Supplementary Information

The following information is associated with Network Rail Standard:
NR CIV/SD/1452 Rev B

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CAD Drawing

- CIV/SD/1452

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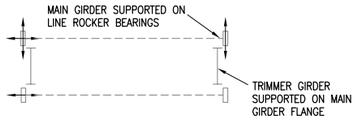
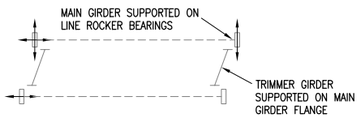
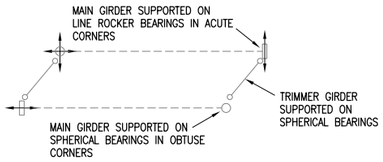
BEARING ARTICULATION REQUIREMENTS

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

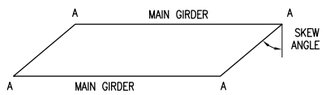
SPAN (m)	SKEW ANGLE (DEGREES)	HORIZONTAL LOADS (kN)				WIND LOADS (kN) MAIN GIRDER SPECIFIC	DISPLACEMENT (mm)		ROTATION (rad)
		LATERAL LOADS		LONGITUDINAL LOADS		LATERAL	LONGITUDINAL	TRANSVERSE	MAIN GIRDER SPECIFIC
		NOSING	CENTRIFUGAL	TRACTION / BRAKING	BEARING FRICTION / SEE NOTE	Pt / TOTAL	EXPANSION & CONTRACTION		
12	ALL	± 50	± 211	± 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 (FOR 1 TRACK)	150mm TRACK OFFSET (FOR 1 TRACK)	TRACTION BRAKING	PARAPETS AND WALKWAYS
		A	B	C	D	E	F	G	H	J	NARROW FLOOR	NARROW FLOOR	NARROW FLOOR		
12	0 25 50	DESIGNER TO CALCULATE	140 145 93	140 159 124	– – 30	– – 35	560 505 297	560 658 544	– – 155	– – 206	ALL SKEWS ± 21	± 201	± 33	± 16 ± 20	24
21	0 25 50	DESIGNER TO CALCULATE	240 247 189	240 271 228	– – 30	– – 35	813 696 475	813 801 769	– – 127	– – 192	± 21	± 260	± 50	± 14 ± 17	43
30	0 25 50	DESIGNER TO CALCULATE	340 349 287	340 384 330	– – 30	– – 35	985 853 613	985 999 971	– – 140	– – 188	± 21	± 321	± 65	± 11 ± 16	62

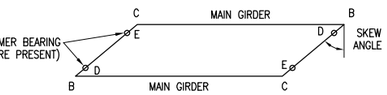
KEY TO TABLE

PERMANENT LOADS

LOADS DUE TO WEIGHT OF MAIN GIRDERS ONLY

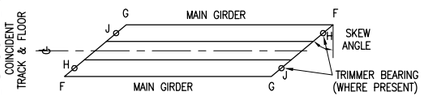


LOADS DUE TO WEIGHT OF FLOOR, BALLAST, TRACK & TRIMMER

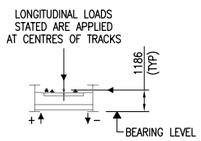


RAILWAY LOADS

RAILWAY (LIVE) LOADS DUE TO RU LOADING



NOSING LOADS

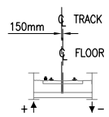


CENTRIFUGAL LOADS

NOTES

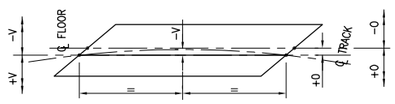
1. Fc = 0.2 P
2. HORIZONTAL LOADS SHOULD BE APPLIED THUS:
3. 3405 WIDE FLOOR ASSUMED FOR CENTRIFUGAL AND NOSING LOADS.

TRACK OFFSET



NOTES

1. FOR CURVED TRACK TAKE EFFECTIVE OFFSET AS BELOW.

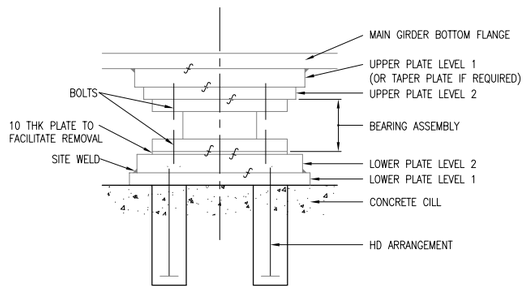


EFFECTIVE OFFSET $= 0_f + \left(\frac{2}{3}x - V\right)$

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/1452

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	DG	IP
A	22.12.09	FIRST ISSUE	DG	IP
P1	00.02.09	INDEPENDENT CHECK	DG	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 STEEL FLOOR BEARINGS

Scale	AS SHOWN	
Drawing Number	NR/CIV/SD/1452	B

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