Supplementary Information

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NR CIV/SD/107 Rev A

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CAD Drawing

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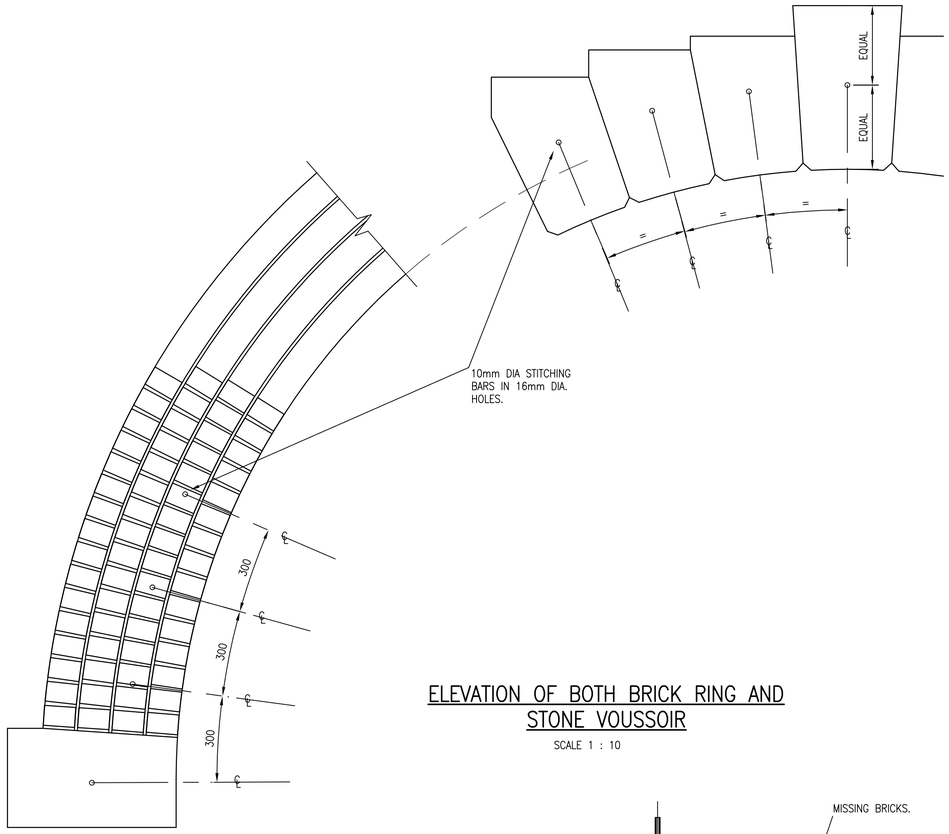
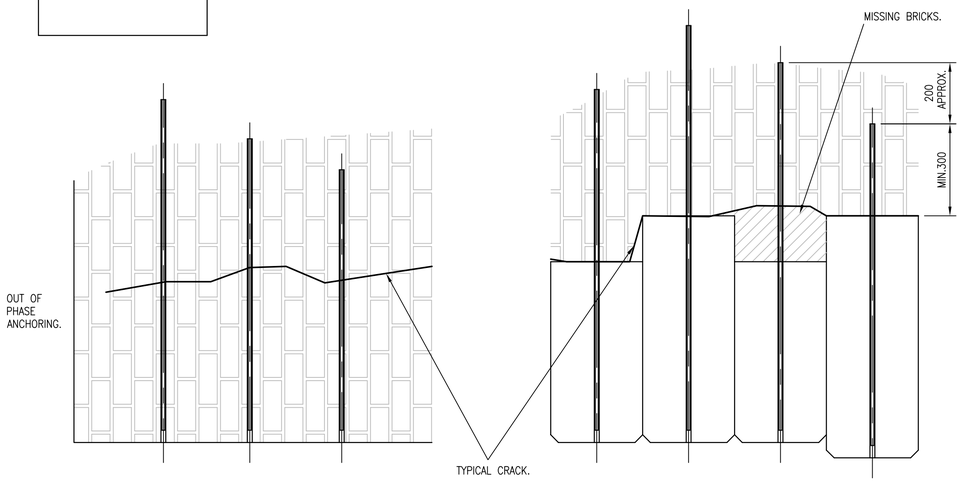
DRAWING No. NR/CIV/SD/107



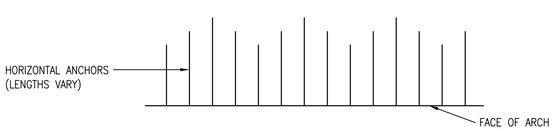
ELEVATION OF BOTH BRICK RING AND STONE VOUSSOIR

SCALE 1 : 10



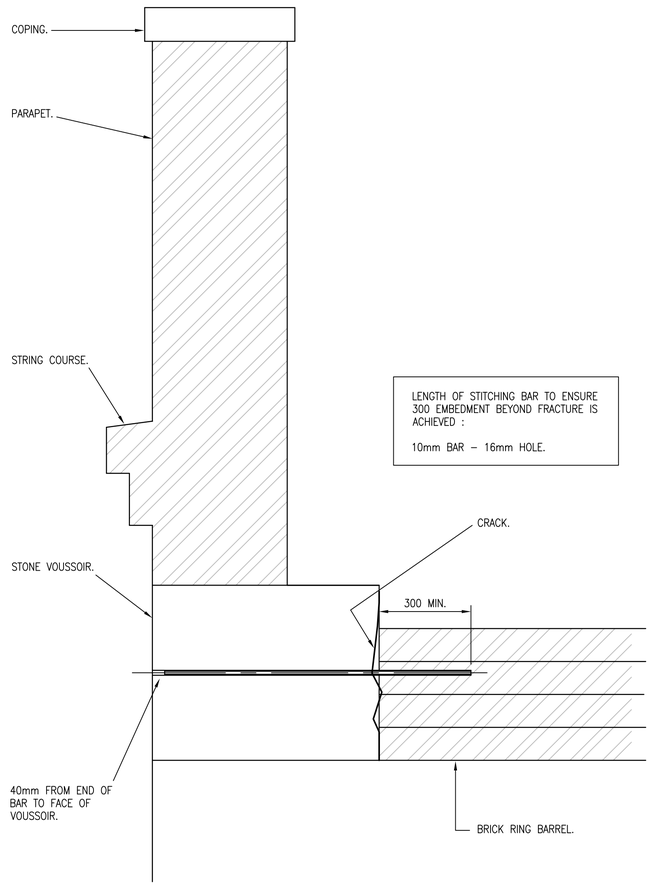
REFLECTED PLAN OF ARCH SHOWING OFFSET OUT OF PHASE STITCHING

SCALE 1 : 10



OUT OF PHASE STITCHING BAR ARRANGEMENT

SCALE 1 : 10



LENGTH OF STITCHING BAR TO ENSURE 300 EMBEDMENT BEYOND FRACTURE IS ACHIEVED :

10mm BAR – 16mm HOLE.

STITCHING SYSTEM FOR TYPICAL LONGITUDINAL CRACK BETWEEN VOUSSOIRS AND ARCH BARREL

SCALE 1 : 10

INSTALLATION GUIDANCE

a) DEPENDING ON THE POSITION OF LONGITUDINAL CRACKS, CERTAIN STRUCTURES MAY REQUIRE THE OPTION OF A NUMBER OF STITCHING BARS TO BE DRILLED COMPLETELY THROUGH THE STRUCTURE/DRILLED FROM EACH FACE AND OVERLAPPED IN A CRACK–FREE ZONE.

b) STITCHING BAR POSITIONS TO BE MARKED OUT AND DRILLED WITH ROTARY/ROCK DRILLING EQUIPMENT. STITCHING BARS OR ANCHORS SHALL BE INSTALLED HORIZONTALLY THROUGH THE VOUSSOIRS AND ARCH BARREL, PARALLEL TO THE SPRINGING. THE LEVEL OF THE BAR SHALL BE EQUIDISTANT FROM THE INTRADOS AND EXTRADOS OF THE ARCH BARREL. HOLE DIAMETER TO BE DRILLED WITH A TOLERANCE OF 0 TO + 5%.

c) HOLES SHALL, WHEREVER REASONABLY PRACTICABLE, BE FORMED THROUGH BRICKS OR MASONRY UNITS AS APPLICABLE AND NOT THROUGH JOINTS OR WHERE DAMAGE TO NEW BRICKWORK OR BONDING MAY OCCUR. HOLES TO BE FLUSHED CLEAR OF ALL DIRT AND DEBRIS, AND ANY SHARP PROTRUSIONS REMOVED.

d) GROUT TO BE INJECTED INTO THE ANCHOR HOLE AT A PRESSURE RECOMMENDED BY THE SUPPLIER/MANUFACTURER. THE GROUT SHALL HAVE A LOW HEAT OF HYDRATION AND LOW PLASTIC SHRINKAGE, WITH A HIGH RESISTANCE TO SULPHATE AND OR OTHER CHEMICAL ATTACK.

e) INSERT THE ANCHOR BARS INTO THE HOLES ENSURING THAT WHEN FULLY INSERTED, A CLEARANCE OF 40mm FROM THE FACE OF THE ARCH IS MAINTAINED.

f) REMOVE ANY SURPLUS GROUT FROM DRILLED HOLE AND FACE OF STRUCTURE. POINT UP ANY REMAINING HOLES WITH MORTAR TO MATCH THE EXISTING STRUCTURE. CRACK TO BE POINTED UP & GROUTED ON COMPLETION.

g) THE CONTRACTOR IS AT LIBERTY TO PROPOSE ALTERNATIVE METHODS AND/MATERIALS FOR CARRYING OUT THE WORKS, IN A SEPARATE PROJECT SPECIFIC FORM A/B SUBMISSION.

GENERAL

h) THE CONTRACTOR SHALL PROVIDE A METHOD STATEMENT WITH DETAILS OF THE CRACKS TO BE INJECTED, THE PROCEDURE FOR CLEANING OUT CRACKS, THE INJECTION PROCESS AND PROPOSED MATERIALS TO BE USED ENSURING NO DAMAGE OCCURS TO THE EXISTING STRUCTURE. CRACK INJECTION USING PROPRIETARY SYSTEMS SHALL BE IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS.
MORTAR OR SEALING COMPOUNDS USED TO SEAL THE FACE OF THE CRACK SHALL HAVE ACHIEVED SUFFICIENT STRENGTH BEFORE INJECTION COMMENCES.
THE CHOICE OF MORTAR, SEALING COMPOUND AND INJECTION MATERIAL SHALL TAKE INTO ACCOUNT THE CRACK WIDTH, DEPTH, PRESENCE OF WATER AND COMPATIBILITY WITH THE "PARENT" MATERIAL.

NOTES

GENERAL

1. CONTRACTOR TO DECIDE ON LENGTH OF STITCHING BAR HOLES, RELATIVE TO THE POSITION OF THE CRACK IN ACCORDANCE WITH DRAWING NR/CIV/SD/008.

2. LENGTH OF ADJACENT ANCHORS TO BE VARIED TO PREVENT A NEW LONGITUDINAL CRACK FORMING, BY PRODUCING AN ELONGATED 'S'–SHAPED 'OUT OF PHASE' OFFSET LINE ON PLAN AS SHOWN.

3. ALL TERMINOLOGY IS BASED ON THAT TYPICALLY USED TO DESCRIBE BRIDGE DEFECTS NOT TUNNEL DEFECTS.

SPECIFICATION

MINIMUM ANCHOR LENGTH BEYOND TYPICAL CRACK TO BE 300mm.

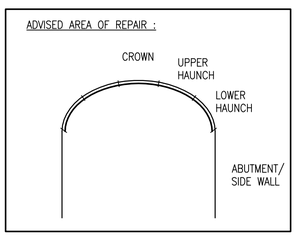
DESIGN ASSUMPTIONS

NONE.

RISK ASSESSMENT

REFER TO DRAWING NR/CIV/SD/101.

ADVISED AREA OF REPAIR :



AREA APPROPRIATE FOR DETAILED REPAIR IS SHOWN BY HEAVY LINE.

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

STITCHING OF LONGITUDINAL CRACKS IN ARCHES & TUNNEL LINING BETWEEN BRICK SPANDREL /VOUSSOIR & ARCH BARREL

Scale	AS SHOWN	
Drawing Number	NR/CIV/SD/107	REV. A

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