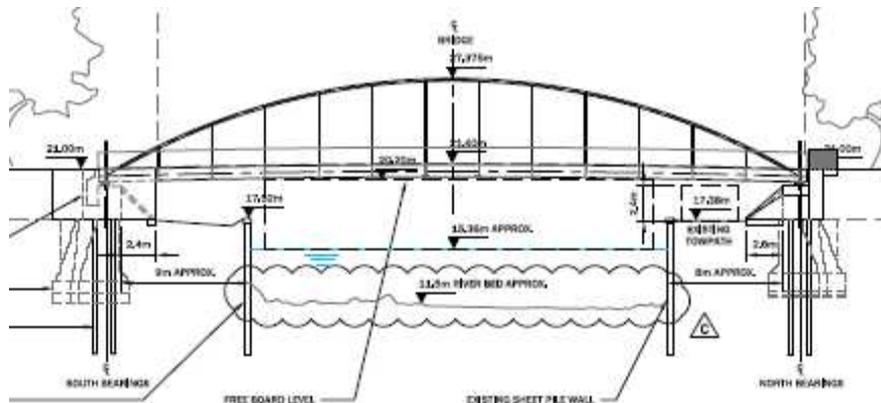
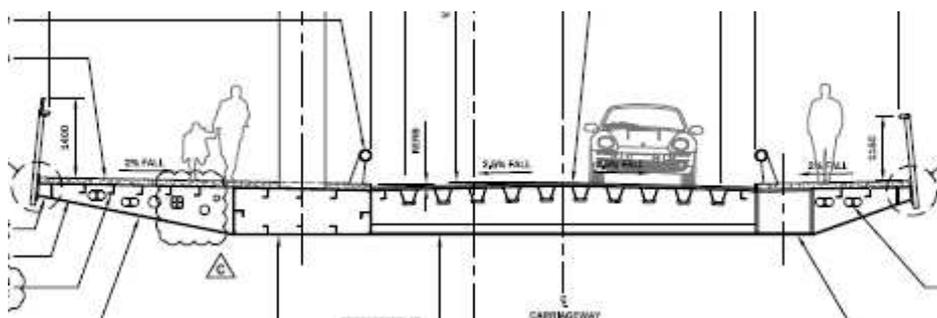


1) Scope and brief description of the project

The new Destructor Bridge is a road single 48m long span steel bridge over the River Avon in Bath (UK) with cycle and footway on one side and pedestrian way on the other.



Cross section is 14.8m wide asymmetrical comprising two main longitudinal box girders, two edge box section and a steel arch over the main west box. Road deck is Orthotropic with crossbeams supported on the main boxes at 3.7m c/c while footways/cycleway are supported by cantilever beams at 1.85m c/c out of the main boxes.



Main contractor is Britannia Construction Ltd, Designer Flint & Neill. Cordioli is a prospective sub-contractor for the supply, assembly and erection of the structural steelwork.

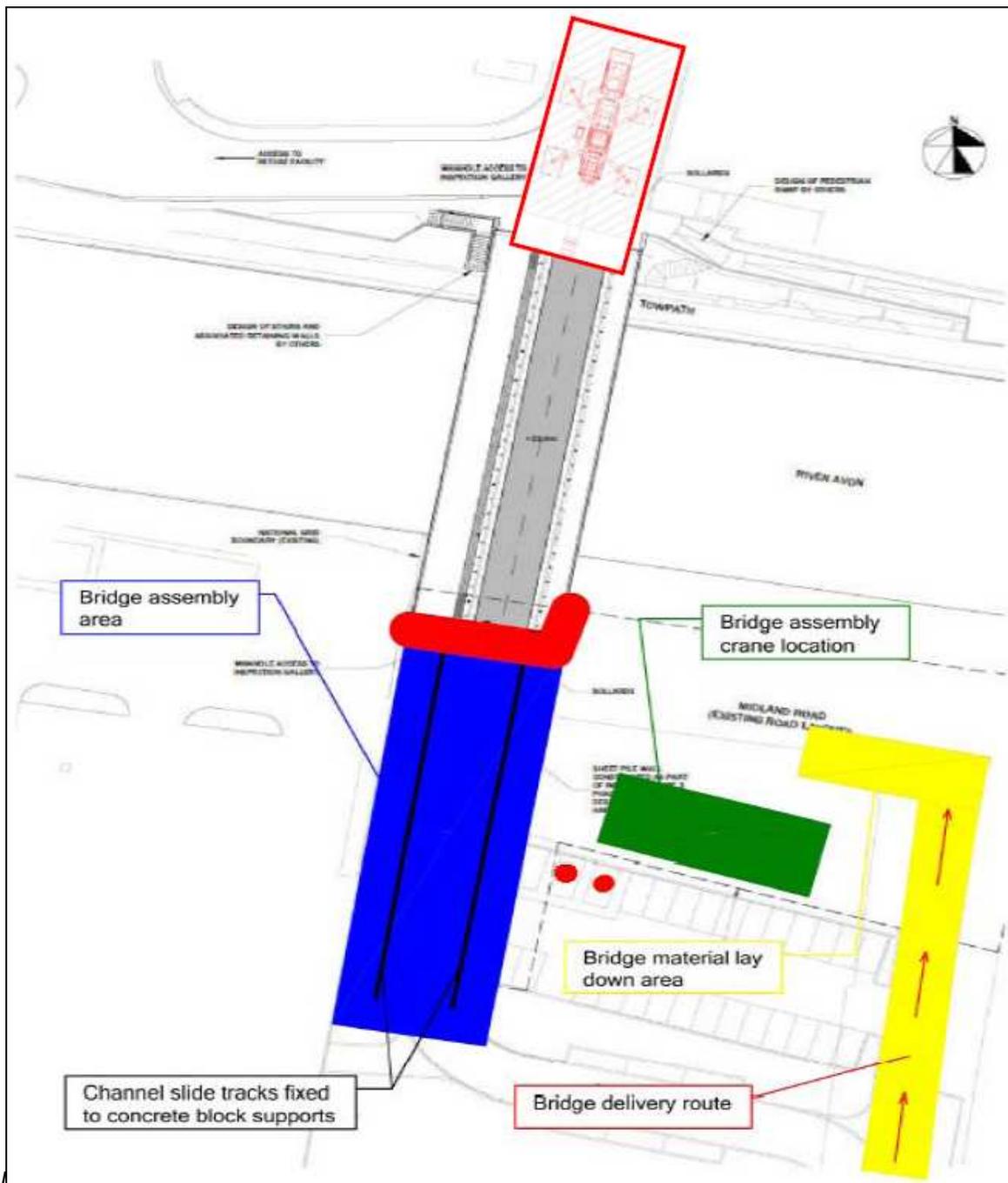
This document is based on the tender status drawings:

1428-001_C; 1428-002_C; 1428-003_C; 1428-004_C; 1428-011_C; 1428-022_C; 1428-101_C; 1428-103_C; 1428-104_B; 1428-105_C; 1428-107_B; 1428-108_B; 1428-109_B; 1428-110_A; 1428-111_A; 1428-120_A; 1428-121_B; 1428-202_C; 1428-211_C; 1428-212_C; 1428-221_C; 1428-222_C; 1439.001.DD.ST.SK-01 ; 1439.001.DD.ST.SK-02 ;

Scope of the document is to describe the methods envisaged by Cordioli for the assembly and erection of the bridge.

2) Site areas

It is assumed the availability of the south bank area as per Britannia document "Assembly Area.pptx" and the possibility to place a 500ton capacity crane on the north bank for the final stages of the bridge erection.



The assembly area has to be prepared with two lines of concrete blocks at approx 10m c/c to support the main box girders (approx. 14m x 1.5m high blocks required). Blocks might need a superficial foundation (approx 30ton reaction under each block) depending on ground bearing capacity. Site assembly area is assumed to be hard-standing (bearing capacity approx. 250KN/sqm) to allow use of forklift, access aerial platforms and SPMT (self propelled modular transporters).

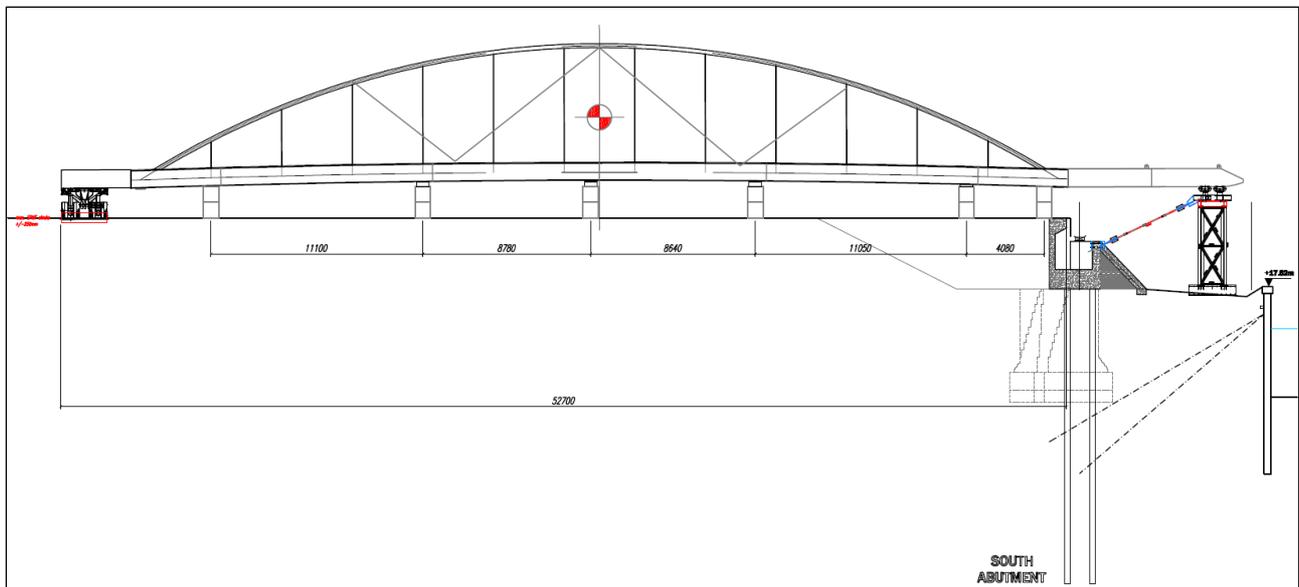
3) Bridge assembly

Steelwork components are to be delivered to the site on standard lorries and stored in the “material lay down area”.

For material off loading It is envisaged the use of a single 80 ton capacity mobile crane mainly standing on the assembly crane location shown in the figure above. The same crane is to be used in the assembly area moving backwards (south to north) during the various activities.

Assembly activities will follow the sequence:

- Lay down on levelled concrete blocks main box girder segments. Check geometry and weld transversal splices.
- Lift in the deck crossbeams supported on the box girders by means of temporary steel brackets welded to the underside of the boxes, check alignment and weld.
- Place Orthotropic deck panels on crossbeam and weld.
- Erect arc segments from one end to the other using temporary stabilized hanger plates as props.
- Lift in lateral cantilever beams fixed with temporary brackets
- Place footpath deck plates and weld
- Installation of parapets
- Paint touch-up operations



Bridge in the assembly area ready for launching

4) Bridge launching

The envisaged method of erection of the bridge is by incremental launching from the south bank, using 2n° x 2file SPMT, skid/rollers on temporary piers installed on the south bank and a 500 ton capacity crane placed on the north bank for the final launching phases and the lowering of the bridge on permanent bearings.

There is no hauling system, the SPMT will provide the movement of the bridge against skates friction (estimated max 250KN horizontal pushing force). South bank piers will be connected with ties to the south abutment to withstand friction horizontal reaction. Should it be required adequate ballast might have to be placed on the SPMT in the final launching phases when they are less loaded.

Launching sequence, arrangement and preliminary evaluation of reaction loads on temporary supports are shown in the drawings attached to this procedure.

Launching the bridge from the south bank will require the following preparatory work:

- Installation of 2n° temporary piers on the South bank, approximate vertical reaction under the most loaded pier (east side) is 1500 KN. Each pier will be centred under one of the two webs of the respective box girders;
- Installation of 2n° launching skids/rollers on south temporary piers;
- Erection of front launching nose (approx 9m long) on the river side of the assembled bridge. Nose beams are to be fixed with a temporary bolted connection to the main box girders.
- Erection of rear tail beams designed for SPMT transport connected with temporary bolted slices to main box girders;
- Installation of arch to main box temporary vertical bracing might be required depending on result of structural check;
- Installation of 2n° temporary piers on North bank side.

Foundation for the 4n° temporary piers will be required.

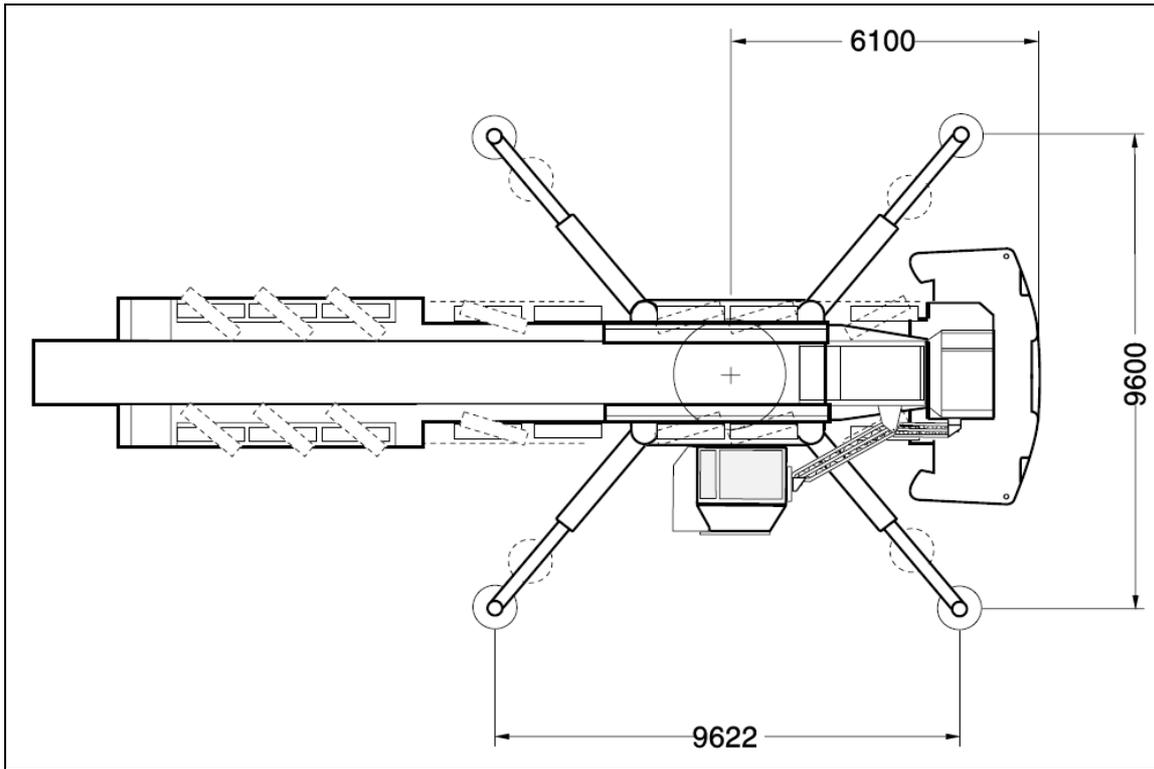
5) Bridge lowering on bearing

Launching level will be approximately 2.4m higher of the final hence once the bridge arrives at the final position in plan it is necessary to lower it down on the bearings. This will be achieved using the 180ton capacity crane on the north abutment side. On the south side the first part of the lowering is achieved using the SPMT, then the bridge load is transferred to hydraulic jacks and the lowering is completed.

6) Plant and equipment information

To follow main technical data of the envisaged plant and equipment to be utilised for the assembly and erection activities:

- Mobile crane on north bank : 1n° mobile 500ton capacity



HA LIFTING CAPACITIES · TRAGFÄHIGKEITEN · CAPACITÉS DE LEVAGE · PORTATE · CAPACIDADES DE CARGA

160 t		360°													DIN/ISO	
Radius · Ausladung		Main boom · Hauptausleger · Flèche principale · Braccio base · Pluma principal													Radius · Ausladung	
Portée															Portée	
Sbraccio															Sbraccio	
Radio	m	14,7 ¹⁾	14,7	19,3 ¹⁾	19,3	24,0 ¹⁾	24,0	28,6	33,2	37,9	42,5	47,2	51,8	56,0	Radio	m
3	500,0*	257,0	-	-	-	-	-	-	-	-	-	-	-	-	3	3
3,5	381,0*	257,0	257,0	257,0	-	-	-	-	-	-	-	-	-	-	3,5	3,5
4	346,0*	257,0	257,0	257,0	245,0	245,0	-	-	-	-	-	-	-	-	4	4
4,5	317,0*	257,0	257,0	257,0	245,0	245,0	-	-	-	-	-	-	-	-	4,5	4,5
5	293,0*	253,0	257,0	252,0	245,0	245,0	210,0	-	-	-	-	-	-	-	5	5
6	257,0	224,0	249,0	224,0	233,0	224,0	196,0	166,0	-	-	-	-	-	-	6	6
7	231,0	201,0	221,0	201,0	211,0	201,0	184,0	156,0	142,0	-	-	-	-	-	7	7
8	207,0	182,0	198,0	182,0	191,0	182,0	171,0	146,0	134,0	117,0	-	-	-	-	8	8
9	184,0	166,0	180,0	166,0	174,0	166,0	160,0	138,0	125,0	110,0	95,3	82,9	-	-	9	9
10	165,0	153,0	165,0	153,0	159,0	152,0	149,0	130,0	118,0	104,0	89,9	78,6	66,8	-	10	10
12	137,0	131,0	136,0	131,0	134,0	130,0	129,0	115,0	103,0	93,5	80,4	71,0	61,2	-	12	12
14	-	-	115,0	112,0	115,0	111,0	111,0	102,0	91,1	84,1	72,5	64,4	56,0	-	14	14
16	-	-	99,5	97,2	99,7	95,9	96,8	90,5	80,9	75,8	65,9	58,7	51,2	-	16	16
18	-	-	75,9	77,5	87,3	83,9	84,8	80,5	72,8	68,5	60,2	53,7	46,9	-	18	18
20	-	-	-	-	77,4	74,2	75,1	72,5	66,1	62,1	55,1	49,4	43,1	-	20	20
22	-	-	-	-	64,3	64,4	67,1	66,2	60,2	56,5	50,7	45,5	39,7	-	22	22
24	-	-	-	-	-	-	59,9	61,0	55,0	51,6	46,7	42,1	36,7	-	24	24
26	-	-	-	-	-	-	53,3	54,6	50,3	47,3	43,2	39,1	34,1	-	26	26
28	-	-	-	-	-	-	-	49,1	46,2	43,6	40,2	36,4	31,8	-	28	28
30	-	-	-	-	-	-	-	44,4	42,5	40,4	37,6	34,0	29,8	-	30	30
32	-	-	-	-	-	-	-	-	39,4	37,8	35,4	32,0	28,1	-	32	32
34	-	-	-	-	-	-	-	-	36,0	35,2	33,3	30,0	26,3	-	34	34
36	-	-	-	-	-	-	-	-	-	32,9	31,6	28,5	24,8	-	36	36
38	-	-	-	-	-	-	-	-	-	30,3	29,8	26,9	23,3	-	38	38
40	-	-	-	-	-	-	-	-	-	28,0	28,2	25,6	22,1	-	40	40
42	-	-	-	-	-	-	-	-	-	-	26,3	24,3	20,8	-	42	42
44	-	-	-	-	-	-	-	-	-	-	24,5	23,1	19,8	-	44	44
46	-	-	-	-	-	-	-	-	-	-	-	22,0	18,7	-	46	46
48	-	-	-	-	-	-	-	-	-	-	-	20,9	17,8	-	48	48
50	-	-	-	-	-	-	-	-	-	-	-	-	17,0	-	50	50
52	-	-	-	-	-	-	-	-	-	-	-	-	16,2	-	52	52

- SPMT units : 2n° 4 axle x 2 file units (total capacity 280ton)

EQUIPMENT DATA SHEET - SPMT

The development of self propelled modular transporters (SPMT's) is a major advance in the technology of moving very large loads.

This new generation of heavy transport equipment combines state of the art design with proven components. The 4 and 6 axle line transporter units can be operated independently or assembled into any combination.

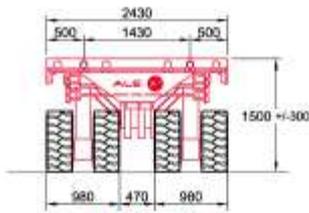
Individual transporters can be hydraulically and electronically linked to provide a support platform matched to the characteristics of the load and the route.

Programmable, 360 degree electronic steering achieves extremely accurate load positioning even under arduous site conditions.

The SPMT transport system is an unrivalled method for the safe and effective transport of the largest loads.

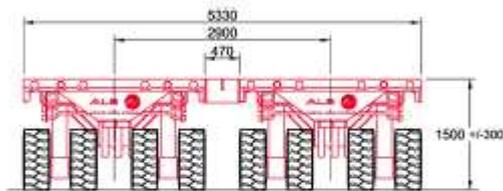


Self Propelled Modular Transporter



2 FILE UNIT

Carrying Capacity 36t / Axle

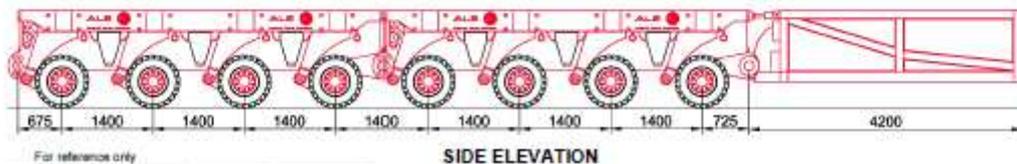


4 FILE UNIT

Carrying Capacity 72t / Axle

Key features of the SPMT system include:

- Hydraulically driven for movement in any direction.
- Multi-axle, high torque drive units, maximising the tractive effort.
- 25 to 50 percent of all axles driven.
- Multi power modules capable of being interlinked.
- Advance coupling system to reduce rigging time.
- In cab or remote control option.
- Single point control for multi transfer operation.
- 3, 4 or multi suspension.



SIDE ELEVATION



- Assembly crane : 1n° mobile 80 ton capacity
- Forklift
- Aerial platforms

Appendix:

Drawings of launching and lowering phases DV1 to DV7