

6. WPD will witness the commissioning of the G59/2 protection associated with this connection when site is ready to be energised. The cost of this site visit is included in this offer. Additional visits will be treated as chargeable variations.

The Customer shall provide and install, at no cost to WPD, the following:-

1. a suitable weatherproof building to accommodate WPD's auxiliary equipment, including protection and telecontrol equipment, d.c. batteries and charger. This building shall include provision of a separate metering room for WPD's metering equipment;
2. the customer will provide an appropriate site for the substation within the development. The substation location shall be on the boundary of your site to allow us 24 hour operational access/egress.
3. the customer built substation shall be placed such that it falls outside the 1 in a 1000 year flood level zone. This is the responsibility of the customer.
4. any works to the Customer's Installation required to establish intertripping and interlocking arrangements between the Customer's 11,000V main circuit breaker and WPD's 66,000V metered Connection Point circuit breaker;
5. a 230 volt supply and electrical installation within the substation building for lighting, battery charging, frost protection heating (including the heater) and twin switched socket outlets within the WPD section of the switchroom. There may be a requirement for the Customer to provide a standard dedicated telephone line, with associated socket installed in the metering room, for use by the Customer's appointed meter operator for modem data collection from on-site metering. The Customer shall confirm the requirements for a standard telephone line with their appointed meter operator and install such a line, where required; and
6. a suitable earthing system for the Customer's site.

All work shall be carried out to WPD specification.

2.3 Matters outside the scope of the Connection Works

The following matters have not been included in the estimated Connection Charge:

- a. The diversion of any third party apparatus (including without limitation any gas pipes and telephone lines) has not been included in the Connection Charge nor taken into account when estimating the period for completion of the Connection Works. WPD shall not be liable for any delay in commencement or performance of the Connection Works resulting from such diversion and any costs resulting from such delay shall be borne by the Customer.
- b. The diversion of WPD's existing assets (if any) on the Premises.
- c. Any requirement for specialist disposal of soil and import of suitable backfill.
- d. Any requirement for trenching through rock or hard substances greater than 10%, and
- e. Any requirement for foundations for buildings, towers etc. to be established in ground which is not normal ground bearing type.
- f. No environmental surveys have been carried out for the proposed scheme; if any special measures are required e.g. dealing with protected species of plant or animal then the associated costs will incur an additional charge.

3. Programme of Connection Works

This Connection Offer is made on the understanding that the Connection Works are completed within 4 years from the date of acceptance of this Connection Offer, and that the Customer's generation is operating in parallel with WPD's Distribution System within 4 years of the acceptance of this Connection Offer.

If WPD is unable to complete the Connection Works by the end of the 4 year period due to any reasons beyond WPD's reasonable control, WPD reserves the right to amend or terminate the Agreement, including amending the Connection Charge.

4. Bilateral connection agreements

It is a condition of this Connection Offer that the Customer will be required to enter into a formal Connection Agreement and Responsibility Schedule with WPD for the project. The Connection Offer is made on the understanding that we will reach conclusions satisfactory to

WPD.

The Connection Agreement will govern the terms and conditions under which the Customer's Installation may be connected (and remain connected) to the Distribution System. The Connection Agreement is based on an industry standard and terms and conditions contained therein are largely non-negotiable. Any request by the Customer to amend the Connection Agreement will require referral for legal advice and the Customer shall be responsible for costs incurred by WPD regardless of whether or not these changes or amendments are agreed and incorporated in the Connection Agreement.

The Responsibility Schedule is required under Section 22 of The Electricity Safety, Quality and Continuity Regulations 2002. It will define the division of responsibilities between WPD and the Customer for operation, maintenance and control of the installation.

If the Customer chooses to perform any of the Contestable Connection Works, the Customer will need to enter into an Adoption Agreement with Western Power Distribution for any assets to be adopted as part of the Contestable Connection Works. This shall be agreed and signed before work commences on site.

Before a supply of electricity can be taken through the new connection, the Customer must ensure an electricity supplier is appointed and has registered in accordance with electricity trading arrangements. (For a list of licensed suppliers please call WPD on (01209) 616888. Alternatively, you can visit the Ofgem website, www.ofgem.gov.uk/Licensing).

Following acceptance of this Connection Offer, WPD will provide the Customer with a Supply Number for the new electricity connection. The Customer will need to quote the Supply Number(s) to the electricity supplier of their choice in order to arrange an electricity supply. If the supplier fails to register the connection, WPD will be unable to energize the connection.

For connections with a maximum demand above 100kW, half hourly metering is mandatory. The Customer's appointed supplier may arrange for a meter operator to install half hourly metering but it is usual for the Customer to appoint their meter operator directly. A list of meter operators can be obtained from the Association of Meter Operators, www.meteroperators.org.uk. It will be necessary for the Customer to ensure, in conjunction with the meter operator, that suitable metering is installed for the required level of import and export capacity.

5. Notice of completion

WPD will, where agreed, allow the connection to be/remain energized subject to the terms and conditions as set out below and any other conditions set out under this Connection Offer.

- I. It is the Customer's responsibility to ensure that the Customer's Installation to which the Customer requires an electricity connection from WPD is installed in such a manner that it will comply with Regulations 8(4) and 25 of The Electricity Safety, Quality and Continuity Regulations 2002 immediately prior to Energisation.
- II. The Customer must provide WPD with a completed Notice of Completion of Installation (Notice).
- III. The Customer must allow WPD access to any property covered by the Connection Offer to ensure that the Customer's Installation complies with Regs 8(4) and 25.
- IV. The Customer undertakes to indemnify and keep WPD fully indemnified against all proceedings costs expenses liabilities injury death loss or damage arising directly or indirectly out of the Customer's breach or negligent performance or failure in performance by the Customer of its obligations set out in the Connection Offer.

WPD will provide a Notice of Completion of Installation (to be completed by the installer) on request by the Customer.

6. Customer's Installation

WPD shall not be compelled to commence or continue to provide a connection to the Customer unless it is reasonably satisfied that each part of the Customer's Installation is so constructed, installed, protected and used so far as is reasonably practicable to prevent danger, and not to cause interference with the Distribution System.

The Customer shall be required to confirm the electrical layout, provisions for protection and electrical parameters of the Customer's Installation prior to commencement of the Connection Works by WPD.

WPD has the right to amend the Agreement in the event that the Customer makes changes to the proposed apparatus at the Customer's Installation that, in the opinion of WPD, cause the Connection Works to be unsuitable.

7. Safety

Any work in the vicinity of WPD equipment must be carried out in a safe manner, including, as a minimum, compliance with the relevant Health and Safety Executive Guidance Notes available from HMSO.

In particular:

- GS6 - Avoidance of danger from overhead electric lines.
- HS(G)47 - Avoiding danger from underground cables.

8. Other conditions

i) Substation site on Premises

The Customer shall at no cost to WPD:-

- provide suitable accommodation for the 66,000V circuit breaker along with the associated plant, protection & control equipment and
- provide a suitable cable entry to the substation, when required, for WPD's cables and to carry out any subsequent weatherproofing or other civil works after the cables have been installed.

Where the substation includes a shared building (to be built to WPD specification – see attached document '*WPD Control Room Specification*') for both the Customer's Installation and WPD's protection, telecontrol and battery equipment then the Customer shall either:-

- establish separate sections of the building for WPD and the Customer's equipment, with separate access and locking arrangements for WPD personnel and the Customer's personnel, such that access to any of the WPD equipment is limited to WPD personnel only and access is not possible from any section of the switchroom to which the Customer has access; or
- ensure that where access is required by the Customer, or a representative thereof, to any part of the building that contains any of the WPD equipment, then the Customer, or Customer's representative, shall be appropriately authorised by WPD for such access.

For safety & operational reasons, the Customer shall be required to provide 24 hour unhindered vehicular access to the substation for WPD personnel, or authorised agents thereof.

The Customer shall produce detailed civil drawings & specifications in line with WPD's performance specification for the construction of the substation. Detailed proposals shall be submitted to WPD for approval, at least one calendar month in advance of commencement of construction works on site.

WPD reserves the right to make site inspections by prior arrangement with the Customer to ensure construction meets the required specification and quality. This does not remove the Customer's obligation to provide a structurally stable, secure, weathertight and non-hazardous environment to accommodate WPD plant.

The construction of substations is not usually classed as permitted development and consequently the Customer may need to obtain planning permission for the construction beforehand.

ii) System protection

It is a precondition for Energisation, and the Customer's responsibility, to ensure that the site be connected and operated strictly in accordance with the provisions and requirements of the Electricity Supply Industry's Engineering Recommendation G59/2 (Recommendations for the Connection of Embedded Generating Plant to the Distribution Systems of Licensed Distribution Network Operators) A copy of this document can be obtained directly from the Energy Networks Association at 18 Stanhope Place, Marble Arch, London, W2 2HH.

Prior to any parallel operation of the Customer's proposed new generation with the Distribution System WPD must witness commissioning tests carried out on the Customer's Installation with regard to compliance with Engineering Recommendation G59/2. Parallel operation with the Distribution System can only be permitted following written confirmation that the commissioning has been successfully completed and witnessed by WPD. A minimum of two weeks' notice will be required for the witnessing to be arranged. To arrange a suitable date for witnessing please contact me on the telephone number or e-mail address at the top of this letter.

The proposed WPD-owned 66,000V metered circuit breaker at the Connection Point substation shall have installed as standard overcurrent and earth fault protection. WPD shall provide the Customer with details of the protection settings employed at the metering circuit breaker. It is the Customer's responsibility to ensure that these settings provide adequate protection of the Customer's Installation. It is the Customer's responsibility to provide protection for their equipment. The Customer shall provide IDMT overcurrent, IDMT earth fault and instantaneous overcurrent protection on the Customer's 11,000V circuit breaker. The Customer shall be responsible for the provision of suitable protection to ensure tripping of the proposed generation under 'loss of mains conditions'. In all cases, the protection shall be agreed with WPD prior to installation.

WPD may consider accepting tripping signals from the Customer. Each request will be considered on its merits. WPD will not accept responsibility for the inclusion of its own equipment and protection into your protection scheme and this facility is offered on the basis that it is entirely at your risk. These arrangements will need to be agreed prior to completion. Where WPD agrees to accept tripping signals from the Customer, normally open volt free contacts for this purpose shall be provided by the Customer.

The Customer shall provide an emergency trip button, of a break glass type, within the metering room, for the Customer's purposes. WPD will make provision to enable the Customer to trip WPD's 66,000V metering circuit breakers, using the emergency trip button should an emergency arise.

The Customer shall make provision within the Customer's Installation, and perform all necessary associated works to the Customer's Installation, for the establishment of intertripping and interlocking arrangements as follows:-

- a trip operation of the proposed WPD-owned 66,000V Connection Point metered circuit breaker, shall cause the Customer's 11,000V circuit breaker to be tripped. A single set of normally open 'remote trip' volt free contacts, for incorporation, by the Customer, into the tripping circuit of the Customer's 11,000V circuit breaker, shall be provided from WPD's Connection Point metered circuit breaker.
- operation of the Customer's emergency trip button at the Customer's Connection Point substation shall trip the proposed new WPD-owned 66,000V Connection Point metered circuit breaker. The Customer shall provide a single set of normally open volt free contacts from the emergency trip button, for this purpose.
- closure of the proposed WPD-owned 66,000V Connection Point metered circuit breaker, shall be inhibited unless the Customer's 11,000V generator circuit breaker is open. The Customer shall provide a set of normally closed volt free contacts from the Customer's 11,000V circuit breakers for this purpose.

Where interlocking/intertripping arrangements are to be established by wiring between the Customer's 11,000V circuit breaker panel and WPD's proposed 66,000V Connection Point metered circuit breaker, the Customer shall make arrangements for such wiring to utilise links mounted on the panels to enable the wiring to be segregated, where required for testing.

iii) Earthing

It is the Customer's responsibility to ensure that the Customer's Installation has adequate earth fault protection, and no liability will be accepted by WPD if its earth terminal is used.

The Customer's site earthing system shall be designed and constructed by the Customer to meet the requirements of Engineering Recommendation EATS 41-24 (available from the Energy Networks Association), along with additional WPD requirements as necessary. These requirements are further detailed in WPD Specification EE SPEC:89/1, Relating to Fixed Earthing Systems for Major Substations.

The Customer's earthing design for WPD's plant building shall include provision of suitable earth electrode to enable WPD's plant and apparatus to be bonded by WPD to the Customer's earthing system, without the requirement for WPD to perform any excavation works.

Special precautions must be taken with telecommunications plant and strict working procedures adopted in the immediate vicinity of substations where the rise of local earth potential could under severe fault conditions exceed 430V within a substation, or 1150V outside a substation. Where these limits are exceeded, the site will be classified as 'hot'.

Prior to installation of the proposed earthing system, the Customer shall provide details of the proposed earthing design to WPD, for comment, including details of the assessment performed to examine the adequacy of the proposed design. WPD will require examination of the Customer's earthing design to ensure that the substation does not become 'hot'. The costs of any works associated with making the generator site or WPD's substation 'cold' or of any costs for remedial works of third parties due to either being hot, shall be borne by the Customer.


Upon completion of the Customer's earthing system installation, the Customer shall provide WPD with detailed 'as constructed' drawings for the Customer's earthing system, including details of electrode size and installed depth. It is the Customer's responsibility to ensure that the Customer's Installation has adequate earth fault protection, and no liability will be accepted by WPD if its earth terminal is used.

iv) Voltage fluctuations / harmonics

Voltage fluctuation/unbalance and harmonics arising from the operation of the Customer's Installation must not exceed levels laid down in National Engineering Recommendation P28, P29 and G5/4.

- G5/4 sets down the 'Limits for harmonics in the United Kingdom supply system'.
- P28 covers 'Planning limits for voltage fluctuations caused by industrial, commercial and domestic equipment in the United Kingdom'.
- P29 covers the 'Planning limits for voltage unbalance in the United Kingdom'.

PLEASE NOTE: This plan ONLY shows assets owned by Eastern Power Distribution, Electricity assets owned by ENO's (Independent Network Operators) MAY be present in this area.

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Company Directive

STANDARD TECHNIQUE : CA6A/3

Relating to the Installation of Underground Cables

Policy Summary

This technique forms the approved installation procedure for all underground cables, which are installed within Western Power Distribution with the exception of pressure-assisted cables at 33kV, 66kV and 132kV cables.

Author: Peter White

Implementation Date: October 2011

Approved by

PJ White

Policy Manager

Date:

11-10-11

Document Revision & Review Table		
Date	Comments	Author
31 July 2013	• Multiple circuits for 33kV shown	Peter White

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UNDERGROUND CABLE INSTALLATION

1.0 INTRODUCTION

- 1.1 This document has been produced for all staff engaged in the installation of cables. It must be noted that the scope of this document **does not** cover the installation of pressure-assisted 33kV, 66kV and 132kV cables, as they are supplied and installed by the cable manufacturer concerned or some other selected installer.
- 1.2 It is the responsibility of all staff engaged in underground cable installation to comply with appropriate legislation. The legal framework for health and safety at work is set down in a variety of legislation - Acts of Parliament, and Statutory Regulations. A range of guidance providing information on recognised good practice supports the legal requirements. This guidance is in the form of Approved Codes of Practice (issued by the Health and Safety Commission) and guidance notes, booklets and leaflets (issued by the Health and Safety Executive, trade organisations, professional institutions etc.). There are also British and International Standards.
- 1.3 The principle legislation, guidance etc. relevant to underground cable installations is as follows: -
- Health and Safety at Work Act 1974
 - Electricity, Safety, Quality and Continuity Regulations 2002
 - Electricity at Work Regulations 1989
 - Control of Pollution Act 1990
 - Controlled Waste Regulations 1991
 - New Roads and Streetworks Act 1991 (NRSWA)
 - Traffic Management Act 2004
 - Management of Health and Safety at Work Regulations 1992
 - Workplace (Health, Safety, and Welfare) Regulations 1992
 - Provision and Use of Work Equipment Regulations 1992
 - Manual Handling Regulations 1992
 - Construction (Design and Management) Regulations 2007
 - WPD Distribution Safety Rules
 - HSG 47 Avoiding Danger from Underground Services.
 - NJUG Publications - Volume 1 "NJUG Guidelines on the Positioning and Colour Coding of Underground Utilities' Apparatus"
 - NJUG Publications - Volume 4 "NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees"
 - HSG 66 "Protection of Workers and the General Public during the Development of Contaminated Land"

2.0 PREPARATION

Before any work is carried out, the following items must have been completed and copies of relevant documents are available at the site of the works: -

- 2.1 Accurate plans showing all apparatus (WPD's and other utilities or service providers) in vicinity of work site.
- 2.2 Plan of proposed new cable route.
- 2.3 Easements/landowners notified.
- 2.4 Highway authorities and statutory undertakers notified sufficiently in advance to meet NRSWA requirements.
- 2.5 Correct signing & guarding implemented as per ST: HS14D.

3.0 EXCAVATION

3.1 Trial Holes

Unless it is known from co-ordination drawings that the route is relatively clear of obstructions, trial holes shall be taken at proposed joint locations and at such other positions along the route as is necessary to ascertain the practical positioning of the cable.

Trial holes should generally be at right angles to the run of cables and at least 150mm deeper than the proposed trench.

Surface covers belonging to other utilities may give a guide to the location of their equipment.

3.2 Excavation and Waste

Refer to figures 3.2a, 3.2b & 3.2c and table 3.2 for details of specific trench dimensions. If it is necessary to lay Surf fibre ducts in the same trench as the WPD mains cables, refer to drawings G 4064.33, G4064.66 and G4065 for dimensions and layout.

The actual width of trench depends on the following factors: -

- Type and size of cable being laid.
- Number of cables being laid in same trench.
- If low and high voltage cables being laid in same trench, the effect on the cable ratings must be considered.
- Whether ducts are being used.

- If mechanical means are being used in order to excavate the trench in order to install a single cable, then the width can be as narrow as 150mm.
- The trench width must also allow for mechanical compaction.

Trenches should: -

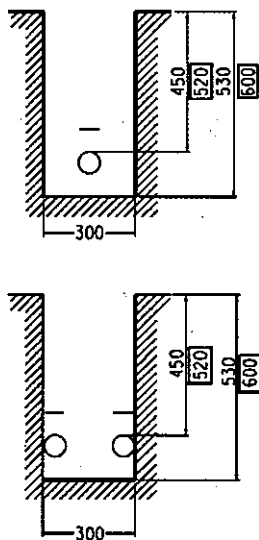
- (a) Have lines, levels, and contours to suit continuous pulling of cable by winch.
- (b) Be as straight as possible. Where bends are unavoidable the trench should allow the cable to be installed at not less than its minimum-bending radius using cable rollers.
- (c) Be to the approved dimensions and normally have vertical sides which should have a side support system (e.g. timbering), should the ground be soft or loose.
- (d) Have a firm and smooth contoured base.
- (e) Be excavated with such precautions as are necessary to prevent damage to the highway or ground surface from a slip or breaking away of the sides of the trench. Cutting by machine (e.g. road saw, chain excavator or planer) is preferred.
- (f) Be excavated so that all railways, tramways, walls, roads, sewers, drains, pipes, cables, structures, places, shall be secure against risk of subsidence or damage, and shall be carried out to meet the requirements of the authorities concerned.
- (g) Where they pass from a footway to a roadway or at other positions where a change of level is necessary, have a base that rises or falls gradually.
- (h) Be cleared of water by pumping to prevent the risk of the trench collapsing and hazard to the general public, especially trespassing children. In locations where flooding can occur, measures shall be taken to divert rainwater away from the trench (e.g. use of sandbags).
- (i) Have provisions made during their excavation to cater for access of persons and vehicles to property of places alongside the route.
- (j) In concrete surfaces be cut through the concrete as per the HAUC Specification for the Reinstatement of Openings in Highways.
- (k) Where short lengths of ducts are installed, have a hole dug below the front of the leading edge of duct-run so that anything that could be dragged into the duct during cable pulling will fall into the hole instead.
- (l) If ground conditions in open terrain could lead to collapse of the trench wall, the trench can be excavated with sloping sides. With machine excavation, a standard 'V' shaped ditching bucket may be used.

Other works and properties, such as decorative walls and lawns, shall be safeguarded against damage from excavated material by using some form of sheeting. When machines are being used for excavation and the location of other plant is known, the plant should be uncovered by hand excavation to reduce the possibility of damage. If the excavation is likely to reduce the stability of any part of any structure, work shall not be commenced unless adequate precautions are taken to prevent the structure from collapse or deterioration. Flooding, or vibration from heavy traffic can cause collapse of trench sides and subsidence of adjacent structures. A trench side support system or shoring shall be used to avoid this.

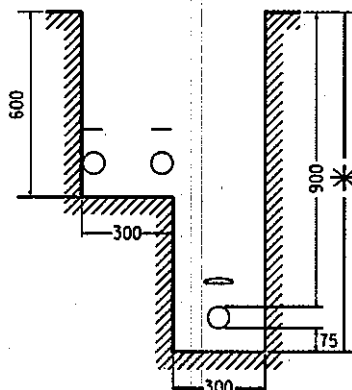
See ST: HS14B/3 Excavation and Shoring.

FOOTWAYS & ROADWAYS

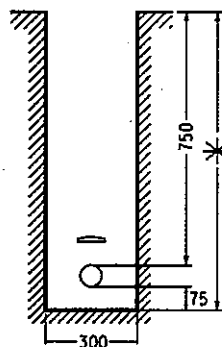
LV & 11kV Cables



LV, 11 & 66kV Cables



33kV Cables.



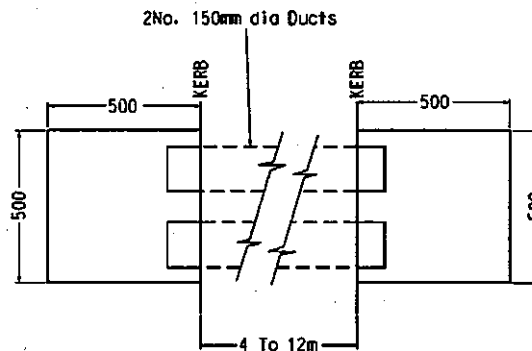
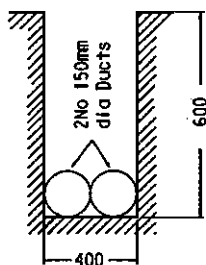
KEY:
 100 Dimension in Footway
 100 Dimension in Roadway
 — Marker tape
 Plastic marker tiles (or equivalent)
 This can represent a three core cable or a triplex cable at hv

Notes:

1. Marker tape to be laid 75mm above LV & 11kV Cables.
2. Plastic marker tiles (or equivalent) to be laid 75mm above 33 66 & 132kV Cables.

ROAD CROSSINGS.

LV & 11kV Cables.



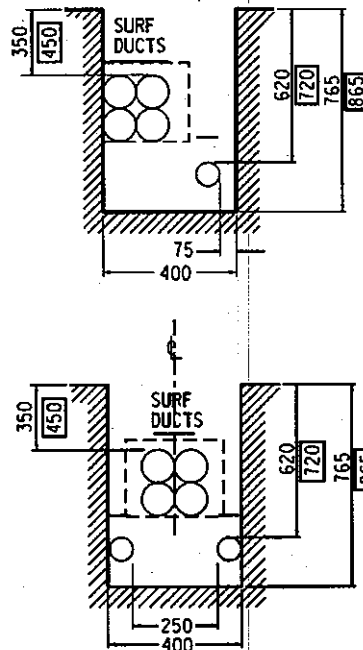
The crossing is to include laying 2No. 150mm dia ducts (provided by WPD), a 500x500mm opening in the footpath each side of the road, removing and reinstating kerb edges as necessary and complete reinstatement on completion of works.

7	RJB			07/11	TEXT ADDED		
Rev No	Drawn	Chk'd	App'd	Date	Revision		
ORIGINAL ISSUE		DATE		<div>WESTERN POWER DISTRIBUTION Design Department. Avonbank, Feeder Road, Bristol BS2 0TB Tel: 0117 933 2000 Fax: 0117 933 2001</div> <div>WESTERN POWER DISTRIBUTION</div>			
Drawn	R.J.B.	11.97					
Checked							
Approved							
SCALE		N.T.S.		Title		Drg. No.	Rev No
				LV. 11, 33 AND 66kV ARRANGEMENT AND DIMENSIONS OF TRENCHES FOR CABLES.		3.2a	7

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FOOTWAYS & ROADWAYS

11kV / LV Cables.



KEY:

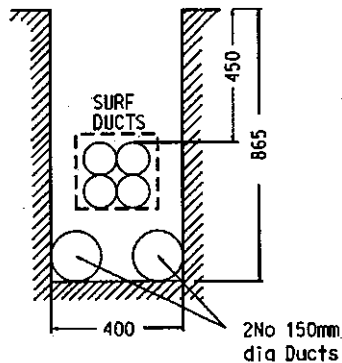
- 100 Dimension in Footway
- 100 Dimension in Roadway
- Marker tape
- Plastic marker tiles (or equivalent)

Notes:

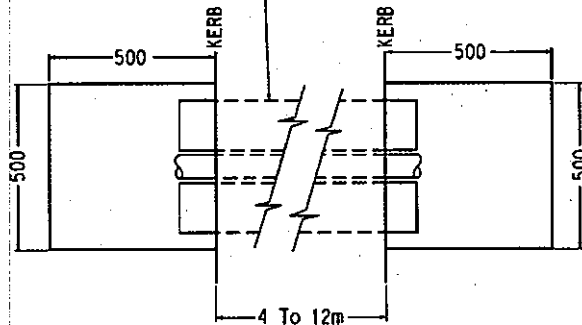
1. Marker tape to be laid 75mm above LV & 11kV Cables.
2. SURF ducts to be surrounded by 75mm of soft fill in all directions

ROAD CROSSINGS.

11kV / LV Cables.




2No. 150mm dia Ducts



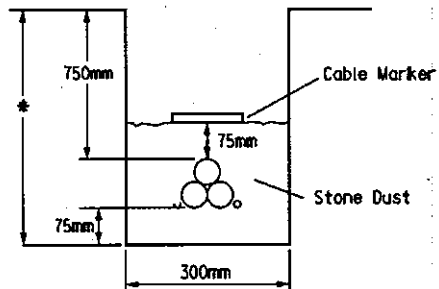
SURF ducts to be surrounded by 75mm of soft fill in all directions

The crossing is to include laying 2No. 150mm dia ducts (provided by WPD plc), a 500x500mm opening in the footpath each side of the road, removing and reinstating kerb edges as necessary and complete reinstatement on completion of works.

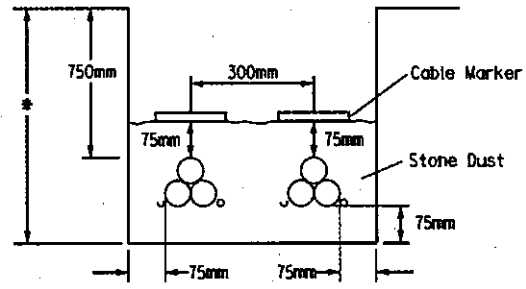
8	RJB			07/11	HV CHANGED TO 11kV		
Rev No	Drawn	Chk'd	App'd	Date	Revision		
ORIGINAL ISSUE		DATE		WESTERN POWER DISTRIBUTION Design Department. Avonbank, Feeder Road, Bristol BS2 0TB Tel: 0117 933 2000 Fax: 0117 933 2001.		 WESTERN POWER DISTRIBUTION	
Drawn	R.J.B.	05.00					
Checked	P.W.						
Approved				Title		Drg. No.	Rev No
SCALE		N.T.S.		LAYING OF SURF TELECOM DUCT WITHIN LV / 11KV TRENCH		G4065	8

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33kV 1xCCT



33kV 2xCCT's



WPD Substation - Marker Tape

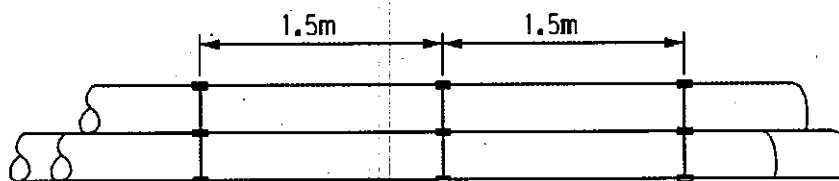
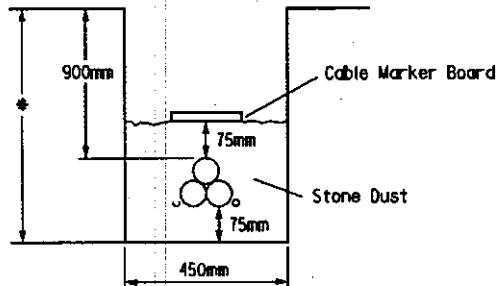
Non - WPD Land - Polythene Board

75mm Cover To Marker Tape

75mm 3mm To Dust, Limestone Or Granite Fine Stone Dust Bedding & Blinding


66/132kV

* This Dimension Will Vary Due To The Diameter Of The Respective Cable Being Installed



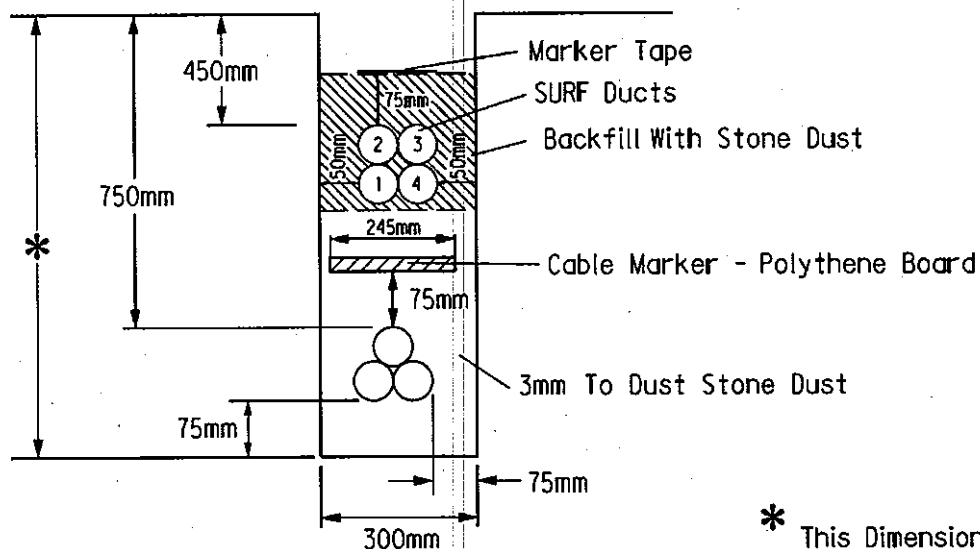
Plastic Cable Ties

33,66 & 132kV Cables Laid In Trefoil & Cable Tied At 1.5m Intervals
(1m At Bends)

6	RJB			10/12	66/132kv DIMENSION ALTERED	
Rev No	Drawn	Chk'd	App'd	Date	Revision	
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Drawn	R.J.B.	11.97		 WESTERN POWER DISTRIBUTION		
Checked						
Approved						
SCALE		N.T.S.		Title	Drg. No.	Rev No
				33.66 & 132kv 3 x SINGLE CORE POLYMERIC CABLES	3.2b	6

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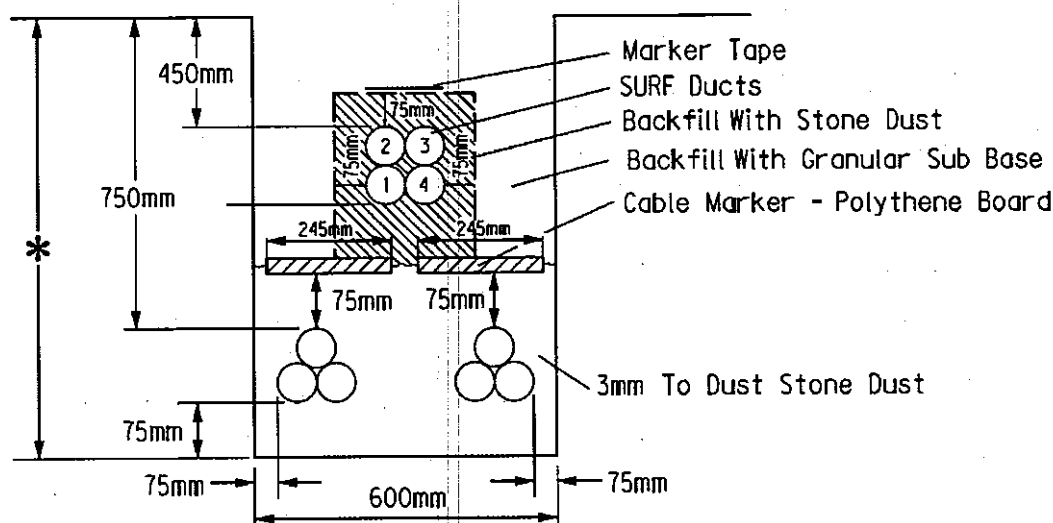
SINGLE CIRCUIT




75mm Cover To Marker Tape
75mm Fine Stone Dust Bedding

* This Dimension Will Vary Due To The Diameter Of The Respective Cable Being Installed

DUAL CIRCUIT

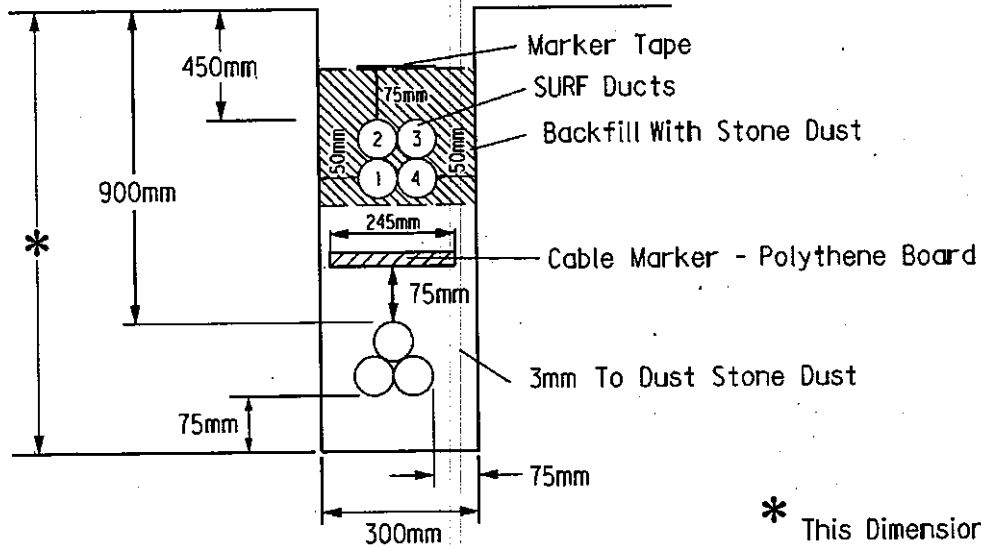


75mm Cover To Marker Tape
75mm Fine Stone Dust Bedding

8	RJB			07/11	TRENCH DEPTH ALTERED	
Rev No	Drawn	Chk'd	App'd	Date	Revision	
ORIGINAL ISSUE	DATE	WESTERN POWER DISTRIBUTION Design Department. Avonbank Feeder Road, Bristol BS2 0TB Tel: 0117 933 2000 Fax: 0117 933 2001.				
Drawn	R.J.B.	05.00				
Checked	P.W.					
Approved						
SCALE	N.T.S.	Title				
		LAYING OF SURF TELECOM DUCT WITHIN 33kV TRENCH				
		Drg. No.				Rev No
		G4064.33				8

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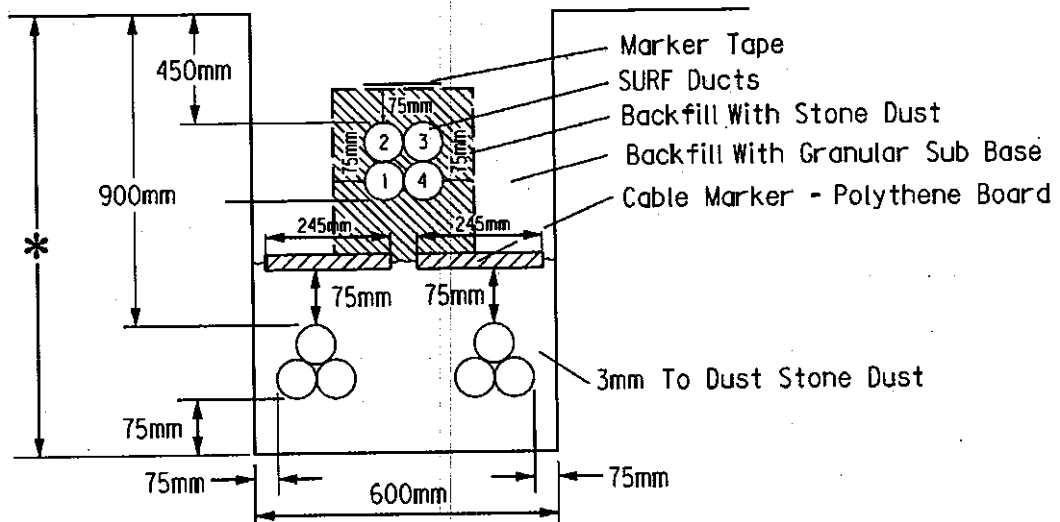
SINGLE CIRCUIT




75mm Cover To Marker Tape
75mm Fine Stone Dust Bedding

* This Dimension Will Vary Due To The Diameter Of The Respective Cable Being Installed

DUAL CIRCUIT

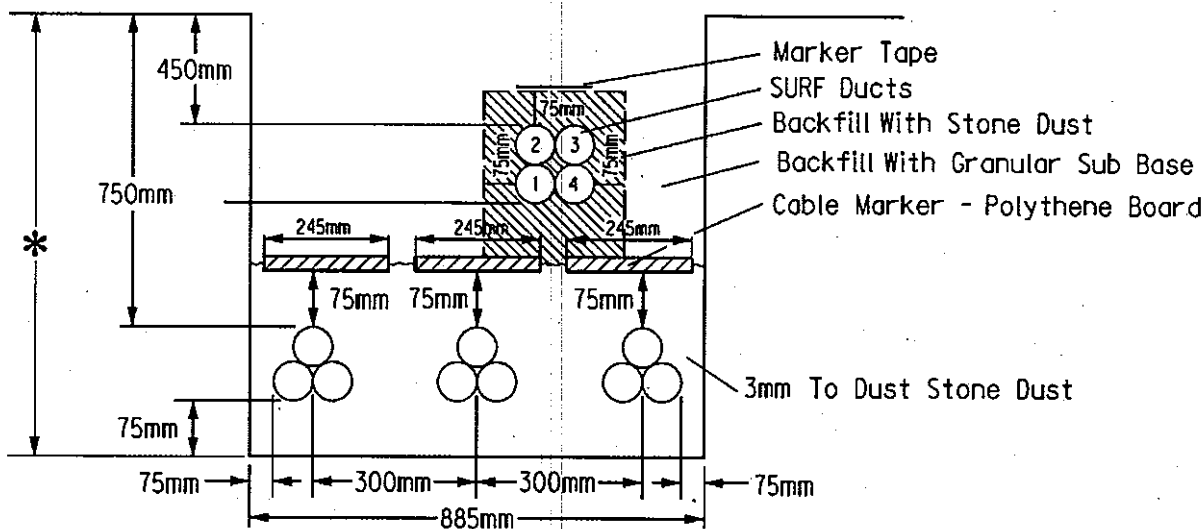


75mm Cover To Marker Tape
75mm Fine Stone Dust Bedding

8	RJB			07/11	TRENCH DEPTH ALTERED	
Rev No	Drawn	Chk'd	App'd	Date	Revision	
ORIGINAL ISSUE	DATE	WESTERN POWER DISTRIBUTION Design Department. Avonbank, Feeder Road, Bristol BS2 0TB Tel: 0117 933 2000 Fax: 0117 933 2001				 WESTERN POWER DISTRIBUTION
Drawn	R.J.B.	05.00				
Checked	P.W.					
Approved						
SCALE	N.T.S.	Title LAYING OF SURF TELECOM DUCT WITHIN 66KV TRENCH CABLES LAID IN TREFOIL				Drg. No. G4064.66 Rev No 8

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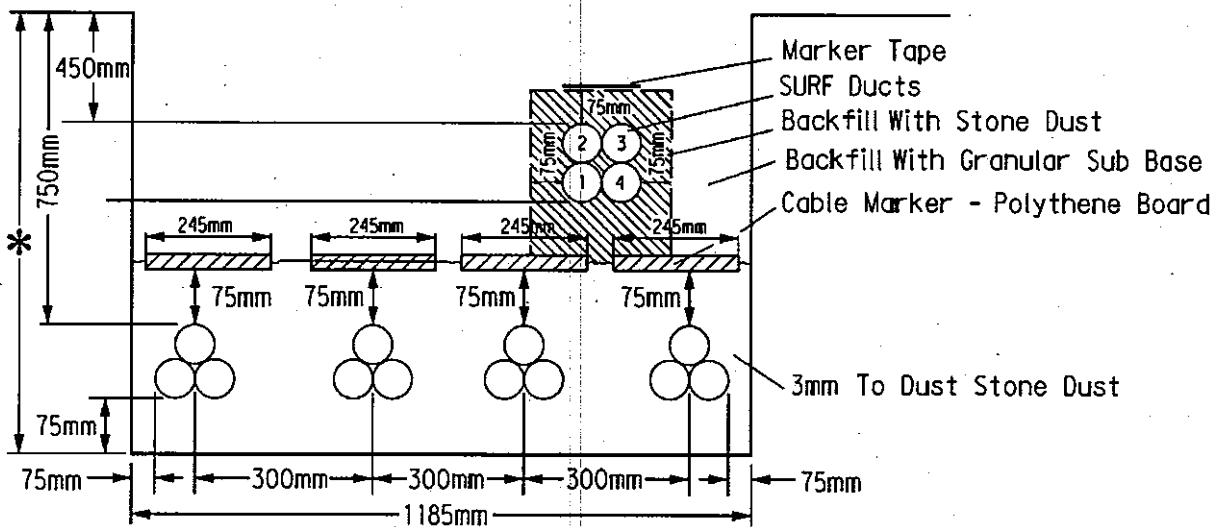
TRIPLE CIRCUIT



75mm Cover To Marker Tape
75mm Fine Stone Dust Bedding

* This Dimension Will Vary Due To The Diameter Of The Respective Cable Being Installed

QUAD CIRCUIT



75mm Cover To Marker Tape
75mm Fine Stone Dust Bedding

[illegible]

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TABLE 3.2 - NORMAL TRENCH DIMENSIONS - Three-Core Cable or Triplex.

Cable Type	Location	Trench Depth	Trench Width Single Cable	Min Cover Over Cable	Trench Width Two Cables
LV & Services	Pavement or private land	530mm	300mm	450mm	300mm
LV & Services	Roadway (ducts)	600mm	300mm	520mm	300mm
11kV (PICAS)	Pavement or private land	530mm	300mm	450mm	300mm
11kV (PICAS)	Roadway (ducts)	600mm	300mm	520mm	400mm
11kV (Triplex EPR or XLPE)	Pavement or private land	530mm	300mm	450mm	300mm
11kV (Triplex EPR or XLPE)	Roadway (ducts)	600mm	300mm	520mm	400mm
33kV H or HSL Solid Type Cable	all locations	900mm	300mm	750mm	600mm

- Single Underground Circuit using Single Core Cables (Laid in Trefoil)

Cable Type	Locations	Trench Depth	Trench Width	Min Cover over Cable
66kV EPR or XLPE laid in Trefoil	all locations	1098mm	450mm	900mm
66kV EPR or XLPE laid with 2D Flat Spacing (630mm ² or larger c.s.a only)	all locations	Depends on diameter of cable but approximately 1050mm	550mm	900mm
33kV EPR or XLPE laid in trefoil	all locations	900mm	450mm	750mm
11kV (Single core EPR) laid in trefoil	Pavement or private land	530mm	300mm	450mm
11kV (Single core EPR) laid in trefoil	Roadway (ducts)	600mm	300mm	520mm

When installing cables in **agricultural land**, it is necessary that the cable be laid at sufficient depth to allow for deep ploughing and cultivation. The recommended depths, to the top of the cable, as agreed with the National Farmers' Union are as follows:

All LV & 11kV cables	-	1000mm depth
All 33kV cables	-	1000mm depth
All 66kV cables	-	1000mm depth
All 132kV cables	-	1000mm depth

3.3 Abnormal Trench Depths, Shuttering, and Unstable Ground

Shuttering with timber or other suitable material must be provided where it is necessary to prevent danger from trench side collapse or falls of rock or other material from the side of the ground adjacent to the trench.

This requirement must be carefully considered where a person could be trapped or buried or struck by material from any height. The Construction (Health, Safety, and Welfare) Regulations 1996 can be referred to for further guidance.

Where excavations deeper than normal are to be dug, reference should also be made to ST: HS 14B – Excavation and Shoring, and BS 6031 (2009), which is the Code of Practice for Earthworks. This deals with the dangers of water draining into a deep excavation and also with the importance of having knowledge of the types of ground being excavated.

All excavation works shall be risk assessed prior to starting work in order to determine whether appropriate shoring is required. As a guide excavations in excess of 1.2m deep shall be classified as 'deep excavations' by the ST: HS 14B and NRSWA, and, as such, the relevant highway authority shall be notified of the special condition.

In ground where subsidence is likely, the cable should be bedded in crushed limestone or crushed granite dust with a pronounced snake, from one side of the cable trench to the other side of the cable trench, to allow for settlement. Damage may be caused to a cable termination by movement of the cable due to ground subsidence, and an anchor should be fitted to the cable with a loop provided to ensure that the minimum of stress is applied to the accessory.

3.4 Coordinated Trenching

Coordinated trenching involves excavating one trench of suitable size to accommodate all the mains to be laid by the various utilities (water, gas, BT etc.). The advantages are cheaper trenching, minimum disturbance to the public, and a lower likelihood of any undertaker damaging another's plant.

It is essential that early consultation takes place and full liaison between all interested parties is imperative for the full benefits to be assured.

3.5 Positioning of Utilities' Apparatus in Pavement

Figure 3.5, overleaf, shows the NJUG agreed standard positioning of utilities' apparatus in a 2m wide new pavement and this shall normally be followed.

If these clearances to other utilities' plant cannot be achieved refer back to the relevant utility for guidance.

Table 3.5.1, overleaf, details how other utilities' plant can be identified underground.

TABLE 1 – Recommended Colour Coding of Underground Utilities Apparatus
All depths are from the surface level to the crown of the apparatus

Utility	Duct	Pipe	Cable	Marker Systems	Recommended Minimum Depths	
					Footway/Verge	Carriageway
Electricity HV (High Voltage)	Black or red duct or tile	N/A	Red or black	Yellow with black and red legend or concrete tiles	450-1200mm	750-1200mm
Electricity LV (Low Voltage)	Black or red duct or tile	N/A	Black or red	Yellow with black legend	450mm	600mm
Gas	Yellow	*** See row below	N/A	Black legend on PE pipes every linear metre.	600mm footway 750mm verge	750mm
	*** PE - up to 2 bar - yellow or yellow with brown stripes (removable skin revealing white or black core pipe). - between 2 to 7 bar - orange. Steel pipes may have yellow wrap or black tar coating or no coating. Ductile Iron may have plastic wrapping Asbestos & Pit / Spun Cast Iron – No distinguishable colour					
Water non Potable & Grey Water	N/A	Black with green stripes	N/A	N/A	600 – 750mm	600 – 750mm
Water - Firefighting	N/A	Black with red stripes or bands	N/A	N/A	600 – 750mm	600 – 750mm
Oil / fuel pipelines	N/A	Black	N/A	Various surface markers Marker tape or tiles above red concrete	900mm <i>All work within 3 metres of oil fuel pipelines, must receive prior approval</i>	900mm <i>All work within 3 metres of oil fuel pipelines, must receive prior approval</i>
Sewerage	Black	No distinguishing colour / material (eg: Ductile Iron may be red; PVC may be brown)	N/A	N/A	Variable	Variable
Telecomms	Grey, white, green, Black, purple	N/A	Black or light grey	Various	250 – 350mm	450 - 600mm
Water	Blue or Grey	Blue polymer or blue or uncoated Iron / GRP. Blue polymer with brown stripe (removable skin revealing white or black pipe)	N/A	Blue or Blue/black	750mm	750mm minimum
Water pipes for special purposes (e.g. contaminated ground)	N/A	Blue polymer with brown stripes (non-removable skin)	N/A	Blue or blue/black	750mm	750mm minimum

TABLE 3.5.1 - COLOURS OF DUCTS, PIPES, CABLES & MARKER TAPES

TABLE 2 – Recommended Colour Coding of Other Underground Apparatus
All depths are from the surface level to the crown of the apparatus




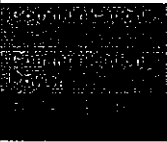


Asset Owner	Duct	Pipe	Cable	Marker Systems	Recommended Minimum Depths	
					Footway	Carriageway
Highway Authority Services						
At the time of publication the following were current examples of known highway authority apparatus colour coding						
Street Lighting						
England and Wales 	Black or orange* * Consult electricity company first	N/A	Black	Yellow with black legend	450mm	600mm
	Purple	N/A	Purple	Yellow with black legend or purple	450mm	450mm
Northern Ireland	Orange	N/A	Black or Orange	Various	450mm	450mm
Other						
Street Furniture	Orange		Orange	Yellow with black legend		
	Black	N/A	Black	Yellow with black legend	450mm	600mm
Telecoms 	Purple/orange	N/A	Black	Various		
Motorways and Trunk Roads						
England and Wales						
	Purple	N/A	grey	Yellow with black legend	450mm	
	Purple	N/A	black	Yellow with black legend		
	Orange	N/A	Black	Yellow with black legend		
Scotland						
Communications 	Black or grey	N/A	Black	Yellow with black legend		
	Purple	N/A	Purple	Yellow with black legend		

TABLE 3.5.1 Continued - COLOURS OF DUCTS, PIPES, CABLES & MARKER TAPES

3.6 Use of Trench Plates

Only fibreglass type trench plates (such as Technotrak 'Safety Cross' or Parker 'Defiance Trench Cover') will be used within WPD. For ease of ordering, these items have been set up on the SHOPS system.

Trench plate use is restricted to footway excavations only where access to properties is to be maintained.

Trench plates must be used in conjunction with appropriate signing and guarding. Trench plates shall not be left on site in isolation.

A trench plate must be firmly fixed to the adjacent surfaces, preferably by using pins at the corners. The plate must fit flush to the existing footway and any edge trips will be ramped with temporary tarmac.

A risk assessment will be completed on every occasion a trench plate is used.

Trench plates shall not be used to defer permanent reinstatement.

FIGURE 1 - Recommended Positioning of Utility Apparatus in a 2 metre Footway

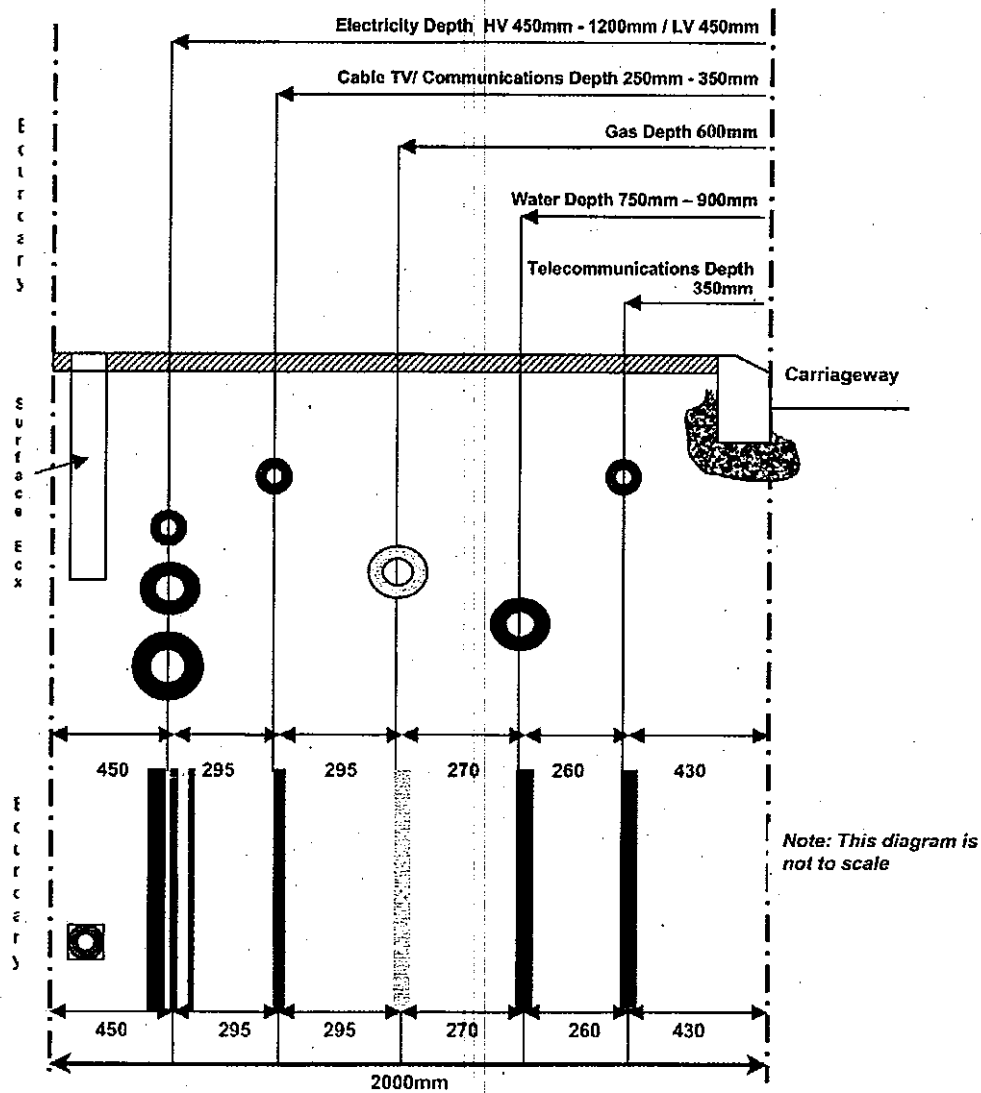


FIG 3.5 - TYPICAL CROSS-SECTION OF TRENCH SHOWING RELATIVE POSITION OF MAINS

3.7 Pipes and Ducts

Where pipes and ducts are to be installed they should be kept as straight as possible and should be surrounded by crushed limestone dust 3mm to dust.

Rigiduct shall be used for LV and 11kV circuits, and "Emtelle" smooth walled uPVC type to BS EN50086-2-4: 1994 shall be used on 33, 66, 132 and 275kV circuits.

In theory, any length of pipe or duct will adversely affect the rating of a cable, but in practice it is generally accepted that pipes or ducts up to 15m long may be used without derating. Two or more such sections may also be used without derating; provided that no more than 30m are ducted in a total cable length of 250m and that there is a minimum separation of 10m between any two ducted sections.

The rating of the cable section can be restored if the ducts are bentonited after the cables have been installed. To ensure the thermal equivalence to the direct buried parts of the route, the ducts shall be completely filled with a bentonite-sand-cement mixture.

The filling medium shall be prepared by adding 20 parts of sand and 8 parts of cements, by weight, to 100 parts of a 10:1 water/bentonite mixture.

Note: The bentonite forms a gel, which is stabilized by the cement, and the addition of sand increases the load-bearing properties of the mixture. Should it be necessary to remove this mixture, it may be flushed out of the ducts by using high-pressure water jets.

Ducts, which are filled with a bentonite mixture, shall be installed wherever possible in a concrete surround but if not, any joints in the duct run must be effectively sealed. At the duct ends, the gap around the cable must be effectively sealed to prevent migration of the bentonite mixture and preserve its moisture content under service conditions.

In general duct lengths of up to 100m can be filled where a standard 150mm nominal bore duct is installed.

When installing duct banks, the ducts shall then be smooth walled with a 75mm radial separation of concrete between ducts. Special care should be taken to seal the joints to stop wet concrete seeping into the ducts. It must be noted that any metallic object shall not be used to maintain separation between ducts, as eddy currents will be induced if single core cables are employed in the ducts.

In long sections, synthetic fibre drawcord should be introduced as the pipes are laid.

Ducts or pipes should normally cross established roads at right angles but it may facilitate cable laying in new developments to install them diagonally.

Page revised 20 August 2012

3.8 Joint Hole Dimensions

Drawing G 4016 A gives the dimensions and layout for all standard joint holes used in WPD.

3.9 Preparation of 66 and 33kV Joint Holes

As 66 and 33kV joints are basically flexible it is necessary to support the joints on concrete slabs. Drawing 3.7.1 shows the recommended joint bay layout. The length of slabbing will be dependant upon the particular joint involved, (e.g. for trifurcating joints a length of 6 slabs should be used).

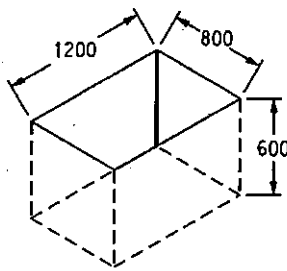
Three-slab width allows one slab each side of the joint as a working platform and these outer slabs may be recovered once jointing is complete.

A granular sub-base will allow easy levelling of the slabs in addition this will also assist with drainage of the working area if the area is wet. Sand bags beyond the ends of the joint should support the cables, and be left in position once jointing is complete.

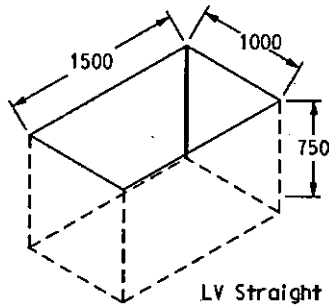
3.10 Installation of Cross Bonding Link Boxes on 66kV Flat Spaced Circuits

When installing 66kV or 132kV single core cables of conductor sizes of 630mm² or larger then it becomes economical to consider laying the circuit in flat spaced configuration where the spacing between the individual conductors can be D, 2D, 3D or 4D spacing where D is the diameter of an individual core, this will give the circuit a slightly higher current rating but this will be offset by the increased cost of the cross bonding link boxes. The design of the cross bonding system shall comply with Electricity Network Association Engineering Recommendation C55/4, refer to the Company Cable Engineer in Avonbank. When the link boxes are installed in the ground the length of the bonding leads which connect the joints to the link boxes **must not** exceed 8m.

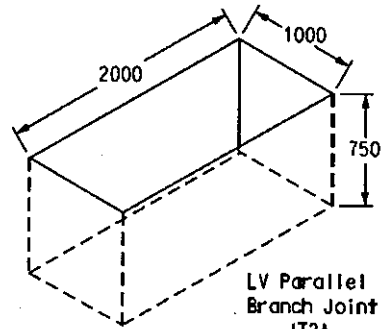
This means that if the circuit is laid in the carriageway then the cross bonding link boxes can be installed in the sidewalk; this will allow future maintenance on the link boxes without having to get a lane closure. See drawing 3.10



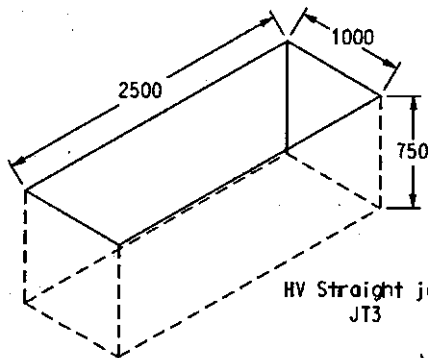
Service joints
JT1



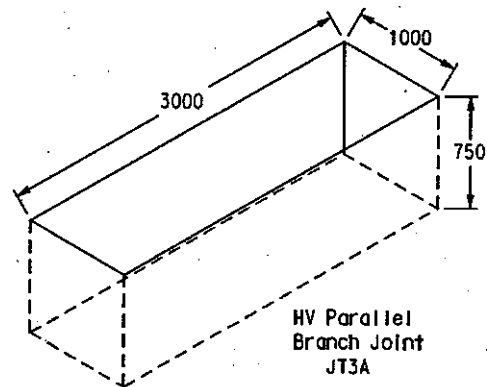
LV Straight joint
JT2



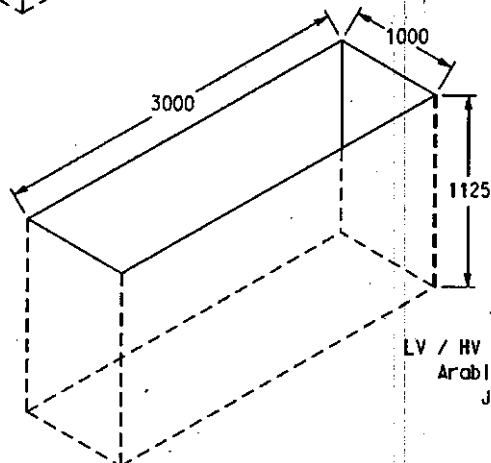
LV Parallel
Branch Joint
JT2A



HV Straight joint
JT3



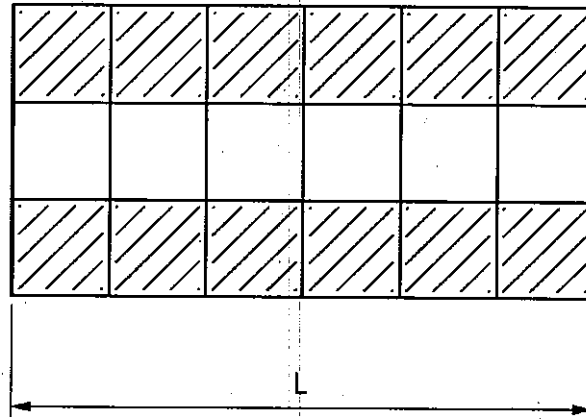
HV Parallel
Branch Joint
JT3A



LV / HV Joints In
Arable Land
JT4

3	RJB			06/03	JOINTS CHANGED	
Rev No	Drawn	Chk'd	App'd	Date	Revision	
ORIGINAL ISSUE	DATE	WESTERN POWER DISTRIBUTION Design Department. Avonbank, Feeder Road, Bristol BS2 0TB Tel: 0117 933 2000 Fax: 0117 933 2001.				WESTERN POWER DISTRIBUTION
Drawn		Title				Drg. No.
Checked						Rev No
Approved						
SCALE	N.T.S.	STANDARD JOINT HOLES				G4016 / A
						3

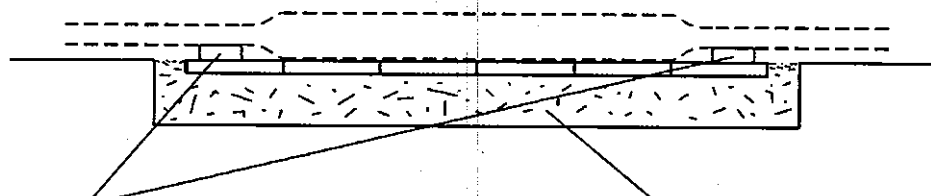
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450x450 slabs

L is dependent upon joint being made


Shaded slabs may be removed upon completion of jointing



Cables supported by
sand bags at end of joint

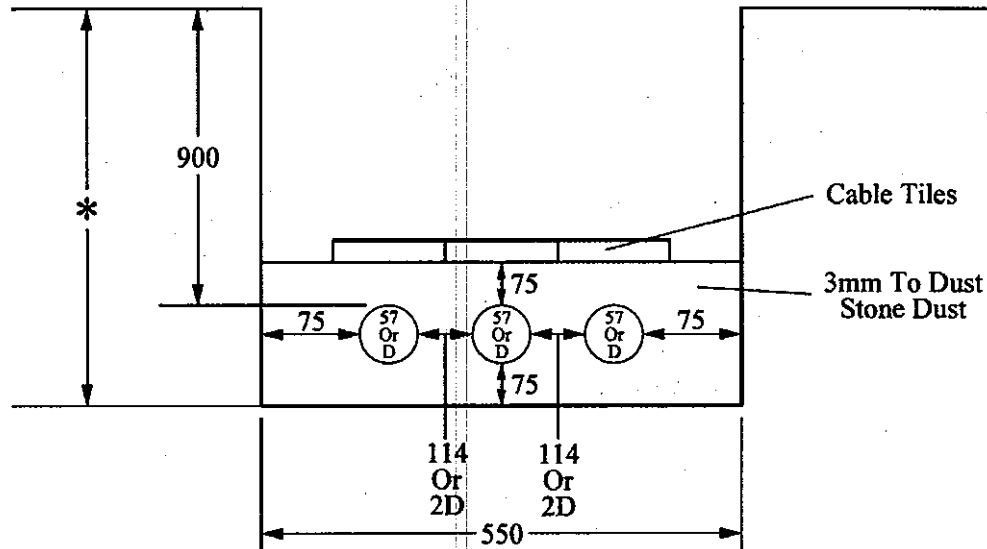
Granular bedding to assist
levelling of slabs and to
increase drainage in wet conditions

Note shoring requirements
for deep excavations

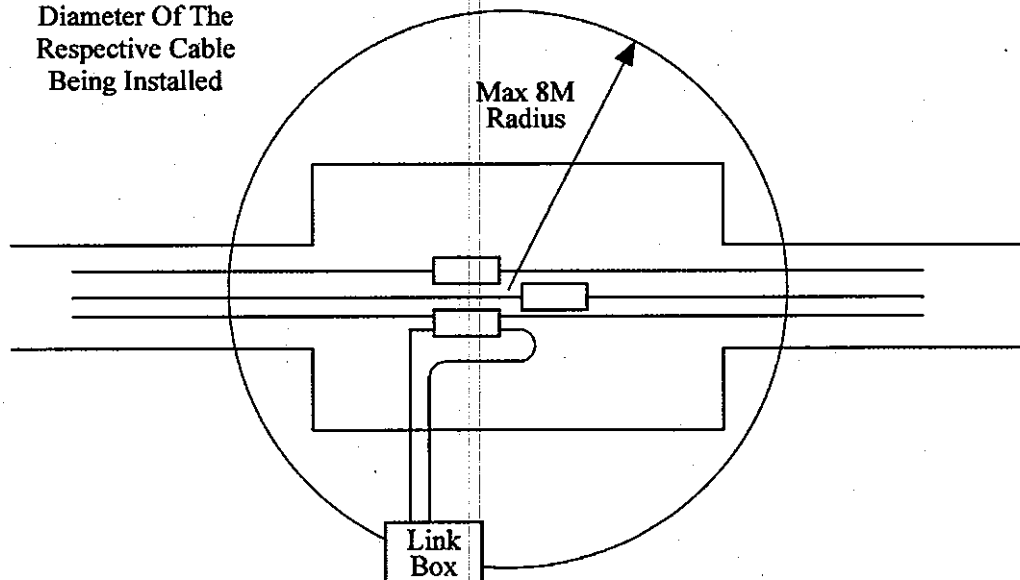
2	RJB			07/11	SAND BAGS ADDED		
Rev No	Drawn	Chk'd	App'd	Date	Revision		
ORIGINAL ISSUE		DATE		WESTERN POWER DISTRIBUTION Design Department. Avonbank, Feeder Road, Bristol BS2 0TB Tel: 0117 933 2000 Fax: 0117 933 2001.			 WESTERN POWER DISTRIBUTION
Drawn	R.J.B.	03.97					
Checked							Drg. No. 3.7.1
Approved				Title JOINT BAY BASE FOR 33 & 66kV JOINTS			
SCALE		N.T.S.					

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All dimensions in mm



* This Dimension Will Vary Due To The Diameter Of The Respective Cable Being Installed



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3.11 Landfill Tax

POL: EN 3, ST: EN 3A and ST: EN 3B sets out the regime for the disposal of material excavated from sites. It defines inert and active waste and the composition of mixed loads for the purposes of the interpretation of the HM Customs and Excise Landfill Tax Levy.

Inactive or general waste incurs the lower rate of tax and is tightly defined. For WPD purposes, materials such as rocks, soils, and concrete fall into this category. Active waste includes plastics, tins, bitumen, paper and wood and the higher tax rate applies. It is very important, therefore, that a mixed load is not corrupted with unacceptable items of active waste such as compound tins, bits of cable, wood shuttering etc. It is worth noting that the tax does make allowances for small quantities of bitumen material including tarmac or asphalt in a load of soil dug up for Utilities' street works. This qualifies at the lower tax rate if these incidental amounts of active waste are considered to be no pollution risk.

3.12 Contaminated Ground

Often the local knowledge of a site is the single most important aspect when assessing the risks of carrying out an excavation. In order to assess the risks attached to the laying of cables in development land, the developers should notify WPD of the land being contaminated and provide details of the contamination. If the ground to be excavated is known to contain a high percentage of ash or peat, or is contaminated with industrial waste or organic acids, then ST: HS 12J "Precautions to be taken when working on contaminated land" should be referred to. It defines contaminated material, the nature of its possible occurrence on WPD sites, and the safe handling and personal protective measures to be employed by employees and appointed contractors when carrying out excavation in the vicinity of such material.

3.13 Bridge Crossings

The method of crossing and work involved should be agreed with the relevant Bridge Authority who may opt to supervise the installation to ensure that the bridge fabric and abutments are not damaged.

All cables shall be snaked prior to the approach of an abutment, to allow for expansion and contraction of the bridge structure.

In the case of 33, 66 and 132kV cables, they shall also be cleated to the abutment.

It may be necessary to install cables in pipes or on trays fixed to the external fabric of the bridge. Cleating should be avoided particularly on structures subject to vibration. In situations where vibration occurs, then advice should be sought from the Company Cable Engineer.

Where it is not practicable to obtain normal burying depths, consideration should be given to laying the cables in ducts, which in turn may have to be protected by concrete and/or steel plates. Alternatively, chases may be formed under the footpath and suitably protected from the possibility of vehicles mounting the footpath.

3.14 Substations and Buildings

The Distribution Safety Rules apply to work on or near WPD's system and apparatus, and apply to WPD employees and contractors alike.

All work in substation buildings and compounds must comply with the Distribution Safety Rules, the appropriate sections of the Factories Acts, the Electricity (Factories Act) Special Regulations and the Electricity Supply Regulations. No person shall enter a substation without authority.

Where long objects or large machines have to be used, a Senior Authorised Person must give permission and the work must be directly supervised by an Authorised Person.

For safety and operational reasons, substations should not be used as stores, mess rooms, or for shelter.

3.14.1 Work in Buildings, including Indoor Substations

In buildings protected by CO₂ fire fighting installation the automatic operating mechanism must be rendered inoperative before any work is done in the building.

Sensitive equipment is often installed in buildings and special care must be taken to keep vibration to a minimum when working in the vicinity of such equipment. Guidance on cleating is given in section 4.3.

Cable entry positions must be sealed to keep out vermin and stop water and gas entering the building.

3.15 Earth Wires

For all aspects of earthing, the WPD Manual of Earthing Practices shall be referred to for guidance.

3.16 Excavation Work near Other Cables

Where work is being carried out near our underground cables special care is required. The person in charge of the site of work shall be warned of the dangers and advised of the route and depth of the mains, which may be affected. Copies of the WPD booklet "Avoiding danger from underground electricity cables" shall be sent to all contractors who work near WPD circuits. Further information can be obtained from the Health & Safety Executive Guidance booklet HS (G) 47 entitled "Avoiding danger from underground services".

3.17 Laying Cables near Trees

Tree roots keep a tree healthy and upright. Most roots are found in the top 600mm of soil and often grow out further than the tree's height. The majority of these roots are very fine; even close to a tree few will be thicker than a pencil. Most street tree roots grow under the footway but may also extend under the carriageway. If roots are damaged the tree may suffer irreversible harm and eventually die.

Protecting Roots - Do's and Don'ts

There are three designated zones around a tree each of which has its own criteria for working practices.

The Prohibited Zone

Don't excavate within this zone.

Don't use any form of mechanical plant within this zone

Don't store materials, plant or equipment within this zone.

Don't move plant or vehicles within this zone.

Don't lean materials against, or chain plant to, the trunk.

Do contact the local authority tree officer or owner of the tree if excavation within this zone is unavoidable.

Do protect any exposed roots uncovered within this zone with dry sacking.

Do backfill with a suitable inert granular and top soil material mix as soon as possible on completion of works.

Do notify the local authority tree officer or the tree's owner of any damage.

The Precautionary Zone

Don't excavate with machinery. Where excavation is unavoidable within this zone excavate only by hand or use trenchless techniques.

Don't cut roots over 25mm in diameter, unless advice has been sought from the local authority tree officer.

Don't repeatedly move / use heavy mechanical plant except on hard standing.

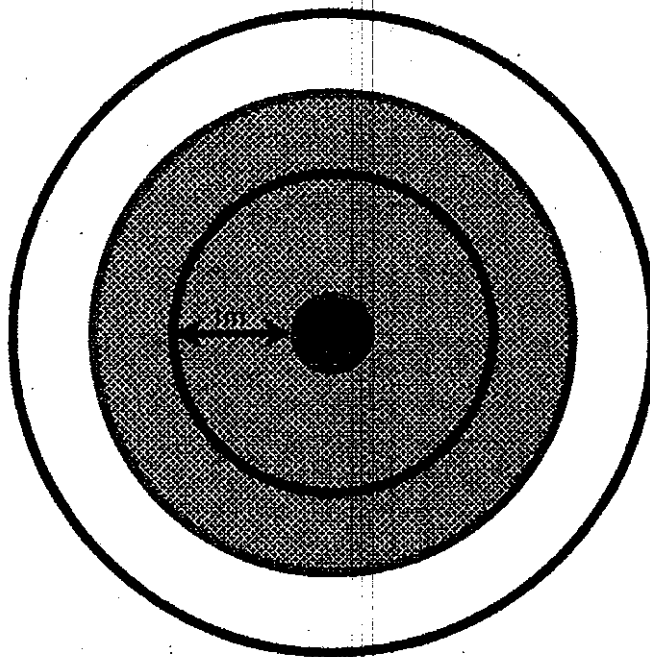
Don't store spoil or building material, including chemicals and fuels, within this zone.

Do prune roots which have to be removed using a sharp tool (e.g. secateurs or handsaw). Make a clean cut and leave as small a wound as possible.

Do backfill the trench with an inert granular material and top soil mix. Compact the backfill with care around the retained roots. On non highway sites backfill only with excavated soil.

Do protect any exposed roots with dry sacking ensuring this is removed before backfilling.

Do notify the local authority tree officer or the tree's owner of any damage.



TREE PROTECTION ZONE

Key to Diagram



Trunk of Tree



Spread of canopy or branches



PROHIBITED ZONE – 1m from trunk. Excavations of any kind must not be undertaken within this zone unless full consultation with Local Authority Tree Officer is undertaken. Materials, plant and spoil must not be stored within this zone.



PRECAUTIONARY ZONE – 4 x tree circumference. Where excavations must be undertaken within this zone the use of mechanical excavation plant should be prohibited. Precautions should be undertaken to protect any exposed roots. Materials, plant and spoil should not be stored within this zone. Consult with Local Authority Tree Officer if in any doubt.

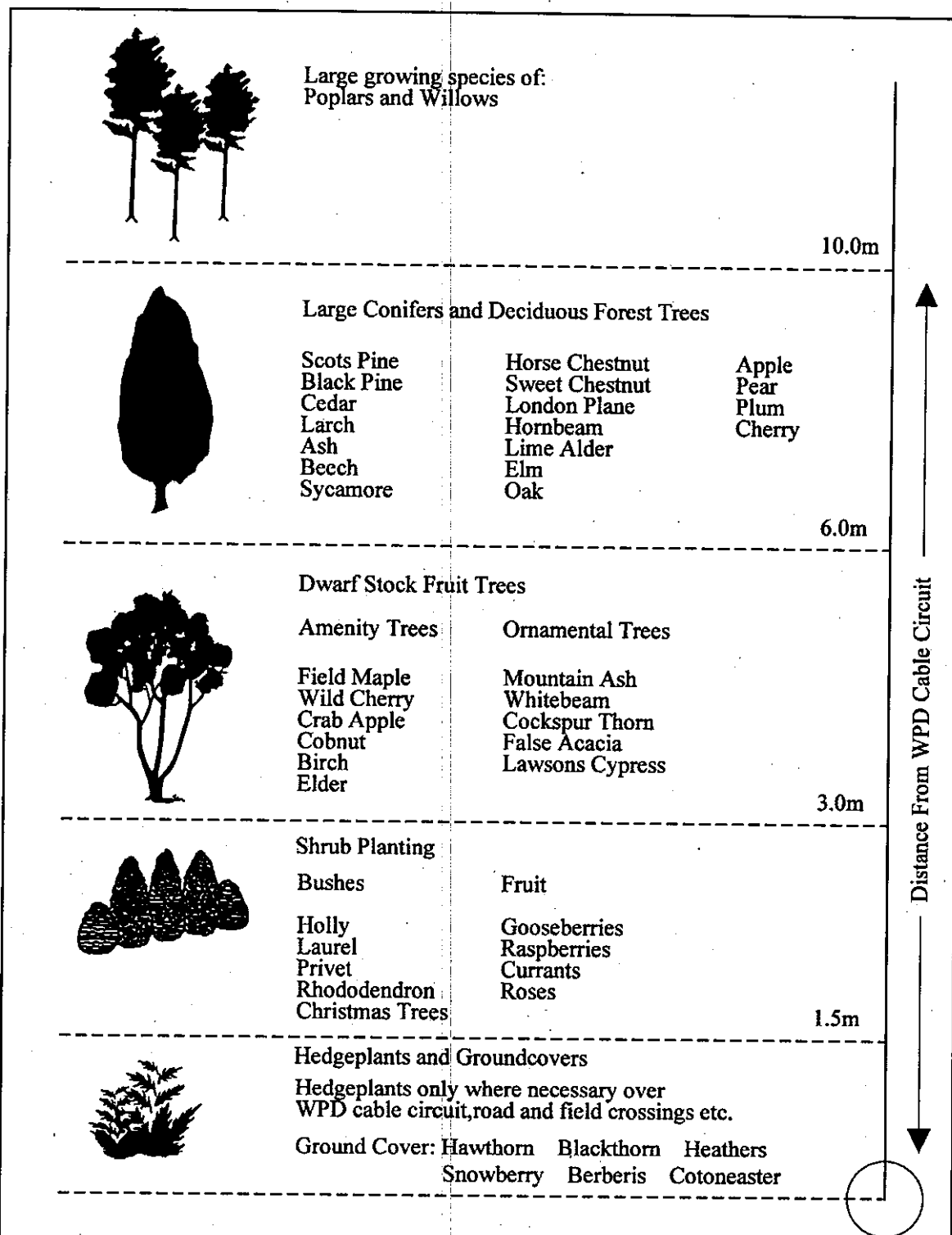


PERMITTED ZONE – outside of precautionary zone. Excavation works may be undertaken within this zone however caution must be applied and the use of mechanical plant limited. Any exposed roots should be protected.

3.18 Tree Planting Restrictions near Underground Cables

Early consultation with WPD should take place before any tree work, including planting, is undertaken to ascertain the position of existing apparatus. When planning new tree planting, there should be liaison with the WPD, local authority and landowner so that the risks trees may pose to utility apparatus in the future are minimised.

- 3.18.1 It has been established that root growth of some trees is a definite hazard to all types of LV, 11kV, 33kV, 66kV and 132kV underground cable circuits, therefore before any tree planting is carried out on an underground cable easement, written approval must be obtained from Western Power Distribution (WPD). Any approval granted by WPD to plant trees on the easement must be subject to WPD retaining the right to remove, at any time in the future, all trees which in the opinion of WPD Engineer might become a danger to the underground cables. See drawing 3.18.1.
- 3.18.2 The written consent to plant trees will state what area may be planted and also the type of tree.
- 3.18.3 The only hardwood plants, which can be planted directly across the underground cable circuit, are hedge plants such as Quickthorn, Blackthorn, Holly, etc. and these should only be planted where a hedge is necessary either for screening purposes or to indicate a field boundary.
- 3.18.4 Poplar and Willow trees should not be planted within 10.0m of the underground circuit.
- 3.18.5 The following trees and those of similar size, be they deciduous or evergreen, should not be planted within 6.0m of the underground cable circuit: Ash, Beech, Birch, most Conifers, Elm, Horse Chestnut, Lime, Maple, Oak, and Sycamore. Apple and Pear trees also come into this category. These trees may only be planted as individual specimens or a single row in an area between 6.0m and 10.0m of any underground cable circuit. Dense mass planting may only be carried out at distances greater than 10.0m from any underground cable circuit.
- 3.18.6 Raspberries, Gooseberries, Red and Blackcurrants may be planted on the easement but a 4.0m strip (2.0m each side of the underground cable circuit) must be left clear at all times.
- 3.18.7 Root barriers can only be used with dwarf stock only. If these are to be used please notify WPD with type and details of root barrier, and final growth and root size.
- 3.18.8 In cases where screening is required, the following are shallow rooting and may be planted close to any underground cable circuit: - Blackthorn, Broom, Cotoneaster, Elder, Hazel, Laurel, Privet, Quickthorn, Snowberry and most ornamental flowering shrubs.
- 3.18.9 Christmas trees (Picea Abies) may be planted within 3.0m of any underground cable circuit. However, permission is given on the strict understanding that the Christmas trees are clear felled at intervals not exceeding seven years.



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3.18.10 In situations where trees and bushes are already established over or near the underground cable circuit, contact will be made with you by WPD to decide on a future course of action.

3.19 Railways

Access to, or work within the Network Rail infrastructure and level crossings poses special safety hazards to staff, contractors, railway users and the general public. Consequently there are rigorous control measures in place, primarily set out in: -

(a) Energy Networks Association Engineering Recommendation G56/1-1996 "Arrangements for access by ENA Member Company staff to Railtrack infrastructure".

(b) Department for Transport - Code of Practice for Coordination of Street Works and Works for Road Purposes and Related Matters, third edition August 2009 – See Appendix C on Works at or near Level Crossings.

Compliance with these requirements is mandatory, and further information should be sought from WPD Policy Document POL: GE14 and WPD Standard Technique ST: GE14A and ST: GE14B.

It is also worth noting that when trenching under a railway bridge, there is a need to establish the position and details of the foundations plus a need to contact Network Rail to gain written clearance from them that the proposed cable route will not impinge on their existing structure.

3.20 Motorways

Motorways are classified as 'protected' in the New Roads and Streetworks Act (1991). WPD do not have any statutory rights in respect of motorways and the consent of the Ministry responsible for motorways must be obtained before WPD circuits can cross over or under motorways.

It is highly unlikely that any surface excavation will be allowed on motorways after they have been opened to traffic. Underground crossings may only be allowed if guided boring techniques are employed. It is therefore extremely important that provision be made during the construction of motorways for cable crossings, if these are foreseen.

3.21 Trenchless Technology

Trenchless technology can be a useful technique for installing cables where open excavation may prove uneconomical or difficult. Many different systems can be employed which are dependant on site/ground conditions. The varying techniques, which may be employed, include: -

- Impact mole boring
- Push rodding
- Impact pipe ramming
- Auger boring
- Rock boring
- Guided boring (directional drilling)

Advantages include the fact that fewer openings are required, these being limited to the launch and receiving pits, and points where other existing services cross the intended route. Careful planning is essential in determining the route with its launch and receive pits and in accurately locating the points at which existing underground mains and services cross the route. If necessary, trial holes must be excavated at crossing points to ensure that no damage results from the passage of the mole.

4.0 LAYING CABLE

4.1 Preparation

4.1.1 Precautions in Cold Weather

Cables with PVC or paper insulation or PVC oversheaths (e.g. service and wavecon cables) should take place only when both cable and ambient temperature have been at or above freezing point 0°C for the previous 24 hours as the cold will damage the insulation and or oversheath. Polymeric (EPR and XLPE) cables with MDPE oversheaths can be damaged if they are installed when the cable temperatures are below -10°C. In very cold weather, special measures must be taken to ensure that the cables are at a temperature above freezing point when being laid.

Under such circumstances cables shall be stored indoors, preferably in a heated building, to 'thaw out' for 24 hours before laying. The cable should then be delivered to site on a sheeted trailer and installed as quickly as possible.

If the drum has already reached a temperature below freezing, the use of a hot air blower, possibly of the propane type is recommended. Localised overheating must be avoided.

Cables stored at temperatures, which are below that recommended for installation should not be subject to any mechanical stress including shocks, impact, bending or torsion.

4.1.2 Cable Drums - Handling and Positioning

When handling drums, suitable precautions should be taken to avoid damage to the cable and injury to people. Due regard should be paid to the mass of the drum, the method and direction of rolling and the method of lifting.

It is preferable for ease of handling and safety to move drums by special cable drum trailers and whenever possible the cable should be laid direct from these. In certain cases it may be possible to lay cable from a drum trailer whilst it is being towed alongside the trench, thus giving a considerable saving in time and effort. For more guidance refer to section 4.2.3.2.

The drum mounting position, if stationary, will be influenced by the following:

- **Accessibility** - Good access to where the cable drum is to be mounted.
- **Gradient** - On sloping ground, cables should be pulled downhill.
- **Bends** - The drum should be mounted at the end of the trench nearest the bends. The force required to pull cable is less near to the drum, and therefore, the side forces and friction on the bends will also be less.
- **Ducts** - To minimise the disturbance to ducts and the resulting possibility of damage to the cables, the drum should be at the end of the trench farthest from the ducts.
- **Jointing** - Consecutive lengths of cable should be laid 'A' end to 'Z' end to ensure correct rotation of the cores when jointing.

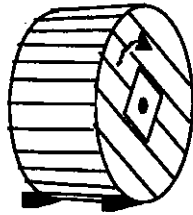
Generally, more than one of the above factors will be present and a compromise will be necessary. When bends and ducts are adjacent the guidance given for bends applies.

When rolling drums, it should be over short distances only and the drum rotation should always be according to the arrow marked on the drum flange. This will ensure that any slack cable is worked to the outer end. Failure to take this precaution may result in slack cable collecting at the hub of the drum causing damage.

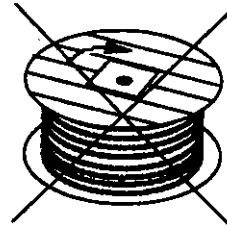
If it is necessary to alter the course on which the drum is being rolled, a drum-slewing bar should be used, as shown in figure 4.1.2. Pipes or other make-do equipment should not be used for this purpose, as they are unsuitable and dangerous.

The cable drum shall never be left unchecked, in case it rolls either by accident or vandalism.

Cable drums should be transported with the drum axis horizontal and any drum movement should be avoided.



*Keep the drum standing upright,
using wedges in the heels of the
flanges*



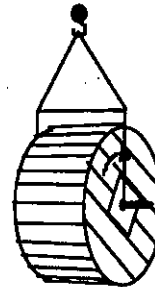
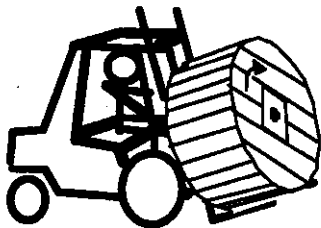
Not recommended

The cable drum must be so arranged that the cable be pulled off the top of the drum. If battens are fitted and the end of the cable cannot be seen, the drum should be set up so that it will rotate during cable laying in the opposite direction to the 'rolling' arrow.

Cable ends should be firmly attached to the drum during transport and storage to prevent damage to the cable.

Care should be taken to avoid damage to the cables caused by nails or staples used in drum manufacture or when applying battens.

For loading and unloading of cable drums, suitable lifting and hoisting equipment should be used. A drum should not be dropped.



Drums may be lifted either by crane or fork-lift truck

4.1.3 Winch Positioning

Normally, the cable will be pulled direct from the drum trailer but in its absence, drum jacks and spindles should be used. A 2.1m long by 75mm outside diameter 5000kg SWL high tensile seamless steel tubular drum spindle with 2 x 5000kg ratchet type cable drum jacks with timber bases and cups to take up to 100mm spindles will support cable drums holding up to 250m of the largest standard sizes of LV, HV and EHV cables.

Cable drum jacks should be mounted on a firm level base. If the ground is uneven, a foundation should be provided by using stout timber solidly packed.

Timber packing may also be necessary to prevent settling of the jacks by spreading the weight if the ground is soft. It may be necessary to locate the drum in the roadway away from the trench and in this case the drum should then be offset by not more than 30 degrees to the line of the trench. For safety, the drum should not be mounted closer than 1m to trench excavations of normal depth.

The drum should be raised to just clear the ground and the drum spindle levelled to prevent the drum moving to one end. The level of the drum should be checked by a plumb bob against the drum side or by placing a spirit level on the drum spindle. When using a spirit level with heavy cable drums, readings should be taken at each end to compensate for deflection of the loaded spindle.

The spindle should be greased and a check made for smooth rotation of the drum.

Drum battens and steel bands if fitted may then be removed. For safety, all nails should be withdrawn from the battens and drum rim immediately and the battens stacked neatly.

The winch to be used may be of the platform mounted, trailer mounted, or vehicle mounted type.

The winch should be positioned at the end of the cable trench and securely anchored. It is important to note that where a boom is used, the main anchorage against the pull must be at the lower end of the boom. The anchorage should be obtained by cross bracings recessed into the sides of the trench.

4.1.4 Cable Bedding

The bed of the cable trench shall be free from water, stones, and pieces of rock that may cause damage to the cable. Loose stones in the trench sides that may be dislodged during the cable pull, shall be removed.

Crushed limestone dust 3mm to dust, or crushed granite, 3mm to dust, shall be imported and should be laid to provide a suitable bedding for the cable or duct. Once the cable or duct has been laid onto the bedding a further layer of crushed limestone dust or crushed granite dust shall be applied, this shall be for a depth of 75mm above the cable or duct.

4.1.5 Cable Rollers - Positioning

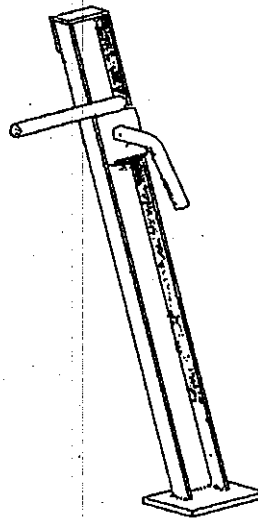
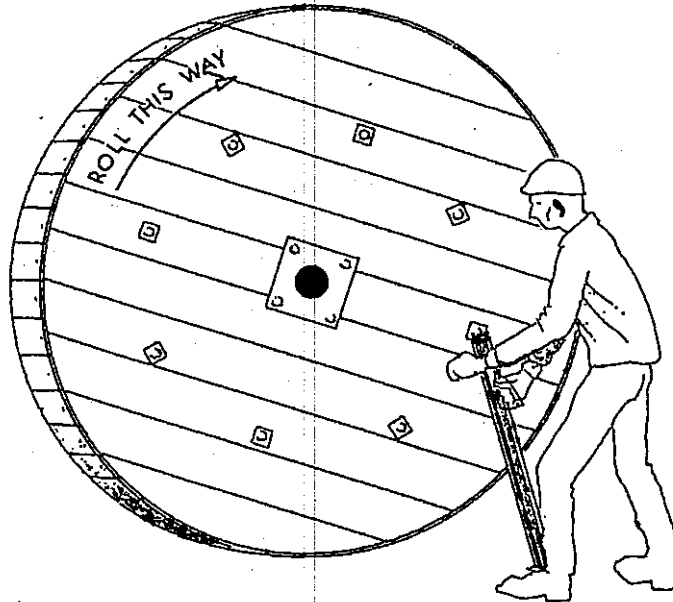
The rollers are necessary to avoid abrasion of the cable by keeping it clear of the ground and to reduce friction during pulling. The types of roller generally available are depicted in figure 4.1.5a. The ramps built into the straight and corner cable rollers allow the cable end to ride over without being lifted. These rollers are, therefore, suitable for either winch or hand pulling. The arrangement of cable rollers will depend upon which of these methods is used.


A typical arrangement of rollers in a trench is shown in figure 4.1.5b.

The straight rollers should be no more than 2m apart. Too great a spacing between rollers will allow excessive sag in the cable and 'rowing' will result whenever the pull is released and then taken up again. This is particularly wasteful of effort during hand pulling. Special attention should be paid to the position of rollers in the trench at points where a change of direction is made.

The positioning of the rollers should be such that the cable is not bent around too sharp a radius. Refer to table 4.1.5 for details of minimum bending radius for cables.

Drum slewing bar intercepts nut at end of one of the tie bars and, as the drum is rolling, it lifts one side of the drum and alters the direction.



2	RJB			06.03	REDRAW ON CAD	
Rev No	Drawn	Chk'd	App'd	Date	Revision	
ORIGINAL ISSUE		DATE		WESTERN POWER DISTRIBUTION Design Department. Avonbank, Feeder Road, Bristol BS2 0TB Tel: 0117 933 2000 Fax: 0117 933 2001.		 WESTERN POWER DISTRIBUTION
Drawn	RJB			Title USE OF THE DRUM SLEWING BAR		
Checked						
Approved						
SCALE		N.T.S.		Drg. No. 4.1.2.		Rev No 2

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TABLE 4.1.5 - MINIMUM BENDING RADII OF WPD STANDARD CABLES

LV SERVICE CABLES		
Type of Cable	SINGLE CORE (mm)	THREE CORE (mm)
4 mm ² CONC	75	-
16 mm ² CONC	100	200
25 mm ² CONC	125	200
25 mm ² HYBRID	125	200
35 mm ² HYBRID	125	250
4 mm ² SPLIT	100	-
16 mm ² SPLIT	125	-
25 mm ² SPLIT	150	-
35 mm ² SPLIT HYBRID	-	250

LV MAINS		
Type of Cable	SINGLE CORE (mm)	THREE CORE (mm)
3 Core Wavecon		
3 Core 95 mm ² WAVECON	-	550
3 Core 185 mm ² WAVECON	-	700
3 Core 300 mm ² WAVECON	-	850
4 Core Wavecon		
4 Core 95 mm ² WAVECON	-	600
4 Core 185 mm ² WAVECON	-	800
4 Core 300 mm ² WAVECON	-	1000

LV ARMoured	
Type of Cable	SINGLE CORE (mm)
480 mm ² SOLIDAL	350
600 mm ² SOLIDAL	400
740 mm ² SOLIDAL	400
960 mm ² SOLIDAL	450

11kV Cables		
Type of Cable	SINGLE CORE (mm)	THREE CORE (mm)
95 mm ² PICAS	-	600
185 mm ² PICAS	-	750
300 mm ² PICAS	-	900
500 mm ² PILC Cu	650	-
630 mm ² PILC Cu	750	-
630mm ² Cu. Single core EPR	1000	-
300mm ² Cu. Single core EPR	800	-
95mm ² Al. Single core EPR	600	-
95mm ² Al. Triplex EPR	-	600
185 mm ² Al. Triplex EPR	-	650
300 mm ² Al. Triplex EPR	-	750

Page revised 9 October 2012

33 kV Cables		
Type of Cable	SINGLE CORE (mm)	THREE CORE (mm)
185 mm ² EPR or XLPE	940	-
240 mm ² EPR or XLPE	980	-
400 mm ² EPR or XLPE	1100	-
630 mm ² EPR or XLPE	1260	-
185 mm ² 'H' type Cu	-	1400
240mm ² 'H' type Cu.	-	1500

66 kV Cables		
Type of Cable	SINGLE CORE (mm)	THREE CORE (mm)
185 mm ² EPR or XLPE	1300	-
300 mm ² EPR or XLPE	1300	-
400 mm ² EPR or XLPE	1400	-
630 mm ² EPR or XLPE	1500	-
1000 mm ² EPR or XLPE	1700	-

A rope should be used to check that the corner assemblies have a smooth curvature, are free of protrusions and will allow the cable to rise smoothly on to the main area without bearing on the leading edge.

Where cable has to pass through ducts the rollers must be so arranged that the cable enters in a straight line and does not bear against the duct wall. For this reason the rollers should be placed so that their surface throws the cable at least 10mm off the duct interior wall.

These points are particularly important where a bend in the cable precedes entry to the duct and then some additional standoff may be necessary to allow for movement of the roller assembly under thrust.

Removable split bell mouths can be inserted into the leading edge of pipe or ducts to facilitate cable entry.

4.1.5.1 Winch Pulling

Dynamometers should be fitted to all winches so as the maximum pulling tension of the cables is not exceeded on installation. A digital print out should also be obtained at the end of each completed cable pull to prove the cable was not over tensioned during installation. If the cable pull appears to be difficult it is advisable to use a caterpillar cable pusher, which is installed at the start of the cable run. This caterpillar is used in conjunction with the winch, when used in this fashion this will greatly reduce pulling tensions on the cable.

The winch cable will always take a direct line between angle positions and may also tend to lift up or bear down hard according to the contour of the trench. The position and level of the rollers must, therefore, be carefully arranged to prevent the taut winch rope, or cable damaging or being damaged by pipes crossing the trench. An inverted skid plate attached to screw jacks wedged across the trench will guide the cable and winch rope under obstructions.

To facilitate the pulling of cables around bends in the trench, curved steel plates or special curved corner roller assemblies should be set up against the wall of the trench to minimise the additional strain due to change of direction. To counteract sideways thrust, packing should be used to stabilise the corner assemblies.

Crowbars or single rollers **should not** be used on their sides at bends as they can cause flattening or bird caging of the triplex cable during installation.

Where pulling is difficult lubrication will ease cables round bends and through ducts. For safety, the lubricant must be applied by stick or brush and not by hand. A mixture of common household powdered detergent and powdered graphite mixed in equal proportions with water to form a paste is recommended for this, as it is 'non-sticky' and loose stones are unlikely to adhere to the cable.

Grease should not be used as the lubricant as grit will adhere to it.

When two cables are to be laid side by side, a double line of rollers should be placed in the trench at bends and duct entrance positions so that the second cable can be pulled as soon as the first cable has been taken off the straight line rollers and while the men are still in position.

4.1.5.2 Hand Pulling

Cable rollers should be arranged as for winch pulling but some relaxation of the measures to counter thrusts at corners may be possible. On straight sections of the trench the rollers should be placed centrally to allow a man to stand astride the cable when pulling.

4.2 Cable Pulling

Cable should always be pulled to provide a 1.2m overlap for jointing purposes. Where cable is cut to length the end **must be sealed** to prevent moisture ingress.

4.2.1 Cable Attachments

When using Triplex cable it helps to prevent the unwinding of the cable if 13mm wide cable ties (SHOPS No. 35370) are placed on the leading 5m to 7m of cable, prior to the cable being laid. If this cable is then to be pulled into ducts the cable ties should be taped over with Scotch 88 tape to prevent the cable ties snagging on the ducts. All short lengths of triplex should be cable tied to prevent the cable unwinding, prior to the laying of the short length of cable.

4.2.1.1 Attachment of Cable Stocking to Cable

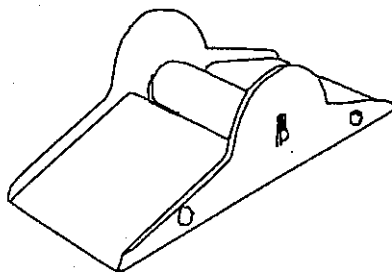
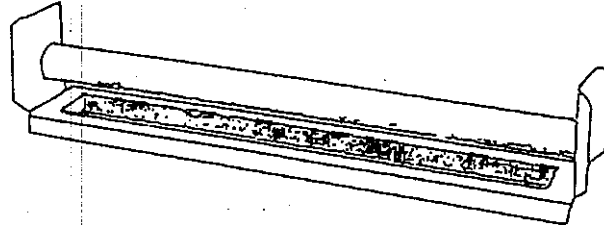
The approved method of attachment of the cable pulling rope to the cable is by cable stocking or three in one swivel head. There are wide ranges of sizes available from many different manufacturers. The stockings distribute the pull and avoid damage; care must be taken to ensure that the stocking fits over the oversheath of the cable. In the case of Triplex cable individual stockings should be applied to all three cores and these in turn should be attached to the swivel on the pulling bond. In all cases the stocking should be pushed fully on to the cable and should be secured at the end with binding wire as shown in figure 4.2.1.1. The cable stocking will also have a SWL equivalent to the maximum pulling tension of the cable. After the end of the cable has been freed from the drum the cable stocking should be fitted.

Table 4.2.1 gives guidance on maximum pulling tensions and diameters of cables most commonly used in WPD.

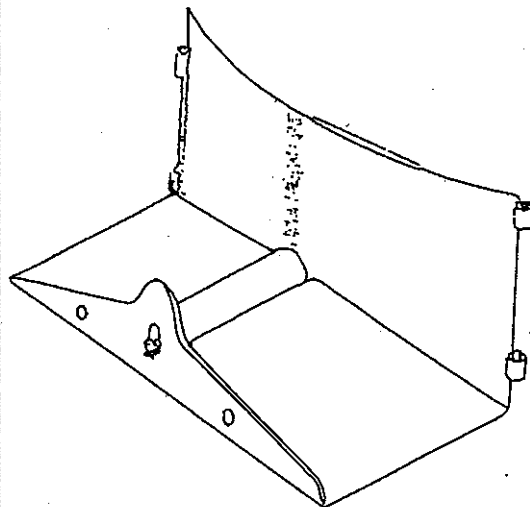
TABLE 4.2.1 - MAXIMUM STOCKING PULLING TENSIONS & OVERALL DIAMETERS

Cable voltage	Cable type	Nominal overall diameter (mm)	Pulling tension safe limit (N)
66kV	185 mm ² EPR or XLPE	54	6185N
66kV	300 mm ² EPR or XLPE	57	6300N
66kV	400 mm ² EPR or XLPE	60	6400N
66kV	630 mm ² EPR or XLPE	65	6630N
66kV	1000 mm ² EPR or XLPE	76	61000N
33kV	185 mm ² XLPE	47	6627N
33kV	240 mm ² XLPE	49	7203N
33kV	400 mm ² XLPE	55	9075N
33kV	630 mm ² XLPE	63	11907N
33kV	240mm ² 'H' type Cu.	75	16875N
33kV	185 mm ² 'H' type Cu	70	14700N
11kV	95 mm ² PICAS	50	6800N
11kV	185 mm ² PICAS	61	11163N
11kV	300 mm ² PICAS	73	15987N
11kV	400 mm ² PICAS Cu.	81	19683N
11kV	500 mm ² PILC	43	5547N
11kV	630 mm ² PILC	47	6627N
11kV	630 mm ² EPR	48	6912N
11kV	95 mm ² EPR Triplex	28	2352N
11kV	185 mm ² EPR Triplex	33	3267N
11kV	300 mm ² EPR Triplex	37	4107N
LV	3 Core 95 mm ² WCON	35	3675N
LV	3 Core 185 mm ² WCON	46	6348N
LV	3 Core 300 mm ² WCON	55	9075
LV	4 Core 95 mm ² WCON	40	4800N
LV	4 Core 185 mm ² WCON	54	8748N
LV	4 Core 300 mm ² WCON	64	12288N


Leading Roller



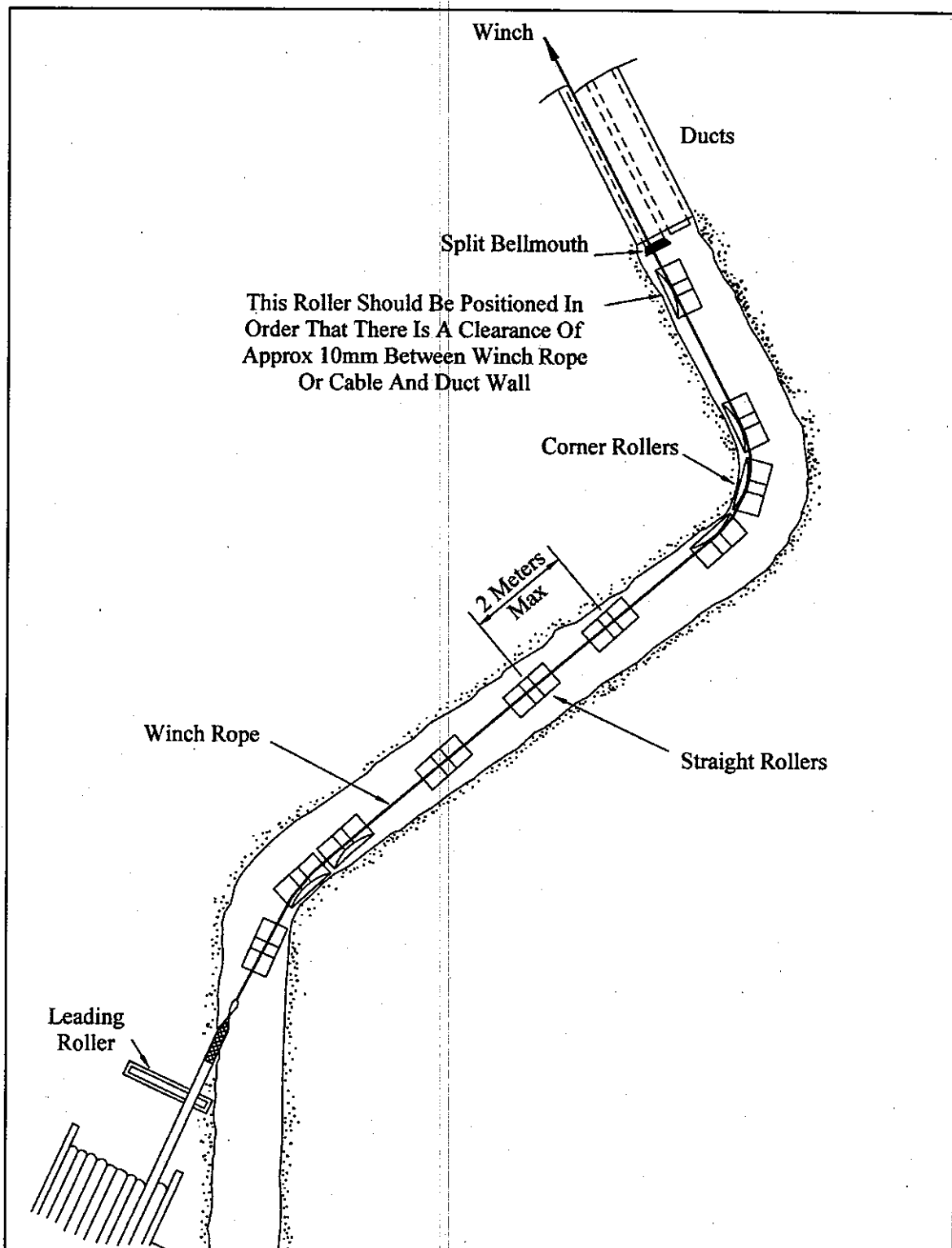
'Straight' Cable Roller




'Corner' Cable Roller

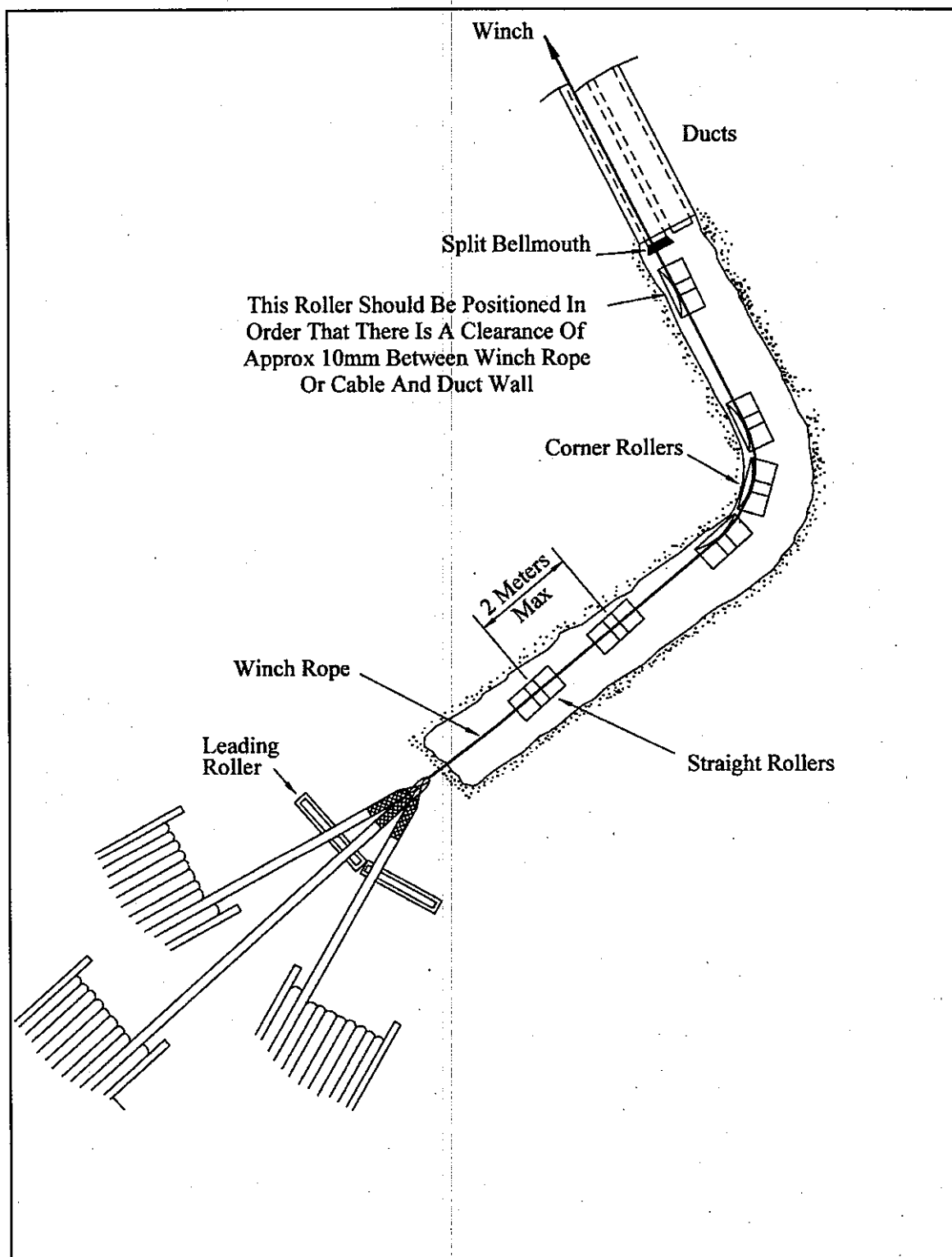
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				CABLE ROLLERS		4.1.5.a	1

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Checked				Title		Drg. No.	Rev No
Approved				TYPICAL ARRANGEMENT OF ROLLERS IN A CABLE TRENCH		4.1.5.b	2
SCALE		N.T.S.					

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4.2.1.2 Attachment of Pulling Rope to Cable Stocking

When pulling by winch, a clevis-ended swivel must be fitted between the rope and the thimble of the cable stocking. The swivel, as shown in figure 4.2.1.1, is streamlined and complete with clevis fittings for rope and stocking. It shall also have a SWL, which will at least match the maximum pulling tension associated with the cable to be installed.

The swivel allows the rope to turn freely. Without a swivel a twisting strain will result under load, and should there be a sudden release of this, the whip-back on a steel rope will be dangerous and in many cases cause kinking.

4.2.2 Rope Bonds

The preferred rope bond used is steel wire rope, but this is not suitable for hand pulling as it is springy, too small in diameter to grip, and broken strands may lead to injury.

When pulling by hand, either natural or synthetic fibre rope may be used but care must be taken to ensure the SWL of the rope is not a limitation when pulling cables to the recommended maximum tensions.

4.2.2.1 Steel Wire Rope

For winches, steel wire rope is preferred to fibre rope as its smaller size allows a compact arrangement of winch and take up spool, and there is little deterioration if the rope is properly maintained. Gloves must always be worn when handling wire ropes.

Tapered Talurit compressed ferrules should be specified for the thimble end to avoid a shoulder that could catch up on ducts or rollers.

To prevent the possibility of kinking and disturbance of the lay, ropes should be paid out without slack and in a straight line.

After use and before storage, the wire rope should be wire brushed, examined and lubricated with wire rope dressing.

4.2.3 Methods

Winch pulling or the laying of cable direct from a moving cable drum trailer is to be preferred to hand pulling purely because it is less arduous and fewer people are required.

Nevertheless for short lengths of cable, hand pulling may be expedient. Whichever method is used all men should wear protective gloves and footwear throughout the pulling/handling operations.

4.2.3.1 Winch Pulling

The winch operating procedures outlined in these sections are suitable for most types of winch at present available, although some variation in procedure may be required for a particular type of winch.

Winches should be fitted with a digital dynamometer arrangement to ensure the maximum pulling tension of the cable being installed is not exceeded. A print of the pulling tensions should be provided at the end of each completed cable pull.

The number of men required is dependant on the winch type and size, and the nature of the job.

Figure 4.2.3.1 depicts a typical example of the location and duties of men on winch cable pulling.

The person-in-charge should ensure that all personnel employed on cable winching are familiar with the signalling procedures employed. Each signal should be positive and distinct.

Portable radio may be helpful on schemes where hand signals cannot easily be used.

At any time, any man in the team is at liberty to give the emergency stop signal should personal danger or serious circumstances arise.

4.2.3.2 Laying Cable from a Moving Drum Trailer

Laying the cable directly into or beside the trench from a drum trailer whilst it is being towed along slowly can make considerable saving in time and effort. This method can only be used if there is unobstructed access beside the trench and if there were no pipes or services crossing the trench under which the cable would have to be laid. It is ideally suited to coordinated mains laying in a common trench.

When laying direct into a trench, the end of the cable should be fed off the drum and laid in position in the trench. The drum trailer should then be towed slowly alongside the trench. Three or four men must initially hold back the cable and then progressively ease it over the edge and onto the trench bed.

If the trench edge is not firm enough to allow a vehicle to be driven reasonably close to it, the cable can be fed from the drum trailer on to the ground beside the trench. The cable end is pulled from the trailer and placed in its final position in the trench. The remainder of the cable is then laid from the moving drum trailer directly on to the ground beside the trench. Subsequently the cable is manhandled on to the trench bed, starting from the point where the end of the cable is already in the trench.

This method is not recommended for 33kV cable or the larger sizes of 11kV EPR cable, i.e. 300mm² single core EPR and 630mm² single core EPR, as it is heavier, and stiffer to control and bend.

4.2.3.3 Pulling in by Hand

When it is necessary to pull in by hand, the men should be spaced clear of each other along the pulling rope. As the cable is pulled into the trench the men should move back from the rope on to the cable.

To avoid dangers from trapping, men should not be positioned on corners, or on the drum side of the cable rollers for pulling cable. The cable itself should be handled with cable slings thereby avoiding the possibility pinching fingers between cable rollers and the cable, and enabling men to pull with a straight back.

Care should be taken at bends to congregate men on the approach side so as to relieve friction on the bend.

The supervisor should ensure good control of the cable and unified pulling efforts either by using a whistle or other means with which the staff are familiar. Similarly, cessation of pull should follow a clear signal.

It must also be seen to that any undue slack does not accumulate on the drum, by employing somebody to apply braking, via the drum flanges, when necessary.

Where a cable is drawn through a road-crossing duct, pulling in should be stopped when the cable end is near the duct mouth and the pulling in rope attached to a pilot rope or wire, which has been previously drawn into the duct. The cable end should then be eased into the duct mouth and pulling continued.

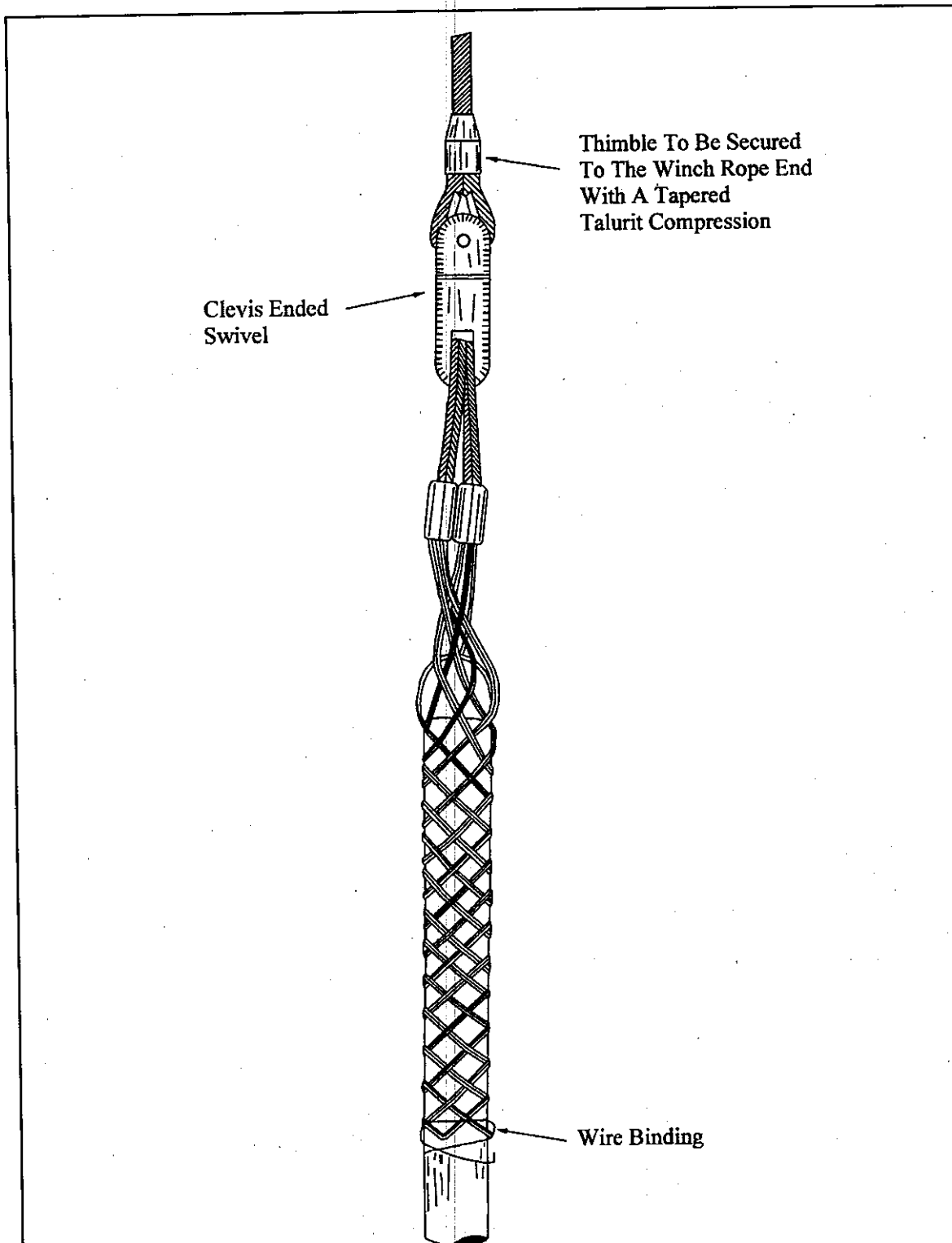
4.2.3.4 Bond Pulling


The general principle of bond pulling is as shown in figure 4.2.3.4.

A steel wire bond, which shall be at least twice the cable section length, is run out through the whole length of the trench over cable rollers positioned in the trench in the line, which the cable is to follow.

The cable shall be tied to the bond at no greater than 2m intervals along its entire length. Where large diameter cables are to be installed, or the cables are to be installed on a steep incline or down a shaft, the number of ties is to be increased.

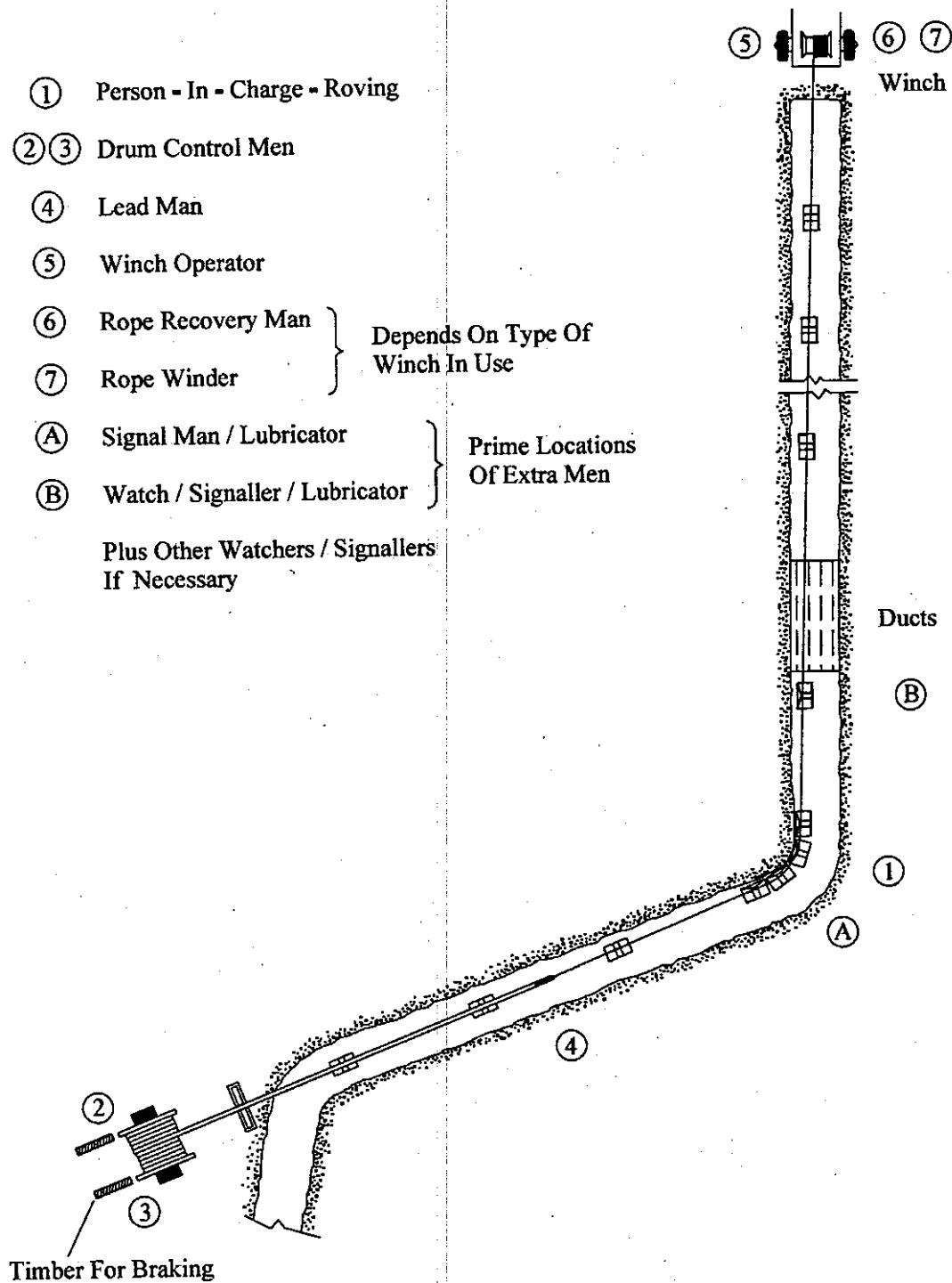
At each change of direction the ties shall be released and the cable taken round the bend using a series of vertical skid plates and horizontal rollers, the bond wire passing through a snatch block. The cable shall be re-attached to the bond immediately after the change of direction. The nose of the cable shall be guided over the corner rollers ensuring that a positive tension is maintained on the nose of the cable to prevent the build up a slack at the bend.




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- ① Person - In - Charge - Roving
- ②③ Drum Control Men
- ④ Lead Man
- ⑤ Winch Operator
- ⑥ Rope Recovery Man } Depends On Type Of Winch In Use
- ⑦ Rope Winder }
- Ⓐ Signal Man / Lubricator } Prime Locations Of Extra Men
- Ⓑ Watch / Signaller / Lubricator }
- Plus Other Watchers / Signallers If Necessary



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SCALE		N.T.S.		Title	LOCATION AND DUTIES OF MEN ENGAGED ON WINCH CABLE PULLING (TYPICAL EXAMPLE)	Drg. No. 4.2.3.1.	Rev No 3

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Although this procedure is rather labour intensive, it has the overwhelming advantage that there is no tension applied to the nose of the cable as it is distributed along the length and the risk of stretching one or more of the cable components is minimal.

4.2.4 Flaking and Coiling Cable

As it is not always possible to lay the complete length of cable directly into the trench due to obstructions, limited choice of drum mounting position, or the need to excavate and backfill part of the trench quickly and as a result it may be necessary to coil the remainder of the cable or flake it off the drum.

At all stages of these operations, care must be taken not to twist the cable or bend it too sharply.

In the coiling method, few men are required as the cable has already been pulled off the drum and the coils have merely to be handled individually into position, where they require little space.

The flaking method requires more labour as the cable has to be pulled off the drum and handled in figures of eight which are larger than coils and require more space.

4.2.4.1 Coiling Cable

Where the whole of the required cable can be taken off the drum in the initial pull but only part of this is laid directly in the trench, the surplus can be coiled to a suitable position in the manner shown in figure 4.2.4 a. The cable should be subsequently rolled out by a similar method. The coil diameter should not fall below the minimum-bending radius of the cable.

4.2.4.2 Flaking Cable

Where all the required cable cannot be taken from the drum during the initial pull (i.e. if the drum has to be mounted part way along the cable route) the cable can then be laid in the trench up to the drum position and the remainder then flaked off the drum and laid on the ground in the form of a figure of eight as shown in figure 4.2.4 b.

4.2.5 Pulling Single Core 66kV, 33kV EPR and Single Core 11kV EPR Cable

The single cores should be laid in trefoil in trenches with dimensions as detailed in table 3.2 and figure 3.2b.

It is important that the trench is sufficiently wide to accommodate operatives who should tie the three cores together at 1.5m intervals with 13mm wide plastic cable ties SHOPS No 35370 (1m at bends). When installing three single core cables, the method to be adopted depends on site conditions. In most cases it may prove easier to pull each of the cores out individually and then tie them together in the trench. If the cables are to be laid in a green-field site, it may prove preferable to pull the three cores simultaneously from three drums and then tie them together as they enter the trench.

4.3 Cleating

When it is necessary to install metal-sheathed cables on supports, the spacing of these is an important factor.

Single core cables are to be cleated every 1.5m using Ellis patent cleats with an Ellis patent strap in between every cleat.

The thermal expansion of 3 core cables is approximately 100mm in 250m over the normal operating temperature range. Cleats if erected too closely together may produce sheath fractures over a period due to localised flexing caused by expansion and contraction with change in temperature.

Hooks or cleats should provide an axial length of support of not less than 0.6 times the diameter of the cable and the corners should be radiused 5mm to prevent sharp indentations or damage to the cable.

4.3.1 Horizontal Straight Runs

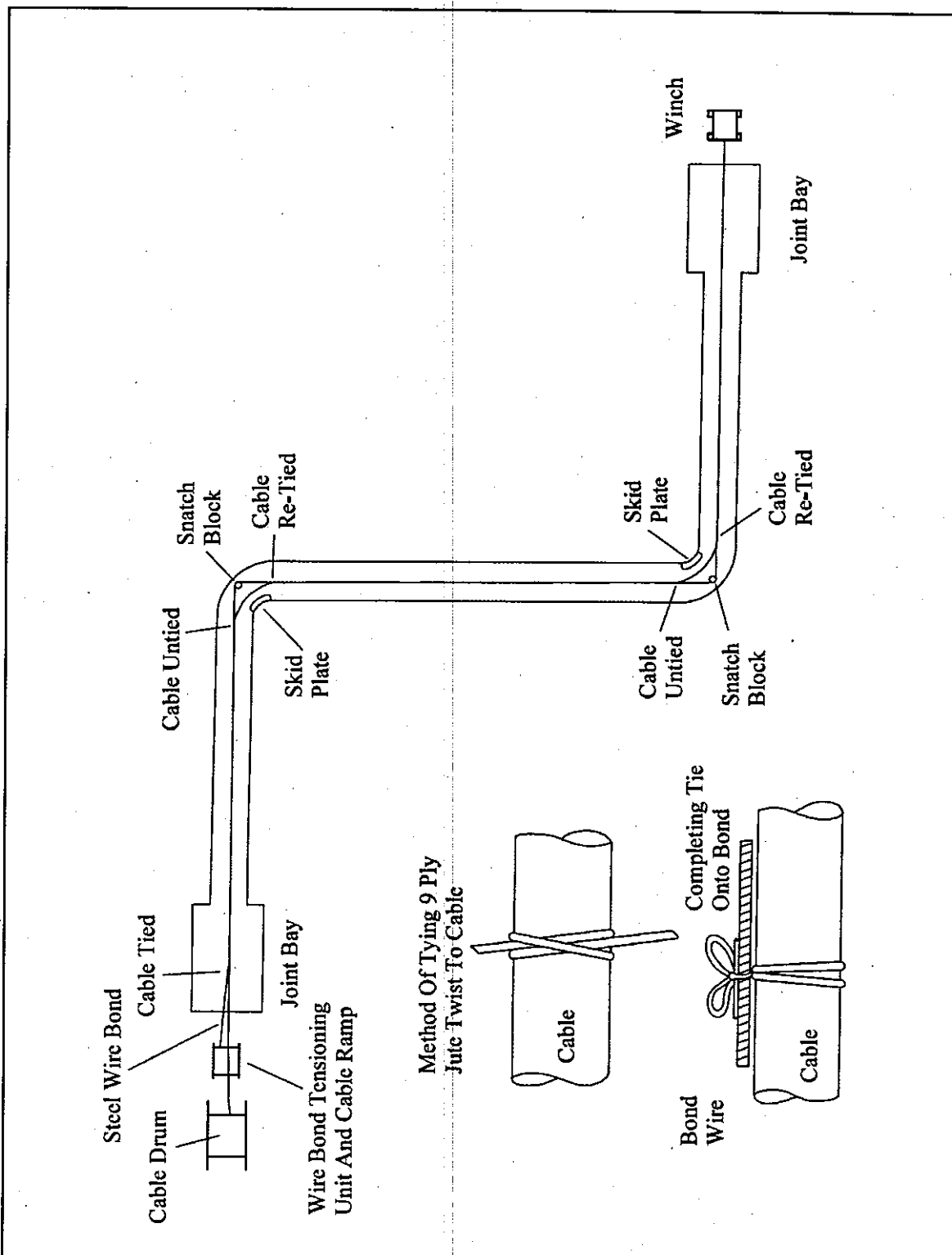
Cables should be installed with sag in order to reduce the amount of flexing of the sheath and 2% of the recommended span is suitable.


Normally, sagging should be carried out on each span about 2 spans behind the last support in which the cable has been laid. It may be necessary to hold down each span while the next one is sagged and a straight edge with a projection at the middle equal to the required sag will be useful.

Supports, which grip the cable, are required only where a tendency to move has to be restrained, such as joints, vertical runs, or slopes.

4.3.2 Horizontal Bends

Spacing of cleats on horizontal bends should be similar to that on straight horizontal runs. If the distance between cleats is increased, horizontal supports should be provided on the bends to allow lateral movement of the cable during expansion.



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Drawn	RJB	11.97					
Checked						Drg. No. 4.2.3.4.	
Approved							
SCALE		N.T.S.		Title METHOD OF BOND PULLING		Rev No 2	

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4.3.3 Cable Runs other than Horizontal and Straight

On bends, which are sloping or vertical, the cables should be cleated no more frequently than is required for stable positioning.

For vertical or steeply sloping (> 60 deg from the horizontal) lengthy straight runs, the cable should be snaked by bowing in opposite directions alternatively between successive cleats.

A deflection of 5% of cleat spacing is suitable. For this the cleat should be at an angle of about 6 degrees to the line of run and a single bolt fixing is convenient to enable each cleat to set itself to the cable. Cleating should be carried out from the bottom, with the cable eased off from the top as required. The greater the spacing of the cleats compatible with mechanical strength, the easier will be the setting of the cable.

4.4 Cable End Capping

The capping of cable ends, once the cable has been laid, is very important to prevent the ingress of moisture. With the more modern insulating materials such as PVC, XLPE etc. the need to prevent moisture ingress is to allow the LDPU resin to seal effectively, prevent corrosion of aluminium conductors as well as the requirement for electrical safety when working on these cables.

There are three preferred methods of capping cables: -

- (a) Cold shrink cap
- (b) Heat shrink cap
- (c) Denso seal

4.4.1 Cold Shrink Cap

The most commonly used, can be applied to all cable types. Before preparing and applying, a cap of the correct size must be selected, caps are range taking to suit variable cable diameters and to ensure a good moisture seal the selection is most important.

Methods of Application

PVC Oversheath Cables

1. Select correct cap to suit cable diameter, ensure the cap is coated internally with sealant and not pin-holed.
2. Clean and degrease PVC oversheath.
3. Slide the cap onto the cable pushing well onto the cable end.

4. Pull the spiral out of the cold shrink cap in an anti-clockwise direction until the cold shrink cap is fully shrunk onto the cable.

4.4.2 Heat Shrink Cap

This is the most widely used method as it can be applied without any specific skills. Before preparing and applying a heat shrink cap, the correct size must be selected, as these caps are range taking to suit variable cable diameters.

In order to seal PVC oversheath cables such as service cable, WAVECON, or PICAS, the following steps should be followed:

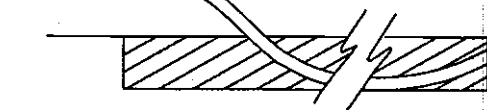
- (1) Select correct size for cable diameter.
- (2) Clean PVC oversheath with approved cleaner.
- (3) Abrade PVC oversheath for the length of the cap using a rasp on large diameter cables or emery cloth for service cables. Ensure the abrading is undertaken circumferentially and all glossing if the sheath is removed.
- (4) Clean abraded area with approved cleaner.
- (5) Slide cap onto cable, pushing onto cable end.
- (6) Using a soft blue flame, start shrinking from the closed end of the cap and work towards the open end. Ensure the flame is worked evenly around the cap and enough heat is given to melt the sealant, but not to burn the material. Once the cap is fully shrunk down, a ring of sealant will be seen at the open end of the cap.

In order to seal PILCSTA or PILCSWA, either a heat shrink cap or a plumbed cap can be used. If a heat shrink cap is to be used, the following steps should be carried out:

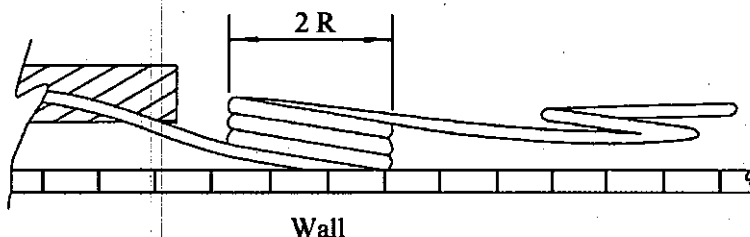
- (1) Mark outer serving the length of the cap plus 50mm from the cable end, apply a wire or PVC tape binder at this point.
- (2) Remove outer serving.
- (3) Using a depth gauge, hacksaw cut around the armour at the binder.
- (4) Remove armour and underlying bedding.
- (5) Apply heat and remove bitumen impregnated paper, thoroughly clean lead sheath and allow to cool.
- (6) Clean lead sheath with approved cleaner.

Note:
Care Must Be Taken To Ensure
That The Cable Loop Is Not Smaller
Than Twice The Minimum Bending
Radius ('R') (See Drg 7.6.1 A)

From Drum
Or Winch

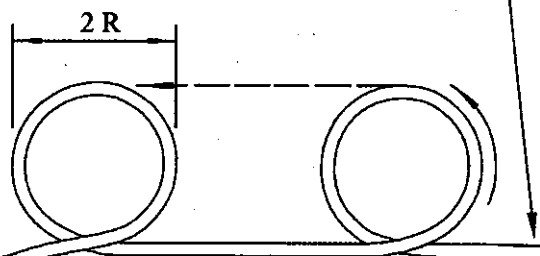


If Coils Are To Be
Stored On Other Side
Of The Trench, Right
Hand Coiling Will Be
Required
(As Illustrated Below)



Left Hand Coiling (As For L.H. Thread)

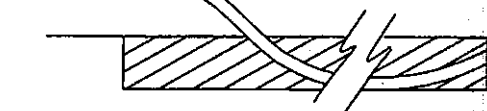
End Of Cable Stationary
While Coil Being Rolled



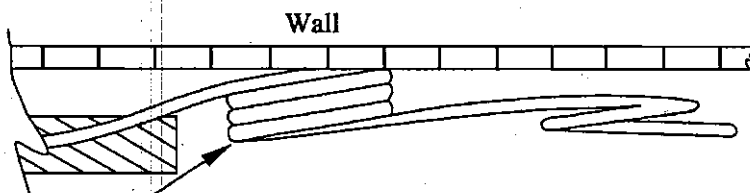
From Drum
Or Winch

End Of Cable Stationary
While Coil Being Rolled


From Drum
Or Winch



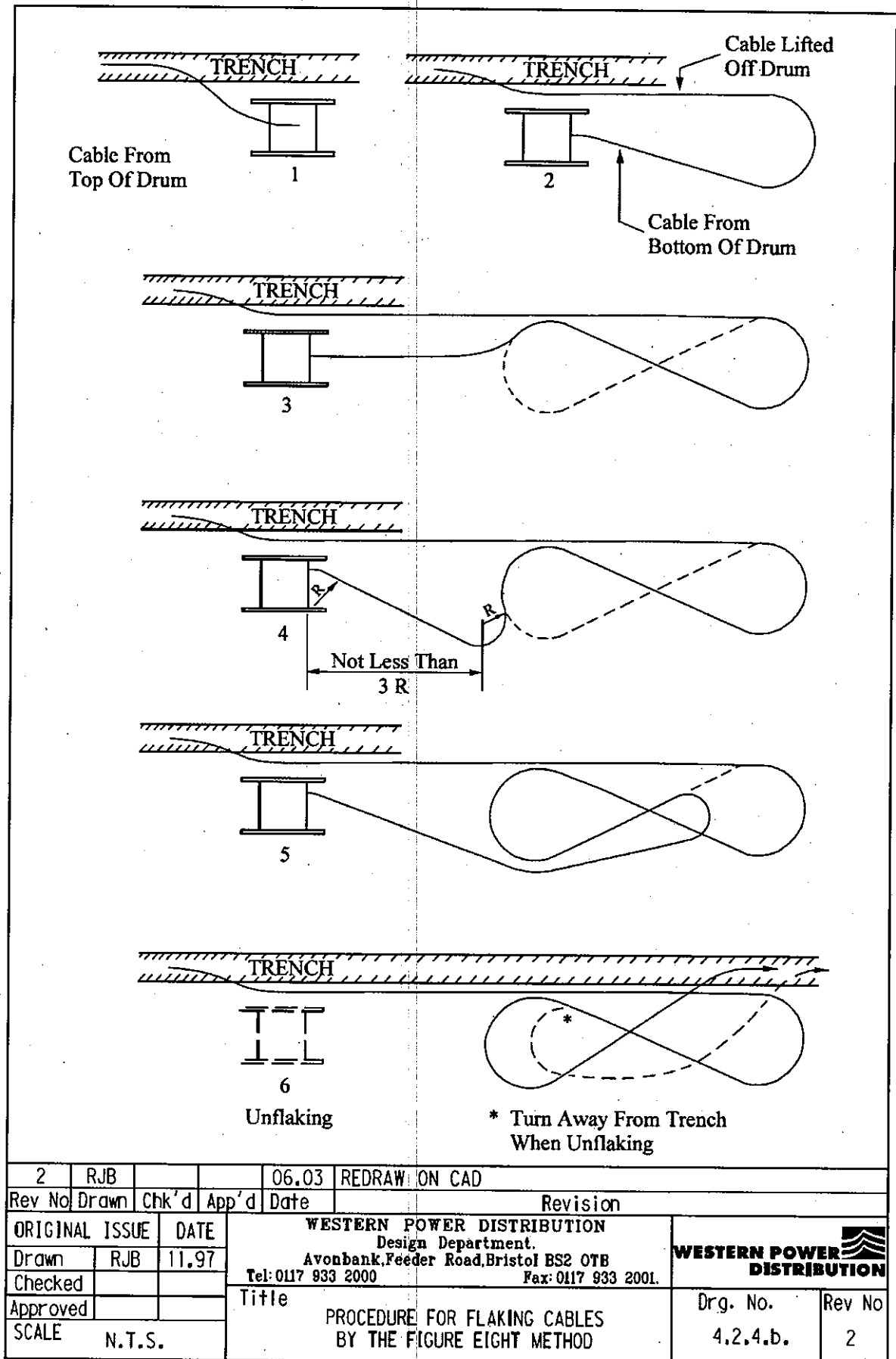
Alternative Method
Of Rolling Cable
Depending Upon
Which Side Cable Is
To Be Supported



Right Hand Coiling (As For R.H. Thread)

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Drawn	RJB	11.97							
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SCALE		N.T.S.		Title		Drg. No.		Rev No	
				CABLE COILING		4.2.4.A.		2	

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- (7) Abrade the circumference of the lead sheath the full length of the cap, using a file.
- (8) Clean abraded area with approved cleaner.
- (9) Ensure all sharp edges are removed from the cable end.
- (10) Complete using steps 5 and 6 as for PVC oversheathed cables.

In order to seal Single core XLPE, Single core EPR or Triplex EPR, a heat shrink cap shall be used and the following procedure applied: -

- (1) Select correct size for cable diameter.
- (2) Clean oversheath with approved cleaner.
- (3) Abrade sheath for the length of the cap using a rasp on large diameter cables or emery cloth for service cables, whilst ensuring the abrading is undertaken circumferentially.
- (4) Clean abraded area with approved cleaner.
- (5) Using a very soft blue flame, gently heat up the abraded area until it appears to slightly change colour.
- (6) Complete using steps 5 and 6 as for PVC oversheathed cables.

4.4.3 Denso Tape Seals

As a temporary measure Denso tape seals may be applied to each individual cable core end to affect a moisture seal.

5.0 REINSTATEMENT

5.1 Backfill to Marker Tape

Particular care is required when laying unarmoured cables in order to ensure that no objects can cause a pressure point on the cable sheath. It may be necessary to pad the sharp edged ends of earthenware ducts if there is any likelihood of cable settlement.

Crushed limestone dust, 3mm to dust, or crushed granite dust, 3mm to dust, must be used when bedding and blinding cables. The depth of crushed stone dust bedding will depend on the cross sectional area or physical size of the cable being laid; this should be compacted prior to laying the cable. The blinding should be laid in a single operation after the cable has been lifted off the cable rollers.

Cables shall be blinded by 75mm of imported crushed stone dust before warning marker tape be laid above the run of the cable. Should site conditions warrant the use of protective equipment such as the 'Stokboard', the blinding of crushed limestone or granite dust, shall still be 75mm.

5.2 Re-use of Excavated Material

Temporary spoil and material heaps should be sited to interfere as little as possible with the work to be carried out. Whilst, for convenience in handling, it might be necessary to place them near excavations, the following points should be borne in mind: -

- a) They should not interfere with free access to the excavation.
- b) They should be so constructed that there is no danger of the spoil slumping in wet weather and entering the excavation.
- c) Spoil heaps should not be placed in such a position as to endanger the stability of existing works above or below ground or of the excavation, the sides or side supports of which should be so designed as to be capable of withstanding the additional stresses due to any superimposed load.

Spoil heaps should be graded to safe slopes taking into account the nature of the material and the effects of wet weather, the material should remain substantially unaltered in wet weather, but with materials that soften and slump a substantial reduction in the slope should be anticipated and a adequate distance maintained between the spoil heap and the edge of the excavation.

The clearance between the toe of the spoil heap and the edge of the excavation should give sufficient working space at all times, and for this purpose the clearance should be a distance equal to the depth of the excavation with a minimum width of 1.50m

The following materials are categorised as unacceptable for reuse: -

- Peat and materials from swamps, marshes, or bogs.
- Logs, stumps, and perishable materials.
- Materials in a frozen condition.
- Liquid clays.
- Materials subject to spontaneous combustion.
- Materials having hazardous chemical or physical properties.

5.3 Compacting

Special care should be taken not to damage the cable during consolidation and only hand rammers should be used within 150mm of the cable. When mechanical rammers are used, there should be enough material placed in the trench so that it can be compacted to a 150mm layer, particular care must be taken if the 'thumping' type rammer is used.

5.4 Reinstatement above Marker Tape

The reinstatement, whether it is 'permanent' or 'interim', should meet the requirements as set out in the Department for Transport Specification for the Reinstatement of Openings in Highways April 2010. This also applies reinstating verges adjacent to highways.

For the reinstatement of open ground, it is usually adequate to compact the ground from the surface. The ground should be left 'proud' to allow for subsequent settlement. If turf has to be re-laid, it should be watered thoroughly during dry weather.

6.0 PRIOR TO ENERGIZATION OF THE ALL CABLE CIRCUITS

In compliance with the ESQC Regulations 2003 no cable circuit shall be energized unless the following minimum conditions have been met: -

On building sites where cable has been laid, and/or additional cable will be required to be laid in the near future then the minimum, which will be acceptable prior to the cable, being energized, is the cables are covered with 75mm of crushed limestone or granite dust, 3mm to dust, and marker tape laid on top of the crushed limestone or granite dust, as per ST: NC2H – Relating to Inspection and Recording.

Where joint holes have been dug and exposed the cables the minimum requirement shall be that the joint hole shall be signed and guarded as per ST: HA14D.

Where the cable has been laid up to a pole, the minimum requirement shall be that the cable and pole shall be signed and guarded as per ST: HS14D.

APPENDIX A

SUPERSEDED DOCUMENTATION

This Standard Technique supersedes ST: CA6A/2 dated September 2003.

APPENDIX B

ANCILLARY DOCUMENTATION

POL: EN3, POL: GE14, ST: EN3A, ST: EN3B, ST: HS12J, ST: HS14B/3, ST: GE14A, ST: GE14B, HS (G) 47.

APPENDIX C

IMPACT ON COMPANY POLICY

This Standard Technique has been updated to reflect the changes based on recent legislation and now incorporates the polymeric EHV cables.

APPENDIX D

IMPLEMENTATION OF POLICY

This Standard Technique shall be communicated to all relevant WPD engineers and site staff at the next Team Briefing by the Team Manager.

APPENDIX E

KEY WORDS

Cable, Installation, Excavation, Laying, Reinstatement.

WESTERN POWER DISTRIBUTION

OUTLINE DESIGN GUIDE FOR CUSTOMERS SEEKING WPD ADOPTION OF 66kV SWITCHGEAR, ASSOCIATED EQUIPMENT, COMPOUND & HOUSINGS

18th December 2012

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Section 2.	Technical Requirements
Section 3.	Protection Requirements
Section 4.	Metering VT and CT Requirements
Section 5.	Operational Requirements
Section 6.	Earthing Requirements
Section 7.	Substation Compound
Section 8.	Control Room
Section 9.	Metering Equipment Accommodation
Section 10.	Design Submission
Figure 1.	Switchgear Connection Arrangements 66kV Single Circuit

1. INTRODUCTION

This document has been prepared to assist customers, their consultants and contractors with the design and specification of 66kV connections for adoption by Western Power Distribution (WPD). It applies to embedded generator and demand connection projects where the Point of Connection is the 66kV system and an outdoor single circuit tee off solution has been requested. Typical installations include:

- Wind Farms
- Biomas Fuelled Plant
- Recycling/Waste Fuelled Plant
- All large demand connections

The specific requirements for 66kV switchgear, protection and control, substation compounds and equipment housings, earthing, overhead and underground circuit works for a connection are detailed within a suite of WPD policy documents. The Customer shall be expected to demonstrate compliance with relevant WPD Policy in as part of the acceptance/ adoption process.

This document has been prepared primarily to provide summary guidance on WPD acceptance criteria in relation to substation works.

2. TECHNICAL REQUIREMENTS

WPD's technical requirements for 132kV circuit breakers, disconnectors, VT's and CT's are described in *Engineering Specification: EE Spec 7/2*.

Presently, the following 66kV circuit breakers are approved for use on the WPD network:

- Siemens type 3AP1-DT 72.5kV
- Alstom type DT1 72.5kV

It may be advantageous for a Customer to benefit from designs/ specifications established between WPD and it's suppliers, although alternatives may be offered to WPD by the Customer for consideration, assuming that they meet acceptance criteria.

3. PROTECTION REQUIREMENTS

Engineering Specification: EE Spec 87/5 gives WPD's requirements for protection and control cubicles for outdoor 72kV circuit breakers. Schedule 1A, Panel Type 36MA/OD applies.

Note: The standard drawings SL36MA/OD and SPC36MA/OD show 33kV CT and VT ratios. 66kV VT's and CT's shall be in accordance with *Engineering Specification: EE Spec 7/2* and the overview of protection and control requirements in the table below.

The cubicle shall be free standing.

Description	Further Details	36MA/OD Free Standing Metering CB
Standard Drawings	Single Line Diagram Schematic Diagram Schematic Diagram Wales	SL36M2/OD SPC36M2/OD PSD0221
CT's and VT's		
CT's for overcurrent and earth fault protection and transducers	800/400/1 30VA 5P20	Two sets of 3
CT's for metering	Ratio to agreed 15VA Class 0.2S	For circuit capacities up to 100MVA One set of 3 For circuit capacities above 100MVA Two sets of 3
CT's for customer use	As required	One set of 3
Voltage Transformer (Electromagnetic type)	66000/110/110/110 Star/Star/Star/Open Delta For circuit capacities up to 100MVA Class 0.5/3P For circuit capacities above 100MVA Class 0.2/3P	3 off single phase
Control/Relay Cubicle		
Circuit breaker control switch and handle	EE 87/5 clause 8.5	1
Local/Supervisory switch and handle	EE 87/5 clause 8.5	1
Telecontrol CB open interposing relay	EE 87/5 clause 8.4 & Data Sheet AR1	1
Telecontrol CB Close interposing relay	EE 87/5 clause 8.4 & Data Sheet AR1	1
Current/Voltage/MW/MVAR Transducer	EE 87/5 clause 8.6 & Data Sheet TD4	1
Main Protection Relay/s	EE 87/5 Clause 7.0	3OCIT EIT TCS
Backup Protection Relay/s	EE 87/5 Clause 7.0	3DOCIT DEIT VTS NVD 30V (2 stage)

		Optional, as per system requirements
Trip/Intertrip Relay	EE 87/5 Clause 7.0	TDS
Customer Trip Flag Relay	EE 87/5 Clause 7.0	TI
SF6 Gas Low	EE 87/5 Clause 7.0	A (SF6 Low) all Stages
Spring Charge Fail	EE 87/5 Clause 7.0	A (SCF)
Relay Test Block	EE 87/5 Clause 7.0	RTB (2 off)
CB Indication Lamps	EE 87/5 Clause 8.7 & Data Sheet IL2, IL3 & IL4	3 off
Terminal Blocks	EE 87/5 clause 8.2	As Required
Fuses & Links	EE 87/5 clause 8.3	As Required

All protection and ancillary relays must be approved by WPD. The standard schematic diagrams show the protection relay types applicable to the scheme (i.e. MICOM P122). Full details of all WPD approved relays can be found in *Engineering Specification: EE Spec 98/2*.

The standard schematic diagrams show generic switchgear and are not specific to any customer network arrangement. Detailed protection scheme design, including any WPD/Customer intertripping, alarms and more complex protection requirements will be on a project specific basis and will be the responsibility of the customer.

An emergency trip button (break glass type) shall be provided that will trip the WPD circuit breaker. The location of the emergency trip will normally be in the customer's own substation or control room but this will be decided on a project specific basis in conjunction with the customer.

4. METERING CT & VT REQUIREMENTS

Voltage Transformer

The Voltage Transformer shall be three off single phase electromagnetic type and comply with:

Rated voltage 72kV
Ratio 38106/63.5/63.5/63.5
Star/Star/Star/Open Delta
Minimum rating of 100VA for all windings.
Voltage factor of 1.9 for 30seconds.

For circuit capacities up to 100MVA, all windings shall satisfy the accuracy requirements for both Class 0.5 and Class 3P.

For circuit capacities above 100MVA, all windings shall satisfy the accuracy requirements for both Class 0.2 and Class 3P.

Metering VT's shall be error tested by the manufacturer and Test Certificates provided to WPD. See EE Spec:7/2 for further details.

Metering Current Transformers

Metering Current Transformer ratio shall be selected from the following preferred list on a project specific basis, depending on load or export capacity:

100/50/1
200/100/1
300/150/1
400/200/1
800/400/1
2000/1200/1

Metering CT's shall have a 15VA rating and satisfy the accuracy requirements of Class 0.2S. For circuit capacities up to 100MVA, one dedicated set of CT's is required. For circuit capacities above 100MVA, two dedicated sets of CT's is required.

Metering CT's shall be error tested by the manufacturer and Test Certificates provided to WPD. See EE Spec:7/2 for further details.

5. OPERATIONAL REQUIREMENTS

WPD's preferred switchgear and equipment arrangement for a single circuit metering arrangement is shown in Figure 1.

A mechanical interlock scheme shall be installed utilising Castell Q type locks. Using the nomenclature (typical) in figure 1, the following requirements must be satisfied:

- The CB interlock key 1L5 shall only be released with the CB in the open position.
- Disconnectors 1L3 and 1L4 shall only operate with interlock key 1L5 inserted. Key 1L5 shall be trapped during operation, but released with the Disconnector in the open or closed position.
- Disconnector 1L3 shall release a key 1L3 when in the open position.
- Line Earth Switch 1L1 shall only operate with key 1L3 inserted. Key 1L3 shall be trapped during operation and when the switch is closed to earth. It shall only be released with the earth switch opened from earth.

6. EARTHING REQUIREMENTS

An earth electrode grid for shall be installed for WPD use in accordance with *Engineering Specification: EE Spec 89*.

While the overall site earthing solution may allow the WPD and the customer's earth electrode grids to be interconnected, the WPD earthing system shall be designed to act as a stand alone system. The earthing study and report shall demonstrate this.

7. SUBSTATION COMPOUND

The arrangements for accommodating WPD's equipment and the customer's equipment shall be determined on a project specific basis. Drawing GCS0012 shows the substation layout for a typical 66kV single circuit metering arrangement. The compound size gives WPD's minimum spatial requirements for the equipment shown.

Generally

In addition to the customer's criteria and that of local authority planning officers, the selection of a suitable site for the establishment of the substation compound will require consideration of the route of circuit connections to the WPD network, earthing issues, ease of vehicular access, flood resilience and site levelling requirements.

A 2.0m wide level maintenance access / clear walkway shall be provided around the external perimeter of the fenced substation compound. No embankments, walls, building structures, stored items, etc. are to be located near / adjacent to the substation security fence which could provide a climbing aid to unauthorised site access. Similarly, all trees/ overhanging branches are to be removed/ cut back/ lopped to a line 3.0m outside the WPD perimeter fence. Where necessary, an independent 1.2m high stock fence will be erected 2m outside the WPD compound perimeter. No fence/ other perimeter structure/ feature is to be connected to the WPD compound fence (other than the Customer's compound fence) without appropriate electrical isolation and anti-climb provision.

The substation compound surface shall be configured so that there is not more than a 1 in 60 fall across the site. Site leveling/ earthworks/ cut-and-fill operations may need to be carried out by the Customer to achieve this.

A site-specific study will be required to ascertain earthing strategy, the nature and extent of buried conductor, potential interconnection with customer's earthing and any potential hot site issues.

As part of the customer's site evaluation/ selection/ design process, it will generally be necessary to carry out geotechnical desk studies/ site sampling/ testing to facilitate substructure and drainage design and to identify any potential contaminants within subsoils and groundwater. Where it is identified that special control measures are required for excavation, handling or disposal of excavated waste then this information shall be made available to WPD as soon as possible.

Vehicular Access

WPD will require unrestricted 24 hour access to and egress from the substation. Wherever possible, it shall be located in such a way that it avoids the need for WPD

personnel to pass through any external perimeter fence/ security controls. Where present however, site access gates and the like are to be provided with a dual locking facility, incorporating a WPD substation security lock.

The substation shall be provided with an external access road / safe unloading area as follows:

- A surfaced access road between the public highway and substation compound of minimum width of 4.5m wide and designed to accept a minimum axle weight of 11 tonnes.
- A minimum headroom of 4.5m along the access road
- A minimum internal radius on corners of 6.0m
- A minimum external radius on corners of 13.5m
- A maximum gradient of 1:15
- A maximum negotiable concave 'valley' of 48m
- A maximum negotiable convex 'crown' to avoid 'grounding out' of 76m
- A turning bay/ splay where vehicular access is only possible from one direction
- A surfaced unloading area of minimum dimensions 3.0m x 3.0m on plan directly outside the entrance doors of WPD's Control/Switch Room

It should be noted that the above criteria are those normally use by WPD to ensure unrestricted tractor/ low-loader trailer combinations access for 66kV transformer delivery. For delivery and erection of 66kV outdoor switchgear only by WPD, the above criteria may be relaxed, by agreement on a site-specific basis.

Avoidance of Flooding

Unless appropriate protective measures are proposed by the Customer and agreed by WPD, the compound finished level shall be positioned to minimise flood risk. In practical terms, the compound finished level should be at least 500mm above the 1 in 1000 year fluvial flood level and 300mm above the 1 in 200 year tidal flood level). Care shall be taken to ensure that the presence of cable ducts/trenches do not breach any flood defences/ protective measures.

Compound Lighting

Provision shall be made for compound floodlighting. Positions of lighting columns shall be such as not to infringe safety clearances, vehicular access or access for operational and maintenance activities.

Typical Specification for Groundworks/ Compound fencing

- Clear site of all bushes, scrub and undergrowth and grub up and dispose of all large roots.
- Excavate and dispose of all topsoil / vegetable matter.

- Excavate / fill as necessary to reduced level subject to geotechnical data but min. 150mm below finished site level and compact sub-grade to receive compound sub-base and surfacing (see Surfacing).
- Install compound storm / ground / surface water drainage system as necessary to effectively drain the site and prevent the unacceptable build up of ground water or the ponding of surface water. Collect / convey discharge from drainage network to a suitable point of disposal.
- Install Terram T1000 (or similar approved) geotextile as sub-base / sub-grade separation membrane in full compliance with the manufacturer's technical recommendations.
- Lay and compact (min. 75mm thick) bed of approved, well graded hardcore / granular sub-base material.
- Lay (min. 75mm thick) bed of 20mm single size graded clean granite/ limestone chippings / aggregate, spread and levelled around concrete bases and the like. Chippings should have a target wet resistivity of no less than 1500 ohm m.
- Install (min. 2.4m high) galvanised steel security palisade fence and gates to BS 1722 Part 12, enhanced to Western Power Distribution specification document ST:SP5A (copy available upon request).

8. CONTROL ROOM

The arrangements for accommodating WPD's protection and control equipment shall be determined on a project specific basis. WPD's preferred arrangements are:

- Separate buildings for WPD and the customer with provision for multicore cables between WPD's and the customer's equipment. The WPD control room will normally be leased from the customer.
- Separate but adjacent switch rooms within the same building owned by the customer. As above, provision for multicore cables between WPD's and the customer's equipment.

Irrespective of the arrangement selected by the Customer, access to the WPD control room will be restricted to WPD authorised personnel only.

WPD's control room must satisfy the following requirements:

Generally

The enclosure is to be designed and constructed by the customer and is to provide a secure, internal, dry, stable, level, clean, dust-free, non-aggressive and non-hazardous environment for WPD plant/ equipment.

All planning consents are to be obtained by the customer or developer. WPD recommend that the customer does not submit a full planning consent application until the design has been agreed with WPD.

The Control Room is to be located directly adjacent to the WPD substation compound, as indicated on drawing *GCS0012*. The external elevation of the building shall be such that no climbing aid is presented for unauthorised access to the compound.

Drawing *GCS0007* shows a typical layout of WPD's Control Room. The drawing shows the minimum internal spatial requirements and positions of electrical plant and equipment to conform to WPD cabling, operational and safety requirements.

Designs should afford sufficient clearance for primary plant to be removed without the removal of secondary plant and vice-versa. Door swings should be taken into account when considering minimum internal switchroom dimensions.

The designs should avoid the establishment of 'confined spaces'. Adequate provision shall be made for multicore cables

Structural Loads

The enclosure shall be designed in accordance with the codes of practice relevant to the proposed structural materials and shall adequately carry and transmit to the natural foundation all dead, imposed and wind loads

Trench steelwork supports should be specified to withstand static loads from switchgear and an additional imposed load of 1.5kN/m² to allow for pedestrian access. Where heavy equipment is likely to be rolled over trenches during installation/removal, all elements shall be suitably rated for this purpose

Fire Resistance

The enclosure shall be designed to provide a minimum fire resistance of 1 hour.

Durability / Moisture Resistance/ Avoidance of Flooding

The design life of the enclosure shall be a minimum of 50 years and every effort shall be made to specify materials with minimised structure / fabric maintenance requirements.

The enclosure shall be designed to protect the structure and its contents from damage or risks to health and safety due to the effects of weather, water / moisture penetration and ground contaminants.

External ground / access road levels shall be designed such that there is no / detrimental build up of surface water in the proximity of the enclosure.

Unless appropriate protective measures are proposed by the Customer and agreed by WPD, the Control Room floor level shall be positioned to minimise flood risk. In practical terms, the switchroom floor level should be at least 500mm above the 1 in 1000 year fluvial flood level and 300mm above the 1 in 200 year tidal flood level). Care shall be taken to ensure that the presence of cable ducts/ cut-out's/ entries within the Control Room substructure do not breach any flood defences/ protective measures.

The enclosure shall be designed to adequately collect and convey surface / storm water to a suitable point of disposal.

Thermal Performance / Insulation/ Ventilation

The enclosure shall be designed to deliver a maximum target u value of $0.45 \text{ W/m}^2 \cdot \text{K}$. Any risk of condensation build-up at cold-bridging points shall be mitigated. This is of particular importance on the underside of switchgear and control gear

The enclosure shall be designed to provide adequate ventilation and to prevent adverse levels of condensation or gas concentrations likely to cause damage to the fabric of the structure and its contents or pose a risk to health and safety. Passive ventilation/ secure grilles (providing 8000 mm^2 of ventilation) should be provided as a minimum.

Forced ventilation/ air conditioning solutions should be avoided wherever possible as undetected failure of these may have an adverse effect on substation plant

Security

The enclosure shall be constructed with no areas of glazing and designed to prevent any unauthorised entry or access to the electrical plant / equipment. Appropriate safety / warning / danger signs and notices shall be permanently displayed.

All double / single leaf entrance doors shall be outward opening, of robust / vandal resistant / durable / maintenance free hardwood, steel or g.r.p. construction and fitted with a secure locking arrangement (with panic exit provision) capable of receiving a Euro profile locking cylinder which will be supplied and fitted by WPD. All door hinges shall be vandal resistant / heavy duty with concealed fixings.

Double leaf entrance doors, where required, shall be designed such that the right hand leaf (viewed from outside) will open first. The meeting stiles shall be rebated / overlap or otherwise be resistant to prising. The left hand leaf shall be fixed internally by short top and bottom sliding bolts into receptors within the frame head and cill.

Heavy duty door restraints shall be fitted at the head of each door leaf and shall be capable of holding the doors open at 90 degrees.

L.V. Electrical/ Services Generally

The heating, lighting and power requirements are indicated on drawing *GCS0007* and are to be supplied and installed by the customer/developer. The consumer unit for WPD's Control Room heating and lighting requirements is to be located in the WPD Control Room.

In addition to the heating and lighting requirements, a dedicated (minimum) 6 way 20A consumer unit shall be provided for WPD's essential services (66kV circuit breaker, protection panel, batteries and telecontrol). This consumer unit shall be a metal clad type, suitable for terminating SWA multicore cables. Traywork is to be supplied and installed by the customer/developer vertically from the consumer unit to a suitable cable trench.

Where the switchroom is not located within an area benefitting from external lighting, a PIR activated external light shall be provided above the entrance doors

The LV supply is to be afforded to WPD from the Customers private network. This supply is to be 'firm' and available 24/7. The customer should make provision for an alternative supply or back-up generation in the event of losing the 66kV connection.

The Switchroom will be provided by the Customer with a dedicated external telephone line and socket.

All wiring shall be run in conduit.

The electrical installation shall incorporate recommendations, where applicable, contained within BS 7671 'Requirements for Electrical Installations' (The IEE Wiring Regulations)

No gas/water/telecomms or any other utilities fixtures (other than those for sole WPD use) are to be located within the substation enclosure.

9. METERING EQUIPMENT ACCOMMODATION

Metering equipment (meter operator equipment) shall be accommodated in a separate room or cubicle that is accessible to WPD, the meter operator/data collection organisations and the customer. This room or cubicle shall be located within 10m of the WPD Compound to keep the connections to the metering CT's and VT's as short as practicable. Access to the metering equipment shall not be via WPD's operational area

Where WPD will be appointed Meter Operator, the functional/performance requirements for the Control Room building shall also apply to the metering accommodation. Where this is not the case, the appointed Meter Operator should be consulted for their requirements.

Where WPD will be appointed Meter Operator, the metering room should be provided with one emergency light fitting switched from inside the door, one 13A double socket incorporating a 30mA residual current device (RCD) and a dedicated external telephone line and socket.

Irrespective of the selection of Meter Operator, the Customer shall ensure that a dedicated 100mm diameter smooth radius duct with draw-wire is provided between the WPD switchroom trench and the Metering Room.

10. DESIGN SUBMISSION

The customer is required to provide WPD with all information relating to their design in order to confirm suitability for adoption and connection to WPD's network.

The customer's must provide a (single) full and comprehensive design submission for all of the plant and equipment being considered for adoption by WPD. Part or incomplete designs will not be accepted as the formal design submission. Where WPD does not consider the submission to be full and comprehensive, we will inform the customer that the submission has been rejected. The design submission shall be in electronic format.

On receipt of an acceptable full design submission, WPD will respond to the customer with any comments within 20 working days.

The minimum information required in the design submission relating to the 66kV switchgear and switchgear housing will include:

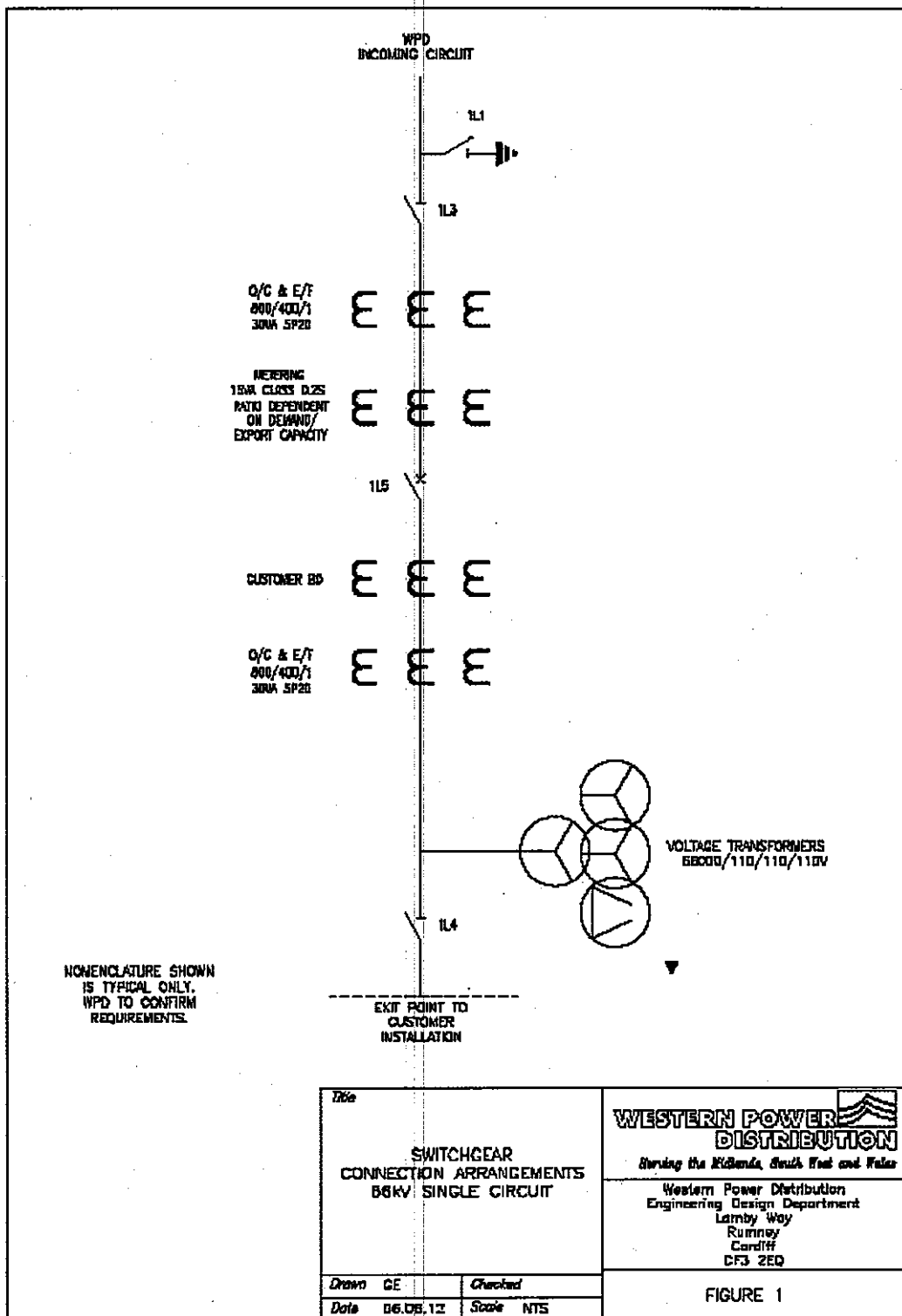
- The manufacturer, type, ratings and supporting specification/manufacturers information relating to the 66kV switchgear, disconnector, earth switch, VT's and any other equipment required to provide the connection.
- The manufacturer, drawings and supporting design calculations for the equipment support structures.
- Single Line Diagram, showing physical arrangements.
- Main Connections & Protection Diagram, showing tripping to and from the customer's equipment.
- Customer's SLD and Main Connections & Protection Diagram.
- Schematic Diagrams showing protection, instrumentation and metering arrangements.
- Protection panel General Arrangement drawings and Wiring Diagrams.
- Multicore cable schedule.
- Protection relay full model numbers.
- Substation location plan, showing access roads from the public highway.
- Substation compound and equipment foundation design details, including drawings and supporting calculations
- Control Room civil drawings, showing structure and substructure materials and construction, access doors, cable and multicore cable trench details
- Control Room drawings, showing electrical equipment layout.
- Control Room drawings, showing building LV services, heating, lighting etc.

- Earthing study, report and drawing of earth electrode grid, including details of WPD equipment earthing.
- 110V Battery manufacturer, type, ratings and supporting specification/information.

Further information for a typical 66kV connection may include but not be limited to:

- 66V cable, joints and terminations manufacturer, type, ratings and supporting specification/information.
- 66kV OHL construction details
- 66kV cable and OHL route plans.

As constructed contract drawings relating to WPD equipment shall be issued to WPD in electronic dwg format within 4 weeks of the date of energising.



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TROUGH/TRENCH

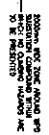
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132KV CIRCUIT BREAKER CONTROL PANEL

**WESTERN POWER
DISTRIBUTION**

HEATING, LIGHTING AND
CONTROL EQUIPMENT LAYOUT
FOR WPD'S CONTROL FOR
GENERATION CONNECTION
STANDARDS

[illegible]



- OKED WITH WESTERN POWER
MAKER.

WESTERN POWER
DISTRIBUTION

Appendix Q – Submissions to discharge planning conditions precedent to commencement of the development

Provided in separate folder

Schedule 21: Not used

6

Schedule 22: Company Guarantee

Q

Private and Confidential

DATED

2014

HITACHI Zosen CORPORATION (1)

and

MERCIA WASTE MANAGEMENT LIMITED (2)

PARENT COMPANY GUARANTEE

relating to a plant at

Plot H600, Oak Drive, Hartlebury Trading Estate,

Worcestershire DY10 4JB

Wragge & Co



THIS DEED OF GUARANTEE is made on

BETWEEN:

- (1) **HITACHI ZOKEN CORPORATION** a company incorporated in Japan whose registered office is situate at 7-89, Nanko-Kita, 1 Chome Suminoe-Ku, Osaka 559-8559 Japan ("the Guarantor" which expression shall include its successors in title and permitted assigns); and
- (2) **MERCIA WASTE MANAGEMENT LIMITED** (Company no.03525188) whose registered office is situate at The Marina, Kings Road, Evesham, Worcestershire, WR11 3XZ ("the Employer" which expression shall include its successors in title and permitted assigns)

WHEREAS:

- (A) This Guarantee is supplemental to a contract made on or about the date of this Deed ("the Contract") to procure a plant ("the Plant") at Plot H600, Oak Drive, Hartlebury Trading Estate, Worcestershire DY10 4JB made between the Employer and Hitachi Zosen Inova AG ("the Contractor")
- (B) By a contract dated 22 December 1998 as varied by the variation deed dated on or about the date of this Deed (the "Project Contract") Worcestershire County Council of County Hall, Spetchley Road, Worcester WR5 2NP AND The County of Herefordshire District Council of Brockington, 35 Hafod Road, Hereford HR1 1SH (together the "Authorities") have appointed the Employer to carry out the provision of residual waste treatment to the Authorities at each and every site/facility as contemplated by the Project Contract including the carrying out of the design, construction, commissioning and testing of the Plant.
- (C) The Guarantor has agreed to guarantee the performance of the Contract by the Contractor in the terms of this Guarantee

NOW IT IS HEREBY AGREED as follows:

- 1 In consideration of the Employer entering into the Contract with the Contractor the Guarantor guarantees and undertakes to the Employer the due and punctual performance by the Contractor of each and all the obligations, duties and undertakings of the Contractor under or in connection with the Contract when and if such obligations, duties and undertakings shall become due and performable according to the terms of the Contract.
- 2 If the Contractor in any respect fails to observe or perform any of its obligations, duties and undertakings to the Employer under or in connection with the Contract, or if the Contractor fails to pay any losses, debt, damages, interest, expenses or costs due from the Contractor to the Employer under or in connection with the Contract, or if the employment of the Contractor under the Contract determines by operation of or notice given under clause 43.1 of the Contract then the Guarantor shall

- 2.1 observe or perform or cause to be observed or performed the said obligations, duties and undertakings; and/or
- 2.2 reimburse the Employer for all losses, debts, damages, interest, costs and expenses incurred by the Employer by reason of the Contractor's said failure, non-payment or termination; and
- 2.3 if required to do so by notice given by the Employer, itself pay to the Employer subject to clause 8 the amount of the said unpaid losses, debt, damages, interest, expenses or costs, as the case shall require.
- 3 The Guarantor's obligations under this Guarantee shall not be affected by any time being given to the Contractor by the Employer or by any concession or arrangement granted or made by the Employer to or with the Contractor or by anything that the Employer or the Contractor may do or omit or neglect to do including (but not limited to)
 - 3.1 any time or waiver granted to or composition with the Contractor or any other person; or
 - 3.2 the taking, variation, compromise, renewal or release of, or refusal or neglect to take, effect or enforce any rights securities or remedies against the Contractor or any other person; or
 - 3.3 the dissolution, liquidation, amalgamation, reconstruction or reorganisation of the Contractor or any other person; or
 - 3.4 any amendment or supplement to the Contract or any other document or security;
 - 3.5 any instruction change or variation made pursuant to the Contract or any document supplemental thereto.
- 4 Until all amounts which may be or become payable under the Contract or this Guarantee have been irrevocably paid in full, the Guarantor shall not in respect of any undischarged liability incurred under this Guarantee:
 - 4.1 seek to recover any loss arising from such liability from the Contractor whether by way of claim, set off or counterclaim; or
 - 4.2 prove in competition with the Employer in respect of any loss suffered by the Guarantor pursuant to such liability; or
 - 4.3 claim to have the benefit of any security which the Employer holds or may hold for any money or liabilities due or incurred by the Contractor to the Employer.
- 5 If any payment, security or other disposition is avoided on the bankruptcy, liquidation or otherwise of the Contractor then the liability of the Guarantor under this Guarantee shall continue as if no such payment, security or disposition has been made.

- 6 This Guarantee is a continuing guarantee and accordingly shall remain in force until the earlier of either 12 years in relation to the civil elements of the Works (as identified in the definition of Latent Defects Period contained in the Contract), or 3 years in relation to the balance of the Works after the date of Take-Over stated in the Take-Over Certificate pursuant to the Contract, or 12 months after the termination of the Contract for whatever reason save in relation to any claim under the Guarantee made in writing to the Guarantor before such date, and is in addition to and not in substitution for any other security which the Employer may at any time hold for the performance of such obligations and may be enforced without first having recourse to any such security and without taking any steps or proceedings against the Contractor.
- 7 By entering into this Guarantee the Guarantor confirms that it is liable to the Employer as if it were primary obligor and had entered into the Contract as contractor.
- 8 The Employer shall have no greater rights against the Guarantor than it has or had against the Contractor and the same defences set-off and/or counterclaims which would have been available to the Contractor shall be available to the Guarantor but without double-counting any such entitlement and without limitation to the rights of the Employer to counter any such defence set-off and/or counterclaim.
- 9 The Employer may without the consent of the Guarantor assign or charge the benefit of this Guarantee to Authorities as waste authority in relation to the Plant any person providing funding for the Plant or to whom the Employer lawfully assigns or charges the benefit of the Contract. This Guarantee shall not be otherwise assignable without the Guarantor's consent (such consent not to be unreasonably withheld or delayed).
- 10 Any notice to be given under this Guarantee shall be in writing and shall be deemed to be given properly if it is delivered by hand, or sent by special delivery or recorded delivery to the address of the relevant party set out above (or such other address as that party may have nominated for service). If the notice is sent by special delivery or recorded delivery, it shall be deemed to be received five business days after the day it was posted. If the notice is delivered by hand, it shall be deemed to be received on the day it is delivered.
- 11 This Guarantee and any dispute or claim arising out of, relating to or in connection with it is governed by, and construed in accordance with, the laws of England. All disputes or claims arising out of, relating to or in connection with this Guarantee shall be subject to arbitration in accordance with clause 48 of the Contract (mutatis mutandis).
- 12 Notwithstanding any other provision of this Guarantee nothing in this Guarantee confers or purports to confer any right to enforce any of its terms on any person who is not a party to it where that right would not exist but for the Contracts (Rights of Third Parties) Act 1999.

IN WITNESS whereof the parties hereto have duly executed this document as a deed
the day and year first before written.

SIGNED by

Duly authorised to execute
the Guarantee on behalf of
HITACHI Zosen CORPORATION

Name

EXECUTED and DELIVERED
as a deed by MERCIA WASTE
MANAGEMENT LIMITED by
means of these signatures (or, where
the COMMON SEAL of MERCIA
WASTE MANAGEMENT LIMITED
was hereunto affixed, in the presence of):

)
)
)
)
)
)
)

.....
(Signature)

Director

.....
(Name)

.....
(Signature)

Director/Secretary

.....
(Name)



Schedule 23: EPC Authority Direct Agreement

2

DATED

2014

- (1) HITACHI ZOSEN INOVA AG**
- (2) THE COUNTY OF HEREFORDSHIRE DISTRICT COUNCIL**
- (3) WORCESTERSHIRE COUNTY COUNCIL**
- (4) MERCIA WASTE MANAGEMENT LIMITED**

AUTHORITY DIRECT AGREEMENT

**relating to the Energy from Waste Plant at Plot H600, Oka Drive, Hartlebury
Trading Estate, Worcestershire DY10 4JB**

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THIS DEED is made on

2014

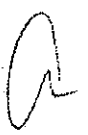
BETWEEN:

- (1) **HITACHI ZOSEN INOVA AG** of Hardturmstrasse 127, 8005 Zurich (the "Contractor");
- (2) **THE COUNTY OF HEREFORDSHIRE DISTRICT COUNCIL** of Brockington, 35 Hafod Road, Hereford HR1 1SH ("HDC", which expression includes its permitted successors in title and assigns);
- (3) **WORCESTERSHIRE COUNTY COUNCIL** of County Hall, Spetchley Road, Worcester WR5 2NP ("WCC", which expression includes its permitted successors in title and assigns); and
- (4) **MERCIA WASTE MANAGEMENT LIMITED** (Company No. 03525188) whose registered office is at The Marina, Kings Road, Evesham, Worcestershire WR11 3XZ (the "Purchaser").

BACKGROUND

- (A) By a contract dated 22 December 1998 as varied by a variation agreement dated on or around the date of this Deed (the "Project Contract") WCC and HDC (together the "Authority") the Authority has appointed the Purchaser to carry out, in relation to the sites, the provision of residual waste treatment to the Authority at each and every site/facility as contemplated by the Project Contract including the carrying out of the design, construction, commissioning and testing of the Works and the provision of the Services (as defined in the Project Contract).
- (B) The Contractor has been appointed by the Purchaser under a contract dated on or around the date of this Deed (the "EPC Contract") to carry out the design, construction, commissioning and testing of the Works for a plant at Plot H600, Oka Drive, Hartlebury Trading Estate, Worcestershire DY10 4JB ("the Site").
- (C) The Contractor is obliged under the EPC Contract to give a warranty in this form in favour of the Authority.

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1. **OPERATIVE PROVISIONS**

In consideration of the payment of [REDACTED] by the Authority to the Contractor, receipt of which the Contractor acknowledges, the parties agree as follows:

2. **DEFINITIONS AND INTERPRETATIONS**

In this Deed unless the context otherwise requires, the following expressions shall have the following meanings:

"Competitor" means any of the companies listed in the attached schedule 1 (Competitors);

"Lender(s)" means any organisation providing funding to the Purchaser in connection with the carrying out of the Works;

- 2.1 Unless expressly defined otherwise in this Deed, any defined term in this Deed shall have the same meaning given to such term in the EPC Contract.

3. **CONTRACTOR'S WARRANTY AND LIABILITY**

- 3.1 The Contractor warrants to the Authority that it has carried out and will continue to carry out its duties under the EPC Contract in accordance with the EPC Contract and that it has exercised and will continue to exercise, in carrying out the design of the Works, the level of skill and care reasonably to be expected from an appropriately qualified and competent professional contractor providing those services in relation to a project of a similar size and scope to the Works. In particular and without limiting the generality of the foregoing the Contractor covenants with the Authority that it has carried out and will carry out and complete the Works in accordance with the EPC Contract and duly observe and perform all its duties and obligations thereunder.

- 3.2 The Contractor shall be entitled in any action or proceedings by the Authority to raise equivalent rights in defence of liability (except for set off or counterclaim) as it would have against the Purchaser under the EPC Contract, and shall have no liability under this Deed that is of greater or of longer duration than it would have had if the Authority had been a party to the EPC Contract as joint employer. Upon the expiration of twelve (12) years from the date of Take Over of the Works in accordance with the EPC Contract, the liability of the Contractor under this Deed shall cease and determine, save in relation to any claims made by the Authority

against the Contractor and notified by the Authority to the Contractor in writing prior thereto.

- 3.3 The Contractor shall have no liability to the Authority under this Deed in respect of any delay in the Take-Over of the Works howsoever caused save to the extent that the liability arises under the EPC Contract and the Authority shall have exercised its right to step in under clause 10. Any claim in relation to a delay in Take Over of the Works but not otherwise will be extinguished to the extent that the Purchaser has had deducted liquidated damages under clause 15 of the EPC Contract.

4. DOCUMENTATION

- 4.1 The Contractor hereby grants (or, if such grant cannot legally take place until a later date, agrees to grant) to the Authority with effect from the date of this Deed or in the case of Documentation not yet in existence with effect from the creation thereof, a royalty-free non-exclusive licence (such licence to remain in full force and effect notwithstanding completion of the Contractor's obligations under the EPC Contract or the termination of the EPC Contract or the determination of the Contractor's engagement under it or any dispute thereunder or hereunder) to use and to reproduce all Documentation for any purpose whatsoever connected with the Works including, but without limitation, the execution, completion, maintenance, letting, advertisement, modification, reinstatement and repair of the Works, and such licence will carry the right to grant sub-licences and will be transferable to third parties. The Authority will not hold the Contractor liable for any use it may make of the Documentation for any purpose other than that for which they were originally provided by it unless the Contractor authorises such use and confirms the Documentation is suitable for it, provided that the Contractor shall not be liable for any modifications to the Documentation or the Works by the Authority or any representative of the Authority.
- 4.2 The Contractor warrants to the Authority that he has used the standard of skill, care and diligence as set out in clause 3.1 to see that the Documentation (save to the extent duly appointed sub-contractors have been used to prepare the same) are its own original work and that in any event their use in connection with the Works will not infringe the rights of any third party.

5. INSURANCE

The Contractor shall upon request provide to the Authority reasonable evidence that it is maintaining the insurances it is required to take out and maintain under the EPC Contract.

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6. NOTICES

Any notice to be given by any party will be sufficiently served if sent by hand or by post to the registered office or if there is none the last known address of the party to be served. Any notice sent by hand will be deemed to be served on the date of delivery provided that if any notice sent by hand is sent after 4.45 pm on any day it will be deemed to be served on the next Business Day. Any notice sent by post will be deemed to have been duly served at the expiration of 6 Business Days after the time of posting if the end of that period falls before 4.45pm on a Business Day and otherwise on the next Business Day.

7. ASSIGNMENT

- 7.1 The benefit of and the rights of the Authority under this Deed may be assigned without the consent of the Contractor on two occasions only and the Authority will notify the Contractor in writing following any such assignment specifying the name and address of the assignee and the date of the assignment. The Contractor will not contend that any such assignee is precluded from recovering any loss resulting from any breach of this Deed (whatever the date of such breach) by reason only that that person is an assignee and not the original beneficiary hereunder or by reason that the original beneficiary or any intermediate beneficiary escaped any loss resulting from such breach by reason of the disposal of any interest in the Site or that the original beneficiary or any intermediate beneficiary has not suffered any, or as much, loss.

8. AUTHORITY'S REMEDIES

The rights and benefits conferred upon the Authority by this Deed are in addition to any other rights and remedies it may have against the Contractor including without prejudice to the generality of the foregoing any remedies in negligence.

9. INSPECTION OF DOCUMENTATION

The Contractor's liabilities under this Deed will not be in any way reduced or extinguished by reason of any inspection or approval of the Documentation or attendance at site meetings or other enquiry or inspection which the Authority may make or procure to be made for its benefit or on its behalf.

10. STEP-IN RIGHTS IN FAVOUR OF THE AUTHORITY

- 10.1 The Contractor will not exercise or seek to exercise any right which may be or become available to it to terminate or treat as terminated or repudiated the EPC Contract or its engagement under it or discontinue the performance of any duties or obligations thereunder without first giving to the Authority not less than thirty (30) days' prior written notice specifying the Contractor's ground for terminating or

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treating as terminated or repudiated the EPC Contract or its engagement under it or discontinuing its performance thereof and stating the amount (if any) of monies outstanding under the EPC Contract and the amounts it anticipates will become due for payment in the period between the issue of the notice by the Contractor and the expiry of the thirty (30) days notice period. Within such period of notice:

10.1.1 the Authority may give written notice to the Contractor that the Authority will thenceforth become the Purchaser under the EPC Contract to the exclusion of the Purchaser and thereupon the Contractor will admit that the Authority is the Purchaser under the EPC Contract and the EPC Contract will be and remain in full force and effect notwithstanding any of the said grounds;

10.1.2 if the Authority has given such notice as aforesaid or under **clause 10.3**, the Authority shall accept liability for the Purchaser's obligations under the EPC Contract and will as soon as practicable thereafter remedy any outstanding breach by the previous client which properly has been included in the Contractor's specified grounds and which is capable of remedy by the Authority provided that the maximum amount payable by the Authority pursuant to this **clause 10.1.2** in respect of monies outstanding under the EPC Contract at the date of the Contractor's notice shall be the amount notified to the Authority by the Contractor pursuant to **clause 10.1**; and

10.1.3 if the Authority has given such notice as aforesaid or under **clause 10.3**, the Authority will from the service of such notice become responsible for all sums properly payable to the Contractor under the EPC Contract accruing due after the service of such notice but the Authority will in paying such sums be entitled to the same rights of set-off and deduction as would have applied to the previous client under the EPC Contract.

10.2 Notwithstanding anything contained in this Deed and notwithstanding any payments which may be made by the Authority to the Contractor, the Authority will not be under any obligation to the Contractor nor will the Contractor have any claim or cause of action against the Authority unless and until the Authority has given written notice to the Contractor pursuant to **clause 10.1.1** or **clause 10.3**.

10.3 The Contractor further covenants with the Authority that if the EPC Contract is terminated (other than as a result of an event of Default of the Authority standing in the shoes of the Purchaser (as defined in the EPC Contract)) the Contractor, if requested by the Authority by notice in writing and subject to **clause 10.1.2** and **clause 10.1.3**, will accept the instructions of the Authority to the exclusion of the Purchaser in respect of its duties under the EPC Contract upon the terms and conditions of the EPC Contract and will if so requested in writing enter into a novation agreement whereby the Authority is substituted for the Purchaser under

the EPC Contract. If the Authority exercises its rights pursuant to this **clause 10.3**, any purported termination of the EPC Contract pursuant to clause 43A thereof shall be of no effect.

- 10.4 Where the Contractor has given rights in relation to the EPC Contract similar to those contained in this **clause 10** to any other person including the Lenders then if both the Authority and the Lenders serve notice under **clause 10.1** or **clause 10.3** or its equivalent the notice served by the Authority shall not prevail over any notice served by the Lenders but shall prevail over any notice served by any other person. If the Authority serves notice under **clause 10.1** or **10.3** and the Lenders subsequently serve an equivalent notice, then such Lenders' notice shall without prejudice to the EPC Contractor's rights against the Authority for the period that its notice was valid, take priority over and supersede the Authority's notice.
- 10.5 The Purchaser acknowledges that the Contractor will be entitled to rely on a notice given to the Contractor by the Authority under **clause 10.3** as conclusive evidence that the Project Contract has been terminated by the Authority.
- 10.6 The Authority may by notice in writing to the Contractor appoint another person (but not a Competitor of the Contractor) to exercise its rights under this **clause 10** subject to the Authority remaining liable to the Contractor as guarantor for its appointee in respect of its obligations under this Deed.
- 10.7 Upon request by the Authority following notice given by the Authority under this **clause 10** the Contractor agrees to co-operate with the Authority in determining the duties performed or to be performed by the Purchaser and to provide a copy of the EPC Contract and any variations thereto and details of all monies paid and due under the EPC Contract.

11. SUB-CONTRACTORS

Following a written request from the Authority the Contractor will execute (unless it has already done so) and/ or procure that such of its sub-contractors as are listed in the EPC Contract as Major Subcontractor's shall execute a deed of collateral warranty in the relevant form specified in the EPC Contract in favour of any person in whose favour the EPC Contract obliges the Contractor to give or procure the giving of such a warranty.

12. APPLICABLE LAW AND JURISDICTION

The law applicable to this Deed and any non-contractual obligations arising out of or in connection with it shall be English Law and the English Courts shall have non-exclusive jurisdiction with regard to all matters arising in connection with or under this Deed (including (without limitation) in relation to any non-contractual obligations).

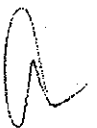
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13. THIRD PARTY RIGHTS

This Deed is enforceable by the original parties to it and by their successors in title and permitted assignees. Any rights of any person to enforce the terms of this Deed pursuant to the Contracts (Rights of Third Parties) Act 1999 are excluded.

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SCHEDULE 1

Competitors

1. LAB
2. Gotaverken Miljo
3. DrySotec
4. Alstom
5. Caldyn
6. Luhr Filter
7. FLSmidth Airtech
8. Area Impianti
9. CN1M
10. Martin
11. VINCI
12. Keppel Seghers Fisia Babcock Babcock Wilcox Volund Energos
13. Standardkessel Baumgarte
14. Xervon ThyssenKrupp/Remondis
15. KAB-Takuma
16. Visser Smit Hanab
17. Doosan
18. Volker Fitzpatrick Rafako
19. Termomeccanica JFE



IN WITNESS of which this document is executed as a Deed and is delivered on the date first before written

SIGNED AS A DEED by)
HITACHI ZOSEN INOVA AG)
a company incorporated in Switzerland)
and acting by)
and)
being persons who in accordance with)
the laws of that territory are acting)
under the authority of that company)

THE COMMON SEAL OF)
THE COUNTY OF)
HEREFORDSHIRE DISTRICT)
COUNCIL)
was hereunto affixed BY ORDER)
in the presence of)
Authorised Officer)

Authorised Officer

THE COMMON SEAL OF)
WORCESTERSHIRE COUNTY)
COUNCIL)
was hereunto affixed in the)
presence of Authorised Officer)

Authorised Officer

EXECUTED as a DEED)
for and on behalf of)
MERCIA WASTE MANAGEMENT)
LIMITED)

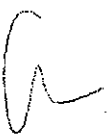
By:

For **FCC ENVIRONMENT SERVICES (U.K.) LIMITED** as Authorised Signatory/Director

By:

For **URBASER LIMITED** as Director

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EPC Sub-Contract Direct Agreement

Hitachi Zosen Inova AG

as Contractor

Hitachi Zosen Corporation

as Guarantor

Mercia Waste Management Limited

as Purchaser

Worcestershire County Council

and

The County of Herefordshire District Council

as Lenders

and

The Law Debenture Trust Corporation p.l.c.

as Security Agent

relating to the County of Herefordshire District Council and Worcestershire County Council Energy
from Waste Project

2014

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Schedule 24: Funder's Direct Agreement

A handwritten signature in black ink, located in the bottom right corner of the page. The signature is stylized and appears to be a cursive or semi-cursive script.

THIS DEED is made on

2014

BETWEEN:

- (1) **HITACHI Zosen INOVA AG** (a company incorporated under the laws of Switzerland whose registered office is at Hardturmstrasse 127, Zurich, p.o. box 680 8037 (the "**Contractor**");
- (2) **HITACHI Zosen CORPORATION** (a company incorporated in Japan whose registered office is at 7-89, Nanko-Kita, 1-Chome Suminoe-Ku, Osaka 559-8559 Japan (the "**Guarantor**");
- (3) **MERCIA WASTE MANAGEMENT LIMITED** (a company incorporated in England and Wales with registered number 03525188) whose registered office is at The Marina, Kings Road, Evesham, Worcestershire, WR11 3XZ (the "**Purchaser**");
- (4) **WORCESTERSHIRE COUNTY COUNCIL** and **THE COUNTY OF HEREFORDSHIRE DISTRICT COUNCIL** as lenders (the "**Lenders**"); and
- (5) **THE LAW DEBENTURE TRUST CORPORATION P.L.C.** as security agent for the Secured Creditors (the "**Security Agent**").

RECITALS

- (A) The Authority and the Purchaser have entered into the Waste Management Service Contract to set out the terms on which the Purchaser will carry out/provide waste management services.
- (B) In order to enable the Purchaser to perform its obligations under the Waste Management Service Contract, the Purchaser and the Contractor have entered into the Contract.
- (C) The obligations of the Contractor under the Contract are to be guaranteed by the Guarantor under the EPC Contract Guarantee.
- (D) Under the Senior Term Loan Facilities Agreement the Lenders have agreed to make available certain credit facilities to the Purchaser for the purposes of the Project. Pursuant to the Senior Term Loan Facilities Agreement the Lenders have appointed the Security Agent to act on their behalf under the terms of the Finance Documents.
- (E) It is a requirement of the Senior Term Loan Facilities Agreement that this Deed is entered into by the parties hereto.
- (F) It is the intention of the parties that this document be executed as a deed notwithstanding the fact that a party may only execute this Deed under hand.

THE PARTIES AGREE AS FOLLOWS:

1. INTERPRETATION

1.1 Definitions

In this Deed:

"Authority" means Worcestershire County Council and The County of Herefordshire District Council;

"Compensation Account" means the account opened in the name of the Purchaser called the "Compensation Account", with such details as are notified by the Purchaser to the Contractor and the EPC Guarantor in accordance with clause 14.5 (Accounts);



"Competitor" means any of the companies listed in schedule 5 (Competitors);

"Contract" means the EPC Contract to be entered into by the Contractor and the Purchaser on or around the date of this Deed relating to the provision of the Works;

"Contract Documents" means

- (a) the Contract;
- (b) the EPC Contract Guarantee;

"Councils" means Worcestershire County Council and the County of Herefordshire District Council in their capacity as procuring authorities;

"Decision Period" means, subject to clause 9.6 (Extension of Decision Period or Step-In Period), the period commencing on the occurrence of a Relevant Event or the date on which the Lenders receive a copy of an Intended Termination Notice and ending on the earliest of:

- (a) the date falling 45 days thereafter (or, if in relation to an Intended Termination Notice, the right of the Contractor to terminate the Contract has been or is referred to a dispute resolution procedure specified in clauses 45 (Disputes) to 48 (Arbitration) of the Contract, the date falling 15 days after a determination is made in respect of the dispute);
- (b) the Step-In Date;
- (c) the Novation Effective Date;
- (d) the revocation of the relevant Intended Termination Notice; and
- (e) the Senior Discharge Date.

"Documentation" has the meaning given to it under the Contract;

"Enforcement Action" means any action whatsoever to:

- (a) demand payment, declare prematurely due and payable, claim, recover, retain or receive any amount from the Purchaser (including, without limitation, by exercising rights of any set-off);
- (b) exercise or enforce any security rights or rights against sureties or any other rights pursuant to the provisions of any document or agreement in relation to (or given in support of) such amounts or any part thereof;
- (c) petition for (or take any other steps or action which may lead to) an order being made for the winding up of the Purchaser or any other insolvency proceedings in respect of the Purchaser;
- (d) commence legal proceedings against the Purchaser or compete with any Finance Party on a liquidation of the Purchaser or claim to be subrogated to any rights of any Finance Party;
- (e) take the benefit of any Security Interest for, or guarantees or other assurance against financial loss for or in respect of the Subordinated Liabilities; or
- (f) take or omit to take any action whereby subordination of the Subordinated Liabilities might be terminated, impaired or adversely affected;

"Event of Default" has the meaning given to it in the Senior Term Loan Facilities Agreement;

"Finance Documents" has the meaning given to it in the Senior Term Loan Facilities Agreement;

"Insolvency Event" means a court making a winding up order for the dissolution or liquidation of the Purchaser or a liquidator, receiver, manager, administrator or other similar officer being appointed to the Purchaser;

"Intended Termination Notice" has the meaning given to it in clause 5.1 (No Termination or Suspension Without Notice);

"Joint Performance Liquidated Damages Account" means the account opened jointly in the name of the Purchaser and the Councils called the "Joint Performance Liquidated Damages Account" with such details as are notified by the Purchaser to the Contractor and the EPC Guarantor in accordance with clause 14.5 (Accounts);

"Liabilities" means all present and future sums, liabilities and other obligations payable or owing by the Purchaser (whether actual or contingent, jointly or severally or otherwise howsoever);

"Novation" has the meaning given to it in clause 9.1 (Novation Notice);

"Novation Effective Date" means the date on which the conditions referred to in clause 9.7 (Novation Deed) are satisfied;

"Novation Notice" has the meaning given to it in clause 9.1 (Novation Notice);

"Performance Liquidated Damages" means the liquidated damages payable to the Purchaser in accordance with clause 35.9 (Performance Tests and Availability Tests) of the Contract;

"Permitted Payments" means any and all of the following:

- (a) payment of any sum which is agreed or determined to be due and payable by the Purchaser to the Contractor under the terms of the Contract as consideration for the carrying out of the Works; and
- (b) payment of any other sum agreed or determined to be due and payable by the Purchaser to the Contractor under the terms of the Contract in relation to any event or circumstance where such payment is made out of:
 - (i) monies received by the Purchaser in satisfaction of any corresponding obligation owed to the Purchaser by the Authority under the terms of the Waste Management Service Contract or by any other counterparty to a Key Contract in relation to that event or circumstance; or
 - (ii) insurance proceeds received by the Purchaser pursuant to any claim arising out of that event or circumstance;

"Proceeds Account" means the account opened in the name of the Purchaser called the "Proceeds Account", with such details as are notified by the Purchaser to the Contractor and the EPC Guarantor in accordance with clause 14.5 (Accounts);

"Project" has the meaning given to it in the Contract;

"Receiver" means any person appointed as a receiver or manager of the Purchaser pursuant to any Security Document;

"Relevant Event" means any and all of the following:

- (a) the occurrence of an Event of Default; and
- (b) the Security Agent receiving valid and binding instructions to enforce any of the Security Documents or giving notice to the Senior Creditors of its intention to enforce any of the Security Documents;

"Representative" means:

- (a) any Lender and/or any of their respective Affiliates;
- (b) an administrative receiver, receiver or receiver and manager of the Purchaser appointed under the Debenture;
- (c) an administrator of the Purchaser;
- (d) a person directly or indirectly owned or controlled by any Lender; or
- (e) any other person approved by the Contractor (such approval not to be unreasonably withheld or delayed),

named as Representative in a Step-In Notice. For the avoidance of doubt, neither the Security Agent nor any of its Affiliates shall be a Representative;

"Security Interest" means any mortgage, charge (fixed or floating), pledge, lien, right of set-off, security trust, assignment by way of security, reservation of title, any other security interest or any other agreement or arrangement (including a sale and repurchase arrangement) having the commercial effect of conferring security;

"Senior Discharge Date" means the date upon which all Senior Liabilities have been fully and irrevocably paid or discharged in full and no further Senior Liabilities are capable of becoming outstanding;

"Senior Liabilities" means all Liabilities to the Finance Parties arising under or in connection with the Finance Documents;

"Senior Term Loan Facilities Agreement" means the senior term loan facilities agreement entered into on or about the date of this D  d between the Purchaser (as borrower), the lead arrangers named therein, the Lenders (as original lenders) and the Security Agent;

"Step-In Date" means the date specified in a Step-In Notice as the date on which a Representative is to step in to the rights and obligations of the Purchaser under the Contract Documents in accordance with clause 7 (Step-In);

"Step-In Notice" has the meaning given to it in clause 7.1 (Step-In Notice);

"Step-In Period" means the period from a Step-in Date until the earliest of:

- (a) the date falling 24 months after the Step-In Date (or any later date agreed in accordance with clause 9.6 (Extension of Decision Period or Step-In Period));
- (b) the Step-Out Date;
- (c) the Novation Effective Date;
- (d) the date of termination of the Contract as permitted under clause 7.6 (Termination or Suspension During Step-In Period);

- (e) the Senior Discharge Date; and
- (f) the expiry of the Contract Documents;

"Step-Out Date" means the date specified in a notice given under clause 8.1 (Notice of Step-Out Date);

"Subordinated Liabilities" means all Liabilities of the Purchaser to the Contractor or the Guarantor under the terms of the Contract or the EPC Contract Guarantee as the case may be, other than Permitted Payments;

"Substitute Entity" means a person who is (or is proposed by the Lenders) to take a novation of the Purchaser's rights, benefits, obligations and liabilities under the Contract Documents in accordance with clause 9 (Novation);

"Technical Adviser" means Fichtner Consulting Engineers Ltd. or such other person as the Lenders may appoint from time to time to perform this role in accordance with the terms of the Senior Term Loan Facilities Agreement;

"Termination Event" means any of the events or circumstances set out in the Contract entitling the Contractor to terminate the Contract;

"Termination Notice" means a notice terminating the Contract given by the Contractor to the Purchaser in accordance with the Contract;

"Waste Management Service Contract" means the waste management service contract entered into by the Authority and the Purchaser on 22 December 1998 as amended and restated by a deed of variation to be entered into by the same parties on or around the date of this Deed;

"Works" has the meaning given to it in the Contract.

1.2 Construction

- (a) Unless the context otherwise requires or unless otherwise defined in this Deed, words and expressions defined in the Senior Term Loan Facilities Agreement have the same meanings when used in this Deed.
- (b) In this Deed, unless a contrary intention appears:
 - (i) a reference to any person is, where relevant, deemed to be a reference to or to include, as appropriate, that person's successors and permitted assignees or transferees;
 - (ii) any reference to a public organisation shall be deemed to include a reference to any successor to such public organisation or any organisation or entity which has taken over the functions or responsibilities of such public organisation;
 - (iii) references to clauses and schedules are references to, respectively, clauses of and schedules to this Deed and references to this Deed include its schedules;
 - (iv) a reference to (or to any specified provision of) any agreement or document is to be construed as a reference to that agreement or document (or that provision) as it may be amended, supplemented, novated or replaced from time to time, but excluding for this purpose any amendment, supplementation, novation or replacement which is contrary to any provision of any Finance Document;

- (v) a reference to a statute, statutory instrument or accounting standard or any provision thereof is to be construed as a reference to that statute, statutory instrument or accounting standard or such provision thereof, as it may be amended or re-enacted from time to time;
 - (vi) a time of day is a reference to London time;
 - (vii) the index to and the headings in this Deed are inserted for convenience only and are to be ignored in construing this Deed; and
 - (viii) words importing the plural shall include the singular and vice versa.
- (c) In the event of a conflict between the provisions of this Deed and the provisions of the Contract Documents, the provisions of this Deed shall prevail.

2. NOTIFICATION OF AND CONSENT TO SECURITY

2.1 Notice of Security Interest

The Purchaser hereby gives notice to the Contractor and the Guarantor that it has granted to the Security Agent a Security Interest over all of its respective present and future right, title, benefit and interest in and to the Contract Documents.

2.2 Acknowledgement of Security Interests

Each of the Contractor and the Guarantor:

- (a) acknowledges that by virtue of clause 2.1 (Notice of Security Interest) it has received notice of the Security Interests granted by the Purchaser over its right, title, benefit and interest under the Contract Documents in favour of the Security Agent under the Security Documents; and
- (b) consents to the Security Interests granted by the Purchaser specified in clause 2.1 (Notice of Security Interest).

2.3 No Other Security Interests

The Contractor (in respect of the Contract Documents other than the EPC Contract Guarantee) and the Guarantor (in respect of the EPC Contract Guarantee) confirm to the Purchaser that they have not received notice of any Security Interests granted over the Purchaser's right, title, benefit and interest under the Contract Documents other than the Security Interest specified in clause 2.1 (Notice of Security Interest).

2.4 Continuing Liabilities

- (a) It is agreed that the Security Agent shall have no obligations or liabilities to the Contractor or the Guarantor as a result of the Security Interests specified in clause 2.1 (Notice of Security Interest).
- (b) Each of the Contractor and the Guarantor acknowledges by its execution of this Deed that it remains fully liable for the fulfilment of all its obligations, liabilities and duties under the Contract Documents to which it is a party (including the Guarantor's obligations under the EPC Contract Guarantee, which shall continue in full force and effect notwithstanding any action pursuant to clause 7 (Step-In) or any novation under clause 9 (Novation)) unless released in accordance with this Deed or the relevant Contract Documents.

3. RESTRICTIONS ON ENFORCEMENT ACTION

3.1 Subordination

- (a) The rights of the Contractor and the Guarantor against the Purchaser in respect of the Subordinated Liabilities are, prior to the Senior Discharge Date, subordinated to the claims of the Finance Parties against the Purchaser in respect of the Senior Liabilities and accordingly payment of any amount of the Subordinated Liabilities is conditional upon the irrevocable payment in full of the Senior Liabilities.
- (b) Prior to the Senior Discharge Date neither the Contractor nor the Guarantor shall take any Enforcement Action in relation to the Purchaser in respect of the Subordinated Liabilities without the prior written consent of the Lenders.
- (c) Prior to the earlier of (a) the date of termination of the Contract and (b) the Senior Discharge Date and at any time during a Step-In Period, neither the Contractor nor the Guarantor shall take any Enforcement Action in relation to the Purchaser in respect of the Permitted Payments, other than demand payment of any of the Permitted Payments, without notice to the Lenders (with a copy to the Security Agent).

3.2 Turnover

Subject to clause 3.1(c) (Subordination) above, if at any time prior to the Senior Discharge Date:

- (a) the Contractor or the Guarantor receives or recovers the Subordinated Liabilities or any part thereof from the Purchaser; or
- (b) [not used]; or
- (c) the Purchaser makes any payment in respect of the Subordinated Liabilities, or
- (d) any of the Subordinated Liabilities are discharged by set-off or otherwise,

and unless the Lenders and the Security Agent shall agree otherwise, each of the Contractor and the Guarantor shall:

- (i) if the Contractor or the Guarantor has received the amount discharged or purported to be discharged, promptly pay such amounts to the Lenders for application towards the Senior Liabilities; or
- (ii) if the Contractor or the Guarantor has not, as a result of discharge by set-off or otherwise, actually received the amount discharged or purported to be discharged, pay to the Lenders an amount equal to the amount discharged or purported to be discharged.

3.3 Purchaser Undertakings

The Purchaser agrees and undertakes to the Lenders and the Security Agent that, prior to the Senior Discharge Date it shall not, except with the prior consent of the Lenders:

- (a) make any payment, repayment or prepayment of any amount in respect of the Subordinated Liabilities;
- (b) secure all or any part of the Subordinated Liabilities;
- (c) redeem, purchase or otherwise acquire any of the Subordinated Liabilities; or

- (d) take or omit to take any action whereby the subordination of the Subordinated Liabilities or any part thereof to the Senior Liabilities might be terminated, impaired or adversely affected.

3.4 Continuing Subordination

The subordination provisions in this Deed constitute a continuing subordination and benefit to the ultimate balance of the Senior Liabilities regardless of any intermediate payment or discharge of the Senior Liabilities in whole or in part.

3.5 Waiver of Defences

The subordination provisions in this Deed will not be affected by any act, omission or circumstance which (but for this provision) may operate to release or otherwise exonerate the Purchaser, the Contractor or the Guarantor from its obligations hereunder or otherwise affect such subordination and priority provisions including, without limitation:

- (a) any time or indulgence granted to or composition with the Purchaser or any other person; or
- (b) the taking, variation, compromise, renewal or release of or refusal to enforce any rights, remedies or securities against or granted by the Purchaser or any other person; or
- (c) any legal limitation, disability, incapacity or other circumstance relating to the Purchaser or any other person or any amendment to or variation of the terms of this Deed or any other document or security (including, without limitation, the Finance Documents and Security Documents); or
- (d) any fluctuation in or partial repayment or prepayment of the Senior Liabilities.

3.6 Rights of the Contractor and Guarantor

Subject to clauses 3.1 (Subordination) to 3.5 (Waiver of Defences) above, each of the Contractor and the Guarantor may enforce its rights under the Contract Documents.

4. UNDERTAKINGS

4.1 Copies of Notices to be Delivered to the Lenders and the Security Agent

The Contractor shall deliver to the Lenders and the Security Agent, at the same time as it delivers or provides to the Purchaser, a copy of:

- (a) notice of actual or potential termination, warning notices, notices proposing, agreeing to or refusing any amendment, waiver or variation of the Contract Documents, claims for additional payment, etc, delivered by it to the Purchaser pursuant to the Contract;
- (b) any notice of default served by the Contractor under the Contract, including a non-payment default under clause 43A(1)(a) (Termination for Purchaser's Default) of the Contract; and
- (c) any other notification, information or other communication in relation to the Contract Documents that the Lenders may reasonably require.

4.2 Rights of termination by the Purchaser

The Contractor and the Purchaser agree with the Lenders and the Security Agent that any notice issued by the Purchaser to terminate, cancel or rescind the Contract or the

employment of the Contractor thereunder shall be of no effect unless the notice is accompanied by written confirmation from the Lenders that each Lender approves the giving of such notice.

4.3 **Contractor Undertakings**

The Contractor undertakes to the Lenders and the Security Agent that:

- (a) on receipt of a Step-In Notice from the Lenders, it shall accept as validly given by the Purchaser any notices or demands given by the Representative under the Contract Documents if the same would have been validly given had it been given by the Purchaser;
- (b) it shall not, other than in accordance with the provisions of this Deed or with the prior written consent of the Lenders, agree to amend, modify, waive, cancel or surrender any provision of the Contract Documents;
- (c) it shall not, other than in accordance with the provisions of this Deed or with the prior written consent of the Lenders, assign, subcontract (other than as permitted under the terms of the Contract), charge or otherwise dispose of any right, title, benefit or interest in or to the Contract Documents (or any part thereof) provided that this shall not affect the Contractor's right to execute a charge in favour of the Contractor's bankers of any monies due under the Contract or the subrogation to Insurers of the Contractor's rights;
- (d) it shall promptly notify the Lenders and the Security Agent if it becomes aware of any event or circumstance occurring under the Contract which constitutes a Termination Event or which would, with the lapse of time, the giving of notice or the fulfilment of any other condition, constitute a Termination Event;
- (e) it shall not, without the prior consent of the Lenders, enter into any document in respect of the Project with any person which gives such other person step-in rights or similar rights against the Contractor; and
- (f) it shall not terminate, purport to terminate or take any other action to terminate any of the Contract Documents otherwise than in accordance with the express rights of termination in the Contract Documents.

Without prejudice to any obligation of the Lenders or Representative pursuant to this Deed, none of the Lenders, Security Agent or Representative shall have any obligation to the Contractor under or in respect of the Contract Documents.

4.4 **Guarantor Undertakings**

The Guarantor undertakes to the Lenders and the Security Agent that:

- (a) on receipt of a Step-In Notice from the Lenders, it shall accept as validly given by the Purchaser any notices or demands given by the Representative under the Contract Documents if the same would have been validly given had it been given by the Purchaser;
- (b) it shall not, other than in accordance with the provisions of this Deed or with the prior written consent of the Lenders, agree to amend, modify, waive, cancel or surrender any provision of the EPC Contract Guarantee;
- (c) it shall not, other than in accordance with the provisions of this Deed or with the prior written consent of the Lenders (not to be unreasonably withheld or delayed), assign or otherwise dispose of any right, title, benefit or interest in or to the EPC Contract Guarantee (or any part thereof);

- (d) It shall not, without the prior consent of the Lenders, enter into any document in respect of the Project with any person which gives such other person step-in rights or similar rights against the Guarantor.

Without prejudice to any obligation of the Lenders or Representative pursuant to this Deed, none of the Lenders, the Security Agent and the Representative shall have any obligation to the Guarantor under or in respect of the EPC Contract Guarantee.

4.5 Lenders to Inform

The Lenders agree to notify the Contractor as soon as reasonably practicable after a notice has been served to the Purchaser that an Event of Default under the Senior Term Loan Facilities Agreement is continuing.

5. TERMINATION AND SUSPENSION BY THE SUB-CONTRACTOR

5.1 No Termination or Suspension Without Notice

Prior to the Senior Discharge Date, the Contractor shall not terminate the Contract, deliver any Termination Notice, treat the Contract as having been repudiated by the Purchaser or suspend the performance of its obligations under the Contract without giving the Purchaser, the Lenders and the Security Agent prior notice (an "**Intended Termination Notice**") of its intention to do so, and for the avoidance of doubt, service of an Intended Termination Notice can be made at any time after the final date for payment in respect of a payment to be made pursuant to the Contract.

5.2 Form of Intended Termination Notice

Any Intended Termination Notice delivered by the Contractor pursuant to clause 5.1 (No Termination or Suspension Without Notice) in relation to the Contract shall specify:

- (a) the proposed date of termination, repudiation or (as the case may be) suspension;
- (b) reasonable details of the relevant Termination Event or ground for suspension; and
- (c) the information specified in clause 6.1 (Statement of Amounts Due and Unperformed Obligations).

5.3 Effect on Termination Notice

Any Termination Notice given by the Contractor after an Intended Termination Notice has been given pursuant to clause 5.1 (No Termination or Suspension Without Notice) shall be deemed to be suspended and shall only be effective to terminate the Contract:

- (a) (if no Step-In Notice or Novation Notice has then been given) on the expiry of the Decision Period; or
- (b) (if a Step-In Notice has been issued but no Novation Notice has then been given) on the expiry of the Step-In Period,

and provided that the relevant Termination Event is then continuing and has not been remedied or waived.

5.4 Suspension of Performance

During a Decision Period:

- (a) the Contractor shall not take any Enforcement Action save that the Contractor may suspend performance of the Works (other than to secure any existing Works) where:

- (i) permitted to do so for non-payment pursuant to the Contract or section 112 of the Housing, Grants, Construction and Regeneration Act 1996; or
- (ii) from the date following 30 days after the commencement of the Decision Period,

in each case until the earlier of:

- (A) receipt of a Step-In Notice by the Contractor pursuant to clause 7.1 (Step-In Notice);
 - (B) the date on which the event or circumstance giving rise to the Intended Termination Notice or Termination Notice is remedied; or
 - (C) the expiry of the Decision Period.
- (b) The Lenders may, where applicable, procure remedial action, consistent with the terms of the Contract Documents, as may be necessary to remedy the effects of the event or circumstance which has given rise to an Intended Termination Notice or Termination Notice and the Contractor agrees that any such action shall, to the extent of such remedy, constitute a valid discharge of the Purchaser's obligations under the Contract Documents.

5.5 Withdrawal of Intended Termination Notice or Termination Notice

The Contractor may withdraw an Intended Termination Notice or a Termination Notice at any time.

6. NOTIFICATION OF OUTSTANDING OBLIGATIONS

6.1 Statement of Amounts Due and Unperformed Obligations

The Contractor shall, together with any Intended Termination Notice (or within five Business Days of receipt of a Step-In Notice where no Intended Termination Notice has been delivered) notify the Lenders and the Security Agent of:

- (a) all amounts due and payable by the Purchaser to the Contractor under the Contract Documents as at the date of the Intended Termination Notice (or, as the case may be, the date of receipt of the Step-In Notice) but remaining unpaid at such date; and
- (b) all amounts accrued but not yet due under the Contract Documents as at the date of the Intended Termination Notice (or, as the case may be, the date of receipt of the Step-In Notice) that will become due on or prior to the expiry of the Decision Period,

(the "Statement").

6.2 Updates

- (a) The Lenders may from time to time after receipt of the information provided by the Contractor under clause 6.1 (Statement of Amounts Due and Unperformed Obligations) request the Contractor to specify, as at the date of such request and to the best of the Contractor's knowledge, any other liabilities or unperformed obligations of the Purchaser which are or will become due and payable under the

Contract Documents in the period specified in such request, such period not to exceed twelve months.

- (b) The Contractor shall promptly give the Lenders and the Security Agent a notice updating any Statement if the Contractor becomes aware that:
 - (i) the information contained in such Statement is untrue, incomplete and/or inaccurate; or
 - (ii) any information relevant to such Statement has yet to be disclosed to the Lenders and the Security Agent.

6.3 **Sums or Obligations Not Notified**

Subject to clause 7.5 (Rights and Obligations on Step-In), any sums or obligations not duly notified in accordance with clause 6.1 (Statement of Amounts Due and Unperformed Obligations) or clause 6.2 (Updates) shall not:

- (a) as between the Representative, the Contractor and the Guarantor, unless the Representative otherwise agrees, be assumed by the Representative during any Step-In Period; or
- (b) as between any Substitute Entity taking a novation in accordance with clause 9 (Novation), the Contractor and the Guarantor, be assumed by the Substitute Entity unless the Substitute Entity otherwise agrees.

6.4 **Verification**

The Lenders may instruct the Technical Adviser and/or an independent chartered accountant to verify at the Purchaser's costs the Statements submitted by the Contractor.

7. **STEP-IN**

7.1 **Step-In Notice**

- (a) Without prejudice to the rights of the Security Agent under the Security Documents, the Lenders may, at any time during the Decision Period, give not less than five Business Days' notice (a "**Step-In Notice**") to the Contractor or the Guarantor in the case of the EPC Contract Guarantee (in each case with a copy to the Security Agent) that a Representative is to step in to the Contract Documents in accordance with clause 7.5(a) (Rights and Obligations on Step-In).
- (b) The Step-In Notice shall be in the form set out at schedule 1 to this Deed and shall (i), specify the appointed Representative, (ii) specify the proposed Step-In Date (which must fall at or prior to the expiry of the Decision Period) and (iii) enclose details of the appointed Representative's finances and resources as evidence of its financial standing.
- (c) The Lenders may revoke a Step-In Notice at any time prior to the Step-In Date by notice to the Contractor.

7.2 **Approval of Representative**

The Contractor or the Guarantor may within 14 days of the Step-In Notice notify the Lenders (with a copy to the Security Agent) that it does not consent to the Representative being appointed if, acting reasonably:

- (a) it is not satisfied that the Representative has:

- (i) the legal capacity, power and authorisation; or
 - (ii) the technical competence, financial standing and resources;
- to assume the position of Representative; or
- (b) the Representative is a Competitor of the Contractor.

7.3 Deemed Consent to Appointment Representative

If the Contractor or the Guarantor does not object to the appointment of the Representative pursuant to clause 7.2 (Approval of Representative), the Representative shall be deemed to be approved by the Contractor and the Guarantor.

7.4 Consultation in relation to appointment of Representative

- (a) If notice is given pursuant to and in accordance with clause 7.2 (Approval of Representative) above, the Lenders and the Contractor or the Guarantor (as the case may be) shall then consult, for a period not exceeding three days, upon the issues raised in the notice.

- (b) If by the expiry of the period specified in clause 7.4(a) above:

- (i) the Contractor or the Guarantor (as the case may be) has not withdrawn its objections; or

- (ii) the Lenders have not agreed to withdraw the Step-In Notice,

then within five days of that date the Lenders and the Contractor or the Guarantor (as the case may be) shall appoint an independent person having the appropriate degree of expertise (the "Expert") to determine the matter and the Lenders shall notify the Security Agent of such appointment. Failing agreement by them on the choice of Expert within that period, the Expert shall be appointed by the Lenders after consulting the Contractor or the Guarantor (as the case may be) and the Lenders shall notify the Security Agent of such appointment.

- (c) Subject to the provisions of this Deed, the Expert shall resolve the dispute in such manner as he shall in his absolute discretion see fit and shall have power to request the parties to the dispute to provide him with such statements, documents or information as he may determine. He shall act as an expert and not an arbitrator and his decision shall be final and binding on the parties to the dispute.

- (d) The Contractor or the Guarantor (as the case may be) and the Lenders shall use all reasonable endeavours to procure that the Expert shall, within 15 days of his appointment, give written notice of his decision to the parties to the dispute (with a copy to the Security Agent), stating in reasonable detail the reasons for it.

7.5 Rights and Obligations on Step-In

- (a) With effect from the Step-In Date and during the Step-In Period:

- (i) the Representative shall, for the duration of the Step-In Period, be deemed to be a party to the Contract Documents specified in the Step-In Notice as an additional obligor with the Purchaser and shall be jointly and severally liable with the Purchaser under the Contract Documents to the Contractor for (aa) the liabilities set out in each Statement and (bb) all obligations and liabilities arising under the Contracts on and after the Step-In Date and shall be entitled to the same rights as the Purchaser under the Contract Documents;

- (ii) the Purchaser shall remain liable for all of its obligations under the Contract Documents regardless of the appointment of the Representative;
 - (iii) each of the Contractor and the Guarantor shall continue to comply with all of its obligations under the Contract Documents in accordance therewith during the Step-In Period; and
 - (iv) the Contractor and the Guarantor owe their respective obligations to the Purchaser and the Representative jointly but performance by the Contractor in favour of either the Representative or the Purchaser (unless otherwise notified by the Representative) alone shall be good discharge of its obligations under the Contract Documents.
- (b) Without prejudice to clause 7.6 (Termination or Suspension during Step-In Period) neither the Contractor nor the Guarantor shall take steps to terminate or suspend performance of the Contract Documents or treat the Contract Documents as being repudiated during the Step-In Period on grounds:
- (i) that the Lenders have taken any action referred to in clause 7.1 (Step-In Notice) or that the Security Agent has enforced any Security Document;
 - (ii) arising prior to the Step-In Date and whether or not continuing at the Step-In Date; or
 - (iii) arising out of an Insolvency Event.

7.6 Termination or Suspension During Step-In Period

The Contractor and the Guarantor shall be entitled to terminate or suspend performance of the Contract Documents during the Step-In Period by written notice to the Lenders, the Security Agent and the Purchaser only if:

- (a) any amount referred to in clause 6.1(a) (Statement of Amounts Due and Unperformed Obligations) has not been paid on or before the date falling 10 days after the Step-In Date;
- (b) any amount referred to in clause 6.1(b) (Statement of Amounts Due and Unperformed Obligations) has not been paid on or before the date falling 10 days after the date on which sum amount became due; or
- (c) the grounds for termination arise after the Step-In Date in accordance with the terms of the Contract and the event or circumstance giving rise to such grounds has not been remedied within 30 days of receipt by the Representative of a notice in writing from the Contractor in respect thereof.

The provisions of clause 5.1 (No Termination or Suspension Without Notice) shall not apply to any Enforcement Action taken pursuant to this clause 7.6.

7.7 Contractor and the Guarantor to Deal With the Representative

The Contractor and the Guarantor shall deal with the Representative and not the Purchaser during the Step-In Period.

8. STEP-OUT

8.1 Notice of Step-Out Date

The Lenders or the Representative may at any time during the Step-In Period give to the Contractor and the Guarantor (with a copy to the Security Agent) not less than five

Business Days' notice that the Representative (if any) is to step out of the Contract Documents in accordance with clause 8.2 (Release From and Cessation of Liabilities), and such notice shall be in the form set out at schedule 2 to this Deed (or such other form as the Lenders or the Representative may approve).

8.2 Release From and Cessation of Liabilities

On the expiry of the Step-In Period:

- (a) the Representative shall be released from all of its obligations and liabilities to the Contractor and the Guarantor under the Contract Documents and under this Deed save for any outstanding claims made by the Contractor and/or the Guarantor prior to the expiry of the Step-In Period and the rights of the Representative against the Contractor shall be cancelled;
- (b) the Contractor and the Guarantor shall no longer deal with the Representative and shall deal with the Purchaser or (as the case may be) a Substitute Entity (if any) appointed pursuant to clause 9 (Novation) in relation to the Contract Documents; and
- (c) the Purchaser shall continue to be bound by the terms of the Contract Documents and this Deed; notwithstanding the occurrence of the Step-Out Date.

9. NOVATION

9.1 Novation Notice

Subject to the other provisions of this clause 9, at any time during the Decision Period or the Step-In Period the Lenders or a Representative (as the case may be) may give notice (a "**Novation Notice**") to the Contractor and the Guarantor (with a copy to the Security Agent) that it proposes to novate the Purchaser's benefits, obligations and liabilities under the Contract Documents to a Substitute Entity (a "**Novation**"), and such notice shall be in the form set out at schedule 3 to this Deed (or such other form as the Lenders or the Representative and the Contractor may approve).

9.2 Details of Substitute Entity

The Novation Notice shall include such information as the Contractor or the Guarantor may reasonably require to enable it to decide whether to grant approval to the Novation, including:

- (a) the proposed date for the novation to be effected pursuant to clause 9.7 (Novation Deed);
- (b) the name of the Substitute Entity;
- (c) the names of the shareholders in the Substitute Entity and details of the respective interests held by each of them;
- (d) the manner in which the Substitute Entity is to be financed and the extent to which such finance is committed;
- (e) the resources which the Substitute Entity has available to it to perform the obligations of the Purchaser or (as the case may be) the Representative under the Contract Documents; and
- (f) any information which may be reasonably required to enable the Contractor and the Guarantor to ascertain whether the proposed Substitute Entity meets the criteria detailed in clause 9.3 (Consent to Novation).

9.3 Consent to Novation

The Contractor and the Guarantor may within 14 days of receipt or deemed receipt of the Novation Notice notify the Lenders or the Representative in writing (as the case may be) (with a copy to the Security Agent) that it does not consent to the Novation if, acting reasonably:

- (a) it is not satisfied that the Substitute Entity has:
 - (i) the legal capacity, power and authorisation; or
 - (ii) the technical competence, financial standing, committed finance and resources;to assume the obligations of the Purchaser under the Contract Documents; or
- (b) the Substitute Entity is a Competitor of the Contractor.

9.4 Deemed Consent to Novation

If the Contractor or the Guarantor does not object to the Novation pursuant to clause 9.3 (Consent to Novation), the Novation shall be deemed to be approved by the Contractor and the Guarantor.

9.5 Consultation in relation to Novation

- (a) If notice is given pursuant to and in accordance with clause 9.3 (Consent to Novation) above, the Lenders or the Representative (as the case may be) and the Contractor or the Guarantor (as the case may be) shall then consult, for a period not exceeding five days, upon the issues raised in the notice.
- (b) If by the expiry of the period specified in clause 9.5(a) above:
 - (i) the Contractor or the Guarantor has not withdrawn its objections; or
 - (ii) the Lenders or the Representative (as the case may be) has not agreed to withdraw the Novation Notice,

then within five days of that date the Lenders or the Representative (as the case may be) and the Contractor or the Guarantor (as the case may be) shall appoint an independent person having the appropriate degree of expertise (the "Expert") to determine the matter and the Lenders shall notify the Security Agent of such appointment. Failing agreement by them on the choice of Expert within that period, the Expert shall be appointed by the Lenders after consulting the Contractor or the Guarantor (as the case may be) and the Lenders shall notify the Security Agent of such appointment.

- (c) Subject to the provisions of this Deed, the Expert shall resolve the dispute in such manner as he shall in his absolute discretion see fit and shall have power to request the parties to the dispute to provide him with such statements, documents or information as he may determine. He shall act as an expert and not an arbitrator and his decision shall be final and binding on the parties to the dispute.
- (d) The Contractor or the Guarantor (as the case may be) and the Lenders or the Representative (as the case may be) shall use all reasonable endeavours to procure that the Expert shall, within 15 days of his appointment, give written notice of his decision to the parties to the dispute (with a copy to the Security Agent), stating in reasonable detail the reasons for it.

9.6 **Extension of Decision Period or Step-In Period**

If at the date on which (but for this clause 9.6) the Decision Period or (as the case may be) the Step-In Period would expire the Lenders or the Representative is negotiating in good faith with a Substitute Entity, the Decision Period or (as the case may be) the Step-In Period shall continue until the earlier of:

- (a) the Novation Effective Date; or
- (b) the expiry of such reasonable period (not exceeding 20 days) following the date on which (but for this clause 9.6) the Decision Period or (as the case may be) the Step-In Period would expire as the Lenders or the Representative may specify by notice to the Contractor.

9.7 **Novation Deed**

The Purchaser, any Representative, the Contractor and the Guarantor shall enter into a novation deed in the form set out in schedule 4 (Form of Novation Deed) within five days of the Substitute Entity being approved or deemed to be approved in accordance with this clause 9. Subject to clause 6.3 (Sums or Obligations Not Notified) and clause 8.2 (Release from and Cessation of Liabilities) the novation deed shall give the parties the same rights and obligations as under the Contract Documents and shall provide that on the Novation Effective Date:

- (a) the Decision Period or (as the case may be) the Step-In Period shall expire;
- (b) the Contractor shall not be entitled to terminate the Contract by reason of any Termination Event or any other act or omission occurring prior to the Novation Effective Date unless such Termination Event, act or omission remains outstanding and has not been waived or remedied within 10 days of the Novation Effective Date;
- (c) the Purchaser, the Representative (if any), the Contractor and the Guarantor shall be released from all their obligations and liabilities to each other under or in connection with the Contract Documents (as applicable) (the "**Discharged Obligations**");
- (d) the Substitute Entity, the Contractor and the Guarantor shall assume obligations towards each other which differ from the Discharged Obligations only insofar as they are owed to or assumed by the Substitute Entity instead of the Purchaser and the Representative (if any), which obligations shall include for the avoidance of doubt any unperformed obligations of the Purchaser, the Representative (if any), the Contractor and the Guarantor;
- (e) the rights of the Purchaser and the Representative (if any) against the Contractor and the Guarantor under the Contract Documents and vice versa (the "**Discharged Rights**") shall be cancelled;
- (f) the Substitute Entity, the Contractor and the Guarantor shall acquire rights against each other which differ from the Discharged Rights only insofar as they are exercisable by or against the Substitute Entity instead of the Purchaser and the Representative (if any);
- (g) the Substitute Entity shall become a party to the Contract Documents as purchaser, in place of the Purchaser, and shall assume all the obligations and liabilities, and become entitled to all the benefits, rights, powers and discretions of the Purchaser under the Contract Documents; and

- (h) the Contractor, the Guarantor, the Substitute Entity and the Security Agent shall enter into a direct agreement with the Lenders providing finance facilities to the Substitute Entity on substantially the same terms as this Deed.

If any time has elapsed up to (and including) the Novation Effective Date in relation to an obligation of the Purchaser or the Representative (if any) which remains unperformed and for which the relevant Contract Document specifies a time for performance, then (as between the Contractor, the Guarantor and the Substitute Entity) the time specified for performance shall (if necessary) be extended by such period as is reasonable, given the then prevailing circumstances, to allow the Substitute Entity to perform or remedy the unperformed obligation, provided that in the case of an unperformed obligation of the Purchaser or the Representative (if any) to make a payment, that period shall be extended by 5 days.

10. COLLATERAL WARRANTY

The Contractor warrants and undertakes to the Lenders and the Security Agent that:

- (a) in carrying out the Works it will exercise all the reasonable skill, care and diligence to be expected of a properly qualified contractor who has held himself out as competent to carry out the Works and who is experienced in carrying out works of a similar size, scope, nature, complexity and value to the Works; and
- (b) it shall comply promptly and efficiently with the terms of and shall fulfil its duties and obligations set out in the Contract

provided that:

- (i) the liability of the Contractor (when calculated in aggregate) arising under the Contract and this Deed cannot in any circumstance exceed the liability of the Contractor under the Contract; and
- (ii) the Lenders and the Security Agent shall not make any claims under this clause 10 (Collateral Warranty) unless and until the Contract has been terminated in accordance with its terms.

11. INTELLECTUAL PROPERTY

- (a) The Contractor insofar as it is able hereby grants to the Lenders with full title guarantee a royalty free, non-exclusive and irrevocable licence to use the Documentation provided by the Contractor under the Contract in connection with the design, construction, operation, maintenance and repair of the Works. Nothing in this clause 11(a) shall require the Contractor to disclose, and the licence hereby granted shall not extend to, any confidential information relating to the Contractor, including the Contract.
- (b) The Contractor agrees to grant to the Lenders such intellectual property rights as it undertakes to grant to the Purchaser pursuant to and on the same terms as set out in the Contract.
- (c) The licence granted pursuant to clause 11(a) above shall also permit the copying and use of the Documentation for an extension to the completed development, provided that such extension does not result in the construction of any separate or additional production plant or does not result in an increase in the production capacity of the Works of more than 25% over the original design.
- (d) The copyright in all Documentation shall remain vested in the Contractor or his Sub-Contractors as the case may be, subject to pre-existing rights of any third party.

- (e) The Contractor agrees on reasonable request at any time and following reasonable written prior notice to give the Lenders or those authorised by it access to the Documentation and to provide copies (including negatives and CAD disks) thereof at the expense of the Purchaser, which the Lenders may reasonably require for the purpose of discharging their responsibilities under the Finance Documents, subject to the Lenders providing a written undertaking to keep all such information confidential.
- (f) The Contractor warrants to the Lenders that the Documentation (save to the extent that other duly appointed sub-contractors have been used to prepare the same) are its own original work and that in any event their use in connection with the Works will not infringe the rights of any third party.

12. PAYMENT INSTRUCTION

12.1 Payment

- (a) For the purposes of the Security Interest referred to in clause 2.1 (Notice of Security Interest), the Purchaser and the Security Agent hereby authorise and instruct the Contractor and the Guarantor to make all payments which are or may become due from the Contractor or the Guarantor under or arising from or in respect of a Contract Document (whether before or after termination of such agreement but arising prior to the Senior Discharge Date) to:
 - (i) the Proceeds Account (other than payments of Compensation or Performance Liquidated Damages); or
 - (ii) in the case of any Compensation, to the Compensation Account; or
 - (iii) in the case of Performance Liquidated Damages, to the Joint Performance Liquidated Damages Account; or
 - (iv) following the commencement of a Decision Period and at any time thereafter, to a Representative, the Security Agent or a Substitute Entity taking a novation in accordance with clause 9 (Novation), to such other account in the United Kingdom as such person may from time to time direct in writing to the Contractor or the Guarantor in accordance with the provisions of this Deed,and each of the Contractor and the Guarantor agree to comply with the authority and instruction in this clause 12.1.
- (b) Any payment made in accordance with clause 12.1(a) shall constitute a good discharge pro tanto of the obligation to make such payment.
- (c) The authority and instruction in this clause 12.1 may not be revoked or varied by the Purchaser without the prior written consent of the Security Agent (copied to the Contractor and the Guarantor).

12.2 Set-off and Counterclaim

Each of the Contractor and the Guarantor agrees to make all payments due from it under the Contract Documents free and clear of, and without any deduction for or on account of, any such set-off or any counterclaim save only where the right of set-off or counterclaim is made pursuant to the Contract Documents.

13. REPRESENTATIONS

Each of the Contractor and the Guarantor makes the representations and warranties as to itself set out in clauses 13.1 (Incorporation) to 13.3 (Authorisation) (inclusive) to the Purchaser, the Lenders and the Security Agent.

13.1 Incorporation

It is duly incorporated and validly existing with limited liability under the laws of its place of incorporation and has the corporate power to own its assets and to carry on its business as contemplated by the Contract Documents (to which it is a party).

13.2 Power and Capacity

It has the power and capacity to enter into and comply with its obligations under this Deed and the Contract Documents.

13.3 Authorisation

It has taken all necessary corporate, shareholder and other action:

- (a) to authorise the entry into and compliance with its obligations under this Deed and the Contract Documents;
- (b) to ensure that its obligations under this Deed and the Contract Documents are valid, legally binding and enforceable in accordance with their terms; and
- (c) to make this Deed and the Contract Documents admissible in evidence in the courts of England.

14. MISCELLANEOUS

14.1 Further Assurance

The Contractor, the Guarantor and the Purchaser shall, at the Purchaser's expense, take whatever action:

- (a) the Lenders;
- (b) a Representative; or
- (c) a Substitute Entity taking a novation in accordance with clause 9.1 (Novation),

may reasonably require for perfecting any novation, release or assumption under clause 7.1 (Step-In), 8 (Step-Out) or 9 (Novation) including the execution of any novation or assignment, and the giving of any notice, order or direction and the making of any registration which, in each case, the Lenders, the Representative or Substitute Entity reasonably requires.

14.2 Binding Agreement

This Deed shall remain in effect until the earlier of:

- (a) the date upon which all obligations of the Contractor and the Guarantor under the Contract Documents have been finally discharged; and
- (b) the Senior Discharge Date (such date to be notified by the Lenders to the Contractor and Guarantor on or before the date falling 30 days after its occurrence).

14.3 Amendments

- (a) No purported amendment or modification of this Deed shall be valid unless in writing executed by the parties.
- (b) The Purchaser shall as soon as reasonably practicable, inform the Security Agent where there has been an amendment or variation to the Contract relating to:
 - (i) the definition of "Documentation", "Performance Liquidated Damages", "Project", "Termination Event", "Termination Notice" or "Works";
 - (ii) clause 35.9 (Performance Tests and Availability Tests); or
 - (iii) the scope of events or circumstances constituting a Termination Event.

14.4 Security Agent

The Security Agent is only a party to this Deed so that it may exercise the rights conferred to it under this Deed. The Security Agent shall not, for the avoidance of doubt, assume any obligations by virtue of it entering into this Deed.

14.5 Accounts

The Purchaser shall provide details of the Compensation Account, Proceeds Account and the Joint Performance Liquidated Damages Account (including the sort code and the account numbers) to the Contractor and the Guarantor, within ten (10) Business Days of such accounts being opened.

15. NO IMPLIED WAIVER

15.1 Failure to Exercise Rights

No failure or delay by the Lenders or the Security Agent in exercising any right, power or privilege under this Deed will operate as a waiver thereof nor will any single or partial exercise of any right, power or privilege preclude any other or further exercise thereof or the exercise of any other right, power or privilege.

15.2 Cumulative Rights

The rights and remedies provided in this Deed are cumulative and not exclusive of any rights and remedies provided by law.

15.3 Grant of Waivers

A waiver given or consent granted by the Lenders or the Security Agent under this Deed will be effective only if given in writing and then only in the instance and for the purpose for which it is given.

16. ASSIGNMENT

16.1 Assignment

Subject to clause 16.2 (Exceptions) no party to this Deed may assign or novate all or any part of its rights, benefits or obligations under this Deed.

16.2 Exceptions

Each of the Lenders and Security Agent may assign or novate its rights and (in the case of the Lenders) its obligations under this Deed to its successors in accordance with the terms

of the Finance Documents in which event the Contractor, the Guarantor and the Purchaser shall enter into a direct agreement with the successor Lender or Security Agent on substantially the same terms as this Deed.

17. NOTICES

17.1 Mode of Service

- (a) Except as specifically provided otherwise in this Deed, any notice, demand, consent, agreement or other communication (a "Notice") to be served under or in connection with this Deed will be in writing and will be made by letter or by facsimile transmission to the party to be served.
- (b) The address and facsimile number of each party to this Deed for the purposes of clause 17.1(a) (above) are:
 - (i) the address and facsimile number shown immediately after its name on the signature pages of this Deed (in the case of any person who is a party as at the date of this Deed);
 - (ii) the address and facsimile number notified by that party for this purpose to the Lenders on or before the date it becomes a party to this Deed (in the case of any person who becomes a party after the date of this Deed); or
 - (iii) any other address and facsimile number notified by that party for this purpose to the other parties to this Deed by not less than five Business Days' notice.
- (c) Any Notice to be served by any party to this Deed on the Lenders or the Security Agent will be effective only if it is expressly marked for the attention of the department or officer (if any) specified in conjunction with the relevant address and facsimile number referred to in clause 17.1(b) (above).

17.2 Deemed Service

- (a) Subject to clause 17.2(b) (below), a Notice will be deemed to be given as follows:
 - (i) If by letter, when delivered personally on actual receipt, or five (5) Business Days from the date of posting if sent by first class post; and
 - (ii) If by facsimile, when delivered.
- (b) A Notice given in accordance with clause 17.2(a) (above) but received on a non-Business Day or after business hours in the place of receipt will only be deemed to be given on the next Business Day.

17.3 Notice to the Security Agent

Notwithstanding anything else contained in this Deed, it is agreed that any communication or document delivered or required to be given under this Deed to the Security Agent shall be deemed to have been received only if made or delivered in accordance with the foregoing provisions of this clause 17 (Notices) to the Security Agent and then only on actual receipt by it.

18. CONFIDENTIALITY

The parties to this Deed will keep this Deed and their subject matter (including all details relating to the structure and financing of the Project) confidential, except to the extent that they are required by law or regulation to disclose the same or, in the case of the

Purchaser, the Lenders and the Security Agent, to the extent permitted by the Senior Term Loan Facilities Agreement. Each of the Lenders and the Security Agent agrees with each other party to this Deed to hold confidential all information which it acquires under or in connection with this Deed, except to the extent it is required by law or regulation to disclose it or it comes into the public domain (otherwise than as a result of a breach of this clause 18). A party may, however, disclose any such information to its auditors, legal advisers or other professional advisers (the "**Professionals**") for any purpose connected with the Finance Documents, provided that the relevant party takes reasonable steps to procure that each Professional maintains the confidentiality of that information.

19. INVALIDITY OF ANY PROVISION

If any provision of this Deed is or becomes invalid, illegal or unenforceable in any respect under any law, the validity, legality and enforceability of the remaining provisions shall not be affected or impaired in any way.

20. COUNTERPARTS

This Deed may be executed in any number of counterparts and all of those counterparts taken together shall be deemed to constitute one and the same instrument.

21. CONTRACT (RIGHTS OF THIRD PARTIES) ACT 1999

Without prejudice to the rights of any Representative or Substitute Entity taking a novation in accordance with clause 9.1 (Novation), a person who is not a party to this Deed shall have no right under the Contracts (Rights of Third Parties) Act 1999 to enforce any term of this Deed. This clause 21 does not affect any right or remedy which exists or is available otherwise than pursuant to that Act.

22. PROCESS AGENT

Each of the Contractor and the Guarantor agree to appoint Hitachi Zosen Europe Limited of 5th floor, 107 Cannon Street, London, EC4N 5AF marked for the attention of the managing director as its authorised agent for the purpose of accepting service of process for all purposes in connection with this Deed.

23. GOVERNING LAW AND SUBMISSION TO JURISDICTION

23.1 Governing Law

This Deed (and any dispute, controversy, proceedings or claim of whatever nature arising out of or in any way relating to this Deed or its formation) shall be governed by and construed in accordance with the laws of England and Wales and the parties submit to the exclusive jurisdiction of the English courts.

23.2 Courts of England and Wales

Each of the parties hereto irrevocably agrees that the courts of England and Wales shall have exclusive jurisdiction to settle any disputes which may arise out of or in connection with this Deed and that any suit, legal action or proceedings (together in this clause 23 referred to as the "**Proceedings**") with respect to this Deed or any judgment in connection therewith, may be brought in such courts, and accordingly, each of them submits to the exclusive jurisdiction of such courts for the purposes of such Proceedings.

23.3 Irrevocable Agreements

Each of the parties hereto hereby irrevocably and unconditionally:

- (a) waives any objection it may now or hereafter have to the laying of venue of any such Proceedings, in any of the aforesaid courts and any claim it may now or hereafter have that any such Proceedings have been brought in an inconvenient forum; and
- (b) agrees that failure by any process agent to give notice of any process to it shall not impair the validity of such service or of any judgment based thereon.

IN WITNESS whereof this Deed has been duly executed on the date first above written.

SCHEDULE 1
FORM OF STEP-IN NOTICE

Date: [●]

To: [Contractor/Guarantor]

Attention: [●]

Copied to: [Contractor/Guarantor]

Attention: [●]

Copied to: The Law Debenture Trust Corporation p.l.c
Fifth Floor
100 Wood Street
London
EC2V 7EX

Attention: The Manager, Commercial Trusts (Ref: 200840)

Dear Sirs,

Herefordshire and Worcestershire Waste Project

1. We refer to the EPC Direct Agreement dated [●] (the "**Direct Agreement**") between, amongst others, us as Lenders and you as [Contractor/Guarantor].
2. This is a Step-In Notice under clause 7 of the Direct Agreement.
3. Terms defined in (or defined by reference in) the Direct Agreement shall have the same meaning in this notice.
4. We hereby appoint [*Insert name of Representative*] as Representative under the Direct Agreement to step into the Contract Documents in accordance with clause 7.5(a) of the Direct Agreement.
5. We also enclose details of the Representative's finances and resources as evidence of its financial standing in accordance with clause 7.1(b) of the Direct Agreement.
6. By its signature of this notice, we undertake that the Representative shall:
 - 6.1 pay to you any amount referred to in clause 6.1(a) (Statement of Amounts Due and Unperformed Obligations) on or before the date set out in clause 7.6(a) (Termination or Suspension During Step-In Period);
 - 6.2 pay to you any amount referred to in clause 6.1(b) (Statement of Amounts Due and Unperformed Obligations) on or before the date set out in clause 7.6(b) (Termination or Suspension During Step-In Period); and
 - 6.3 perform the obligations of the Representative set out in clause 7.5(a)(i).
7. The Step-In Date shall be [●].
8. Please acknowledge receipt of this notice by signing and returning the enclosed duplicate.

Yours faithfully

The COMMON SEAL OF
WORCESTERSHIRE COUNTY COUNCIL
was hereunto affixed BY ORDER

)
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)

An Officer authorised to attest the sealing of Documents

THE COMMON SEAL of
THE COUNTY OF HEREFORDSHIRE DISTRICT COUNCIL
was hereunto affixed in the presence of

)
)
)
)
)
)

Authorised Officer

For and on behalf of [●], as Representative

.....[Director][Authorised Signatory]

[On duplicate]

Date: [●]

We [●] hereby acknowledge receipt of the Step-In Notice dated [●] 20[●] of which this is a duplicate.

For and on behalf of [Contractor/Guarantor]

.....[Director][Authorised Signatory]

SCHEDULE 2
FORM OF STEP-OUT NOTICE

Date: [●]

To: [Contractor/Guarantor]

Attention: [●]

Copied to: [Contractor/Guarantor]

Attention: [●]

Copied to: The Law Debenture Trust Corporation p.l.c.
Fifth Floor
100 Wood Street
London
EC2V 7EX

Attention: The Manager, Commercial Trusts (Ref: 200840)

Dear Sirs,

Herefordshire and Worcestershire Waste Project

1. We refer to the EPC Direct Agreement dated [●] (the "**Direct Agreement**") between, amongst others, the Lenders and you as [Contractor/Guarantor].
2. We refer also to the Step-In Notice dated [●] 20[●] given to you by us on [●].
3. Terms defined in (or defined by reference in) the Direct Agreement shall have the same meaning in this notice.
4. We hereby notify you that with effect from [●] 20[●] (the "**Step-Out Date**") the Representative will step out of the Contract Documents in accordance with clause 8.2 of the Direct Agreement.
5. Please acknowledge receipt of this notice by signing and returning the enclosed duplicate.

Yours faithfully

[The COMMON SEAL OF
WORCESTERSHIRE COUNTY COUNCIL
was hereunto affixed BY ORDER

An Officer authorised to attest the sealing of Documents

THE COMMON SEAL of
THE COUNTY OF HEREFORDSHIRE DISTRICT COUNCIL
was hereunto affixed in the presence of

Authorised Officer

)
)
)¹

[For and on behalf of *[insert name of Representative]*]

.....[Director][Authorised Signatory]]²

[On duplicate]

We [●] hereby acknowledge receipt of the step-out notice dated [●] 20[●] of which this is a duplicate.

For and on behalf of *[Contractor/Guarantor]*

.....[Director][Authorised Signatory]

¹ Delete if to be served by the Representative.

² Delete if to be served by the Lenders.

SCHEDULE 3
FORM OF NOVATION NOTICE

Date: [●]

To: [Contractor/Guarantor]

Attention: [●]

Copied to: [Contractor/Guarantor]

Attention: [●]

Copied to: The Law Debenture Trust Corporation p.l.c.
Fifth Floor
100 Wood Street
London
EC2V 7EX

Attention: The Manager, Commercial Trusts (Ref: 200840)

Dear Sirs,

Herefordshire and Worcestershire Waste Project

1. We refer to the EPC Direct Agreement dated [●] (the "**Direct Agreement**") between, amongst others, the Lenders and you as [Contractor/Guarantor].
2. This is a Novation Notice under clause 9 of the Direct Agreement.
3. Terms defined in (or defined by reference in) the Direct Agreement shall have the same meaning in this notice.
4. We propose to novate the Purchaser's benefits, obligations and liabilities under the Contract Documents to [*insert name of Substitute Entity*] as Substitute Entity under the Direct Agreement.
5. The proposed date that the Novation shall be effected is [●].
6. We enclose further details of the ownership, finances and resources at the Substitute Entity, and the extent to which such finance is committed in accordance with clause 9.2 of the Direct Agreement.
7. Please acknowledge receipt of this notice by signing and returning the enclosed duplicate.

Yours faithfully

[The COMMON SEAL OF
WORCESTERSHIRE COUNTY COUNCIL
was hereunto affixed BY ORDER

An Officer authorised to attest the sealing of Documents

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THE COMMON SEAL of
THE COUNTY OF HEREFORDSHIRE DISTRICT COUNCIL
was hereunto affixed in the presence of

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)³

Authorised Officer

For and on behalf of [Representative] as Representative

.....[Director][Authorised Signatory]⁴

[On duplicate]

We hereby acknowledge receipt of the Novation Notice dated [●] 20[●] of which this is a duplicate.

For and on behalf of [Contractor/Guarantor]

.....[Director][Authorised Signatory]

³ Delete if to be served by the Representative.

⁴ Delete if to be served by the Lenders.

SCHEDULE 4 FORM OF NOVATION DEED

Novation Deed

☐

as Contractor

☐

as Guarantor

☐

as Purchaser

☐

and

☐

as Lenders

☐

as Representative]

☐

as Security Agent

and

☐

as Substitute Entity

relating to the EPC Sub-Contract Direct Agreement for the County of Herefordshire District Council
and Worcestershire County Council Energy from Waste Project

☐

THIS DEED is made on

[●]

BETWEEN:

- (1) [●] (a company incorporated under the laws of [●] whose registered office is at [●] (the "Contractor");
 - (2) [●] (a company incorporated in [●] whose registered office is at [●], (the "Guarantor");
 - (3) [●] (a company incorporated in [●] with registered number [●]) whose registered office is at [●] (the "Purchaser");
 - (4) [●] and [●] as lenders (the "Lenders");
 - (5) [●] as representative (the "Representative");
 - (6) [●] as security agent, (the "Security Agent"); and
 - (7) [●] as substitute entity (the "Substitute Entity"),
- (together, the "Parties").

RECITALS

- (A) The Parties, with the exception of the Substitute Entity and the Representative, entered into an EPC sub-contract direct agreement on [●] 20[●] (the "Direct Agreement").
- (B) This is a novation deed under clause 9.7 of the Direct Agreement.
- (C) Terms defined in (or defined by reference in) the Direct Agreement shall have the same meaning in this Deed.

THE PARTIES AGREE AS FOLLOWS:

1. Substitute Entity

We [Name of Substitute Entity] Limited are a Substitute Entity in accordance with clause 9 of the Direct Agreement.

2. Novation Effective Date

The Decision Period or (as the case may be) the Step-In Period shall expire as at the date of this Deed (the "Novation Effective Date").

3. No Termination

The Contractor agrees that it shall not be entitled to terminate the Contract by reason of any Termination Event or any other act or omission occurring prior to the Novation Effective Date unless such Termination Event, act or omission remains outstanding and has not been waived or remedied within ten (10) days of the Novation Effective Date.

4. Discharge of Obligations

From the Novation Effective Date, the Purchaser, the Representative (if any), the Contractor and the Guarantor shall be released from all obligations and liabilities to each other under or in connection with the Contract Documents (as applicable) (the "Discharged Obligations").

5. **Assumption of Obligations**

From the Novation Effective Date, the Substitute Entity, the Contractor and the Guarantor, shall assume obligations towards each other which differ from the Discharged Obligations only insofar as they are owed to or assumed by the Substitute Entity instead of the Purchaser and the Representative (if any), which obligations shall include for the avoidance of doubt any unperformed obligations of the Purchaser, the Representative (if any), the Contractor and the Guarantor.

6. **Discharge of Rights**

The rights of the Purchaser and the Representative (if any) against the Contractor and the Guarantor under the Contract Documents and vice versa (the "**Discharged Rights**") shall be cancelled from the Novation Effective Date.

7. **Assumption of Rights**

From the Novation Effective Date, the Substitute Entity, the Contractor and the Guarantor, shall acquire rights against each other which differ from the Discharged Rights only insofar as they are exercisable by or against the Substitute Entity instead of the Purchaser and the Representative (if any).

8. **Substitution**

8.1 The Substitute Entity shall become a party to the Contract Documents as purchaser, in place of the Purchaser, and shall assume all the obligations and liabilities, and become entitled to all the benefits, rights, powers and discretions of the Purchaser under the Contract Documents.

8.2 The Substitute Entity shall enter into a Direct Agreement with the Lenders and the Security Agent as purchaser, in place of the Purchaser and shall assume all the obligations and liabilities under the Direct Agreement.

9. **Extension of time for performance of Works**

If any time has elapsed up to and including the Novation Effective Date in relation to an obligation of the Purchaser, the Representative (if any), the Contractor or the Guarantor which remains unperformed and for which the relevant Contract Document specifies a time for performance, the Parties agree that the time specified for such performance shall (if necessary) be extended by such period as is reasonable, given the then prevailing circumstances, to allow the Parties to perform or remedy the unperformed obligation, provided that in the case of an unperformed obligation of the Purchaser or the Representative (if any) to make a payment, that period shall be extended by five (5) days.

10. **Notices**

The Substitute Entity's [and Representative's] address and facsimile number for the purposes of clause 17 (Notices) of the Direct Agreement, and for the giving of notice under the Contract are:

[Name of Substitute Entity] [●] Limited

[Address]

Attention: [●]

Fax number: [●] Jurisdiction



[Name of Representative] [●] Limited

[Address]

Attention: [●]

Fax number: [●] Jurisdiction

The notice details for the Lenders and the Security Agent are [as set out in the signature pages of the Direct Agreement]/[set out below:]

[Insert notice details for the Lenders/Security Agent if applicable]

11. Governing Law

This Deed (and any dispute, controversy, proceedings or claim of whatever nature arising out of or in any way relating to this Deed or its formation) shall be governed by and construed in accordance with the laws of England and Wales and the parties submit to the exclusive jurisdiction of the English courts.

12. Courts of England and Wales

Each of the parties hereto irrevocably agrees that the courts of England and Wales shall have exclusive jurisdiction to settle any disputes which may arise out of or in connection with this Deed and that any suit, legal action or proceedings (together in this clause 12 referred to as the "Proceedings") with respect to this Deed or any judgment in connection therewith, may be brought in such courts, and accordingly, each of them submits to the exclusive jurisdiction of such courts for the purposes of such Proceedings.

13. Irrevocable Agreements

Each of the parties hereto hereby irrevocably and unconditionally:

- (a) waives any objection it may now or hereafter have to the laying of venue of any such Proceedings, in any of the aforesaid courts and any claim it may now or hereafter have that any such Proceedings have been brought in an inconvenient forum; and
- (b) agrees that failure by any process agent to give notice of any process to it shall not impair the validity of such service or of any judgment based thereon.

14. Miscellaneous

- 14.1 The Security Agent is only a party to this Deed so that it may exercise the rights conferred to it under this Deed. The Security Agent shall not, for the avoidance of doubt, assume any obligations by virtue of it entering into this Deed.
- 14.2 This Deed is intended to and shall take effect as a deed.
- 14.3 This Deed may be executed in any number of counterparts and by one or more parties in separate counterparts, each of which shall together constitute one and the same instrument.

IN WITNESS whereof this Deed has been duly executed on the date first above written.



SIGNATURE PAGES TO THE NOVATION DEED

Executed and Delivered as a Deed on the date above stated by

[insert Contractor's name])

acting by:)

..... Director

..... Director/Secretary

Executed and Delivered as a Deed on the date above stated by

[insert Guarantor's name])

acting by:)

..... Director

..... Director/Secretary

Executed and Delivered as a Deed on the date above stated by

[insert Purchaser's name])

acting by:)

..... Director

..... Director/Secretary

Executed and Delivered as a Deed on the date above stated by

[Insert Security Agent's name] acting by

)

)

)

.....
[Director]

.....
[Director/Secretary]

THE COMMON SEAL OF

[●]

COUNCIL

was hereunto affixed in the
presence of Authorised Officer

)

)

)

)

)

THE COMMON SEAL OF

[●]

was hereunto affixed BY ORDER
in the presence of
Authorised Officer

)

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)

)

)

Executed and Delivered as a Deed on the date above stated by

[Insert Representative's name]

)

acting by:

)

..... Director

..... Director/Secretary

Executed and Delivered as a Deed on the date above stated by

[*Substitute Entity*])

acting by:)

..... Director

..... Director/Secretary

SCHEDULE 5

Competitors

1. LAB
2. Gotaverken Miljo
3. DrySotec
4. Alstom
5. Caldyn
6. Luhr Filter
7. FLSmidth Airtech
8. Area Impianti
9. CN1M
10. Martin
11. VINCI
12. Keppel Seghers Fisia Babcock Babcock Wilcox Volund Energos
13. Standardkessel Baumgarte
14. Xervon ThyssenKrupp/Remondis
15. KAB-Takuma
16. Visser Smilt Hanab
17. Doosan
18. Volker Fitzpatrick Rafako
19. Termomeccanica JFE



SIGNATURE PAGES TO THE DIRECT AGREEMENT

SIGNED AS A DEED by HITACHI ZOSEN INOVA AG)

a company incorporated in Switzerland)

and acting by)

and)

being persons who in accordance with the)

laws of that territory are acting under the)

authority of that company)

.....
.....

Notice Details

Address: Hardturmstrasse 127
Zurich
Switzerland
p.o. box 680 8037

Facsimile: 0041 44 277 1313
Attention: Mercia Project Director

EXECUTED AS A DEED by the)
HITACHI ZOSEN CORPORATION acting by)
its Representative Director)

Representative Director

Print name:

Notice Details

Address: Hitachi Zosen Europe Limited
5th floor 107 Cannon Street
London
EC4N 5AF

Attention: Managing Director

EXECUTED as a **DEED** for and)
on behalf of)
MERCIA WASTE)
MANAGEMENT LIMITED)

By:
For **FCC ENVIRONMENT SERVICES (U.K.) LTD,**
as Director

By:
For **URBASER LTD,**
as Director

Notice Details

Address: The Marina,
 Kings Road,
 Evesham,
 Worcestershire
 WR11 3XZ

Facsimile: 01386 446757
Attention: EnviRecover Project Director

The Security Agent

Executed as a Deed by Julian Mason-Jebb for and on behalf of **THE LAW DEBENTURE TRUST CORPORATION P.L.C.** under a power of attorney dated.....2014 in the presence of:

Witness's Signature

Name of witness

Address of witness

Occupation of witness

Notice Details

Address: The Law Debenture Trust Corporation p.l.c.
Fifth Floor
100 Wood Street
London
EC2V 7EX

Attention of: The Manager, Commercial Trusts (Ref: 200840)

Fax number: 020 7606 0643

Schedule 25: Advance Payment Bond

A

Mercia Waste Management Limited
The Marina Kings Road
Evesham
Worcestershire, WR11 3XZ
England

.....[Insert Date]

Advance Payment Bond No.

We are informed by Hitachi Zosen Inova AG, Hardturmstrasse 127, 8005 Zurich, Switzerland, ("the Contractor") that they will enter into a contract with you (the "Contract") for the County of Herefordshire District Council and Worcestershire County Council energy from waste project ("the Project") in the United Kingdom, and we are informed that you have agreed to make an advance payment to the Contractor of [REDACTED]

[REDACTED] ("the Advance Payment") subject to the receipt of an advance payment bond ("the Bond").

On behalf of the Contractor, we,, hereby irrevocably and unconditionally undertake to pay to you any sum or sums not exceeding in aggregate a maximum amount of [REDACTED]

(the "Bond Amount") within 7 Business Days following receipt by us of your demand or demands over original handwritten signatures on us (but not by fax) either by hand delivery, post or courier at our London offices (at[Address]) or by[named process agent (of[named process agent's address])] at our office written above and accompanied by your written statement stating:

- (a) that the Contractor has failed to repay the Advance Payment in accordance with the Conditions of Contract; and
- (b) the amount which the Contractor has failed to repay.

Your written demand or demands shall be conclusive evidence of our liability to pay you and of the amount of the sum or sums which we are liable to pay to you. Our obligation to make payment under this Bond shall be a primary, independent and absolute obligation and we shall not be entitled to delay or withhold payment for any reason.

Our obligations under this Bond shall not be affected by any act, omission, matter or thing which but for this provision might operate to release or otherwise exonerate us from our obligations hereunder in whole or in part.

Any claim(s) must bear the confirmation of your bankers that the signatures thereon are authentic.

This Bond shall become effective upon receipt of a notice from you accompanied by a copy of the debit advice from your bank confirming that the advance payment has been made to the Contractor. Such Bond Amount shall be reduced by the amounts of the advance payment repaid to you, upon receipt by us of a request from the Contractor, accompanied by a notice from you confirming that reduction. Following a request from the Contractor together

with receipt of your notice we shall promptly notify you of the revised Bond Amount accordingly.

This Bond shall be valid until [REDACTED] (the Expiration Date), but this will not affect or discharge our obligation to make payment of any demand or demands made in accordance with this Bond which are received before the Expiration Date.

Any demand or demands made pursuant to this Bond must be received by us at[address] on or before the Expiration Date marked for the attention of[department]. Each and every payment will be paid in British Pounds into the bank account identified in any demand you send to us.

This Bond will be reduced by each payment made by us as a result of a claim.

We have been informed that the Contractor may be required to extend this Bond if the advance payment has not been repaid by the date 15 days prior to such Expiration Date. We undertake to pay you such Bond Amount less any amount previously paid to you upon receipt by us, within such period of 15 days, of your demand in writing and your written statement that the Advance Payment has not been repaid and that this Bond has not been extended.

All demands pursuant to this Bond may be sent by registered mail or delivered by courier or made in person.

This Bond shall be returned to us immediately after the above Expiration Date, or any extension thereof. However, this Bond shall become null and void on the Expiration Date, whether returned to us or not.

If at any time one or more of the provisions of this Bond is or becomes illegal, invalid or otherwise unenforceable in any respect, such provision or provisions will be ineffective to the extent only of such illegality or unenforceability and such illegality, validity or unenforceability will not invalidate any other provision of this Bond.

The benefits of this Bond are not assignable without our prior consent (such consent not to be unreasonably withheld or delayed) except that you shall be entitled to assign your rights in this Bond without requiring our consent to Law Debenture Trust Corporation P.L.C as Security Agent, to any other third party to whom the benefit of your interest under and in accordance with the terms of the Contract may be assigned (except any third party with whom we are not permitted (by any regulatory authority with whose requirements we are bound to comply) to maintain any business relationship) or to any financial institution acting as agent for the lenders for the Project from time to time. We will acknowledge any such assignment of the Bond upon receipt of your written notice of assignment.

All payments under this Bond shall be made free and clear of any withholding or deduction on account of tax or otherwise.

This Bond shall be governed by and construed according to the laws of England and will be subject to the exclusive jurisdiction of the English Courts.

Mercia Waste Management Limited
The Marina Kings Road
Evesham
Worcestershire, WR11 3XZ
England

.....[Insert Date]

Advance Payment Bond No.

We are informed by Hitachi Zosen Inova AG, Hardturmstrasse 127, 8005 Zurich, Switzerland, ("the Contractor") that they will enter into a contract with you (the "Contract") for the County of Herefordshire District Council and Worcestershire County Council energy from waste project ("the Project") in the United Kingdom, and we are informed that you have agreed to make an advance payment to the Contractor of [REDACTED]

[REDACTED] ("the Advance Payment") subject to the receipt of an advance payment bond ("the Bond").

On behalf of the Contractor, we,, hereby irrevocably and unconditionally undertake to pay to you any sum or sums not exceeding in aggregate a maximum amount of [REDACTED]

[REDACTED] (the "Bond Amount") within 7 Business Days following receipt by us of your demand or demands over original handwritten signatures on us (but not by fax) either by hand delivery, post or courier at our London offices (at[Address]) or by[named process agent (of[named process agent's address])] at our office written above and accompanied by your written statement stating:

- (a) that the Contractor has failed to repay the Advance Payment in accordance with the Conditions of Contract; and
- (b) the amount which the Contractor has failed to repay.

Your written demand or demands shall be conclusive evidence of our liability to pay you and of the amount of the sum or sums which we are liable to pay to you. Our obligation to make payment under this Bond shall be a primary, independent and absolute obligation and we shall not be entitled to delay or withhold payment for any reason.

Our obligations under this Bond shall not be affected by any act, omission, matter or thing which but for this provision might operate to release or otherwise exonerate us from our obligations hereunder in whole or in part.

Any claim(s) must bear the confirmation of your bankers that the signatures thereon are authentic.

This Bond shall become effective upon receipt of a notice from you accompanied by a copy of the debit advice from your bank confirming that the advance payment has been made to the Contractor. Such Bond Amount shall be reduced by the amounts of the advance

payment repaid to you, upon receipt by us of a request from the Contractor, accompanied by a notice from you confirming that reduction. Following a request from the Contractor together with receipt of your notice we shall promptly notify you of the revised Bond Amount accordingly.

This Bond shall be valid until [REDACTED] (the Expiration Date), but this will not affect or discharge our obligation to make payment of any demand or demands made in accordance with this Bond which are received before the Expiration Date.

Any demand or demands made pursuant to this Bond must be received by us at[address] on or before the Expiration Date marked for the attention of[department]. Each and every payment will be paid in British Pounds into the bank account identified in any demand you send to us.

This Bond will be reduced by each payment made by us as a result of a claim.

We have been informed that the Contractor may be required to extend this Bond if the advance payment has not been repaid by the date 15 days prior to such Expiration Date. We undertake to pay you such Bond Amount less any amount previously paid to you upon receipt by us, within such period of 15 days, of your demand in writing and your written statement that the Advance Payment has not been repaid and that this Bond has not been extended.

All demands pursuant to this Bond may be sent by registered mail or delivered by courier or made in person.

This Bond shall be returned to us immediately after the above Expiration Date, or any extension thereof. However, this Bond shall become null and void on the Expiration Date, whether returned to us or not.

If at any time one or more of the provisions of this Bond is or becomes illegal, invalid or otherwise unenforceable in any respect, such provision or provisions will be ineffective to the extent only of such illegality or unenforceability and such illegality, validity or unenforceability will not invalidate any other provision of this Bond.

The benefits of this Bond are not assignable without our prior consent (such consent not to be unreasonably withheld or delayed) except that you shall be entitled to assign your rights in this Bond without requiring our consent to Law Debenture Trust Corporation P.L.C as Security Agent, to any other third party to whom the benefit of your interest under and in accordance with the terms of the Contract may be assigned (except any third party with whom we are not permitted (by any regulatory authority with whose requirements we are bound to comply) to maintain any business relationship) or to any financial institution acting as agent for the lenders for the Project from time to time. We will acknowledge any such assignment of the Bond upon receipt of your written notice of assignment.

All payments under this Bond shall be made free and clear of any withholding or deduction on account of tax or otherwise.

This Bond shall be governed by and construed according to the laws of England and will be subject to the exclusive jurisdiction of the English Courts.

Schedule 26: Performance Bond

2

Mercia Waste Management Limited
The Marina Kings Road
Evesham
Worcestershire, WR11 3XZ
England

..... [Insert Date]

Performance Bond No.

We are informed by Hitachi Zosen Inova AG, Hardturmstrasse 127, 8005 Zurich, Switzerland, ("the Contractor") that they will enter into a contract with you (the "Contract") for the County of Herefordshire District Council and Worcestershire County Council energy from waste project ("the Project") in the United Kingdom, and we are informed that it is a term of the contract, that the Contractor procures a performance bond of [REDACTED]
[REDACTED] (the "Performance Bond" or "Bond").

On behalf of the Contractor, we,, hereby irrevocably and unconditionally undertake to pay to you a sum or sums not exceeding in aggregate a maximum amount of [REDACTED]
[REDACTED] (the "Amount of the Bond") within 7 Business Days following receipt by us of your first written demand or demands over original handwritten signatures on us (but not by fax) either by hand delivery, post or courier at our London offices (at[Address]), or by[named process agent (of[named process agent's address])] at our office written above and accompanied by your written statement stating:

- (i) that the Contractor has failed to fulfil his obligations under the Contract;
- (ii) the respect in which the Contractor is in breach; and
- (iii) the amount of the payment which is to be made

without us being obliged to make any enquiry either of you or the Contractor, and without the need for you to take legal action against or to obtain the consent of the Contractor, and notwithstanding any objection by the Contractor or any third party and without any further proof or conditions and without any withholding or deduction of any kind whether by way of right of set-off, counterclaim or otherwise.

Your written demand or demands shall be conclusive evidence of our liability to pay you and of the amount of the sum or sums which we are liable to pay to you. Our obligation to make payment under this Performance Bond shall be a primary, independent, irrevocable and absolute obligation and we shall not be entitled to delay or withhold payment for any reason.

Our obligations under this Bond shall not be affected by any act, omission, matter or thing which but for this provision might operate to release or otherwise exonerate us from our obligations hereunder in whole or in part.

Any claim(s) must bear the confirmation of your bankers that the signatures thereon are authentic.

This Bond shall automatically come into force at receipt of Notice to Proceed (as defined in the Contract) by the Contractor.

In case Notice to Proceed (as defined in the EPC Contract) has not been received by the Contractor on or before [REDACTED] at the latest, this Bond shall automatically expire at this date irrespective of the Expiration Date.

This Bond shall be valid until [REDACTED] (provided that on or before that date the retention bond required to be provided by the Contractor under the Contract in favour of you is also issued under the Contract) (the "Expiration Date"), but this will not affect or discharge our obligation to make payment of any demand or demands made in accordance with this Bond which are received before the Expiration Date.

Any demand or demands made pursuant to this Bond must be received by us at[address] on or before the Expiration Date marked for the attention of[department]. Each and every payment will be paid in British Pounds into the bank account identified in any demand you send to us.

This Bond will be reduced by each payment made by us as a result of a claim.

We have been informed that the Contractor may be required to extend this Bond if Take Over (as defined in the Contract) has not been achieved by the date 15 days prior to such Expiration Date. We undertake to pay you the Amount of the Bond, less any amounts previously paid to you in accordance with this Bond, but otherwise without any withholding or deduction of any kind whether by way of right of set-off, counterclaim or otherwise upon receipt by us, within such period of 15 days of your demand in writing and your written statement that Take Over (as defined in the Contract) has not been achieved and that this Bond has not been extended as required, without us being entitled or obliged to make any enquiry either of you or the Contractor and without the need for you to take legal action against or to obtain the consent of the Contractor, and notwithstanding any objection by the Contractor or any third party and without any further proof or conditions.

All demands pursuant to this Bond may be sent by registered mail or delivered by courier or made in person and must be actually received by us on or before the Expiration Date.

This Bond shall be returned to us immediately after the above Expiration Date, or any extension thereof. However, this Bond shall become null and void on the Expiration Date, whether returned to us or not.

If at any time one or more of the provisions of this Bond is or becomes illegal, invalid or otherwise unenforceable in any respect, such provision or provisions will be ineffective to the extent only of such illegality or unenforceability and such illegality, validity or unenforceability will not invalidate any other provision of this Bond.

The benefits of this Bond are not assignable without our prior consent (such consent not to be unreasonably withheld or delayed) except that you shall be entitled to assign your rights in this Bond without requiring our consent to Law Debenture Trust Corporation P.L.C as Security Agent, to any other third party to whom the benefit of your interest under and in accordance with the terms of the Contract may be assigned (except any third party with whom we are not permitted (by any regulatory authority with whose requirements we are bound to comply) to maintain any business relationship) or to any financial institution acting

as agent for the lenders for the Project from time to time. We will acknowledge any such assignment of the Bond upon receipt of your written notice of assignment.

All payments under this Bond shall be made free and clear of any withholding or deduction on account of tax or otherwise.

This Bond shall be governed by and construed according to the laws of England and it will be subject to the exclusive jurisdiction of the English Courts.

A handwritten signature or mark, possibly a stylized 'A' or 'R', located in the bottom right corner of the page.

Schedule 27: Retention Bond

A

Draft

Form of Retention Bond

Beneficiary

address

[Insert Date]

Retention Bond No.

We are informed by Hitachi Zosen Inova AG, Hardturmstrasse 127, 8005 Zurich, Switzerland, ("the Contractor") that they have entered into a contract with you, dated [], (the "Contract") for the ("the Project") in the United Kingdom, and we are informed that it is a term of the contract, that the Contractor procures a retention bond of British Pounds [Amount] (say GBP [amount in words]) (the "Bond").

On behalf of the Contractor, we, [Bank or Insurance], hereby irrevocably and unconditionally undertake to pay to you a sum or sums not exceeding in aggregate a maximum amount of British Pounds [Amount] (say GBP [amount in words]) (the "Amount of the Bond") within 7 Business Days following receipt by us of your first written demand or demands over original handwritten signatures on us (but not by fax) either by hand delivery, post or courier at our London offices (at [Address]), or by [named process agent (of [named process agent's address])] at our office written above and accompanied by your written statement stating:

- (i) that the Contractor has failed to fulfil his contractual warranty obligations under the Contract;
- (ii) the respect in which the Contractor is in breach; and
- (iii) the amount of the payment which is to be made,

without us being obliged to make any enquiry either of you or the Contractor, and without the need for you to take legal action against or to obtain the consent of the Contractor, and notwithstanding any objection by the Contractor or any third party and without any further proof or conditions and without any withholding or deduction of any kind whether by way of right of set-off, counterclaim or otherwise.

Your written demand or demands shall be conclusive evidence of our liability to pay you and of the amount of the sum or sums which we are liable to pay to you. Our obligation to make payment under this Bond shall be a primary, independent, irrevocable and absolute obligation and we shall not be entitled to delay or withhold payment for any reason.

Our obligations under this Bond shall not be affected by any act, omission, matter or thing which but for this provision might operate to release or otherwise exonerate us from our obligations hereunder in whole or in part.

Any claim(s) must bear the confirmation of your bankers that the signatures thereon are authentic.

This Bond shall be valid until [] (the "Expiration Date"), but this will not affect or discharge our obligation to make payment of any demand or demands made in accordance with this Bond which are received before the Expiration Date.

Any demand or demands made pursuant to this Bond must be received by us at [address] on or before the Expiration Date marked for the attention of [department]. Each and every payment will be paid in British Pounds into the bank account identified in any demand you send to us.

This Bond will be reduced by each payment made by us as a result of a claim.

All demands pursuant to this Bond may be sent by registered mail or delivered by courier or made in person and must be actually received by us on or before the Expiration Date.

This Bond shall be returned to us immediately after the above Expiration Date, or any extension thereof. However, this Bond shall become null and void on the Expiration Date, whether returned to us or not.

If at any time one or more of the provisions of this Bond is or becomes illegal, invalid or otherwise unenforceable in any respect, such provision or provisions will be ineffective to the extent only of such illegality or unenforceability and such illegality, validity or unenforceability will not invalidate any other provision of this Bond.

The benefits of this Bond are not assignable without our prior consent (such consent not to be unreasonably withheld or delayed) except that you shall be entitled to assign your rights in this Bond without requiring our consent to [name], to any other third party to whom the benefit of your interest under and in accordance with the terms of the Contract may be assigned (except any third party with whom we are not permitted (by any regulatory authority with whose requirements we are bound to comply) to maintain any business relationship) or any financial institution acting as agent for the lenders for the Project from time to time. We will acknowledge any such assignment of the Bond upon receipt of your written notice of assignment.

All payments under this Bond shall be made free and clear of any withholding or deduction on account of tax or otherwise.

This Bond shall be governed by and construed according to the laws of England and it will be subject to the exclusive jurisdiction of the English Courts.

Schedule 28: Commercially Sensitive Information

A handwritten signature or mark, possibly initials, located in the bottom right corner of the page.

COMMERCIALLY SENSITIVE INFORMATION

The Parties acknowledge that information that comes into existence during the term of this Contract may be commercially sensitive. As such, the Parties may agree to update this Schedule 28 (*Commercially Sensitive Information*) from time to time to ensure that it remains up-to-date and effective.

Commercially Sensitive Information	For the period ending on the date below
Waste Management Service Contract fee, payment/price provisions and caps on liability in Sub-Contracts	Expiry Date
<p>The following Waste Management Service Contract provisions:</p> <ul style="list-style-type: none"> • Definition of "Contractor's Maximum Liability" • Definition of "Variation Revenue Cost" • Definition of "Variation Revenue Saving" • Clause 5.3 – Indemnity Beyond Appeal Contingency • Clause 5.5 – Reimbursement of Appeal Contingency • Clause 5.6.6 – Obligations of the Contractor • Clause 5.8.3 – Councils to enter Statutory Agreement • Clause 5.8.4 – Councils to enter Statutory Agreement • Clause 5.9.2 – Satisfactory Planning Permission and other Necessary Consents • Clause 5.9.3 – Satisfactory Planning Permission and other Necessary Consents • Clause 24 – Liability of Contractor • Clause 25.2 – Managed Property Licence Indemnity • Clause 48 – Termination without Default • Clause 49 – Remedies and Payments on Termination • Clause 55 – Limitation of Liability • Schedule 4 – Payment Mechanism • Schedule 9 – Insurances (solely to the extent that figures and value therein and other commercial terms relating to insurances are not in the public domain) 	Expiry Date



Commercially Sensitive Information		For the period ending on the date below
<ul style="list-style-type: none"> Schedule 13 – Compensation on Termination 		
Variation Agreement to the Waste Management Service Contract fee, payment/price provisions and caps on liability		Expiry Date
<p>The following Variation Agreement to the Waste Management Service Contract provisions:</p> <ul style="list-style-type: none"> Schedule 1 (<i>Schedule of Amendments to the Waste Management Service Contract</i>), Definition of "Construction Long-Stop Date" Schedule 1 (<i>Schedule of Amendments to the Waste Management Service Contract</i>), Clause 24A (<i>Performance Liquidated Damages</i>) Schedule 1 (<i>Schedule of Amendments to the Waste Management Service Contract</i>), Clause 49.3 (<i>Compensation on Termination</i>) Schedule 1 (<i>Schedule of Amendments to the Waste Management Service Contract</i>), Clause 49A (<i>Payment at Expiry</i>) Schedule 1 (<i>Schedule of Amendments to the Waste Management Service Contract</i>) Schedule 9 (<i>Insurances</i>) Annex 5 – Financing Agreements Annex 9 – Payment Mechanism Annex 11 – Compensation on Termination Annex 13 – Guarantee Annex 16 – Financial Model Annex 17 – Service Delivery Plan (solely to the extent that drawings, designs or commercially sensitive technical information are not already in the public domain (whether pursuant to planning applications or otherwise)) Annex 23 – Environmental Deed Annex 32 – Base Year Reviewable Items 		Expiry Date
The WMSC Guarantee		Expiry Date
The Collateral Agreement		Expiry Date
[The Funding Side Agreement]		Expiry Date
EPC Contract Agreement fee, payment/price provisions and caps on liability		Expiry Date

Commercially Sensitive Information		For the period ending on the date below
<p>The following EPC Contract provisions:</p> <p>Agreement</p> <p>General Conditions of Contract</p> <ul style="list-style-type: none"> • Clause 1 Definitions of Major Sub-Contractors, Proprietary Process Information and Substantial Completion • Clause 3 Contractor's Responsibilities • Clause 4.7 Title • Clause 6 Sufficiency of Contract Price • Clause 7.3 Statutory and other obligations • Clause 9 Assignment and subcontracting • Clause 14 Delays • Clause 15 Damages for delay • Clause 16 Variations • Clause 17 Contractor's Variations • Clause 18 Contractor's claims • Clause 20 Confidentiality • Clause 21 Documentation • Clause 22.6 Pre-installation testing • Clause 23.1 The site • Clause 25 Ownership of materials • Clause 26.5 Site conditions • Clause 28 Site Working Conditions • Clause 30 Care of the Works • Clause 33 Taking over • Clause 35 Performance tests and availability tests • Clause 36 Acceptance 		Expiry Date

Commercially Sensitive Information		For the period ending on the date below
<ul style="list-style-type: none"> • Clause 37 Liability for defects • Clause 38 Final certificate • Clause 39 Payment • Clause 40 Provisional and prime cost sums • Clause 41 Suspension of the Works • Clause 42 Termination by the Purchaser for convenience • Clause 43 Termination for Contractor's default • Clause 43A Termination for Purchaser's default • Clause 44 Limitation of liability <p>Schedules 1-30</p>		
Construction Management Agreement fee, payment/price provisions and caps on liability in Sub-Contracts		Expiry Date
<p>The following Construction Management Agreement provisions:</p> <ul style="list-style-type: none"> • Definition of "Default Rate" • Clause 9 – Time for Performance • Clause 10 – Deed of Guarantee • Clause 12 – Reimbursable Cost Items • Clauses 13.2 - Remuneration • Clauses 13.5 - Remuneration • Clause 14 - Construction Manager's Indemnities • Clause 15 - Construction Manager's and Contractor's Insurances • Clause 16 - Fines and Penalties • Clause 17 – Liability • Clause 21 – Extension of Time • Clause 23 – Termination 		Expiry Date

Commercially Sensitive Information		For the period ending on the date below
Schedule 3 – Reimbursable Costs and Expenses		
O&M Agreement fee, payment/price provisions and caps on liability		Expiry Date
<p>The following Operation and Maintenance Agreement provisions:</p> <ul style="list-style-type: none"> • Definition of "Default Rate" • Definition of "Variable Fee" • Clauses 7.3 - 7.5 – Hand Back of the Waste to Energy Plant • Clauses 9.3 – 9.6 – Defects • Clause 10 – Payments in Respect of Defects • Clause 11.2 – Interface • Clause 17 – Fines and Penalties • Clause 24 – Limitation and Expenditure • Clause 26 – Payments • Clause 27 – Performance Incentives • Clause 32 – Indemnification • Clause 33 – Insurance • Clause 35 – Liability • Clause 41.5 – Obligations upon Termination • Schedule 2 – Payments and Invoices • Schedule 3 – Parallel Loan Agreement 		Expiry Date
Operation and Maintenance Technical Support Agreement fee, payment/price provisions and caps on liability		Expiry Date
<p>The following Operation and Maintenance Technical Support Agreement provisions:</p> <ul style="list-style-type: none"> • Clause 9 – Payments and Invoicing • Clause 12 – Limitation of Liability • Schedule 2 – Payments Procedure 		

Commercially Sensitive Information		For the period ending on the date below
Construction Management Technical Support Agreement fee, payment/price provisions and caps on liability		Expiry Date
<p>The following Construction Management Technical Support Agreement provisions:</p> <ul style="list-style-type: none"> • Clause 9 – Payments and Invoicing • Clause 12 – Limitation of Liability • Schedule 2 – Payments Procedure 		Expiry Date
The CMA Deed of Guarantee		Expiry Date
<p>Bid documentation pertaining to commercial and technical aspects of the submission including but not limited to the following:</p> <ul style="list-style-type: none"> • PFD (Process flow diagrams) • Functional Design Specifications • DCS architecture • Control system FAT & SAT acceptance • CCTV system outline design and specifications • Landscaping drawings • Traffic concept (Roads and Places) • Layout and interface termination points • Detailed Layout (not layout contained in the Permit) • Chute to stack design data • Performance test data and report • Detailed construction drawings • Combustion control logic. 		Expiry Date
Drafts and final versions of Professional Adviser Reports (including (without limitation) the Funders' legal due diligence report)		Expiry Date
Terms of the Financing Agreements and any associated term sheets and any correspondence and negotiation with the Funders		Expiry Date

Commercially Sensitive Information	For the period ending on the date below
Information in any Sub-Contracts to the extent that the same relates to any commercially sensitive technical and/or financial information (howsoever recorded)	Expiry Date



Schedule 29: Major Subcontractor warranties



Private & Confidential

DATED _____

[SUB-CONTRACTOR]

(1)

and

[BENEFICIARY]

(2)

and

[CONTRACTOR]

(3)

WARRANTY

Sub-Contractor to Beneficiary
Collateral to a Sub-Contract relating to a
[Development] at []

2

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THIS DEED OF WARRANTY is made on

BETWEEN:

- (1) [SUB-CONTRACTOR] [(Company no [])] [whose registered office is situate at []] [of []] ("the Sub-Contractor" which expression shall include its successors in title and permitted assigns and those deriving title under it or them)
- (2) [AUTHORITY] of [] (which expression shall include its successors in title and permitted assigns and those deriving title under it or them) and [AUTHORITY] of [] (which expression shall include its successors in title and permitted assigns and those deriving title under it or them), (together "the Beneficiary")
- (3) [CONTRACTOR] (Company no []) whose registered office is situate at [] ("the Contractor" which expression shall include its successors in title and permitted assigns and those deriving title under it or them)

WHEREAS:

- (A) By a contract dated 22 December 1998 as varied by the variation deed dated [DATE] (the "Project Contract") the Authority has appointed Mercia Waste Management Limited (Beneficiary no 03525188) ("the Employer") to carry out, in relation to the sites, the provision of residual waste treatment to the Beneficiary at each and every site/facility as contemplated by the Project Contract including the carrying out of the design, construction, commissioning and testing of the works and the provision of the services (as defined in the Project Contract).
- (B) The Employer has appointed the Contractor by a contract made between the Employer of the one part and the Contractor of the other part dated [] ("the Building Contract") to carry out the design construction and completion of works (more particularly described in the Building Contract) ("the Works") [which comprise [part of] [the whole of] the construction of [] at [] ("the [Development]")]
- (C) The Contractor has appointed the Sub-Contractor by a sub-contract made between the Contractor of the one part and the Sub-Contractor of the other part dated [] ("the Sub-Contract") to provide [] in connection with the design construction and completion of works (more particularly described in the Sub-Contract) ("the Sub-Contract Works") [which comprise [part of] [the whole of] the construction of the [Development]].
- (D) The Sub-Contractor is obliged under the Sub-Contract to give a warranty in this form in favour of the Beneficiary.

NOW THIS DEED WITNESSES in consideration of the sum of [REDACTED] paid by the Beneficiary (receipt of which the Sub-Contractor acknowledges) as follows:

1 Duty of Care Warranty

- 1.1 The Sub-Contractor warrants to and undertakes to the Beneficiary that it has carried out and completed or has carried out and will continue to carry out and complete the Sub-Contract Works fully in accordance with and subject to the terms of the Sub-Contract and has observed and performed and will continue to observe and perform all of its obligations expressed in or arising out of the Sub-Contract.

- 1.2 Without derogation from clause 1.1 and to the extent that under the Sub-Contract the Sub-Contractor takes responsibility for the design of the Sub-Contract Works and the selection of goods materials plant and equipment for incorporation therein the Sub-Contractor warrants to the Beneficiary that the same have been or will be designed and selected using all the reasonable skill care and diligence to be expected of the Sub-Contractor's specialist trade.
- 1.3 The Sub-Contractor further warrants that it owes a duty of care to the Beneficiary and the Sub-Contractor acknowledges that the Beneficiary will be relying upon the Sub-Contractor complying with its obligations under the Sub-Contract.

PROVIDED THAT the duties and liabilities of the Sub-Contractor to the Beneficiary under this clause 1 shall be no greater or of longer duration than the duties and liabilities the Sub-Contractor would have had to the Beneficiary under the Sub-Contract had the Beneficiary been named as the employer of the Sub-Contractor in the Sub-Contract provided that the Sub-Contractor shall not be entitled to set-off or deduct from any sums payable to the Beneficiary under this Deed any sums due or claimed as due by the Sub-Contractor from the Contractor.

2 Materials

- (a) The Sub-Contractor has not specified or used nor will it specify for use or use any products or materials in the Sub-Contract Works which at the time of use are not permitted under the Sub-Contract.

3 Delegation

- 3.1 It is hereby agreed and declared that the duties obligations responsibilities and liabilities of the Sub-Contractor under this Deed shall not be modified released or in any way affected by the fact that the Sub-Contractor may delegate or may have delegated all or any part of the design of the Sub-Contract Works to a consultant or sub-sub-contractor.

4 Copyright

- 4.1 All design rights and copyright in all technical information drawings models bills of quantities specifications schedules details plans calculations or other materials provided or to be provided by the Sub-Contractor in respect of the Sub-Contract Works/[Development] and all amendments and additions thereto (whether in existence or yet to be made) and any works designs or inventions of the Sub-Contractor incorporated or referred to therein ("the Documents") shall remain vested in the Sub-Contractor but the Sub-Contractor hereby grants to the Beneficiary an irrevocable non-exclusive and royalty-free licence to use, reproduce and modify the Documents for the design construction operation maintenance and repair, thereof. Such licence shall include a licence to use the Documents for the extension of the Development but such use shall not include a licence to reproduce the designs contained in the Documents for any extension of the Development. The licence shall include the right without the consent of the Sub-Contractor to assign the licence or grant a sub-licence to any person whatsoever provided that the Sub-Contractor shall not be liable for any such use by the Beneficiary or any licensee for any purpose other than that for which the same were provided by the Sub-Contractor, and provided also that the Sub-Contractor shall not be liable for any modifications or adaptations to the Documents including any infringement of any other parties' intellectual property rights which may result from the subject matter as modified or adapted.

- 4.2 The Sub-Contractor shall upon the written request of the Beneficiary (but subject to reimbursement of the Sub-Contractor's reasonable photocopying charges) provide to the Beneficiary copies of the Documents and such other information in relation to the Sub-Contract Works as the Sub-Contractor can reasonably supply.
- 4.3 The Sub-Contractor shall procure on behalf of the Beneficiary and/or grant to the Beneficiary any and all licences and rights as may be necessary to use any and all forms of software (excluding software and/or source codes that are regarded as Proprietary Process Information under the Building Contract) in relation to the Sub-Contract Works which the Beneficiary may require.

5 Beneficiary's Rights and Liabilities

- 5.1 Save as hereinafter mentioned the Beneficiary has no authority to issue any direction or instruction to the Sub-Contractor in relation to the performance of the Sub-Contractor's duties and responsibilities under the Sub-Contract.
- 5.2 The Sub-Contractor acknowledges that the Beneficiary has no liability to the Sub-Contractor in respect of fees and expenses under the Sub-Contract unless and until the Beneficiary exercises its rights under clause 6.2 to be substituted for the Contractor.

6 Step-In Rights

- 6.1 The Sub-Contractor will not in any circumstances exercise any right it may have to terminate its employment under the Sub-Contract or to treat its employment under the Sub-Contract as having been terminated by the Contractor or to discontinue the performance of its duties and responsibilities thereunder until it shall first have given to the Beneficiary not less than twenty one days (or in the case of suspension for non-payment seven days) written notice of such matters, including details of any sums outstanding and due to the Sub-Contractor under the Sub-Contract ("the Sub-Contractor's Notice") PROVIDED THAT compliance by the Sub-Contractor with the provisions of this clause 6 shall not be treated as a breach of the Sub-Contract by the Sub-Contractor nor as a waiver of any breach on the part of the Contractor giving rise to the right of determination nor otherwise prevent the Sub-Contractor from exercising his rights after the expiration of the notice unless the right of determination shall have ceased under the provisions of clause 6.3.
- 6.2 In the event of termination of the Project Contract by the Beneficiary otherwise than by mutual agreement with the Employer or the service of a Sub-Contractor's Notice (PROVIDED THAT in both cases the Contractor is in default under the Building Contract and the Employer terminates the Building Contract for the Contractor's default) the Sub-Contractor will if so required by notice in writing given to it by the Beneficiary within twenty one days (or in the case of suspension for non-payment seven days) of the date of termination of the Building Contract or the Sub-Contractor's Notice accept the instructions of the Beneficiary or its appointee to the exclusion of the Contractor to continue to perform its duties and responsibilities under the Sub-Contract.
- 6.3 Provided always that any notice given by the Beneficiary under clause 6.2 shall state that in the event of the Beneficiary's right to be substituted for the Contractor being exercised the Beneficiary or its appointee accepts liability for payment of the monies payable to the Sub-Contractor under the Sub-Contract including payment of any monies properly due to the Sub-Contractor under the

terms of the Sub-Contract and outstanding at the date of such notice. Upon receipt of such notice by the Sub-Contractor the Sub-Contract shall continue in full force and effect as if any right of determination on the part of the Sub-Contractor had not arisen and in all respects as if the Sub-Contract had been made between the Sub-Contractor and the Beneficiary (to the exclusion of the Contractor) ab initio.

- 6.4 Upon payment by the Beneficiary of an amount equal to the fees and disbursements owed by the Contractor to the Sub-Contractor at the date of the Beneficiary's notice under clause 6.2 the Sub-Contractor shall assign to the Beneficiary all the Sub-Contractor's rights against the Contractor in respect of such unpaid fees and disbursements and shall pay to the Beneficiary any of the same subsequently received by him from the Contractor.
- 6.5 The Sub-Contractor and the Contractor hereby agree with the foregoing provisions of this clause 6 and to be bound by them.
- 6.6 If two or more valid notices are received on the same day any notice served by the Employer shall be deemed to have first priority. Only the notice deemed to have first priority shall take effect and no other relevant notice will bind the Sub-Contractor.

7 Insurance

- 7.1 The Sub-Contractor currently has, or shall take out from the date hereof, and will maintain for a period expiring no earlier than [twelve years][three years]¹ from the Take-Over Date (as defined in the Building Contract) with reputable insurers carrying on business in the United Kingdom [professional indemnity][product liability]² insurance of not less than [] million pounds (£[,000,000) for each and every claim arising out of any one event [(but in the aggregate for each one year of insurance for pollution or contamination or date recognition claims)] PROVIDED ALWAYS that such insurance is generally available in the market to the Sub-Contractor's profession at commercially reasonable rates.
- 7.2 The Sub-Contractor shall when required so to do supply to the Beneficiary satisfactory documentary evidence of such insurance and shall immediately inform the Beneficiary if the Sub-Contractor fails to renew such insurance or fails to renew such insurance at the level required by clause 7.1.

8 Assignment

- 8.1 The Beneficiary shall be fully entitled without the consent of the Sub-Contractor to assign all or any of its rights and benefits arising under this Deed at any time to any third party acquiring its interest in the Works and in each case any such assignment shall be subject to the same restriction on use and have the same non-disclosure provisions as set out the Building Contract (but this Deed shall not be assigned on more than two occasions).
- 8.2 The Beneficiary shall notify the Sub-Contractor upon each occasion that it shall assign this Deed.

¹ Period to depend on whether the work of the subcontractor comes within limb (1) or (2) of the definition of Latent Defects Period in the Building Contract.

² Type and level of insurance to be as required in Schedule 7 of the Building Contract.

- 8.3 The Sub-Contractor shall not be entitled to assign transfer charge or otherwise dispose of all or any of its rights or liabilities arising under this Deed to any other party.

9 Independent Inspection

- 9.1 The liability of the Sub-Contractor under this Deed shall not be modified released or diminished or in any way affected by any independent inspection investigation or enquiry into any relevant matter which may be made or carried out by or for the Beneficiary nor by any failure or omission to carry out any such inspection investigation or enquiry nor by the appointment by the Beneficiary of any independent firm company or party whatsoever to review the progress of or otherwise report to the Beneficiary in respect of the Sub-Contractor's duties under the Sub-Contract nor by any action or omission of such firm company or party whether or not such action or omission might give rise to any independent liability of such firm company or party to the Beneficiary provided always that nothing in this clause shall modify or affect any rights which the Sub-Contractor might have but for the existence of this clause to claim a contribution from any third party whether under statute or at common law.

10 Limitation

- 10.1 No action or proceedings for any breach of this Deed shall be commenced against the Sub-Contractor after the expiry of [12][3]³ years from the date of Take Over of the Works (as defined in the Building Contract).

11 Notices

- 11.1 Any notice provided for in this Deed shall be duly given if delivered by hand or sent by first class pre-paid special delivery post or recorded delivery to the party named therein at the address of such party shown above in this Deed or at such other address as such party may specify from time to time by written notice to the other party hereto and if sent by first class pre-paid special delivery post or recorded delivery it shall be deemed to have been received on the second working day after the date of posting (or on the sixth working day if the recipient is based outside of the Country of the party serving the notice).

12 Law

- 12.1 This Deed and any non-contractual obligations arising out of or in connection with it will be construed in accordance with English law and be in all respects subject to the non-exclusive jurisdiction of the English courts.

13 General

- 13.1 The provisions of this Deed shall remain in full force and effect notwithstanding the termination of the Sub-Contract.
- 13.2 Notwithstanding any other provision of this Deed nothing in this Deed confers or purports to confer any right to enforce any of its terms on any person who is not a party to it where that right would not exist but for the Contracts (Rights of Third

³ Period to depend on whether the work of the subcontractor comes within limb (1) or (2) of the definition of Latent Defects Period in the Building Contract.

Parties) Act 1999.

IN WITNESS whereof this Deed has been executed by or on behalf of the parties and delivered the day and year first above written

EXECUTED as a DEED by
[THE SUB-CONTRACTOR] by
means of these signatures (or,
where the COMMON SEAL of
[THE SUB-CONTRACTOR] was
hereunto affixed, in the
presence of):

Director

.....
Signature

.....
Name

Director/Secretary

.....
Signature

.....
Name

EXECUTED AS A DEED
by [AUTHORITY]
by the affixing of the Common Seal
in the presence of Authorised Signatory(ies):

Authorised Signatory

Authorised Signatory

EXECUTED AS A DEED
by [AUTHORITY]
by the affixing of the Common Seal
in the presence of Authorised Signatory(ies):

Authorised Signatory

Authorised Signatory

EXECUTED as a DEED by
[THE CONTRACTOR] by means
of these signatures (or, where
The COMMON SEAL of
[THE CONTRACTOR] was
hereunto affixed, in the
presence of):

Director

.....
Signature

.....
Name

Director/Secretary

.....
Signature

.....
Name

