

Table 2C - Rolling Stock Minimum Requirements and Specifications - Suburban Service Type

Service Type: Suburban		Min Req applies	Minimum Requirement Introduction Date*		*Where applicable, rolling stock is exempt from the early Minimum Requirement Introduction Date if it can be demonstrated that it will be replaced by new build rolling stock												
			If Not Exempt	If Exempt	Class 142	Class 143	Class 150/2	Class 150/9	Class 230	Class 170/2	Class 170/2	FLIRT DEMU	FLIRT Tri-Mode (4 car)	Class 153			
Type and Route Information	1	Class															
	2	Type		N/A	N/A	DMU	DMU	DMU	DMU	DMU	DMU	DMU	DMU	Bi-mode fitted with batteries	DMU		
	3	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
	4	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
	5	Lease Start Date		N/A	N/A	14/10/2018	14/10/2018	14/10/2018	14/10/2018	01/04/2019	01/10/2019	01/10/2019	See R6.7	See R6.7	14/10/2018		
	6	Lease End Date		N/A	N/A	31/12/2019	31/12/2019	31/12/2023	31/12/2023	16/10/2033	16/10/2033 + [REDACTED]	16/10/2033 + [REDACTED]	16/10/2033	16/10/2033	31/10/2022		
	7	Number of units at the Start Date		N/A	N/A	15	15	36	0	0	0	0	0	0	8		
	8	Number of units (max number used during term of Grant Agreement)		N/A	N/A	15	15	36	6	5	4	8	11	17	13		
	9	Vehicles / Unit		N/A	N/A	2	2	2	3	3	2	3	4	4	1		
	10	Specified Routes		N/A	N/A	Cardiff - Bridgend	Cardiff - Bridgend	Cardiff - Maesteg - Cheltenham - Ebbw Vale	Cardiff - Maesteg - Cheltenham - Ebbw Vale	Wrexham - Bidston	Cardiff - Maesteg - Cheltenham - Ebbw Vale	Cardiff - Maesteg - Cheltenham - Ebbw Vale	Cardiff - Maesteg - Cheltenham - Ebbw Vale	Rhymney - Cardiff - Bridgend	CVL + Barry/Penarth		
Minimum Requirements	11	PRM / RVAR Compliant (* Mandatory compliance by December 31st 2019)	✓	31/12/2019	N/A	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
	12	Seats aligned with windows		N/A	N/A	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
	13	PRM Compliant Toilets	✓	31/12/2019	N/A	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
	14	CET Toilet	✓	31/12/2019	N/A	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
	15	Baby changing facilities	✓	31/12/2019	N/A	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
	16	Power Supply available at all seats	✓	31/10/2020	31/12/2023	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
	17	Catering facilities		N/A	N/A	No	No	No	No	No	No	No	No	No	No	No	
	18	Overhead racks throughout train for storing small items of luggage		N/A	N/A	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
	19	Facilities for storing large items of luggage within sight/proximity of passengers	✓	31/10/2020	N/A	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
	20	Storage capacity for pushchairs / prams	✓	31/10/2020	31/10/2022	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
	21	Dedicated cycle storage		N/A	N/A	No	No	No	No	Yes	No	No	No	No	Yes		
	22	Flexible storage for cycles	✓	31/10/2020	31/10/2022	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No		
	23	Vehicle will not affect mobile phone signal	✓	31/10/2020	N/A	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
	24	Passenger Counting system	✓	31/10/2020	31/10/2022	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No		
	25	CCTV (passenger environment)	✓	31/10/2020	31/10/2022	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No		
	26	Wireless internet access	✓	31/10/2020	N/A	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
	27	Air Conditioning System	✓	31/10/2020	31/12/2023	No	No	No	No	Yes	Yes	Yes	Yes	Yes	No		
	28	Pacer removal from service	✓	30/09/2020	N/A	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
29	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	
30	Seat reservation		N/A	N/A	No	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes			
31	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]			
General Information	32	Vehicle Length in metres		N/A	N/A	15.55	15.11	20.06	20.06	18.12 - 18.37	23.62	23.61 - 23.62	15.7 - 21.050	15.7 - 21.050	23.21		
	33	Number of vehicles fitted with passenger counting system		N/A	N/A	0	0	18	3	6	8	24	44	68	0		
	34	Year built		N/A	N/A	1985 - 1987	1985 - 1986	1987	1987	1979 - 1983	1998 - 2005	1998 - 2005	2022	2022 - 2023	1987 - 1988		
	35	Age at the Start Date		N/A	N/A	33 - 31	32 - 33	31	31	35 - 39	13 - 20	13 - 20	0	0	30 - 31		
	36	Max speed in mph		N/A	N/A	75	75	75	75	60	100	100	100	75	75		
	37	Vehicle range limiting factor		N/A	N/A	1500 km	1500 km	3300 km	3300 km	[REDACTED]	2320 km	2320 km	[REDACTED]	[REDACTED]	3300 km		
	38	Flexibility to deploy on other routes		N/A	N/A	Flexible, will go on most routes	Flexible, will go on most routes	Flexible, will go on most routes	Flexible, will go on most routes	Flexible, will go on most routes	Flexible, will go on most routes	Flexible, will go on most routes	Flexible, will go on most routes	Flexible, will go on most routes	Flexible, will go on many routes and short platforms		
	39	Maximum operating length of train in metres		N/A	N/A	155	155	200.6	200.6	54.36 - 55.11	236.2	236.2	240	240	230		
	40	Remote Fault-finding systems		N/A	N/A	No	No	KA fitting [REDACTED] fault finding system	KA fitting [REDACTED] fault finding system	TCMS + OTDR	KA fitting [REDACTED] fault finding system	KA fitting [REDACTED] fault finding system	[REDACTED] integrated diagnostic and visualisation system	[REDACTED] integrated diagnostic and visualisation system	KA fitting [REDACTED] fault finding system		
	41	Vehicle and infrastructure monitoring systems		N/A	N/A	No	No	Vibration monitoring	Vibration monitoring	Vibration monitoring	Vibration monitoring	Vibration monitoring	Vibration monitoring	Yes - UGMS + plain line pattern recognition + OLE monitoring	Vibration monitoring		
	42	CCTV (forward facing)		N/A	N/A	No	No	No	No	Yes	Yes	Yes	Yes	Yes	No		
	43	Acceleration rate in m/s ²		N/A	N/A	0.48	0.48	0.66	0.66	[REDACTED]	0.7	0.7	[REDACTED]	[REDACTED]	0.61		
	44	Deceleration rate in m/s ²		N/A	N/A	Compliant to RGS braking standards	Compliant to RGS braking standards	0.7	0.7	[REDACTED]	0.98	0.98	[REDACTED]	[REDACTED]	0.7		
	45	Engine Emission Standard		N/A	N/A	Pre emission standards	Pre emission standards	Pre emission standards	Pre emission standards	Euro Stage III B	Euro Stage II	Euro Stage II	Stage III B	Stage III B	Pre emission standards		
46	Unit tare weight in tonnes		N/A	N/A	49.5	51.7	74	110.5 or 111.5 dependent on formation	[REDACTED]	91.4	133.7	[REDACTED]	[REDACTED]	41.2			
47	Unit fully laden weight in tonnes		N/A	N/A	64.55	66.82	95	140 - 144	[REDACTED]	112.47	165.13	[REDACTED]	[REDACTED]	49.18			
48	Diesel emission statement		N/A	N/A	• CO: 0.87 g/kWh • HC: 0.39 g/kWh • NOx: 10.07 g/kWh • PM: not known g/kWh	• CO: 0.87 g/kWh • HC: 0.39 g/kWh • NOx: 10.07 g/kWh • PM: not known g/kWh	• CO: 0.84 g/kWh • HC: 0.14 g/kWh • NOx: 21.19 g/kWh • PM: 0.11 g/kWh	• CO: 0.84 g/kWh • HC: 0.14 g/kWh • NOx: 21.19 g/kWh • PM: 0.11 g/kWh	[REDACTED]	• CO: 4 g/kWh • HC: 1.1 g/kWh • NOx: 7 g/kWh • PM: 0.15 g/kWh	• CO: 4 g/kWh • HC: 1.1 g/kWh • NOx: 7 g/kWh • PM: 0.15 g/kWh	[REDACTED]	[REDACTED]	• CO: 0.84 g/kWh • HC: 0.14 g/kWh • NOx: 21.19 g/kWh • PM: 0.11 g/kWh			

Table 2C - Rolling Stock Minimum Requirements and Specifications - Suburban Service Type

Service Type: Suburban		Min Req applies	Minimum Requirement Introduction Date*		*Where applicable, rolling stock is exempt from the early Minimum Requirement Introduction Date if it can be demonstrated that it will be replaced by new build rolling stock									
			If Not Exempt	If Exempt	Class 142	Class 143	Class 150/2	Class 150/9	Class 230	Class 170/2	Class 170/2	FLIRT DEMU	FLIRT Tri-Mode (4 car)	Class 153
Capacity Information	49	Standard Class Fixed Seats	N/A	N/A	90	92	111	175	115	105	170	171	159	58
	50	Standard Class Tip-Up Seats	N/A	N/A	12	12	7	11	8	13	11	31	30	4
	51	Standard class seating layout (1+2, 2+2, 2+3, longitudinal, etc.)	N/A	N/A	2+2	2+2 high-back Chapman seating, mainly uni-directional	2+2 high-back Chapman seating, mainly uni-directional	2+2 high-back Chapman seating, mainly uni-directional	2+2 bays and longitudinal	2+2 Chapman and Lazarini facing/uni-directional seating	2+2 Chapman and Lazarini facing/uni-directional seating	2+2	2+2	2+2 high backed Chapman seating.
	52	First / Business Class Fixed Seats	N/A	N/A	0	0	0	0	0	0	7	0	0	0
	53	First / Business class seating layout (1+2, 2+2, 2+3, longitudinal, etc.)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2+1 Chapman and Lazarini facing	N/A	N/A	N/A
	54	Wheelchair Spaces per Unit	N/A	N/A	4	4	2	2	2	2	2	2	2	2
	55	Standing Capacity	N/A	N/A	Assume 0.25sqm per standing passenger 109	Assume 0.25sqm per standing passenger 108	Assume 0.25sqm per standing passenger 173	Assume 0.25sqm per standing passenger 248	Assume 0.25sqm per standing passenger 301	Assume 0.25sqm per standing passenger 181	Assume 0.25sqm per standing passenger 259	Assume 0.25sqm per standing passenger 221	Assume 0.25sqm per standing passenger 234	Assume 0.25sqm per standing passenger 52
	56	Dedicated cycle storage spaces per unit	N/A	N/A	0	0	0	0	2	0	0	0	0	4
	57	Flexible storage spaces for cycles per unit	N/A	N/A	4	4	2	2 or 4 (dependent on formation)	2	1	1	9	9	0
	58	Toilets per unit	N/A	N/A	1	1	1	1 or 2 (dependent on formation)	1	2	3	1	1	1
	59	Door position on vehicle (i.e. vehicle end doors or 1/3 and 2/3 positioned doors)	N/A	N/A	3 doors per vehicle. Twin-leaf inward pivoting (based on a bus door)	3 doors per vehicle. Twin-leaf inward pivoting (based on a bus door)	Bi-parting sliding doors at 1/3 and 2/3 position, cab-door sliding	Bi-parting sliding doors at 1/3 and 2/3 position, cab-door sliding	4 single sliding doors	Double leaf, bi-parting sliding plug doors at 1/3 and 2/3 positions	Double leaf, bi-parting sliding plug doors at 1/3 and 2/3 positions	1/3 and 2/3 position (Coaches 1 & 4) Central door (Coach 2 & 3)	1/3 and 2/3 position (Coaches 1/2/4) Central door (Coach 3)	Single leaf sliding plug at vehicle ends
	60	Facilities for standing passengers	N/A	N/A	Seat back handles and grab poles provided	Seat back handles and grab poles provided	Seat back handles and grab poles provided	Seat back handles and grab poles provided	Seat back handles and grab poles provided	Seat back handles and grab poles provided	Seat back handles and grab poles provided	Seat back handles and grab poles provided	Seat back handles and grab poles provided	Seat back handles
	61	Number of fixed tables per vehicle	N/A	N/A	0	0	12 (5 DMSL + 7 DMS)	17 (5 DMSL + 7 DMS + 5 DMS) or 19 (5 DMSL + 7 DMS + 7 DMS) dependent on formation	10 (DMS 4, TSL 2, DMS 4)	19 (10 DMCL, 9 DMSL)	23 (7 DMCL, 8 MSL, 8 DMSL)	21 (Car A 6, Car B 4, Car C 3, Car D 6)	24 (Car A 8, Car B 2, Car C 6, Car D 8)	6 (DMSL)
	62	Number of folding tables per vehicle	N/A	N/A	0	0	20 / 32	20 / 32	0	18 / 23	24 / 26 / 34	4 / 36 / 26 / 4	4 / 26 / 12 / 4	24
	63	Type of heating and ventilation fitted (air conditioning, pressure ventilation and body side heater, etc.)	N/A	N/A	Engine waste heat, ducted warm air. No air-con in cab. No air-con in saloon.	Engine waste heat, ducted warm air. No air-con in cab. No air-con in saloon.	Engine waste heat, ducted warm air. No air-con in cab. No air-con in saloon.	Engine waste heat, ducted warm air. No air-con in cab. No air-con in saloon.	CAB and Saloon air conditioning	Air conditioning (Saloon and cab (210-273) independent systems). Both AIT (now KBRs)	Air conditioning (Saloon and cab (210-273) independent systems). Both AIT (now KBRs)	HVAC system	HVAC system	Warm air, hot water radiators. No air-con in cab. No air-con in saloon.
	64	Floor covering (i.e. lino, carpet, etc.)	N/A	N/A	Polyflor Floor Covering	Polyflor Floor Covering	Polyflor Floor Covering	Polyflor Floor Covering	Polyflor Floor Covering	Carpet	Carpet	Lino	Lino	Carpet
	65	Door control system fitted	N/A	N/A	Guard control panel	Guard control panel	Guard control panel	Guard control panel	Guard control panel	Guard control panel	Guard control panel	Guard control panel/ Driver control	Guard control panel/ Driver control	Guard control panel
	66	GPS system fitted	N/A	N/A	KA fitting [REDACTED] GPS system	KA fitting [REDACTED] GPS system	KA fitting [REDACTED] GPS system	KA fitting [REDACTED] GPS system	TL&M compliant GPS	KA fitting [REDACTED] GPS system	KA fitting [REDACTED] GPS system	TL&M compliant GPS	TL&M compliant GPS	KA fitting [REDACTED] GPS system
	Rolling Stock Improvements	68	Refurbishment 1 - Start Date			14/10/2018	14/10/2018	14/10/2018	N/A	N/A	01/10/2019	01/10/2019	N/A	N/A
69		Refurbishment 1 - End Date			31/08/2019	31/08/2019	07/09/2019	N/A	N/A	01/02/2020	01/02/2020	N/A	N/A	28/10/2019
70		Refurbishment 1 - Scope			Deep clean, powerpoints fitted	Deep clean, powerpoints fitted	PRM + Train wrap to rebrand, internal refurbishment, including seat cover replacement, grab pole repainting and floor covering replacement to match TfW branding. CCTV+Pax counting	N/A	N/A	Rebranding, at seat power, passenger counting system installation	Rebranding, at seat power, passenger counting system installation	N/A	N/A	PRM + Train wrap to rebrand, internal refurbishment, including seat cover replacement, grab pole recoating, carpets/flooring renewal and seat power at bay locations
71		Refurbishment 2 - Start Date			N/A	N/A	N/A	N/A	N/A	01/01/2027	01/01/2027	N/A	N/A	N/A
72		Refurbishment 2 - End Date			N/A	N/A	N/A	N/A	N/A	31/12/2017	31/12/2017	N/A	N/A	N/A
73		Refurbishment 2 - Scope			N/A	N/A	N/A	N/A	N/A	Full interior and Passenger equipment midlife refurbishment	Full interior and Passenger equipment midlife refurbishment	N/A	N/A	N/A
74		Provides level access with sliding gap filling step			No	No	No	No	No	No	No	Yes	Yes	No
75		Passenger Assist Bluetooth Beacon fitted by 2020			N/A	N/A	Yes	Yes	Yes	Yes	Yes	By vehicle introduction date	By vehicle introduction date	Yes
76		[REDACTED] PIS fitted			No	No	No	No	No	No	No	Yes	Yes	No
77		3-pin and USB power sockets at every seat			USB sockets to be fitted at selected locations in passenger saloon	USB sockets to be fitted at selected locations in passenger saloon	3-pin and USB sockets to be fitted at every seat	3-pin and USB sockets to be fitted at every seat	3-pin to be fitted at bay seats with USB sockets at all other seats	Yes	Yes	Yes	Yes	3-pin to be fitted at bay seats
78		End gangways fitted			No	No	Yes	Yes	No	No	No	No	No	Yes
79		On-Train Data Recorder (OTDR) data harvester			To be fitted	To be fitted	To be fitted	To be fitted	To be fitted	To be fitted	To be fitted	N/A	N/A	To be fitted
80		Wheel Slip/ Slide Protection (WSP) system fitted			No	No	To be fitted	To be fitted	Yes	Yes	Yes	Yes	Yes	No
81		On Board Energy Storage (OBES) fitted			No	No	No	No	Yes, to improve train acceleration	No	No	No, passive provision provided	Yes	No
82		Twin Cat 7 ethernet backbones to enable gigabit transmission fitted			No	No	No	No	No	No	No	By vehicle introduction date	By vehicle introduction date	No
83		Driver Advisory System (DAS) to be fitted if not already installed			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
84	Selective Door Opening (SDO) fitted			No	No	No	No	No	No	No	No	No	No	
85	ETCS fitted			No	No	No	No	No	No	No	No	No	No	