service areas above ground (Zone 1) is underfloor heating and warming tubes in the concrete walls. The zone has natural ventilation in the form of openable elements at the top of the glass facades, where the entrant – somewhat unclearly – states there is a natural intake of air from ducts in the double basement structure. In the opinion of the assessment panel, the indoor environment in Zone 1 will be challenged by the large glass facades (which are otherwise very high-quality) and the direct connection to the exhibition level where there is in fact no heating.

### **Sustainability**

The entrant states that the use of low-temperature underfloor heating and wall heating, possibly night cooling, and compliance with the BK2020 requirements are the most important elements in terms of sustainability.

### **Operation**

In the opinion of the assessment panel, the building will generally be easy to clean, although the large and exposed window areas will require frequent cleaning. The assessment panel assumes that such cleaning will require the use of a lift both indoors and outdoors. Maintenance of technical installations in the 0.5-0.6 metre

wide spaces in the outer basement walls will be a challenge in terms of access and health and safety standards. The concept of using water-filled tubes cast into the decks and walls gives rise to operational concern with regard to the installation of exhibition furniture, and such tubes should be kept completely separate from the exhibition area.

### **Fire safety**

The entry states nothing about mechanical or natural smoke ventilation and in fact does not describe any real fire safety strategy, but only indicates the fire emergency stairs which are not defined on the plans of the outdoor terrain. The fire strategy is inadequate and adjustment of the design is probably necessary.

### **COSTS**

The entrant refers to a calculation of construction costs which shows that the proposed scheme can be realised within the financial budget of DKK 41.15 million exclusive of VAT stated in the competition brief.

Reference is also made to the remarks on costs in the assessment panel's general remarks on the entries.

### **SUMMARY**

The solitary pavilion takes up a relatively large volume and uses expressive features in terms of formats and glass variations such as prism shapes and crystalline wave movements of rib ends, as well as beam ends that are visible in the roof. The architectural idiom chosen thus accentuate the structures and the cladding.

However, the overall concept presented left the assessment panel in doubt as to whether the proposed scheme would in fact be a sustainable low-energy building.

The interior of the building features a space with a great deal of visual contact and intake of natural light through several levels. It generates an atmosphere of



something fine and special, but the building comes across as an art museum rather than a thematic museum about Danish resistance 1940-45.

