

East West Rail Phase 2

Transport Works Act Order (TWAO), Network Rail (East West Rail) (Bicester to Bedford Improvements) Condition 7 Landscape

Condition 7 (a) for (b)(i) Charbridge Lane (OXD/36AA)

Document Number: 133735-EWR-DRG-EEN-000776

Rev A01



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1. Introduction

In response to receipt of Transport Works Act Order (TWAO), Network Rail (East West Rail) (Bicester to Bedford Improvements), this document has been produced to discharge the requirements of TWAO Planning Condition 7 for landscape.

2. Scope

This document includes comment, drawings and specifications relating to the Charbridge Lane overbridge (OXD/36AA). In respect of Planning Discharge Condition 7.

3. Standards & Specifications

- Buckinghamshire County Council, Street Lighting, Development Management Specification, February 2019.
- Highway Design Guide, Oxfordshire County Council, Street Lighting Design Requirements 2017.
- Milton Keynes Council, Streetlighting Specification, June 2017 Rev. 2.
- BS5837(2012) Trees in relation to design, demolition and construction. Recommendations

4. The Conditions

(b)(i) Charbridge Lane (OXD/36AA) The works shall be set out in a scheme which shall include the details of:

Condition 7 (a)(i) Any structure such as street furniture, means of enclosure and lighting

There is no street furniture associated with this structure.

Enclosure (fences / gates / hedges) and Street Lighting positions are shown on the following drawings:

133735_2A-EWR-OXD-XX-DR-L-011100

133735_2A-EWR-OXD-XX-DR-L-011020

133735_2A-EWR-OXD-XX-DR-L-011021

133735_2A-EWR-OXD-XX-DR-L-011103

133735_2A-EWR-OXD-XX-DR-L-011104

133735_2A-EWR-OXD-XX-DR-L-011105

133735_2A-EWR-OXD-XX-DR-L-011106

133735_2A-EWR-OXD-XX-DR-L-011107

The lighting columns Type A on Charbridge Lane will be as follows:

Style	Column style 9 Conical – Ayr & Avon style brackets (Oxfordshire County Council Std Drawing HSD/1300/021)
Nominal height	10 m
Column material	Steel
Type	Tapered conical
Bracket projection	0.75 m, compatible with Ø34-42mm luminaire mounting
Protection and finish	Finished RAL 6013 (Reed Green)

The Luminaire Type 1 on Charbridge Lane will be as follows:

Manufacturer	DW Windsor
Product	Kirium Pro 2 (Product Brochure App B)
Reference	64-LED 3000K A1
Dimensions	(L) 720 mm (W) 350 mm (D) 140 mm
Weight	9.5 kg
Windage	0.034 m ²
Finish	Finished RAL 6013 (Reed Green)
Light source	LED
Light source wattage	148 W
Light source luminous flux	15.2 klm
Drive current	750 mA
Control gear	Dimmable electronic
Method of operation	PECU (switching to be advised by OCC) with pre-programmed driver to dim to 75% output between 00.00 and 06.00
Unit circuit protective device rating	6A

AYR STYLE (double arm bracket)
(same dimensions & fixing as Thames)

AVON STYLE COLUMN (Thames style single arm bracket)

Notes

- All dimensions are in millimetres unless shown otherwise.
- Column heights vary from 8 to 15 m.
- All brackets arms to be 5 deg uplift.
- Rationalised wind loading factors (RWF) for Oxfordshire as specified in PD6547:2009 are to be used as a pressure for the design of lighting columns.
- Bracket arm lantern spigots to be in line with the bracket arm.
- All columns to be BS EN 40 BD94/07.
- Conical steel column supplied by Stainton Metal Co. Avon Style or similar approved. For double arm column use Ayr bracket or similar approved.
- Maximum projection of bracket to be 0.75 metre.
- Column to have a G2a protection system EPA Compliant Oxfordshire Specifications (see Appendix 3c or 19/3). Final coat to be Reed Green RAL 6013, Graphite Black RAL 9011 or as specified by the Engineer.
- See HSD/13/005 for planting depth, foundation detail and painting numbers.
- For details of column heights see Appendix 13/1.
- Manufactures label must be fitted indicating production date and batch number.
- White banding is required when a post is causing an obstruction in a footway. That is when a post is more than 0.3m from back edge of kerb a white band of non-reflective self-adhesive premium vinyl tape (3M 100-10 or similar approved) shall be applied. Band width 200mm - 25mm black, 150mm white, 25mm black. Height of lower edge above ground 1400mm min. to 1600mm max.
- All columns shall be numbered at the time of erection in 50mm high black figure(s) on a white background. This is to be a self adhesive (one piece) label manufactured by BRADY B-580 (outdoor marking vinyl film in high gloss with permanent adhesive) or similar approved. Numbers are applied 2m above ground level, and shall face the carriageway. When the column is a double arm then the numbers are fixed on either side.
- Column door must be erected facing away from oncoming traffic.

f	Note 14 amended	10.15
e	Note 15 & door and tree note added	10.14
d	Note 13 amended	07.14
c	Note 6 amended	03.14
b	Note 13 amended	05.13
a	Notes 4 & 14 amended	02.11

Scale Not to Scale	Initials	Date	Index Drawing No. HSD/13/026f	Category 1
	Drawn			
	Traced			
	Checked			

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STREET LIGHTING COLUMNS : Style 9 Conical

ILLUMINATED SIGNS AND STREET LIGHTING

Oxfordshire County Council Std Drawing HSD/1300/021

Document ref:
133735-EWR-DRG-EEN-000776 A01



DW Windsor Kirium Pro 2 brochure



Think all street lights are made equal?

**think
again**

Our most comprehensive range of LED street lighting yet. Need performance? Minimal whole life cost? Precise lighting control? Think Kirium Pro. Available in five sizes and with 23 standard optical solutions, it's the most innovative, forward-thinking, and future-proof product we've ever developed.



Whatever your requirements, we have the solution

From 320lm – suitable for residential roads and car parks – to 46109lm, ideal for larger roads and motorways.

Key advantages:

- 5 sizes for true flexibility
- 23 optical solutions to suit any project requirement
- With Diamond+ optic technology for the ultimate in precise lighting control
- Exceptional thermal management for optimised performance and product life
- Impressive energy efficiency delivering a minimal whole life cost solution
- Flexible drive current for tailored performance and accurate lighting levels
- Choice of control options for even greater energy savings
- Tool-free access via quick-release latches mean easy installation and maintenance
- Safety first; with automatic electrical disconnect
- 2700K / 3000K / 3500K / 4000K
- ENEC approved
- Suitable for international markets with operating temperature range -45°C to +50°C

Applications:

-  Footpaths
-  Cycleways
-  Residential
-  Car parks
-  Road
-  Rail
-  Motorway



Design features

Surge protection device
Maximises the lifetime value and prevents down-time due to storms, lightning strikes etc.

Lift-off head*

Cooling fins
To dissipate heat and extend LED lifetime

Cool Zone™ exceptional thermal management
Air void and thermal barrier that assists in delivering a long lifetime

Hinged opening

High-pressure die-cast aluminium body (LM6)
For corrosion resistance and added strength & durability

Performance lighting
High power LEDs (from 4 to 128 LED options)

Tool-less entry
Quick-release latches for speedy installation and maintenance.

Automatic electrical disconnection*
Safety feature; cuts power to the luminaire when opened

CLO: Constant Light Output
Fully programmable

Safety tether
Supplied with an integral dampening safety tether, and an external fail-safe device as standard (Kirium Pro 3 only)

Flexible mounting
Direct post (Ø60mm / Ø60-78mm)
Side entry (Ø34-42mm / Ø60mm)
Direct post/side entry inclination: -15° -10° -5° 0° +5° +10° +15°

Optical control

Featuring Diamond+

23 standard optical distributions for ultimate flexibility and precise lighting control.

An evolution of our award-winning and patented Diamond Optic™ reflector technology, Diamond+ gives you the ability to create widely different lighting distributions from a single luminaire.

Choose Diamond+ for refined lighting distribution

<p>Diamond+ A Optic</p> <p>Options: A1, A2, A3, A4, A5</p> <p>Typical applications: Wide roads and dual carriageways (M classes)</p>	<p>Diamond+ B Optic</p> <p>Options: B1, B2, B3, B4, B5</p> <p>Typical applications: Narrow roads and footpaths</p>
<p>Diamond+ C Optic</p> <p>Options: C1, C2, C3, C4, C5</p> <p>Typical applications: Area applications</p>	<p>Diamond+ D Optic</p> <p>Options: D1, D2, D3, D4, D5</p> <p>Typical applications: Standard roads and wide footpaths</p>
<p>Diamond+ Z Optic</p> <p>Options: ZL, ZR or ZF</p> <p>Typical applications: Zebra and pedestrian crossings</p>	

Please refer to dewindoor.com/diamond for full optical configurations

4

Kirium Pro Mini/Midi

*available on Kirium Pro 1, 2 and 3 only

5



Control options

From simple factory-set dimming to full CMS: enhance your luminaire through intelligent, connected sensors and control systems.

Benefits of smart control

- Reduced energy consumption
- Reduced carbon footprint
- Longer luminaire life
- Lower capital, maintenance and energy costs
- Ability to collect data

Bluetooth

For on/off switching, light control and dimming.



Smart control

Integral CMS: connected (or Smart) assets which use wireless communications networks, offering optimal flexibility. Control a single luminaire or group switch remotely.



Simple, stand-alone controls

Factory-set dimming, time switches, photocells and presence detectors. Control in its simplest form.



Installation and maintenance



Tool-less quick-release latches for speedy access



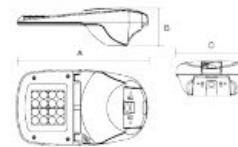
Hinged opening



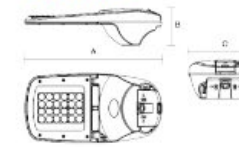
Lift-off head, with automatic electrical disconnect (available on Kirium Pro 1, 2 and 3 only)

Dimensions

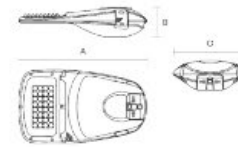
Kirium Pro Mini



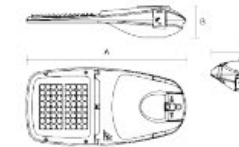
Kirium Pro Midi



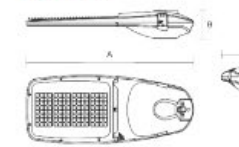
Kirium Pro 1



Kirium Pro 2





Kirium Pro 3





	Dimensions (mm)			Weight (kg)	OsB (m²)
	A	B	C		
Kirium Pro Mini	390	110	227	3.6	0.021
Kirium Pro Midi	481	119	227	5.0	0.028
Kirium Pro 1	610	140	350	7.1	0.029
Kirium Pro 2	720	140	350	9.5	0.034
Kirium Pro 3	930	167	485	17.5	0.058

Unequaled flexibility. Unequaled choice


Product Kirium Pro Mini (16 LED) 2,710lm @ 17W		Replaces 70W SON-T 80% energy saving	Typical applications Footpaths / cycleways / residential
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Product Kirium Pro Midi (24 LED) 5,485lm @ 33W		Replaces 100W SON-T 73% energy saving	Typical applications Footpaths / cycleways / residential
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Product Kirium Pro 1 (32 LED) 5,185lm @ 31W		Replaces 100W SON-T 75% energy saving	Typical applications Road / car parks / rail
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Product Kirium Pro 2 (64 LED) 8,905lm @ 50W		Replaces 150W SON-T 72% energy saving	Typical applications Road / car parks / rail
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dwwindsor.com/5-top-tips-for-great-car-park-lighting'"/>

Product Kirium Pro 3 (128 LED) 19,462lm @ 148W		Replaces 250W SON-T 61% energy saving	Typical applications Road / motorways
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Technical specification

Product lumen packages and wattages matrix

The table below provides base lumen packages for the new Kirium Pro range. Calculations based on 4000K with no LOR applied. Due to continuous development of LEDs the figures within this table are subject to change at any time.

Model	Number of LEDs	Drive current (mA)																	
		200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	
Kirium Pro Mini	4	3m	385	484	578	659	759	844	920	1021	1099	1172	1249	1323	1399	1470	1540	1606	1674
		W	3	4	5	5	6	7	7	8	9	9	10	9	11	12	13	14	15
Kirium Pro Mini	8	3m	770	967	1156	1317	1517	1687	1858	2024	2189	2343	2497	2648	2798	2939	3082	3214	3348
		W	6	7	8	9	10	9	12	14	15	16	18	19	20	22	23	25	26
Kirium Pro Mini	16	3m	1516	1890	2293	2618	3049	3305	3637	3961	4286	4586	4887	5178	5477	5753	6008*	6239*	6544*
		W	10	12	14	17	19	23	23	26	28	30	33	36	37	40	42*	46*	47*
Kirium Pro Midi	24	3m	2314	2895	3455	3993	4638	5024	5217	5585	6475	6898	7338	7750	8150	8797	8944	9294	9642
		W	14	17	20	23	27	30	33	36	39	42	46	48	53	56	60	63	67
Kirium Pro 1	32	3m	2901	3678	4330	5006	5680	6300	6958	7576	8358	8775	9351	9978	10490	11008	11535	12037	12540
		W	19	23	27	31	35	39	43	48	52	56	61	65	70	75	79	84	89
Kirium Pro 2	48	3m	4382	5462	6541	7561	8581	9546	10511	11477	12483	13254	14025	14978	15830	16628	17424	18193	18942
		W	27	33	39	45	51	57	64	70	76	82	89	95	102	109	116	123	131
Kirium Pro 2	64	3m	5703	7218	8645	9995	11343	12693	13893	15125	16389	17521	18671	19798	20925	21976	23001	24008	25038
		W	35	42	50	58	66	74	82	90	98	108	116	125	134	142	151	160	168
Kirium Pro 3	80	3m	6977	8858	10714	12540	14364	16200	18027	19799	21606	22452	23850	25508	26476	27744	28953	30162	31482
		W	43	52	61	70	80	89	99	109	117	127	138	149	160	171	182	193	206
Kirium Pro 3	96	3m	8373	10666	12959	14932	16906	18908	20904	22924	24978	26548	27928	29518	30608	32008	33198	34388	35332
		W	53	64	77	89	101	113	126	139	151	164	177	190	203	216	229	242	256
Kirium Pro 3	128	3m	11784	14929	18074	21219	24364	27509	30654	33799	37324	39774	42424	45174	47924	50674	53424	56174	58924
		W	70	85	101	116	132	148	164	181	197	214	231	248	265	282	300	317	335

*only applies to Kirium Pro 1 (96LED)

Colour temperature

OCT	Light output reduction factor	S/P ratio
2700K	0.76	1.2
3000K	0.84	1.3
3500K	0.9	1.4
4000K	1.0	1.5

Comparable products for HID replacement schemes

Lamp and comparison	Power	Energy saving (%)
25W SQX	66	25
16LED @ 350mA	66	25
50W SQX	77	25
16LED @ 550mA	26	25
90W SQX	30	25
24LED @ 750mA	49	25
135W SQX	30	25
48LED @ 550mA	16	25
180W SQX	246	25
64LED @ 650mA	128	25
50W SQX-T	59	25
16LED @ 350mA	17	25
10W SQX-T + ACDO-TT	30	25
16LED @ 550mA	26	25
100W SQX-T + ACDO-TT	33	25
24LED @ 750mA	49	25
150W SQX-T + ACDO-TT	30	25
48LED @ 550mA	70	25
250W SQX-T + ACDO-TT	301	25
64LED @ 800mA	134	25
45W CPD-TW	50	25
16LED @ 450mA	21	25
60W CPD-TW	66	25
18LED @ 650mA	30	25
90W CPD-TW	36	25
24LED @ 650mA	42	25
140W CPD-TW	53	25
32LED @ 800mA	70	25

Ordering details

You may find the following product codes helpful for ease of specification and ordering:

Model	Code	Example
Kirium Pro Mini	KPM	
	KPMd	
	KPI	KP2
Kirium Pro Midi	KPM	
	KPMd	
	KPI	KP2
Kirium Pro 1	KPM	
	KPMd	
	KPI	KP3
LED quantity		
4 LED		004
8 LED	8 LED	008
16 LED	16 LED	016
24 LED	24 LED	024
	32 LED	032
30 LED	48 LED	048
	64 LED	064
30 LED	80 LED	080
	96 LED	096
128 LED	128	
Mounting		
Ø34-42mm Side entry	S	
Ø76mm Direct post	D	D
Ø40mm Side entry / Direct post adapter	I	
Colour temperature		
2700K	27	
3000K	30	30
3500K	35	
4000K	40	
Distribution		
Wide road - Diamond+ A Optic (A1 / A2 / A3 / A4 / A5)	A1 / A2 / A3 / A4 / A5	
Footpath - Diamond+ B Optic (B1 / B2 / B3 / B4 / B5)	B1 / B2 / B3 / B4 / B5	
Area - Diamond+ C Optic (C1 / C2 / C3 / C4 / C5)	C1 / C2 / C3 / C4 / C5	D1
Standard road - Diamond+ D Optic (D1 / D2 / D3 / D4 / D5)	D1 / D2 / D3 / D4 / D5	
Pedestrian crossing - Diamond+ Z Optic (Z1 / ZR / ZF)	Z1 / ZR / ZF	
Drive current		
Drive currents from 200mA to 1000mA are available in 50mA increments. Insert drive current value in 4-digit format (eg 250mA = 0250).	0200 / 0250 / 0300 / 0350 / 0400 / 0450 / 0500 / 0550 / 0600 / 0650 / 0700 / 0750 / 0800 / 0850 / 0900 / 0950 / 1000	0650
Glazing		
Toughened glass	FG	FG
Polycarbonate (Kirium Pro Mini, Kirium Pro Midi & Kirium Pro 1 only)	RA	
Product colours		
RAL 7046 Mid grey	CF	
RAL 7035 Light grey	29	29
RAL 9005 Black	10	
Control		
No photocell	N	
Photocell 35 lux (H.0.5)	U	
Part night switching (Photocell 35 lux (±0.5) (switch off midnight - 05:30) (Elexon regime 762)	A4	
Photocell 35 lux (H.0.5) + pre-programmed dimming (dimmed to 50% midnight - 05:30) (Elexon regime 531)	DB	
3 pin NEMA	E	
5 pin NEMA	CS	U
7 pin NEMA	D2	
4 pin Zhaga socket	Z4	
Integral CMS - Urban Control	ILC	
Integral CMS - Telensa	ITE	
Integral CMS - Mayflower	IMA	
Pre-programmed dimming*		
Example code = KP2 048 D 30 D1 0650 FG 29 U		

*Available as standard subject to further information being provided at time of order.

Kirium Pro



IP66 | IK10 | CLASS I | CLASS II

Key features

Our most comprehensive range of LED road lanterns, available in 5 sizes
 Extensive optical solutions; introducing Diamond+ the ultimate in flexible, precise lighting control. 23 standard optical solutions available
 Simple, speedy and safe installation and maintenance via tool-free, quick-release latches. Lift-off head and automatic electrical disconnect
 Emergency option available (Kirium Pro 1, 2 and 3 only)
 Environmentally tested to BS EN 60098-2-6 2008
 New: Complementary bollard and wall luminaire available, visit www.dwindor.com/kirium-pro

Options

Kirium Pro Mini (4 / 8 / 16 LEDs) for mounting at 4-6 metres
 Kirium Pro Midi (24 LEDs) for mounting at 4-8 metres
 Kirium Pro 1 (8 / 16 / 24 / 32 LEDs) for mounting at 5-8 metres
 Kirium Pro 2 (32 / 48 / 64 LEDs) for mounting at 6-10 metres
 Kirium Pro 3 (64 / 80 / 96 / 128 LEDs) for mounting at 8-16 metres

Optical control

Wide road - Diamond+ A Optic (A1, A2, A3, A4, A5)
 Footpath - Diamond+ B Optic (B1, B2, B3, B4, B5)
 Area - Diamond+ C Optic (C1, C2, C3, C4, C5)
 Standard road - Diamond+ D Optic (D1, D2, D3, D4, D5)
 Pedestrian crossing - Diamond+ Z Optic (Z1, ZR, ZF)
 Optional obtrusive light shield(s) available and can be fitted post installation without opening the luminaire

L90 lifetime prediction

In excess of 100,000 hours

Total luminaire lumens

Kirium Pro Mini: 320-6734lm
 Kirium Pro Midi: 2314-9642lm
 Kirium Pro 1: 639-12284lm
 Kirium Pro 2: 2372-24319lm
 Kirium Pro 3: 4762-46109lm

Colour temperature

2700K
 3000K
 3500K
 4000K

Colour rendering index

70Ra (4000K / 3500K / 3000K)
 80Ra (3000K / 2700K)

Total measured luminaire efficacy

Up to 174lm/W

Drive current

200mA - 1000mA (in 50mA increments)

Mounting

Direct post (Ø60mm / Ø60-79mm)
 Side entry (Ø34-42mm / Ø60mm)
 Direct post/side entry inclination: -15° -10° -5° 0° +5° +10° +15°
 Adaptors available for various spigot diameters

Control

CLO: Constant Light Output enabled - for energy savings and dependable light throughout the lifetime of the luminaire
 Smart City ready: Able to support Smart City equipment and Zhaga compliant connectors
 Switch: On/Off through conventional PEC, Miniature or NEMA
 Dim: Factory set dimmed / customer specified dimming
 CMS: Compatible with all available CMS systems

Product colours

RAL 9005 Black
 RAL 7046 Mid grey
 RAL 7035 Light grey
 Other RAL colours on request

Materials

Body: High-pressure die-cast aluminium (LMS)
 Glazing: Toughened glass / Polycarbonate for IK10
 Seals: Silicone
 Finish: Polyester powder coat

Installation and maintenance

Available with various cable tail options profiled
 Short form LUMSUK codes available on the website
 Operational temperature range: -40°C to +50°C
 Surges protection: 10kV

Kirium® Pro is a registered design

Due to continuous product development the details within this brochure are subject to change at any time, please contact us for the most up-to-date information or visit www.dwindor.com

DW Windsor

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dwindor.com



Supplied by EWR

Condition 7 (a)(ii) A plan of existing trees and tree features (such as groups of trees or woodland) to be retained or to be removed

Trees to be removed and retained are shown on the following drawings:

133735_2A-EWR-OXD-XX-DR-L-011108

133735_2A-EWR-OXD-XX-DR-L-011109

133735_2A-EWR-OXD-XX-DR-L-011110

133735_2A-EWR-OXD-XX-DR-L-011111

133735_2A-EWR-OXD-XX-DR-L-011112

133735_2A-EWR-OXD-XX-DR-L-011113

133735_2A-EWR-OXD-XX-DR-L-011114

Condition 7 (a)(iii) Any new trees showing their species, spread and maturity and new planting plans including written specification (incl. cultivation and other operations associated with plant and grass establishment), Schedules of plants, including their location, number, species, size and planting density

Planting schedules are shown on Overview drawing 133735_2A-EWR-OXD-XX-DR-L-011100.

Refer to detail drawings for planting positions and the Specification 133735_RW-EWR-XX-XX-SP-L-000004 for details of cultivation and establishment. Detail drawings are:

133735_2A-EWR-OXD-XX-DR-L-011020

133735_2A-EWR-OXD-XX-DR-L-011021

133735_2A-EWR-OXD-XX-DR-L-011103

133735_2A-EWR-OXD-XX-DR-L-011104

133735_2A-EWR-OXD-XX-DR-L-011105

133735_2A-EWR-OXD-XX-DR-L-011106

133735_2A-EWR-OXD-XX-DR-L-011107

Condition 7 (a)(iv) Any earth screen bunds

There are no screening bunds on this structure

Condition 7 (a)(v) Any areas of grass turfing or seeding and depth of topsoil to be provided

There are no areas of Turfing associated with this structure. For areas of grass seeding refer to detail drawings:

133735_2A-EWR-OXD-XX-DR-L-011020

133735_2A-EWR-OXD-XX-DR-L-011021

133735_2A-EWR-OXD-XX-DR-L-011103

133735_2A-EWR-OXD-XX-DR-L-011104

133735_2A-EWR-OXD-XX-DR-L-011105

133735_2A-EWR-OXD-XX-DR-L-011106

133735_2A-EWR-OXD-XX-DR-L-011107

Condition 7 (a)(vi) A timescale for the implementation of hard landscape works

Within the area around this structure there are no hard landscape treatments specified. Landscape treatments are limited to planting of trees, hedges, shrubs and grass seed mixes.

5. Landscape Design, Tree Retention and Removal Drawings and Specification

East West Rail Phase 2

GRIP 5 Design Specification

Landscape Specification

Section: Route Wide

Document Number: 133735_RW-EWR-XX-XX-SP-L-000004 (PW No.)

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Rev C01



East West Rail Phase 2

Landscape Specification

May 2020

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APPROVED FOR CONSTRUCTION	
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Signed J. Green	Date 03/06/20
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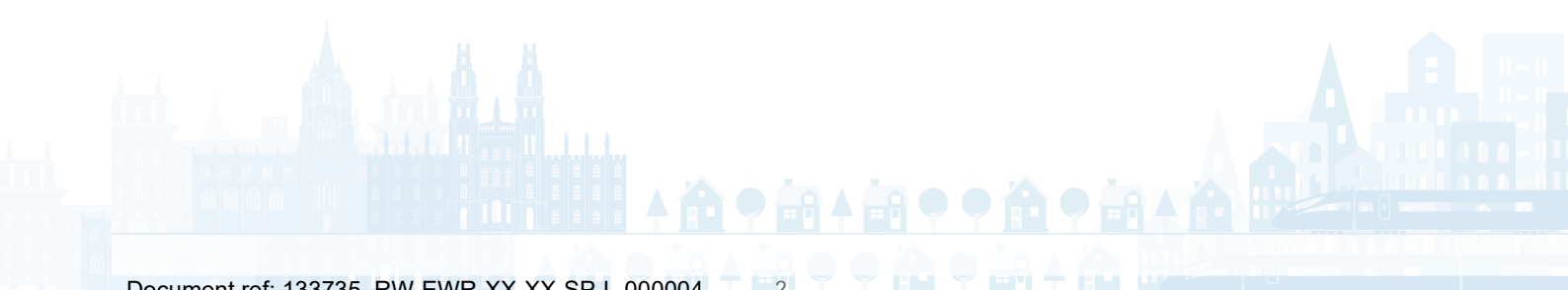
Note

In the following specification headings are defined as the following examples:

000/01 = Section

1 = Clause

1.1 = Paragraph



000 GENERAL

000/01

1. Quality Management Schemes

- 1.1 Sub-contractors appointed to carry out landscape and ecological works shall be accredited to ISO 9001 : Quality Management and ISO 14001 : Environmental Management.

2. Notice and Liaison

- 2.1 For the purpose of the contract, the 'Extent of Disturbance' shall refer to the extent of the boundary of the works to include: -
- all areas of soft estate within the site boundary including new and existing grassland, woodland and drainage features
 - all areas of hard standing including those associated with the old and new track alignment
 - all areas used temporarily during construction including the site compounds and temporary lay down areas.
- 2.2 For the purpose of this Contract the Overseeing Organisation shall refer to the scheme Landscape Clerk of Works (EWR Alliance LCoW) or designated representative.
- 2.3 New trees and shrubs shall be planted into established grass areas (either existing or newly seeded as part of the works), treated to create weed free planting stations as described below. The programme for works should allow newly grassed areas to establish prior to planting where possible.
- 2.4 The Drawings referred to throughout these appendices are listed in Appendix E
- 2.5 The Landscape Sub-Contractor shall at all times adhere to the Health and Safety requirements of EWR Alliance. Where relevant, site specific Health, Safety and Environmental Risks are noted on the drawings listed in Appendix E.
- 2.6 The Reports referred to throughout these appendices refer to: -
- Landscape works inspection reports (Appendix B)
 - Soil Management Plan. A plan will be produced for each sub-section and should be referred to before commencement of work.
 - Ecological Management Plans
- 2.7 Notice of the intention to commence planting or grass seeding operations shall ensure that all earthwork profiles are approved prior to commencing these operations.
- 2.8 There may be areas of planting to privately owned land (off-site planting and mitigation works). The Landscape Sub-Contractor shall liaise with the landowner to agree access to carry out works.
- 2.9 No construction activity including site clearance operations shall commence until all existing features that are to be retained and protected have been clearly identified in accordance with the Arboricultural 'Existing Vegetation Protection Plan' and Landscape Design drawings listed in Appendix E and approved on site by the EWR Alliance LCoW.
- 2.10 The EWR Alliance LCoW will examine and may direct the works as they progress. The Sub-Contractor's site supervisor shall be an employee of the Sub-Contractor and must: -
- Be on site at all times when work is in progress

- Be fully aware of his responsibilities under the Conditions of Contract
 - Be provided with a copy of the Specification, and
 - Shall attend progress meetings as required by the EWR Alliance LCoW.
- 2.11 The Sub-Contractor shall attend a meeting prior to commencement of the Works on site and at regular intervals thereafter as required by the EWR Alliance LCoW.
- 2.12 The Sub-Contractor shall familiarise himself with the specific quantities and operations noted in these appendices. The Sub-Contractor shall be deemed to have approved the use of the specified quantities and details of the operations as appropriate to best horticultural practice and meeting performance standards required.
- 2.13 The Sub-Contractor shall submit the following samples of goods, materials certificates and lists to the EWR Alliance LCoW: -
- Procurement proposal for tree and shrub stock of local provenance, including inspections of nursery and stock as required
 - Procurement proposal for local provenance wildflower plants and marginal, emergent and aquatic plants, including inspections of nursery and stock as required
 - List of Suppliers for Goods and Materials
 - Certification of germination, purity and provenance of species rich / wildflower seed together with varieties
 - Certification confirming that all tree and shrub stock is grown from seed of local provenance
 - Manufacturers product specification of compost including results of analysis tests (if required) – **Clause 22**
 - Sample of imported topsoil 0.5 m3 (if required) – **Para. 8.1**
 - Manufacturers product specification of fertiliser – **Clause 21**
 - Sample of weed proof membrane and current manufacturers product specification – **Para. 48.3**
 - Sample of pegs and current manufacturers product specification – **Para. 48.7**
 - Sample of tree and shrub guards, current manufacturers product specification and fixing instructions – **Clause 50**
 - Manufacturers product specification of tree stakes – **Clause 45**
 - Sample of tree ties, current manufacturers product specification and fixing instructions – **Para. 45.5**
- 2.14 These samples shall be supplied in sufficient time for them to be approved by the EWR Alliance LCoW, taking into account the programme for the Works period.

3. Peat

- 3.1 There are no areas within this Contract where peat should be necessary for habitat creation purposes. Peat shall only be permitted on this Contract as a constituent of recycled material, for example, in spent mushroom compost.

4. Pesticide Application

- 4.1 No pesticides are to be used without the prior written approval of the EWR Alliance ECoW. The interval for submission of the record forms noting the use of pesticides is monthly during the construction period or following every maintenance visit, whichever is the shorter interval.
- 4.2 Where the use of pesticides is approved the Sub-Contractor shall complete the attached Pesticides Record, Appendix 1, and submit to the EWR Alliance ECoW and EWR Alliance LCoW, as requested.

5. Bird Nesting Season

- 5.1 Vegetation site clearance work must be undertaken outside the bird breeding season which is widely considered to be 1st March to 30th September. Vegetation site clearance shall be complete by 1st March to minimise risk of breach of legislation, otherwise a qualified ecologist shall be present on site at all times when vegetation clearance is taking place to check for the presence of breeding birds. If occupied nests are found to be present, the vegetation shall not be removed.

6. Inspection Reports

- 6.1 The Sub-Contractor shall for the duration of the contract provide an Inspection Report to the EWR Alliance LCoW at monthly intervals or following every maintenance visit, whichever is the shorter. A sample pro-forma is provided at Appendix B.

250 PREPARATION OF TOPSOIL

250/01 CULTIVATION OF TOPSOIL

Vegetation Clearance

- 7.1 Care must be taken to ensure no damage occurs to existing vegetation to be retained as a result of vegetation clearance works. The Sub-Contractor shall make good any such damage to trees or plants at their own expense and to the satisfaction of the EWR Alliance LCoW.
- 7.2 Proposals and programmes for all vegetation clearance work shall be agreed with the EWR Alliance LCoW prior to commencement to ensure seasonal constraints (including current legislative requirements) are accommodated.
- 7.3 New trees and shrubs shall be planted into established grass areas (either existing or newly seeded as part of the works), treated to create weed free planting stations as described below. The programme for works should allow newly grassed areas to establish prior to planting where possible
- 7.4 Over the areas identified on the Landscape Design Drawings to be planted with hedges, transplants and shrubs within plots, and for individual trees, the Sub-contractor shall cut all grass and herbage to a height of between 50 and 75mm. All arisings to be removed off site unless agreed by EWR Alliance LCoW.
- 7.5 For transplants and shrubs in plot areas and individual tree stations, after raking aside any herbage arising from mowing, the Sub-Contractor shall create an area free of all live plant growth not less than 600 mm and not more than 800 mm in diameter at each plant station.
- 7.6 Over the lengths identified on the drawings as hedges the Sub-Contractor shall treat a strip 1.5m wide with an appropriate herbicide to kill all grass and herbs rooted in the strip.
- 7.7 On areas where the grass sward is not fully established hand-held tools only, and no vehicles whatsoever, shall be used. Such areas are to be agreed by the EWR Alliance LCoW and the Sub-Contractor.
- 7.8 The Sub-Contractor shall ensure that no residual herbicides are used in areas that may adversely affect the establishment of proposed or existing plants. No herbicide shall be used within any watercourse unless approved by the EWR Alliance LCoW.
- 7.9 Unless otherwise agreed by the EWR Alliance LCoW, the Sub-Contractor shall not commence any excavation or cultivation of the areas where herbicide has been applied until competing vegetation has been effectively controlled.

8. Topsoil

- 8.1 Topsoil for tree pits shall be equivalent to General Purpose Grade as defined in BS 3882, and can be reused from temporary stores created from construction excavations from the proposed works area.
- 8.2 Imported and site won topsoil shall comply with BS 3882 and additional requirements of this specification: -
 - It shall be good quality general-purpose grade topsoil

- It shall be genuine vegetable soil, free from chemical or other pollution, rubbish, brickbats, pests, perennial weeds and undecayed vegetative matter
 - It shall be of medium texture containing a high proportion of loamy material and free from subsoil
 - It shall have a pH of 6.0 – 7.5.
 - It shall be no more than slightly stony (1 – 5% stones by dry weight). Stones to be no larger than 50 mm in any one dimension.
- 8.3 Site won or imported topsoil shall be subject to analysis as outlined below.
- 8.4 Imported and site won subsoil for use as low nutrient substrate shall have the following specification: -
- It shall have a pH of 6.0 – 7.0
 - It shall have an organic matter content of 1% - 2%
 - It shall have a phosphorous content of <10mg/L

9. Subsoil Treatment

- 9.1 Where required by the EWR Alliance LCoW subsoiling shall be carried out as follows: -
- 9.2 A single tine ripper with two wings shall be drawn through the area of the planting plot at 750mm spacing and to a minimum depth of 450mm for light non-cohesive subsoil. For stiff clays and other cohesive subsoils, a single tine ripper shall be drawn to a depth of 450mm at 600mm spacing. A lightweight agricultural caterpillar tracked tractor shall be used for subsoiling operations.
- 9.3 This operation is to be carried out when the soil is in a dry condition in order to achieve maximum heave and efficient traction of the subsoiling machines.
- 9.4 The Sub-Contractor shall grade out areas of heave by a means as approved by the EWR Alliance LCoW and remove offsite to the Sub-Contractor's tip all stones and other material over 75mm in dimension and any other deleterious matter brought to the surface.
- 9.5 In relation to existing services and supplies the Sub-Contractor shall comply with any special requirements of Network Rail.

10. Final Preparation of Soils

- 10.1 Stripping, storage and deployment of soils shall be in accordance with the Soil Management Plan and associated drawings and specifications, and all Environmental Design drawings.
- 10.2 Topsoil (including that sourced from within the site) shall be in accordance with the requirements of **Paragraphs 8.1, 8.28.1, 8.4** and tested to determine the following: -
- pH
 - available P, K, Mg and micronutrients
 - soil texture and type
 - total N content
 - organic matter content
 - % stone content
 - electrical conductivity

- presence of copper, nickel, zinc, water-soluble boron, arsenic, cadmium, chromium, lead, Mercury.
- 10.3 Any consolidated material is to be broken up to 300 mm depth and the top 50 mm of all soil reduced to a tilth suitable for final shaping with a grading blade (particle size 10 mm and below). All undesirable material brought to the surface including stones larger than 50 mm in any dimension, roots, tufts of grass and foreign matter is to be removed.
- 10.4 When material is reasonably dry and workable it shall be graded in accordance with the Drawings.
- 10.5 Finished levels of material after settlement shall be at the same level as adjoining soil areas.
- 10.6 Once material has been spread and/or graded, the area shall not be traversed by machinery or used for storage purposes.
- 10.7 Where required, topsoil and low nutrient soils shall be spread evenly in areas and to the depths indicated in the Soil Distribution Plan or as instructed by the EWR Alliance LCoW. Attention shall be paid to areas of Woodland on low nutrient soils, where topsoil and compost shall only be incorporated at each planting station at a rate of 30 litres of topsoil to 10 litres of compost. Care shall be taken to ensure compost and topsoil is not spilt over surrounding areas of low nutrient substrate.
- 10.8 Spoil material can be retained on site (location of temporary storage areas to be agreed with the EWR Alliance LCoW before use) and used as fill material in proposed planting areas provided it has a minimum cover of 300mm topsoil where required. Spoil material containing more than 20% non-organic material or materials, which may adversely affect the establishment of the new vegetation, or objects greater than 50mm in any dimension shall NOT be suitable for use in planting areas. The use of any such material shall be reviewed by the EWR Alliance LCoW before approval. Any material used for this purpose without such approval shall be removed and replaced with suitable material at the Sub-Contractor's expense.

Species Rich Grassland, Marsh and Wet Grassland and Woodland on Low Nutrient Soils

- 10.9 Areas proposed for species rich grass (**Para. 26.1, Mix B**), marsh and wet grassland (**Para. 26.1, Mix C & D**) and woodland on low nutrient soils shall not be topsoiled, aside from soils applied to individual planting stations. The surface of the in-situ low nutrient substrate shall be cultivated to a depth of 50mm. This shall only be carried out in suitable weather conditions when the soils are workable and in accordance with the Landscape Design Drawings (Appendix E).

Conditions for Soil Spreading

- 10.10 Soil spreading shall be carried out in accordance with the Soil Management Plan or as instructed by the EWR Alliance LCoW, to ensure that works are only carried out under satisfactory soil conditions and soil is graded with a minimum of compaction. Forking or ripping of soils shall loosen any area that becomes unduly compacted. Soil spreading shall be suspended during prolonged periods of heavy rain; if the soil is waterlogged or if the formation grades are flooded.

Excavation into Hard Materials

- 10.11 The Sub-contractor may need to make allowance for excavating into hard materials; "hard material" is defined as material that requires the use of breakers or splitters for its removal.

11. Soils Contaminated During the Contract

- 11.1 Where the Sub-Contractor has contaminated the ground with cement slurry, oil, tar or any material harmful to plant life, soil shall be excavated to a depth of 1.0 m and removed off Site. Uncontaminated subsoil and topsoil shall be used for backfilling, to the finished profiles required under the Contract.

250/02 WEED CONTROL

12. General

- 12.1 For the duration of the Works, weed control shall be undertaken to maintain the 'Extent of Disturbance' free of weeds and competing vegetation at all times during the growing season (April – October). This shall include those weeds covered by the 1959 Weed Act and those invasive weeds covered by the Wildlife and Countryside Act 1981 as listed below: -
- Broad leafed dock.
 - Curled dock.
 - Common ragwort.
 - Creeping thistle.
 - Spear thistle.
 - Himalayan Balsam.
 - Giant hogweed.
 - Japanese knotweed.
- Other species which may be a nuisance locally that require control are listed below: -
- American Skunk Cabbage
- 12.2 Weed control shall be achieved by strictly controlled spot treatment of herbicides used as required by current legislation and no other broadleaved plants shall be killed as far as is practicable. Ragwort and other plants not killed by herbicide or as directed by the EWR Alliance LCoW must be pulled by hand and removed from site.
- 12.3 In particular, the Sub-Contractor shall ensure that weed control ensures that no species defined as 'weeds' or competing vegetation by this specification are allowed to set viable seed prior to removal. Should such seed be allowed to set the Sub-Contractor shall institute a regime to remove the weed and seed from the area concerned to the satisfaction of the EWR Alliance LCoW.
- 12.4 Weed control by hand pulling or cutting shall be carried out as and when required by the EWR Alliance LCoW.
- 12.5 All weed arisings shall be removed from site and disposed of in the appropriate manner, or as required by legislation.

13. Injurious Weeds

- 13.1 Sub-Contractor shall also ensure eradication of any species, not included in the list at **Clause 13.1**, which is considered by the EWR Alliance LCoW to be detrimental to the establishment or sustainability of the landscape or ecology measures for the scheme in any way. The Sub-Contractor shall submit a proposal for eradication to the EWR Alliance LCoW for approval prior to commencement of any work. An example list of species, but not limited to includes regeneration of: -

- Gorse
 - Bramble
 - Broom
 - Willow
- 13.2 Prior to and during the removal of any species the Sub-Contractor shall ensure that control measures are put in place to prevent any further spread of the plants by personnel or vehicles or by the method of removal. Areas containing the species should be clearly identified and cordoned off from access using high visibility materials.

14. Total Weed Control

- 14.1 Total weed control should be used on areas of hard standing, gravelled or paved areas beneath overbridges and around all street furniture (to a maximum of 300mm offset, for example, to traffic signs and crash barriers)
- 14.2 Total weed control by non-residual herbicide should be carried out in areas for site preparation (to areas proposed for grass seeding), to temporary topsoil heaps or in planting plots as identified on the Landscape Design drawings. The application should be applied in sufficient time for total weed control to have taken effect prior to planting.
- 14.3 Total weed control in the vicinity of watercourses (in existing open ditches, swales, filter drains and in the vicinity of drainage ponds) should only be carried out with the approval of the EWR Alliance ECoW, and only when vegetation growth poses a threat to the engineering function of the drainage feature.

15. Selective Weed Control in Grass

- 15.1 Selective control of broadleaved weeds should be carried out to all existing and proposed grass areas (only 6 months after initial sowing) within the 'Extent of Disturbance', a minimum of twice a year during periods of active growth.

16. Weed Control by Spot Application of Herbicide

- 16.1 Spot treatment with translocated herbicide should be carried out on all injurious weeds listed in **Para. 12.1** and the following perennial weeds, occurring in all existing and proposed grass areas within the 'Extent of Disturbance', as and when they appear: -
- Nettle (*Urtica dioica*)
 - Creeping buttercup (*Ranunculus repens*)
 - Couch grass (*Agropyron repens*)
 - Rosebay willowherb (*Epilobium angustifolium*)

17. Weed Control by Pulling/Hand weeding

- 17.1 Hand weeding shall be carried out within tube guards in all new planting areas to ensure nothing grows in the tube except the specimen plant.
- 17.2 Where weed growth cannot be effectively controlled by herbicide without risk of damage to wildflowers, the Sub-Contractor shall also carry out weed control by hand within wildflower grassland. Hand weeding in these areas shall be carried out as required to maintain the wildflower grassland with a weed free sward.

18. Weed Control by Cutting

- 18.1 Any areas identified as containing Japanese knotweed shall be fenced off to prevent trafficking and spread across the site. Japanese knotweed shall then be controlled by cutting with a follow up application of translocated herbicide poured directly down the top of the cut tube. Refer to 'Model Specification for Control of Japanese Knotweed' and Arboriculture Research Note 150/00 'Japanese Knotweed in Amenity Areas' as issued by the Arboricultural Advisory and Information Service. Eradication by a combination of cutting and herbicide may be specified by invoking several **Clauses** of **Section 250/02** together.
- 18.2 Any other weeds occurring within the 'Extent of Disturbance', which require control through cutting, shall be agreed with the LCoW prior to operations.

19. Arisings from Weed Control Operations

- 19.1 In areas of hard standing, once weed control operations have taken effect (a minimum of three weeks after the application of a translocated herbicide) the dead weeds shall be removed off site.
- 19.2 Where cutting operations are required during control of Japanese knotweed, in consultation with the EWR Alliance LCoW, all arisings shall be removed to a licensed tip in accordance with Part II of the Environmental Protection Act 1990.

250/03 HERBICIDES

20. Herbicides

- 20.1 All pesticides, methods of application, materials and tank mixes, methods of working, transportation, storage and records shall be strictly in accordance with current legislation and codes of practice. The Sub-Contractor shall make available to the LCoW, evidence of competency in the use of pesticides using the pro-formas included at Appendix A.
- 20.2 The herbicide shall be fit for the purpose for which they are intended. Only herbicides intended for horticultural applications (not agricultural applications) shall be used. All herbicide shall be used in strict accordance with the manufacturer's instructions.
- 20.3 Herbicides shall be stored in accordance with the manufacturers' instructions in tightly sealed and correctly labelled containers in a locked store, accessible only to authorised persons.
- 20.4 Water used for dilution of pesticides shall be from a clean supply.
- 20.5 On hardstandings, gravelled or paved areas and around street furniture, contact, translocated and residual herbicides approved for total weed control shall be applied in accordance with the manufacturer's instructions, at the locations and frequency stated in **Clause 14**.
- 20.6 Herbicide applied to weeds in or near waterbodies, including banks adjacent to open ditches, lagoons, watercourses and filter drains, shall be a contact or translocated herbicide approved for use in or near water. The herbicide shall be applied in accordance with the manufacturer's instructions and **should only be carried out with the approval of the EWR Alliance ECoW, and only when vegetation growth poses a threat to the engineering function of the drainage feature**.
- 20.7 Before each pesticide application near a watercourse, the Sub-Contractor shall notify the Environment Agency and obtain any necessary consent forms. The Sub-Contractor shall be responsible for the return of completed consent forms to the Environment Agency. Prior to commencement the Sub-Contractor shall publicise, in accordance with current regulations, that pesticides applications are to be undertaken.
- 20.8 Herbicides shall be approved by the Ministry of Agriculture, Fisheries and Food appropriate to the proposed use and recommended by English Nature. Herbicides to be used in the vicinity of a body of water shall be recommended by the Environment Agency. The choice of herbicide shall take proper regard of any necessity to consider the selective, or the toxic nature of such herbicides.
- 20.9 Herbicide: All chemicals used shall be non-toxic to human beings, birds and animals under normal use. Chemicals that are not on the current list of Agricultural Chemicals Approved Scheme shall not be used. Soil acting residual, contact and the translocated herbicides shall be applied as necessary to areas of hard surfacing. **Simazine and Atrazine SHALL NOT be used**.
- 20.10 All herbicides shall be securely and safely stored and transported. All used or partly used containers shall be removed from Site immediately after use. Application equipment and containers shall not be rinsed out on Site under any circumstances.
- 20.11 The Sub-Contractor shall ensure that all machinery and equipment used in the application of all herbicides is properly cleaned, maintained, serviced and repaired in accordance with the manufacturer's instructions to ensure correct application and to prevent malfunction and leakage at all times.
- 20.12 The herbicide is to be applied during the season and weather conditions favourable to the effective control of the targeted species. The method of application shall minimise spray drift. No pesticide shall be applied when wind speeds are high enough to cause spray drift. The Sub-Contractor shall postpone, cancel or suspend the application of pesticides at any time when it is considered that conditions have become unsuitable.

- 20.13 Areas specified to lie fallow between topsoiling and seeding shall be kept free of noxious and invasive weeds by use of systemic contact herbicides in accordance with **Clause 16**, or by hand weeding, taking special care to remove tap roots and other deep seated growth. Fallow areas to be planted shall be kept weed free. All weeds on the areas to be landscaped shall be kept down during execution of the landscaping works and throughout the Defects Correction Period, see **Clause 12**.
- 20.14 Application of herbicides shall be confined to the areas approved by the EWR Alliance LCoW and/or ECoW. Spillage or spray drift of the material on to the site staff, Sub-Contractors, members of the public, crops, livestock, neighbouring property, Sites of Special Scientific Interest, conservation areas, or any watercourse shall be prevented.
- 20.15 Herbicides shall not be applied in wet or windy conditions, nor stored or mixed in the vicinity of any watercourse or other body of water. Upon completion of weed killing operations, all herbicide materials surplus to requirements and contaminated equipment shall be removed from the Site and disposed of in accordance with the herbicide manufacturer's recommendations.

250/04 FERTILISERS

21. Fertilisers

- 21.1 Where specified in **Clause 25**, a pre-seeding granular fertiliser shall be used. The rate of incorporation during the final cultivation should be 70gms/m² or as proposed by the Sub-Contractor and approved by the LCoW.
- 21.2 Where specified in **Clause 66**, slow-release fertiliser shall be used. The fertiliser shall be thoroughly and evenly mixed with the pit backfill or into the top 75 mm of planting bed soil, or scattered over an area 600 mm in diameter around the planting position, at the rates specified in **Para. 66.3**.
- 21.3 To each bare root and container grown trees and shrub station, the Sub-Contractor shall supply and incorporate a slow release fertiliser in accordance with horticultural best practice and manufacturer's guidance as approved by the EWR Alliance LCoW.
- 21.4 Before the sowing of grass seed or in advance of the laying of any turfs, the topsoil after spreading shall be treated with fertiliser at a rate in accordance with the manufacturer's recommendations. The fertiliser shall be a compound containing not less than:-
- 10% nitrogen
 - 15% phosphoric acid
 - 10% potash
 - Or other similar composition, to be approved by the EWR Alliance LCoW.
- 21.5 Fertilisers shall not be spread when the ground is saturated and run off will occur, when heavy rainfall is expected, in the vicinity of watercourses, or in a designated nitrate sensitive zone.

250/05 SOIL AMELIORANTS

22. Compost

- 22.1 Planting compost shall be incorporated into the backfill or cultivated soil during cultivation at the following rates: -
- Large trees: In lower 200mm of arisings at 80 litres per pit
 - Transplants and container grown trees and shrubs: 10 litres per pit
 - Hedge lines: 1 part compost to 3 parts soil (assuming topsoil is at 300m depth)
- 22.2 Planting compost shall be peat-free organic composted material graded <25mm and free from non-biodegradable material or contamination of any kind. Planting compost shall have an analysis of: -
- pH 6-7.5
 - Conductivity 600-3000 us/cm
 - Available Nitrogen as NO 35-300mg/1 Available
 - Phosphorous as P205 75-250mg/1
 - Available Potassium as K2010 1500mg/1 Available
 - Magnesium as Mg 75-400mg/1
- 22.3 Testing for pH, conductivity and volume shall be in accordance with the methods listed in BS 4156: 1990. The compost shall be sterilised and supplied by a reputable source approved by the LCoW. The Sub-Contractor shall supply the EWR Alliance LCoW with a certificate to prove that the compost has been sterilised. The compost shall have a COSHH Certificate.

23. Other Ameliorants

- 23.1 Anti-transpiration sprays, root dips, anti-desiccant soil additives or other forms of anti-desiccants, as agreed with the LCoW, shall be used for all woody plant material, in accordance with **Clause 53**.

251 GRASS SEEDING AND TURFING

251/01 PERFORMANCE SPECIFICATION FOR GRASS SEEDING

24. Season

- 24.1 All new trees and shrubs shall be planted into an established sward where possible and seeding operations shall be programmed accordingly.
- 24.2 Seeding for general grass shall be carried out in the months of September - October or March - May inclusive.
- 24.3 Wildflower grassland shall be sown in the months of April - May and August - October inclusive or in accordance with any special requirements outlined in the relevant Ecological Management Plan. Ecological Management Plans are currently being compiled and will be regularly updated through the project, request latest Plan before commencement of work.

251/02 AREAS TO BE SEEDED

25. Final Cultivations

- 25.1 Details of areas to be seeded comprise the following:
- 25.2 Areas identified Open Grassland - new verge areas within the rail corridor, visibility splays, most areas of woodland planting and all other grass areas with no other ecological or landscape designation are to be sown with general low maintenance grass mix, Emorsgate EM1 or similar approved, as detailed in the Landscape Schedules.
- 25.3 Areas indicated as Wildflower Grassland - to be achieved sowing a mix of wildflower and low vigour grass seed, Emorsgate EM4 or similar approved, as detailed in the Landscape Schedules and the relevant Ecological Management Plan.
- 25.4 Areas indicated as Marsh and Wet Grassland - to be achieved by sowing a marsh and wet grassland mix of wildflower and low vigour grass seed, Emorsgate EM8 or similar approved, as detailed in the Landscape Schedules and the relevant Ecological Management Plan.
- 25.5 Compensatory Flood Storage Areas shall be seeded with a Wet Grassland mix of grass seed, Emorsgate EG8 or similar approved, as detailed in the Landscape Schedules and any relevant Ecological Management Plans.
- 25.6 Areas of agricultural reinstatement shall be seed with Meadow Grassland mix of grass seed, Emorsgate EG4 or similar approved, as detailed in the Landscape Schedules.
- 25.7 Areas identified on the Landscape Drawings to be seeded, the upper 50mm of substrate shall be reduced to a fine tilth before seeding.
- 25.8 Where a partial sward already exists, the Sub-Contractor shall scarify the ground by mechanical means to a depth of 25 mm so that the thatch is broken up creating a proportion of expose soil of 15-20%, to provide sufficient tilth for the germination of the seeds, but also to allow the established grass sward to

remain viable. Arisings shall be removed off Site to the Sub-Contractor's tip. The method employed shall avoid the uprooting of desirable vegetation such as fine grasses. A sample area treatment shall be carried out to the EWR Alliance LCoW's approval prior to the remainder being scarified.

- 25.9 Seeding operations shall not take place until the final cultivation / scarifying operation has the written approval of the EWR Alliance LCoW.
- 25.10 For all areas to be seeded all rubbish, debris, stones over 50mm, weeds, roots etc brought to the surface during cultivation /scarifying shall be removed from site to the Sub-Contractor's tip. Edges of newly worked areas shall be married into existing landscape areas with no debris spilt onto surrounding ground.
- 25.11 A pre-seeding granular fertiliser shall be used to all areas of Open Grassland, but **not** to areas designated for Wildflower Grassland, Marsh and Wet Grassland or Wet Grassland mix or on areas of existing topsoil taken from former agricultural land. The rate of incorporation during the final cultivation should be 70gms/m² or as proposed by the Sub-Contractor and approved by the EWR Alliance LCoW.
- 25.12 Marking and setting out shall be carried out in accordance with the EWR Alliance specified standards and procedures. At the time of compiling this specification setting out procedures and standards were being produced. Sub-Contractor to obtain the Alliance standards or seek instruction before commencement of setting or marking out.

251/03 SEED MIX

26. Seed Mix

- 26.1 Seed mixes used shall be as specified on the Landscape Drawings and Schedules and as listed below. Note during some years the seed mix availability will change slightly. If availability of some species is limited obtain approval from ecology before ordering seed.

Table 26.1 MIX A - OPEN GRASSLAND (EM1 OR SIMILAR APPROVED)

Wild Flowers		
%	Latin name	Common name
1	<i>Achillea millefolium</i>	Yarrow
5	<i>Centaurea nigra</i>	Common Knapweed
1	<i>Daucus carota</i>	Wild Carrot
4	<i>Galium verum</i>	Lady's Bedstraw
0.5	<i>Leucanthemum vulgare</i>	Oxeye Daisy
2	<i>Poterium sanguisorba</i> - (<i>Sanguisorba minor</i>)	Salad Burnet
1	<i>Prunella vulgaris</i>	Selfheal
3	<i>Ranunculus acris</i>	Meadow Buttercup
0.5	<i>Rumex acetosa</i>	Common Sorrel
2	<i>Silene dioica</i>	Red Campion
20		
Grasses		
%	Latin name	Common name
8	<i>Agrostis capillaris</i>	Common Bent
40	<i>Cynosurus cristatus</i>	Crested Dogstail
28	<i>Festuca rubra</i>	Slender-creeping Red-fescue
4	<i>Phleum bertolonii</i>	Smaller Cat's-tail
80		

Table 26.2: MIX B - WILDFLOWER GRASSLAND (EM4 OR SIMILAR APPROVED)

Wild Flowers		
%	Latin name	Common name
0.5	<i>Achillea millefolium</i>	Yarrow
2	<i>Betonica officinalis</i> - (<i>Stachys officinalis</i>)	Betony
3.5	<i>Centaurea nigra</i>	Common Knapweed
1	<i>Filipendula ulmaria</i>	Meadowsweet
2.5	<i>Galium verum</i>	Lady's Bedstraw
0.4	<i>Lathyrus pratensis</i>	Meadow Vetchling
0.5	<i>Leucanthemum vulgare</i>	Oxeye Daisy
0.5	<i>Lotus corniculatus</i>	Birdsfoot Trefoil
1	<i>Plantago lanceolata</i>	Ribwort Plantain
1	<i>Primula veris</i>	Cowslip
1	<i>Prunella vulgaris</i>	Selfheal
2	<i>Ranunculus acris</i>	Meadow Buttercup
2	<i>Rhinanthus minor</i>	Yellow Rattle
1.4	<i>Rumex acetosa</i>	Common Sorrel
0.4	<i>Silaum silaus</i>	Pepper Saxifrage
0.2	<i>Silene flos-cuculi</i> - (<i>Lychnis flos-cuculi</i>)	Ragged Robin
0.1	<i>Trifolium pratense</i>	Wild Red Clover
20		
Grasses		
%	Latin name	Common name
10	<i>Agrostis capillaris</i>	Common Bent
2	<i>Alopecurus pratensis</i>	Meadow Foxtail (w)
2	<i>Anthoxanthum odoratum</i>	Sweet Vernal-grass (w)
1	<i>Briza media</i>	Quaking Grass (w)
36	<i>Cynosurus cristatus</i>	Crested Dogstail
24	<i>Festuca rubra</i>	Slender-creeping Red-fescue
1	<i>Hordeum secalinum</i>	Meadow Barley (w)
4	<i>Phleum bertolonii</i>	Smaller Cat's-tail
80		

Table 26.3: MIX C - MARSH & WET GRASSLAND (EM8 OR SIMILAR APPROVED)

Wild Flowers		
%	Latin name	Common name
0.5	<i>Achillea millefolium</i>	Yarrow
0.2	<i>Achillea ptarmica</i>	Sneezewort
1	<i>Betonica officinalis</i> - (<i>Stachys officinalis</i>)	Betony
2.5	<i>Centaurea nigra</i>	Common Knapweed
2	<i>Filipendula ulmaria</i>	Meadowsweet
1.5	<i>Galium verum</i>	Lady's Bedstraw
0.4	<i>Geum rivale</i>	Water Avens
0.5	<i>Leucanthemum vulgare</i>	Oxeye Daisy
0.6	<i>Lotus pedunculatus</i>	Greater Birdsfoot Trefoil
1	<i>Plantago lanceolata</i>	Ribwort Plantain
1	<i>Primula veris</i>	Cowslip
1	<i>Prunella vulgaris</i>	Selfheal
2	<i>Ranunculus acris</i>	Meadow Buttercup
1.5	<i>Rhinanthus minor</i>	Yellow Rattle
1	<i>Rumex acetosa</i>	Common Sorrel
2	<i>Sanguisorba officinalis</i>	Great Burnet
0.5	<i>Silaum silaus</i>	Pepper Saxifrage
0.2	<i>Silene flos-cuculi</i> - (<i>Lychnis flos-cuculi</i>)	Ragged Robin
0.6	<i>Succisa pratensis</i>	Devil's-bit Scabious
20		
Grasses		
%	Latin name	Common name
10	<i>Agrostis capillaris</i>	Common Bent
2	<i>Alopecurus pratensis</i>	Meadow Foxtail (w)
2	<i>Anthoxanthum odoratum</i>	Sweet Vernal-grass (w)
2	<i>Briza media</i>	Quaking Grass (w)
32	<i>Cynosurus cristatus</i>	Crested Dogstail
1	<i>Deschampsia cespitosa</i>	Tufted Hair-grass (w)
24	<i>Festuca rubra</i>	Slender-creeping Red-fescue
1	<i>Hordeum secalinum</i>	Meadow Barley (w)
6	<i>Schedonorus pratensis</i> - (<i>Festuca pratensis</i>)	Meadow Fescue (w)
80		

Table 26.4: MIX D - WET GRASSLAND (EG8 OR SIMILAR APPROVED)

Grasses		
%	Latin name	Common name
12.5	<i>Agrostis capillaris</i>	Common Bent
2.5	<i>Alopecurus pratensis</i>	Meadow Foxtail (w)
2.5	<i>Anthoxanthum odoratum</i>	Sweet Vernal-grass (w)
2.5	<i>Briza media</i>	Quaking Grass (w)
40	<i>Cynosurus cristatus</i>	Crested Dogstail
1.25	<i>Deschampsia cespitosa</i>	Tufted Hair-grass (w)
30	<i>Festuca rubra</i>	Slender-creeping Red-fescue
1.25	<i>Hordeum secalinum</i>	Meadow Barley (w)
7.5	<i>Schedonorus pratensis</i> - (<i>Festuca pratensis</i>)	Meadow Fescue (w)
100		

Table 26.5: MIX E - MEADOW GRASSLAND (EG4 OR SIMILAR APPROVED)

Grasses		
%	Latin name	Common name
12.5	Agrostis capillaris	Common Bent
2.5	Alopecurus pratensis	Meadow Foxtail (w)
2.5	Anthoxanthum odoratum	Sweet Vernal-grass (w)
1.25	Briza media	Quaking Grass (w)
45	Cynosurus cristatus	Crested Dogstail
30	Festuca rubra	Slender-creeping Red-fescue
1.25	Hordeum secalinum	Meadow Barley (w)
5	Phleum bertolonii	Smaller Cat's-tail
12.5	Agrostis capillaris	Common Bent
100		

- 26.2 The Sub-Contractor shall supply to the EWR Alliance LCoW certification for provenance, germination and purity of seed not more than six months prior to sowing, together with the names of the varieties used in the mixture. The information on seed certificates and seed bag labels shall correspond.
- 26.3 Seed shall be certified under EEC regulations, of British origin and local provenance from local sources if available. Grass seed shall have a certified germination of not less than 10% and a certificate of purity of not less than 90%.
- 26.4 Total weed seed and other crop seed content shall not be more than 1%.
- 26.5 All seed is to be delivered to site in the original bags, unopened, and inspected by the EWR Alliance LCoW prior to use, with sufficient notice provided to EWR Alliance LCoW to enable works to proceed on programme.
- 26.6 The Sub-Contractor shall provide fresh grass seed for each season throughout the Contract Period.

27. Unobtainable Stocks

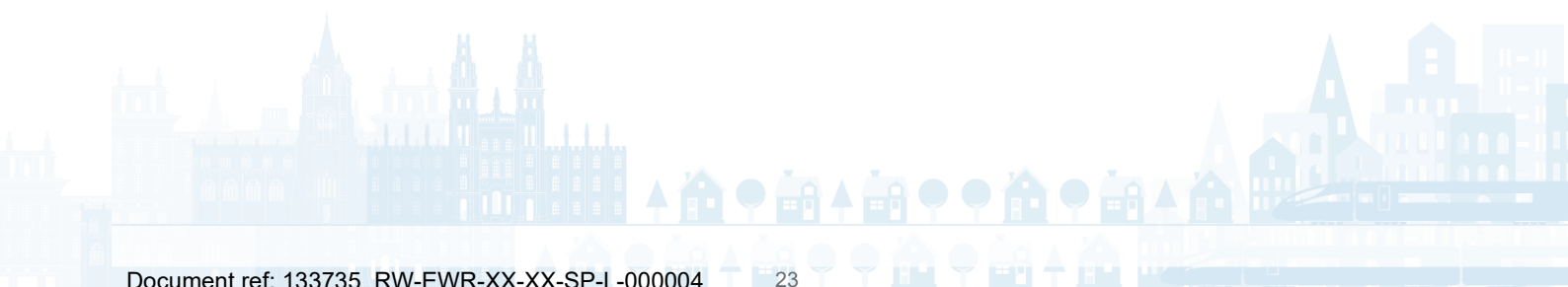
- 27.1 If the Sub-Contractor, having used his best endeavour, cannot obtain seed mixes of the species or percentages specified in the Landscape Schedules but can obtain suitable alternative seed species or mixes, the Sub-Contractor shall give written notice to the EWR Alliance LCoW stating the details of the suggested alternative(s). Such notice shall be given not later than 3 weeks after the EWR Alliance LCoW's order to commence the Works to enable the EWR Alliance LCoW to consider and if necessary give effect to any change which may be required and to avoid delay in the performance of the Sub-Contractor's obligations under the Contract.

251/04 SEED IMPREGNATED MATTING FOR EARTH

WALLS

28. Seed Impregnated Matting for Earth Walls

28.1 Section 251/04 shall not apply to this contract.



251/05 STORAGE OF GRASS SEED

29. Storage of Seed

- 29.1 All seed is to be delivered to site in the original bags, unopened, and inspected by the EWR Alliance LCoW prior to use, with sufficient notice provided to EWR Alliance LCoW to enable works to proceed on programme.
- 29.2 The Sub-Contractor shall provide fresh grass seed for each season throughout the Contract Period.
- 29.3 Seed shall be stored on or off site in a cool dry location protected from adverse weather conditions in a vermin proof building and out of direct sunlight. The storage time of seed shall not exceed 12 months.



251/06 SOWING

30. Conventional Sowing

- 30.1 Conventional seeding shall be used in the locations where side slopes are gentler than 1:3, or where hydraulic seeding is not possible, and shall be agreed with the EWR Alliance LCoW prior to commencement of seed application.
- 30.2 All seed mixes shall be sown at the rates listed in the Landscape planting Schedules.
- 30.3 Sowing shall be carried out by evenly distributing the seed at the rates listed in the Landscape Planting Schedules.
- 30.4 Sowing shall be immediately followed by lightly raking the surface of the soil to cover the seeds, by use of a chain harrow or other suitable plant.

31. Hydraulic Seeding

- 31.1 Hydraulic seeding shall be used (where possible) on all cuttings and embankments steeper than 1:3 and shall be agreed with the EWR Alliance LCoW prior to commencement of seed application.
- 31.2 All seed mixes shall be combined with a coloured carrier to be approved by the EWR Alliance LCoW and sown at the rates listed in the Landscape planting Schedules.
- 31.3 Where the side slopes exceed a gradient of 1:3, all seed mixes shall be combined with a coloured carrier to be approved by the EWR Alliance LCoW and then mixed with a suitable product for bank stabilisation (such as Hydra CX or similar approved) and sown at rates to be approved by the EWR Alliance LCoW.
- 31.4 The mixtures shall be kept constantly stirred during application to maintain a homogenous slurry.

32. Grass Seed Germination

- 32.1 The seeding shall be repeated as necessary until an evenly distributed dense sward is established over the seeded area. The Sub-Contractor shall allow for maintenance of all grass areas in accordance with Section 253 until this has been achieved. Establishment shall be regarded as achieved when at least 80% of quadrant sub-divisions are recorded as 'filled' when tested in accordance with Annex A3 of BS 3969.

251/07 TURFING

33. Turfing

- 33.1 Turfing shall be carried out in accordance with BS 3969 and BS 4428.
- 33.2 When it is stated on the Landscape Drawings that turf arising on Site shall be used, such turf shall be stripped as follows:
- Grass shall be mown before lifting to no more than 35 mm high.
 - Turves shall be cut using plant or tools designed for the purpose
 - Turves shall not be cut from soil that is frozen, waterlogged, or excessively dry.
 - Turves shall be of uniform thickness, in accordance with BS 3969.
 - Turves shall be rectangular, with the shorter sides not less than 300 mm.
- 33.3 Where stated on the Landscape Drawings, imported turf shall be used. All imported turf shall comply with BS 3969 and BS 4428. Imported turf shall contain the grass and/ or herb mixture stated in **Clause 26**, above.
- 33.4 The source of turf shall be notified in writing to the EWR Alliance LCoW and a sample of not less than 6 no. 300 mm x 300 mm turves provided for approval in accordance with this Specification, not less than one week prior to commencement of turfing.
- 33.5 Imported turf shall be delivered to the Site within 24 hours of lifting. Care shall be taken in transport to avoid deterioration due to inadequate covering or overheating.
- 33.6 Turf shall be laid within 18 hours of delivery between 1 April and 30 September and within 24 hours of delivery between 1 October and 31 March. If this is not possible, turf shall be temporarily laid flat on topsoil and kept moist.
- 33.7 Turves shall not be stored in stacks over 1.4 m in height.
- 33.8 Turf shall be laid on soil that is moist but not frozen or waterlogged. Turf shall not be laid during periods of drought or onto soil that is excessively dry, or during heavy rainfall.
- 33.9 Turf shall be placed working from planks laid on previously laid turves.
- 33.10 Turf shall be laid to a bond with broken joints, butted up with joints no wider than 10 mm. When laid on slopes, the bond shall be laid diagonally across the slope.
- 33.11 Levels shall be adjusted by raking out or infilling with fine soil under the turves. When laid, turf shall be lightly tamped in place with clean wooden beaters. The use of rollers shall not be permitted.
- 33.12 After laying turf the surface shall be dressed with finely sifted topsoil/sand which shall be brushed in to completely fill all joints
- 33.13 Whole turves shall be used at edges and trimmed to a clean line. Turf shall be neatly cut away to a diameter of 800 mm around individual trees
- 33.14 If required by the EWR Alliance LCoW for turf laid on a slope, turf shall be secured in position using either
- Softwood pegs, 200 mm long x 25 mm square; or
 - Galvanised wire pins, 200 mm long x 4 mm diameter, bent or hairpin pattern.

- 33.15 Turfed areas shall be watered at a rate of 15 L/m², immediately after laying and in accordance with **Clause 34**.
- 33.16 Newly sown or turfed grass shall be watered as necessary to ensure establishment. When grassed areas require irrigation, water shall be applied at the rate of 15 l/m² using low pressure hose sprinkler or spray evenly over the entire area.

251/08 WATERING OF SEEDED AREAS AND NEW LAID

TURF

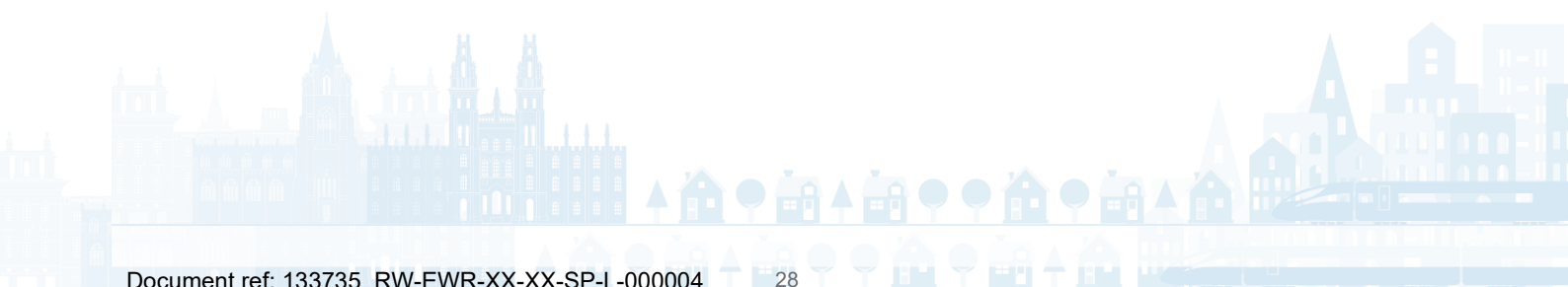
34. Watering of seeded areas and new laid turf

- 34.1 The Sub-Contractor shall ensure that there is no delay in the execution of watering by obtaining all necessary licences and permissions from water companies for the efficient execution of watering on any particular Site including stand pipes, pressure reducing valves, hoses, bowsers, pumps, sprinklers and ascertaining the availability of second class water from sewage works or other approved sources in the event of a Hose Pipe Ban.
- 34.2 The Sub-Contractor shall water all planting undertaken under the Contract, in accordance with this Clause, at the frequency necessary to ensure establishment and survival, until all planting works are completed.
- 34.3 Where required, additional watering shall be instructed by the EWR Alliance LCoW during periods of abnormally dry weather. When instructed, water shall be applied to grassed areas at the rate of 15 L/m² using low pressure hose sprinkler or spray evenly over the entire area.
- 34.4 Watering should be carried out with sprinklers, perforated hose pipes or oscillating sprays to avoid washing soil out of the joints. It is essential that turves should not be allowed to dry out, and that water penetrates into the underlying topsoil. If shrinkage occurs any open joints should be filled with fine topsoil or compost brushed in and subsequently well-watered. Special care is needed on banks.
- 34.5 Watering of grass, shrubs, hedges and trees shall be temporarily suspended in areas where ponding occurs or where there is a risk of surface run-off. Once any surface water has soaked away, repeated applications shall be applied until the watering operation has been completed.
- 34.6 Any damage caused as a result of watering operations shall be reinstated. Following watering areas shall be left even and all plants firm and root systems not exposed. Particular care shall be taken not to damage plants when handling hoses in planted areas. Displacements of grass seed or turfs occurring as a result of artificial watering or from the incidence of storms, including the formation of runnels and the resulting dry course shall be made good and re-seeded.

251/09 REPLACEMENT OF TURF AND RE-SEEDING

36. Grass Seed Germination

- 36.1 The seeding shall be repeated as necessary until an evenly distributed dense sward is established over the seeded area. The Sub-Contractor shall allow for maintenance of all grass areas in accordance with Section 253 until this has been achieved. Establishment shall be regarded as achieved when at least 80% of quadrant sub-divisions are recorded as 'filled' when tested in accordance with Annex A3 of BS 3969.
- 36.2 Humps or depressions appearing after sowing of grass seed shall be levelled or filled with fresh topsoil and re-seeded.



252 PLANTING OF SHRUBS AND TREES

252/01 PERFORMANCE SPECIFICATION FOR SHRUBS

37. General

37.1 The performance objective for this contract shall be to prevent any damage to all new areas of planting from animals, including rabbits and deer, for the duration of the works. Rabbits are known to be active on site, in particular within existing hedgerows and areas of established woodland and scrub adjacent to the scheme. The Sub-Contractor shall be responsible for identifying any areas of planting subject to potential rabbit or deer damage and providing suitable control.

38. Control Operations

38.1 Bramble and herbage shall be cut to facilitate rabbit and deer control where it is considered necessary to do so and only with the approval of the EWR Alliance LCoW. Arisings shall be disposed off site.

38.2 Control measures shall include:

- Installation and maintenance of fences, shelters or guards as described in the Contract.
- Any other measures considered necessary by the Sub-Contractor or the EWR Alliance ECoW subject to approval by the EWR Alliance LCoW.

39. Rabbit and Deer Control within the Rail Corridor

39.1 The means by which new planting is effectively protected is for the Sub-Contractor to determine. The requirement for individual plant protectors should be noted and these may be considered to have a double function as rabbit and deer protection. The Sub-Contractor shall maintain these throughout the duration of the contract. It should also be noted that the use of spiral and open net guards is not acceptable.

39.2 For the duration of the contract the EWR Alliance LCoW will inspect the site together with a representative of the Sub-Contractor at regular intervals to monitor animal activity and agree whether effective control has been achieved. Within the Sub-Contractor's monthly Inspection Reports the effectiveness of rabbit and deer control should be reported.

40. Clearance of Rabbit and Deer in Fenced Areas to be Planted

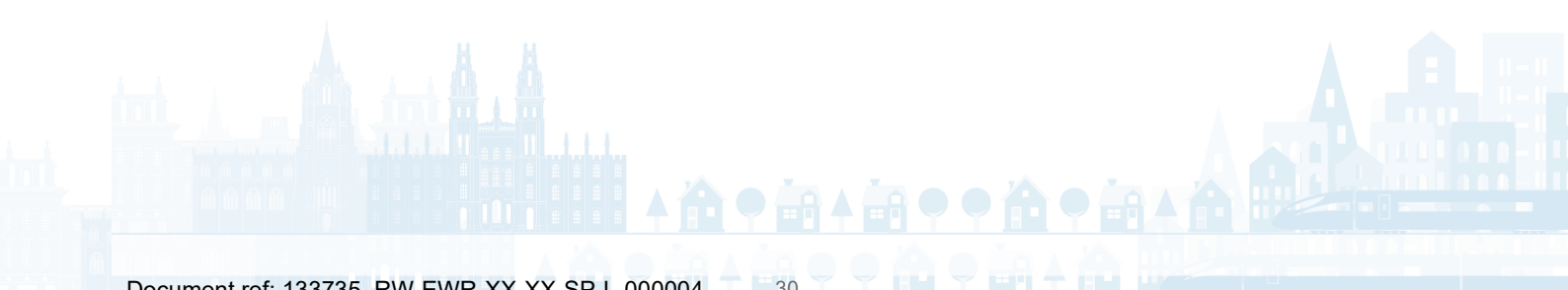
40.1 Should EWR ALLIANCE choose to protect areas of planting through the use of additional fencing, the Sub-Contractor shall agree the type of fencing to be installed with the EWR Alliance LCoW. The Sub-Contractor shall control rabbits and deer within fenced areas in accordance with **Paragraphs 39.1 and 39.2**

40.2 Any rabbit burrows located within fenced enclosures for planting shall be cleared of all rabbits and all exit/entry holes effectively blocked immediately after completing the fencing of each enclosure, in accordance with the requirements shown on the Landscape Design Drawings (Appendix E).

40.3 Unless otherwise instructed by the Overseeing Organisation, the Sub-Contractor shall not plant any area until all rabbits and deer have been cleared from the fenced enclosure.

41. Replacement of Plants Damaged by Animals

- 41.1 For the duration of the Works the Sub-Contractor shall replace and maintain at his expense any plant material damaged by rabbits or deer due to the failure of the Sub-Contractor to correctly install and/or maintain any fences, shelters or guards as described in this specification in accordance with **Clause 50**.
- 41.2 Replacement plants shall be planted in accordance with **Clauses 61 to 66** and maintained in accordance with **Section 253** MAINTENANCE OF LANDSCAPED WORKS. Any damaged plants shall be replaced in the next planting season and shall be maintained until the end of the aftercare period.



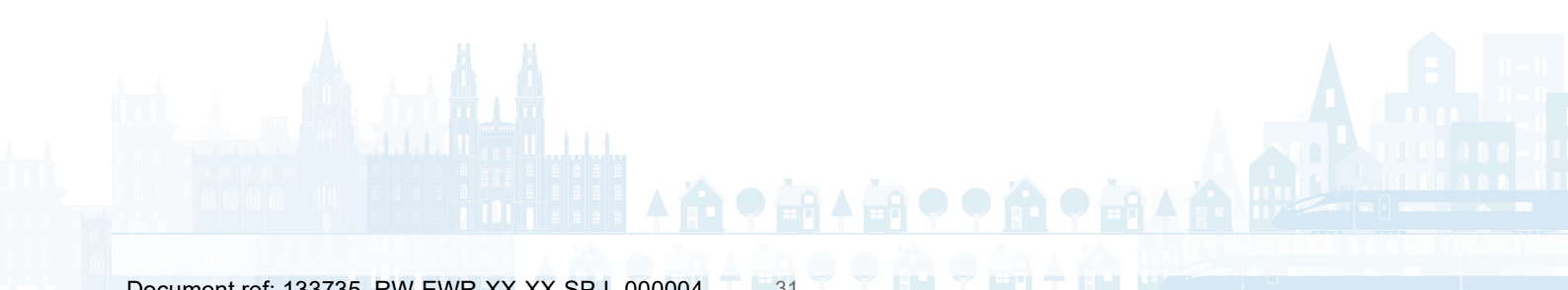
252/02 FUNCTION OF SHRUBS

43. Function of Shrubs

43.1 The function of the shrubs planted within the EWR Phase 2 Scheme will have, once established, various functions including:

- Provision of ecological habitat required to compensate for the removal of vegetation required to be removed as a consequence of construction.
- To provide a green corridor of vegetation along the scheme which will:
 - Screen certain views of the railway from sensitive receptors
 - Soften the structure of the railway and contribute to assimilation of the scheme into the landscape.
 - Provide foraging and commuting routes for wildlife.
 - Provide visual context to structures and features such as PROW

43.2 Shrubs are specified to form hedges and areas of scrub planting. Spacing, species mixes and maintenance varies in order to create the required effect for specific locations. Details of the specific treatment is specified on the Landscape Detail drawings (Appendix E), Planting schedules, Planting Specification and Maintenance and Management plan for each area.



252/03 SHRUBS

and

252/04 TREES

44. Trees, Shrubs and Hedging Plants

- 44.1 Plants shall have been grown in accordance with the requirements of the Landscape Schedules and this Specification.
- 44.2 Local gene provenance is required for transplant tree, shrub and hedging material used on this project and all plants. Provenance shall be:
- preferably seed collected from local sources where possible
 - seed from Forestry Commission Areas 402 and 405
 - Where the seed origin of native plant species is required to be of specific provenance, the provenance shall be determined and described in accordance with Forestry Commission Practice Note 8: Using Local Stock for Planting Native Trees and Shrubs. Written evidence of its provenance shall be provided to the Overseeing Organisation prior to planting, using the Provenance Certificate pro-forma in Appendix C. Plant material shall comply with any other special provenance requirements stated in the scheme planting schedules.
- 44.3 Written evidence of provenance in accordance with the requirements of this specification shall be provided to the EWR Alliance LCoW prior to delivery of plant material to site, using the Provenance Certificate proforma at Appendix C.
- 44.4 Tree and shrub plant material from other than British origin shall not be acceptable under any circumstances.
- 44.5 The Sub-Contractor shall ensure that all species-specific procurement requirements are considered in order that the programme is met, and material can be supplied to the species, age, size and condition stated in Landscape Drawings and Schedules.
- 44.6 Where stocks are unobtainable, the species of trees and shrubs used as substitutes shall be approved by the EWR Alliance LCoW before bringing to site in accordance with **Para. 55.2**.

252/05 TREE STAKES

45. Stakes and Ties

- 45.1 Each standard or feathered tree shall be fitted with a stake which shall be round timber, peeled of bark, straight in length and free of snags, pests and diseases. Stakes shall have a top diameter of 50-75 mm.
- 45.2 All adjustable tree ties, strapping or spacers shall be made of black PVC or reinforced rubber. The width of the belt shall be 25 mm.
- 45.3 Stakes for all standards and feathered trees shall be firmly driven at a 45° angle and positioned into the tree planting pit before planting to a minimum depth of 300 mm below the bottom of the pit. The stake shall be positioned off centre on the prevailing windward side of the tree as near to the tree as possible but shall not interfere with the free movement of the branches and shall cause no rubbing.
- 45.4 The Sub-Contractor shall use the shortest possible stake to support the tree; when the stake has been driven into the ground there shall be not more than one third of the height of the clear stem of the tree above ground.
- 45.5 For all standards and feathered trees, one tie shall be used for each tree, fixed within 50 mm of the top of the stake and secured to the stake with a 25 mm galvanised clout nail. Ties shall be of a size appropriate to the size of the tree and stake and equipped with spacers of a size that will ensure that the tree remains vertical.
- 45.6 Any damage to the trees caused by the Sub-Contractor during this operation may result in rejection of stock and replacement by the Sub-Contractor at his own expense.

252/06 MULCH

46. Ground Preparation

- 46.1 Over the areas identified on the Landscape Design drawings to be planted with hedges, the Sub-Contractor shall cut all grass and herbage.
- 46.2 Over the lengths identified on the drawings as hedges the Sub-Contractor shall treat a strip 1.5m wide with an appropriate herbicide to kill all grass and herbs rooted in the strip.
- 46.3 The Sub-Contractor shall ensure that no residual herbicides are used in areas that may adversely affect the establishment of proposed or existing plants. No herbicide shall be used within any watercourse unless approved by the EWR Alliance ECoW.

47. Organic Mulches and Individual Mulch Mats

- 47.1 Organic mulch and individual mulch mats shall not be used for this contract.

48. Sheet Mulch

- 48.1 Weed proof membrane shall be installed to the base all hedgerows only, in advance of planting operations.
- 48.2 Before application of any mulch the planting areas and/or tree positions which are to be mulched shall be free of grass and weed growth, as above.
- 48.3 Weed proof membrane shall be black in colour and shall be manufactured from woven or spun-bonded polypropylene weighing 100 to 110g/m² and shall contain an ultra-violet inhibitor.
- 48.4 Whip stock planting stations shall be cut into the membrane with a single lengthwise cut, max 250mm length, per planting station.
- 48.5 Standard trees planting stations shall be cut into the membrane with a crosscut to the centre of each station, max length 400mm each direction.
- 48.6 Note. Woven materials which fray shall not be cut on site unnecessarily. This includes cutting into the edge of the membrane to create plant stations as this will undermine the structural integrity of the membrane, reducing its effectiveness in weed suppression and moisture retention.
- 48.7 Edges of membrane shall be secured by proprietary plastic pegs manufactured for this purpose, driven through the mat to their full depth at the edges the membrane max 1200mm spacing, plus a peg to secure the overlapped slit and all corners/turns.

49. Sheet Mulch Collars

- 49.1 Sheet mulch collars shall not be used for this contract

252/07 TREE GUARDS

50. Tubes, Shelters/Guards and Ties

- 50.1 For all tree and shrub plant material and in accordance with the manufacturer's instructions the Sub-Contractor shall: -
- 50.2 Supply and fix to each *Quercus robur* transplant one 600mm high and 130-160mm internal diameter, as appropriate to the plant, wrap around guard of green plastic netting with light-degradable polythene film.
- 50.3 Supply and fix to all other tree species one 600mm high and 75mm internal diameter, wrap around guard of green plastic netting with light-degradable polythene film.
- 50.4 Supply and fix to all other shrub species one 600mm high and 130-160mm internal diameter, as appropriate to the plant, wrap around guard of green plastic netting with light-degradable polythene film.
- 50.5 Supply and fix to each large tree one 600mm high and 75-110mm internal diameter, as appropriate to the plant, wrap around guard of green plastic netting with light-degradable polythene film.
- 50.6 The guards described above shall be tubular with flared top and the polythene film ultra violet light degradable within five years. The shrub guard shall be supported by one wooden stakes all straight and in length 32 mm x 32 mm pressure treated sawn softwood minimum 900 mm long, fixed with two releasable ratchet ties fitted at height 200 and 400 mm.
- 50.7 The Sub-Contractor shall provide samples of guards specified and current copies of the manufacturers product specifications and fixing instructions to the EWR Alliance LCoW at least 7 days before use on site.

51. Temporary Protective Fence (Stock Proof Fence)

- 51.1 Unless otherwise stated temporary protective fence will be 1.2m high Post and wire fence with stock proof mesh fixed to it.
- 51.2 Stock proof fencing to be 1.2m high, in accordance with NR_L2_TRK_5100_3PSN revA Standard Detail with strained double twisted barbed wire to top straining wire. All to meet BS1722:2006.
- 51.3 Timber posts and struts to be supported in rammed backfill unless otherwise stated
- 51.4 Maintenance gates in to fenced areas are to be installed 1.2m tall, 1.1m wide, wooden construction hung with stock proof wire

252/08 LIFTING OF PLANTS AT NURSERY

and

252/09 HANDLING AND TRANSPORT

and

252/10 STORAGE OF PLANTS

52. Supply & Handling

- 52.1 The Sub-Contractor shall identify the nursery(ies) from which all plant material as identified in the Plant Schedules in this Specification are to be supplied in order that the EWR Alliance LCoW may carry out inspection and mark such stocks at the nursery should he so wish.
- 52.2 All trees and shrubs supplied for the Contract shall be supplied in accordance with the requirements of EWR Plant Schedules and shall comply with BS3936: Part1 to 10 as relevant, BS4043, The National Plant Specification, published by the Horticultural Trades Association. If plants grown in cells are required, the cells shall be designed for tree or shrub use and the plants shall be grown in open conditions for one growing season. Plants indicated as container grown shall have been so grown and shall be delivered to site complete with pots or containers. All container grown plants shall have been grown in their final pot size for 6 months prior to delivery or equivalent approved by the EWR Alliance LCoW.
- 52.3 Grafted stock shall not be permitted.
- 52.4 The Sub-Contractor shall make available samples of plants as specified in the Plant Schedules. Any stock rejected by the EWR Alliance LCoW as not meeting the required specification shall be replaced by stock identified for this Contract and from no other source.
- 52.5 The Sub-Contractor shall inform the EWR Alliance LCoW immediately of any deviation from the Specification of any planting stock supplied.

53. Lifting Packing, Handling and Storage

- 53.1 This section shall apply for lifting packing and handling all plants for this contract.
- 53.2 Plants shall be lifted, packed and handled in accordance with BS 3936, BS 4043 and the Horticultural Trades Association publication, the National Plant Specification, Section 10.2, Handling and Establishing Landscape Plants.
- 53.3 During the period subsequent to the receipt of the plants and prior to planting, the Sub-Contractor shall comply with the treatment of nursery stock specified below.
- 53.4 Plants to be supplied bare rooted shall have the soil carefully removed from the roots, which shall be dipped immediately in a root dip to prevent fungal contamination, packed with damp straw and wrapped and tied in hessian or plastic bags.
- 53.5 All bare rooted plant stock shall be treated with a mycorrhizal root dip prior to planting. Details of the root dip shall be advised to the EWR Alliance LCoW for approval and used in accordance with manufacturer's instructions.

- 53.6 Bare-root plants - Prior to despatch or on arrival at Site plants may be stored up to 3 days in bundles with a covering of freely draining moisture-retentive material such as wet sacking or straw which is moistened periodically. For a storage period of more than three days, bundles shall be opened, and the plants spread out and heeled into trenches in topsoil, minimum depth 300 mm, with the roots fully in contact with the soil.
- 53.7 Bare-root plants transported in plastic bags - Plants in bags shall be stored no more than one layer deep and be protected from direct sunlight at all times. Where delay of more than one day occurs, the bags shall be stored upright, not stacked, in a cool shady position or shed, or placed in a cold store. If cold store facilities are not available, plants shall be removed from bags and heeled into soil with all roots covered.
- 53.8 Container or cell grown plants - Containers shall be maintained upright, watered as required, sheltered and protected from frost, and shall not be packaged or stored more than one layer deep. Degradable pots, cells or root-trainers that may disintegrate in transit shall be enclosed in polythene film (250 gauge) and firmly secured.
- 53.9 Rootballed plants - Ball rooted plants shall be lifted only when the whole rootball is thoroughly moist so that the rootball can be lifted, wrapped and tied in hessian, and transported without damage to the roots or loss of soil. Permeable wrappings shall be kept moist by watering and plants in polythene wrappings protected from direct sunlight. For longer periods of storage, root-balls with permeable wrappings shall be placed on a well-drained surface and covered with a deep layer of sand, pulverised bark, wood shavings or other suitable material.
- 53.10 Protection from frost - When necessary, additional measures shall be undertaken to protect plants from frost.
- 53.11 The location for temporary storage shall be sheltered from winds and well drained.
- 53.12 All containers shall remain completely filled with compost. If up to 10% compost has been lost from containers at any stage, then further suitable moistened compost shall be added to completely cover the root systems and fill the containers. Any containers which have lost more than 10% compost shall be replaced. All containerised plants shall be thoroughly soaked prior to planting and all containers removed.
- 53.13 Any plants damaged by frost, desiccation, or in any other way prior to planting, shall be removed from site and replaced with new plants.
- 53.14 All other arisings from the planting including containers, wrappings, paddings, fastenings and bags shall be collected immediately by the Sub-Contractor and removed off Site.

252/11 PROGRAMMING OF PLANTS

54. Time of Planting

- 54.1 The time of planting for all categories shall take place during favourable weather and soil conditions, during the season stated below.
- 54.2 Bare rooted or root balled conifers or evergreens shall be planted during November or March. The planting season for all other bare-rooted and container grown tree and shrub plants shall be November to March inclusive.
- 54.3 All planting of wildflower plants shall be carried out during April or September.
- 54.4 Bulbs shall be planted between 15 September and 30 November.
- 54.5 The planting season for wetland plants is March to April.

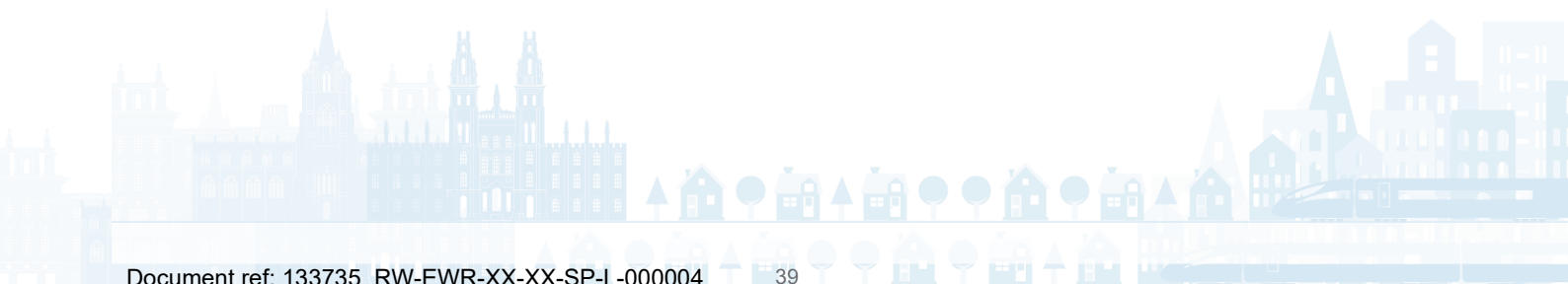
55. Unobtainable Stocks

- 55.1 If the Sub-Contractor, having used his best endeavour, cannot obtain seed or plants for such species as specified in the Plant Schedules but can obtain seed / plants of an acceptable alternative species or from an acceptable alternative source then the Sub-Contractor shall give written notice to the EWR Alliance LCoW stating the details of the suggested alternative, such notice shall be given not later than 3 weeks after the EWR Alliance LCoW's order to commence the Works to enable the EWR Alliance LCoW to consider and if necessary give effect to any change which may be required and to avoid delay in the performance of the Sub-Contractor's obligations under the Contract.
- 55.2 As soon as practicable after the receipt of any such notice the EWR Alliance LCoW shall, if he is satisfied that the Sub-Contractor has used his best endeavours to obtain the species described in the Contract and that they are not obtainable without undue delay shall either.
- Direct the Sub-Contractor to supply such species as described in the Contract at the billed rates.
 - Direct the Sub-Contractor to supply at billed rates species of a similar type to be agreed with the EWR Alliance LCoW.
 - Direct the Sub-Contractor to supply species other than those described in his said notice at a rate to be negotiated between the EWR Alliance LCoW and the Sub-Contractor.
- 55.3 All labels, canes and ties (except tree ties to staked trees) should be removed after planting and disposed of off site.

252/12 WEATHER CONDITIONS FOR PLANTING

56. Weather Conditions

- 56.1 The EWR Alliance LCoW may extend or reduce the periods outlined in **Clause 54** if the prevailing weather, the ground and conditions of plants are favourable or to accommodate particular plant species.
- 56.2 No planting or preparatory operations shall take place when the ground is frost bound, covered by snow, excessively wet or waterlogged.



252/13 SETTING OUT

57. Setting Out and Planting Areas

- 57.1 Plants shall be set out at the density and spacing listed on the Landscape Drawings and Schedules.
- 57.2 The species, size and location for planting of all trees be as shown on the contract drawings.
- 57.3 The Sub-Contractor shall mark the locations of services within or immediately adjacent to a planting area.
- 57.4 The Sub-Contractor shall mark out the position of fence, scrub planting, trees, hedges and protective fences in accordance with the requirements of the EWR Alliance standards. At the time of compiling this specification the setting out standards have not been published. Clarification of the requirements should be obtained from the EWR Alliance works project manager before mobilisation.
- 57.5 The following restrictions on all planting positions shall apply subject to the requirements of other relevant Clauses and the latest Statutory Undertaker guidance. As a guide: -

58. Utility Wayleaves

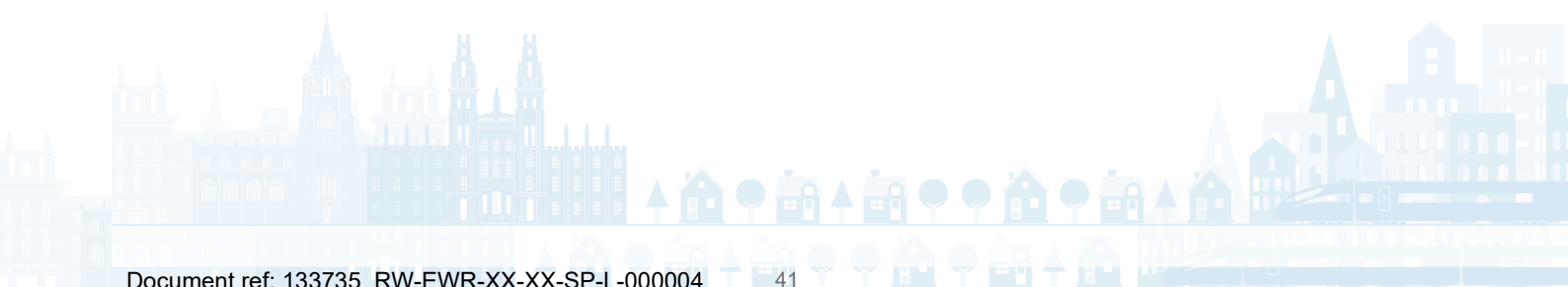
59. Gas Main (SGN)	No hedge position to be closer than 3m. Before planting at 3m Utility provider should be consulted. Hand excavation will be required at 3m from the pipeline.
Water and Sewer pipelines	No tree position to be closer than 5m No shrub position to be closer than 3.5m
Communication, Electricity, BT cables	No tree position to be closer than 2m No shrub position to be closer than 1.5m
Overhead power transmission line	Hedge lines may pass under powerlines when defining field boundaries. Only trees with mature height of less than 8m to be included in hedge below power lines. No tree position to be closer than 8.3 m to a pylon. Trees with mature height between 8m and 11m high can be planted between 8.3m and 12m from centre line of power lines. Trees with mature height between 12m and 19m high can be planted between 12m and 20.5m from centre line of power lines. Trees with mature height between 20m and 40m high can be planted 20.5m plus from centre line of power lines.

- 59.1 No tree or shrub planting, that is likely to reach a size of 250mm trunk girth or greater, shall be permitted within 7m of the track from the edge of the cess. No other shrub planting shall be permitted within 4m of the track from the back edge of the cess.
- 59.2 The edge of planting areas shall be set back a minimum of 1.5 metres from existing fence lines and banks of ditches. Where ditches require maintenance access the Sub-Contractor shall adjust planting distances as required.

60. Marker Posts for Planted Areas

- 60.1 All planting plots (or parts of plots) indicated on the Landscape Design drawings, which will not be enclosed by fencing, shall be marked out by permanent posts.

- 60.2 Marker posts shall be at least 1000 mm long and have a diameter of 50-75mm. The top 300 mm of each marker post shall be painted with a white waterproof paint. Where unpeeled stakes are used the top 300 mm shall be peeled before painting.
- 60.3 Marker posts shall be driven at least 500mm into the ground leaving 500mm above ground.
- 60.4 Posts shall be spaced at not more than 20m apart around the perimeter of the planted area and shall be located at all corners of over 15°.
- 60.5 Where a cable or underground service is adjacent to or within a planted area, then any posts shall not be closer than 1.5m to the cable and painted red.
- 60.6 The pegs shall be maintained in good condition.



252/14 PLANTING GENERALLY

61. Planting Depth

- 61.1 All plants are to be planted at the nursery soil mark. The EWR Alliance LCoW shall require the lifting and re-planting of any plants that are not planted at the correct level.

62. Notch Planting of Trees and Shrubs

- 62.1 No notch planting shall be carried out as part of this contract.

63. Planting Pits, Beds and Trenches

- 63.1 Planting pits to be excavated in accordance with the Table 14.1 below:

64. Table 61.1 Planting Pit Size

Type	Dimensions of excavation W x W x D (mm)	Depth of cultivation at the base of the base of pits or trenches (mm)
Semi-mature trees	Measurement of rootball plus 400mm in each direction	200
Extra heavy standard and heavy standard trees	1600 x 1800 x 750	200
Select standard trees Tall standard trees Standard trees	1000 x 1000 x 600	200
Light standard trees Half standard trees Feathered trees	700 x 700 x 600	200
Whips and transplants	300 x 300 x 300	150
Hedging	*length* x 600 x 300	150
Cell grown plants	150mm greater than W and D of root-plug	

- 64.1 Break up and spread, to a depth of 25mm, the surplus arisings from each tree pit in the vicinity of the planting pit ensuring that any turf is buried to a depth of not less than 250mm. Remove any undesirable materials larger than 75mm in any dimension to Sub-Contractor's tip.
- 64.2 On sloping ground, pits shall be dug with vertical sides and horizontal base and shall maintain the specified minimum depth throughout. When backfilled, planting pits shall be finished to existing contours.
- 64.3 For pits for Standard trees and larger trees, any excavated topsoil shall be set aside to be used as backfill. The Sub-Contractor shall import topsoil in accordance with Section 250/01/8, to make up for any deficiencies caused by the removal of subsoil or fill material.
- 64.4 In all areas of woodland planting on 300mm depth of topsoil, planting pits shall be excavated for all transplants, shrubs and container grown plants in accordance with Section 250/14 and Table 14.1. Remove any undesirable materials larger than 75mm in any dimension to the Sub-Contractor's tip.
- 64.5 Planting pits shall not remain open longer than 24 hours. Sufficient soil shall be returned to raise the level not more than 150mm and not less than 75mm above the adjacent levels after light firming.

- 64.6 In all landscape plots, topsoils and compost shall be mixed and incorporated as an individual mound to each planting station at a rate of 30 litres of topsoil to 10 litres of compost.

65. Planting in Hedges

- 65.1 Over the lengths identified, on the Landscape Design drawing as hedgerows, the hedge line shall be backfilled with pre-mixed 80% topsoil / 20% compost mixture and cultivated to a medium tilth 600mm wide and 300mm deep.
- 65.2 Where required, the ground shall be cultivated to a minimum depth of 300 mm removing all live injurious weed roots and growth to a tip off Site. Any stones or other rubbish over 75 mm in any direction shall be removed from the surface and disposed of. Root disturbance of adjacent plants shall be avoided and the surface left with a medium tilth. Any ameliorants shall be incorporated in a second pass following initial cultivation.
- 65.3 Hedge plants shall be placed in a double staggered row, and species distributed as shown on the relevant detail drawing.

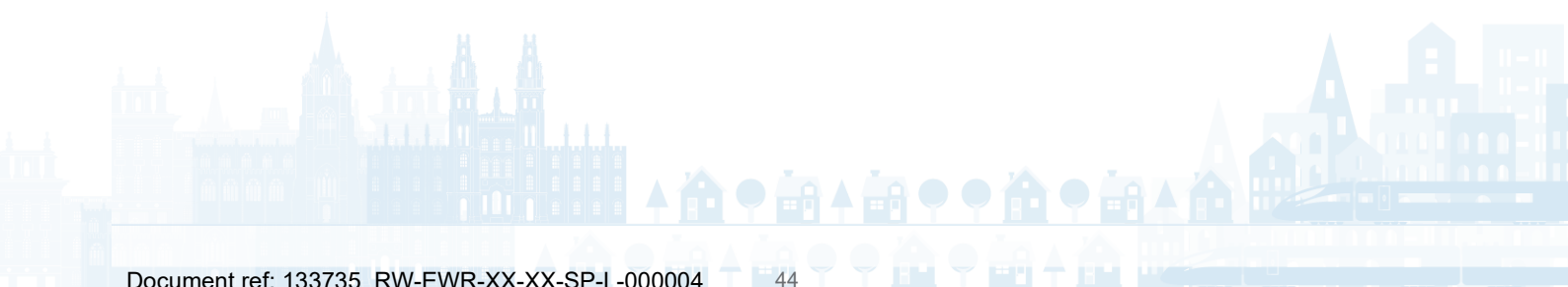
66. Planting of Whips, Transplants and Shrubs into Pits or Trenches

- 66.1 Where plots are to be planted with trees and shrubs of different species this shall be in accordance with the relevant Planting Matrix Drawing, unless otherwise indicated. The distribution of the species within the plots must be agreed with the EWR Alliance LCoW before planting commences and distribution not in accordance with the relevant Planting Matrix drawing will require re-lifting and re-planting by the Sub-Contractor at his own expense.
- 66.2 In all areas of woodland planting, all transplants and shrubs planted into pits shall be placed upright in the centre of the pit with the roots spread evenly outwards and downwards without restriction. Where necessary, any badly damaged roots shall be carefully pruned before being planted.
- 66.3 After correct positioning of the plant each pit shall be backfilled with a friable topsoil mix comprising of 80% existing soil and 20% peat-free organic compost in accordance with **Clause 22** above, incorporating a slow release fertiliser as specified at **Clause 21** above.
- 66.4 After the roots of the plant have been covered, the Sub-Contractor shall firm the soil by treading with the heel adding more soil where necessary to bring the surface level to that of the adjacent areas.
- 66.5 Where appropriate and in the interests of good horticultural practice the Sub-Contractor shall prune back woody species following planting to encourage good side shoot development.

252/15 PLANTING IN UNDISTURBED GROUND

67. Planting in Undisturbed Ground

- 67.1 Planting directly in to undisturbed ground will not be permissible on this project.
- 67.2 All ground must be prepared to provide free draining and aerated growing conditions for each plant
- 67.3 Where the Sub-Contractor encounters conditions that do not achieve the above after preparing planting beds/pits/trenches in accordance with this specification the Sub-Contractor should report the conditions to the EWR Alliance LCoW and request instruction to proceed before planting.



252/16 TREE AND FEATHERED WHIP PLANTING

68. Tree and Feathered Whip Planting

- 68.1 All wrappings, insulation and padding shall be removed from rootballs immediately before backfilling. No wire or plastic mesh containers may be left in position. Any damaged or torn roots shall be cut back cleanly to sound wood prior to planting.
- 68.2 Stakes for all standards and feathered trees shall be firmly driven and positioned into the tree planting pit before planting to a minimum depth of 300 mm below the bottom of the pit. The stake shall be positioned off centre on the prevailing windward side of the tree as near to the tree as possible but shall not interfere with the free movement of the branches and shall cause no rubbing.
- 68.3 Unless otherwise stated, the Sub-Contractor shall use the shortest possible stake to support the tree; when the stake has been driven into the ground there shall be not more than one third of the height of the clear stem of the tree above ground.
- 68.4 Unless otherwise stated, for all standards and feathered trees, one tie shall be used for each tree, fixed within 50 mm of the top of the stake and secured to the stake with a 25 mm galvanised clout nail. Ties shall be of a size appropriate to the size of the tree and stake and equipped with spacers of a size that will ensure that the tree and stake remain vertical.
- 68.5 For extra heavy standards and heavy standards, the staking shall be undertaken after the tree has been positioned. Unless otherwise stated, three stakes, each of 3 m length shall be driven down the side of the rootball and into the pit to a depth of 500 mm below the bottom of the pit. The stakes shall be angled outwards to between 5° and 10° at the top and pulled in moderately by tensioning all the supporting bands equally. The stakes shall be equally spaced and shall not pass through the rootball.

252/17 TREE PRUNING

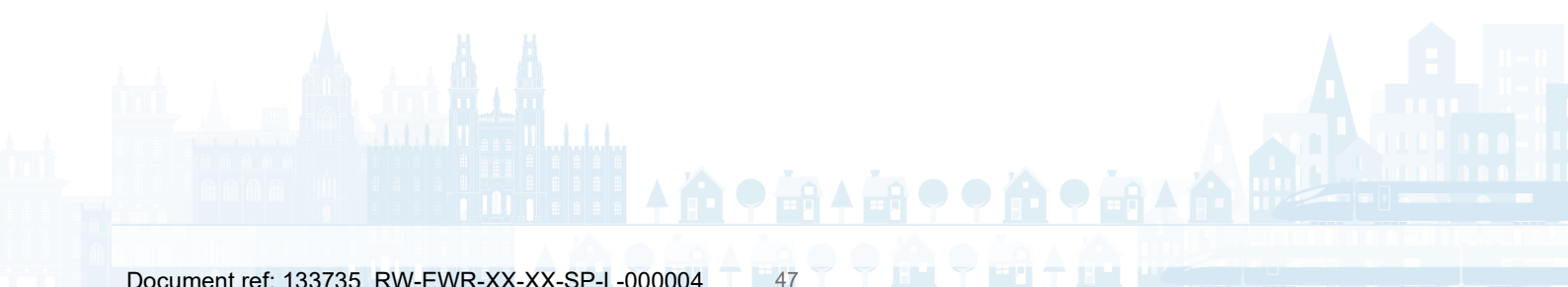
69. Pruning

- 69.1 All pruning shall be carried out in accordance with good horticultural practice unless otherwise directed by the EWR Alliance LCoW.
- 69.2 All pruning shall be undertaken using secateurs and handsaws. Stems shall only be removed so as to retain the natural appearance of the individual plant species in accordance with the guidance in BS 7370 Part 4. Arisings from pruning shall be disposed of offsite.
- 69.3 All broken and badly damaged branches from the plants shall be pruned by cutting back to within 10 mm of the parent branch or trunk or to a suitable bud/node. The cut shall be angled correctly in accordance with BS 7370 Part 4.
- 69.4 At the edges of planted areas, branches and stems shall be cut back to a minimum of 300 mm behind the kerb line, fence, wall or other edge demarcation.
- 69.5 Unless directed otherwise by the EWR Alliance LCoW the Sub-Contractor shall cut all new hedgerows back during the fifth year of aftercare to ensure the dense growth of side shoots and arisings moved off site.

252/18 BACKFILL

70. Backfill

70.1 Backfill shall be in accordance with **Clauses. 10, 20, 21, 63 and 65**



252/19 WATERING IN

71. Watering

71.1 All plants shall be watered-in after planting to ensure planting pits are returned to field capacity, i.e. the amount of water retained by previously saturated soil once full drainage has ceased. As a rough guide: -

- each transplant / container grown tree / shrub should receive 4.5 litres / 1 gallon of water to achieve complete saturation
- each cell grown wildflower plug plant should receive 0.5 litres / 1 pint of water to achieve complete saturation
- large trees should receive 50 litres / 11 gallons of water to achieve complete saturation.

71.2 Watering is at the discretion of the Sub-Contractor to ensure healthy growth of all plant material.



252/20 MULCHING

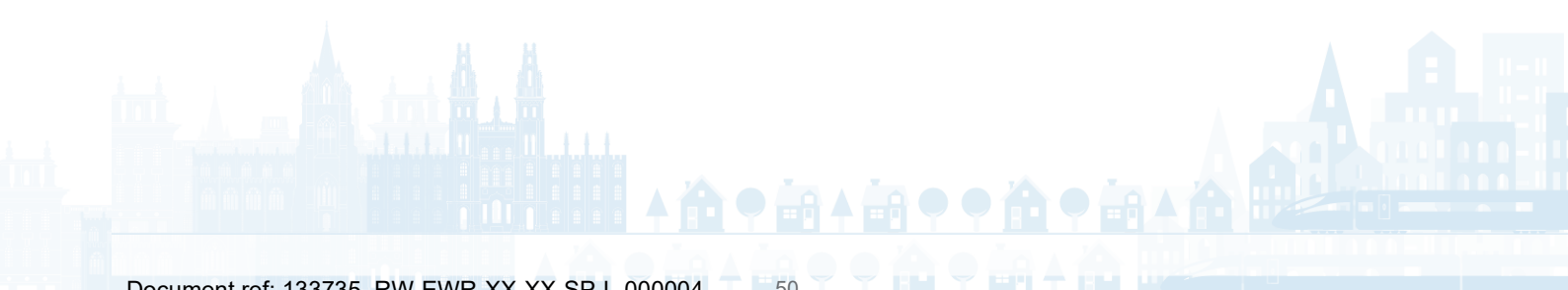
72. Mulching

- 72.1 Mulching shall be in accordance with **clauses 46 to 49**
- 72.2 Weed proof membrane shall be installed to the base of the hedgerows in advance of all planting operations.
- 72.3 Before application of any mulch the planting areas and / or tree positions which are to be mulched shall be free of grass and weed growth.
- 72.4 Weed proof membrane shall be black in colour and shall be manufactured from woven or spun bonded polypropylene weighing 100 to 110g/m² and shall contain an ultra violet inhibitor.
- 72.5 Whip stock planting stations shall be cut into the membrane with a single lengthwise cut, max 250mm length, per planting station.
- 72.6 Standard trees planting stations shall be cut into the membrane with a crosscut to the centre of each station, max length 400mm each direction.
- 72.7 Note. Woven materials which fray shall not be cut on site unnecessarily. This includes cutting into the edge of the membrane to create plant stations as this will undermine the structural integrity of the membrane, reducing its effectiveness in weed suppression and moisture retention.
- 72.8 Edges of membrane shall be secured by proprietary plastic pegs manufactured for this purpose, driven through the mat to their full depth at the edges the membrane max 1200mm spacing, plus a peg to secure the overlapped slit and all corners/turns.

252/21 PLANTING REINFORCED SOIL EMBANKMENTS

73. Planting Reinforced Soil Embankments

- 73.1 At the date of issue of this revision of the specification, the detailed design of all reinforced soil embankments is currently under development. As all planting specifications will be in direct response to this detailed design, this section has been left blank and will be updated, at a later revision, to reflect the results of this design process.

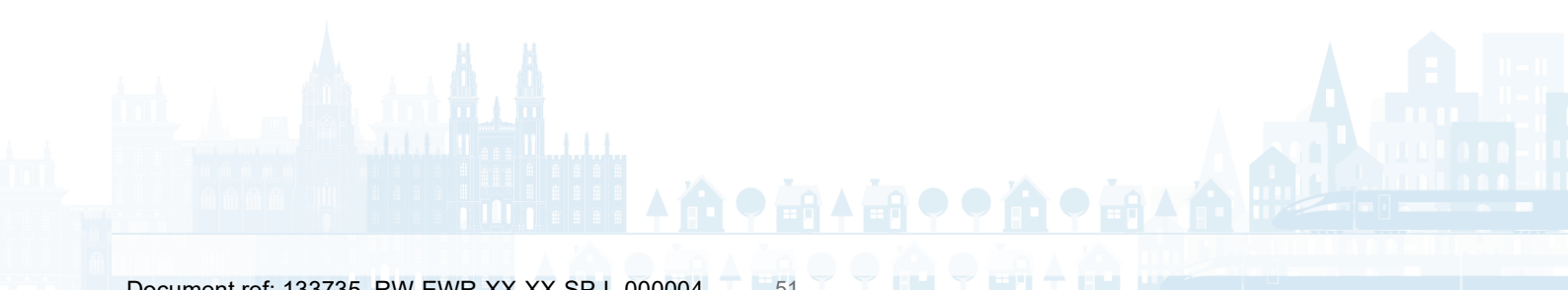


253 MAINTENANCE OF LANDSCAPED WORKS

253/01 MAINTENANCE PERIOD

74. Maintenance

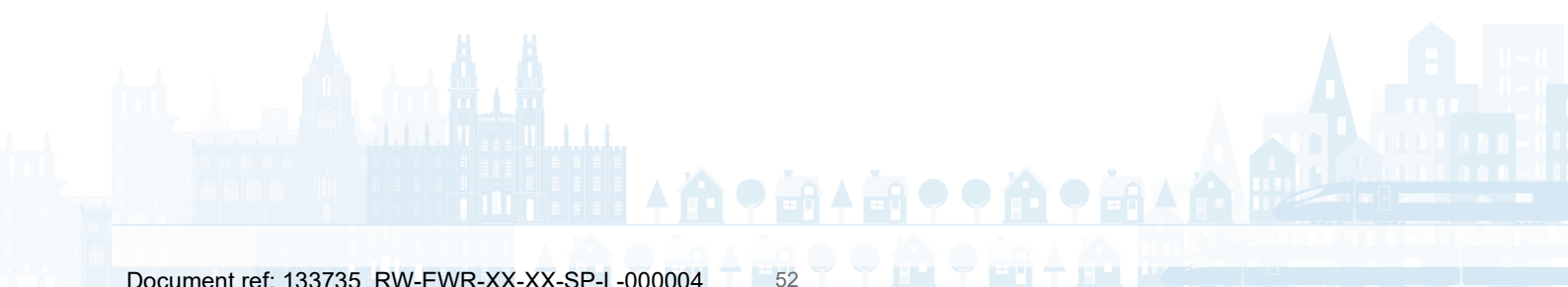
- 74.1 At the date of issue of this revision of the specification, the duration of the maintenance period is yet to confirmed. This section has been left blank and will be updated, at a later revision, to reflect the contractually agreed maintenance period.



253/02 MAINTENANCE VISITS

75. Maintenance Visits

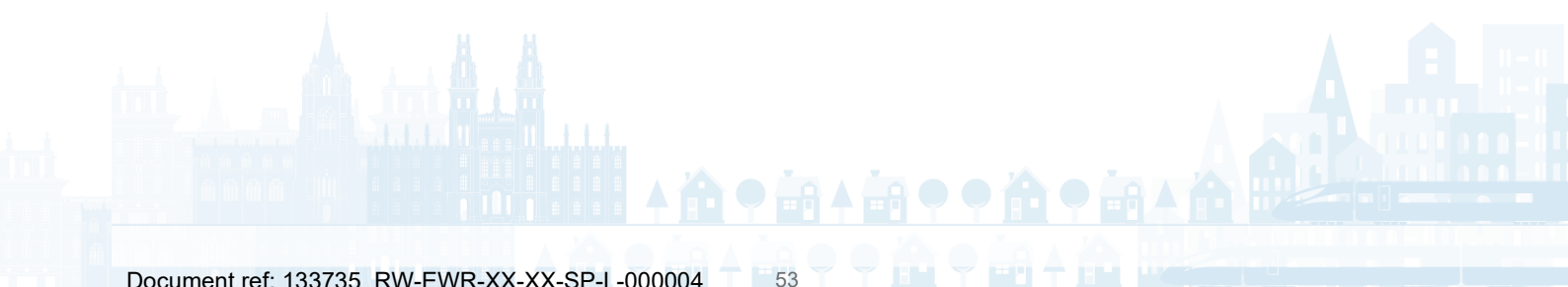
- 75.1 Maintenance visits should be carried out to ensure establishment and survival of sown and planted trees, shrubs, herbaceous plants and grassed areas.



253/03 NOTICE OF VISITS

76. Notice of Visits

- 76.1 The Sub-Contractor shall notify the EWR Alliance LCoW seven days ahead of general maintenance visits or 1 day if urgent watering is required.



253/04 GRASS CUTTING AND WATERING OF SEEDED AND TURFED AREAS

77. Establishment Cuts

- 77.1 Areas of Open Grassland (Mix A), Wet Grassland (Mix D) and Meadow Grassland (Mix E) shall be cut two times during the first growing season following seeding, whenever they reach a maximum of 150mm and reduced to 75mm. Arisings may be left on site, finely chopped and distributed evenly.
- 77.2 Areas of Wildflower Grassland (Mix B) and Marsh & Wet Grassland (Mix C) areas shall be cut in April and October during the 1st and 2nd growing season following seeding and a programme showing the exact timing of which shall be agreed with the EWR Alliance LCoW. Arisings shall be removed from site following each mowing by raking or other suitable method.
- 77.3 Competitive and invasive vegetation shall be controlled within new grass areas in accordance with **Section 250/02** and as required to ensure development of the sward.
- 77.4 Noxious weeds and other undesirable species listed shall be controlled throughout the duration of the Contract in accordance with **Section 250/02**
- 77.5 A list of machinery / plant proposed to be used by the Sub-Contractor for grass mowing should be submitted to the EWR Alliance LCoW for approval before commencing cutting on site. Where wheeled vehicles are used for cutting, low pressure tyres shall be used

78. Grass Cutting

High Frequency

- 78.1 Areas within the TWAO permanent works area marked by the security fence are to be managed in accordance with the Network Rail Management standards.

Medium Frequency

- 78.2 There are no areas subject to medium frequency cutting for this contract.

Low Frequency

- 78.3 All other open grassland areas excluding planting plots, verges, visibility areas and all grass areas not covered by another landscape element shall be cut to a height of 65 mm
- 78.4 The Sub-Contractor shall agree with the EWR Alliance LCoW the precise timing of the cuts.
- 78.5 Mowing operations shall avoid spillage of debris such as stones onto carriageways or footways. Grass clippings and arisings lying on roads, footpaths, car parks, drains and other hard surfaces shall be immediately swept up and removed off Site. Grass clippings and arisings on all other areas shall be dispersed evenly over the sward, unless specified otherwise.

Banks and Ditches

- 78.6 The banks of all new and existing ditches within the 'Extent of Disturbance' shall be cut once per year to a height of between 60 and 80 mm to correspond with cutting operations to the adjacent grassland. The

arisings shall either be dispersed evenly over the sward avoiding blockage of drains and ditches or removed off Site.

Areas of Planting

- 78.7 The Sub-Contractor shall three times a year during late April/May, June/July and late September/October, or as directed by the EWR Alliance LCoW, cut all grass and herbage within the planted areas up to the boundaries of the planted area/plantation.
- 78.8 Grass and herbage shall be cut to a height of not more than 100mm leaving no areas uncut and producing an even sward height across the whole area, whilst avoiding damage to the trees and shrubs.
- 78.9 Arisings shall be finely chopped and evenly dispersed across the plot.

Wildflower Grasslands and Ecological Mitigation Sites

- 78.10 Following establishment cuts, all areas of wildflower grassland shall be cut in mid-August or as directed by the EWR Alliance LCoW. The cutting shall include any developing areas of bramble, broom, gorse, and tree or shrub saplings of less than 20 mm diameter or any other vegetation which may be preventing establishment of the species rich grassland as directed.
- 78.11 All existing and proposed grass areas within the 'Extent of Disturbance' are to be spot treated with herbicide to control undesirable weed species as and when they appear in accordance with **Section 250/02**.
- 78.12 Throughout the duration of the Works, where weed growth cannot be effectively controlled by herbicide without risk of damage to wildflowers, the Sub-Contractor shall carry out weed control by hand within species rich / wildflower areas. Arisings to be removed from site.

253/05 MAINTENANCE WORK

79. Watering

- 79.1 The Sub-Contractor shall water all planting undertaken under the Contract, in accordance with **Clause 71**, at the frequency necessary to ensure establishment and survival, until all planting works are completed.
- 79.2 All planting undertaken under the Contract shall be watered in at the frequency necessary to ensure establishment and survival, for the establishment period specified at **Para. 74.1** from the issue of the Practical Completion certificate

80. Root Firming

- 80.1 Plants shall be inspected during each visit to undertake maintenance operations and any which have been subject to frost heave or wind rock shall be straightened to an upright position and the ground re-firmed.

81. Pruning

- 81.1 All pruning shall be carried out in accordance with good horticultural practice unless otherwise directed by the EWR Alliance LCoW.
- 81.2 All pruning shall be undertaken using secateurs and handsaws. Stems shall only be removed so as to retain the natural appearance of the individual plant species in accordance with the guidance in BS 7370 Part 4. Arisings from pruning shall be disposed of.
- 81.3 All broken and badly damaged branches from the plants shall be pruned by cutting back to within 10 mm of the parent branch or trunk or to a suitable bud/node. The cut shall be angled correctly in accordance with BS 7370 Part 4.
- 81.4 At the edges of planted areas, branches and stems shall be cut back to a minimum of 300 mm behind the kerbline, fence, wall or other edge demarcation.
- 81.5 Unless directed otherwise by the EWR Alliance LCoW the Sub-Contractor shall cut all new hedgerows back during the fifth year of aftercare to ensure the dense growth of side shoots and arisings moved off site.

82. Weed Control

Young Trees and Shrubs in Grass Plot

- 82.1 For the duration of the aftercare period the Sub-Contractor shall maintain an area clear of competing vegetation from each plant station in accordance with **Section 250/02** (minimum application frequency should be four times during the growing season). Residual herbicide should not be used.
- 82.2 The Sub-Contractor shall remove Broom, Gorse, Bramble and any other herb, tree or shrub that, in the opinion of the EWR Alliance LCoW, may interfere or otherwise damage or impede the free growth of planted tree or shrub, all in accordance with **Section 250/02**.

Wildflower Plants

- 82.3 All weeds within areas of species-rich grass / wildflower (LE1.3) plant stations shall be spot treated with herbicide in accordance with **Section 250/02**
- 82.4 Any weed growth that cannot effectively be controlled by chemical means without risk of damage to wildflowers shall be hand weeded to remove competing vegetation.

Young Trees and Shrubs in Cultivated Beds

- 82.5 Cultivated beds are not included as part of this contract.

Hedges

- 82.6 For the duration of the aftercare period all hedges shall be maintained as follows:
As required, the hedge base and an area of 300 mm width on either side of the hedge plants shall be kept free of weeds by herbicide treatment or hand weeding. Herbicides shall be applied in accordance with **Section 250/02**
- 82.7 Any remnant of sheet mulch or pegs should be removed from site five years after planting.

Individual Trees

- 82.8 The individual trees in the locations shown on the construction drawings shall be inspected annually during the growing season and maintained as follows:
- (i) Irrigation systems shall be maintained in working order. Any irrigation pipes shall be checked and repaired if necessary.
 - (ii) All weeds around the base of the tree shall be removed, to a radius of 500 mm in grass. Removal shall be by hand and/or chemical means as directed **Clause 250/02**
 - (iii) Tree supports, stakes, ties and anchoring systems shall be inspected and adjusted.
 - (iv) Rabbit guards, tree guards and grilles shall be inspected and adjusted.
 - (v) When trees can stand unsupported, stakes and/or ties shall be removed, back-filling stake holes with topsoil and compacting topsoil.
 - (vi) Formative pruning shall be carried out in accordance with **Para. 81.1 to Para. 81.5**, including removal of epicormic shoots and the removal of deadwood. Competing secondary leader shoots, and closely spaced, duplicated branches with potentially weak or tight forks shall be removed.
 - (vii) The Sub-Contractor shall report to the Overseeing Organisation any defects requiring further action.

83. Stakes, Ties & Guards

- 83.1 Where fitted and for the duration of the Works, all stakes, tubes, guards and their ties shall be inspected twice per year in October and March and adjusted to allow for the growth of each plant.
- 83.2 Any damaged items shall be removed off Site and replaced with new items in accordance with **Section 252/07**.
- 83.3 Stakes and ties shall be progressively removed as plants establish and disposed of offsite.
- 83.4 Unless directed otherwise by the EWR Alliance LCoW, the Sub-Contractor shall remove all tree stakes and ties, guards and shelters during March / April of the fifth year of post-planting operations.

84. Grassed Areas

General Grass Maintenance

- 84.1 Note: The Sub-Contractor shall take into account that areas of grassland management include steep cutting and embankment slopes.
- 84.2 The Sub-Contractor shall maintain all grassland contained within the site area for the duration of the contract period. For new grass areas, maintenance described here shall commence following establishment cuts described **Section 253/04**
- 84.3 All grass and species rich / wildflower areas shall be maintained in accordance with **Para. 77.1 to 78.12** and the following specification.
- 84.4 The minimum distance of cutting around individual plants should be a 500mm radius. This area shall be maintained weed-free through herbicide treatment.
- 84.5 Grass cuttings and arisings shall be disposed of from all species rich / wildflower areas but in open grass areas cuttings may be left in situ provided they are finely chopped and evenly distributed over the surface of the grass.

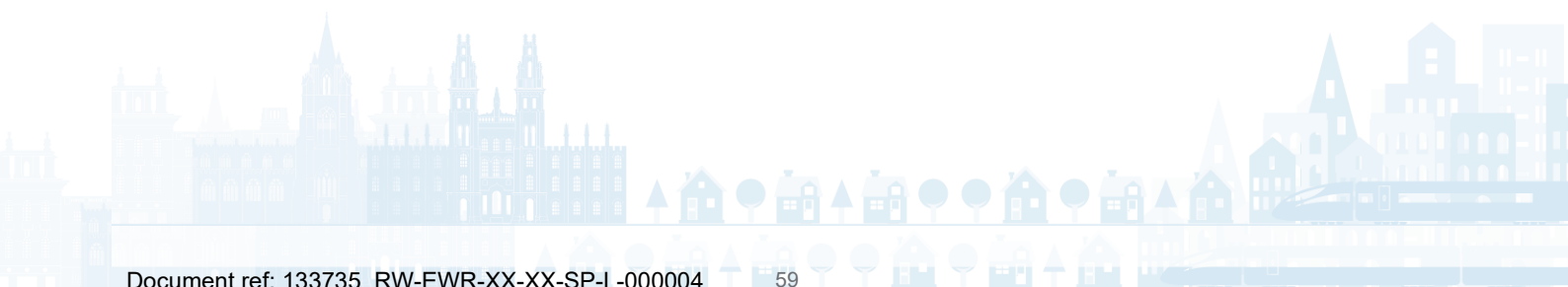
85. Clearing and Disposal of Arisings

- 85.1 Unless specifically mentioned previously all arisings are to be removed from site to Sub-Contractors tip
- 85.2 All packaging and surplus materials is to be removed from site to Sub-Contractors tip.

253/06 INSPECTION AND REPORTING OF DISEASES

86. Inspection Reports

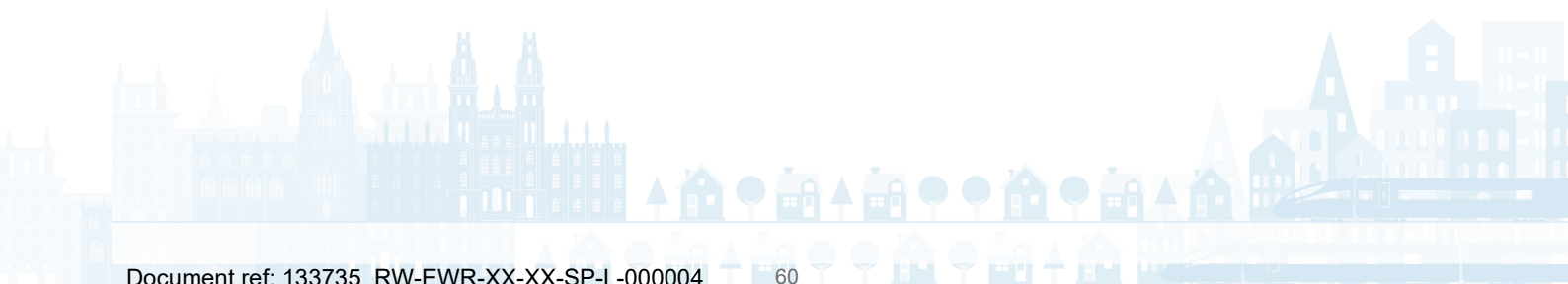
- 86.1 The Sub-Contractor shall for the duration of the contract provide an Inspection Report to the EWR Alliance LCoW at monthly intervals or following every maintenance visit, whichever is the shorter. A sample pro-forma is provided at Appendix B.



253/07 MAINTENANCE RECORDS

87. Maintenance Records

- 87.1 The Sub-Contractor shall complete a Landscape Works at the completion of each maintenance visit. A sample pro-forma is provided at Appendix B.



253/08 HANDOVER AT END OF ADDITIONAL PERIOD OF MAINTENANCE

88. Handover at the end of the Additional Period of Maintenance

- 88.1 Approximately one month before the end of the Maintenance Period, EWR ALLIANCE shall be advised by the Sub-Contractor of any outstanding work, and a joint inspection of the landscaping works shall be carried out by the Sub-Contractor and EWR Alliance LCoW.
- a. Should any part of the landscaped work not be in accordance with the Specification, maintenance of the landscaped works shall remain the responsibility of the Sub-Contractor until all defects are made good.
 - b. Following handover of the landscaped works, any temporary fencing shall be removed.

APPENDIX A

LANDSCAPE WORKS PESTICIDE RECORD		
Contract reference number		
Contract name		
Name of Sub-Contractor		
Sub-Contractor's telephone no		
Date of visit		
Operations carried out	Pesticide used	Plot nos./ locations
Total weed control		
Weed control in any waterbody		
Selective herbicide to areas of grass		
Herbicide to hedgerows		
Herbicide around individual plants in grass		
Other (state purpose)		
Operative Role	Names of operatives on site	Qualifications of operatives named
Supervisor:		
Storeman:		
Application by:		
Signed (for Sub-Contractor)		
Sub-Contractor's observations on damage by others or any incidents		

APPENDIX B

LANDSCAPE WORKS INSPECTION REPORT		
Contract reference number		
Contract name		
Name of Sub-Contractor		
Sub-Contractor's telephone no		
Date of visit		
Operations carried out	Plot nos./ locations	
Pesticide used		
Operative Role	Names of operatives on site	
	Names of operatives on site	
Supervisor		
Operatives		
Sub-Contractor's observations on damage by others or any incidents		
Observations of EWR Alliance LCoW on standard of workmanship, additional work required or general condition of the works:		
Signed (for Sub-Contractor)		Date
Signed (for EWR Alliance LCoW)		Date

APPENDIX C

PROVENANCE CERTIFICATE (Part 1 Of 2)	
Certificate Number	
<p>We hereby certify that the origins of the plant stock incorporated in the Works are as identified in the Contract Schedules.</p> <p>The words and phrases herein, unless otherwise stated have the same meaning as attributed to them in the Forestry Commission Practice Note 8 'Using local Stock for Planting Native Trees and Shrubs'.</p>	
SUB-CONTRACTOR	
Company	
Name	
Position	
Signed	
Date	
Receipt of this certificate is acknowledged by the EWR ALLIANCE LCoW.	
EWR Alliance Landscape Clerk of Works	
Name	
Position	
Signed	
Date	

APPENDIX D

MATERIALS APPROVAL REQUEST		
Contract reference number		
Contract name		
Name of Sub-Contractor		
Sub-Contractor's telephone no		
Contract Specification Details		
MAR Number		
Revision Number		
Specification Clause		
Drawing No.		
Location/Area of Use		
Details of Proposed Material		
Manufacturer/Supplier		
Model		
Other notes		
Specification Documents Attached		
Sub-Contractor's Comments		
Signed (for Sub-Contractor)		Date
EWR Alliance Landscape Clerk of Works Comments		
<input type="checkbox"/> Approved <input type="checkbox"/> Approved with Comments <input type="checkbox"/> Incorporate Comments Revise and Resubmit <input type="checkbox"/> Not Approved		
Signed (for EWR Alliance LCow)		Date

APPENDIX E

LANDSCAPE DESIGN DRAWINGS	
Drawing Number	Drawing Description

At the date of producing this specification the GRIP5 detail design landscape drawings have not been completed. This specification will be revised to list the drawings once they are issued for construction.



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