Supplementary Information

The following information is associated with Network Rail Standard:
NR CIV/SD/580 Rev A

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CAD Drawing

- CIV/SD/580

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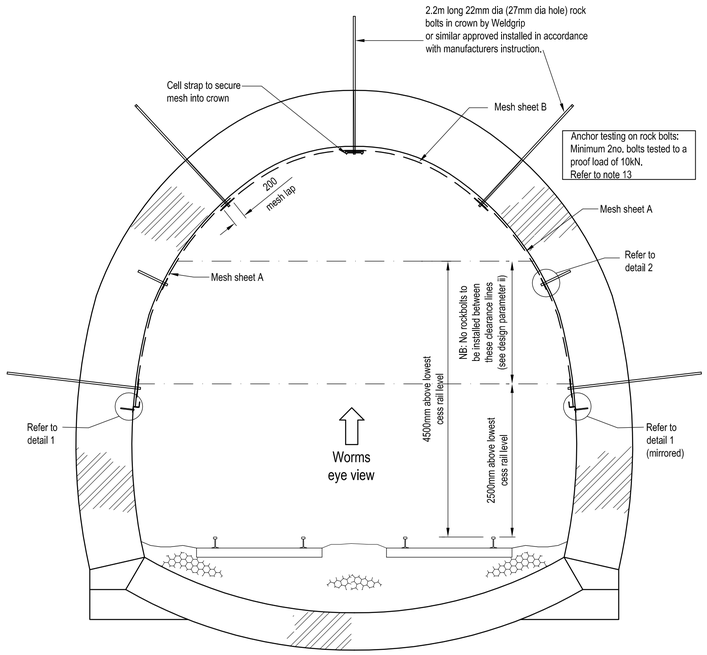
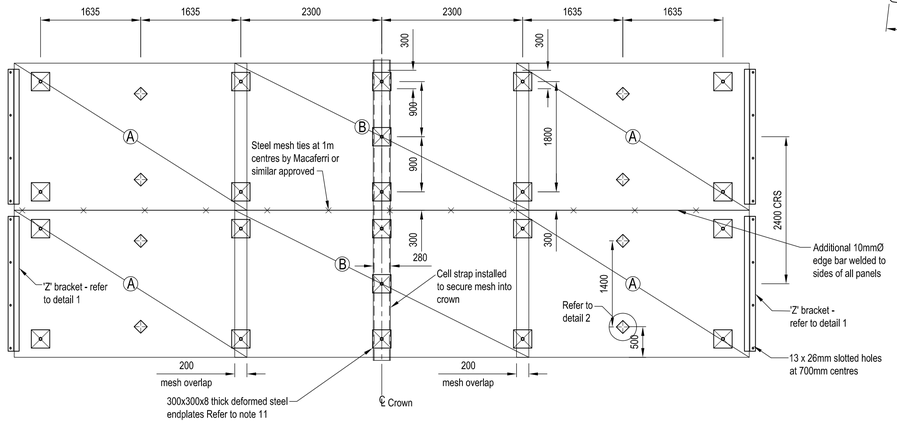


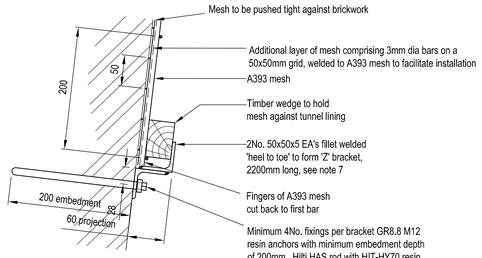
TYPICAL CROSS SECTION SHOWING ROCK BOLT FIXINGS

SCALE 1:50



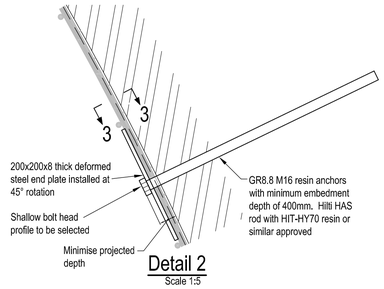
Developed 'Worms Eye' View on Mesh and Rock Bolt Fixings

Scale 1:50



Detail 1

Scale 1:5



Detail 2

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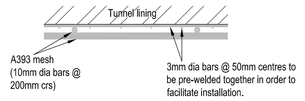
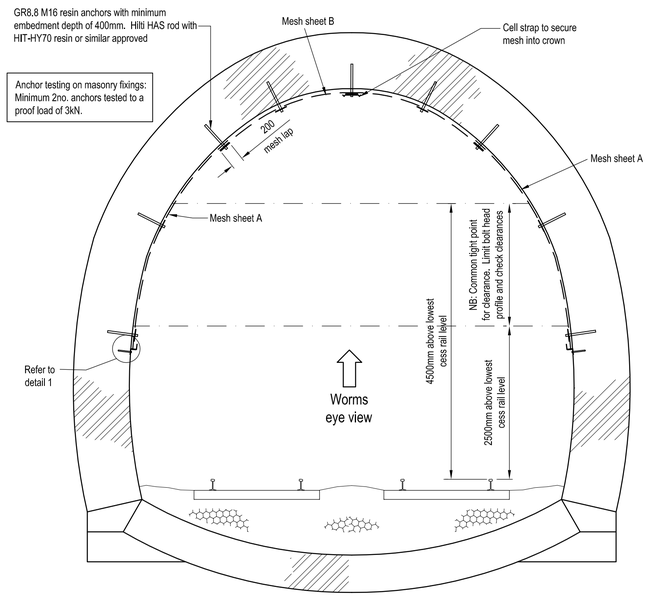


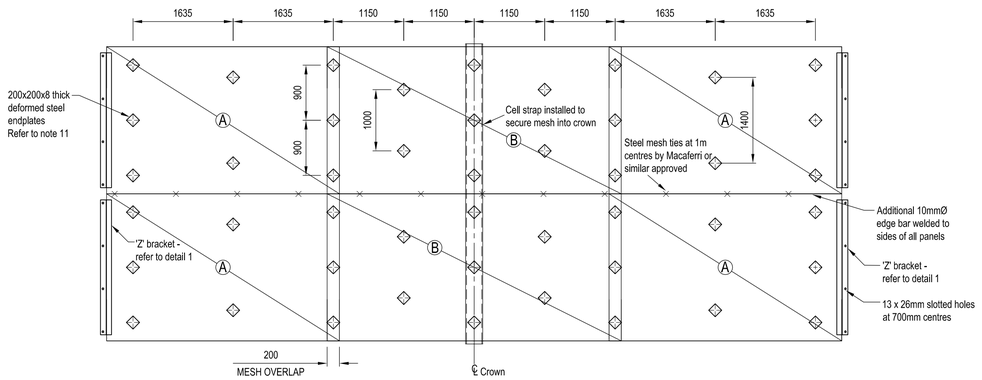
Section 3-3

Scale 1:5



TYPICAL CROSS SECTION SHOWING MASONRY FIXINGS

SCALE 1:50



Developed 'Worms Eye' View on Mesh and Masonry Anchor Fixings

Scale 1:50

SAFETY, HEALTH AND ENVIRONMENT RISK ASSESSMENT

Designer's note - CDM 2007

The following are significant hazards/risks associated with the works outlined in this set of drawings. A site specific risk assessment shall always be undertaken prior to commencing any of the works described on site.

It is assumed that a competent contractor is aware of the risks associated with general construction activities undertaken in the railway environment.

RISK	STAGE	MITIGATING MEASURES
Bricks falling onto personnel	C/O	Remove or wedge all loose bricks prior to installation or secure with wedges.
Rock bolt or fixing failure leading to collapse	C	Carry out rock bolt and fixing tests on 5% of fixings - minimum 2No. per section of repair.
Repair detail struck by train	C/O	Gauging check to be carried out.
Assumptions made during the development of the design may not be appropriate for all tunnel situations	C	Refer to Design Assumptions table in notes and Design Risk Assessment.

NOTE: C = CONSTRUCTION, D = DEMOLITION, O = OPERATION.

Material Element Schedule

Sheet ref.	Dimensions	Details	Approx weight (kg)
Mesh panel (A)	3.8m x 2.4m curved to radius 20% greater than crown radius (see note 8)	1 layer of A393 with 1 layer of fabric from 3mm dia bars on a 50x50mm grid - refer to detail 1.	9.1
Mesh panel (B)	4.8m x 2.4m curved to a radius 20% greater than haunch radius	1 layer of A393 with 1 layer of fabric from 3mm dia bars on a 50x50mm grid - refer to detail 1.	11.5
Rock bolts	2.2m long 22mmØ	GRP rock bolts.	1.7
End plates	300x300x8 thick	Deformed end plate with 24mm Ø hole.	5.6
End plates	200x200x8 thick	Deformed end plate with 24mm Ø hole.	2.5
Z bracket	2No. 50x50x5 equal angles fillet welded 'heel to toe' 2200mm long	Angles fillet welded 'heel to toe' (see note 7)	17.2

DRAWING No. NR/CIV/SD/580

NOTES

1. All dimensions are in millimetres unless stated otherwise.
2. All levels are in metres unless stated otherwise.
3. S&T troughs, ballast & track to be protected during the works.
4. Works to be carried out in accordance with Network Rail Model Clauses for Civil Engineering Works.
5. All proprietary products are to be used in accordance with manufacturers instructions.
6. Areas where the inner ring of brickwork has missing bricks are to be timbered with 4" timbers, wedged against existing bricks.
7. Angles to be grade S275. 50x50x5 EA may have low availability. Larger angles may be used where clearances permit. Smaller sections should be used to reduce manual handling weights on site.
8. Mesh panel A size dependent on tunnel profile and extent of poor brickwork.
9. Rockbolts may be substituted for masonry fixings where the patches of loose/poor brickwork are sparse enough to provide fixings at the required density shown on the plan. Fixings are to be located in competent brickwork (not loose) and the lining is to be 5 rings or thicker.
10. Cell straps may be used to brace the mesh where a fixing location is not possible due to poor surrounding ground or brickwork. Maximum space between fixings to be 2m.
11. Rock bolt locations may be varied by up to 300mm within the mesh panel. Rock bolts and masonry fixings should go through closed squares of mesh. Proprietary deformed end plates to spread load by weldgrip or similar approved.
12. Mesh design life to be 5 years. Mesh to be fitted with a 'scaffolding tag' type label to indicate installation date and required removal date (max. 5 years)
13. For standard details of rockbolt testing see drawing number NR/CIV/SD/591.

Design Parameters

i) A gauge clearance survey shall be carried out prior to the works.
ii) No Rockbolts to be installed between 2.5m and 4.5m above rail level as this is a common tight point for gauge clearance. This may be contravened if clearances allow.
iii) Minimum 2no. rock bolts tested to a proof load of 10kN.
iv) Minimum 2no. masonry fixings tested to a proof load of 3kN.
v) Maximum design loading is 5 bricks between fixings

Rev	Date	Description of revision	Design'd	C'kd
A	JUL–10	FIRST ISSUE	NJ	PH

Network Rail Infrastructure Ltd, Registered office: Kings Place, 90 York Way, London N1 9AG

Approved	P. Clark	Senior Prog. Engineering Manager	PC	JUL–10
	Name	Position	Signature	Date

Master copy with original signatures held by Network Rail HQ CIVIL ENGINEERING STANDARD DESIGN

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STANDARD TUNNEL DETAILS

EMERGENCY TEMPORARY MESH REPAIR DETAIL IN TUNNELS WITHOUT OLE

Scale: AS SHOWN

Drawing Number: NR/CIV/SD/580 REV. A

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