Construction Plant-hire Association
Construction Hoist Interest Group

Construction Hoist Technical Information Note

TIN 302 — Construction Hoist Out-of-Service Wind Speeds

Introduction

When planning the installation of a construction hoist on a site the planning process must take into account both the in-service ***and*** the out-of-service wind speed on the hoist. The out-of-service wind speed will have an effect on both the structure, base and ties of the hoist and thus a bearing on the stability of the hoist. This Technical Information Note (TIN), which applies to all types of construction hoist, outlines the steps to be taken in assessing appropriate out-of-service wind speeds for construction hoists in the UK.

Legal Requirements

The requirement to ensure that an appropriate out-of-service wind speed is taken into account when configuring a construction hoist and designing the ties and base for a particular location is contained in several pieces of legislation:-

- Health and Safety at Work etc. Act 1974. - Sections 2 & 3
- Provision and Use of Work Equipment Regulations (PUWER) 1998 – Regulation 20
- Lifting Operations and Lifting Equipment Regulations (LOLER) 1998 – Regulation 4
- Management of Health and Safety at Work Regulations 1999 – Regulation 3
- Construction (Design and Management) Regulations 2015

Current Requirements

The majority of construction hoists supplied into the UK until recently were designed using the out-of-service wind load requirements of BS 4465:1989.

Construction hoists produced in the past few years have been designed to the European Harmonised Standard for construction hoists - EN 12159:2012. This standard specifies that construction hoists should be designed to take account of out-of-service wind pressures set out in Table 4 of EN 12159, which is reproduced below.

Height H of parts of hoist above ground level [m]	Wind Region							
	A/B		C		D		E	
	Wind Pressure [N/m²]	Wind Speed [m/s]	Wind Pressure [N/m²]	Wind Speed [m/s]	Wind Pressure [N/m²]	Wind Speed [m/s]	Wind Pressure [N/m²]	Wind Speed [m/s]
0<H≤10	544	30	741	34	968	39	1225	44
10<H≤20	627	32	853	37	1114	42	1410	48
20<H≤50	757	35	1031	41	1347	46	1704	52
50<H≤100	879	38	1196	44	1562	50	1977	56
100<H≤150	960	39	1306	46	1706	52	2159	59

Table 1 – Minimum Design Wind Pressure and Speed, based on Table 4 of EN 12159:2012

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The wind pressure varies for both the height of parts of the hoist above ground level and the geographical region in which the hoist will be erected. The geographical regions are set out in the European Storm Wind Map.

EN 13001-2:2014, *Crane safety. General design. Load actions,* encourages the use of detailed national wind maps or local meteorological with the European Storm Wind Map only being used in the absence of more precise data.

The UK National Annex to the Eurocode EN 1991-1-4:2005, *General actions - Wind actions*, was published in 2008 and contains a map of the UK showing the values of fundamental basic wind velocity vb.map before the altitude correction factor is applied. Taking these values and correcting for altitude, it has been possible to produce **Figure 1**, which shows that with the advantage of more precise information, England and Wales fall into Region C, whilst Scotland and Northern Ireland fall into Region D.

It is important to note that whilst this holds true for most areas up to 200m above sea level, higher or more exposed areas will require an individual assessment to be made.

A more detailed explanation of **Figure 1** is given in Annex 2 of CPA Tower Crane Technical Information Note TIN 027 which can be downloaded from the CPA's website at http://www.cpa.uk.net/tower-crane-interest-group-tcig-publications/

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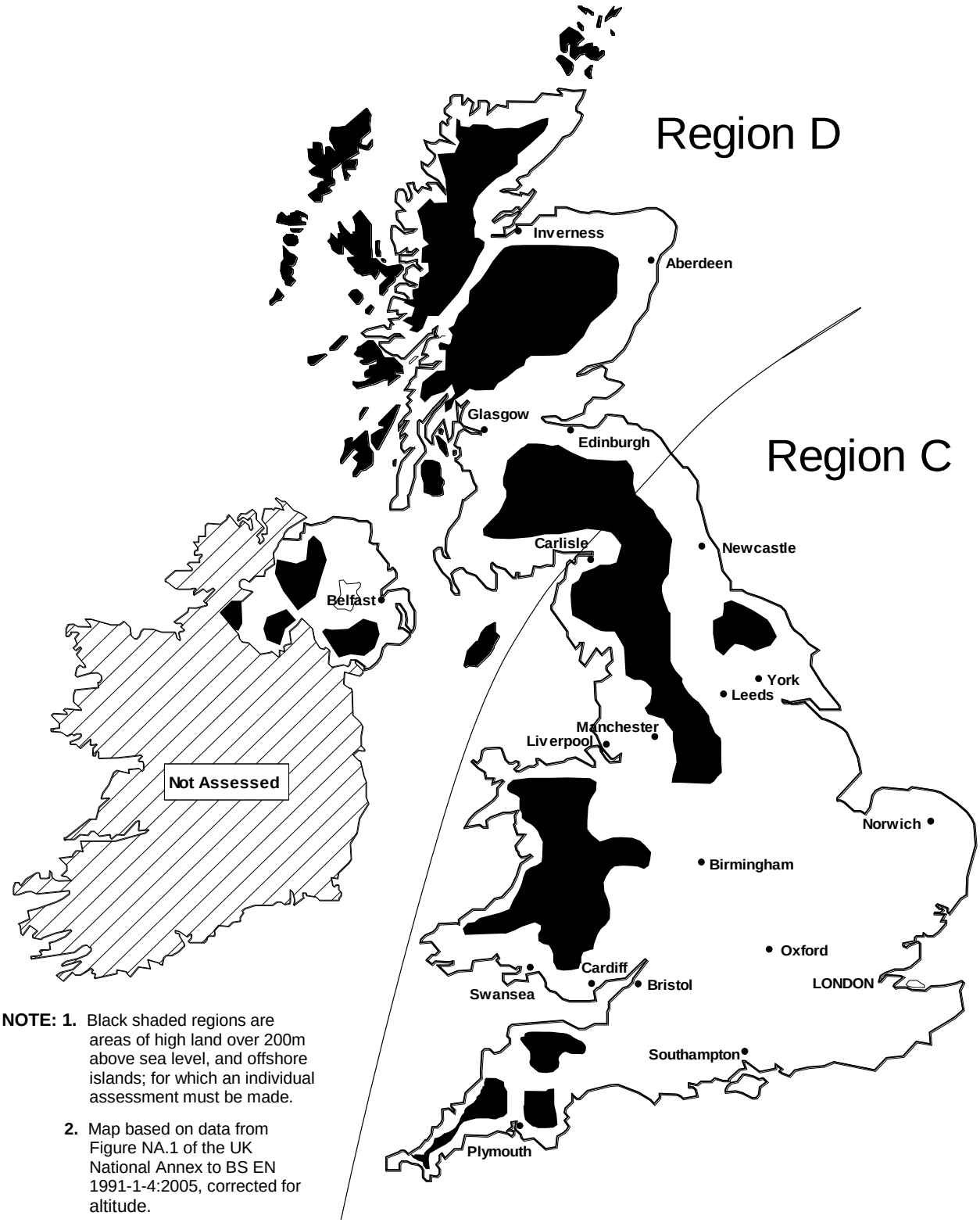

NOTE: 1. Black shaded regions are areas of high land over 200m above sea level, and offshore islands; for which an individual assessment must be made.

2. Map based on data from Figure NA.1 of the UK National Annex to BS EN 1991-1-4:2005, corrected for altitude.

Figure 1 - UK Out-of-Service Wind Region Map for Construction Hoists