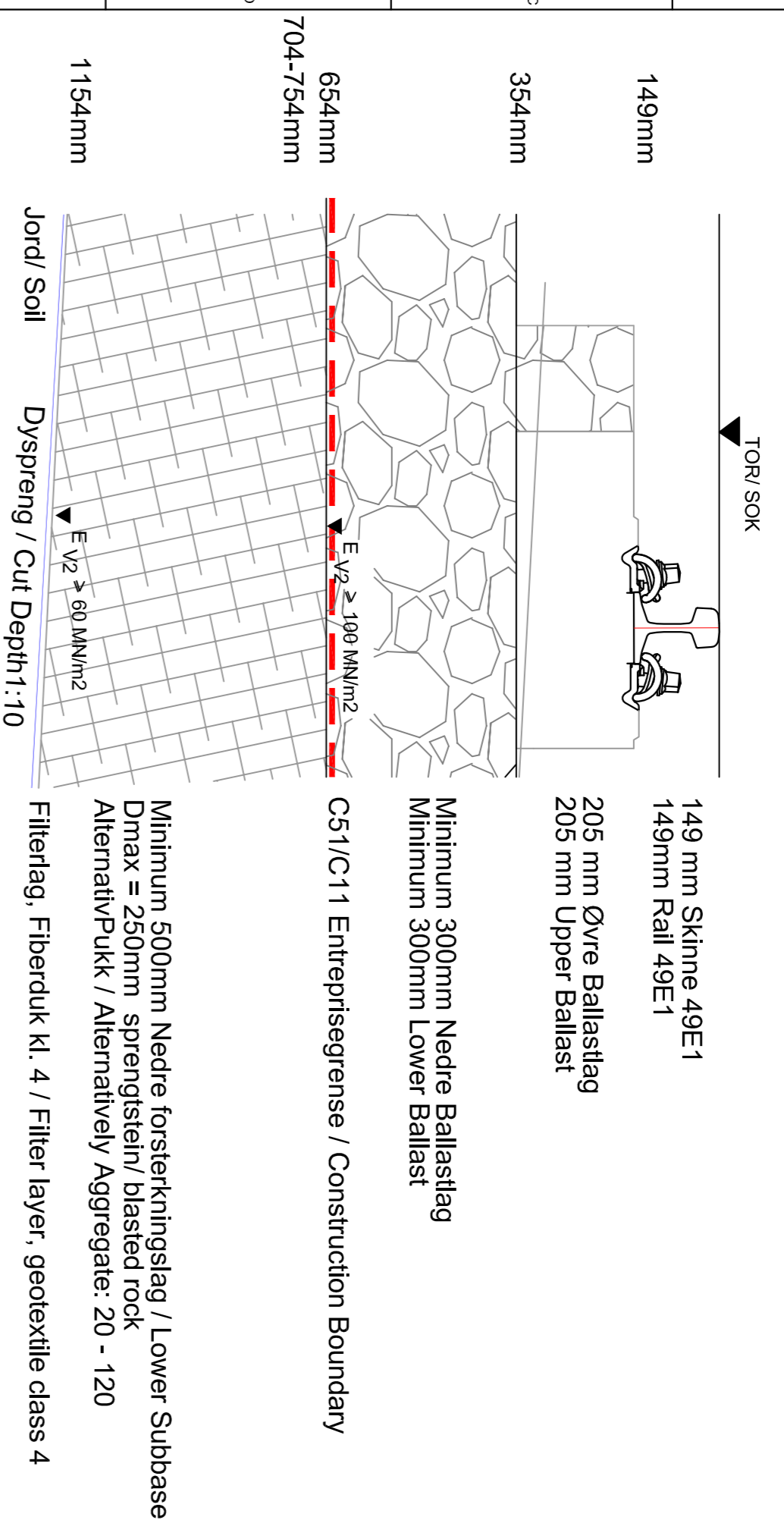
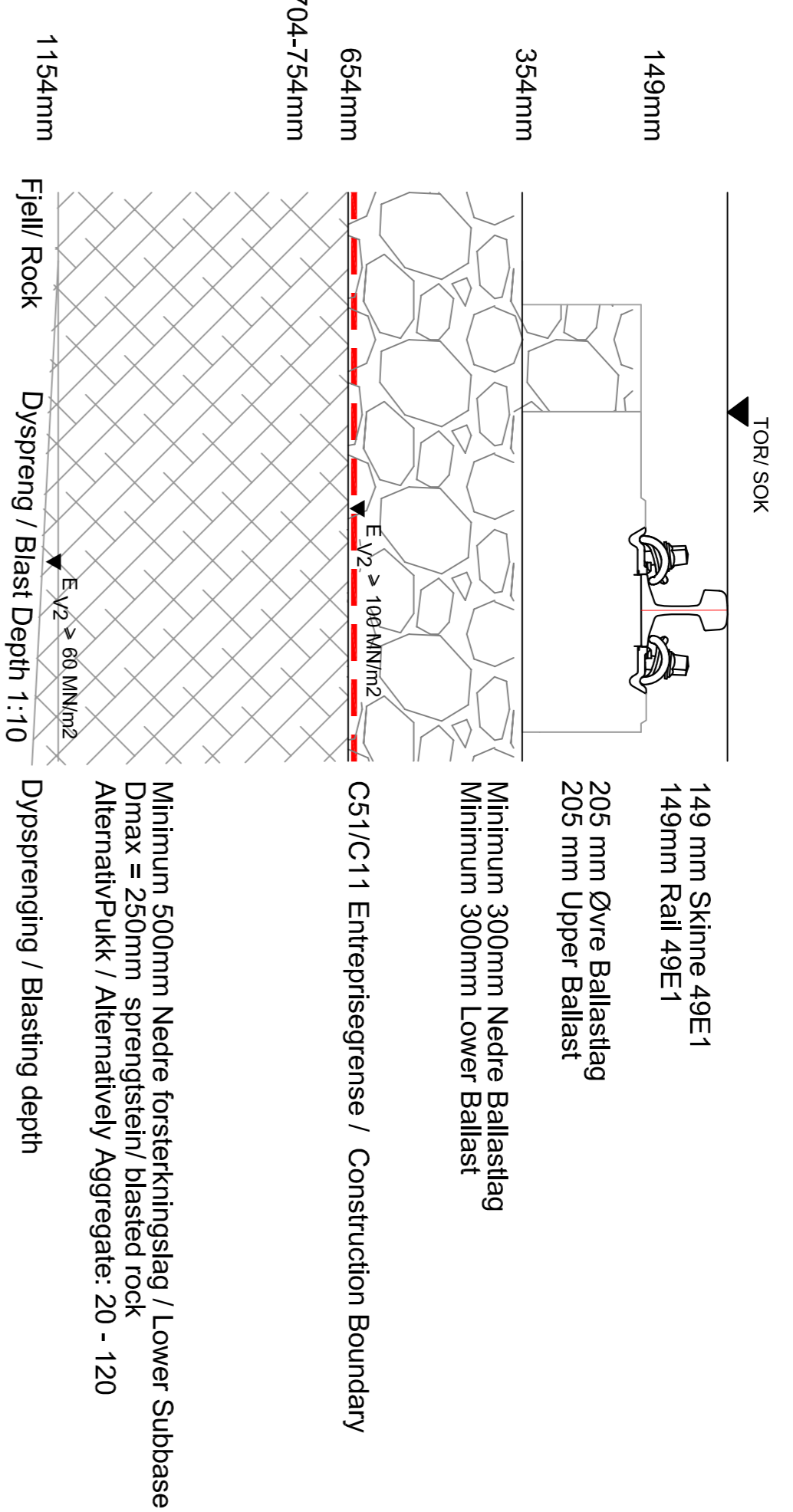


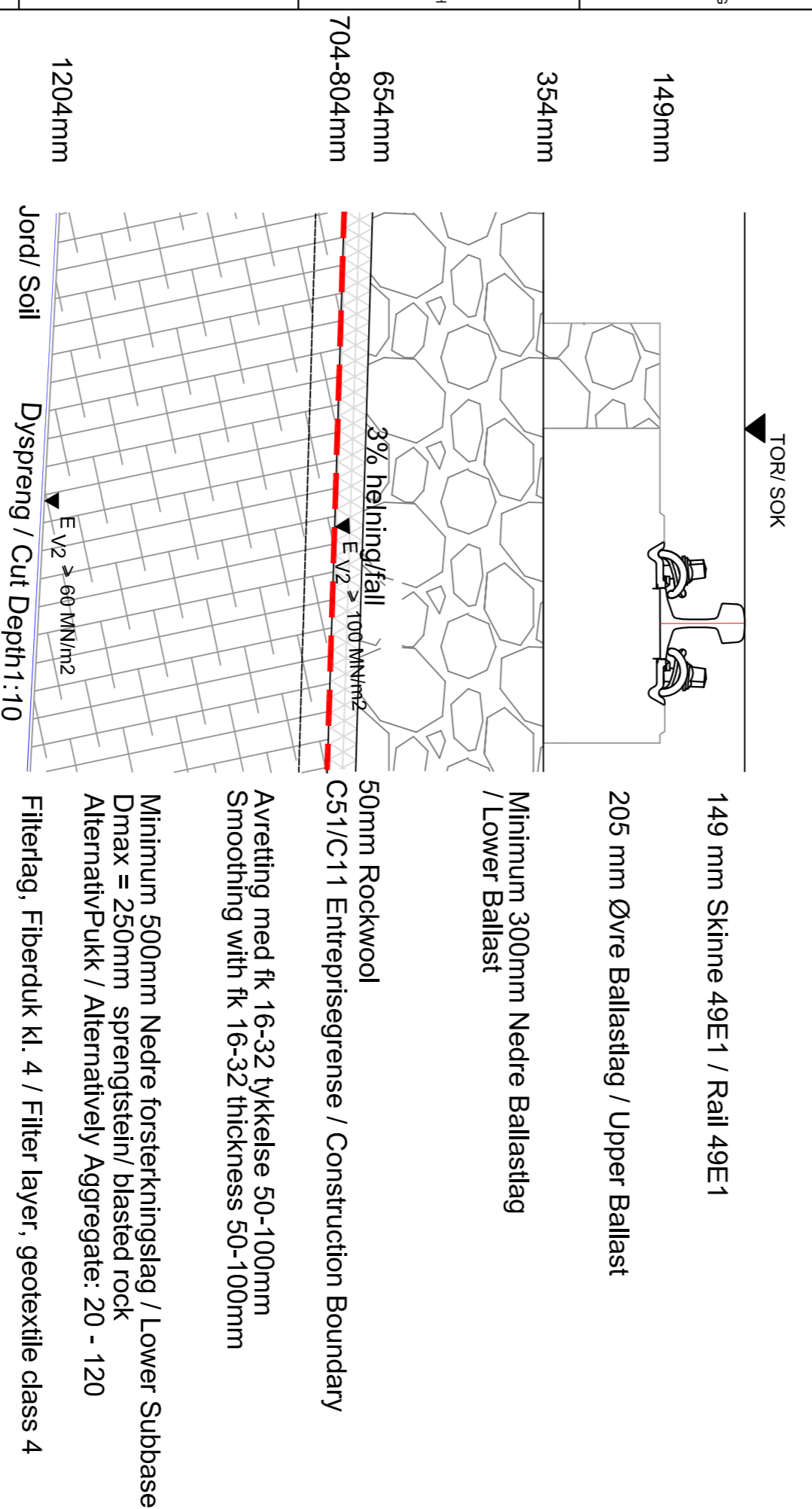
BYBANEN - underbygning jord  
 Frostfri underbygning for hastighetsprofil 0 - 70 km/t  
 BYBANEN - substructure for a speed profile 0 - 70 km/h  
 Frost free substructure for a speed profile 0 - 70 km/h



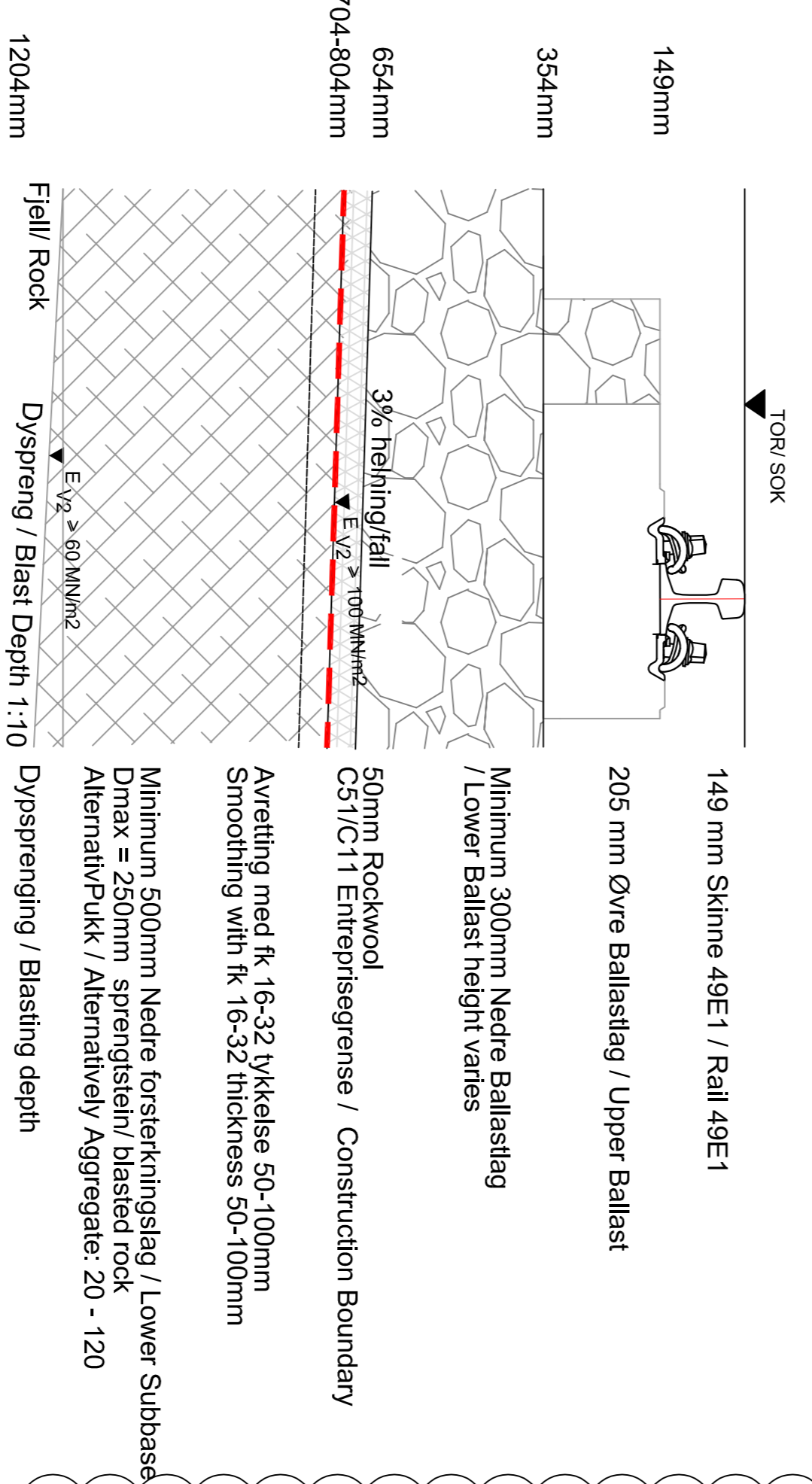
BYBANEN - underbygning fjell  
 Frostfri underbygning for hastighetsprofil 0 - 70 km/t  
 BYBANEN - substructure for a rock  
 Frost free substructure for a speed profile 0 - 70 km/h



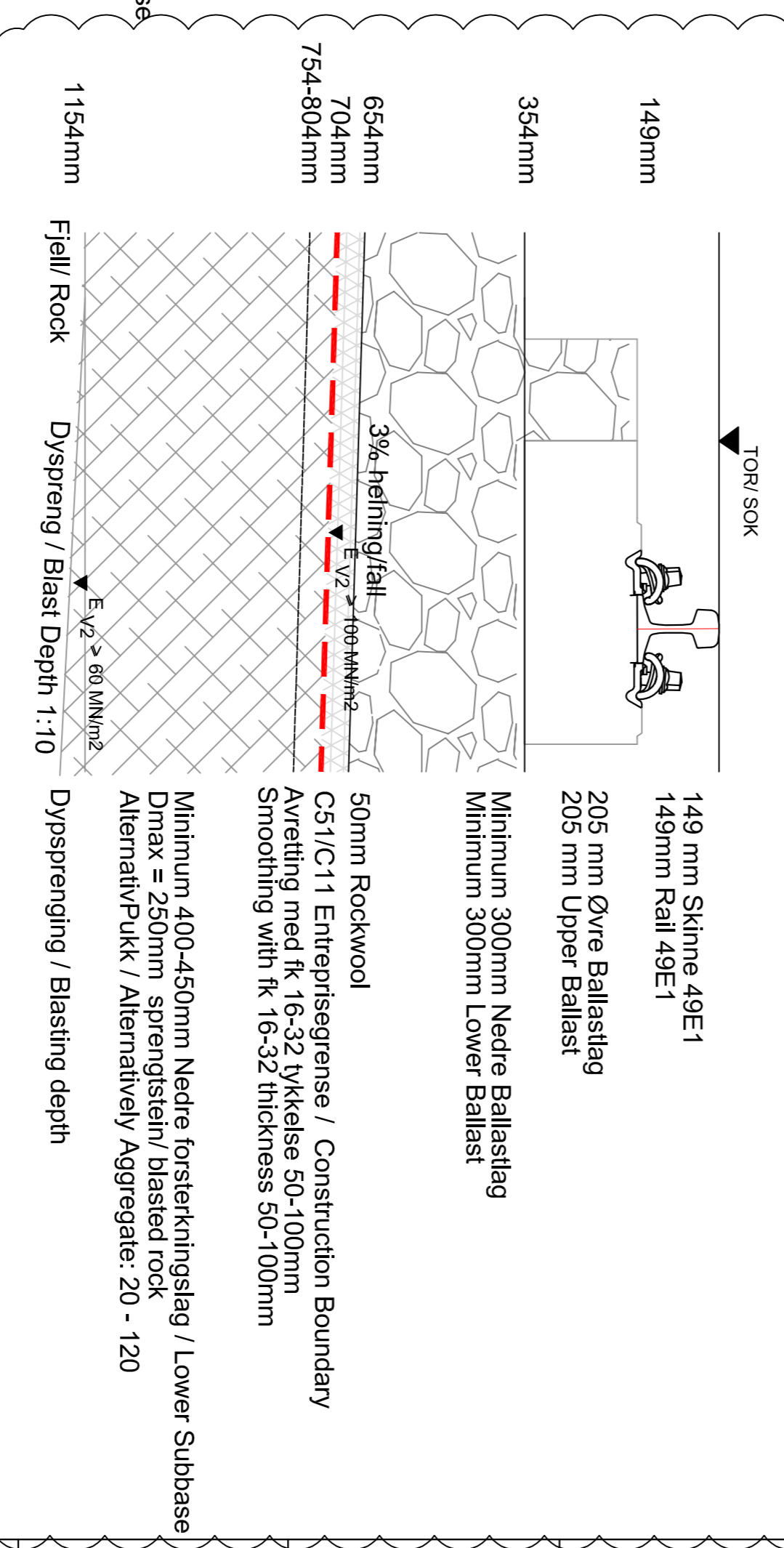
BYBANEN - underbygning jord  
 Frostfri underbygning for hastighetsprofil 0 - 70 km/t med ballastmatter  
 BYBANEN - substructure soil  
 Frost free substructure for a speed profile 0 - 70 km/h with ballast mat



BYBANEN - underbygning fjell  
 Frostfri underbygning for hastighetsprofil 0 - 70 km/t med ballastmatter  
 BYBANEN - substructure rock  
 Frost free substructure for a speed profile 0 - 70 km/h with ballast mat



BYBANEN - underbygning fjell mellom St13660 - Ch13820  
 Frostfri underbygning for hastighetsprofil 0 - 70 km/t  
 BYBANEN - substructure rock between Ch13660 - Ch13820  
 Frost free substructure for a speed profile 0 - 70 km/h



- Merknader / Notes
- Tolerances on lower sub-base are +0 & -50mm
  - Refer to CS2-C-01-TG-1001 for track schematics & ballast & drainage mats
  - Fk 16 - 32 used as ballast is not possible to achieve adequate smoothing with rock fill.
  - Toleranse for nedre forsterkningslag +0 og -50mm
  - Viser til tegning CS2-C-01-TG-1001 for spor prinsippsskisser samt plassering av ballast - og dempermatter
  - Fk 16 - 32 brukes der det ikke er mulig å oppnå tilstrekkelig jammhet med sprengstein.

No.	REVISIONSTABELLEN / REVISION TABLE
1	Underbygning fjell detalj mellom ST13660 - ST13820 lagt til / Substructure rock detail between CH13660 - CH13820 added

Rev	Ansvarlig	Godkjent	Dato
04C	Ansvarlig	Godkjent	21/10/14
03C	Ansvarlig	Godkjent	26/09/14
02C	Ansvarlig	Godkjent	15/07/14
01C	Ansvarlig	Godkjent	17/07/13

TITTEL  
 Underbygning spor

TITTEL  
 Track Substructure

**bybanen**  
 utbygging

**Mott MacDonald**

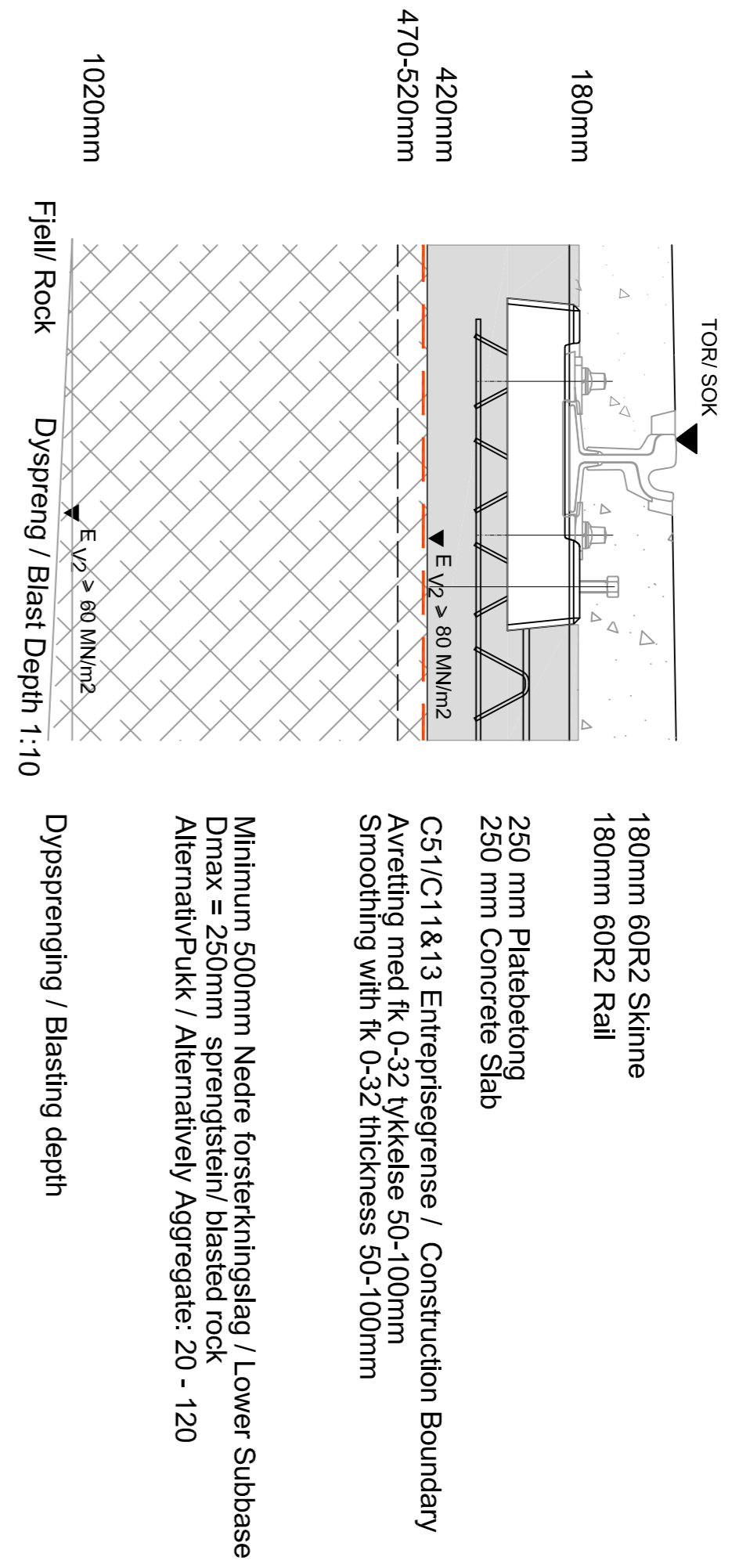
Stasjonsrådal  
 Fylkeskommune

4 - 551 001 2816700  
 www.mottmacdonald.com

C01 Bybanen Rådalen - Flesland

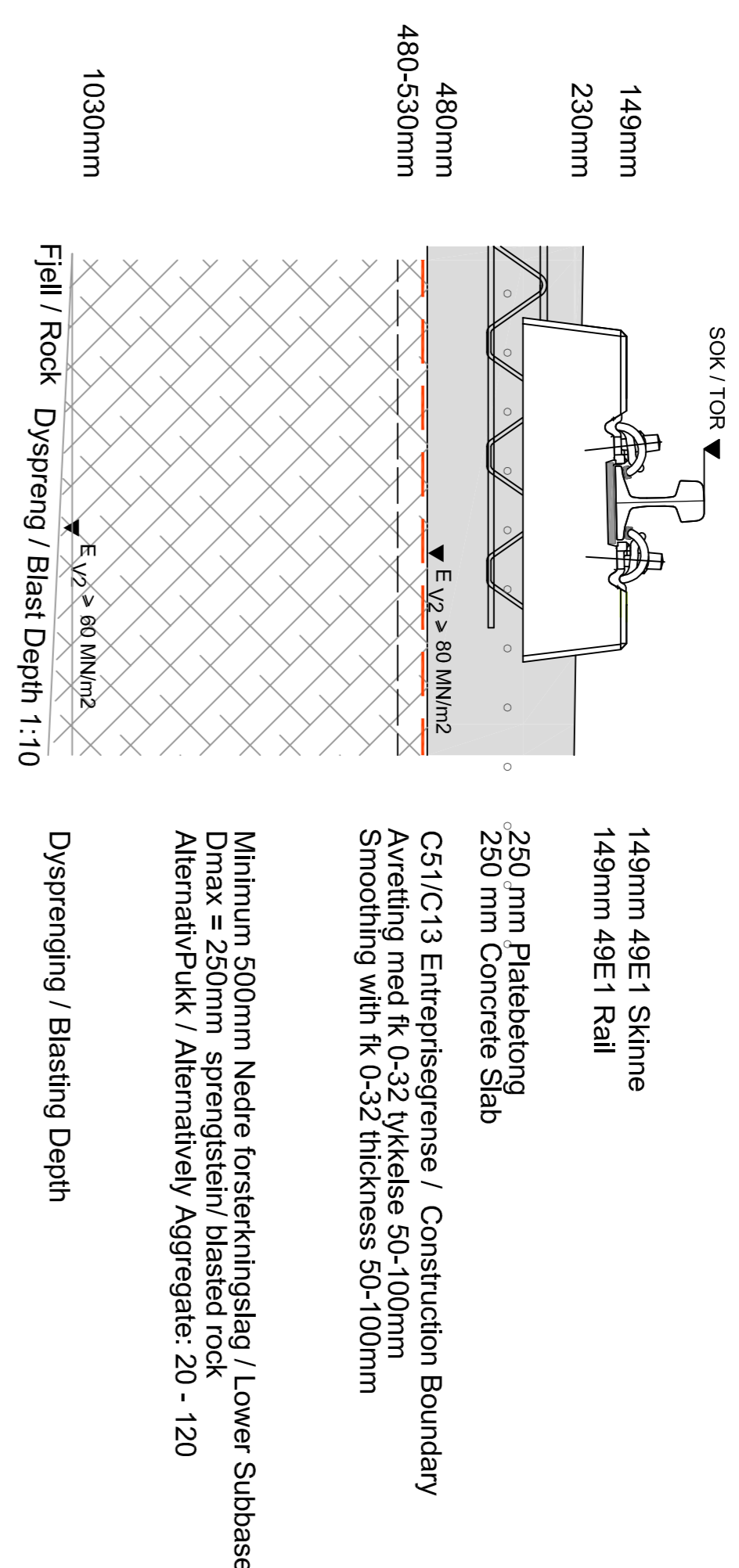
Målestokk @ A1  
 Tegningsnummer C11-F-09-TG-0002\_04C

BYBANEN - underbygning fjell eller jord  
 Frostfritt underbygning for hastighetsprofil 0 - 70 km/t  
 BYBANEN - substructure for rock or soil  
 Frost free substructure for a speed profile 0 - 70 km/h



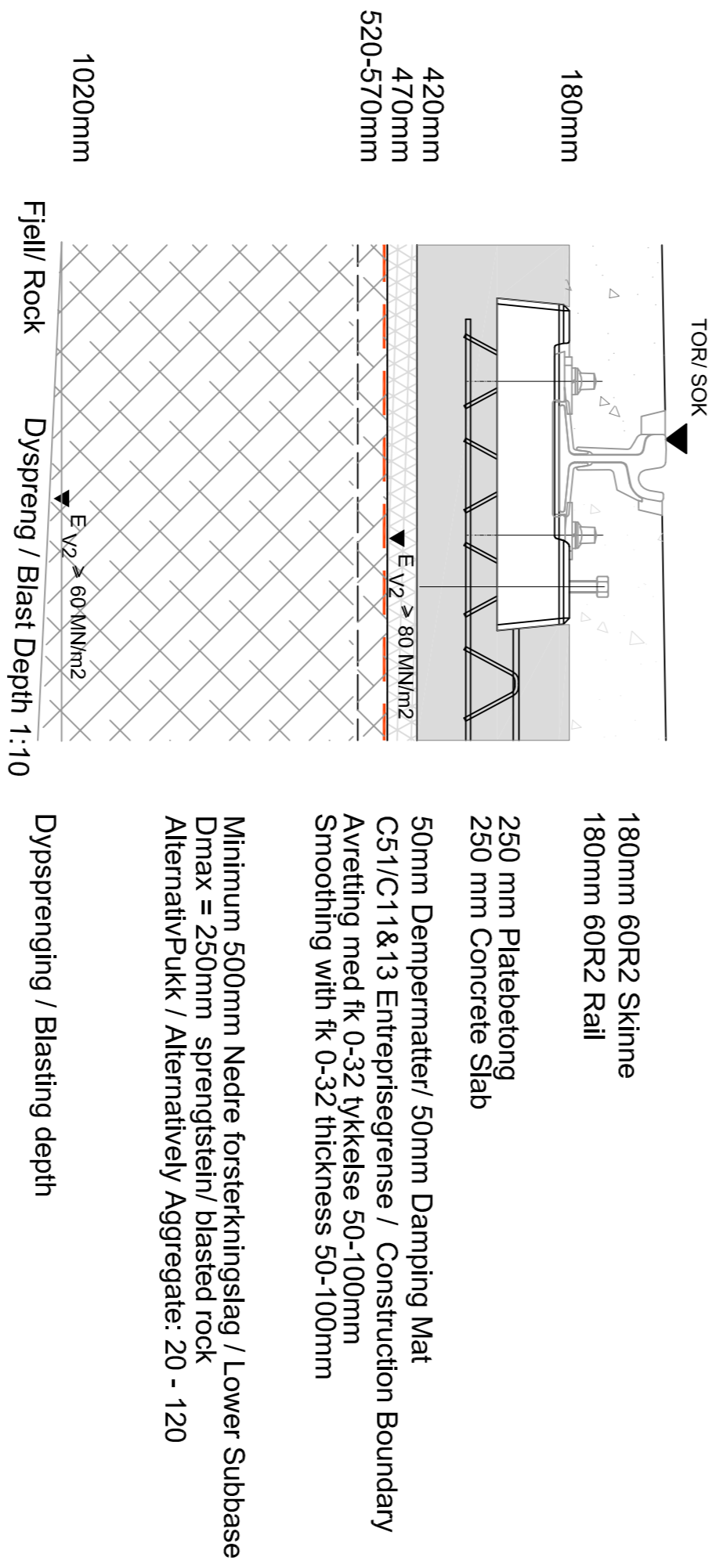
180mm 60R2 Skinne  
 180mm 60R2 Rail  
 250 mm Platebetong  
 250 mm Concrete Slab  
 C51/C13 Entreprisegrense / Construction Boundary  
 Avretting med fk 0-32 tykkelse 50-100mm  
 Smoothing with fk 0-32 thickness 50-100mm  
 Minimum 500mm Nedre forsterkningslag / Lower Subbase  
 Dmax = 250mm sprengstein/blasted rock  
 AlternativPukk / Alternativly Aggregat: 20 - 120  
 Dyvsprengning / Blasting depth

BYBANEN - underbygning fjell eller jord  
 Frostfritt underbygning for hastighetsprofil 0 - 70 km/t  
 BYBANEN - substructure for rock or soil  
 Frost free substructure for a speed profile 0 - 70 km/h



149mm 49E1 Skinne  
 149mm 49E1 Rail  
 250 mm Platebetong  
 250 mm Concrete Slab  
 C51/C13 Entreprisegrense / Construction Boundary  
 Avretting med fk 0-32 tykkelse 50-100mm  
 Smoothing with fk 0-32 thickness 50-100mm  
 Minimum 500mm Nedre forsterkningslag / Lower Subbase  
 Dmax = 250mm sprengstein/blasted rock  
 AlternativPukk / Alternativly Aggregat: 20 - 120  
 Dyvsprengning / Blasting Depth

BYBANEN - underbygning fjell eller jord  
 Frostfritt underbygning for hastighetsprofil 0 - 70 km/t med dempermatter  
 BYBANEN - substructure for rock or soil  
 Frost free substructure for a speed profile 0 - 70 km/h with dampening mat



180mm 60R2 Skinne  
 180mm 60R2 Rail  
 250 mm Platebetong  
 250 mm Concrete Slab  
 50mm Dempermatter / 50mm Dampning Mat  
 C51/C11&13 Entreprisegrense / Construction Boundary  
 Avretting med fk 0-32 tykkelse 50-100mm  
 Smoothing with fk 0-32 thickness 50-100mm  
 Minimum 500mm Nedre forsterkningslag / Lower Subbase  
 Dmax = 230mm sprengstein/blasted rock  
 AlternativPukk / Alternativly Aggregat: 20 - 120  
 Dyvsprengning / Blasting depth

- Merknader / Notes
- Tolerances on lower sub-base are +0 & -50mm
  - Refer to CS2-C-01-TG-1001 for track schematics & details of ballast & bedding mats.
  - Fk 16 - 32 used where it is not possible to achieve adequate smoothing with rock fill.
- Toleranse for nedre forsterkningslag +0 og -50mm
  - Viser til tegning CS2-C-01-TG-1001 for spor prinsippsskisser samt plassering av ballast- og dempermatter
  - Fk 16 - 32 brukes der det ikke er mulig å oppnå tilstrekkelig jammhet med sprengstein.

Rev	DTIC	Arbeidsgrunnlag / Construction	Beskrivelse / Description	Dato / Date	Tegnet / Drawn By	MOF	BLN	DH
				30/09/14				

TITTEL  
 Underbygning spor

TITTEL  
 Track Substructure

bybanen  
 utbygging

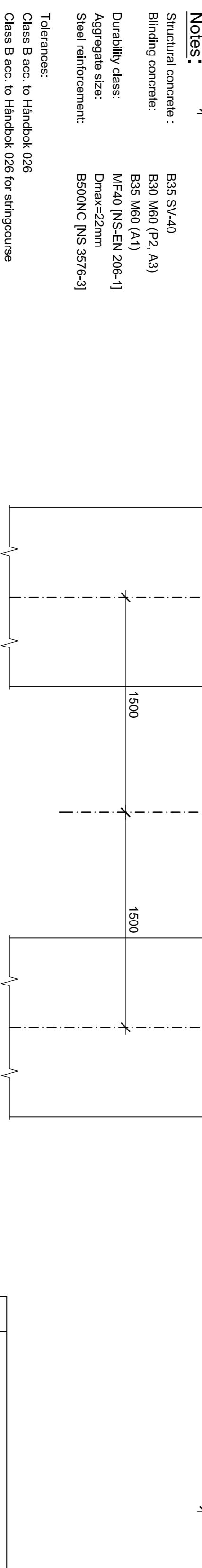
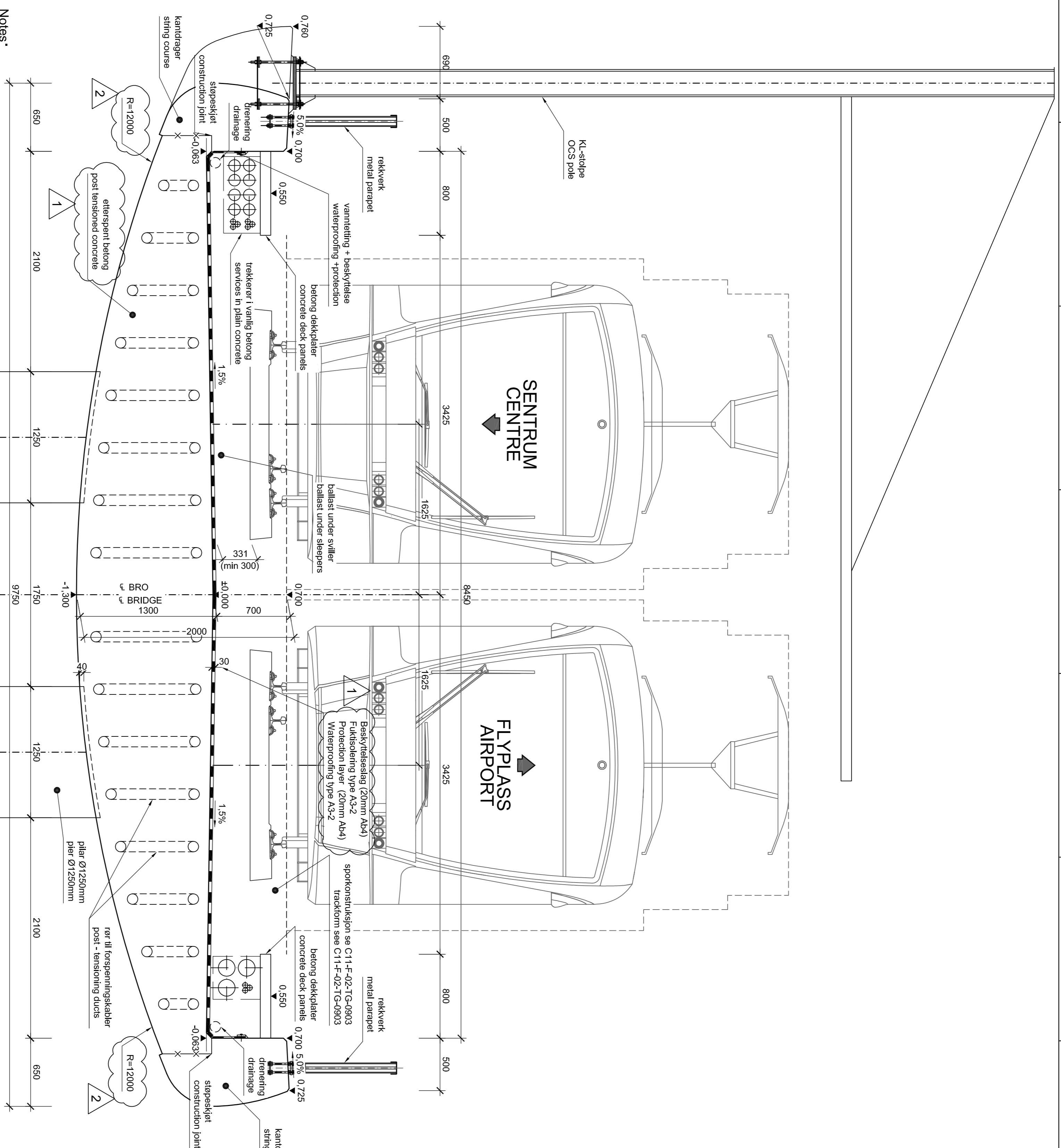
HORDALAND  
 FOLKESKOLEMUNNE

Mott MacDonald  
 South Beach, Dublin 15  
 T +353 (0)1 2945000  
 D Dublin, 15  
 www.mottmacdonald.com

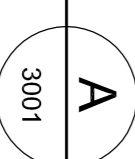
C01 Bybanen Rådalen - Flesland

Målestokk @ A1  
 Tegningsnummer C11-F-09-TG-0003\_01C

© Mott MacDonald  
 This document is issued for the party which commissioned it and for specific purposes connected with the captioned project only. It should not be relied upon by any other party or used for any other purpose.  
 We accept no responsibility for the consequences of this document being relied upon by any other party, or being used for any other purpose, or containing any error or omission which is due to an error or omission in data supplied to us by other parties.



**Tverrsnitt Cross Section**  
1:25



No.	Revisjon
1	Merknader endret / Notes changed
2	Ny merknad / New note
3	

Foreløpig arbeidsgrunnlag/Interim For Construction  
REVISIONSTABELLEN / REVISION TABLE

**Merknader:**

Betong: B35 S14/0  
 Aveling: B30 M60 (P2, A3)  
 Bestandighetsklasse: B35 M60 (A1)  
 Tilslagsstørrelse: M/F40 (NS-EN 206-1)  
 Armering: B500NC (NS 3576-3)

Toleranser: Noyaktighetsklasse B iht. Handbok 026  
 Nøyaktighetsklasse A iht. Handbok 026 for kantdrager

Formwork: Longitudinal board formwork  
 Visible: Optional  
 Not visible: Optional

Rekkverk: i iht. Brukhandbok 267 og 268.

Alle dimensjoner er i millimeter dersom ikke annet er angitt.  
 Alle nivåer er 1 meter over havnivå.  
 Slagseparering målt langs senterlinje høyrespor.

Tegningen må leses i sammenheng med følgende tegninger:  
 C11-K-21-TG-3001  
 C11-K-23-TG-3002  
 C11-K-23-TG-3004

**Notes:**

Structural concrete : B35 S14/0  
 Binding concrete: B30 M60 (P2, A3)  
 Durability class: B35 M60 (A1)  
 Aggregate size: M/F40 (NS-EN 206-1)  
 Steel reinforcement: B500NC (NS 3576-3)

Tolerances: Class B acc. to Handbook 026  
 Class B acc. to Handbook 026 for stringcourse

Formwork: Longitudinal board formwork  
 Visible: Optional  
 Not visible: Optional

Metall parapet: acc. to the Bridge Handbook 267 or 268.

All dimensions are in millimeters unless otherwise indicated.  
 All elevations are in meters above sea level.  
 LRT challenges are measured along the centerline of right track.

This drawing to be read in conjunction with following drawings :  
 C11-K-21-TG-3001  
 C11-K-23-TG-3002  
 C11-K-23-TG-3004

Rev	Arbeidsgrunnlag Construction	Best. utvise Description	Dato Date	Tegnet Drawn By	Kontrollert Checked By	Godkjent Approved By
05C	Arbeidsgrunnlag Construction		04/02/14	SJu	PNg	DH
04C	Arbeidsgrunnlag Construction		12/01/14	LKs	PNg	DH
03C	Arbeidsgrunnlag Construction		16/10/13	JrG	PNg	DH
02C	Arbeidsgrunnlag Construction		06/08/13	LEI	PNg	DH
01C	Arbeidsgrunnlag Construction		17/02/13	LEI	PNg	DH

TITTEL  
**K35 - Steinsvikbroen - Bru no. 12-1196**

Formtegning  
**Tverrsnitt**

TITTEL  
**K35 - Steinsvik broge - Br. no. 12-1196**  
 General Arrangement  
 Cross Section

**bybanen**  
 utbygging

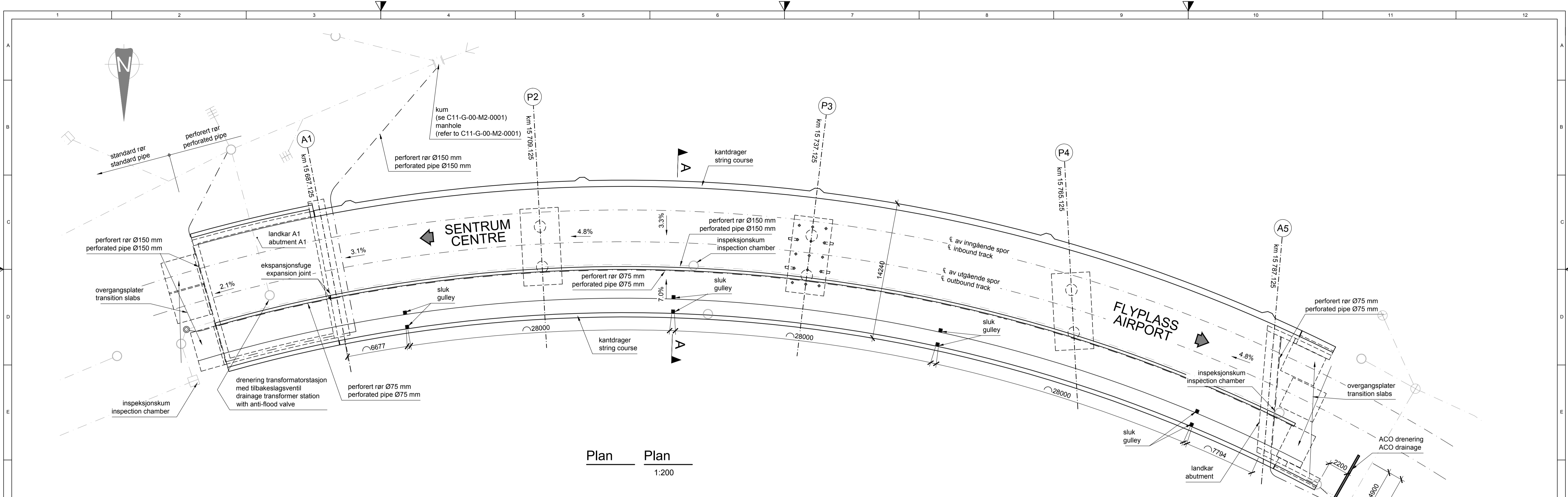
**Mott MacDonald**

Scot Bank, Dundee, UK  
 T +44 (0)1382 670000  
 D +44 (0)1382 670001  
 www.mottmac.com

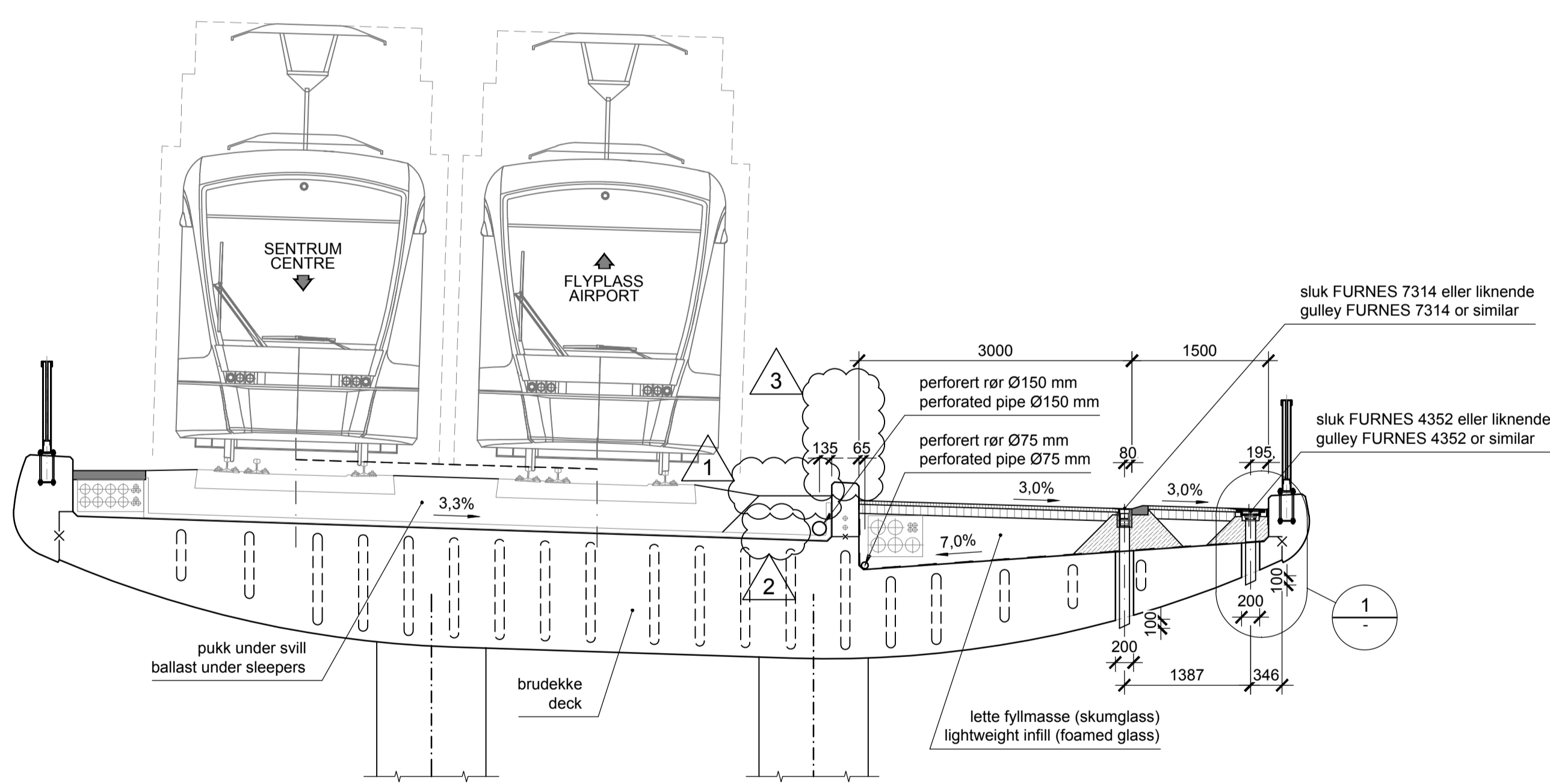
C01 Bybanen Rådal - Flesland

Målestokk @ A1  
 1 : 25  
 Tegningsnummer  
**C11-K-23-TG-3003\_05C**

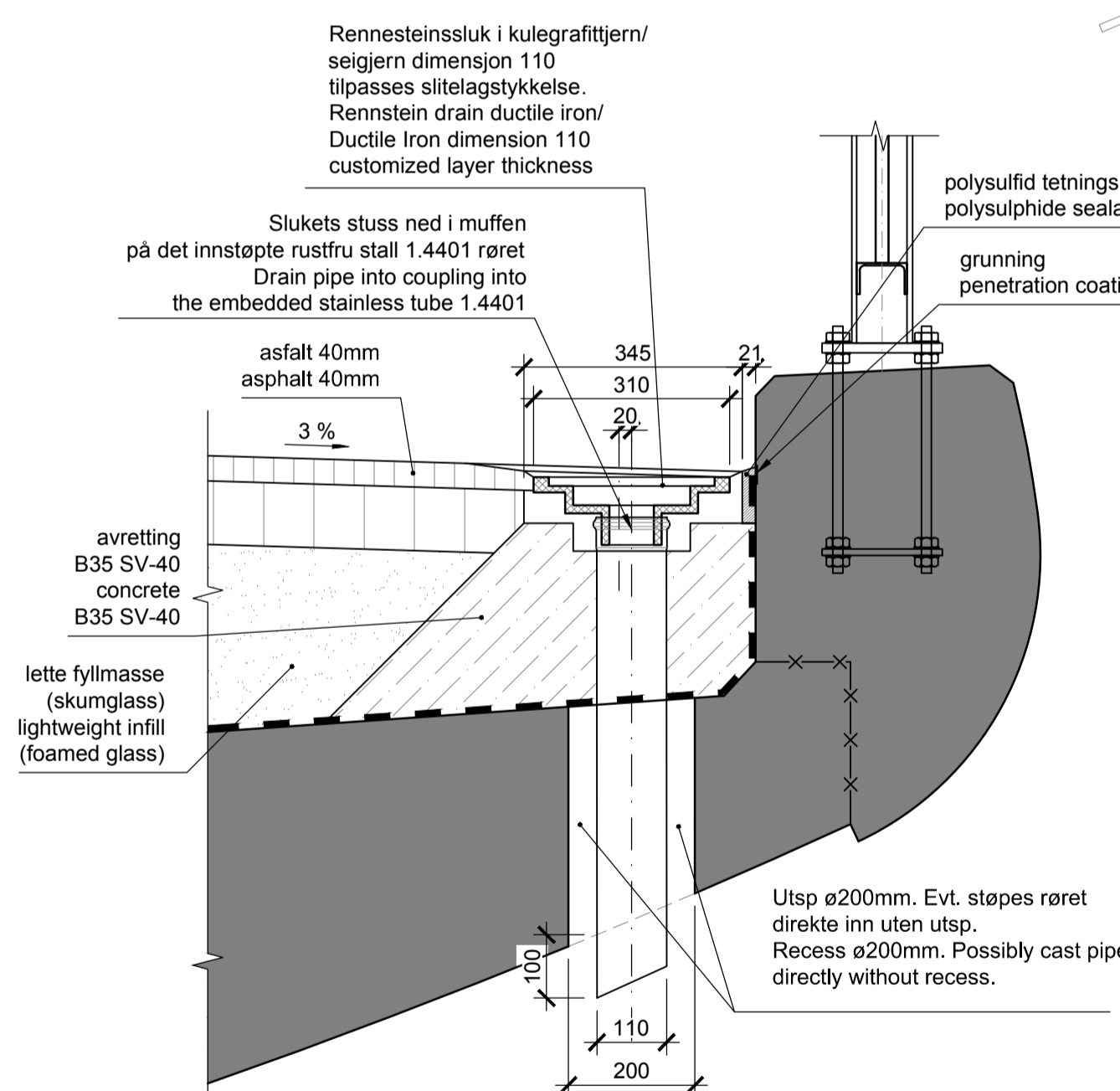
© Mott MacDonald  
 This document is issued for the party which commissioned it and for specific purposes connected with the captioned project only. It should not be relied upon by any other party or used for any other purpose.  
 We accept no responsibility for the consequences of this document being relied upon by any other party, or being used for any other purpose, or containing any error or omission which is due to an error or omission in data supplied to us by other parties.



Plan Plan  
1:200



Snitt Section A  
1:50



Detalj Detail 1  
1:10

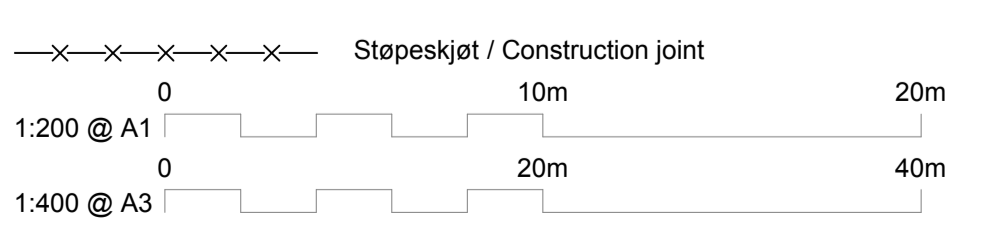
**Merknader:**  
Alle dimensjoner er i millimeter dersom ikke annet er angitt.  
Alle nivåer er i meter over havnivå.  
Stasjonering målt langs senterlinje høyrespor.

**Tegningen må leses i sammenheng med følgende tegninger:**  
C12-K-21-TG-4001 C11-G-00-M2-0001  
C12-K-23-TG-4002 C12-G-00-M2-0001  
C12-K-23-TG-4003  
C12-K-23-TG-4004

**Notes:**  
All dimensions are in millimeters unless otherwise indicated.  
All elevations are in meters above sea level.  
LRT chainages are measured along the center line of right track.

**This drawing to be read in conjunction with following drawings:**  
C12-K-21-TG-4001 C11-G-00-M2-0001  
C12-K-23-TG-4002 C12-G-00-M2-0001  
C12-K-23-TG-4003  
C12-K-23-TG-4004

Foreløpig arbeidsgrunnlag/Interim For Construction	
REVISJONSTABELLEN / REVISION TABLE	
No.	
1	Gangveg overflate endret / Footway surface amendment
2	Fjernet av rør / Ducting removed
3	Fjernet av rekkverk / Metal parapet removed
4	
5	
6	
7	
8	



Rev	Beskrivelse / Description	Dato / Date	Tegnet / Drawn By	Kontrollert / Checked By	Godkjent / Approved By
06C	Arbeidsgrunnlag/ Construction	06/06/14	RSI	PNe	DH
05C	Arbeidsgrunnlag/ Construction	22/05/14	ALu	JKr	DH
04C	Arbeidsgrunnlag/ Construction	05/03/14	JSy	PNe	DH
03C	Arbeidsgrunnlag/ Construction	12/12/13	NDø	PNe	DH
02C	Arbeidsgrunnlag/ Construction	30/06/13	RSI	JKr	DH
01C	Arbeidsgrunnlag/ Construction	19/06/13	RSI	PNe	DH
07C	Arbeidsgrunnlag/ Construction	22/05/15	LEI	JKr	DH

TITTEL  
**K50 - Sandslibroen - Bru no. 12-3011**  
Formtegnning  
Drenering

TITTEL  
**K50 - Sandsli bridge - Br. no. 12-3011**  
General Arrangement  
Drainage

**bybanen**  
utbygging

HORDALAND  
FYLKESKOMMUNE

**Mott MacDonald**

Målestokk  
@ A1  
1:200,50

Tegningsnummer  
**C12-K-23-TG-4005\_07C**

© Mott MacDonald  
This document is issued for the party which commissioned it and for specific purposes connected with the captioned project only. It should not be relied upon by any other party or used for any other purpose.  
We accept no responsibility for the consequences of this document being relied upon by any other party, or being used for any other purpose, or containing any error or omission which is due to an error or omission in data supplied to us by other parties.