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Framework master plan
Final report
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Contents

Glossary of abbreviations

ALC	Agricultural land classification
AOD	Above Ordnance Datum
BRE	Building Research Establishment
BREEAM	BRE Environmental Assessment Method
CCW	Countryside Council for Wales
CHP	Combined heat and power
EAW	Environment Agency Wales
EIA	Environmental impact assessmen
HGV	Heavy goods vehicle
HPPE	Higher performance polyethylene
HVAC	Heating, ventilation and air conditioning
LDP	Local Development Plan
PPW	Planning Policy Wales
PV	Photovoltaic
SPG	Supplementary planning guidance
SSSI	Site of Special Scientific Interest
SuDS	Sustainable drainage systems
TA	Transport assessment
TAN	Technical Advice Note
UDP	Unitary Development Plan
WSP	Wales Spatial Plan

1 Introduction

101 In December 2009, **WYG** Planning & Design was commissioned by the Welsh Assembly Government to prepare a framework master plan, incorporating its standards and aspirations for sustainable development, to guide the future development of its 47-hectare strategic employment site at Brocastle, Bridgend.

102 In 1998, a planning permission was granted for a development on the site to accommodate a maximum of four large users. Since then, however, the site has failed to attract any new inward investment and the planning permission has also lapsed - although suitable access in the form of a roundabout has been constructed. The Brocastle site is still regarded as a strategic employment site with great potential and this framework master plan will be used to inform a future, new application for planning permission and to promote and encourage employment opportunities on the site.

103 This document makes reference to a number of previous reports, notably the **Brocastle Farm, Bridgend: Feasibility Study**[1] that preceded the outline planning application in 1997 and the **Brocastle, Bridgend: Environmental Statement**[2] that accompanied it. Comments given in section 2 of this report are provided in addition to the information given in the **Brocastle Farm, Bridgend: Feasibility Study** and, therefore, should be read in conjunction with that report. Whilst we do not disagree with any of the information given previously, a significant period of time has passed since it was prepared and some circumstances have changed.

[1] On behalf of the former Welsh Development Agency, **Brocastle Farm, Bridgend: Feasibility Study**, Wyn Thomas plc/Howard Humphreys and Partners Limited, February 1997.

[2] On behalf of the former Land Authority for Wales, **Brocastle, Bridgend: Environmental Statement**, Wyn Thomas plc, October 1997.

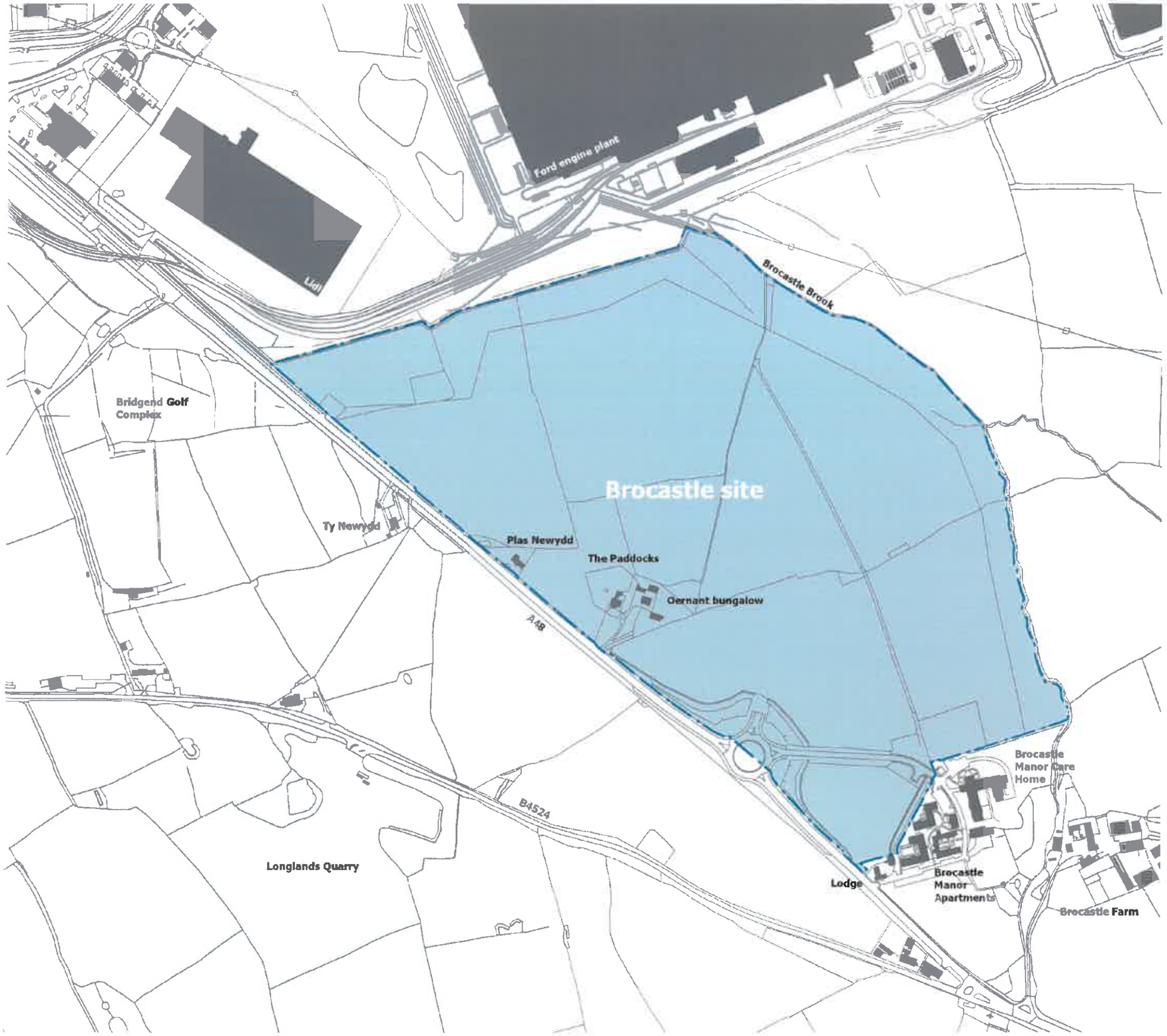
Structure of the report

104 Following this introduction, this master-plan report is presented in four further sections:

- section 2 analyses the site as existing;
- section 3 summarises the planning policy context;
- section 4 describes the framework master plan proposals; and
- section 5 presents the low carbon strategy for the development.

105 All drawings referred to in the text as figures are included in Appendix 1; extracts from some are provided also within the main body of the document.

Left Overhead **aerial photograph** of the Brocastle site and its surroundings, 2006 (before the construction of the Brocastle Manor Care Home and Brocastle Manor Apartments).



Right Extract from **Figure 03 Site identification** (not to scale).

2 The site as existing

Location

201 The regional location of the Brocastle site is shown on Figure 01.

202 The site lies on the south-eastern edge of the town of Bridgend in south Wales: see Figure 02. It is bounded to the east, south and west by the open countryside of the Vale of Glamorgan and to the north by the Ford engine factory, which forms the southern extent of the adjoining Waterton Industrial Estate. It is located alongside the A48 Bridgend to Cowbridge road, approximately 6.5 km from junction 35 of the M4 motorway.

Land ownership

203 The site, as shaded in blue on Figure 03, is owned by the Welsh Ministers.

Site description

204 The site, which is outlined in blue on Figure 03, extends to a total of 46.79 hectares.

Topography

205 Topographically, the site is situated on the southern edge of the south Wales coalfield plateau. The elevation of the site rises from 15 m above Ordnance Datum (AOD) to 40 m AOD in a north to south direction: see Figure 04. It is surrounded by rolling countryside with prominent hill and ridge features rising to between 75 m and 90 m AOD to the south-west and a little over 100 m AOD to the south-east. To the north the land also rises to a higher elevation and it is on this rising land that the town of Bridgend is situated.

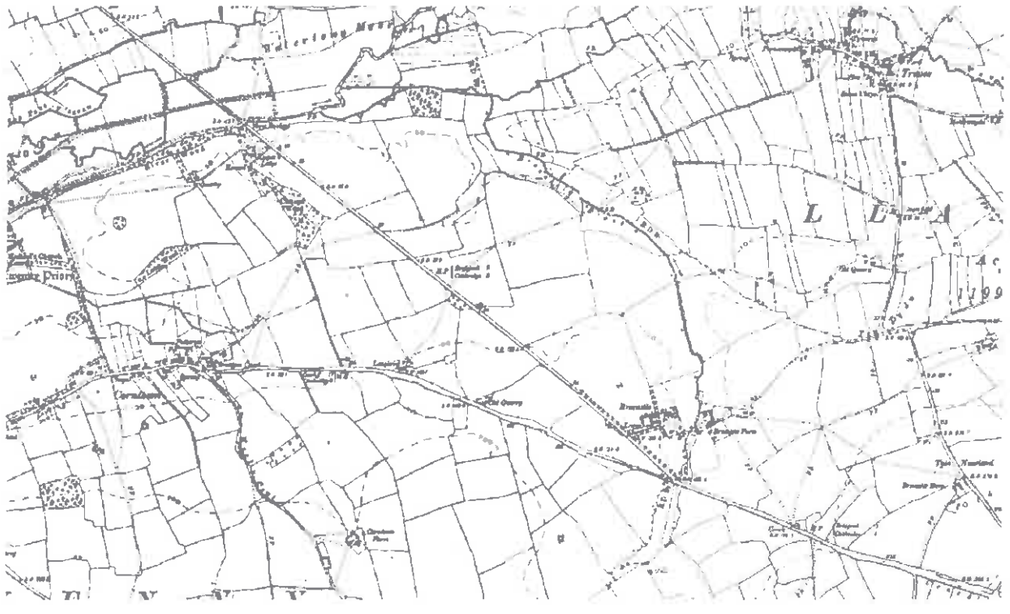
206 The contours and gradients of the land within the site are indicated on Figure 05. The gradient of the majority of the site (for which 1 m contours are available) is between 2.5% and 4.0%. Steeper gradients occur mainly in the south-eastern half of the site, including land descending eastwards towards the Brocastle Book. This land is generally steeper than 4% and in some locations it is steeper that 10%. The north-western half of the site has small areas steeper than 4%, but is predominantly between 2.5% and 4%. A proportion of this area has a gradient over 2.5%.

Site morphology

207 The historical Ordnance Survey maps opposite illustrate the changes that have taken place in the landscape context and physical development surrounding the site since 1875. The historical field pattern is largely intact even today, and it is only on the 1948 map that significant changes appear in the vicinity of the site with development taking place north of Waterton Cross, at what would eventually become Bridgend Industrial Estate.

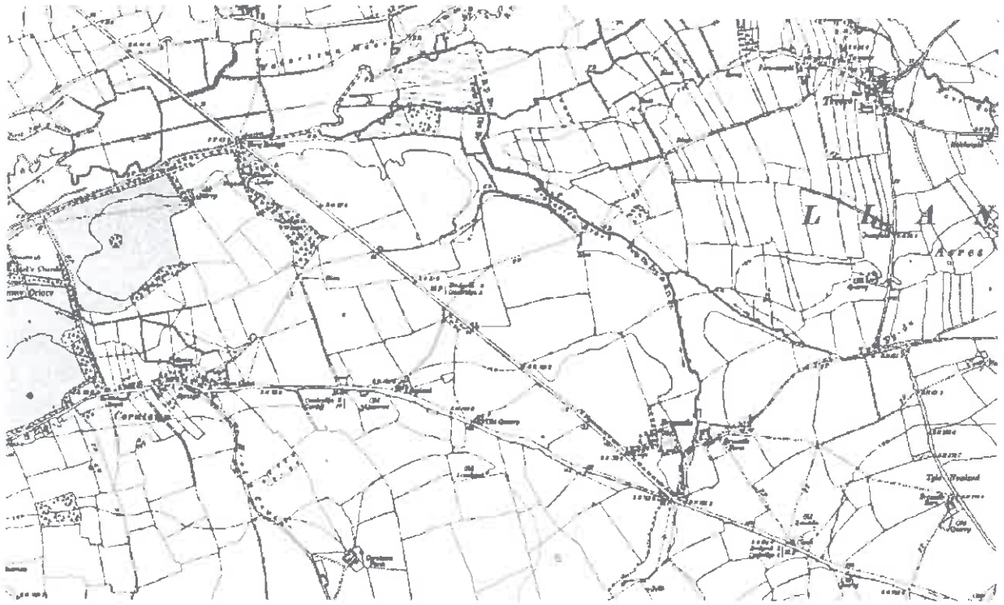
Current uses

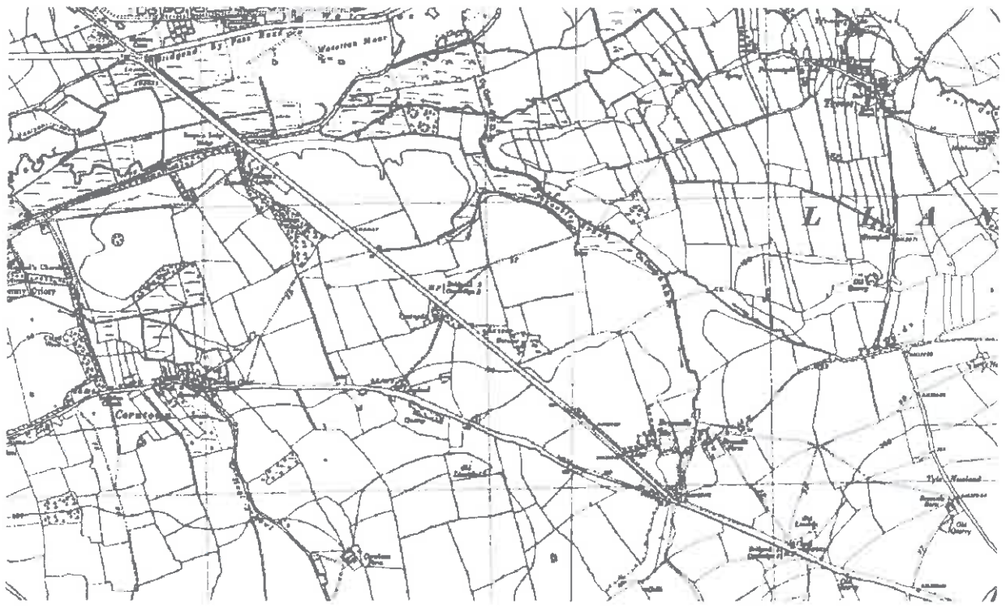
208 The site comprises gently rolling agricultural land divided into a number of medium- to large-sized fields. The eastern/north-eastern edge of the site follows Brocastle Brook, which lies in an enclosed valley of land. To the south lies land adjoining recent development to the west of Brocastle Farm, whilst to the west/south-west the site is bounded by the hedge-lined A48 road. Along the western edge of the site is a group of dwellings that include houses known as The Paddocks and Oernant bungalow. Further to the north lies another dwelling, Plas Newydd. Apart from these,



Right, top Extract from **Ordnance Survey map** of 1875 (not to scale)

Right, bottom Extract from **Ordnance Survey map** of 1900 (not to scale)





there is little evidence of past development or other operations. Public rights of way cross the site, the routes of which are shown on Figure 06 and Figure 12.

209 The quality of the agricultural land was assessed in 1997 using the methodology for Agricultural Land Classification (ALC) developed by the former Ministry of Agriculture, Fisheries and Food[3], and the results noted in the previous reports[4]. In summary, as shown on Figure 07, the agricultural land within the site falls within Grade 3b (Moderate Quality) and Grade 4 (Poor Quality). No land in Grade 1 (Excellent Quality), Grade 2 (Very Good Quality) or Grade 3a (Good Quality) was identified, and it is only land within these grades this is regarded as 'best and most versatile agricultural land' that planning policy seeks to protect.

Surrounding uses

210 The uses surrounding the site are shown on Figure 02 and Figure 03. To the south, east and west these comprise mainly agriculture and a scattering of farmsteads and dwellings. Chief among these is a group of buildings immediately to the south of the site where a care home for older people and a group of retirement flats and houses have recently been developed in the historical setting of a former large house known as Brocastle - itself converted to a conference and training centre as part of the scheme. Further to the south lies Brocastle Farm.

211 A small quarry, known as Longlands, is located to the west of the A48 adjacent to the site. Waterton Industrial Estate, the Ford engine plant and a Lidl distribution centre lie to the north.

Left, top Extract from **Ordnance Survey map** of 1921 (not to scale)

Left, bottom Extract from **Ordnance Survey map** of 1948 (not to scale)

[3] **Agricultural Land Classification of England and Wales revised guidelines and criteria for grading the quality of agricultural land**, MAFF, 1988.

[4] **Brocastle Farm, Bridgend: Feasibility Study**, op cit, page 21; and, **Brocastle, Bridgend: Environmental Statement**, op cit, pages 42 to 46.

Physical factors

Geology

212 The solid geology of the site has been described in previous reports[5] and is only summarised here and on Figure 08. The bedrock beneath the whole site is exposed at the surface and comprises limestone of the Jurassic period, forming part of the Porthkerry Formation, that is interbedded, fine-grained limestone and dark grey shales. In terms of drift geology, there are no drift deposits recorded within the site. However, there are alluvial deposits indicated along the northern and eastern boundaries, associated with the Brocastle Brook.

Hydrogeology

213 Previous reports[6] note that the Jurassic limestone and shales form a multi-layered aquifer, with each of the limestones comprising an individual aquifer unit which probably has only limited continuity with other limestone beds in the sequence.

Ground conditions

214 The Brocastle Farm, Bridgend Feasibility Study suggests that bedrock is close to the surface over much of the site[7]. This is confirmed by a subsequent Factual Report on Ground Investigation[8], which is summarised here, detailing the sixty-four trial pits and four boreholes that were carried out over the whole site. Drawing 2210/C/SK/001[9] in Appendix 2 shows the location of the trial pits and boreholes and is annotated to give an indication of the depth of rock over the site.

215 The trial pits show that approximately 200 mm of topsoil, described as slightly sandy slightly silty gravely peaty clay, is underlain by a similar clay with cobbles and boulders in a layer of varying thickness. Below the topsoil and clay layer is bedrock, predominantly mid- to dark-grey slightly weathered very strong limestone. The limestone rock is encountered below 2 m depth over approximately half the site, while rock can be found at depths shallower than 1 m in other areas, particularly in the north-west and mid east areas of the site. There are few instances of rock occurring at over 2 m depth in the southernmost field. There is one instance of weak siltstone occurring at 1.8 m deep just east of The Paddocks.

216 As suggested in the 1997 feasibility study[10], the presence of strong limestone rock in the ground investigation suggests that shallow foundations founded in rock would be suitable and most economical if buildings could be situated where rock is closest to the surface. If buildings are positioned in locations where rock is deeper, trench fill or short piles taken through structural fill to the rock may be needed.

217 Only two of the boreholes show a water strike. BH-E02 and BH-E03, taken close to the main established hedgerow from Oernant bungalow to Brocastle Brook, show water strikes at 13 m and 9.85 m, respectively. It is unlikely, therefore, that ground water will be a significant issue on site.

218 There is no record of previous mining or extraction activities within the site and no previous usage of or tipping of materials has been recorded, so it is unlikely that contamination will be an issue.

219 Maps for defining areas where radon protective measures are required in new buildings are published by the Health Protection Agency and the British Geological

[5] **Brocastle Farm, Bridgend: Feasibility Study**, op cit, pages 3 to 5; and, **Brocastle, Bridgend: Environmental Statement**, op cit, pages 7 to 8.

[6] **Brocastle Farm, Bridgend: Feasibility Study**, op cit, page 5; and, **Brocastle, Bridgend: Environmental Statement**, op cit, page 8.

[7] **Brocastle Farm, Bridgend: Feasibility Study**, op cit, page 7.

[8] **Factual Report on Ground Investigation**, Wimtec Environmental Limited, November 1999.

[9] Taken from the drawing **Brocastle and Ford Sites - Ground Investigation Borehole & Trial Pit Location Plan**, Parsons Brinckerhoff, 16 April 1999.

[10] **Brocastle Farm, Bridgend: Feasibility Study**, op cit, page 10.

Left Extract from radon **Map 3** (not to scale)

Key
Level of protection required:

- None
- Basic
- Full

Survey, which are also available in the Building Research Establishment's guide to radon protection [11]. Map 3 Dorset, Somerset, Wiltshire and the Bristol Channel (extract above) shows that the Brocastle site appears to be in an area requiring full protective measures in accordance with Building Regulations Approved Document C.

Climate

220 The site is located on a north-facing slope that declines away from the access on the south-west boundary. The prevailing winds will be from the west to south west.

However, there will also be secondary prevailing winds from the north-east which, although less frequent, will be significantly colder: see Figure 09. The site is relatively more exposed to wind at its southern, higher end, and this could provide a suitable location for wind generation of electricity.

221 The whole site is open to the sun. Temperatures are generally not usually excessively hot or cold. However, with climate change, more extremes are likely in future. Therefore, protection against excessive solar gains to building interiors should be considered when configuring road layouts and related building orientations.

222 The northerly aspect of the site should encourage the use of north lighting for daylighting interiors of, say, office-type space, thereby avoiding excessive solar heat gains and the consequent need for mechanical cooling.

223 With the likely increase in benefits from capturing solar energy, both power and thermal, roof orientations should be designed to maximise solar potential. As the site is likely to have buildings with large roof areas, this could be a potential source of income in future as energy (electrical and thermal) tariff structure encourage on-site renewable energy generation.

Built environment

224 The only buildings within the site are the dwellings on the south-western edge of the site referred to in paragraph 208 above. None of these is of any architectural or historic interest.

225 Adjoining the site to the south is the Brocastle Manor Care Home and the Brocastle Manor Apartments. As noted in paragraph 210, the former large house, Brocastle, has been converted with a new two-storey building in a courtyard form constructed to its north accommodating the care home. This has cream/yellow coloured rendered walls with reconstructed stone detailing, and steeply pitched, slated

[11] **BRE Guide 211, Radon: guidance on protective measures for new buildings,** Building Research Establishment, 2007.

roofs - the overall elevational treatment attempting unconvincingly to mimic local historical precedents. To the west of Brocastle, retirement flats have been developed through the conversion of the three-sided, rectangular stone-built former stables/ outbuildings, and the construction of new buildings in a courtyard configuration. These are predominantly two-storey and in a similar idiom to the care home.

226 Brocastle Farm lies to the south-east of the site. The main farm building is of eighteenth century origin (or earlier), and one of its outbuildings may be of late medieval origin.

227 The Ford engine plant adjoins the site to the north: this large-scale industrial building, which has a footprint of over 15 hectares, was built in the late 1970s and dwarfs the more recent Lidl regional distribultion centre depot to its west.

Environmental factors

Cultural heritage

228 The archaeological and cultural heritage assets were assessed in 1997 and catalogued in the feasibility study and environmental statement reports [12]. In summary:

- the site does not contain any **scheduled ancient monuments** designated under the Ancient Monuments and Archaeological Areas Act 1979;
- the site does not contain any buildings **listed as a building of special architectural or historic interest** under the Planning (Listed Buildings and Conservation Areas) Act 1990;
- the site does not form part of a conservation area, designated under the Planning (Listed Buildings and Conservation Areas) Act 1990; and
- the site does not contain or lie close to any **historic park, garden or landscape** listed in the non-statutory Register of Landscapes, Parks and Gardens of Outstanding Historic Interest in Wales [13].

229 There are no sites or artefacts of archaeological significance recorded within the site in the regional Sites and Monuments Record. However, there are a number of prehistoric, Romano-British, medieval and post-medieval finds or sites recorded in the general locality: see Figure 10.

Ecology

230 The notes [14] that follow provide a succinct, up-to-date account of the main ecological features on site and, for each, provide a description, state their significance and define any constraints and opportunities. The notes accompany the Ecological constraints and opportunities plan on page 22.

231 **TN01-TN03 Ancient and/or species-rich hedgerows**: the combined hedgerow sections TN01, TN02 and TN03 provide a very good wildlife corridor and travel route across the site. This feature is likely to be important for maintaining connectivity between adjacent features including the Brocastle Brook, houses and farm buildings (likely to support roosting bats) and hedgerows to the west side of the A48. Although there are no data available on bat usage of the site, good foraging is likely to occur along the full length of the hedgerows. These hedgerows are likely to

[12] **Brocastle Farm, Bridgend: Feasibility Study**, op cit, pages 21 to 22; and,
Brocastle, Bridgend: Environmental Statement, op cit, pages 8 to 13.

[13] **Register of Landscapes, Parks and Gardens of Oustanding Historic Interest in Wales,** Cadw, Countryside Council for Wales, ICOMOS, 1998.

[14] The information provided is based largely on ecological surveys and assessments carried out by David Clements Ecology in 1997, Pryce Consultant Ecologists in 2001, and a site visit carried out by Pryce Consultant Ecologists for this study on 20 January 2010.

support a small number of breeding birds of high conservation concern such as dunnock (Prunella modularis), song thrush (Turdus philomelos) and bullfinch (Pyrrhula pyrrhula).

232 The **value** of TN01-TN03 is assessed as: High Local. In addition to sections of this hedgerow qualifying as 'important' under the terms of the **Hedgerows Regulations 1997**[15] and as a section 42 habitat[16] and UKBAP priority habitat[17] listed under 'ancient and/or species-rich hedgerows', the unit is likely to form a valuable through-corridor of linear habitat within and beyond the site.

233 The **constraints and opportunities** of TN01-TN03 are as follows:

- Due to the importance of this hedgerow length it is strongly recommended that this feature should be retained along its full length.
- Where opportunities exist, supplementary planting should be undertaken to fill gaps and thicken the hedgerows to increase their ecological value. In order to ensure that all planting is compatible with the local gene pool of the area, all woody plant species should be of local provenance as outlined in **Forestry Commission Practice Note 8**[18].
- Appropriate management should be practised to maintain the ecological importance of these features.
- Where opportunities exist, new hedges should be established to increase connectivity of this key feature.

234 **TN04-TN11 Ancient and/or species-rich hedgerows**: the combined hedgerow sections TN04, TN05, TN06, TN07, TN08, TN09, TN10 and TN11 provide wildlife corridors and travel routes at scattered localities across and within the site. These features are likely to be important for maintaining connectivity within the site and provide links between adjacent features including the Brocastle Brook, houses and farm buildings (likely to support roosting bats) and hedgerows on the west side of the A48. Although there are no data available on bat usage of the site, good foraging is likely to occur along most if not all lengths of hedgerow. These hedgerows are likely to support a small number of breeding birds of high conservation concern such as dunnock, song thrush and bullfinch.

235 The **value** of TN04-TN11 is assessed as: High Local. In addition to sections of this hedgerow qualifying as 'important' under the terms of the **Hedgerows Regulations 1997** and as a section 42 habitat and UKBAP priority habitat listed under 'ancient and/or species-rich hedgerows', these features are likely to form a valuable internal corridor of linear habitat within the site.

236 The **constraints and opportunities** of TN04-TN11 are as follows:

- Where possible it is recommended that these features are retained.
- Where opportunities exist, supplementary planting should be undertaken to fill gaps and thicken the hedgerows to increase their ecological value. In order to ensure that all planting is compatible with the local gene pool of the area, all woody plant species should be of local provenance as outlined in **Forestry Commission Practice Note 8**.
- Appropriate management should be practised to maintain the ecological importance of these features.

[15] **The Hedgerows Regulations 1997**, Statutory Instrument 1997 No. 1160.

[16] **Natural Environment & Rural Communities Act 2006: Section 42 list of habitats of principal importance for conservation of biological diversity in Wales**, Welsh Assembly Government, http://www.biodiversity-wales.org.uk/habitats-34.aspx.

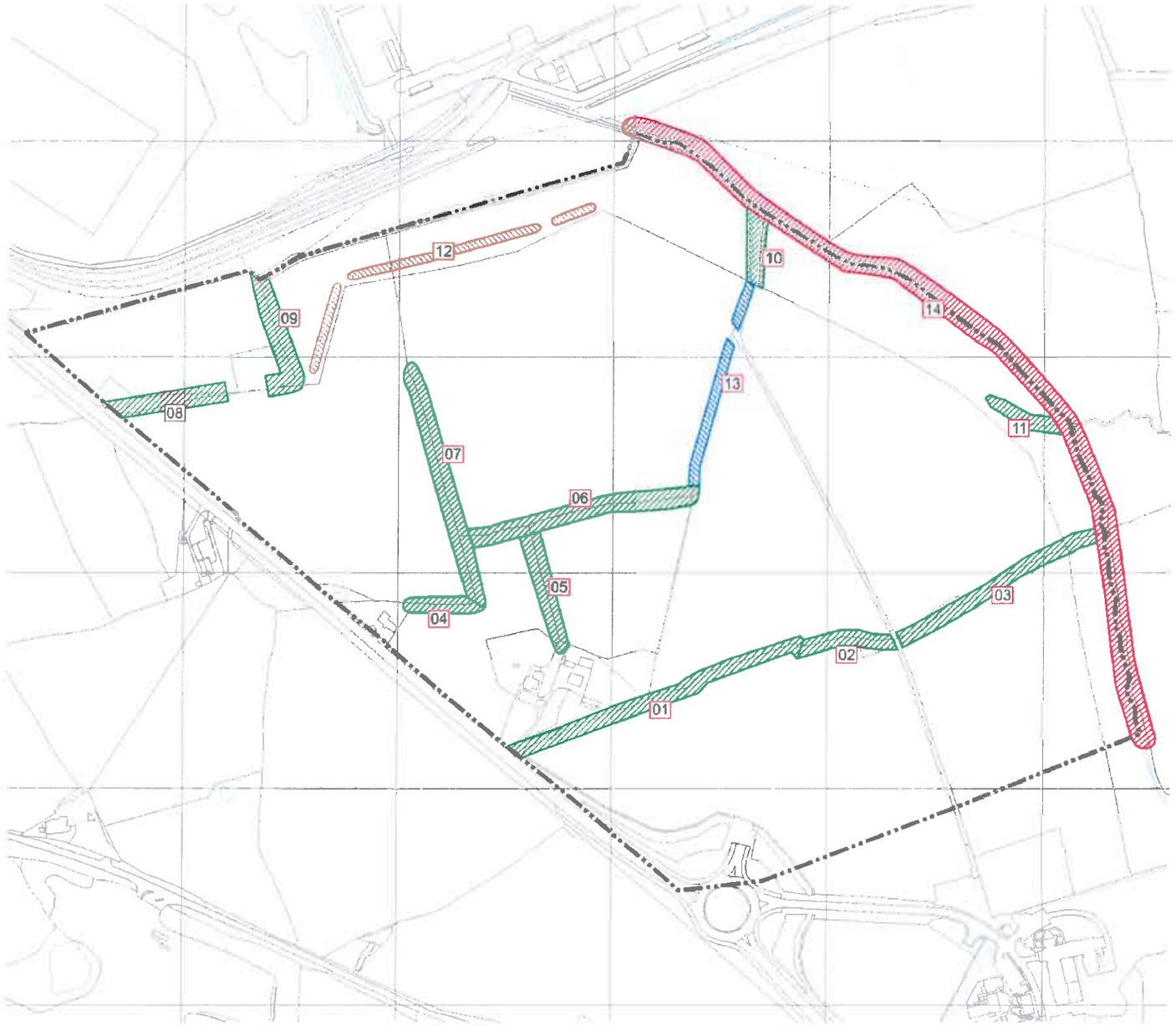
[17] **UK Biodiversity Action Plan, Priority Habitat Descriptions**, Biodiversity Reporting and Information Group, July 2010, http://www.ukbap.org.uk/library/UKBAPPriorityHabitatDescriptionsRevised20100730.pdf.

[18] **Practice Note 8: Using Local Stock for Planting Native Trees and Shrubs**, Forestry Commission, August 1999.

Right **Ecological constraints and opportunities plan** (not to scale)

Key

- Study area boundary
- 06 Target Notes
- (Regional value) Brocastle Brook
- (High-Local value) Ancient and/or species-rich hedgerows
- (High-Local value) Stone/rock soakway
- (High-Local value) Habitat piles of grubbed out hedge bottoms
- (Low-Local value) Improved/species-poor semi-improved grassland



- Where opportunities exist, new hedges should be established around the site periphery, and where possible, these should be linked with existing off-site hedgerows to increase connectivity through and beyond the site.

237 **TN12 Habitat piles**: the habitat piles created by the stockpiling of material grubbed out from the hedgerows provide excellent habitat in which small mammals, herpetiles and invertebrates can find shelter and hibernation sites.

238 The **value** of TN12 is assessed as: High Local. In addition to providing shelter and hibernation sites, these features are likely to form a valuable internal corridor of linear habitat within the site.

239 The **constraints and opportunities** of TN12 are as follows:

- The establishment and maintenance of rough species-rich grassland (managed by implementing an annual cut in early spring or late summer, with removal of arisings) around these habitat piles would greatly increase their ecological benefit, especially for small mammals, herpetiles and invertebrates.
- All sections should be kept open and in full sun to provide basking habitat for reptiles and invertebrates.

240 **TN13 Rock soakway**: the rock and stone soakway provides excellent habitat in which small mammals, herpetiles and invertebrates can find shelter and hibernation sites.

241 The **value** of TN13 is assessed as: High Local. In addition to providing shelter and hibernation sites, this feature is likely to form a valuable internal corridor of linear habitat within the site but is currently suitable principally for ground-dwelling species only.

242 The **constraints and opportunities** of TN13 are as follows:

- Marginal planting should be carried out in short lengths totalling about two-thirds of the length of the north-western side of this feature to enhance the effectiveness of the habitat by increasing shelter and providing an added food resource. In order to ensure that all planting is compatible with the local gene pool of the area, all woody plant species should be of local provenance as outlined in Forestry Commission Practice Note 8.
- Some sections should be kept open and in full sun to provide basking habitat for reptiles and invertebrates.

243 **TN14 Brocastle Brook**: the Brocastle Brook runs along the northern/eastern boundary of the site. This is a moderately fast-flowing watercourse, averaging about 2.0 m to 2.5 m across. It is largely edged by scrub and managed hedgerow with mature trees and scrub frequent in sections. Marginal emergent vegetation is frequent in the open sections. Surveys indicate that otter (Lutra lutra) is unlikely to be anything other than a very occasional visitor along the brook. Although there are no data available on bat usage of the site, good foraging is likely to occur along the full length of the brook which is linked by several connecting hedgerows. A small number of breeding birds of high conservation concern are likely to breed along the brook including species such as dunnock, song thrush and bullfinch. There appears to be some limited invertebrate interest with the localised species such as Grapholita tenebrosana, Epistrophe grossulariae and yellow meadow-ant (Lasius flavus) having been noted during past surveys.

244 The **value** of TN14 is assessed as: Regional Value. This high designation is because of the established habitats described above being well-linked with other ecological features of nature conservation value, forming part of a species-rich linear habitat system extending beyond the boundaries of the site.

245 The **constraints and opportunities** of TN14 are as follows:

- The brook should be retained within an undeveloped buffer zone at least 15 m wide which should be managed as a wildlife corridor providing a diversity of habitat niches.
- The brook corridor should be screened at key sections by embankments and plantings. In order to ensure that all planting is compatible with the local gene pool of the area, all woody plant species should be of local provenance as outlined in Forestry Commission Practice Note 8.
- All site lighting should be of a low spillage type.
- Provision of on-site treatment and attenuation of surface water run-off to a high standard should be agreed with the Environment Agency Wales (EAW). Sustainable drainage systems (SuDS) should be employed where possible.
- Permanently wet habitats should be created around the proposed attenuation ponds and in association with SuDS features.

246 **Other features**: the open habitats of the remainder of the site comprise enclosed grasslands that have been improved for agriculture. All are of an improved or comparatively species-poor type with the dominant species being perennial rye-grass (Lolium perenne), with locally abundant/frequent common bent (Agrostis capillaris) and Yorkshire fog (Holcus lanatus).

247 The **value** of the other features is assessed as: Low Local. The grasslands are botanically rather impoverished, but are used by wintering birds such as redwing (Turdus iliacus) and fieldfare (Turdus pilaris) (both species protected by their inclusion on schedule 1 of the Wildlife and Countryside Act 1981) and may also be used occasionally by foraging badger (Meles meles), (protected by the Protection of Badgers Act 1976).

248 The **constraints and opportunities** of the other features are as follows:

- The planting scheme should incorporate a high proportion of native trees and shrubs around the site periphery, including the establishment of new hedges linked-in with existing off-site hedgerows to provide greater connectivity throughout the site.
- Where opportunities exist, species-rich grasslands should be created. These grasslands should be managed using low intensity methods such as a single early-spring or late-summer cut, with removal of all arisings. Further benefits could be gained by siting these grasslands in association with habitat piles or rock features already established on site.
- In order to ensure that all planting is compatible with the local gene pool of the area, all woody plant species should be of local provenance as outlined in Forestry Commission Practice Note 8.

Landscape

249 **Introduction**: this appraisal evaluates the landscape and visual amenity of the site and surrounding area which could be potentially affected by the proposed development. It will inform the development of the master plan for the site and the landscape strategy, incorporating enhancements for landscape and visual amenity into the master plan.

250 The appraisal of landscape character and visual amenity involves a combination of desk studies and field surveys, with subsequent analysis; and an evaluation of the features, landscape character and views available of the site. The methodology is based on the recommendations and guidance published by the Countryside Commission [19] and by The Landscape Institute and the Institute of Environmental Management and Assessment [20].

[19] **Landscape Assessment Guidance**, Countryside Commission, 2003.

[20] **Guidelines for Landscape and Visual Impact Assessment**, The Landscape Institute and the Institute of Environmental Management and Assessment, second edition, E&FN Spon, 2002.

251 The landscape and visual field surveys that were undertaken for this study involved evaluation of landscape features, character, and visual amenity.

252 **Landscape context**: the main landscape features, settlement pattern and transport network within the site context are shown on Figure 06 and Figure 11. Land form within the site rises from 15 m AOD to 40 m AOD in a north to south direction. The context of the site has a rolling land-form of ridges and valleys with few notable hills.

253 Land use to the south, east and west of the site is mainly agricultural pasture with limited arable cultivation. This land is typical of the rural Vale of Glamorgan with small-medium scale fields defined by hedgerows that are generally trimmed. Some hedgerows have become overgrown with hedgerow trees. There are numerous blocks of deciduous and mixed woodland and copses. Other notable land uses within the rural landscape include: the residential care home at Brocastle; Longlands Quarry off Corntown Road; and, the Bridgend Golf Complex off the A48 to the west of the site.

254 The town of Bridgend is located to the north and north-west of the site, extending across the River Ewenny valley floor and onto higher land at Brackla Hill to the north. Waterton Industrial Estate and Bridgend Industrial Estate occupy a prominent location on the valley floor, visible from adjacent vantage points in Bridgend and the rural areas to the south and east.

255 There are several small villages within 2 km of the site, including Treoes, Llangan, Colwinston, Corntown and Ewenny, and frequent scattered farm houses and dwellings. At the site boundary with the A48 there are two dwellings: The Paddocks and Oernant Bungalow, and to the south, the Brocastle Manor Care Home.

256 The landscape appraisal has referred to a desk-study of published landscape character studies. Landscape assessment, following the LANDMAP methodology[21], has been undertaken for Bridgend and the Vale of Glamorgan. These assessments use the Countryside Council for Wales (CCW)/Wales Landscape Partnership Group approach which separates the defining aspects of the landscape into five categories: geology, habitats, visual and sensory, historic and cultural landscape. It considers the relationship between people and places; how people have given meaning to places through time; and, how the physical landscape has shaped their actions or how their actions have shaped the landscape. The most relevant aspect areas and key findings of most relevance to the site and proposed development are summarised below.

257 **LANDMAP - visual and sensory**: Bridgend County Borough Council prepared a landscape assessment of the County Borough with its neighbouring authorities, Caerphilly County Borough Council and Rhondda Cynon Taf County Borough Council, in 1999. The LANDMAP survey data were updated in 2004.

258 The site is located within visual and sensory aspect area CynonVS726: Bridgend, which is defined as Urban (Level 3). The area is assessed as having low scenic quality defined as an "urban area with no notable qualities, weak sense of place and unattractive urban views, with limited views out to the wider landscape, and noise from the many main roads".

259 Land to the south-west of the site on the southern side of the A48 is within the Vale of Glamorgan. The Vale of Glamorgan Council published a landscape assessment of the County Borough in 1999[22] based on the LANDMAP methodology. Visual and sensory aspect area VLFGLVS797: Ewenny Valley, which is defined as Mosaic Lowland Valleys (Level 3) is located to the south-west. The area is described as a "mosaic of

[21] Countryside Council for Wales's LANDMAP website: http://landmap.ccw.gov.uk/map/Map.aspx.

[22] **Landscapes Working for the Vale of Glamorgan**, The Vale of Glamorgan Council, 1999.

pastoral fields set in hedgerows often containing trees and woodland belts". It is assessed as having moderate scenic quality, defined as "moderately attractive views to gentle lower valley slopes of fields and hedgerows integrating settlement with woodland to the steeper higher slopes... Wider views possible to valley floor...". The study makes specific recommendations for managing woodland, retaining and enhancing hedgerows.

260 Land to the south, east and north-east of the site is within visual and sensory aspect area VLFGLVS943: Northern Vale Lias Slopes, which is defined as Open Rolling Lowland (Level 3). The area is described as "a coastal lowland valley... dominated by gently sloping hills and valley sides... Generally an open landscape there is high intervisibility and long views are possible to Bridgend and the industrial area of Waterton... The landcover is a mosaic of mainly small to medium pastoral fields, with some arable, set within managed hedgerows... However, there are also areas of gappy or overgrown hedges apparent... There are several woodlands scattered throughout the area...". It is assessed as having moderate scenic quality, defined as "pleasant views to well managed fields, hedgerows and wooded area...". The study makes specific recommendations to "introduce blocks of broadleaf woodland to integrate settlement, retain and enhance hedgerows, and restrict development in widely visible areas".

261 **LANDMAP - Geological landscape**: the site has incomplete coverage within the geological landscape LANDMAP data. Low lying land along Brocastle Brook is within CynonGL040: Lower Ogwr valley, defined as Active lowland river-flood plain system. It is described as: "Mature, meandering valleys, with extensive development of glacial sand/gravel & both floodplain & terraced alluvium with patches of head...". The adjacent aspect area to the north-east, east and south-west is VLFGLGL709: Llangan, defined as undulating lowland hill terrain. This area is described as a "broad depression underlain by 'normal' facies Blue Lias formation and forming slope on northern side of more resistant Carboniferous limestone-marginal Lias ridge...".

262 **LANDMAP - Landscape habitats**: the site is located in the Landscape Habitats Aspect Area CynonLH044: Improved Grassland. In addition to improved grassland (65%), a proportion of the area is arable (18%) and marshy grassland (3%). The overall evaluation for the area is moderate due the marshy grassland across the floodplain grazing marsh being BAP habitat. Adjacent land to the south, east and northeast is within area VLFGLLH435: Improved Grassland. This area includes a lower proportion of arable land (5%), a small area of planted broadleaved woodland (1%) and a higher proportion of improved grassland (87%). There is a medium term guideline for this area to "encourage sympathetic management of field boundaries...".

263 **LANDMAP - Historic Landscape**: the site is located in the historic landscape aspect area CynonHL991, defined as other fieldscapes (Level 3). The area has "an evolved fieldscape, mainly of small to medium-sized fields with a rather irregular layout... The existing landscape is largely the product of a post-medieval reworking of the medieval fieldscape...". Land to the north-east is within area VLFGLHL054: Llangan Welsh St Donats and Pendoylan, defined as Regular Fieldscapes (Level 3). This area has "small regular fields of medieval origin; strip fields tend to cluster around the known medieval settlements of St Mary Hill, Treoes... and Llangan and extend outwards". Reference is made to a number of bronze age and iron age finds in the area. Land to the south-east is with area VLFGLHL052: Llysworney and Llandough and VLFGLHL051: Llandow Rural, is located to the south-west. Regular and irregular fieldscapes are a defining feature of both areas.

264 **LANDMAP - Cultural landscape**: the site is located in the cultural landscape aspect area CynonCL021: Vale of Glamorgan Rural Landscape, which is defined as Rural (Level 3). The area is described as a landscape that contains "examples of its evolution from prehistory to the present... a wide range of historic landscapes... field patterns, hamlets and villages...". The overall evaluation is high, "a landscape containing many examples of human cultural activity from prehistory to the present,

Photograph looking north-west along the existing track within the site, towards the Ford plant

Photograph looking north-east across the ecological buffer zone, with vegetation along the Brocastle Brook boundary

threatened in the 21st century by over-development". Waterton and Bridgend to the north-west are located in the cultural landscape aspect area CynonCL015: Bridgend, which is defined as Urban (Level 3). Land to the south, east and north-east of the site is within cultural landscape aspect area VLFGLCL039: Vale of Glamorgan Rural Landscape, which is defined as Rural (Level 3). The "relatively unspoiled nature of the landscape is evidenced by the high number of designated Conservation Areas, testament in themselves to the gradual evolution and acceptable development over time...". It is evaluated as high, "... a relatively untrammelled and evolved surviving agricultural and historic landscape".

265 Site appraisal: the site comprises gently rolling agricultural land divided into a number of small- to medium-scale fields that are used for grazing sheep and horses. Brocastle Brook follows the north-eastern boundary of the site, which lies in an enclosed valley. The brook forms a meandering stream that has become overgrown by scrub in many places. There are areas of impeded drainage across the low-lying parts of the site within the flood plain of Brocastle Brook.

266 Brocastle Manor Care Home and the Brocastle Manor apartments form an area of development to the south-east of the site. This group of buildings and the large agricultural buildings at Brocastle Farm form a distinct cluster of development when viewed from the A48. The south-western boundary of the site is defined by the A48 which is bounded by maintained hedgerows, except for the section at the site access roundabout. Stone walling, land form and planting define the boundary between the site and the A48 roundabout in this location.

267 Within the site, fields are bounded by hedgerows and stock-proof fences, typical of the rural context. Most of the hedgerows are well established and contain standard trees and a mix of native tree and shrub species. Different levels of hedgerow management have led to a variety of hedgerows; the majority are trimmed while others are either becoming overgrown or have developed into tall hedgerows.

268 As noted earlier in paragraphs 205 and 206, the land form of the site descends northwards from a high point of 40 m AOD at the south-eastern boundary of the site, and the steepest gradients are to be found generally in the south-eastern half of the site, along the eastern boundary, and in discrete patches throughout the site.

269 Run-off from the site is drained via field boundary drainage ditches. Low-lying land along Brocastle Brook is waterlogged because of impeded drainage and in some areas compaction by livestock. Damp ground and flushes also occur on elevated land away from Brocastle Brook. These appear to have associated ground water springs, potentially resulting from zones of variable permeability within the underlying geology of limestone and shale.

270 There are two public rights of way within the site boundary. Footpath 19, crosses the northern part of the site from the A48 to Brocastle Brook. Footpath 4 extends from footpath 19 towards Waterton before heading west towards the A48, and beyond the western boundary of the site. Footpath 19 proceeds from the site boundary in a north-east direction towards Treoes, and to the south-west to Corntown.

271 Published landscape design guidance: Landscape working for Bridgend County Borough[23] provides a series of design guidelines for different development types and land uses, although these guidelines are not adopted as supplementary planning guidance (SPG). Design Brief 13 (DB 13), Brocastle Farm, relates to the north-western part of the site. The guidelines suggest the retention of existing vegetation and the creation of wildlife corridors along existing hedgerows. In response to the rural context of the site it is proposed that "buildings and infrastructure should be contained within a strong landscape infrastructure...". The importance of existing trees and tree planting within new development is reflected in SPG 7: Trees and Development[24].

272 Although the site falls outside the area administered by The Vale of Glamorgan Council, the authority boundary forms the majority of the site boundary. The immediate setting of the site includes both the rural Vale of Glamorgan and the urban area of Bridgend. Consideration has been given, therefore, to published design guidelines prepared by The Vale of Glamorgan Council, most notably SPG: Design in the landscape[25]. The SPG seeks to "provide practical advice and guidance on how design issues affecting the landscape are best addressed in new development proposals".

273 Several of the design guidelines within the SPG are of relevance to the site and the proposed development:

- DG1 sustainable development
- DG6 roads - urban
- DG8 industrial and commercial sites
- DG11 rivers - management and integration of development
- DG12 - urban fringe; DG16 woodlands and hedgerows
- DG17 design and management for nature conservation
- DG20 palette of materials hard - rural vale
- DG22 palette of materials: planting - general guidance.

[23] **Landscapes Working for Bridgend County Borough - Design Guidelines Volume 2**, Bridgend County Borough Council, 1997.

[24] **Supplementary planning guidance 7: Trees and Development**, Bridgend County Borough Council, 10 January 2008.

[25] **Unitary Development Plan 1996-2011, Supplementary Planning Guidance - Design in the Landscape**, The Vale of Glamorgan Council, 2006.

274 DG8 industrial and commercial sites, includes a number of recommendations that are specifically relevant to the type of development proposed. It aims to minimise the impact of the development on the wider landscape and enhance the nature conservation value of the site. It supports the efficient use of land and high densities, while ensuring an effective landscape infrastructure.

275 **Visual amenity**: Figure 11 illustrates the features affecting the visibility of the site. The pattern of built development and extent of woodland and other vegetation significantly reduce the extent of the area from which the site is visible as these obscure or filter potential views.

276 The site is visible from the Brocastle Brook valley side slopes and higher ground to the north-east of the site, from minor roads and the distant settlement of St Mary Hill. However, views of the site from these areas occur only where viewpoints are elevated over roadside boundary hedgerows and hedgebanks, or where there are gaps in hedgerows and field gates. The site is a distant element in Appraisal photograph 1 below, taken from St Mary Hill, set within a rural landscape of fields and woodland. Existing vegetation within and adjacent to the site forms part of the wider field pattern. Large industrial buildings at Waterton provide a clear distinction between urban and rural due to their scale and colour.

277 Appraisal photograph 2, on page 30, taken from the minor road between Brocastle Barn and Ton Tŷ-du is approximately 0.8 km away from the site. The eastern part of the site is visible in the middle distance, extending beyond the Brocastle Manor Care Home. Vegetation within the site boundary is not prominent in this view. Mature trees at Brocastle Manor Care Home and along Brocastle Brook contribute to the vegetation pattern.

278 There are views of the site from the south, including near views from the A48 where it passes the site. Corntown Road (B4524) offers relatively near elevated views of the site where there are gaps in roadside boundary hedgerows, as shown in Appraisal photograph 3 on page 30. Hedgerows along the site boundary and within the site subdivide the land within the site in this view, reducing its apparent scale. The tall hedgerow extending from The Paddocks towards the north-east clearly divides the site and provides screening for part of the site to the north.

279 The site is visible from the A48 to the south-east at a high point near the junction of the minor road to Colwinston. Appraisal photograph 4, on page 30, illustrates the type of view available, which is towards the urban area of Bridgend. Mature trees at Brocastle Manor Care Home and along Brocastle Brook are important screening elements that obscure the near part of the site from view. The western part of the site is visible beyond, adjacent to the large buildings within the Waterton Industrial Estate.

Note: See **Figure 11** for location of viewpoints of appraisal photographs.

Appraisal photograph 1: looking south-west towards the site from St Mary Hill

Note See **Figure 11** for location of viewpoints of appraisal photographs.

Appraisal photograph 2:
looking north-west towards the site from near Ton Ty-du

Appraisal photograph 3:
looking north-east towards the site from Corntown Road

Appraisal photograph 4:
looking north-west towards the site from Crack Hill

Appraisal photograph 5:
looking south towards the site from Brackla

280 Views from the urban area of Bridgend are generally obscured by intervening development. Large buildings within the Waterton Industrial Estate obscure potential views from low-lying areas along the Ewenny Valley and the A473. Views are available from higher ground within the urban area at Brackla Hill, subject to intervening buildings. For example, in **Appraisal photograph 5**, opposite, the site is visible on rising land beyond the Waterton Industrial Estate towards the A48. Existing hedgerows crossing the site help to subdivide the site and reduce its apparent scale.

281 **Conclusion**: this appraisal of landscape and visual amenity has identified the following landscape issues to inform the development of the proposed master plan for the site:

- The LANDMAP assessment for the site and its landscape context recommend that hedgerows are retained and enhanced. Additional broadleaved woodland is also proposed.
- Hedgerows within the site contribute to the field pattern of the wider landscape and the biodiversity of the site. These offer key habitat linkages through the site.
- There are views of the site from publicly accessible locations, including receptors which would be sensitive to change. The master plan will include measures to minimise potential adverse visual impacts.
- Two public rights of way cross the site. The master plan will retain these routes, where possible, and may offer additional routes through the site to improve amenity value.
- Planting proposed within the site will be indigenous species and local provenance where practicable.
- The landscape and visual amenity of the residential care home at Brocastle Manor will be an important consideration.
- The A48 is a key frontage to the site where the design approach should reflect the rural context of the site.
- Land form within the site is a constraint to large-scale development. Large scale earthworks would be out of character with the landscape context and, therefore, should be avoided where possible.
- **SPG 7: Trees and Development** "offers advice about looking after existing trees, and planting new trees, on and adjacent to development sites. It sets out advice notes to help developers and their designers to take trees into account in drawing up their proposals. It explains what the County Borough Council expects with regard to tree planting and new development".

Infrastructure

Access

282 **Access from the A48**: since the 1997 feasibility study, a roundabout has been constructed on the A48 south-east of The Paddocks (see **Figure 12**) which provides access to Brocastle Manor Care Home and to the Brocastle development site. The roundabout spur for the latter is flared to achieve access and egress carriageway widths of approximately 7 m. Once combined, the carriageway width would be approximately 9.5 m, sufficient to accommodate a two-lane carriageway into the site, with the potential to incorporate a third lane. There is no alternative vehicular access route to the site. The roundabout includes a segregated pedestrian/cycle way.

283 Improvements have been made to roundabouts on the A48 at Waterton and at the retail park. Also, a new roundabout has been constructed at Broadlands. These were all proposed in the 1997 feasibility study to improve capacity with the development of the Brocastle site in mind.

284 **Public transport**: the A48 is part of the bus route (Vale of Glamorgan service) between Cardiff and Bridgend. There are two bus stops on this route past the site: one near The Paddocks; and the other to the south-west of the Brocastle Manor Apartments.

Existing services

285 Known existing services are indicated on Figure 13.

Foul sewerage

286 A 225 mm foul sewer has been installed since the 1997 feasibility study running from the Brocastle Manor Care Home along the boundary of the buffer zone, outside the development area of the site. This sewer increases to 300 mm diameter in the north-east corner before again following the line of the buffer zone to a new pump station in the north-west corner, outside the site boundary. A section of this sewer is marked as private on the apparatus plan provided by Dŵr Cymru Welsh Water. From the pump station, a 200 mm diameter rising main conveys flows towards Waterton roundabout. This rising main has not yet been adopted. Based on the assumption that the proposed development will be of a similar nature to that originally outlined in the Brocastle Farm, Bridgend Feasibility Study, there should be sufficient capacity in the sewer to accept foul flows from the developed site without attenuation.

Surface water drainage

287 Surface water drainage within the site currently exists as a number of ditches. The most prominent ditch from The Paddocks to Brocastle Brook has been filled with large stones and boulders to form a drainage feature. This ditch outfalls to a small pond via a 100 mm diameter pipe before flows enter the brook. The natural course is eventual outfall to the Ewenny River, which is known to have suffered from flooding problems in the past. Flows from site are likely to be restricted to a greenfield runoff, which would be defined by the EAW.

288 The Environment Agency's flood map, above right, suggests that the area of the site likely to suffer in extreme flood events would be limited to land in the environmental buffer zone. There is a 1 m batter down from the line of the buffer zone boundary, effectively creating a flood defence barrier along the eastern edge of the site. The concrete channel through the Ford factory will need further investigation.

289 The soil is not very permeable and it is expected that SuDS would be incorporated in the form of balancing ponds, which are likely to be located in the eastern and north-eastern extremities of the site. There may be scope to position these within the environmental buffer zone.

Utilities

290 **Electricity**: an 11 kV overhead cable has been installed since the 1997 feasibility study from Oernant bungalow to the Brocastle Manor Care Home. An underground cable also follows the access road to the care home from the new roundabout, where a pole mounted earth device has been erected.

291 The Brocastle Farm, Bridgend: Feasibility Study suggests that two 11 kV cables would be required to service the site[26]. If an additional service is still required,

[26] **Brocastle Farm, Bridgend: Feasibility Study**, op cit, page 19.

consideration should be given to the lead-in time for the installation of such a service which could be twelve to fifteen months.

292 Gas: there are no gas services within the site or in the A48, adjacent to the site. The Brocastle Farm, Bridgend: Feasibility Study notes that the existing gas transmission main supplying Bridgend had reached its design capacity[27].

293 Potable water: there is a 315 mm diameter higher performance polyethylene (HPPE) potable water along the A48, from the roundabout at Waterton Cross in the north-west to the new roundabout south-east of The Paddocks. There is a dedicated spur (including an isolation valve arrangement and fire hydrant) beneath the northern roundabout arm serving the Brocastle site. The main is expected to have sufficient capacity to serve the proposed development of the Brocastle site.

294 Telecommunications: there are no services crossing the site.

295 There are numerous services along either side of the A48, further details of which are given in the Brocastle Farm, Bridgend: Feasibility Study[28].

Constraints and opportunities

296 From the above, the key considerations to the design of the framework master plan may be summarised as follows.

- The topography and geology of the site are such that development would need to take place on a number of plateaux at levels that, as far as possible, achieve a cut-and-fill balance.
- There is the potential to conserve/improve habitats on the site, and to enhance biodiversity through the introduction of appropriate new soft landscape.
- The proposed office and industrial buildings will vary in size and their integration into the landscape through their disposition, design and mitigation is both a constraint and opportunity.
- The vehicular access point to the site is constructed and, therefore, fixed.
- The Welsh Assembly Government's policy is that the new buildings on the site would promote energy efficiency and environmental sustainability, in line with its own proposed building regulations which will require 'zero carbon' new build from 2013.

[27] Ibid.
[28] Ibid, page 19.

3 Planning policy framework

Introduction

301 The local planning authority for the Brocastle site is the Bridgend County Borough Council. Adjacent land to the north-east and south-west - including the A48, which runs to the front of the site - falls within the area administered by The Vale of Glamorgan Council, which is the highway authority for the A48.

302 Any application for planning permission would be considered against the planning policy framework for the area, which comprises:

- the current development plan;
- the national spatial plan;
- the emerging development plan;
- national planning policy guidance; and
- supplementary planning guidance.

Planning designations

Statutory designations

303 The site is not located in an area of environmental restraint such as a National Park or Area of Outstanding Natural Beauty. The site does not contain any buildings listed for their architectural or historic interest, or scheduled monuments, and is not located in a designated conservation area. The site does not contain any trees protected by a Tree Preservation Order, but there is a large area of protected trees to the south-east of the site: see Figure 14.

304 None of the site comprises open access land under the Countryside and Rights of Way Act 2000. The site is crossed by two public rights of way:

- Footpath 19 Coychurch Lower, which runs from the A48 in a north-easterly direction across the site to the Brocastle Brook; and

- Footpath 18 Coychurch Lower, which runs north-westwards from Footpath 19 to the northern site boundary.

304 The site does not contain or form part of an area that is statutorily protected for its nature conservation value. The nearest such sites are the Sites of Special Scientific Interest (SSSIs) at Coedymwstwr Woods to the north, Ewenny and Pant Quarries to the west and Old Castle Down, Ewenny and Clemenstone Meadows, Wick, to the south-west.

Non-statutory designations

305 The site does not contain or form part of a landscape, park or garden identified in the non-statutory Register of Landscapes, Parks and Gardens of Special Historic Interest in Wales[29]. The nearest such sites are:

- Parks and gardens: Ewenny Priory, Merthyr Mawr House and Tythegston Court; and
- Landscapes: Merthyr Mawr, Kenfig & Margam Burrows.

306 A small part of the site, bordering the Brocastle Brook, is identified as lying within a flood risk Zone C2 on the Development Advice Map (Sheet SS97NW, 2009) published to accompany Technical Advice Note 15: Development and Flood Risk[30].

[29] **Register of Landscape, Parks and Gardens of Special Historic Interest in Wales**, Cadw, Countryside Council for Wales, ICOMOS, 1998, 2000, 2001.

[30] **Technical Advice Note 15: Development and Flood Risk**, Welsh Assembly Government, July 2004.

307 As noted in paragraph 209 above, the site comprises land in Grades 3B and 4 of the ALC[31] system, which grades do not constitute "best and most versatile agricultural land" for the purposes of planning policy. Hence, there is no constraint to development on the basis of agricultural land quality.

Current development plan

308 The statutory development plan for the area in which the site is located is the Bridgend Unitary Development Plan (UDP), which was adopted by Bridgend County Borough Council on 12 May 2005. The UDP sets out the Council's policies and proposals for the area until 2016.

309 On the UDP Proposals Map, the site is shown to lie within the settlement boundary for Bridgend and forms part of a larger area of land that is subject to two specific policies: E2(3) and T14(9).

310 Policy E2 identifies three existing industrial estates (Brackla, Bridgend, Waterton) and one new site (Brocastle) as 'key' employment sites, all with specified uses B1, B2 and B8. The policy states that these are intended "primarily for large scale investment" and, in the case of Brocastle, the policy states:

"The development ...will be in accordance with a development brief and/or appropriate planning/highway agreement. These must be agreed with the County Borough Council before development commences."

311 The supporting text to Policy E2 states:

[31] Agricultural land classification survey carried out by Kernon Countryside Consultants, 1997.

"5.5.5 The 'Key' employment sites identified by Policy E2 are characterised and distinguished from other employment sites by their direct access to the strategic road network and are in excess of 50 hectares. They have the capacity to accommodate large-scale single users for the full range of B1, B2 and B8 employment activities, and are generally well located to centres of population. These sites represent a major asset to the County Borough in terms of existing job capacity and their potential to attract further major investment projects, generating significant numbers of additional jobs.

"5.5.6 ...The Brocastle site is an almost entirely undeveloped site, carried forward from the Ogwr Borough Local Plan, where it was only partly allocated for employment purposes. Brocastle is considered to represent the County Borough Council's greatest asset in terms of attracting large-scale investment, providing in excess of 52 hectares of land. Brocastle will be developed in accordance with an approved development brief."

312 Policy T14 states that major improvements to the highway network will be undertaken at a number of locations, including the A48/A473 Brocastle Link. The relevant supporting text to Policy T14 states:

"6.9.23 Development of the Brocastle, and Waterton Industrial sites for employment purposes, i.e. between the existing car engine plant and the A48, will produce increased traffic movements at the roundabout junction of the A48 with the A473 at Waterton as traffic travels north eastward to the M4 motorway via junction 35. A redesign and signalling of the Waterton Roundabout would only provide a partial solution to this problem, whereas, the sites can be most effectively accessed by a new road link which will proceed in a generally north eastward direction from a new junction on the A48 to the southern-most roundabout within the Waterton Industrial estate and then northwards with associated improvements to the Coychurch roundabout to join the A473 to the motorway. The nature and extent of highway works will be determined by a Transport Assessment. Part of the line of the proposed link road will lie within the Vale of Glamorgan Council area and their consent and co-operation will be sought to expedite its development.

"6.9.24 Developers of the Brocastle, and Waterton Industrial sites (between the car engine plant and the A48) will therefore be required to enter into appropriate planning obligations/agreements with the Council, and the Vale of Glamorgan Council, to ensure that the necessary highway works and improvements will be provided to serve these developments. These works will be entirely funded by those developments, whose piecemeal, or other expansion of existing, development of either site will not be permitted."

313 It should be noted that **The Vale of Glamorgan Adopted Unitary Development Plan** [32] makes no provision for this link road, which would need to cross land that is identified in that **UDP** as countryside.

314 Other **UDP** policies may be relevant to the planning of the development and the design of the master plan, notably:

- Policy 6 - transportation
- Policy 20 - energy and utilities
- Policy EV20 - the general protection of biodiversity
- Policy EV21 - the protection/maintenance of broad-leaved trees, etc
- Policy EV27 - reduction of noise
- Policy EV28 - unacceptable noise
- Policy EV29 - external lighting of new development
- Policy EV20 - air quality

[32] Adopted by The Vale of Glamorgan Council on 18 April 2005.

- Policy EV45 - new development design
- Policy EV46 - crime prevention
- Policy EV47 - accessibility
- Policy E7 - protection of identified employment sites
- Policy E13 - polluting industries
- Policy E14 - hazardous industries
- Policy T2 - sustainable improvements to existing highways
- Policy T12 - development affecting public rights of way
- Policy RC12 - general provision of cycle routes
- Policy U1 - the efficient use of energy.

National spatial plan

315 People, Places, Futures: The Wales Spatial Plan[33] (WSP) is a statutory plan that sets out the Welsh Ministers' policies in relation to the development and use of land in Wales over a twenty year period.

316 The Ministerial Foreword emphasises the importance of the WSP, helping to deliver the Government's priorities set out in One Wales[34] and providing an overarching and integration tool for Wales. The WSP defines six spatial plan areas and strategies. Bridgend (including the Brocastle site) lies within the South East Wales - Capital Network.

317 For this spatial area, the heart of the WSP vision is "...a network of strong, sustainable communities spreading prosperity from the two major centres of Cardiff and Newport to valleys across the region"[35]. Bridgend is identified as one of fourteen key settlements in this spatial area, in which the focus is:

[33] **People, Places, Futures: The Wales Spatial plan Update 2008**, Welsh Assembly Government, 2008.

[34] **One Wales: A Progressive Agenda for the Government of Wales**, Labour Party and Plaid Cymru, 27 June 2007.

[35] **People, Places, Futures: The Wales Spatial plan Update 2008**, op cit, page 127.

"... to create affordable and attractive places to work, live and visit. Key settlements will provide the central framework around which high capacity sustainable transport links will be developed. A wider range of facilities and services, which add to employment opportunities, should be delivered locally within the key settlements to reduce the overall need to travel"[36].

318 Bridgend is seen as having a particular role to play in linking with the Swansea Bay city region.

Emerging development plan

319 In December 2005, Bridgend County Borough Council started preparing the statutory Bridgend Local Development Plan 2006-2021 (LDP) which, when adopted, will supersede and replace the UDP. Under the current Delivery Agreement (revised November 2010), the LDP is scheduled to be adopted in early 2013. The LDP is expected to be placed on deposit in March 2011, after which the plan will be subject to independent examination by an inspector.

320 At an early stage in preparing the LDP (November 2006 to January 2007), the Council invited landowners and prospective developers to notify the Council of candidate sites that were being promoted for development. At that stage, the Welsh Assembly Government made a candidate site submission, promoting the site as a key employment site: representation number 825.B2[37].

321 A further representation was made by Bridgend County Borough Council, seeking the allocation of land within the site, and within the Waterton Industrial Estate, for the A48/A473 Brocastle Link road: representation number 859.B34[38]. The Council has

[36] Ibid, page 128.

[37] The representation was made by Mr Chris Delve of the (former) Department of Enterprise Innovation and Networks.

[38] The representation was made by Mr John Duddridge, Assistant Director (Transport & Engineering).

made a similar candidate site submission for the Vale of Glamorgan Local Development Plan, in respect of the intervening land (site reference 2241/CS.2), and The Vale of Glamorgan Council has asked for further supporting evidence to justify the need for the proposed road[39].

322 In December 2008, the Council published, for consultation, the Bridgend Local Development Plan 2006-2021 Pre-Deposit Proposals. This document sets out the Council's strategic priorities and broad locations for development in the period 2011 to 2026 and contains the vision, objectives and key policies that the Council wishes to pursue.

323 The LDP vision is to see the Borough "...transformed to become a sustainable, safe, healthy and inclusive network of communities comprising strong, inter-dependent and connected settlements with improved quality of life and opportunities for all people living, working, visiting and relaxing in the area"[40]. One of the four catalysts for this transformation is identified as "... a successful regional employment, commercial and service centre in Bridgend".

324 The LDP identifies and protects some 160 to 170 hectares of employment land, of which the Brocastle site forms a significant proportion (approximately 30%)[41]. Strategic Policy SP10[42] allocates four strategic sites for employment purposes - Brocastle, Island Farm, Pencoed Technology Park and Ty Draw Farm, North Cornelly - all of which are identified on the Strategic Diagram, on which Brocastle is also identified as part of a "Key Strategic Regeneration Growth Area". The policy states the rationale for the allocation as follows:

"In order to meet the varying requirements of business, and to provide access to employment and training for all residents, a range and choice of sites will be retained and protected for employment (B1, B2 and B8 uses) purposes".

325 The LDP designates a portfolio of high-quality, strategic employment sites "...to assist the local economy by providing opportunities for investment and to enable employers to diversify and grow their own businesses"[43]. For the Brocastle site, the report states:

"The Brocastle site has the potential for large-scale manufacturing and distribution for major inward investment and local business expansion. This 47 hectare site is located on the A48 south of the existing Ford engine plant and Lidl distribution depot. A revised master plan is being prepared to provide a variety of large development sites. Key to accessing this site from the Motorway will be the delivery of the Brocastle Link road, connecting the A48 with the A473 (through the Vale of Glamorgan). Also, this road, improves links for the north and centre of the County Borough with Cardiff Wales airport and the St Athan development"[44].

326 The route of the proposed Brocastle Link road, which impinges on the site, is shown on the Strategic Diagram and is supported by Strategic Policy SP3.

National planning policy guidance

327 Current national planning policy guidance is found principally in Planning Policy Wales[45] (PPW), which and is supported by the series of Technical Advice Notes (TANs) issued from time to time by the Welsh Assembly Government. Various

[39] Report of the Director of Environmental and Economic Regeneration to the Cabinet meeting of The Vale of Glamorgan Council held on 25 March 2009.

[40] **Bridgend Local Development Plan 2006-2021 Pre-Deposit Proposals**, section 6.1

[41] Ibid, paragraph 9.2.42 and Table 9.2

[42] Ibid, paragraph 9.3.39.

[43] Ibid, paragraph 9.2.15.

[44] Ibid, paragraph 9.2.15.

[45] **Planning Policy Wales**, Welsh Assembly Government, Edition 3, July 2010.

government circulars issued by the Welsh Assembly Government and, previously, by the Welsh Office may also be relevant in certain cases.

328 PPW confirms the Welsh Assembly Government's commitment to sustainable development, including a sustainable economy[46]. Section 4.4 of PPW outlines the key policy objectives which, in the context of the proposed development, may be paraphrased as:

- Contributing to climate protection
- Minimising the risks posed by development on or adjacent to land liable to flooding
- Contributing to the protection and improvement of the environment
- Maximising the use of renewable resources
- Promoting access to employment
- Fostering improvements to public transport and services
- Promoting quality, lasting, environmentally-sound and flexible employment opportunities
- Supporting initiative and innovation so as to enhance the economic success of urban and rural areas and helping businesses to maximise their competitiveness
- Respecting and encouraging diversity in the local economy
- Promoting a greener economy.

329 PPW, amongst other things: states a preference for the re-use of previously developed land; seeks to conserve the best and most versatile agricultural land; promotes sustainability through good design; and commits to building a modern economy. It states that the Welsh Assembly Government's objectives for economic development are, in summary, to:

- enhance the economic success of areas
- support initiative and avoid placing unnecessary burdens on enterprise
- respect and encourage diversity in the local economy
- promote the exploitation of new technologies which can provide new opportunities
- ensure that development for enterprise and employment uses is in line with sustainability principles, respecting the local environment in its location, scale and design[47].

330 PPW promotes good design, including inclusive design and the efficient use of resources. Applications for planning permission must be accompanied by design and access statements, which deal with environmental sustainability, movement to, from and within the development, character and community safety. More detailed information and guidance is given in TAN 12: Design[48].

331 PPW advocates climate-responsive developments that mitigate the causes of climate change by minimising carbon and other greenhouse gas emissions, associated with their design, construction, use and eventual demolition. It stipulates that applications for planning permission for non-residential development with a floorspace of 1,000 m^2 or more, or a site area of one hectare or more, are expected to meet the BRE Environmental Assessment Method (BREEAM) "Very Good" standard and achieve the mandatory credits for "Excellent" under issue Ene 1 - Reduction of CO_2 emissions. More detailed information and guidance is given in draft TAN 22: Planning for Sustainable Buildings[49].

332 PPW supports the role of transport assessments (TAs) in anticipating the impacts of development and expects that TAs will be required for developments above

[46] Ibid, paragraph 4.1.5.

[47] Ibid, paragraph 7.1.5.

[48] **Technical Advice Note 12: Design**, Welsh Assembly Government, June 2009.

[49] **Technical Advice Note 22: Planning for Sustainable Buildings**, Welsh Assembly Government, May 2009.

the following gross floor area thresholds: business 2,500 m²; industry 5,000 m²; distribution and warehousing 10,000 m². More detailed information and guidance on TAs and travel plans is given in **TAN 18: Transport**, March 2007.

333 Welsh Office Circular 11/99 **Environmental Impact Assessment** advises on those circumstances in which environmental impact assessment (EIA) may be required in accordance with the **Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999** (SI 1999 No. 293). Previous proposals for the site were the subject of EIA[50] and, subject to any screening opinion that may be given by the local planning authority, future planning applications may also require EIA.

Development brief

334 The Council has produced development briefs for several of the major development sites in its area, but not for the Brocastle site.

Supplementary planning guidance

335 SPG produced by the Council provides additional policy advice. Of SPG adopted to date by the Council, only **SPG 7: Trees and Development**, referred to in paragraph 271 above, is relevant.

Planning history

336 The planning history of the site will be a material planning consideration in the assessment of any new planning application.

[50] **Brocastle, Bridgend: Environmental Statement**, op cit.

337 Outline planning permission for business and industrial development (Classes B1, B2 and B8) and a hotel on the Brocastle site - a larger site than that now under review - was granted by Bridgend County Borough Council on 9 and 21 April 1998 (applications P/97/929/OUT and P/98/25/OUT), subject to conditions, including the standard time condition requiring applications for the approval of reserved matters to be submitted within three years. Under condition 1 of outline planning permission P/97/929/OUT development of the site was restricted as follows:

"No fragmentation of the development beyond that shown in development concept B(15) of the ES [Environmental Statement]"

338 The drawing referred to shows the site (as it then was) developed as four large plots.

339 The period within which reserved matters' applications may be made pursuant to the outline permissions was extended initially to 2004 (applications P/01/139/RLX and P/01/140/RLX approved on 18 April 2001) and subsequently to 2007 (applications P/04/165/RLX and P/04/166/RLX approved on 2 April 2004). From enquiries made[51], it is understood that no further applications were made by the Welsh Assembly Government to extend the period and, hence, further development on the site will necessitate a new application for planning permission.

340 Access into the site, from the A48, has been constructed pursuant to separate full planning permissions granted by Bridgend County Borough Council (P/97/00930/FUL approved on 9 April 1998 and P/03/00183/RLX approved on 26 March 2003) and The Vale of Glamorgan Council (P/97/01104/FUL approved on 17 April 1997 and 03/00182/FUL approved on 4 April 2003).

[51] Mr Chris Delve of the (former) Department for Enterprise, Innovation and Networks.

Matters for further consideration

341 This planning policy appraisal has identified the following matters that will need to be considered as part of the process of producing a master plan for the Brocastle site:

- Further development on the site will necessitate a new application for planning permission.
- Relevant national and local planning policies will need to be taken into account in designing the master plan and preparing the documentation to support a future planning application.
- Depending upon the commercial brief for the proposed development, the development plan restriction (UDP Policy E2(3)) in respect of the site being identified "primarily for large scale investment" will need to be discussed with the Council.
- The development plan requirement for a development brief to be approved by the Council before development is commenced will need to be discussed with the Council and, subject to the outcome of that discussion, a mechanism for producing and approving that brief will need to be agreed.
- The UDP and LDP policies for the proposed Brocastle Link road and their implications in terms of loss of developable area, off-site land acquisition, cost, acceptability to The Vale of Glamorgan Council will need to be considered and, if appropriate, challenged.
- Representations may need to be made on the LDP when it is on deposit, which is expected to be in March 2011.

4 Master plan proposals

The **vision** for the Brocastle site is to be an exemplar strategic employment site that promotes enterprise and investment through the provision of high-quality buildings and places within a rich landscape setting, with the principles of sustainable design at the core of the development.

Right Extract from **Figure 15 Concept** (not to scale).

401 **Buildings within a field pattern**: conceptually, the master plan seeks to integrate a series of large-scale buildings into the historic field pattern, with as little disturbance as possible: see Figure 15.

The master plan

402 The master-plan framework is shown on Figure 16 and the illustrative master plan on Figure 17. The design is based on the following six principles:

- Integrate the buildings into the landscape and topographic context to minimise their visual impact.
- Retain High-Local value ecological assets (ancient/species-rich hedgerows) wherever possible and introduce new planting to support the concept of **buildings within a field pattern**.
- Locate the larger buildings on the lower elevations of the site to minimise their potential visual impact.
- Orientate the buildings to support the low carbon strategy (see section 5), generally in an east-west direction.
- Locate the smaller-scale office buildings along the western, A48 frontage to promote a positive perception of the site.
- Allow for the future Brocastle Link road within the road infrastructure design.

403 The layout derived from the above principles indicates buildings disposed either side of the main access road from the roundabout on the A48 in a generally east-west direction. However, the precise orientation of each building is altered subtly to relate to existing, nearby features to give an informal layout, in harmony with the topography and landscape.

404 The largest (industrial) building, unit 01, is located at the northern, lowest end of the site to minimise its visual impact, exploit the shallower slopes in that area and to allow for the possibility of a goods rail access (via the Ford site, subject to agreement).

405 The office buildings, which would take a courtyard form, are located along the western edge of the site as these are thought to be more likely than the industrial buildings to create a positive frontage to the A48.

Accommodation

406 In parallel with the master-planning process, the Welsh Assembly Government commissioned from the property consultant, King Sturge, a review of the commercial property market position of the Brocastle site which recommended the following development mix:

- one large plateau of 8 hectares to 20 hectares that could accommodate a large occupier of 9,290 m^2 to 23,225 m^2 in the medium term; and
- a number of secondary plateaux of 1 to 2 hectares for occupiers requiring a minimum floor space of 2,323 m^2 to 4,645 m^2 [52].

407 In accordance with the demand assessment, and following further consultation with King Sturge, the master plan envisages the provision of the following buildings, uses and gross internal floor areas:

- **Unit 01**: Industry, floor space 25,548 m^2
- **Unit 02**: Office, floor space 4,645 m^2

[52] **Market review letter** from Lee Lapham, Partner, King Sturge to Alan Driscoll, Department for the Economy and Transport, Welsh Assembly Government, dated 18 March 2010, ref: LL/sw.

Left Extract from **Figure 16 Framework** (not to scale).

Left Extract from **Figure 17 Illustrative master plan** (not to scale).

- **Unit 03**: Industry, floor space 10,219 m²
- **Unit 04**: Industry, floor space 5,110 m²
- **Unit 05**: Office, floor space 4,645 m²
- **Unit 06**: Office, floor space 4,645 m²
- **Unit 07**: Industry, floor space 6,642 m²
- **Unit 08**: Industry, floor space 7,664 m²
- **Unit 09**: Offices, floor space 2,323 m²
- **Campus centre**: site administration and welfare.

408 The total gross internal floor space proposed would be 71,441 m² (excluding the campus centre).

Access

Vehicular access

409 The proposed highway alignment is shown on Figure 16. A TA for the site has not yet been prepared but will be required to support an outline planning application. The results of the TA would also feed into more detailed design and to the site-wide travel plan.

410 The proposed horizontal alignment would lead from the existing roundabout on the A48 northwards to a proposed roundabout in the north-east corner of the site. From this roundabout, the highway would branch to the west, back towards the A48. The highway network has been designed to avoid removal of the existing hedgerows as far as possible.

411 The occupiers of the development plots are expected to be large-scale office or industrial buildings and, therefore, the highway has been designed to accommodate heavy goods vehicles (HGVs).

412 The current highway design shows a 7.3 m wide, two-lane carriageway. Access roads to individual plots would be suitably spaced along the main highway to avoid congestion and delays where high numbers of vehicles would be turning across the main highway. This may also require a central holding lane to allow through traffic to continue. This additional lane has not been included on the master plan at this stage as the need for it would be determined by the results of the TA.

413 The vertical alignment has been designed to optimise the cut-and-fill balance, while allowing individual access roads to connect to the main highway alignment at reasonable gradients.

414 The roundabout in the north-east corner of the site would be sized to safely accommodate HGVs and to offer sufficient capacity to avoid delays to circulating traffic, and would have a minimum inscribed circle diameter of 40 m. Its location would also allow for the future construction of the Brocastle Link road (referred to earlier in paragraph 312), the indicative route for which within the Brocastle site is indicated on Figure 15 and exiting the site at approximately the same location as shown in the UDP.

Pedestrians and cyclists

415 The public rights of way through the site would be retained, although Footpath 19 would be diverted to the route shown on Figure 16, with the entry to the site from the A48 repositioned (possibly as a combined foot/cycle way) to coordinate with the existing bus stop location near The Paddocks. The footpaths would be clearly demarcated with suitable crossing points where the inner site highway is crossed.

416 A footway of minimum 2 m width would be provided on each side of the inner site highway alignment.

Right Extract from **Figure 18 Landscape strategy** (not to scale).

417 Where possible, footpaths between parking areas and buildings would be constructed at a grade shallower than 5% to avoid unnecessarily steep ramps.

418 To promote the use of sustainable transport modes, the master plan indicates a campus centre, which would provide lockers, shower and changing facilities for cyclists.

419 There is potential for the highway alignment within the site to be used as a bus route, particularly if the Brocastle Link is constructed. There is sufficient room between development plots and the access road to allow for localised widening of the highway in places to provide stopping places for buses, should the route be adopted.

Landscape

Landscape objectives

420 The primary landscape objective is to minimise adverse landscape and visual impacts while providing an appropriate setting for the proposed development. A number of secondary design objectives have guided the preparation of the landscape strategy. The principles informing the development of the landscape strategy are to:

- mitigate potential adverse landscape impacts and maximise landscape enhancements resulting from the proposed development;
- incorporate existing habitats and create new habitats within a 'green' framework for the site, within which the development would sit;
- retain and enhance existing field boundary hedgerows and mature trees where possible to reduce the impact of the development on the local landscape and create wildlife corridors;
- supplement existing vegetation with native-species plantings to reinforce the vegetation pattern and subdivide the site to help to integrate the proposed development into its landscape setting;
- soften the appearance of embankment and cutting slopes through sensitive manipulation of land form;
- create an attractive, distinctive and legible landscape for future users and visitors to the site;
- mitigate potential visual impacts associated with large industrial buildings;
- reflect the sequence of proposed buildings along the A48 with native-species plantings to allow views of key frontages from the road;
- realign the existing public footpath 19 to provide a link to a bus stop located on the A48;
- assist in achieving sustainability objectives, for example increasing biodiversity and incorporating SuDS where practicable; and
- ensure that all landscape proposals are consistent with, and further the objectives of, the Local Biodiversity Action Plan[53].

Landscape proposals

421 The landscape design objectives are addressed in part through the retention and improvement of existing site features, identified during the landscape appraisal. These existing features are landscape assets that are a positive addition to the green infrastructure of the proposed development. They offer an opportunity to give the landscape strategy a head start in relation to achieving the design objectives. Furthermore, where existing landscape features or character outside the site boundary can be incorporated or reflected within the landscape proposals, they can assist in integrating the development site into its setting. This approach contributes to the effective mitigation of potential landscape and visual impacts allowing buildings to be contained within a strong landscape infrastructure[54].

[53] **Local Biodiversity Action Plan for Bridgend County Borough**, Bridgend County Borough Council and David Clements Ecology on behalf of the Bridgend Biodiversity Partnership, January 2002.

[54] **Landscapes Working for Bridgend County Borough - Design Guidelines Volume 2**, op cit

422 The landscape proposals retain features and patterns identified during the landscape appraisal and LANDMAP [55] study of the area, and include:

- existing mature hedgerows within the site and peripheral parts of the site beyond the developed area;
- mature hedgerow trees along existing hedgerows; and
- ecological enhancement corridor along Brocastle Brook.

423 The landscape strategy includes structure planting to supplement existing vegetation in key areas, for example, to reduce the massing of the industrial buildings in views of the site from the north-west. Native tree and shrub species and local provenance plant material would be used for the majority of planting proposed within the site.

424 Grassland areas within the site would form a connected network of spaces incorporating species-rich grassland, wildflower meadows and wetlands. These areas would complement the ecological enhancement corridor along Brocastle Brook.

425 The landscape treatment for the main access roads into the site from the south would aim to create an attractive route and form an appropriate transition between the large-scale buildings and the highway.

426 Proposed structure planting and avenue tree planting are concentrated along the access road boundary for maximum effect. A continuous landscape strip would maximise the amenity benefit from the relatively small areas of planting that are possible within the site. Limited use of shrub planting could be included within this zone to soften the impact of buildings and car parking areas.

[55] Countryside Council for Wales's LANDMAP website: http://landmap.ccw.gov.uk/map/Map.aspx.

427 The visual impact of the larger industrial buildings, particularly units 07 and 08 located on the more elevated parts of the site, would be mitigated through the retention and enhancement of the tall hedgerow across the site, which passes to the north of these units. It is proposed to supplement this hedgerow with additional native-species plantings to provide visual separation of units 07 and 08 from units 03 and 04 located to the north in views from the north-west.

Planting proposals

428 In order to ensure that native planting is compatible with the local gene pool of the area, all native woody plant species, where possible, would be of local provenance as outlined in Forestry Commission Practice Note 8 [56]. All herbaceous planting is to be sourced from Flora locale's List of wild flora suppliers: The British Isles and Ireland [57].

Biodiversity enhancement

429 The primary biodiversity objectives are to:

- minimise adverse impacts on existing biodiversity interest;
- enhance existing features, where possible;
- create new habitats that are not currently present within the site; and
- promote habitat connectivity within the site and to the adjacent countryside.

430 All biodiversity enhancement proposals are consistent with, and further the objectives of, the Local Biodiversity Action Plan [58]. The principles informing the development of the biodiversity proposals are as follows.

[56] **Practice Note 8: Using Local Stock for Planting Native Trees and Shrubs**, op cit.

[57] **List of wild flora suppliers: The British Isles and Ireland**, Flora locale: http://www.floralocale.org/content.asp?did=24181.

[58] **Local Biodiversity Action Plan for Bridgend County Borough**, op cit.

431 Brocastle Brook: this would be retained within an undeveloped buffer zone at least 15 m wide which would be managed as a wildlife corridor providing a diversity of habitat niches.

432 The **proposals** for Brocastle Brook are as follows:

- The corridor of the brook would be screened along key sections by embankments and native-species plantings.
- Where possible, areas of grassland adjacent to the brook would be established at a sufficiently low elevation to flood during times of high rainfall to further increase the habitat diversity of the site. Such grassland would remain wet or damp at all seasons and would be allowed to become rank with the establishment of rushes and similar species. Maintenance would consist of, at most, a single annual cut with the removal of arisings.

433 SuDS and wetland features: permanently wet habitats would be created around the proposed attenuation ponds in association with SuDS features.

434 The **proposals** for SuDS and wetland features are as folows:

- The attenuation ponds would be constructed to a geometry that would encourage their use by wildlife and would include, for example:
  - a minimum depth of 1.5 m in the centre (to minimise the colonisation by reed and bulrush over the whole water-body and, therefore, maintenance costs);
  - a scalloped edge to increase the length of shore-line and provide sheltered embayments;
  - battered banks of varying steepness to allow varying width of marginal vegetation colonisation; and
  - the provision of islands or floating platforms for nesting waterfowl.
- A marginal fringe of native-species vegetation would be established and maintained to provide cover, shelter and breeding sites for birds and other fauna.
- SuDS would incorporate the establishment of wetland habitats such as open water, marshy grassland, reedbeds and willow/alder-scrub.

435 Hedgerows: the **proposals** for hedgerows are as follows:

- Hedgerow TN01-TN03 would be retained for most of its length length and enhanced with supplementary native-species plantings to fill gaps and to increase its ecological value. Additional native-species plantings would be made adjacent to the existing hedgerow which, when mature, would form a woodland belt providing a wide, secluded and undisturbed woodland corridor running through the site.
- Additional native-species hedgerows would be established between development plots which would provide additional wildlife resources and further enhance habitat connectivity. Where possible, these would be linked with existing off-site hedgerows to increase connectivity beyond the site into the adjacent countryside.
- An appropriate management regime would be implemented to maintain the ecological importance of all hedgerows, woodland plantings and their margins.

436 Grasslands: most of the existing grassland within the site is of little biodiversity interest. The proposed development would provide the opportunity to enhance grassland habitats by sympathetic management which would result in the establishment of vegetation having both structural and species' diversity.

437 The **proposals** for the grasslands are as follows:

- Where opportunities exist, wildflower meadows comprising native herbaceous and grass species would be created and maintained by mowing three or four times per year.

- Where possible, habitat piles of wood or rubble would be created in edge-habitats and rank, species-rich grassland would be established and maintained around them in order to greatly increase their ecological benefit, especially for small mammals, herpetiles and invertebrates. These grasslands would be managed using low intensity methods such as a single early-spring or late-summer cut.
- Some areas of grassland adjacent to hedgerows or other tall vegetation, especially where they have a sunny aspect, would be mown more frequently in order to keep them open and in full sun to provide basking habitat for reptiles and invertebrates.
- All arisings would be removed whenever mowing takes place in order to maintain/reduce soil fertility levels. Arisings would be taken off site to the council's composting facility.

438 **Existing rock soakway**: the existing rock soakaway would be retained for most of its length with the following **proposals** adopted for its enhancement:

- Marginal planting would be carried out in short lengths totalling not more than two thirds of the length of the north-western side of this feature to enhance the effectiveness of the habitat by increasing shelter and providing an added faunal food resource.
- Some sections would be kept open and in full sun to provide basking habitat for reptiles and invertebrates.

439 **Built environment**: all new buildings and other constructions would be designed and built having regard to the needs of local biodiversity.

- New buildings would incorporate potential bat roost and nest sites for birds such as house sparrow and swift. Roost and nest features would be incorporated into the fabric of buildings as 'bolt-on' boxes are generally inferior to cavities provided in soffits, behind wall cladding, within hollow-bricks or under roof-sarking.
- All drain-pots would be of a type which would enable amphibians to escape should they become trapped.

440 **Site lighting**: all site lighting would minimise light spill to avoid unnecessary illumination of adjacent wildlife habitats at night, including the Brocastle Brook corridor, all hedgerows, the wetland area and, as far as possible, grassland areas managed for their wildlife interest.

Drainage

Foul drainage

441 At this master plan stage there are no identified users of the proposed development, which could attract significant industrial occupiers for which the drainage requirements (particularly with regard to trade effluent) could vary significantly.

442 It is likely that the main foul drainage runs would be located in the highway with individual spurs provided to each development plot. The existing foul sewer through the site is thought to have sufficient capacity for the proposed development and that a gravity connection to the receiving sewer is achievable.

Surface water drainage

443 **Surface water network**: the main surface water infrastructure would be located in the highway through the site at an adequate depth to provide highway loading. Spurs would be provided to the boundary of individual plots allowing connections to the main run. These would be restricted in proportion to the size of the development plots.

444 The EAW has provided a permissible greenfield run off value of 3 litres/second/hectare. This value will be used to restrict flows entering the main surface

water runs from the larger plots. Smaller plots, of less than 1 ha in area, will be permitted a maximum of 5 l/s discharge.

445 In order to comply with this restriction, surface waters would be managed at source wherever possible. The design brief to developers would require implementation of a SuDS strategy, such as permeable parking or other attenuation structures. It would also be a requirement that discharge from development plots is 'clean' surface water to avoid any risk of contamination to the aquifer. Therefore, any surface water run off from parking areas, service and delivery areas would require treatment to remove hydrocarbons and other contaminants before entering the main surface water sewer in the highway.

446 Collected surface waters would be conveyed towards to the north-east corner of the site to be attenuated before outfall to Brocastle Brook. It is proposed to attenuate surface waters in open pond structures. The outfalls from these attenuation ponds would then direct flows to Brocastle Brook via a swale or similar feature. Flow controls at the outfalls of the attenuation ponds would ensure that the discharge rate from the whole development site would not be greater than 75 l/s, which approximately equates to the greenfield run off for the existing site.

447 Should a single pond be constructed, a minimum surface area of 3,050 m^2 at the permanent water level would be required. The volume of the pond would vary with the type of outgoing flow control selected and the design parameters used for that control. To allow for maintenance (such as grass cutting to be carried out by machine), and to enable any persons having accidentally entered the water to egress, it is assumed that the permanent water level would be 0.5 m from the pond bed and that the slopes of the pond would be battered at 33% to tie into existing ground levels.

448 **Highway drainage network**: the highway drainage network would be kept separate from the surface water network to reduce the volume of water that would require treatment before discharge to Brocastle Brook.

449 The highway would be drained positively with gullies connecting to the main run, which would consist of minimum 225 mm diameter pipe work.

450 **Land drainage**: it is not expected that any significant infrastructure would be required to deal with land drainage. Existing ditches within the site are generally located along the lines of hedgerows, which would be maintained as part of the site ecology scheme.

Utilities

451 **Electricity**: as noted in paragraph 291, two 11 kV cables would be required to service the site and, although the content of the development has changed since 1997, there is no reason to suspect that this size of supply would be inadequate for the development proposed now.

452 The 11 kV overhead cable from Oernant bungalow to the Brocastle Manor Care Home would need to be diverted around units 03, 07 and 08 and/or relocated underground.

453 **Gas**: further to the information in paragraph 292, it will be necessary to review the method of gas provision at a later stage, and after the potential demand from end users has been estimated.

454 **Potable water**: the 315 mm diameter HPPE main referred to in paragraph 293 is expected to have sufficient capacity to serve the development of the Brocastle site.

455 **Telecommunications**: it is anticipated that service connections can be made from the numerous services along the A48, adjacent to the site.

Earthworks

456 It is expected that excavated material will be of sufficient quality from most of the site for use as engineered fill to build existing ground up to plateau levels. The levels of the plateaux have been defined to give a local cut-and-fill balance to minimise excavation in rock and to minimise movement of significant volumes of material within the site: see Drawing 2210/C/SK/008 in Appendix 2. It is anticpated that a reasonable cut-and-fill balance could be achieved such that no material would require disposal off site.

457 The main principle adopted in the design of the development plateaux was to create the large areas required, while deviating as little as possible from the existing topography, and using shallow slopes to tie the plateaux into the existing land with as natural an appearance as possible.

Foundations

458 The typical subsoil profile consists of 750 mm of soil or highly weathered rock over 750 mm of moderately weathered rock over widely jointed rock. Therefore, it is assumed that all cut material would be suitable for general fill to raise site levels and form the required flat development plots.

459 Suitable structural founding strata lie relatively close to the surface and it is envisaged that shallow pad or trench fill foundations would be appropriate for the main superstructural loads. The use of ground-bearing industrial floor slabs would require founding on compacted structural fill supported on the appropriate shallow bearing strata. The presence of radon on the site would require full radon protection measures, as noted in paragraph 219 above.

460 The ground floor slabs of the office buildings could be either ground bearing (as the industrial buildings' floors) or suspended using pre-cast beam-and-block or plank systems. These latter options may also simplify the gas protection measures.

5 Low carbon strategy

Introduction

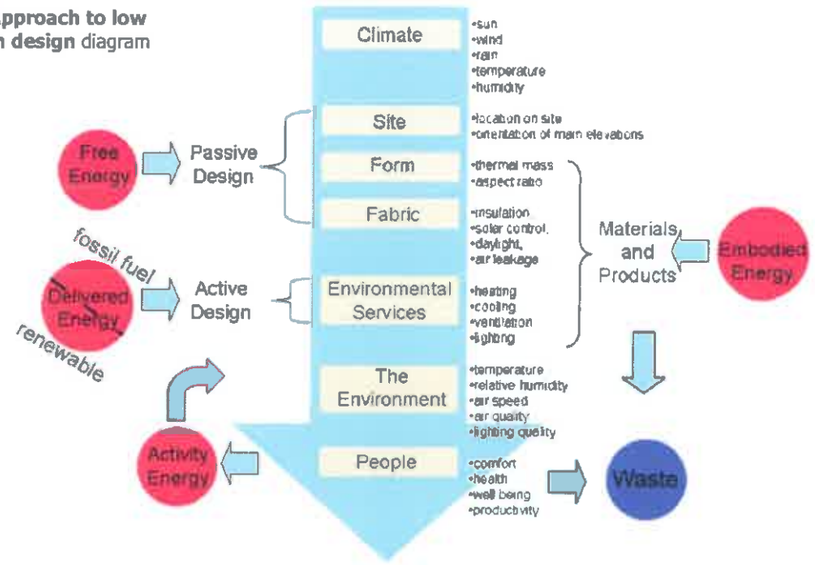
510 The current aspiration of the Welsh Assembly Government is to work towards a 'zero carbon' target for new buildings. Wales aims to have its own building regulations from 2012 which will require 'zero carbon' new build from 2013. The initial definition for zero carbon will be 55% reduction in carbon emissions through measures applied to the building, compared to the 2006 standard. The remaining 45% emission reduction will probably be achieved through some form of allowable solutions, yet to be decided. Over time, the 55% reduction is likely to be increased. Measures applied to the building include reducing energy demand through the design of the building and through more efficient environmental services, together with the application of renewable energy supply from building integrated systems or systems developed specifically for the building.

502 Low carbon design is considered in five stages:

- set targets and assess against targets;
- define internal conditions for health and comfort of people and appropriate to any processes;
- incorporate passive design features in the building design;
- use efficient and effective heating, ventilation and air conditioning (HVAC) systems; and
- provide renewable and low carbon energy supply.

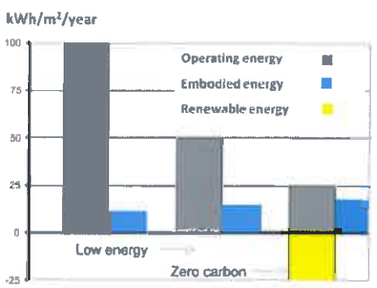
503 The diagram, overleaf, illustrates an approach to low carbon design. It identifies the design elements in relation to site and climate, and through a process of passive and active design.

Right **Approach to low carbon design** diagram



504 It also identifies the various energy considerations, including:

- free energy from natural resources through passive design;
- delivered energy and the move towards the use of renewable and low carbon supplies;
- activity energy from appliances and processes; and
- embodied energy associated with materials and components.



Left **Low energy to zero carbon** diagram

505 The Low energy to zero carbon diagram opposite illustrates the move from 'standard' design to low energy design and then to zero carbon design. Low energy design has a reduced energy demand. Zero carbon design has its energy demand reduced even further and its energy supply met from renewable energy sources. It is interesting to note that the embodied energy in the building construction may increase with the move to low energy and zero carbon design, due to increase in materials and components (especially renewable energy systems). For a zero carbon building the operating energy may be equivalent to the embodied energy.

Set energy targets

506 Specific energy targets will need to be set at the concept design stage, in relation to the building activities. Particular attention should be given to the following.

Energy used for heating, cooling and ventilation

507 **Heating**: At this stage it would be advisable to aim for PassivHaus[57] standards of 15 kWh/m² for heating. This would reduce heat loss to a 'zero carbon' performance.

508 **Cooling**: The cooling load of a space is made up from the solar gains through the façade and internal heat gains from people, small power and lighting. For offices these thermal loads on the space should be less than 25 W/m² (with people heat gains contributing about 10 W/m² of this total, roughly equivalent to 1 person per 10 m²). The solar gain through the façade should be reduced to less than 10% of its incident level at the external surface. It should be possible to deal with this level of cooling load by passive cooling. Where there are specific loads associated with processes, they would need to be considered separately.

[57] PassivHaus is a specific energy-efficient construction standard for buildings: http://www.passivhaus.org.uk.

509 Ventilation: Where mechanical ventilation is used, fan power should be minimised. This will relate to specific ventilation system design and will need to be considered at the concept design stage. Mechanical ventilation should be incorporated into a heat recovery system in winter.

Energy used for appliances and other equipment

510 As the energy used for HVAC is reduced, the other energy uses in a building become more significant and they are often omitted from energy use targeting. They also have an impact on cooling loads. These energy uses include: lighting and appliances (and their standby losses), unit air conditioners (for example, for information technology spaces, server rooms), lifts, air curtains, canteens, vending machines and audio-visual equipment. For a low carbon building these energy uses can typically account for one third or more of the total energy use. Therefore, they should be considered during the design stages. A true zero carbon building (equivalent in housing to Code Level 6 under the Code for Sustainable Homes[59]) would have all its appliance electrical load met by renewable energy systems.

Embodied energy

511 The embodied energy is that associated with processed materials and products used in construction and fit-out. This includes the process energy to acquire natural resources, the production of the materials and components, and the transport energy associated with their production and delivery to site. As the delivered energy can be reduced through a more energy efficient design, the embodied energy becomes of increasing significance. The use of local materials is favoured as transportation energy costs are reduced. Essentially, in terms of the energy used for manufacturing, the more highly processed a material is the higher its embodied energy.

512 The use of low embodied materials, such as timber or materials that can be recycled or produced using a high level of renewable energy, should be preferred. Minimising waste through standardisation and prefabrication can also reduce embodied energy. Justification for material use should be carried out at concept and detailed design stages in relation to reducing embodied energy. This should also include the use of material from sustainable sources.

Internal conditions

513 At the start of the design process a clear definition of what internal conditions are required should be stated. This should include the following.

Provide good air quality

514 In order to be energy efficient the building should be designed and constructed to be relatively airtight. Ventilation will need to be carefully designed to achieve a good air quality, therefore.

515 If **natural ventilation** is used then appropriate openings need to be provided for controllable ventilation to provide fresh air for occupants and to exhaust any excessive heat gains or sources of pollution. A low carbon building can no longer rely on natural air leakage to provide background ventilation. This is particularly relevant to industrial buildings.

516 If **mechanical ventilation** is used then appropriate room air delivery and extract should be selected to maximise ventilation effectiveness, and the potential for heat recovery considered.

[59] Department for Communities and Local Government, **The Code for Sustainable Homes: Setting the standard in sustainability for new homes**, February 2008; and **The Code for Sustainable Homes: Technical Guide**, November 2010.

517 Internal finishes and furniture should be selected to have minimum off-gassing to the space so that the ventilation requirement is only for providing fresh air for occupants.

518 If there are specific sources of pollutants associated with any process, then these should be isolated for the purpose of ventilation.

Provide thermal comfort

519 Thermal comfort should be considered in relation to space use, that is, activity and clothing level. This should include a requirement for space air temperatures, radiant and/or environmental temperature, air speed, and relative humidity (although for most functions this development is unlikely to require control of relative humidity).

520 Space temperatures should be considered in relation to the heating/cooling strategy. For example, if chilled surface cooling is used, in summer space air temperatures could be higher without incurring uncomfortably warm conditions (see also paragraph 534 below).

521 Care is needed to avoid excessive overheating due, for example, to solar heat gains or high levels of internal heat gains from people, lighting and equipment/ appliance use.

Thermal loads

522 Thermal loads on the space from lighting, appliances and equipment should be minimised. Lighting systems and their controls should be selected to maximise efficiency and effectiveness of use.

523 Internal thermal loads for typical office spaces (including people) should not exceed about 25 W/m^2.

Visual comfort

524 Excessive glare from solar radiation should be avoided and spaces should be daylit wherever possible. For office type environments, this would favour the bias of glazing to the north elevation and carefully controlled glazing on other elevations.

525 For industrial environments, sufficient daylight should be provided for background lighting. This might be achieved using roof lights.

Passive design

526 Attention should be focused on passive design features to reduce energy demand and use natural sources of energy as much as possible. These include the following.

527 **Building form and orientation**: The form of the building affects its energy use for heating and cooling. Simpler forms have both lower elemental heat losses and lower thermal bridging heat losses. They should also be more efficient in material use. The buildings should be orientated to allow for the best use of natural daylight and control solar gains. It may also take account of prevailing winds in relation to assisting natural ventilation and providing sheltered areas, for example around entrances.

528 **Insulation**: The construction of a building should incorporate high levels of thermal insulation to reduce heat loss in winter and heat gains in summer. U-values should be selected to meet the zero carbon performance and should be specified as part of the concept design stage.

529 **Air leakage**: The envelope of the building should be relatively airtight to reduce uncontrolled air leakage, which can be a major source of heat loss. Appropriate air leakage standards should be specified at the concept design stage and pressurisation tests carried out on completion of construction.

530 Ventilation: Where natural ventilation is used, controllable openings will be required in order to meet the ventilation loads of the space. Trickle ventilators can achieve background ventilation, while rapid ventilation needs larger openings.

531 With mechanical ventilation, heat recovery should be used. To meet the PassivHaus level for zero carbon design, standards will probably require the use of mechanical ventilation with heat recovery in winter.

532 Solar control: The location and design of glazing should allow for solar heat gains to be used when needed, and have appropriate shading to control overheating from excessive solar gains. Blinds should be used on glazing where solar radiation is incident, especially on the south and west facades. Blinds should be located on the outside or within the glazing system. Blinds on the inside are considerably less effective in reducing heat gains.

533 Daylight: The design and location of glazing systems should take advantage of daylight to minimise electric lighting. It is usual for office spaces to have major glazed areas to the north to avoid solar gains and maximise daylight. Industrial spaces will normally have a proportion of roof lighting (typically 10%) for background.

534 Thermal mass: A major problem with new, highly-insulated buildings is their tendency to overheat in summer. This is why the appropriate amount of thermal mass, combined with shading and controllable ventilation is essential. That provides a buffer against overheating. The thermal mass in the walls, floors and ceilings should be exposed to the internal spaces. They absorb heat from the warm air and radiative heat from warm surfaces. The heat absorbed then exhausts from the mass at a time when the external temperatures are cooler, usually during the night

535 Micro-climate: The micro-climate around buildings to some extent can be modified in a positive way through planting and landscaping, using green areas to provide shade and reduce albedo effects.

Efficient and effective heating, ventilation and air conditioning

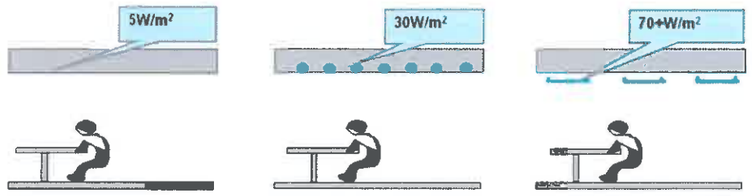
536 After the energy demand of the building has been appropriately reduced by energy efficient and passive design applications, the next stage is to provide the heating, ventilation and coolong in the most efficient and effective way. Some of the emerging innovative methods are introduced below.

537 Ventilation: In many HVAC systems the ventilation air is also used to provide heating and cooling. This can result in air quality being compromised in favour of supplying the required amount of heat or 'coolth' to a space. It is generally good practise to decouple ventilation from heating and cooling and deal with them separately. If mechanical ventilation is used then this should be combined with heat recovery on the exhaust side.

538 Heating and cooling: Heat and 'coolth' can be delivered to a space either through an air system, usually mechanically delivered through some fan system, or through heated or cooled surfaces.

539 The concept of using thermal mass to absorb excessive heat gains was introduced in the previous section. These heat gains would need to be removed from the building either through night time cooling (usually using natural ventilation), or through actively extracting heat from the thermal mass using either air or water (generally water). If an active mass system is used then this can also be used to provide heat. The diagram, overleaf, illustrates some thermal mass cooling strategies.

Below **Exposed thermal mass, chilled ceiling and chilled beam system for cooling, with typical cooling capacities** diagram



540 **Ground cooling of air**: The ground temperature at depth is relatively constant throughout the year. Ventilation air can be supplied to the building through underground ducts (typically below 2 m depth). In this way the air can be cooled by up to 5°C to 10°C during peak summer conditions, and preheated during winter. This is an efficient way of conditioning ventilation air.

541 **Humidity control**: The buildings in this development are unlikely to require humidity control unless there is a specialist process use. However, the selection of internal surface materials to absorb and emit moisture can provide some degree of stability for internal relative humidity.

Renewable energy systems

542 Renewable energy systems, summarised below, are being developed continuously and so advice given here may be overtaken by future advancements.

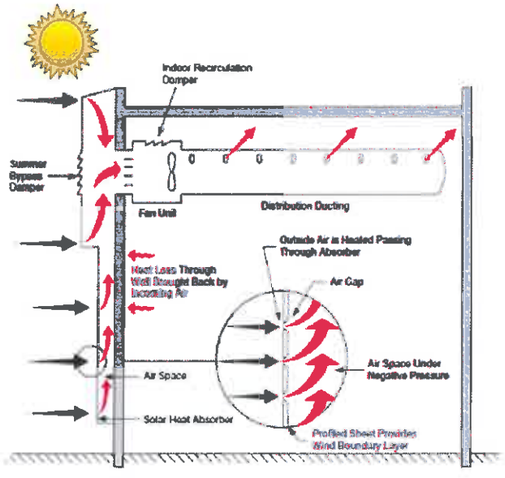
Current systems

543 **Solar photovoltaic (PV)**: PV products are reducing in cost, but are still relatively expensive. Recently introduced feed-in tariff structures have improved the economic case for PVs.

544 New products such as Tata Steel's PV cladding system will provide a low cost (and relatively low efficiency) option for using the whole of a metal roof as a collector.

545 **Solar thermal**: Solar thermal should be considered for the production of hot water services.

546 The newly developed Solar Wall by Tata Steel could be used to provide heat through a south-facing wall element. It could be combined with heat pump and thermal storage systems. The diagram below illustrates the system.



Left **Solar wall air heating cladding system** diagram (source: Tata Steel)

547 **Wind**: Building integrated wind turbines have limited use, but a large wind turbine could be erected on site.

548 **Biomass**: would be a good option provided fuel can be locally sourced. It would be more efficient to set up a biomass power station for the whole site rather than have separate systems for each unit. This could also provide heat for absorbtion cooling and process in summer. However, if the development is to be phased over time, a central plant may not be appropriate.

549 Combined heat and power (CHP): CHP could be an option either in the form of separate systems for each unit or combined with the thermal mass power station, possibly forming a tri-generation plant. An analysis of thermal and power demand load profiles would need to be carried out to assess the efficiency and effectiveness of such a system. However, as above, if the development is to be phased over time, a central plant may not be appropriate.

550 Heat pumps: Ground and air source heat pumps could be an option. Ground source heat pumps have a better coefficient of performance. If heat pumps are to be used they may be combined with other systems to ensure high coefficient of performance during cold periods; for example, combining air source heat pumps with the solar wall described above.

551 Heat pumps use electrical power (as do a number of the systems above), therefore a renewable source of electricity would be required. This could be site based or from green energy grid sources, depending what the building regulations future proposed 'allowable solutions' will permit.

552 Storage: Renewable energy is not always available on-site. Therefore, some form of power and thermal storage is needed. Thermal storage is relatively easier and can utilise the building construction or water/phase change materials. Electrical storage is more difficult and, currently, the grid is considered to be the easiest means of storage, importing and exporting between the development and the grid as appropriate.

Balanced approach

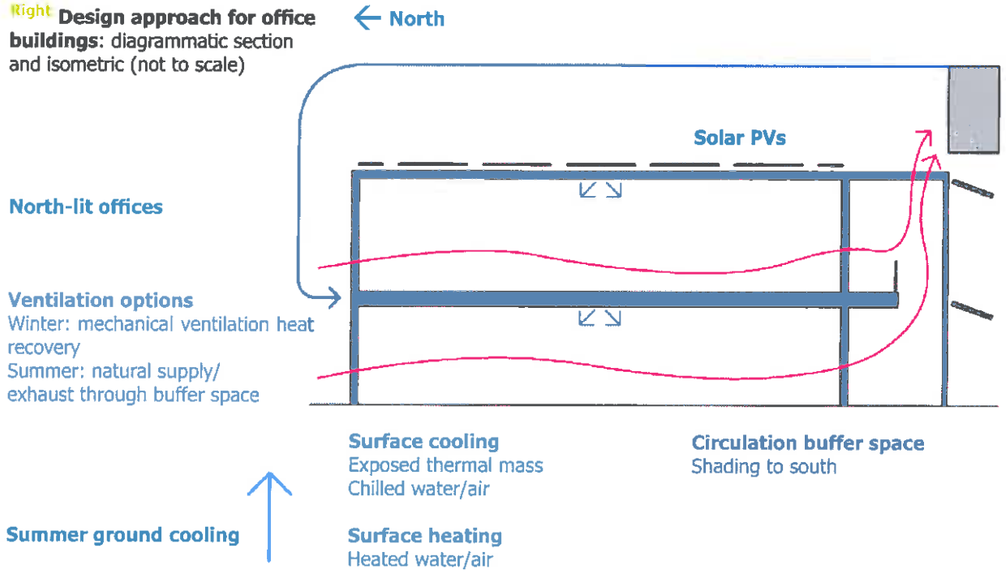
553 In the short and medium term the access to renewable energy is likely to be a combination of building-/site-based systems and grid-based systems. An appropriate balance will need to be achieved. This will to some extent be determined by future building regulations and what might be achieved through 'allowable solutions'. So there is likely to be some level of carbon dioxide emission reduction based on reduced energy demand on the building and some offsetting, which could include grid-based green energy.

Design advice

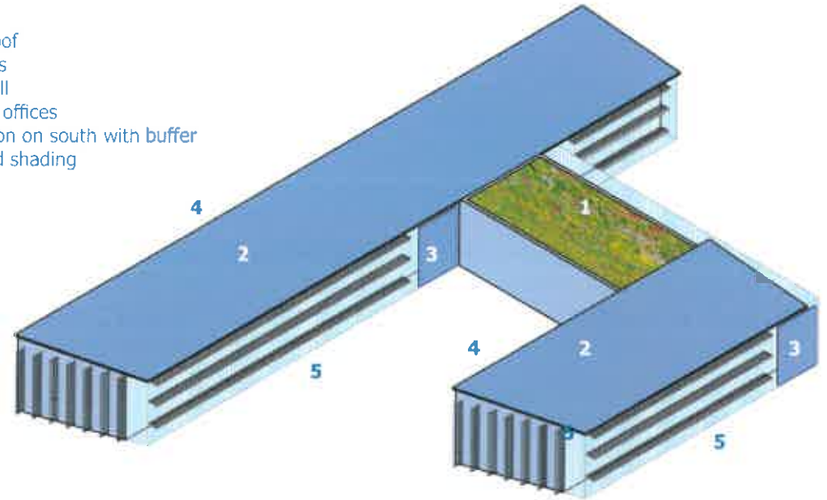
Office buildings

554 Some suggested design approaches for the office buildings are as follows (see Design approach for office buildings diagrams overleaf):

- North lit to provide good daylight without overheating from solar gains.
- Circulation zones are located on the south elevations to provide a buffer for solar gains, with shading (preferably external or inter-pane) to control the solar heat gains and glare.
- The roof is available to locate solar PV. Other areas can have a green roof to provide insulation and contribute to biodiversity, together with solar thermal for water heating.
- A solar wall might be used to provide heating in winter. This would probably be connected to some thermal storage system and/or air source heat pump, using the solar wall as a heat source.
- The ventilation system might incorporate heat recovery in winter. Natural ventilation might be an option in summer, possibly coupled to a ground cooling (fan assisted) system.
- The concrete mass might be exposed to provide thermal mass cooling, which would need night-time cooling through ventilation. Or chilled air or water might be used in the ceiling slab to extract heat. If so this could be used to provide space heating in winter.



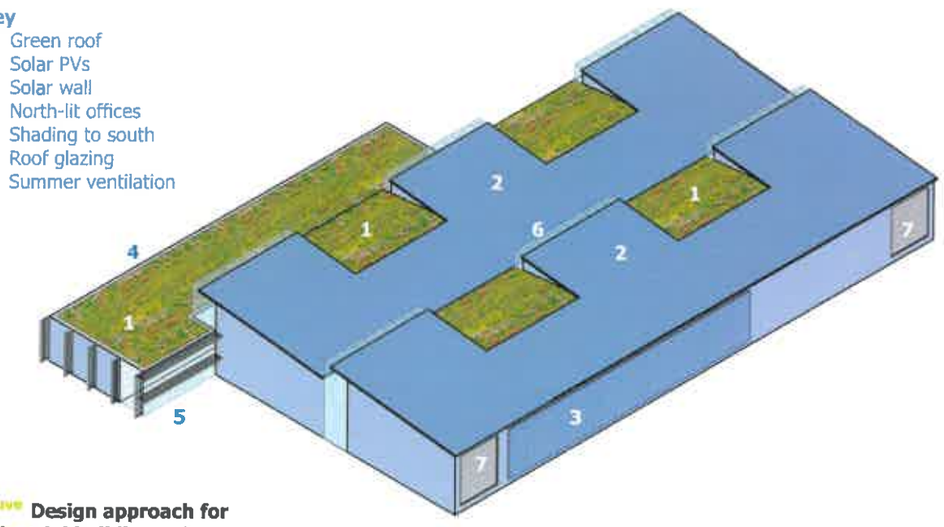
Right **Design approach for office buildings**: diagrammatic section and isometric (not to scale)



Industrial buildings

555 The following design approaches are suggested for the industrial buildings (see Design approach for industrial buildings diagram right):

- The approaches outlined in paragraph 554 above could be applied also to the office elements of the industrial units.
- North roof lights to provide background daylight (typically 10% of the roof area).
- Solar PVs to the roofs generally; elsewhere, green roofs could provide insulation and contribute to biodiversity.
- Solar walls might be used on the south elevations to provide heating in winter. These would probably be connected to some thermal storage system (as described for the office above).
- Natural ventilation with controllable ventilation openings.



Above **Design approach for industrial buildings**: diagrammatic isometric (not to scale)

Appendices

Appendix 1
Drawings by
WYG Planning & Design

01 Site location
02 Site context
03 Site identification
04 Land form
05 Contours and gradients
06 Landscape context
07 Agriculture
08 Geology
09 Climate
10 Archaeology
11 Landscape appraisal
12 Access
13 Existing services
14 Planning designations
15 Concept
16 Framework
17 Illustrative master plan
18 Landscape strategy.

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Brocastle, Bridgend
Master plan
Site location

01

Key

Site boundary

North

0 1000 2000 3000 4000 5000 metres

A060125drg01 Scale 1:50,000@A3

File: A060125drf01v2.mcd 22 December 2010

creative minds safe hands

WYG Planning & Design
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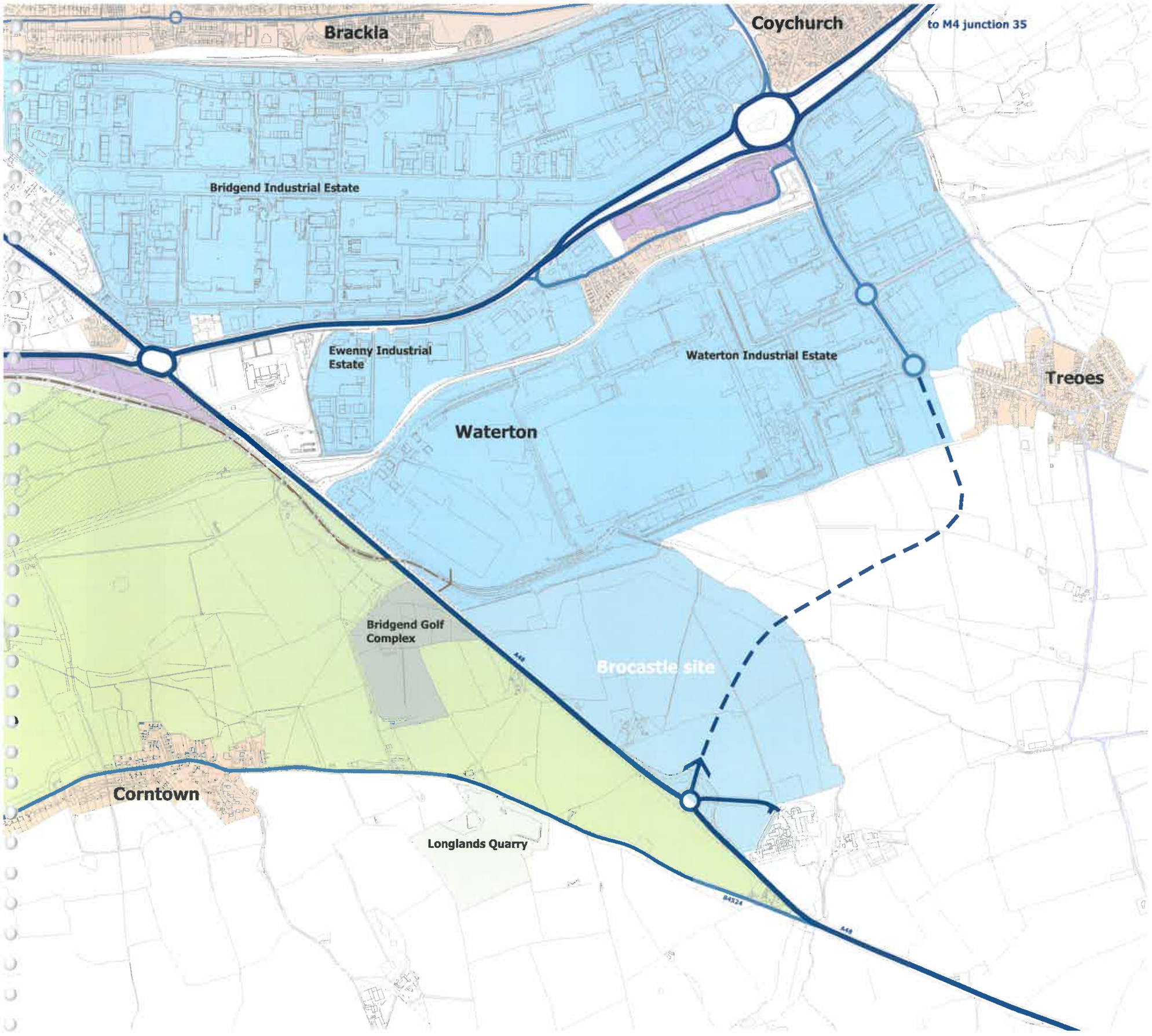
Email: info@wyg.com www.wyg.com



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Brocastle, Bridgend

Master plan

Site context

02

Key

- Site area
- Settlement
- Retail
- Employment
- Quarry
- Golf complex
- Green wedge
- Landscape conservation area
- Primary road
- Secondary road
- Minor road
- Brocastle Link (as proposed by Bridgend County Borough Council)
- Railway

North

0 100 200 300 400 500 metres

A060125drg02 Scale 1:10,000@A3

File: A060125drf01v2.mcd 26 February 2011

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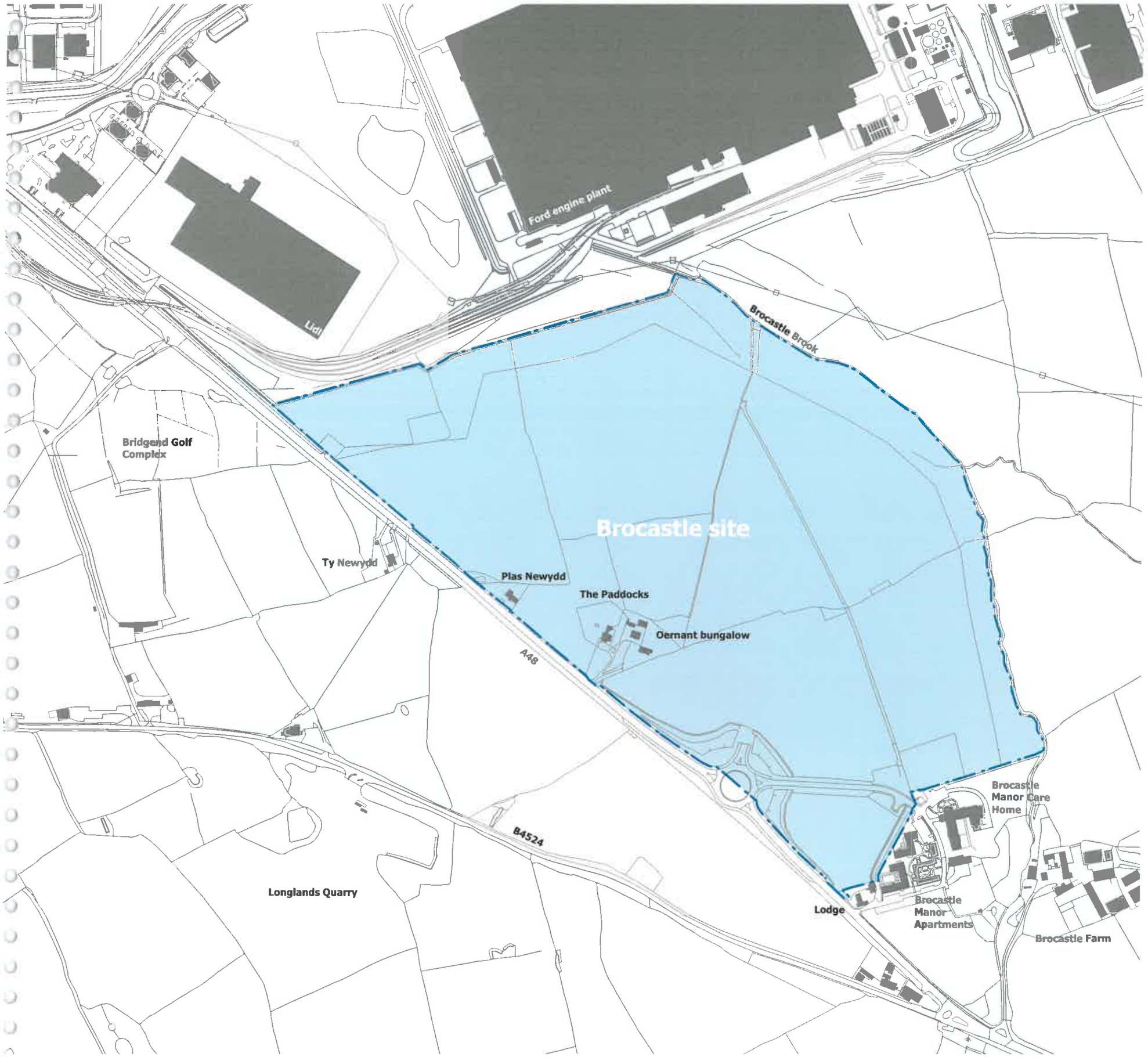

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Brocastle, Bridgend
Master plan
Site identification

03

Key

Site boundary

North

0 50 100 150 200 250 metres

A060125drg03 Scale 1:5,000@A3

File: A060125drf01v1.mcd 26 February 2011

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Brocastle, Bridgend
Master plan
Land form

04

Key

- Site boundary

Height above mean sea level

- 85 metres
- 80 metres
- 75 metres
- 70 metres
- 65 metres
- 60 metres
- 55 metres
- 50 metres
- 45 metres
- 40 metres
- 35 metres
- 30 metres
- 25 metres
- 20 metres
- 15 metres
- 10 metres
- 5 metres

North

0 100 200 300 400 500 metres

A060125drg04 Scale 1:10,000@A3

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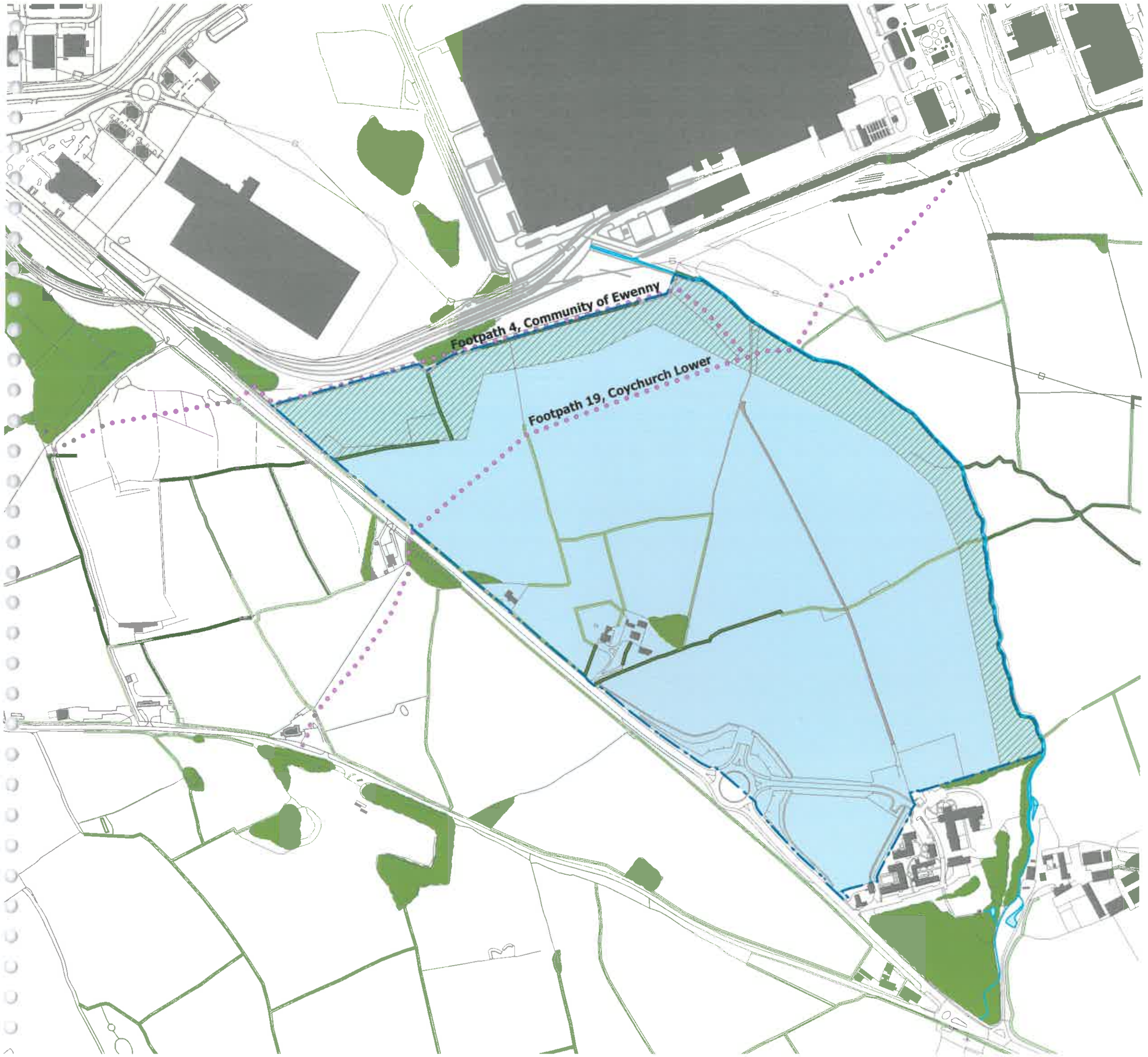

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Brocastle, Bridgend
Master plan
Landscape context

06

Key

- Site boundary
- Ecological buffer zone
- Trimmed hedgerows
- Overgrown / relict hedgerows
- Woodland and copses
- Brocastle Brook
- Public rights of way
- Existing track

North

0 50 100 150 200 250 metres

A060125drg06 Scale 1:5,000@A3

File: A060125drf01v1.mcd 26 February 2011

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Brocastle, Bridgend
Master plan
Agriculture

07

Key

Site boundary

Agricultural Land Quality

Grade 3b (Moderate Quality)

Grade 4 (Poor Quality)

Information re-presented from Figure 19 in the **Brocastle, Bridgend: Environmental Statement**, Wyn Thomas plc, October 1997

North

0 50 100 150 200 250 metres

A060125drg07 Scale 1:5,000@A3

File: A060125drf01v1.mxd 22 December 2010

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Brocastle, Bridgend

Master plan

Geology

08

Key

- Site boundary
- **Alluvium, undifferentiated**: Mainly fine sands, silts and clays with thin peat intercalations; gravel occurs locally
- **Limestone conglomorates**: Heterogeneous deposits comprising of fine to medium grained limestone chipconglomorates and oolites: locally interbedded with shales (Lower Jurassic)
- **Limestone**: Massive and well bedded, shelly and oolitic limestones, locally with domolite and calcite mudstones (Lower Canboniferous)
- **Limestone and Shales**: Interbeded fine grained limestones and grey shales (Lower Jurassic)

Information re-presented from Figure 4 in the **Brocastle, Bridgend: Environmental Statement**, Wyn Thomas plc, October 1997

North

0 50 100 150 200 250 metres

A060125drg08 Scale 1:5,000@A3

File: A060125drf01v1.mcd 22 December 2010

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Brocastle, Bridgend
Master plan
Climate

09

Cold winter winds

Westerly prevailing wind (summer- cooling, winter- warming, but carrier of rain)

South-westerly prevailing wind

June

May/July

April/August

March/September

December

Key

Site boundary

Sun-path diagram

North

0 50 100 150 200 250 metres

A060125drg09 Scale 1:5,000@A3

File: A060125drf01v1.mxd 22 December 2010

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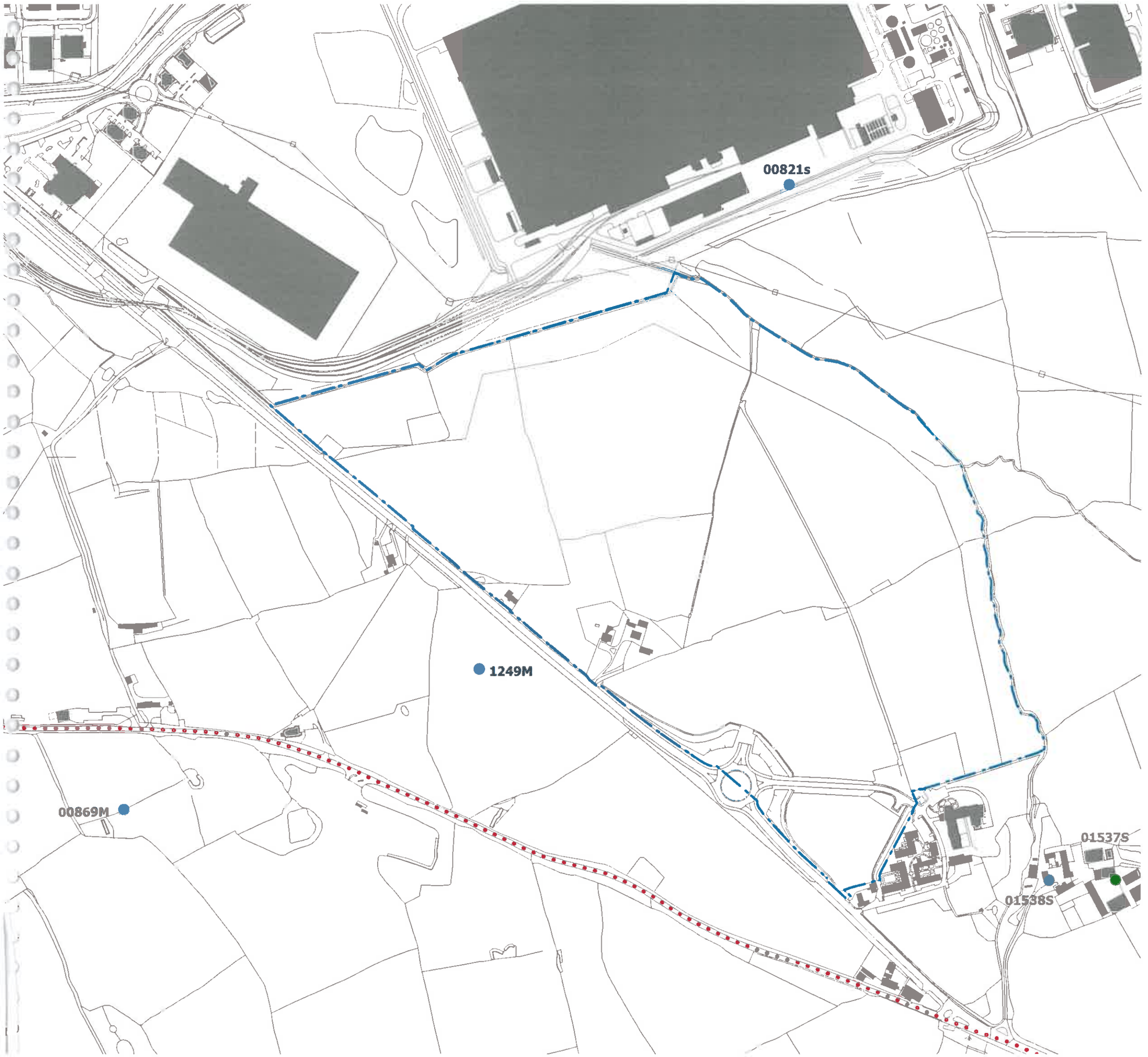

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Brocastle, Bridgend
Master plan
Archaeology

10

Key

Site boundary

Entries from the **Sites and Monuments Record**

Prehistoric

01537S: neolithic axehead found at Brocastle farm in 1971. Acquired by National Museum Wales.

Roman

Roman road

Medieval and Post-medieval

00821s: possible medieval settlement.

00869M: an L-shaped series of earthworks, and adjacent quarry. Noted at Corntown Farm. Possibly a medieval platform house. These earthworks are approached by a sunken lane from the north-west. No finds noted.

01538S: post medieval house (Brocastle Farm). A regional house with an internal chimney and a fireplace stair.

1249M: ridge and furrow ploughing noted under permanent pasture

There is no Scheduled Ancient Monument or known archaeological site within the site

Information re-presented from Figure 8 in the **Brocastle, Bridgend: Environmental Statement**, Wyn Thomas plc, October 1997, and supplemented through consultation with Glamorgan Gwent Archeological Trust in January 2011.

North

0 50 100 150 200 250 metres

A060125drg10 Scale 1:5,000@A3

File: A060125drf01v1.mcd 26 February 2011

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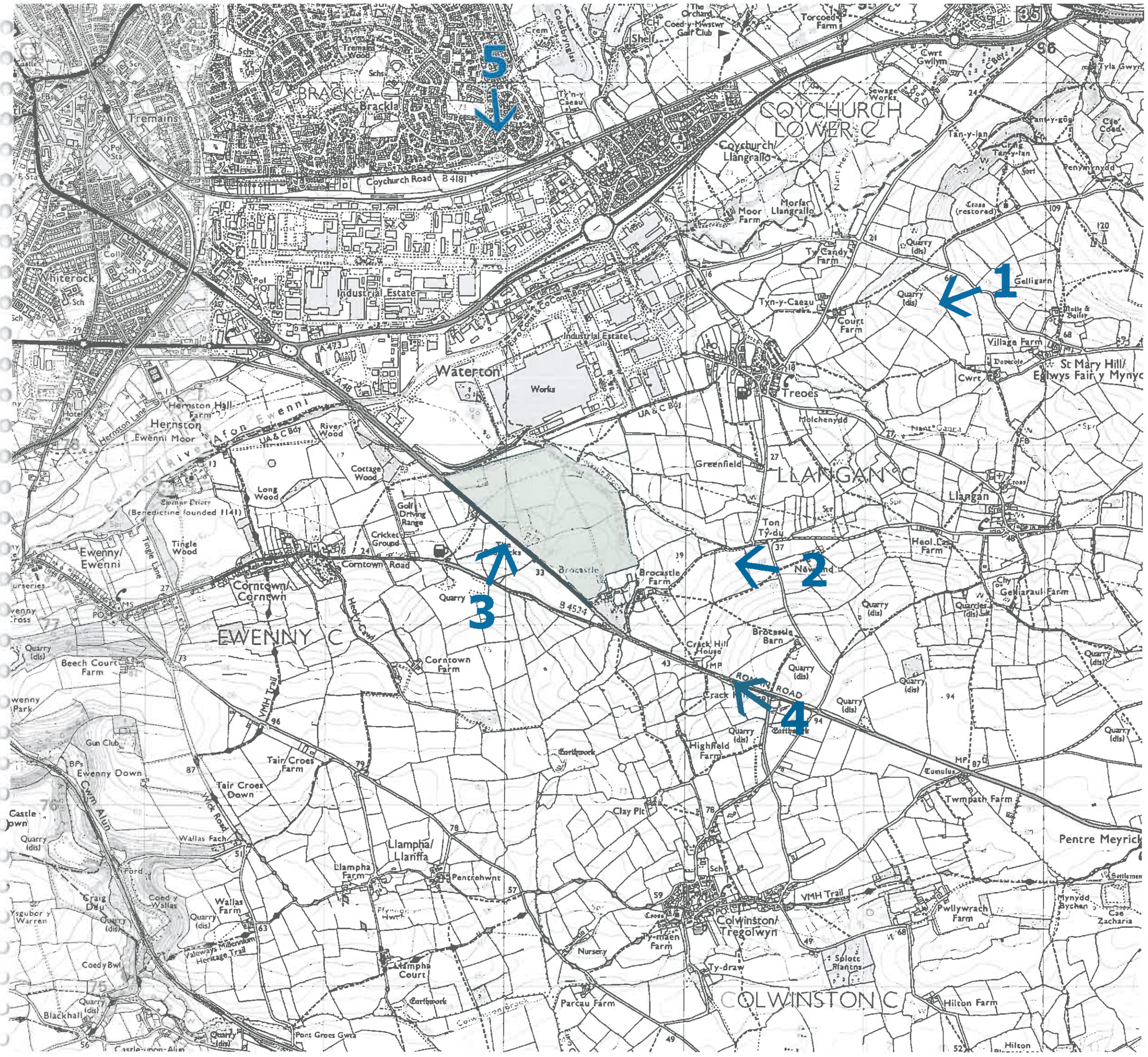

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Brocastle, Bridgend
Masterplan
Landscape appraisal

11

Key

Site area

Appraisal photograph viewpoints
(see pages 29 to 31 of Framework master plan Final report)

North

0 200 400 600 800 1000 metres

A060125drg11 Scale 1:20,000@A3

File: A060125drf01v2.mcd 26 February 2011

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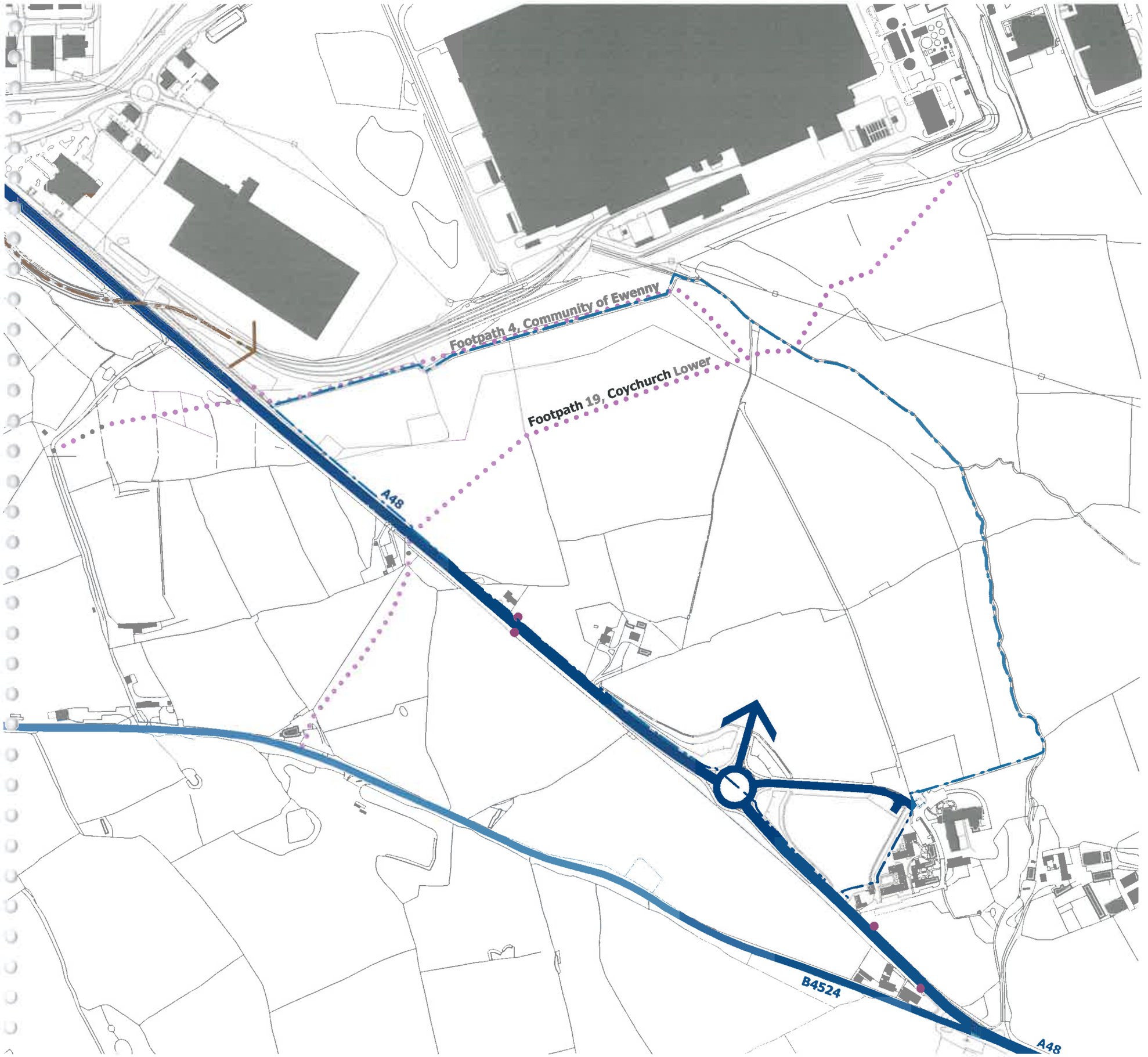

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Welsh Assembly Government

Brocastle, Bridgend
Master plan
Access

12

Key

- Site boundary
- Primary road
- Secondary road
- Bus stops
- Railway
- Public rights of way

North

0 50 100 150 200 250 metres

A060125drg12 Scale 1:5,000@A3

File: A060125drf01v1.mcd 26 February 2011

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Brocastle, Bridgend
Master plan
Existing services

13

Key

- Site boundary
- 132 kv overhead cable
- 11 kv overhead cable
- 11 kv undergrounded cable
- LV undergrounded cable
- Foul drainage
- BT telecommunications
- Potable water main

Compiled from information issued to Burroughs by utility companies in 2010

North

0 50 100 150 200 250 metres

A060125drg13 Scale 1:5,000@A3

File: A060125drf01v1.mxd 26 February 2011

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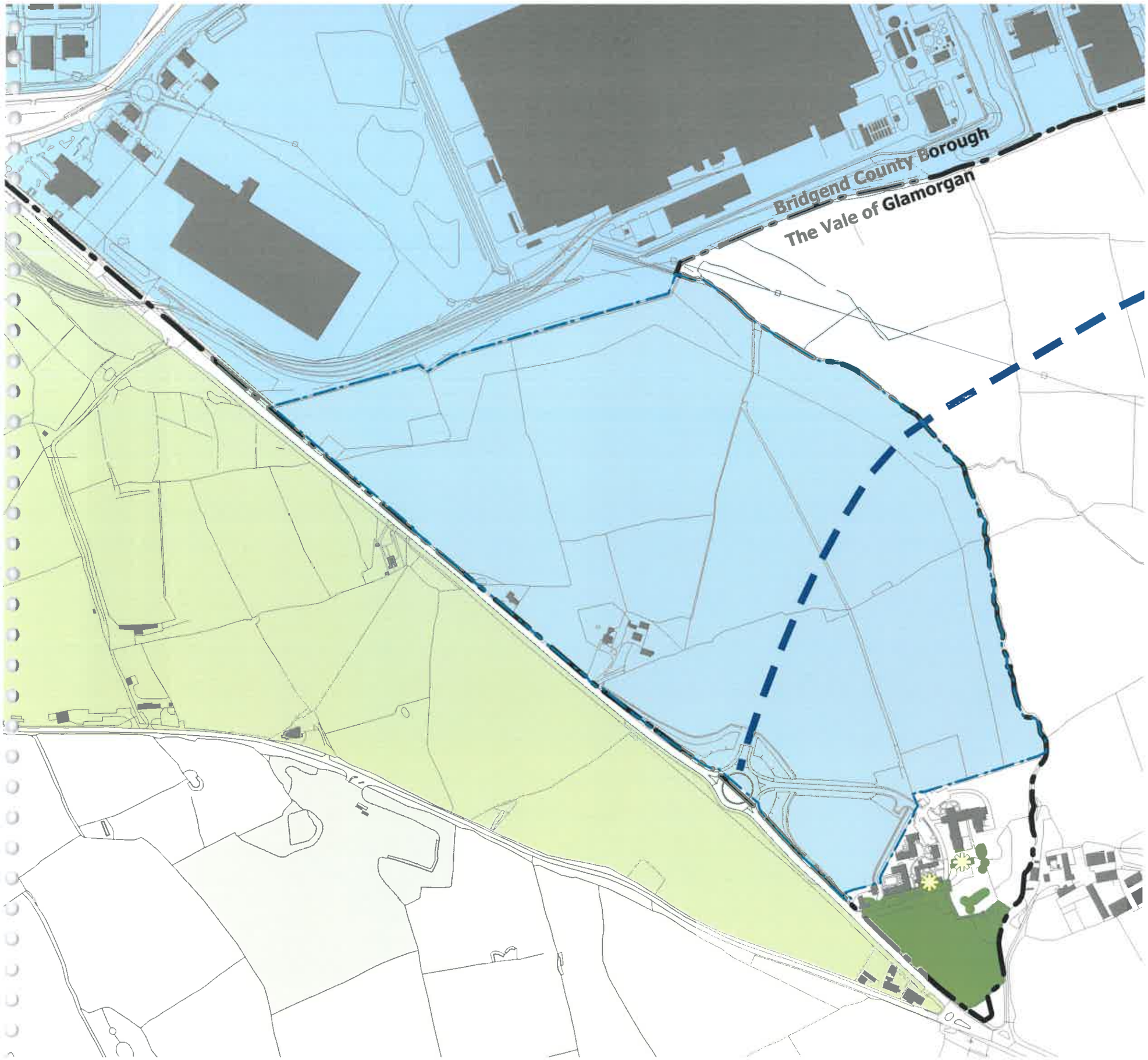

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Brocastle, Bridgend
Master plan
Planning designations

14

Key

- Site boundary
- Unitary authority boundary
- Employment
- Quarry
- Green wedge
- Listed buildings
- Tree preservation orders
- A48 to A473 Brocastle Link

North

0 50 100 150 200 250 metres

A060125drg14 Scale 1:5,000@A3

File: A060125drf01v1.mcd 26 February 2011

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Brocastle, Bridgend
Master plan
Concept

15

North

0 50 100 150 200 250 metres

A060125drg15 Scale 1:5,000@A3

File: A060125drf04v1.mxd 26 February 2011

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Welsh Assembly Government

Brocastle, Bridgend
Master plan
Framework

16

01	Industry	25,548 m²
02	Offices	4,645 m²
03	Industry	10,219 m²
04	Industry	5,110 m²
05	Offices	4,645 m²
06	Offices	4,645 m²
07	Industry	6,642 m²
08	Industry	7,664 m²
09	Offices	2,323 m²

Key

- Significant hedgerows and planting
- Ecological enhancement
- Embankments
- Proposed parking / service areas
- Public rights of way

North

0 50 100 150 200 250 metres

A060125drg16 Scale 1:5,000@A3

File: A060125drf04v1.mcd 26 February 2011

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Welsh Assembly Government

Brocastle, Bridgend
Master plan
Illustrative master plan

17

North

0 50 100 150 200 250 metres

A060125drg17 Scale 1:5,000@A3

File: A060125drf04v1.mcd 26 February 2011

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Welsh Assembly Government

Brocastle, Bridgend
Master plan
Landscape strategy

18

Key

- Site boundary
- Retained vegetation
- Ecological enhancement corridors
- Formal tree planting
- Land form and drainage ditch
- Embankment and cut in slope
- Proposed structure planting
- Hard surfaces
- Pond
- Key views of buildings
- Distant views of site

North

0 50 100 150 200 250 metres

A060125drg18 Scale 1:5,000@A3

File: A060125drf01v1.mcd 26 February 2011

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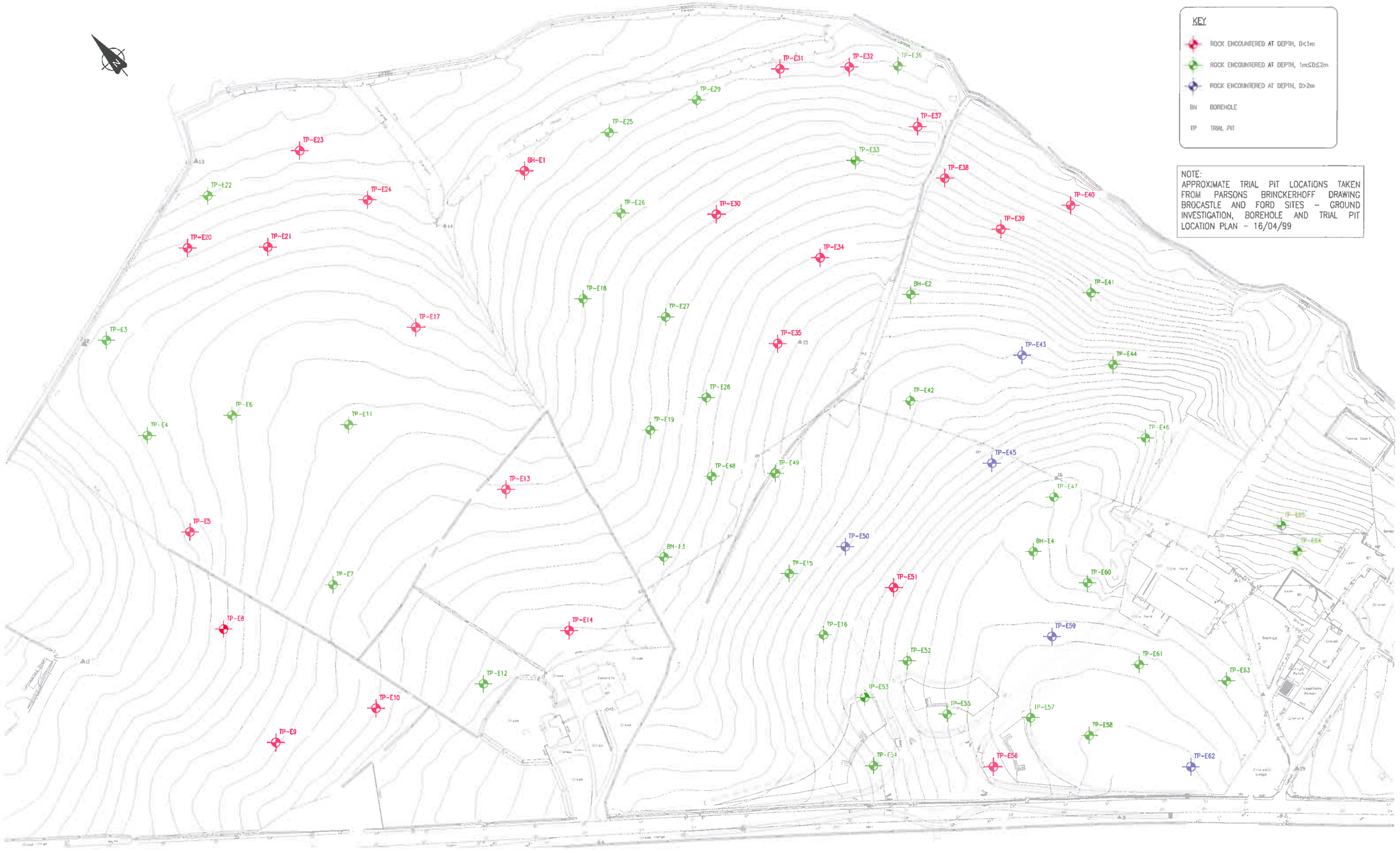
Appendix 2
Drawings by Burroughs

2210/C/SK/001	Borehole and trial pit locations
2210/C/SK/008 revision A	Plateau batters.



Title

Bore Hole & Trial Pit Locations

Drg No. C/SK/001
Rev /
Scale 1:1250 @ A1

Project Brocastle Farm Masterplanning
Job No. 2210
Drn By LRN Date 28.01.10

Burroughs
4 Radnor Court, 256 Cowbridge Rd East, Cardiff, CF5 1GZ Tel: 029 2064 7484. Email: admin@burroughs.co.uk www.burroughs.co.uk
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Title

Plateau Batters

Drg No. C/SK/008
Rev A
Scale 1:2500 @A1

Project Brocastle Farm Masteplanning
Job No. 2210
Drn By LRN Date 16.11.10

4 Radnor Court, 256 Cowbridge Rd East, Cardiff, CF5 1GZ Tel: 029 2064 7484. Email: admin@burroughs.co.uk www.burroughs.co.uk

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