Holmestrand Stasjon

Jernbaneverket

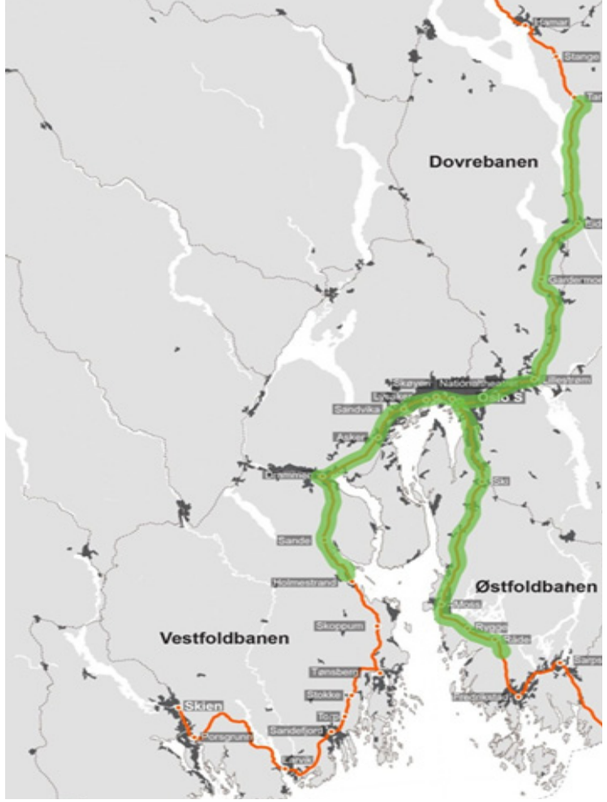
RAMBØLL

GOTTLIEB PALUDAN ARCHITECTS

Højhastighed Oslo-Skien 2016-2030

VESTFOLDBANEN

- Holmestrand stasjon udbud ultimo 2009
- Rambøll Norge vandt udbud januar 2010
- Færdig juni 2017



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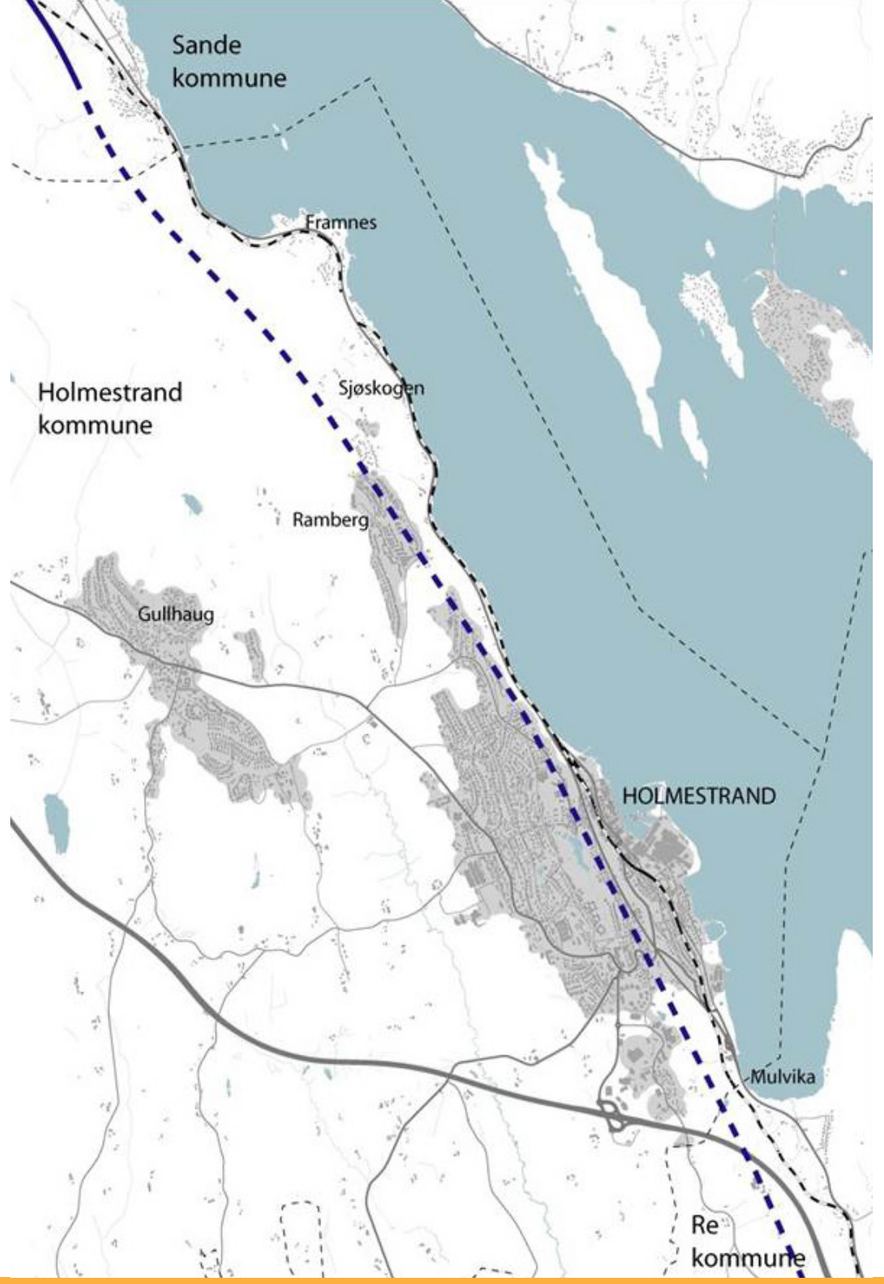
Fakta

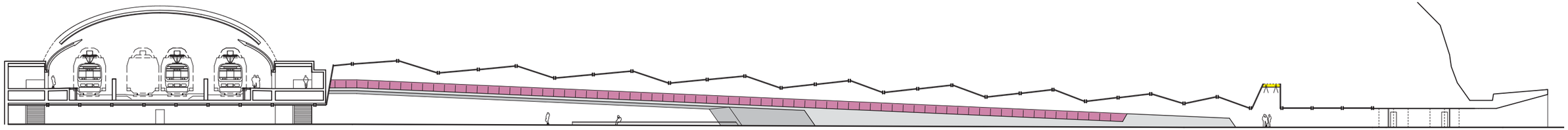
- Total længde 14,2 km
- 12,3 km fjeldtunnel
- 11 rømningstunneler
- 2 adkomster til Holmestrand stasjon i fjell
- ny kollektivterminal
- 2 mill. m3 fjell skal sprænges
- dimensioneret for 250 km/t
- 5 tunnelentrepriser
- økonomiramme 6,6 mia Nkr
- planlagt åbning årsskiftet 2016/17



Holmestrand fjeld og jernbane "i dagen"

Arkitektoniske aspekter

- Krav til universel design. Fokus på tilgængelighed.
- Stærk norsk lovgivning, NS 11001 samt TSI-PRM
- Designkrav formuleret som: ”Undgå avvisningseffekt”
- Fokus på oplevelsesrigt rumforløb fra indgang til platform
- Fokus på materialer, farver og overflader
- Fokus på oplevelsesrig Belysning



Tekniske aspekter

TEKNISKE UDFORDRINGER

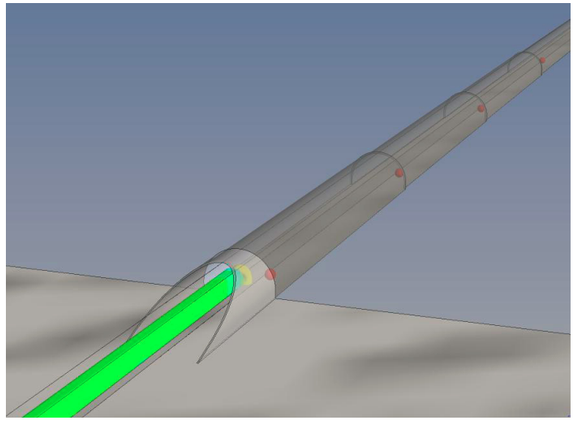
- 250 km.tim
- 100 års levetid
- Eneste station i verden med gennemkørende højhastighedstog og perroner i samme rum i bjerg/tunnel
- Ingen brugbare referencer

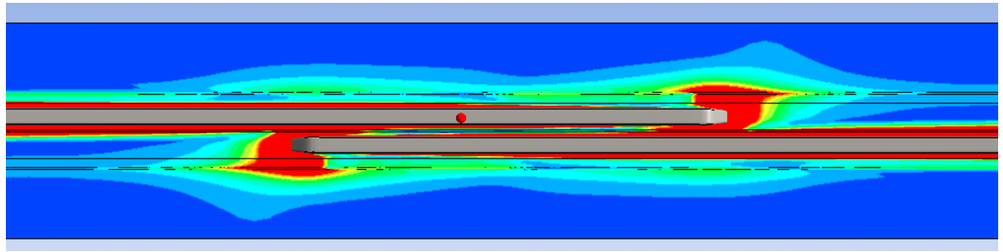
LUFTHASTIGHEDER OG TRYKPÅVIRKNING SAMT TEMPERATUR

- Norm for højhastighed i tunneler: Maksimal trykvariation 10kPa
- Trykændringer større end 4kPa medfører smerter
- Norm for vindhastighed 5m/sek

STØJ OG AKUSTIK

- Målinger og analyser af støj udendørs i tunneller og stationer
- Analyser af hvad det menneskelige øre kan tåle af trykpåvirkning og definering af grænseværdi
- Normer for maksimal støj for passagerer i stationshallen omkring 90db





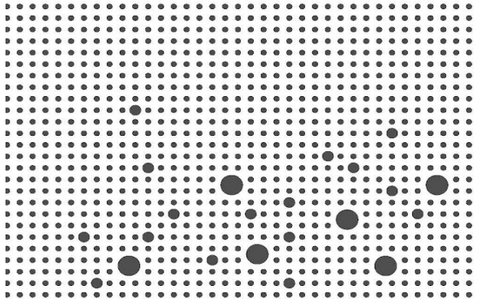
Tekniske aspekter

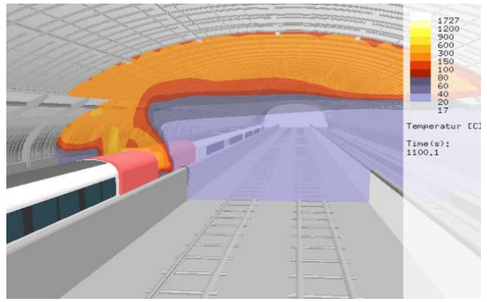
BELYSNING

- Arkitektoniske krav til oplevelserig og varieret belysning i fjellet
- Krav i TSI til belysningsniveau

BRAND OG EVAKUERING

- Stor afstand til platforme (ca 150m)
- Brandkrav kombineret med trykforskelle

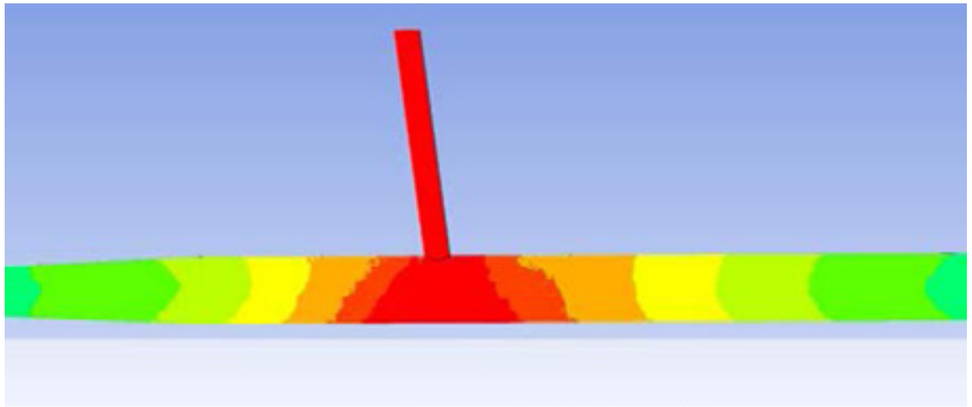


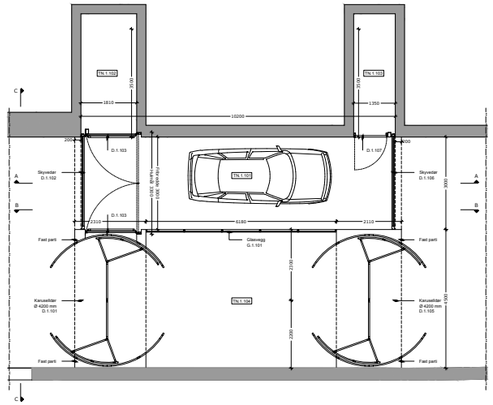


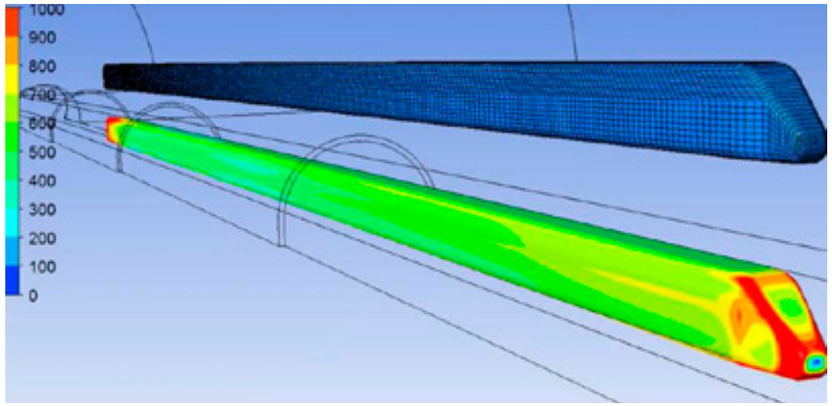
Lufthastigheder og trykpåvirkninger og temperatur

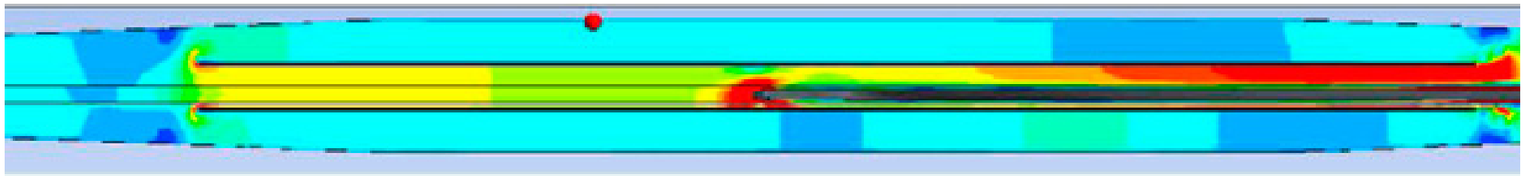
LØSNINGSMODEL FOR REDUCERING AF TRYKFORSKELLE

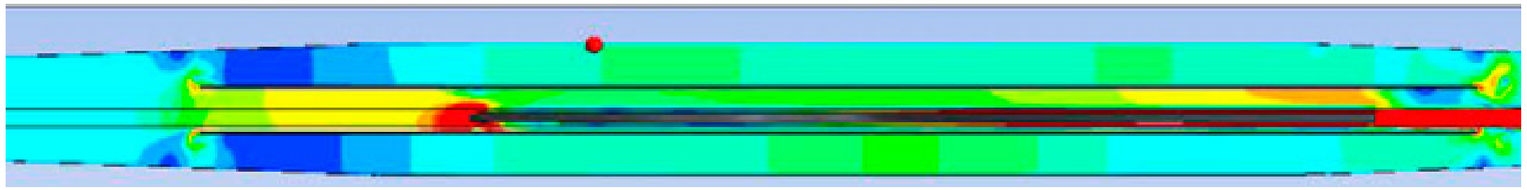
- Trykaflastningstunnel R7
- Studier af temperatur og trykpuls er udført med CFD analyser.
- Påvirkning på konstruktioner og levetid
- Etablering af sluser ved indgange. ”Prop i hullet”
- Trykforskelle dimensioneres til maks +/- 1,6kPa.
- Ved 1 tog på stationen dim med 0,8kPa og ved 2 tog som mødes 1,4kPa.
- Døre udsættes for stort tryk.







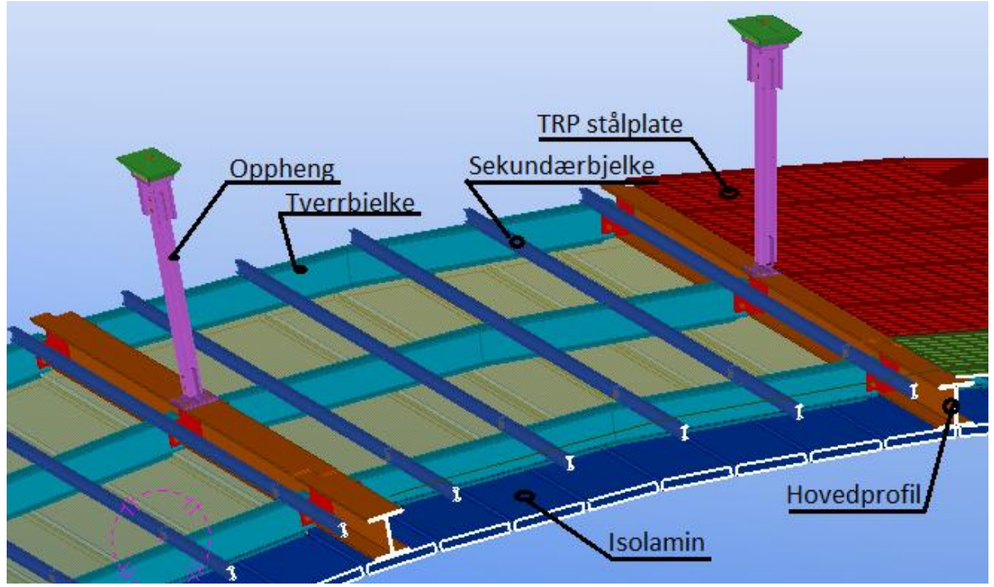


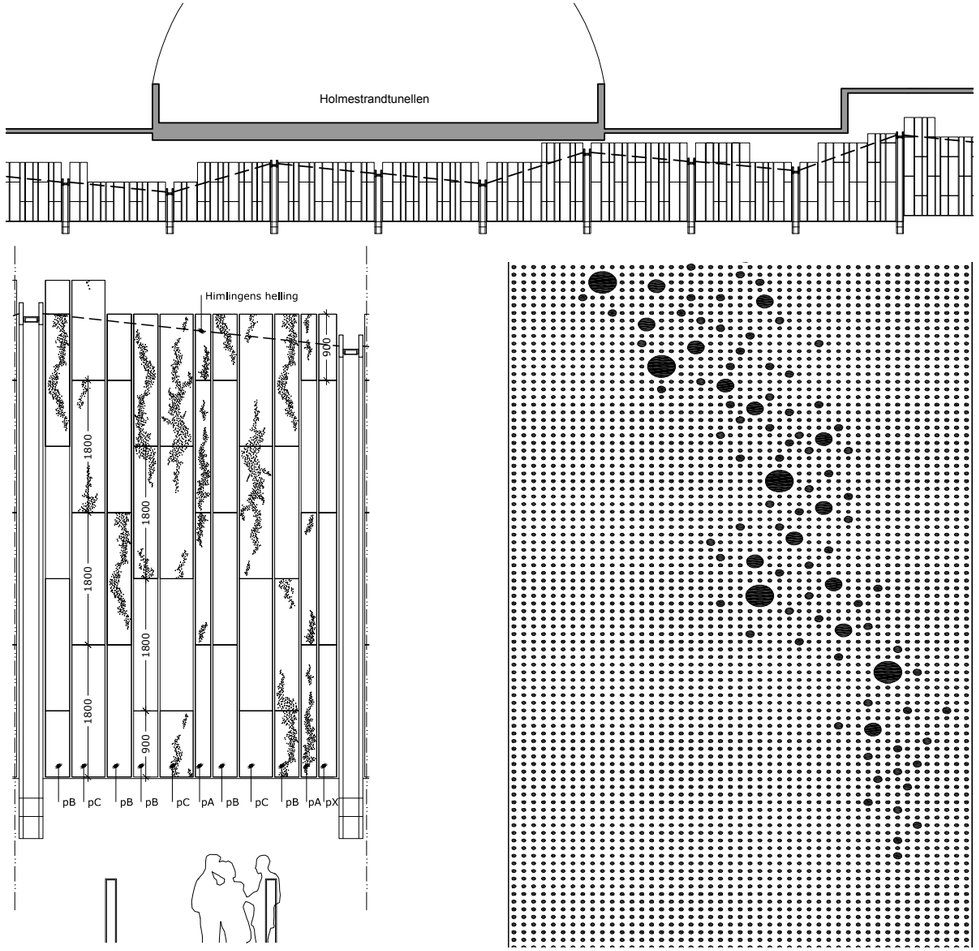


Støj og akustik

AKUSTISKE LØSNINGER

- Etablering af maksimale akustiske overflader i himlinger og vægge i adkomst-tunneler
- Etablering af akustiske himlinger over spor og perroner i stationshallen
- Åbne konstruktioner for luftpassage

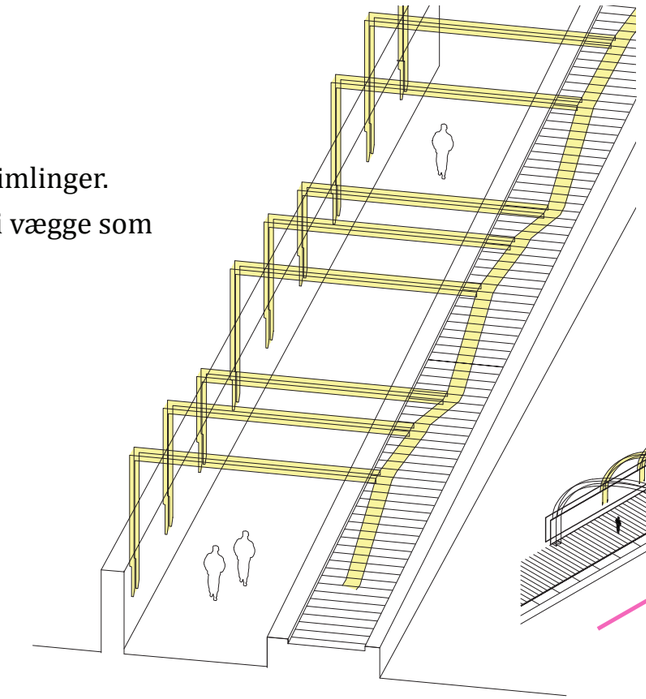


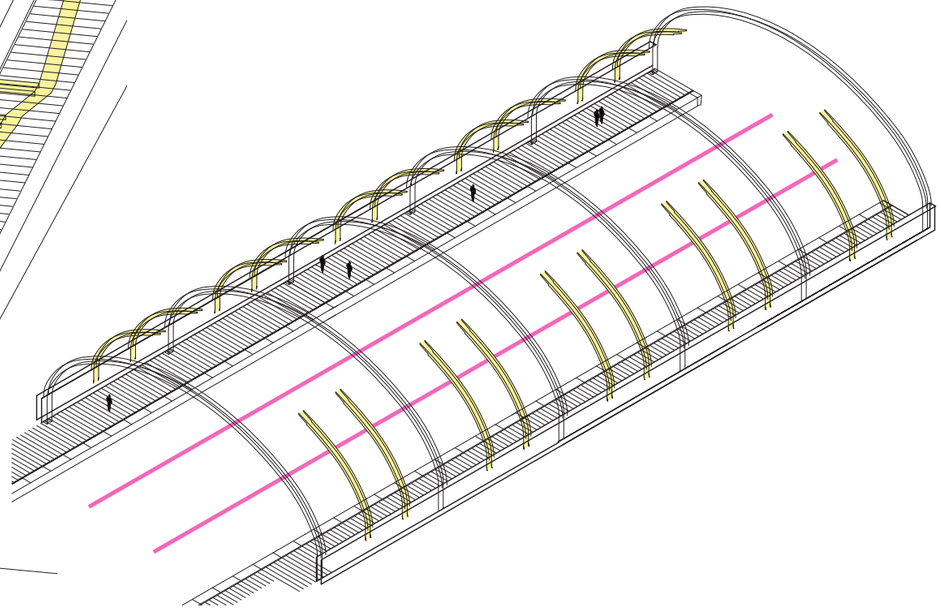


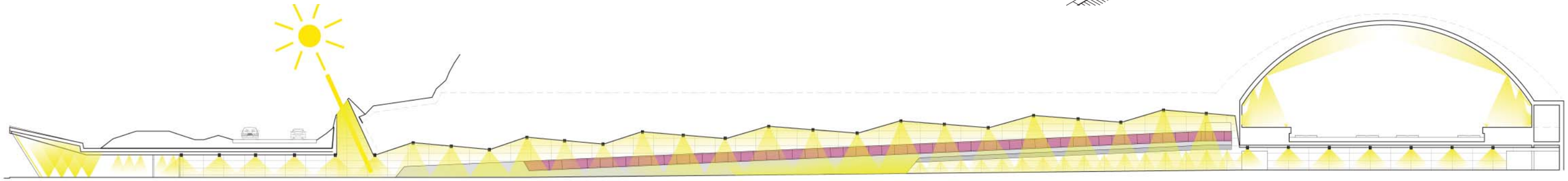
Belysningskoncept

BELYSNINGSLØSNINGER

- Indbygget lys i stålbuer i stationshal suppleret med armaturer i himlinger.
- Konceptet suppleres i adkomsttunneler af indbyggede armaturer i vægge som retningsgivende elementer samt ovenlys over ramper.
- Variation i lysfarven - fra varme til kolde farver.



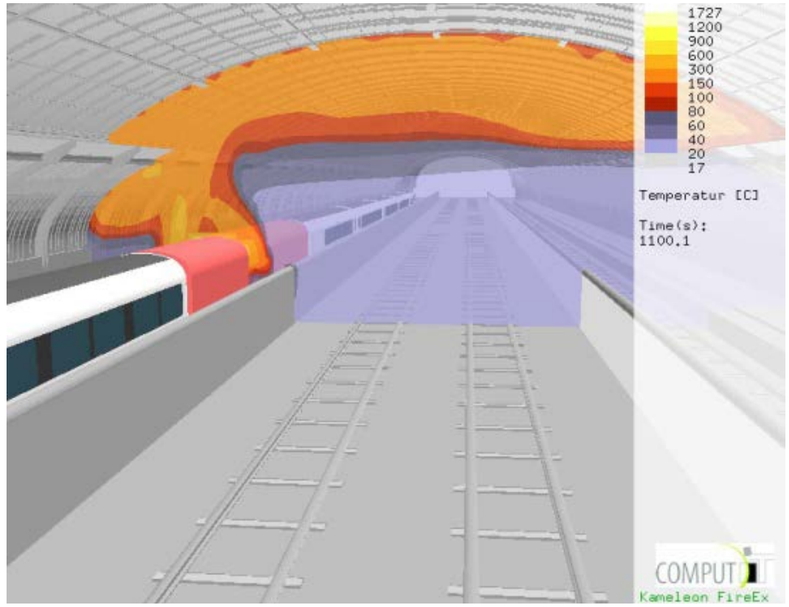


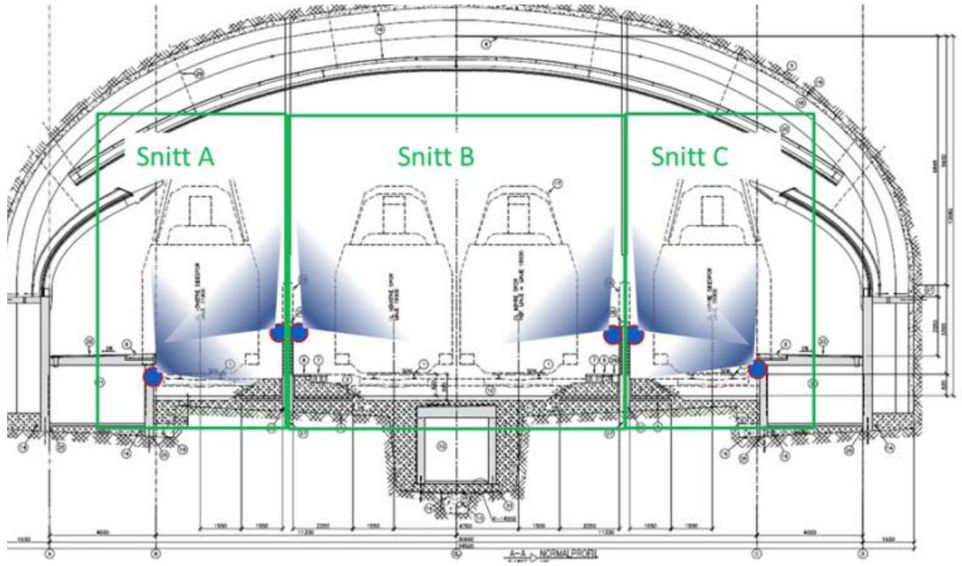


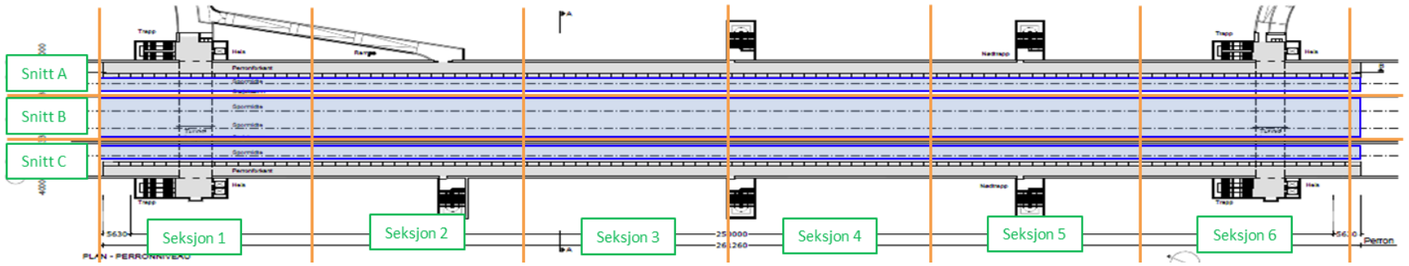
Brand og evakuering

BRAND OG FLUGTLØSNINGER

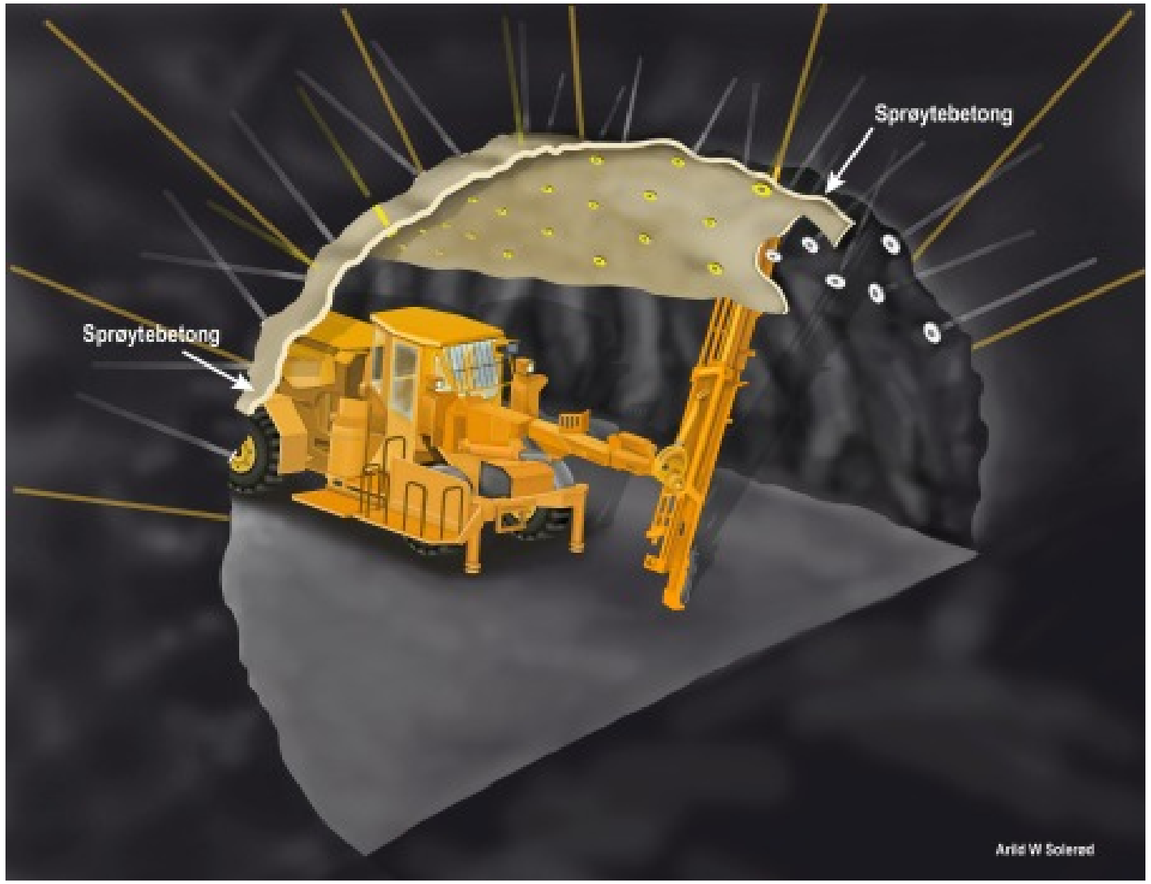
- Brandseksionering med sluser og røgporte
- Vandtågeanlæg ved spor og støjvægge
- Hastighed nedsat før branddøre lukker
- Sektionering med røgporte

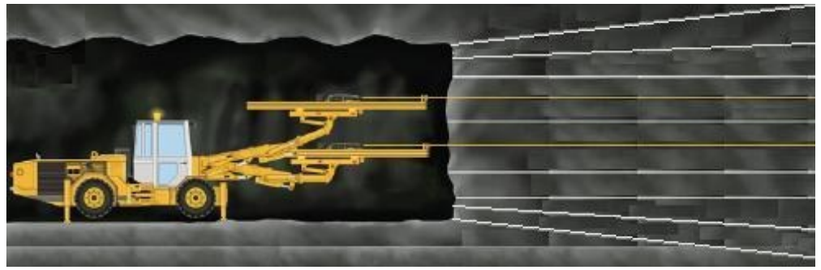


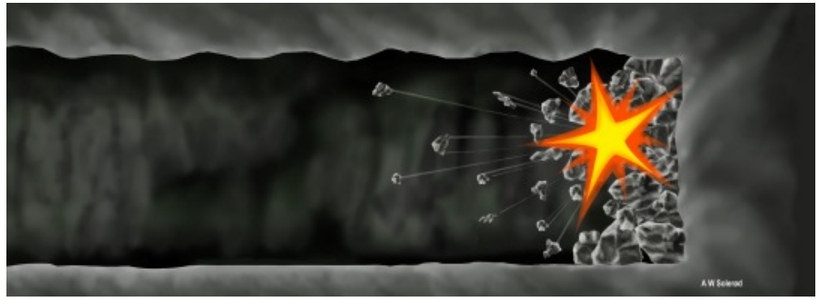




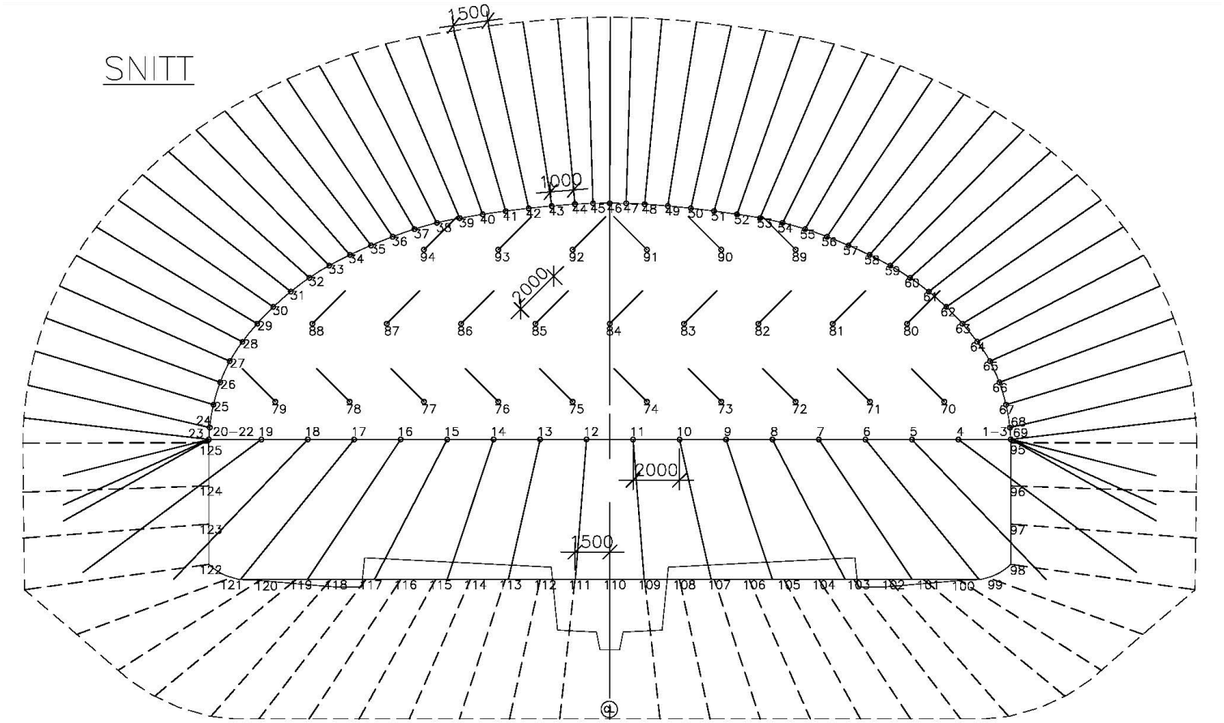
Princip for sprængning, boring og injeksering



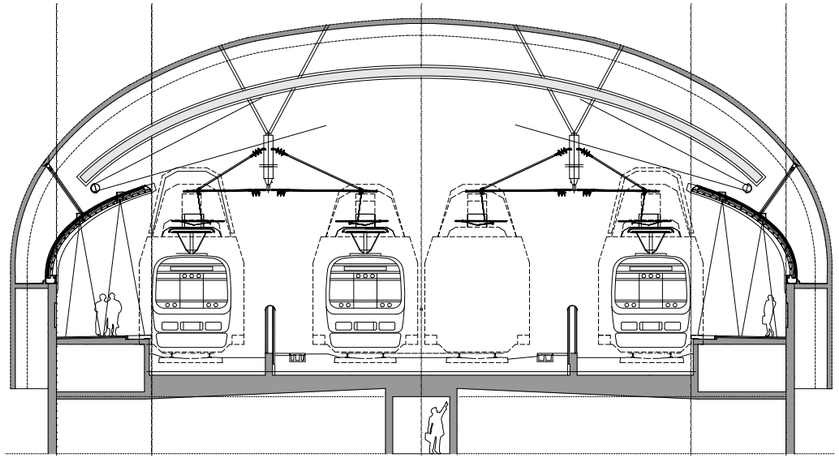


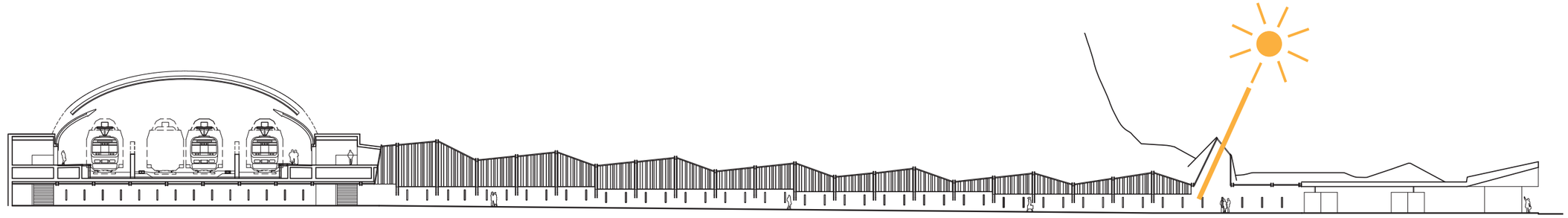


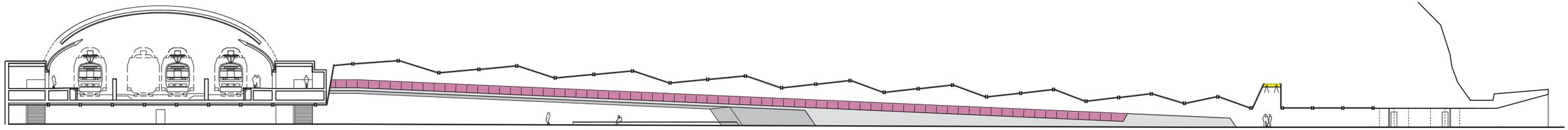
Injeksering i fjeld



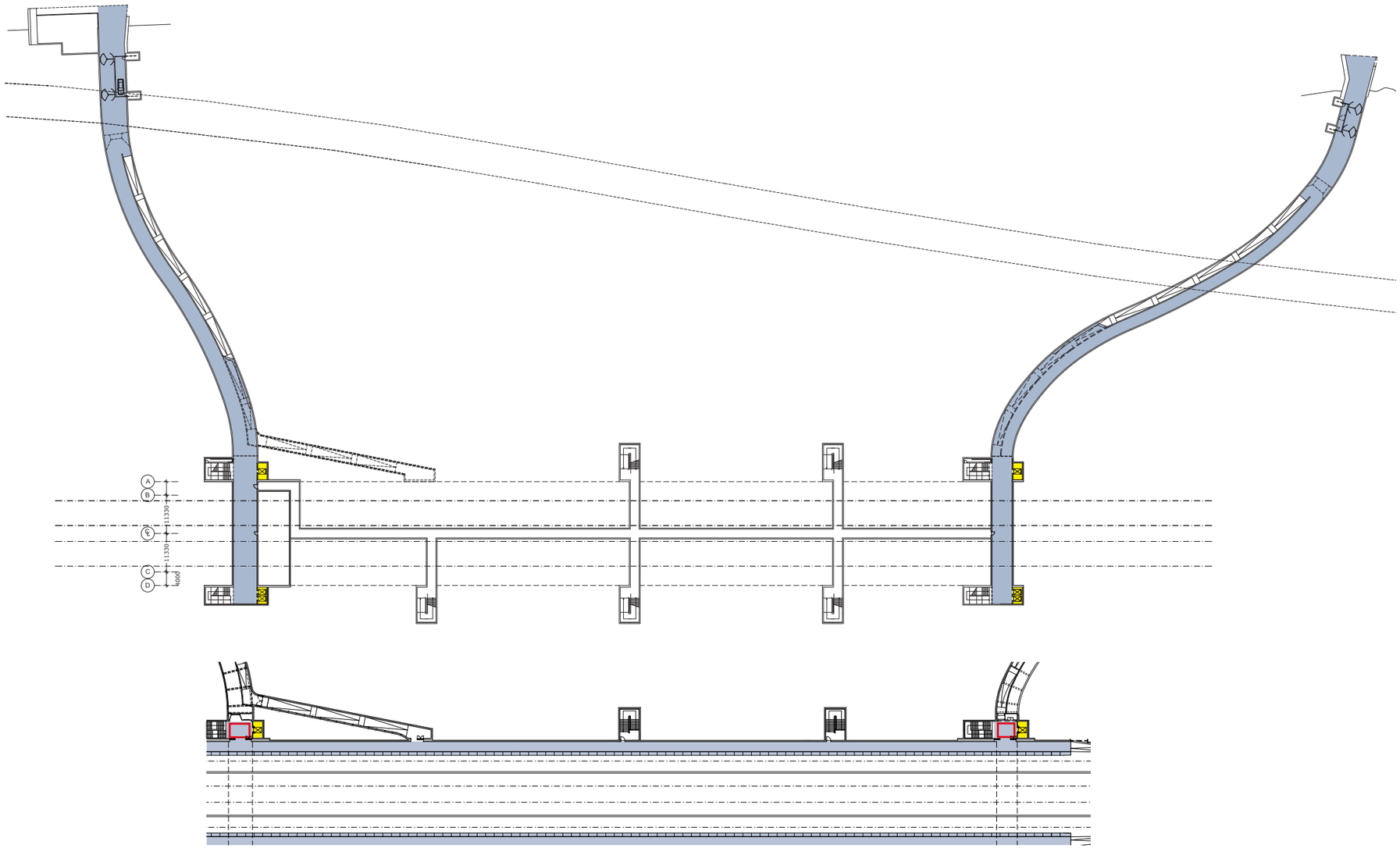
Stationens snit, tunneler og stationshal







Stationens planer



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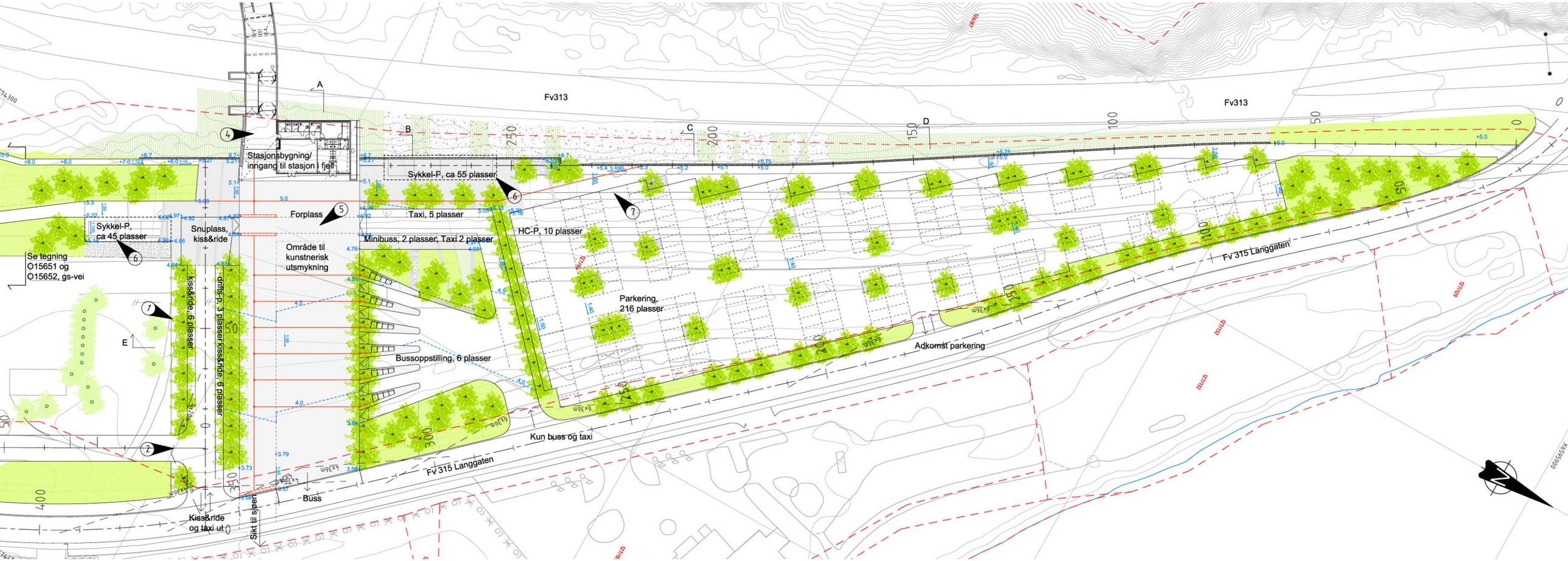
Landskab - stationsplads



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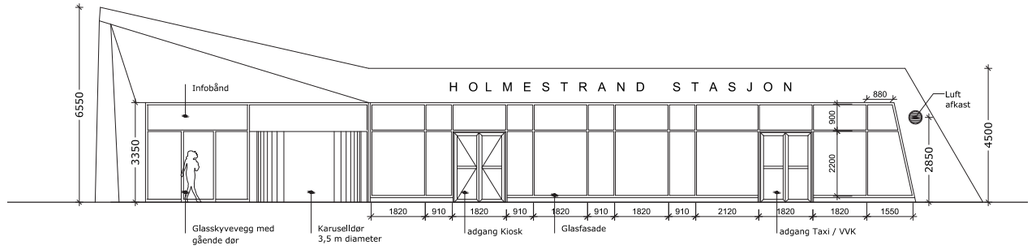
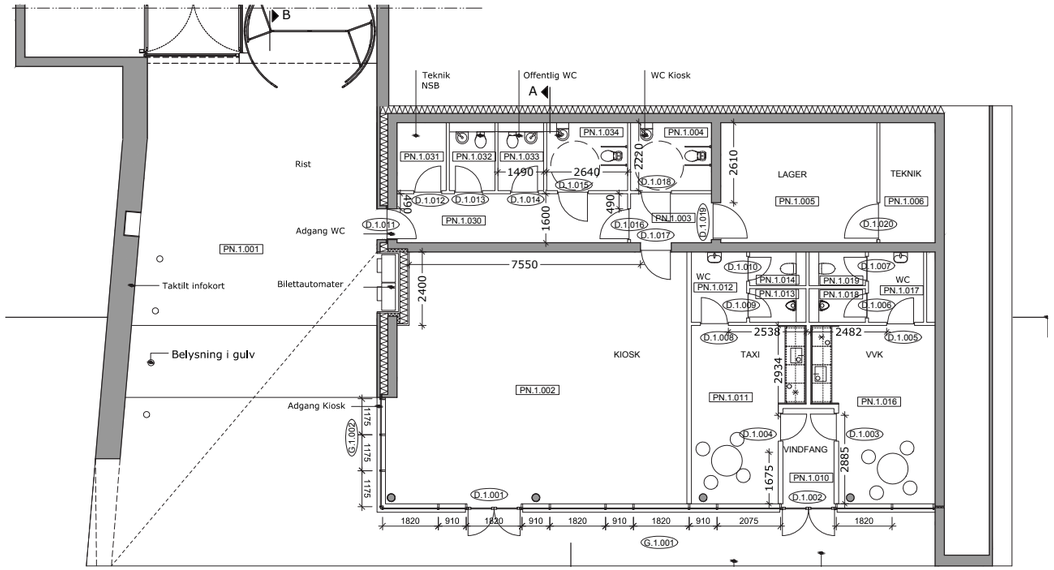
Indgang nord - trafikplads





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Landskab og indgang syd mod centrum

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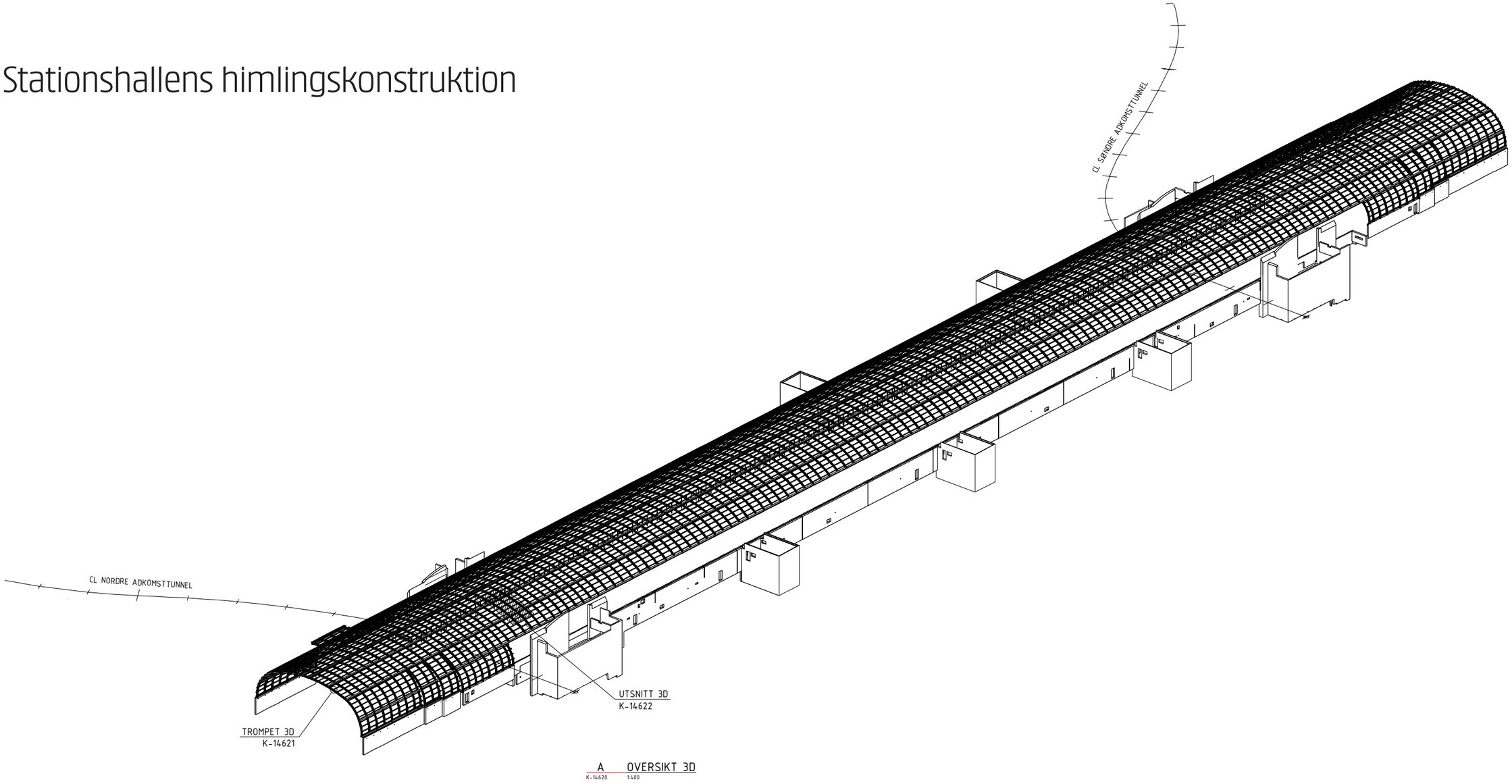
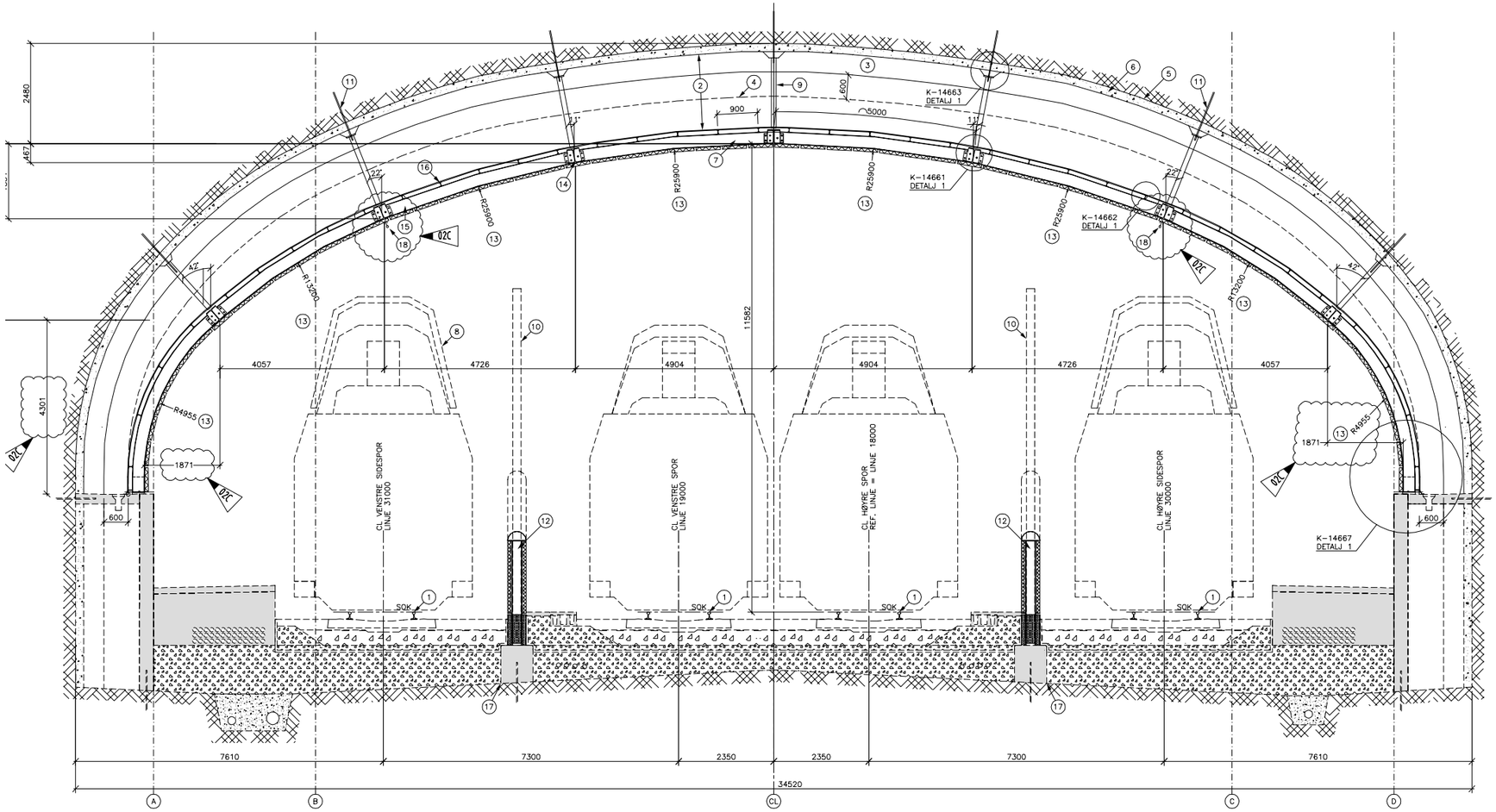
Stationshallens himlingskonstruktion



Stationshal med nedhængt himlingskonstruktion



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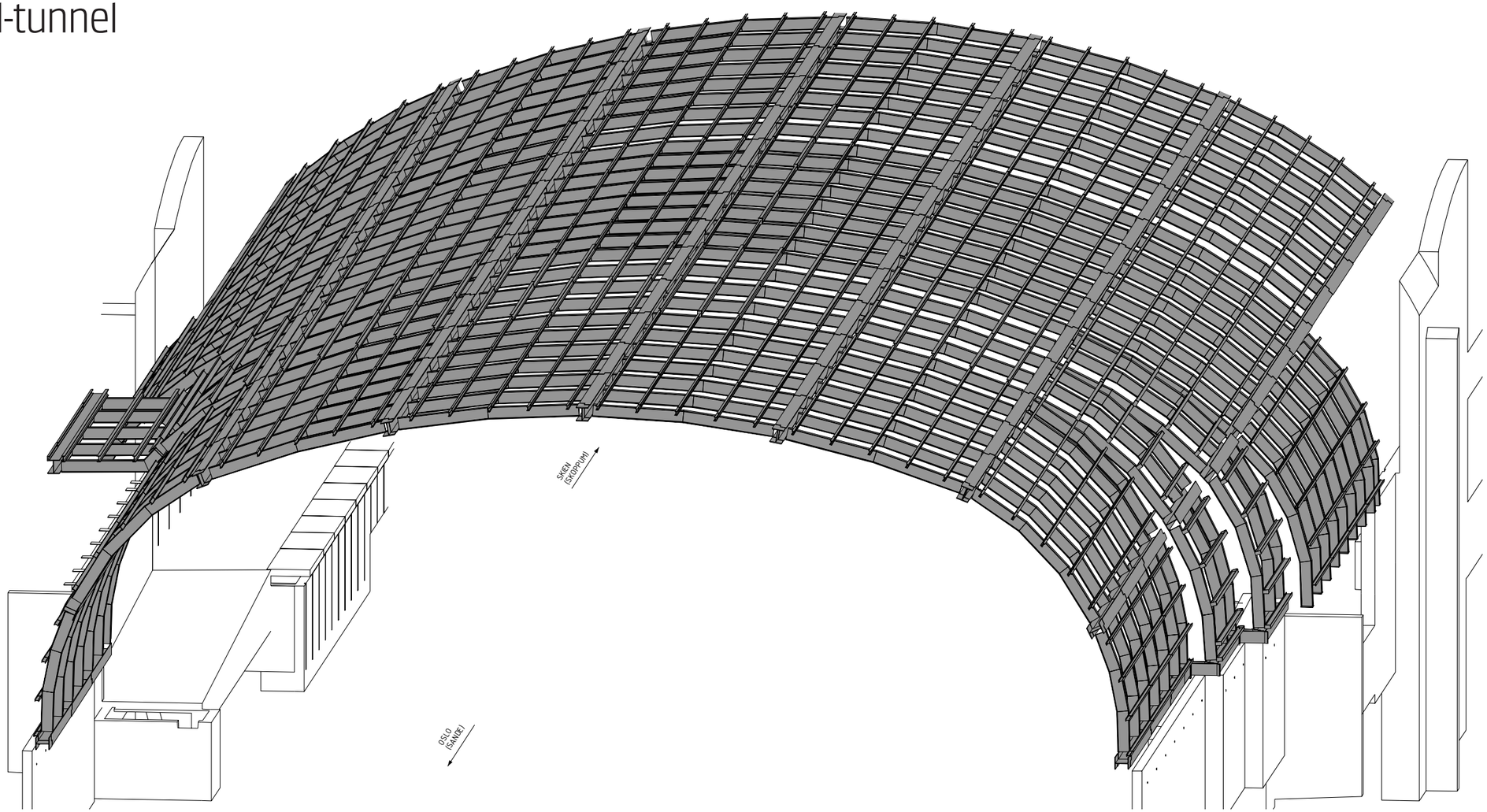
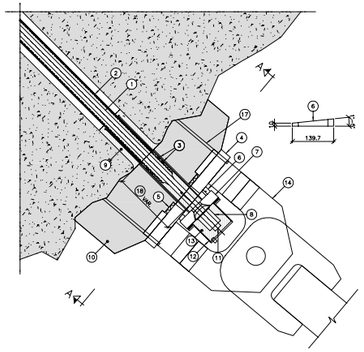
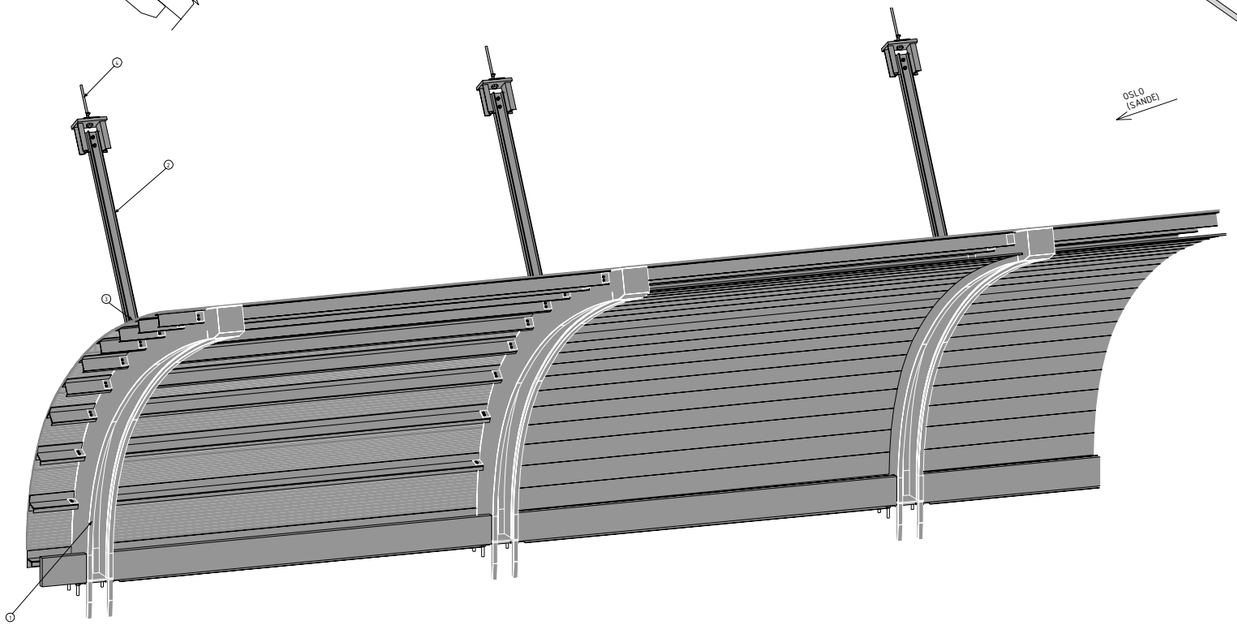
Overgang stationshal-tunnel



Detaljer, knudepunkter og stag





A OVERSIKT 3D
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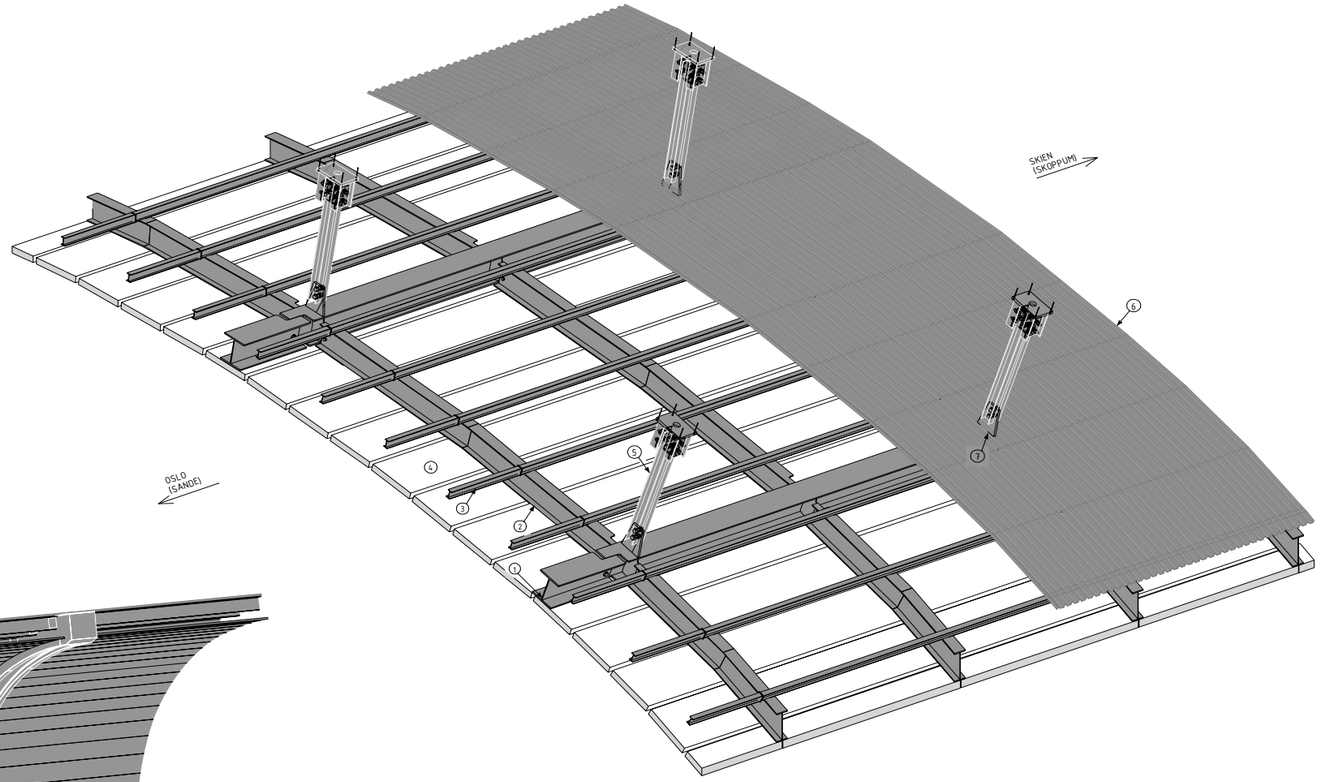

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