102 TONNE COAL CARRYING WAGON
SPECIFICATION: (WAGON #7)

GENERAL DIMENSIONS

LENGTH OVER HEADSTOCK	16517 mm
LENGTH OVER PULLING FACES OF COUPLERS	17757 mm
BOGIE CENTRES	12718 mm
EXTREME WIDTH	2800 mm
INSIDE WIDTH	2790 mm
TOP OPENING WIDTH	1600 mm
TOP OPENING LENGTH	15052 mm
EXTREME HEIGHT	3734 mm
HEIGHT, RAIL TO BOTTOM OF DOOR	298 mm
NUMBER OF DOORS (3 DOUBLES)	6

CLEAR DOOR OPENING	(2) 2560 x 1000 mm (1) 2900 x 1000 mm
TOTAL CLEAR DOOR OPENING	8.02 m^2
SLOPE OF END SLOPE SHEETS	45 DEGREES
SLOPE OF CROSS RIDGE SHEETS	55 DEGREES
SLOPE OF SIDE SHEETS	59 DEGREES
ESTIMATED TARE WEIGHT	27.0 tonnes
CUBIC CAPACITY – LEVEL FULL	Approximately 92.5 m^3

CURVE NEGOTIABILITY

HORIZONTAL – SERVICE	70 m
HORIZONTAL – SHUNTING	55 m
VERTICAL (DOORS CLOSED)	500 m

GAUGE

W6/6A GAUGE FOR FREIGHT VEHICLES

MATERIAL OF CONSTRUCTION

GENERAL DESCRIPTION

This specification describes a 102 tonne Open Top Hopper Wagon, with approximately 92.5 Cubic Meter Capacity and 3 partitioned pockets. Each pocket to be equipped with automatic door operating equipment for 2 doors. The wagon shall have a steel underframe and superstructure, designed for 102 tonne gross rail load. The wagon will be equipped with a standard US-style coupler, draft gear, and a US three-piece bogie. Main structural members used in the construction of the wagon shall be High Strength Low Alloy steel (HSLA) in accordance with specification EN-10025-355-JR or equivalent. The body sheets that come in contact with the product will be made of 3Cr12 semi-stainless steel (EN10088.1.4003 or equivalent). The overall design and construction of the wagon will be in accordance with current AAR, EWS, and Railway Group Standards' requirements as appropriate.

UK RIDE PERFORMANCE

Tare	75 mph welded track 70 mph jointed track
Laden at 102T	60 mph welded track 60 mph jointed track

BRAKE PERFORMANCE

The brake system is currently approved for use in the UK for the following operating speeds and loads.

Tare	75 mph
Laden at 102 T	75 mph

DOOR SYSTEM

The wagons are equipped with a pneumatic door operating system that allows unloading between the rails while the wagons are in motion. The door operating equipment is located at the ends of the doors and operates laterally with respect to the wagon. Each of the three doors is operated by a single cylinder controlled by a hand valve on either side of the wagon. Air to operate the doors is taken from the train brake "second pipe". Castell key locks will be installed to prevent unauthorized operation of the system. The doors are closed and locked with a primary over-center locking system and with a secondary lock on the cylinder.

The wagon will be divided into three segments by partition plates with individual door operation.

JACKING PADS

Fabricated jacking pad assemblies are incorporated into the buffer supports, which will allow for jacking a fully loaded wagon.

SIDE SILLS

Side sills shall be mild steel (EN-10025-355-JR or equivalent) parallel flange channel.

COUPLERS/BUFFERS

The wagon will be equipped with standard AAR SBE68CE couplers.

COUPLER RELEASE

One (1) uncoupling lever shall be provided at each end of the wagon.

CENTRE PLATE

Standard US style flat centre plate shall be used.

DRAFT GEAR

AAR-approved draft gear suitable for a standard 24 5/8" pocket shall be used.

LABEL CLIPS

One (1) document box will be applied on each side of the wagon.

TAIL LAMP BRACKETS

One (1) BR-type lamp bracket will be applied to each end of the wagon.

EARTH BONDING

An electrical path will be provided from the wagon to the bogie side frame through a grounding strap arrangement. Additional grounding straps provide an electrical path from the side frame through the roller bearing pedestal adapter. No insulation is provided at the bogie center pivot.

SIDE BEARINGS

A standard US style side bearing arrangement, utilizing constant contact side bearings, will be used. The side bearings will not provide an electrical path between the bogie frame and wagon body.

BOGIES

GENERAL DESCRIPTION

100-U.S.-ton, 6-1/2" x 12" U.S. three-piece Swing-Motion Bogie with 915mm diameter wheels, 1829 mm wheel base, and 25.5t axle load will be used. Bogies will be retained to the car by a locking type centre pin. Jacking facilities are not provided on these bogies. Bogie towing can be accomplished by roping to main structural members. Note: special towing provisions are not provided.

SIDE FRAMES

Side frames shall be 6-1/2" x 12", 100-U.S.-ton design in Grade "B" cast steel modified to conform to W6A loading gauge, under current conditions of wheel wear. Column guide wear plates shall be applied by welding and bolting with the nut tack welded to the bolt.

BOLSTERS

Bolsters shall be 6-1/2" x 12", 100-U.S-ton design in Grade "B" cast steel, with a 2" deep machined center bowl for application of a composite bowl wear liner.

WHEELS

Wheels shall be AAR J-36 (915mm diameter), two-wear Class "B", curved plate design.

AXLES

Axles shall be 6-1/2" x 12" Grade "F" roller bearing design.

ROLLER BEARINGS

AAR approved 6-1/2" x 12" N. F. L. design roller bearings shall be used.

ROLLER BEARING RETAINER KEYS

AAR approved keys shall be used, fastened with huck bolts.

SPRINGS

The NACO Swing-Motion Bogie will be equipped with four (4) long travel spring groups consisting of: six (6) outer, six (6) inner, two (2) outer control springs and two (2) inner control springs shall be used.

SNUBBING

Friction snubbing is provided by the four (4) iron wedges per bogie. The wedges are supported by the control springs listed above.

BRAKE BEAMS

Modified brake beams shall be used.

BRAKE BEAM WEAR LININGS

Composite wear lining shall be used.

BRAKE BLOCKS

High friction composition 'K' blocks will be used. These will comply with specification BR 567.

BRAKE SHOE KEYS

AAR approved brake shoe keys shall be used.

AIR BRAKE EQUIPMENT

GENERAL DESCRIPTION

Wagons shall be equipped with bogie-mounted brakes, including socket weld flanged trainline fittings and variable load sensors. The air brake rigging shall be designed and applied in accordance with the applicable British Railway Group Standards and EWS requirements. Air brake control equipment will supplied by Westinghouse for a two-pipe system. The second pipe will also provide the air for door operation.

SLACK ADJUSTER

AAR approved automatic type brake slack adjusters for TMX brakes shall be used.

VARIABLE LOAD SYSTEM

Two (2) variable load valves will be used in conjunction with wagon-mounted control valves.

HAND BRAKE

The hand brake will be accessible and operable from both sides of the wagon. The parking brake will satisfy the requirements of British Railway Group Standard GM/TT0171, Clause 10, with the additional requirement of holding a fully laden wagon of 102 tonnes on a 1-in-30 incline. A counter-rotating hand wheel shall be fitted on each side. An indicator shall be provided on the wagon that clearly shows the state of application of the parking brake.

PIPE FITTINGS

Single gasket flange type socket welded fittings shall be used for metal piping connections. Inter-car couplings are British Rail Standard design. Test points will be provided for testing of brake cylinder pressure.

BRAKE PINS

Hardened steel brake pins shall be used.

BRAKE PIPE

With the exception of areas not well suited to heavy pipe, piping shall be ASTM A-53 steel extra heavy schedule 80 pipe. Conventional tubing will be used in lieu of heavy pipe for the connection to the variable load control valve. All piping will conform to BR Specifications MT265, Clause 22 and MT204, Sections 1&2.