Supplementary Information

The following information is associated with Network Rail Standard:
NR CIV/SD/2500 Rev A

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CAD Drawing

- CIV/SD/2500

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USE OF DRAWINGS

1 THE STANDARD DRAWING SERIES AVAILABLE TO THE DESIGNER ARE:

NR-CIV-SD-2500	GENERAL NOTES
NR-CIV-SD-2501	CROSS GIRDER LAYOUT FOR RANGE OF SPANS
NR-CIV-SD-2502	URBAN OPTION CROSS SECTIONS
NR-CIV-SD-2503	RURAL ALL PURPOSE OPTION CROSS SECTIONS
NR-CIV-SD-2504	ACCOMMODATION OPTION CROSS SECTIONS
NR-CIV-SD-2505	CROSS GIRDER SPLICE DETAILS
NR-CIV-SD-2506	END TRIMMER DETAILS
NR-CIV-SD-2507	TRIMMER SPLICE DETAILS
NR-CIV-SD-2508	SHEAR STUD LAYOUT SHEET 1 OF 2
NR-CIV-SD-2509	SHEAR STUD LAYOUT SHEET 2 OF 2
NR-CIV-SD-2510	ALTERNATIVE LONGITUDINAL DECK JOINT
NR-CIV-SD-2511	URBAN OPTION – PLANS ELEVATIONS AND SECTIONS (TYPICAL EXAMPLE)
NR-CIV-SD-2512	ERECTION SCHEME LAYOUT FOR RURAL ALL PURPOSE AND URBAN OPTIONS
NR-CIV-SD-2513	ERECTION SCHEME LAYOUT FOR ACCOMMODATION OPTION
NR-CIV-SD-2514	BEARING SCHEDULE
NR-CIV-SD-2515	TYPICAL DECK REINFORCEMENT DETAILS
NR-CIV-SD-2516	REINFORCED EARTH ABUTMENT AND CILL DETAILS
NR-CIV-SD-2517	REINFORCED CONCRETE PAD FOUNDATIONS
NR-CIV-SD-2518	VERTICAL ALIGNMENT AND SUPER ELEVATION DETAILS
NR-CIV-SD-2519	DRAINAGE DETAILS AND SERVICE DUCT LOCATIONS

2 REFER TO TECHNICAL USER MANUAL NR/CIV/TUM/2500 FOR COMMENTARY ON THE DESIGN PARAMETERS.

3 THE STANDARD DRAWINGS, TOGETHER WITH DRAWINGS OF THE PARTICULAR PROJECT SHALL BE REFERRED TO BY THE CONTRACTOR WHEN PREPARING HIS WORKING DRAWINGS.

4 THESE DRAWINGS DO NOT REPLACE THE NEED FOR THE CONTRACTOR TO PREPARE WORKING DRAWINGS OR WRITTEN WELD PROCEDURES.

5 ALL DIMENSIONS ARE STATED IN MILLIMETRES UNLESS OTHERWISE NOTED

6 DRAWINGS ARE FOR A PARTICULAR SKEW AS INDICATED. ARRANGEMENT OF DETAILS TO BE DETERMINED FOR THE PARTICULAR SPAN SKEW.

MATERIALS AND WORKMANSHIP

7 STEELWORK SHALL COMPLY WITH BSEN 1090-2 AS AMENDED BY THE NETWORK RAIL SPECIFICATION NR/L3/CIV/140/090.

8 ALL STEEL SHALL BE TO BS EN10025-2:2004 AND BS EN10025-3:2004 UNLESS OTHERWISE STATED. STEEL GRADES ARE AS SHOWN ON THE DRAWINGS. FLAME CUT EDGES SHALL BE QUALITY 1 AS DESCRIBED IN BSEN ISO 9013:1995 AND SHALL BE GROUND TO REMOVE ALL VISIBLE SIGNS OF DRAG LINES.

9 ALL WELDS SHALL BE CONTINUOUS ON BOTH SIDES OF ALL JOINTS UNLESS OTHERWISE STATED. WELD SIZES SHALL BE AS SHOWN ON THE DRAWINGS, BUT WHERE NOT STATED SHALL BE MINIMUM 8mm LEG FILLET WELDS.

10 ADDITIONAL WELDS TO MAKE UP SPECIFIED SIZES OR LENGTHS MAY ONLY BE USED WHERE ACCEPTED IN WRITING BY THE ENGINEER UNDER THE CONTRACT. WHERE BUTT WELDS ARE PERMITTED THEY SHALL BE FULL PENETRATION BUTT WELDS WITH QUALITY AT LEAST CLASS "E".

11 HR BOLTS SHALL BE TO BSEN 14399 AND SHALL BE TIGHTENED USING ONE OF THE METHODS GIVEN IN THE SPECIFICATION. GRADE S10T TENSION CONTROLLED BOLTS MAY BE USED AS AN ALTERNATIVE TO HR BOLTS.

12 CONFORMANCE IS REQUIRED TO THE LIMITS ON DISCONTINUITIES, LAMELLAR TEARS AND LAMINATIONS REQUIRED BY THE CONTRACT. PD 6695-1-10 CLAUSE 3 PROVIDES GUIDANCE ON PREVENTION OF LAMELLAR TEARING IN WELDED STRUCTURAL STEELWORK COMPRISING A LIST OF FABRICATION CONTROL MEASURES, WHICH INCLUDES PROCUREMENT OF MATERIAL WITH IMPROVED THROUGH THICKNESS PROPERTIES. THE FABRICATOR MAY, AT HIS OPTION, CHOOSE TO PROCURE MATERIAL WITH IMPROVED THROUGH THICKNESS PROPERTIES BY INVOKING BS EN 10164 AS A SUPPLEMENT TO THE PRODUCT STANDARD.

13 WELD SYMBOLS ARE GENERALLY IN ACCORDANCE WITH BS EN22553. FILLET WELD SIZE GIVEN IS LEG LENGTH, E.G. – z6

14 BUTT WELDS ARE FULL PENETRATION OF THE THICKNESS JOINED, UNLESS MINIMUM DEPTH OF PENETRATION IS STATED, E.G. – s4

15 WEB TO FLANGE WELDS GREATER THAN z8 MAY BE FORMED USING A SUBMERGED ARC WELD PROCEDURE PROVIDED THAT THE THROAT EQUIVALENT DESCRIBED BELOW IS ACHIEVED:–

$$\text{THROAT EQIVALENT} = \frac{\text{LEG LENGTH (z)}}{\sqrt{2}}$$

THE FABRICATOR'S RECORDING PROCEDURES SHOULD IDENTIFY WHERE DEEP PENETRATION FILLET WELDS HAVE BEEN USED.

16 CONCRETE SHALL COMPLY WITH BS8500 AS AMENDED BY NR SPECIFICATION NR/L3/CIV/140/080

17 SCHEME SPECIFIC TECHNICAL SPECIFICATION TO BE PREPARED BY THE SCHEME DESIGNER IN ACCORDANCE WITH NR/L3/CIV/140

BRIDGE INSTALLATION LEVELS

18 BEARINGS ARE TO BE INSTALLED AT LEVELS SUCH THAT A CONSTANT LEVEL DIFFERENCE BETWEEN EACH GIRDER IS MAINTAINED THROUGHOUT THE SPAN UNDER SELF-WEIGHT. THE LEVEL DIFFERENCE BETWEEN THE DECK ENDS SHOULD NORMALLY REFLECT THE ROAD GRADIENT, SUBJECT TO A MINIMUM FALL FOR DRAINAGE PURPOSES. THE DESIGNER SHOULD REFER TO THE USERS MANUAL FOR COMMENTARY.

TRIAL ERECTION REQUIREMENTS

19 REFER TO DRAWINGS NR/CIV/SD/2512 & NR/CIV/SD/2513 FOR TRIAL ERECTION REQUIREMENTS

PERMANENT INSTALLATION REQUIREMENTS

20 REFER TO DRAWINGS NR/CIV/SD/2512 & NR/CIV/SD/2513 FOR PERMANENT INSTALLATION REQUIREMENTS

NON SITE-SPECIFIC RISKS FOR DESIGN, CONSTRUCTION & OPERATION.

21 ALL MAIN UNITS, AND OTHER INDIVIDUAL ITEMS REQUIRING LIFTING OR MOVING, SHALL BE CLEARLY MARKED WITH THEIR WEIGHT. THE MARKING SHALL BE CLEARLY VISIBLE IN POOR LIGHT.

22 ALL PROCESSES (INCLUDING, BUT NOT LIMITED TO WELDING, PAINTING AND WATERPROOFING) SHALL BE CARRIED OUT IN A SAFE MANNER. ALL SUBSTANCES SHALL BE USED IN ACCORDANCE WITH THE COSHH REGULATIONS.

23 REFER TO THE TABLE FOR FURTHER SAFETY, HEALTH AND ENVIRONMENT RISK ASSESSMENT.

DATUM TEMPERATURE.

24 THE DIMENSIONS SHOWN ON THE DRAWINGS ARE VALID FOR A TEMPERATURE OF +16°C. BEARINGS ARE TO FIXED AT TEMPERATURES IN THE RANGE +5°C TO +18°C.

PROTECTIVE TREATMENT.

25 ALL NEW STEELWORK SHALL HAVE SURFACE PROTECTION APPLIED IN ACCORDANCE WITH NR/L3/CIV/039, NR/L3/CIV/040 AND NR/GN/CIV/002 . PREFERRED SYSTEM N1 BUT ACTUAL SYSTEM TO BE AGREED ON SCHEME SPECIFIC BASIS.

TOLERANCES.

26 FABRICATION TOLERANCES TO BE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATION. THE FABRICATED SHAPE OF THE STEELWORK IS TO BE DETERMINED BY THE STEELWORK FABRICATOR TAKING ACCOUNT OF FABRICATION EFFECTS AS WELL AS THE SUM OF THE FINAL DECK PROFILE, THE DEAD LOAD PRE-CAMBER AND THE RESIDUAL CAMBER, (IF ANY), AS DEFINED BY THE DRAWINGS.

SAFETY, HEALTH & ENVIRONMENT RISK ASSESSMENT

RISK	STAGE	MITIGATING MEASURES
NOISE ASSOCIATED WITH BOLTED CONNECTIONS TO THE GIRDERS	C	USE OF CLAMP CONNECTIONS SUCH AS TENSION CONTROLLED BOLTS SHOULD REDUCE THE NOISE ASSOCIATED WITH FORMING FRICTION TYPE CONNECTIONS.
INJURY LIFTING BRIDGE COMPONENTS	D*	SCHEME AND WORKING DRAWINGS TO INCLUDE COMPONENT CENTROIDS AND WEIGHTS
INJURY, DIRECTLY OR INDIRECTLY, DUE TO SITE WELDING.	C	COMPONENTS TO BE SHOP WELDED AND ONLY CONNECTIONS USING BOLTS ARE PERMITTED AT SITE.
INJURY DUE TO UNSUITABLE CONDITIONS FOR INSPECTION AND RELACEMENT OF BEARINGS.	D	SUFFICIENT SPACE MUST BE LEFT IN FRONT OF THE ABUTMENTS AND AROUND THE BEARINGS FOR ACCESS TO INSPECT, MAINTAIN AND REPLACE THE BEARINGS.
INJURY DUE TO UNSUITABLE CONDITIONS FOR INSPECTION AND RELACEMENT OF BEARINGS.	D	STANDARD DESIGNS PROVIDE DETAILS TO FACILITATE THE INSPECTION OF THE BEARINGS, AND DEFINED JACKING POINTS TO BOX GIRDERS PROVIDED.
DISEASE FROM VERMIN EXCREMENT	D/O	WHERE CONSIDERED TO BE A RISK, ANIMALS (INCLUDING PIGEONS AND OTHER ROOSTING BIRDS) ARE TO BE DISCOURAGED FROM ROOSTING ON THE STRUCTURE BY USE OF DETERRENTS SUCH AS PLASTIC ANTI-PERCH SPIKES.
COLLAPSE OF STRUCTURE DUE TO TRAIN STRIKING THE BRIDGE	D*	SELECTION OF DECK GEOMETRY TO ENSURE GAUGE AND ALLOWANCE FOR FUTURE TRACK RE-ALIGNMENT. SUBSTRUCTURES TO BE LOCATED 4.5 METRES FROM CLOSEST RAIL.
TEMPORARY INSTABILITY DURING ERECTION	D*	ERECTION FRAMES INCLUDED IN SDD TO FACILITATE PIECEMEAL ERECTION OF STEELWORK

NOTE: D = DESIGN, D* = SCHEME DESIGN, C = CONSTRUCTION, O = OPERATION

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A	Aug '10	1st Issue	SB	AM

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

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OVERBRIDGE

GENERAL NOTES

FOR FORM B APPROVAL

Scale

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