Supplementary Information

The following information is associated with Network Rail Standard:
NR CIV/SD/1450 Rev B

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CAD Drawing

- CIV/SD/1450

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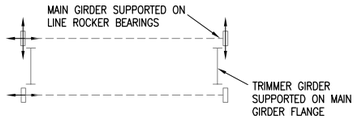
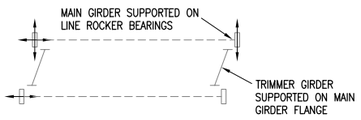
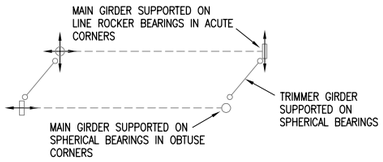
BEARING ARTICULATION REQUIREMENTS

BRIDGE SKEW (degrees)	SINGLE TRACK ARRANGEMENTS (NARROW DECK)
ZERO (square)	
0 TO 25	
25 TO 50	

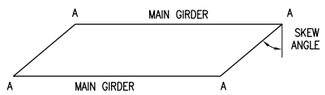
SPAN (m)	SKEW ANGLE (DEGREES)	HORIZONTAL LOADS (kN)				WIND LOADS (kN) (MAIN GIRDER SPECIFIC)	DISPLACEMENT (mm)		ROTATION (rad)
		LATERAL LOADS		LONGITUDINAL LOADS		LATERAL	LONGITUDINAL	TRANSVERSE	MAIN GIRDER SPECIFIC
		NOSING	CENTRIFUGAL	TRACTION / BRAKING	BEARING FRICTION / SEE NOTE	Pt / TOTAL	EXPANSION & CONTRACTION		
12	ALL	± 50	± 210	± 210 / ± 175	100	DESIGNER TO CALCULATE	± 6	± 1.7	<0.01
21	ALL	± 50	± 273	± 318 / ± 265	143	DESIGNER TO CALCULATE	± 10	± 1.7	<0.01
30	ALL	± 50	± 336	± 375 / ± 355	185	DESIGNER TO CALCULATE	± 14	± 1.7	<0.01

SPAN (m)	SKEW ANGLE (DEGREES)	VERTICAL LOADS (kN)												
		PERMANENT LOADS					RAILWAY LOADS				SECONDARY LIVE LOADS			
		MAIN GIRDER WEIGHT	FLOOR LOADS				RU LOADING				NOSING	CENTRIFUGAL	150mm TRACK OFFSET	TRACTION / BRAKING	PARAPETS AND WALKWAYS
		A	B	C	D	E	F	G	H	J					
											ALL SKEWS				
12	0 25 50	DESIGNER TO CALCULATE	237 205 128	237 262 233	– – 70	– – 100	560 508 298	560 643 551	– – 140	– – 210	± 20	± 195	± 33	± 16 ± 20	24
21	0 25 50	DESIGNER TO CALCULATE	393 366 246	393 428 429	– – 80	– – 100	815 709 459	815 792 789	– – 120	– – 190	± 20	± 253	± 50	± 14 ± 17	43
30	0 25 50	DESIGNER TO CALCULATE	554 525 350	554 596 638	– – 90	– – 100	986 888 582	986 967 1009	– – 130	– – 190	± 20	± 312	± 65	± 11 ± 16	62

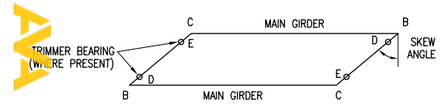
KEY TO TABLE

PERMANENT LOADS

LOADS DUE TO WEIGHT OF MAIN GIRDERS ONLY

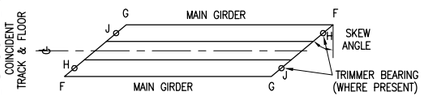


LOADS DUE TO WEIGHT OF FLOOR, BALLAST, TRACK & TRIMMER

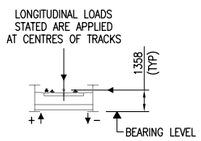


RAILWAY LOADS

RAILWAY (LIVE) LOADS DUE TO RU LOADING



NOSING LOADS

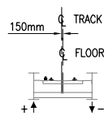


CENTRIFUGAL LOADS

NOTES

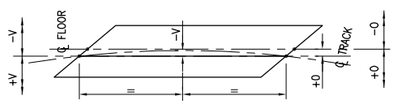
1. Fc = 0.2 P
2. HORIZONTAL LOADS SHOULD BE APPLIED THUS:
3. 3405 WIDE FLOOR ASSUMED FOR CENTRIFUGAL AND NOSING LOADS.

TRACK OFFSET



NOTES

1. FOR CURVED TRACK TAKE EFFECTIVE OFFSET AS BELOW.

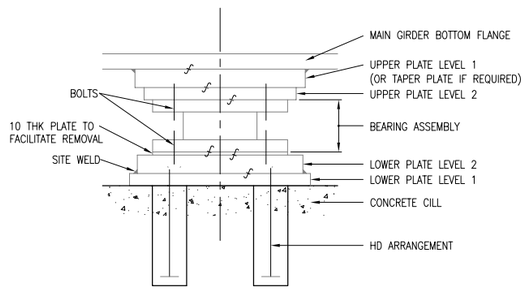


EFFECTIVE OFFSET $= 0_f + \left(\frac{2}{3}x - V\right)$

EXAMPLE: 27m SPAN. R=500m. BRIDGE CENTRAL TO MEAN POSITION OF TRACK.

$-V = \frac{SPAN^2}{8R} = \frac{27^2}{8 \times 500} = -0.182m. \quad \therefore \; 0_f = \frac{+0.182}{2} = +0.091m$

EFFECTIVE OFFSET $= +0.091m + \left(\frac{2}{3}x - 0.182\right) = -0.030m (30mm)$



REQUIRED BEARING PLATE ARRANGEMENT

DRAWING No. NR/CIV/SD/1450

NOTES

1. BEARING LOADS ARE INDICATIVE ONLY TO ASSIST THE DESIGNER IN DETERMINING BEARING SIZES. ACTUAL LOADS TO BE CALCULATED BY THE DESIGNER FOR THE SPECIFIC DECK ARRANGEMENT.
2. ALL LOADS SHOWN ARE UNFACTORED WORKING LOADS PER BEARING (ASSUMING ARTICULATION SHOWN).
3. FLOOR LOADS HAVE BEEN DERIVED ASSUMING 300mm BALLAST BELOW SLEEPER LEVEL.
4. FLOOR WIDTHS CONSIDERED: 3800mm
5. RAILWAY LOADS INCLUDE THE DYNAMIC FACTOR APPROPRIATE FOR SPAN UNDER CONSIDERATION.
6. RAILWAY LOAD: REACTIONS ARE MAXIMA ON EACH BEARING.
7. TRACTION/BRAKING FORCES: NO DISTRIBUTION ASSUMED TRANSMITTED OFF BRIDGE.
8. BEARING FRICTION NOT COINCIDENT WITH TRACTION/BRAKING.
9. TRIMMER BEARING LOADS ARE MAXIMA.
10. INSTALLATION TEMPERATURE ASSUMED 10°C. FREE BEARING COEFFICIENT OF FRICTION ASSUMED 0.06.
11. DISPLACEMENT VALUES ARE THEORETICAL AND DO NOT ACCOUNT FOR POSITIONING TOLERANCES.

Rev	Date	Description of revision	Design'd	C'kd
B	MAY 10	EUROCODE ISSUE	LZ	IP
A	22.12.09	FIRST ISSUE	LZ	IP
P1	00.02.09	INDEPENDENT CHECK	LZ	IP

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Approved	Name	Position	Signature	Date
	Paul Clark	Snr. Proj. Eng. Manager Infrastructure Investment Building and Civils	P.C.	MAY 10

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

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'D' TYPE UNDERBRIDGE STANDARD DRAWINGS

NOTES AND BEARING SCHEDULE FOR STANDARD FILLER BEAM FLOOR BEARINGS

Scale: AS SHOWN

Drawing Number: NR/CIV/SD/1450 B

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