Supplementary Information

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NR CIV/SD/113 Rev A

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- CIV/SD/113

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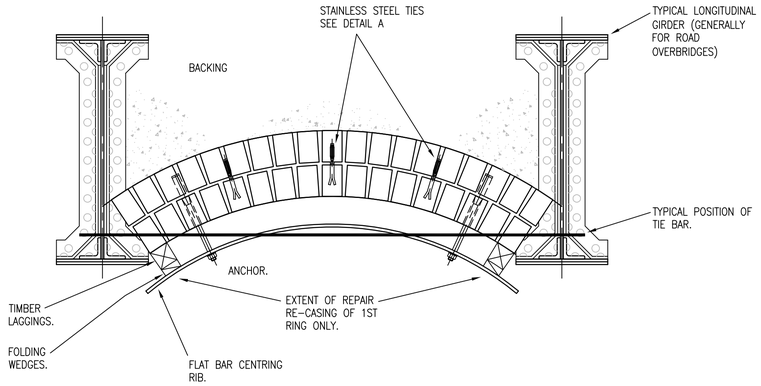
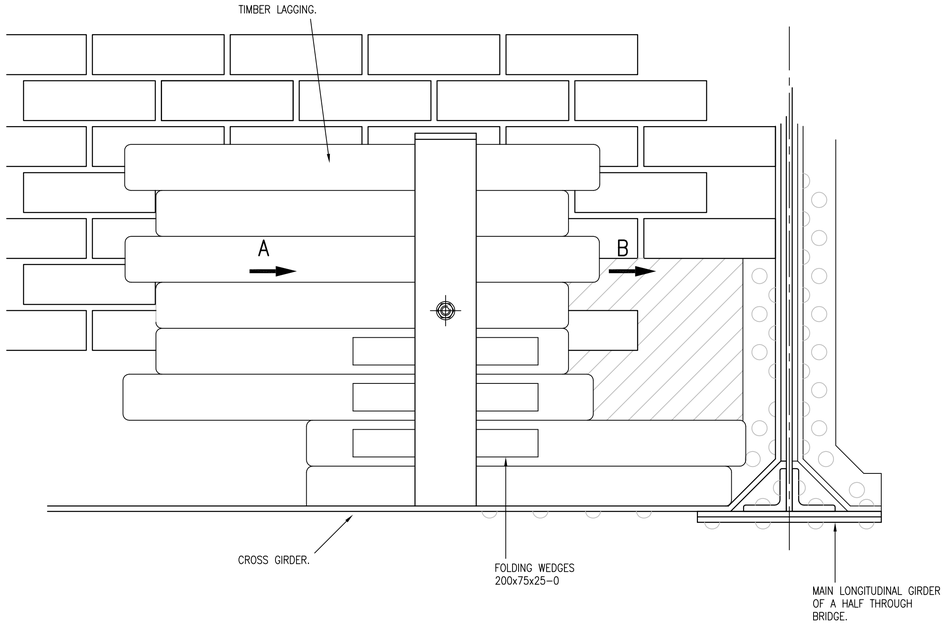
DO NOT SCALE THIS DRAWING

DRAWING No. NR/CIV/SD/113

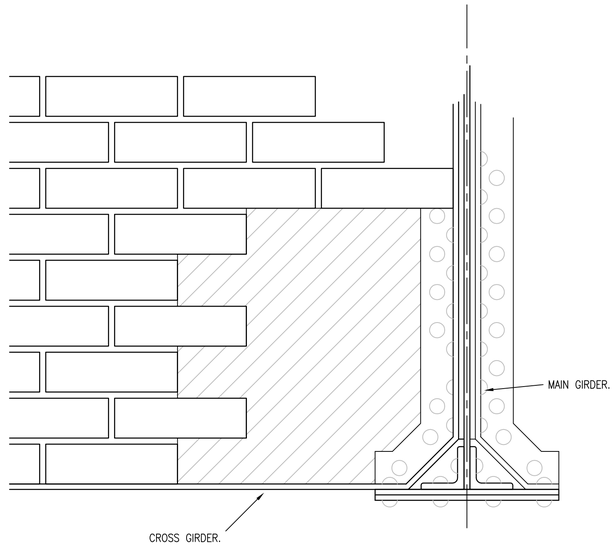


TYPICAL TEMPORARY WORKS ARRANGEMENTS FOR RE-CASING FIRST RING IN JACK ARCH

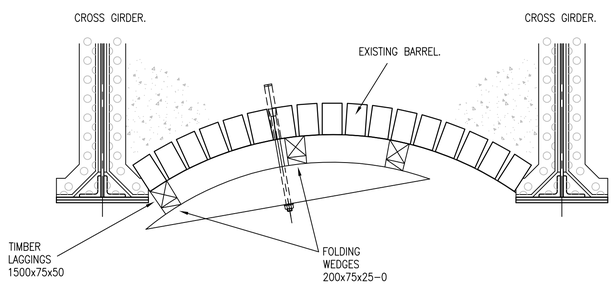
SCALE 1 : 10



TEMPORARY WORKS ARRANGEMENT FOR RECASING JACK ARCHES AFTER INSPECTION OF END GIRDER

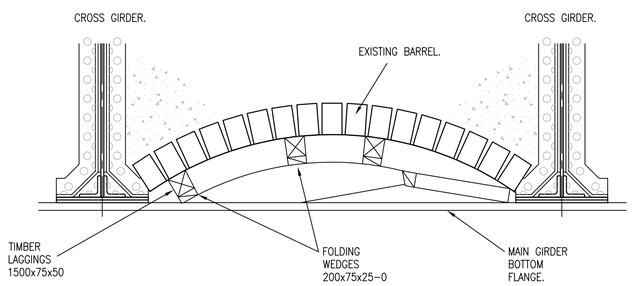


TYPICAL OPENING FOR INSPECTION OF MAIN GIRDERS/CROSS GIRDER INSPECTION



VIEW ON "A" DETAIL OF ANCHORED CENTRING

SCALE 1 : 10



VIEW ON "B" DETAIL OF PROPPED CENTRING

SCALE 1 : 10

NOTES

GENERAL

1. PRIOR TO ANY SUBSTANTIAL STRUCTURAL REPAIRS BEING CARRIED OUT A DESIGN FOR THE TEMPORARY WORKS MUST BE SUBMITTED TOGETHER WITH THE FORM 'C' IN ACCORDANCE WITH THE REQUIREMENTS OF THE NETWORK RAIL SPECIFICATION NR/SP/CIV/003 TECHNICAL APPROVAL OF DESIGN, CONSTRUCTION AND MAINTENANCE OF CIVIL ENGINEERING INFRASTRUCTURE AND MUST TAKE INTO ACCOUNT HEADROOM AND STRUCTURE CLEARANCES AND GAUGING, REF RAILWAY GROUP STANDARD GC/RT5212.

2. REPAIRS TO BRICK JACK ARCHES IS GENERALLY CARRIED OUT ONLY WHERE ENVIRONMENTAL ACTION HAS CAUSED THE SOFFIT TO SPALL, OR WHEN INSPECTION OF THE BRIDGE REQUIRES THE REMOVAL OF THE SURROUNDING MATERIAL. THIS IS DONE TO GIVE ACCESS TO INTERIOR STEEL ELEMENTS IN NEED OF INSPECTION.

3. JACK ARCHES RARELY EXCEED TWO RINGS BUT SOME MAY ONLY HAVE ONE. SINGLE RING ARCHES MAY PROVE DIFFICULT IF THE BACKING MATERIAL PROVES TO BE ANYTHING OTHER THAN CONCRETE. IF THIS IS THE CASE THEN THE REPAIR MUST BE PASSED TO A DESIGN OFFICE TO PROVIDE A TEMPORARY WORKS SOLUTION.

DESIGN ASSUMPTIONS

NONE.

RISK ASSESSMENT

REFER TO DRAWING NR/CIV/SD/101.

SPECIFICATION

a) WHEN REQUIRED FOR INSPECTION PURPOSES BRICKWORK MAY BE REMOVED LOCALLY AS NECESSARY. PROVIDED THE INSPECTION AREA CAN BE MAINTAINED RELATIVELY SMALL THEN SPOT REPLACEMENT OF THE BRICKS USING ONLY WEDGES FOR SUPPORT CAN BE UNDERTAKEN BUT ONLY UNDER THE CONTROL AND INSTRUCTION OF THE EMPLOYERS REPRESENTATIVE. SEE DRAWING NR/CIV/SD/111.

b) LARGER AREAS OF REPAIR MUST BE CARRIED OUT INCORPORATING TEMPORARY WORKS. THE PROFILE OF EACH ARCH MUST BE INDEPENDENTLY MEASURED TO PROVIDE A BESPOKE TEMPLATE FOR CENTRING. CENTRING IS USUALLY FLAT STEEL RIB FORMED TO MATCH THE PROFILE (SEE DRAWING NR/CIV/SD/112) BUT MAY ALSO BE HEWN FROM TIMBER WITH TIMBER LAGGINGS HELD IN PLACE WITH FOLDING WEDGES TO DEFINE THE ARCH PROFILE. FOR ARCHES WITH TWO RINGS, FIXING THE CENTRING TO THE ARCH SOFFIT CAN BE ACHIEVED BY ANCHORING INTO THE SECOND RING.

INSTALLATION GUIDANCE

a) BRICKWORK RE-CASING MUST NOT BE CARRIED OUT UNDER LIVE LOAD CONDITIONS. LIVE LOADING SHOULD ONLY COMMENCE AFTER A MINIMUM OF 10 HOURS HAS ELAPSED AFTER THE REPAIRS HAVE BEEN COMPLETED AND ONLY WITH THE TEMPORARY WORKS STILL IN PLACE.

b) POSITION & ERECT CENTRING (RIBS & LAGGING) TO THE PROFILE OF ARCH TO OFFER COVER AND SUPPORT TO THE AREA OF DEFECTIVE BRICKWORK BEING REMOVED. THIS WILL MINIMISE DISTURBANCE TO THE SURROUNDING BRICKWORK AND SERVE TO ESTABLISH THE PROFILE FOR RE-CASING.

c) WHERE AN INSPECTION HOLE HAS BEEN FORMED IN THE JACK ARCH TO INSPECT THE CROSS GIRDER/MAIN GIRDER CONNECTION, THE CENTRING IS USUALLY PROP SUPPORTED FROM THE INTERNAL BOTTOM FLANGE OF THE MAIN GIRDER AT THE EXPOSED END WHILST THE OTHER END HAS CONVENTIONAL MECHANICALLY ANCHORED CENTRING.

d) INITIALLY, CAREFULLY BREAK OUT DEFECTIVE BRICKWORK AND TOOTH THE SIDES OF THE OPENING ON FIRST ARCH RING ONLY. THIS MUST BE CARRIED OUT WITH THE MINIMUM OF DISTURBANCE TO ADJOINING BRICKWORK OR MASONRY. GENERALLY ONLY THE FIRST RING OF BRICK WILL NEED REPLACING.

e) WHERE NEW BRICKWORK IS TO BE KEYED TO EXISTING BRICKWORK, THE SURFACE OF THE EXISTING BRICKWORK SHALL BE WETTED TO CONTROL THE SUCTION RATE AS FAR AS REASONABLY PRACTICABLE.

f) BRICKWORK RE-CASING TO BE BUILT TO THE EXISTING ARCH PROFILE. ALL TIMBER LAGGINGS TO BE FIRMLY POSITIONED AND WEDGED INTO PLACE.

g) INSTALLING THE CENTRING LAGGINGS MAY PROVE DIFFICULT WHERE THE BRACING TIE BARS INTERSECT THE ARCH. THE LAGGINGS MUST BE CUT AND TAILORED TO ACCOMMODATE THE CONFLICT. WHEN CONSIDERING THE CUTS AND POSITION OF THE LAGGINGS CARE MUST BE TAKEN TO ENSURE ADEQUATE SUPPORT IS GIVEN TO THE REPAIR AREA. IF IT IS NOT POSSIBLE TO AFFECT A COMPLETE REPAIR DUE TO THE CONFLICTS THEN ANY OUTSTANDING BRICKWORK MUST BE INSTALLED LATER AS A SPOT REPAIR (SEE DRAWING NR/CIV/SD/111).

h) BRICKS MUST BE MEASURED FOR SIZE AND STRENGTH AS REPLACEMENTS SHOULD MATCH LIKE FOR LIKE AS CLOSE AS POSSIBLE. IN SMALL JACK ARCHES BRICKS MAY BE SPECIALLY FORMED VOUSSOIRS. AGAIN A MATCH SHOULD BE SOUGHT. LARGER BRICKS CAN BE MACHINE CUT TO THE DESIRED SHAPE AND SIZE TO MATCH. BRICKS MUST BE "BEDDED" ON MORTAR KEYED INTO THE BACKING AND BED COURSE. MORTAR JOINTS TO BE STRUCK FLUSH.

i) WHILE THE REPAIR PATCH IS STILL GREEN THE FIRST AND BOTTOM TIMBER LAGGING CAN BE TEMPORARILY REMOVED TO EXPOSE THE FACE OF RE-CASING. THIS CAN NOW BE BRUSHED CLEAN AND STRUCK. REPLACE THE FIRST LAGGING BEFORE THE SECOND IS REMOVED TO REPEAT THE PROCESS.

j) AFTER ONE WEEK CAREFULLY DISMANTLE WEDGES, LAGGINGS AND CENTRING AND MAKE GOOD ANY ATTACHMENT HOLES.

Rev	Date	Description of revision	Design'd	C'kd
A	22.06.06	FIRST ISSUE -NR APPROVED	RMA	NGAY
P3	17.03.06	REVISED FORM B.	RMA	NGAY
P2	31.01.06	FORM B ISSUE.	RMA	NGAY
P1	13.01.06	PRELIMINARY DRAFT	RMA	NGAY

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Authorised	K. TEAGER	Director of Civil Engineering	KT	08.06.06

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

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BRICK AND MASONRY REPAIR STANDARD DRAWINGS

RE-CASING JACK ARCHES

Scale	AS SHOWN	
Drawing Number	NR/CIV/SD/113	REV. A

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