

WELSH DEVELOPMENT AGENCY

REPORT ON

17 ACRE SITE AT THE HIRWAUN INDUSTRIAL ESTATE

September 1995

Thomas, Morgan & Associates,  
Consulting Civil & Structural Engineers,  
20 Gelliwastad Road,  
Pontypridd,  
Mid Glamorgan. CF37 2BD

Ref: P329.01

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**WELSH DEVELOPMENT AGENCY**  
**17 ACRE SITE - HIRWÄUN INDUSTRIAL ESTATE (Previously Area '8')**

**1.0 GENERAL INTRODUCTION**

- 1.1 Since the submission of our preliminary Report dated 2nd December 1993 and our subsequent discussions, we have now carried out further examination works and present for your information and consideration our updated Statement on the overall findings as detailed in the following text. *(Please note that an Executive Summary is contained under Section 12.00 of this Statement.)*

**2.0 SOURCES OF INFORMATION**

- 2.1 These consist of the following:-

- (i) Planning Study Report, commissioned by W.D.A. in July 1983 (updated May 1987).
- (ii) Trial Pit Logs prepared by W.D.A., dated 15th July 1988.
- (iii) Report on Site Investigation dated January 1972, prepared by Messrs Wallace Evans.
- (iv) In House Archives.
- (v) Site Reconnaissance.
- (vi) Mineral Valuer (Wales)

**3.0 SITE HISTORY/DEVELOPMENT**

- 3.1 The Site was once occupied by an Ordnance Factory, which would appear to have been demolished some time before 1971. After demolition of the Ordnance Factory the site was left for a period as mainly waste ground.
- 3.2 The remains of the factory in the form of concrete roads, old foundations etc. are recorded in the Report on the Site Investigation, dated January 1972. Recommendations in the aforementioned Report to develop the site by cut and fill regrading, would appear to have been implemented.
- 3.3 Flooding had been experienced periodically at various locations in the Estate and improvements have been carried out to alleviate the problem. We are not aware of any present flooding problems in this immediate vicinity and consequently it may be assumed that the improvements implemented in this connection have been successful.

**4.0 GEOLOGY**

- 4.1 The Site is located on carboniferous rocks of the lower Coal Measures which consist of alternating beds of sandstone, siltstone, shales with coal seams and ironstone veins.

#### 4.0 GEOLOGY (Continued)

- 4.2 The Coal Measures, which dip to the South at about 8-10 degrees, are overlain by glacial drift (boulder clays) and glacial till consisting of stiff silty clay and gravels. There is also evidence to suggest that the site was once covered in part with hollows of peat.
- 4.3 The trial pit logs dated July 1988, indicated that the site had been regraded as recommended in the 1972 Site Investigation Report, but that the hollows of peat had been left intact and underlie the fill material of glacial drift. (*Details are included under Appendix 'B'*)
- 4.4 It was not possible to establish the full extent and depth of the underlying peat from the trial pits but it would appear to be restricted to the low lying Southern sectors of the site adjacent to Fifth Avenue. A further Site Investigation was accordingly implemented and the information so obtained on this particular aspect and on the Site generally to augment the present Site Investigation data, is included as an Appendix to this Statement. This site investigation has established that the peat area does not exist to the extent originally anticipated and only shallow depths of peaty subsoil actually exist.

#### 5.0 MINING CONDITIONS AND SUBSIDENCE

- 5.1 Mining conditions in and around the Hirwaun Estate have been well documented in the Planning Study Report. In brief, the Study Report has identified two mining subsidence zones to the North of Rhigos Road.
- 5.2 It would appear that these zones are outside the influence area of the site and that the risks of mining subsidence due to past underground workings within these zones can be discounted.
- 5.3 The Mining Subsidence Report prepared by the Mineral Valuer (Wales) (*See Appendix 'A'*) reaffirms the findings of the Planning Study and confirms that the risk of damage from underground mining subsidence to any proposed development within the Site is minimal.

#### 6.0 TOPOGRAPHY/SITE CONSTRAINTS

The proposed development area straddles the edge of the National Park and is located beneath the South facing embankment of the Penderyn Reservoir. Its Southern and Eastern boundaries are demarcated by Fifth and Ninth Avenues respectively.

- 6.2 The actual National Park Boundary dissects the site into two halves and runs roughly diagonally from the South-West corner up to the North-East corner of the site. Any development on the site will obviously be subject to the planning requirements and restrictions of the National Parks Committee.

## 6.0 TOPOGRAPHY/SITE CONSTRAINTS *(Continued)*

- 6.3 In the vicinity of the existing Sewage Treatment Works, which is located just outside the South West corner of the development area, the ground elevation of the Estate is at its lowest point (197.80m A.O.D.) and gradually rises across the site to the foot of the embankment of the Reservoir, along the Northern boundary to a maximum of 204.90m A.O.D. The general crossfall from North to South being 1:200/1:250.
- 6.4 The levels of the main access roads serving the site are slightly elevated above the general ground level within the development area, thus creating the impression of a relatively low lying site area in relation to Fifth and Ninth Avenues.
- 6.5 Within the curtilage of the development area (in the North Eastern corner) is sited a masonry clad structure which appears to be a Pumping Station serving the reservoir and an electrical sub-station, both of which will form constraints to any proposed development. Adjacent to the structures is an underground tank, the construction of which is unknown.
- 6.6 It is understood that Welsh Water have recently carried out structural and pipe laying works in the vicinity of Ninth Avenue and the North Eastern corner of the site details of such works are shown on the attached drawings.
- 6.7 With regard to reported leakage associated with the Reservoir, this situation has been queried with Welsh Water and we have been assured that the main embankments are sound but some surface water flows on the downstream face have required the introduction of herringbone drainage. A Statement in this respect is included as an Appendix to this Report.
- 6.8 Poor ground drainage and natural erosion have created tumps of exposed silts, clay and boulders and thin hollows of marshy ground covered with coarse grass and gorse. This gives rise to the appearance of a generally wet site.
- 6.9 Extensive tree and shrub growth along the Northern boundary at the base of the reservoir embankments has been noted. A hardcore track leading to the reservoir Pumping Station crosses the site. At the end of the track in a localised area adjacent to the Pumping Station, some illegal tipping of building rubble and domestic refuse has taken place. This will of course require removal to avoid the possibility of contamination from this source.

## 7.0 ROADS

- 7.1 Access to the Hirwaun Industrial Estate is gained from the A465 Heads of the Valley Trunk Road, which is presently being upgraded, and a number of 'A' and 'B' class roads from the Aberdare and Rhondda Valleys area. Within the Estate itself, access to the Site is via Fifth Avenue and Ninth Avenue, and a temporary entrance is presently located at the end of Ninth Avenue.

## 7.0 ROADS (Continued)

- 7.2 Improvements have been undertaken to improve the footpaths, roads and street lighting along Fifth Avenue and Ninth Avenue to allow these to attain adoptable standards and to compliment the main drainage in this area which has already been adopted.
- 7.3 With regard to the overall road system within the Hirwaun Estate, substantial lengths have now been adopted as shown on the attached drawings. The works carried out for adoption purposes have considerably enhanced the appearance of the Site areas concerned and the traffic flows involved should easily be accommodated by the overall road system concerned.
- 7.4 It is presently considered that permanent accesses off Fifth Avenue and Ninth Avenue would best suit the Site and the proposals in this respect allow for such arrangements. No problems are envisaged in agreeing such proposals with the Mid Glamorgan County Council.

## 8.0 DRAINAGE AND SEWERAGE

- 8.1 Having appraised the drainage and sewerage arrangements outlined in the Planning Study, we understand that:-

- (i) The Storm Water Systems for the Southern and Northern areas of the Estate are connected into the watercourse named the Camnant, at an outfall near the South Western corner of the Site.
- (ii) The combined Foul Water Sewer in the immediate area of the Site is routed adjacent to Fifth Avenue and connects to the Sewage Pumping Station, from where the flow is pumped to the confluence of the Foul Water System for the Eastern and Western areas. This connects to the inlet of the Sewage Treatment Works, located to the South Western corner of the Site.
- (iii) The Storm and Foul Water flows from any proposed development on the site could conveniently be drained via the same system, but in order to avoid possible overloading of the Storm Water Sewers, it will be necessary to drain the Storm flows by a new sewer directly to the watercourse.

Correspondence has been entered into with the N.R.A. to determine whether there would be any restrictions in draining the resulting Surface Water directly to the Camnant and the N.R.A. have confirmed that the watercourse has no history of flooding problems and accordingly on site storage would not be required in this case.

- (iv) It would appear that the flood relief schemes on Fifth Avenue, as outlined in the Planning Study Report, have been completed and are functioning satisfactory. However, we understand that the originally proposed culverts within the development area itself have not been undertaken.

## 8.0 DRAINAGE AND SEWERAGE (Continued)

- 8.2 Although there have been no complaints of site flooding since the completion of the relief works in the area of Fifth Avenue, the land drainage required within any upfilling areas will have to be connected into the existing watercourses/ditches in the immediate vicinity.
- 8.3 Foul drainage from any proposed new development will have to be directed to the existing Pumping Station at the South West corner of the site boundary and if this is to carry a significant Trade Effluent Discharge, uprating of the existing station with the possible replacement of the Rising Main may be required.
- 8.4 With regard to the Treatment Works itself, we understand that it is presently receiving some 50% of the flows that it was originally designed for, i.e. 1,000,000 l/day (220,000 gallons/day), and accordingly, it is considered that sufficient capacity should be available to treat the resulting flows from the new development. This matter will however require a further examination in conjunction with Welsh Water when the overall foul flows have been accurately established. It should be noted in this respect that a Report prepared by Freeman, Fox, Braine & Partners in December 1975, showed that the present Consent Conditions for the works allowed for a D.W.F. of 2.25m litres per day (500,000 gallons/day) and the Nominal Capacity of the Works was in accordance with such figures.

## 9.0 FUTURE DEVELOPMENT CONSIDERATION

- 9.1 It was suggested in the original Planning Study Report, that a maximum size of unit of 2300m<sup>2</sup> be considered since larger units could prove difficult to let, given the Estate's Development Area status at the time of preparation of the Planning Study Report.
- 9.2 It is our understanding however, that the future development for this site has been identified as the possible location for a single end user, such as a large manufacturing organisation and with this potential end user in mind, various building layouts/options up to 18,600 m<sup>2</sup> (200,000 ft<sup>2</sup>) have been developed as shown on the attached Drawings No'd P329/IV, V, VI, and VII. (Included in Appendix 'E')
- 9.3 As the site is relatively low lying in relation to the access roads serving the site, consideration has been given in the design of the proposed development plateau, to bring it above the influence of flooding potential from the existing drainage channels and watercourses. The need to drain the proposed development thereto is also a basic requirement and raising the low lying South Western area of the site and reducing the higher North Eastern areas of the site to produce a relatively level plateau at a horizon of approximately 199.50m A.O.D., is considered the optimum solution.



## 10.0 PEAT DEPOSITS

10.1 Trial pit investigations undertaken in July 1988, suggested that there was an underlying area of peat deposits located at the South West corner of the site.

10.2 As a consequence, the ground investigations undertaken by Exploration Associates in July 1995, were designed to delineate the area of peat thought to exist at the site and assess the level of long term differential settlements that would be likely to occur as a consequence of such peat deposits.

10.3 However, the peat thought to be present in the South West corner of the site was not encountered by any of the trial pits or boreholes carried out as part of the above ground investigations.

10.4 A dark grey black clayey stratum containing much partly decomposed plant material, was found to occur directly below the Made Ground overlying the natural alluvial clay deposits. This stratum is thought to be a relict grassed surface which has been subsequently buried by the mantle of made ground.

10.5 The dynamic probe holes and trial pit investigations did show a soft area towards the extreme South East corner of the site, which may indicate a pocket of peat or very soft clay. It is suggested that structures are not placed in the area of the site without the use of piled foundations.

## 11.0 SUBSTRUCTURE DESIGN/RECOMMENDATIONS

### 11.1 GENERAL ASSUMPTIONS

11.1.1 A relatively level plateau will be created under the proposed development works. The general level being approximately 199.50m A.O.D., as illustrated on Drawing P329/III.

11.1.2 This will be achieved by a combined cut and fill contouring operation and will result, as previously discussed, in the low lying South Western area of the site being raised and the higher North Eastern areas being reduced in level.

11.1.3 Prior to the general cut and fill operation, the site will be subjected to an initial site strip, removing surface deposits of soft or unsuitable material.

11.1.4 Selection and placement of upfilling will be vigorously controlled and will be deposited to comply with D.O.T. Specification for Highway Works Clauses 801-8 inclusive.

11.0 SUBSTRUCTURE DESIGN/RECOMMENDATIONS (Continued)

11.2 OPTION 'A'

- 11.2.1 The main building foot print measures roughly 117m x 190m, with its North/South axis running parallel to Ninth Avenue, Office accommodation, being provided and housed in an annexe wing (40m x 65m) located at the South East corner of the main building.
- 11.2.2 The transition line between cut and fill would appear to bisect the main building into roughly two equal halves.
- 11.2.3 Depths of upfilling beneath the floor slab construction reaching 600mm to 700mm along the Western end of the main building.
- 11.2.4 Although the depth of upfilling beneath the building will be in the order of 600mm to 700mm along the Western end, the Eastern half of the building is situated in an area of cut and it should therefore be possible to adopt traditional strip and pad foundations coupled with a traditional ground supported floor slab construction within this half of the building.
- 11.2.5 It is normally accepted and good practice, to limit the depth of filling beneath ground supported slabs, to 600mm
- 11.2.6 On this basis, the extreme western third of the building is likely to have depths of upfilling exceeding this dimension.
- 11.2.7 We would recommend in this area that a psuedo raft solution is adopted for the ground floor construction.
- 11.2.8 Foundations in areas of upfilling will need to be extended down and into the underlying natural strata. As indicated in the Site Investigation Report (July 1995), such strata is located at a maximum depth of some 2000mm and on this basis, we anticipate foundation depths ranging from 1000mm to 2000mm below ground slab level, which are considered reasonable and viable for foundations constructed using traditional mass concrete trench fill techniques. 1/10

11.3 OPTION 'B'

- 11.3.1 The building size and layout is the same as Option 'A', but with the East-West axis of the main building running parallel with Fifth Avenue.
- 11.3.2 Consequently, the extent of upfilling beneath the building increases with the transition line between cut and fill, running roughly from the South East corner of the main building up to the middle of the North elevation, thus resulting in a triangular wedge in the North East corner, which is formed in cut.

## 11.0 SUBSTRUCTURE DESIGN/RECOMMENDATIONS (Continued)

### 11.3 OPTION 'B' (Continued)

- 11.3.3 Depths of upfilling beneath the floor slab construction range from 100mm at the North West corner, up to a maximum of 750mm at the South West corner of the building.
- 11.3.4 As with Option 'A', we consider it possible and viable to adopt traditional strip and pad foundations, with a ground supported floor slab construction over the majority of the building.
- 11.3.5 In areas of deep upfilling (i.e. greater than 600mm), the use of psuedo raft construction for the ground slab and trench fill foundations extending down and into the underlying natural strata, are again considered appropriate and should be adopted.

### 11.4 OPTION 'C'

- 11.4.1 The building size and layout is generally as Option 'B', but with the building shifted some 15 metres along the site in a North-East direction away from North Avenue.
- 11.4.2 As a consequence, the extent and depth of upfilling beneath the building footprint has increased further, reaching depths of 700mm to 1000mm beneath ground slab construction along the North West elevation of the building.
- 11.4.3 Dividing the building into two halves, we anticipate that the Eastern half of the building could be developed using traditional strip and pad foundations coupled with a ground supported floor slab construction.
- 11.4.4 The Western half of the building which is located in the areas of relatively deep upfilling, will require the use of psuedo raft construction and trench fill foundations as previously discussed for Options 'A' and 'B'.

### 11.5 OPTION 'D'

- 11.5.1 This option comprises twin units of approximately 85m x 117m plan dimension, separated by a car parking zone of 50 metre width.
- 11.5.2 The East-West axis of the twin units runs parallel with Fifth Avenue, with the North and South sides of the building being located on the same line as the North and south sides of building Options 'B' and 'C'.
- 11.5.3 Resultant upfilling beneath the Eastern Building Unit is likely to be minimal and should allow the complete building unit to be developed using traditional strip and pad foundations, with ground supported floor slabs throughout.

## 11.0 SUBSTRUCTURE DESIGN/RECOMMENDATIONS (Continued)

### 11.5 OPTION 'D' (Continued)

11.5.4 The whole of the western building unit is located in an area of relatively deep filling with the depth of upfilling beneath the ground slab construction reaching approximately 1000mm at the South West corner of the building unit.

11.5.5 A pseudo raft ground slab construction and trench fill foundations would appear to be appropriate throughout this building unit.

### 11.6 GENERAL CONSIDERATIONS

11.6.1 Ground slab construction and design will be dependant on the building usage, nature and distribution of floor loadings and settlement characteristics of the subgrade/ formation.

11.6.2 It has been our experience in the past that the practice of categorising floor loads as notional uniformly distributed loads is misleading, as the design of the slab depends on many influencing factors, namely:-

- (i) Usage of the building.
- (ii) Nature of loading regime (i.e. pallet racking, block stacking etc.)
- (iii) Racking configuration/layout.
- (iv) Trucking speeds and frequencies.
- (v) Settlement properties of the sub-grade.

11.6.3 As will be appreciated therefore, before final designing of the floor slab it will be necessary to determine all these factors. It is our opinion however, that the resulting formation for the Site should provide good support to the ground supported slabs for a notional uniformly distributed loading of up to 50 kN/m<sup>2</sup> (½ T/Ft.<sup>2</sup>) without undue difficulty.

11.6.4 Consideration will also need to be given to the design/slope stability of the plateau embankment located along the Western edge of each of the building options, together with an assessment of its influence on the building substructure.

### 11.7 ADVANCE PREPARATION WORKS/SITE ACCESS

11.7.1 The Hirwaun Industrial Estate is a key employment location in the Cynon Valley and has the advantage of a good location adjacent to the Heads of the Valleys Road.

11.7.2 Although the site would appear suitable for a range of building/business developments, the visual conditions on site do not in our opinion, create the right impression for attracting or selling the site to future industrials.

11.0 SUBSTRUCTURE DESIGN/RECOMMENDATIONS (Continued)

11.7 ADVANCE PREPARATION WORKS/SITE ACCESS (Continued)

- 11.7.3 The provision of Advance Preparation Works, to include a well landscaped environment, would be a practical way of enhancing the visual conditions on the site and be effective in creating the right impression.
- 11.7.4 Access to the site at present is via a temporary entrance located at the end of Ninth Avenue and under the A.P. Works; the construction of more prominent/definite site entrances, coupled with appropriate landscape screening would in our view, improve the existing site conditions, with minimal land use, resources and a limited spend.
- 11.7.5 With this in mind, an overall layout has been prepared to show details in relation to a proposed plateau to accommodate the preferred option for a single unit of 18,600m<sup>2</sup> (200,000 m<sup>2</sup>) or alternating two 10,000m<sup>2</sup> units.
- 11.7.6 The level of the proposed plateau has been determined to allow for a suitable Surface Water outlet to the stream to be obtained and this also provides for a general raising of the site to bring the levels closer to the adjacent Fifth Avenue.
- 11.7.7 A roadway into the Site has also been allowed for from Fifth Avenue together with service spurs for Gas, Electricity and Water. Costs in relation to such A.P. Works and services are shown in Appendix 'D'.
- 11.7.8 With regard to the implementation of landscaping only, we commissioned Landscape Architects, Messrs Lingard & Styles Landscape, to advise us on the feasibility of implementing such a landscape improvement scheme and in brief, their Study has identified the four corners of the Site as visually sensitive areas and have prepared a Report (*See Appendix 'H'*) which sets out a range of landscape proposals together with approximate costings.
- 11.7.9 The associated costings are however considered to be disproportionately high and accordingly, modified proposals to include some bunding and safe landscaping thereto have been allowed for under the A.P. Works referred to previously.

## 12.0 EXECUTIVE SUMMARY

- 12.1 The site was once occupied by an Ordnance Factory but this was demolished in the early 1970's and the area was then regraded under a cut and fill operation to give a fairly level plateau.
- 12.2 The overall area is located on carboniferous rocks of the lower coal measures and these are overlaid by glacial drift and glacial till. Some hollows of peat appear to have been in existence before the cut and fill operations and these appeared to have been covered over.
- 12.3 Mining has taken place to the North of the Rhigos Road but these zones are outside the influence area of the site and the Mineral Valuer has confirmed that the risk of damage from underground mining subsidence is minimal.
- 12.4 The National Park Boundary dissects the site and accordingly any future development will be subject to the planning requirements of the Park Committee.
- 12.5 An existing surface structure is in evidence in the north Eastern corner of the site and an underground tank is also present in this vicinity. Welsh Water have also carried out mainlaying and structural works adjacent to Ninth Avenue and in the North Eastern corner of the Site and details in this respect are shown on the attached drawings.
- 12.6 Works have been implemented on both the Ninth and Fifth Avenues in order to allow these to be adopted and Foul and surface Water Sewers as shown on the attached plan have already been adopted. A suitable outlet exists for the future foul sewage of the Site but the existing Pumping Station which will serve this area may need upgrading to deal with the resulting flows. The Surface Water flows may be accommodated by the existing watercourse in the area and the N.R.A. have confirmed that on site storage will not be required.
- 12.7 The Sewage Treatment Works is presently receiving some 50% of its design inflow, i.e. 1,000,000 l/day (220,000 gallons/day), and accordingly this is not considered to be a constraint to the site development. This will of course require checking once the magnitude of the Effluent Foul flow is known.
- 12.8 With regard to the existing ground conditions, it was recommended that the previous 1972 Site Investigation be augmented by further work in order to determine the engineering properties of the overall area concerned. Such investigation works have been undertaken and details of these are given in the attached Appendices.
- 12.9 As indicated in the main body of the Report, the Hirwaun Estate has the advantage of being served by the adjacent Heads of the Valleys Road (A465) and it is understood that this system will be further improved by the extension of the A470 and A4780 to link to the A465 at a position to the North West of Merthyr. This is scheduled for completion in early 1997.

## 12.0 EXECUTIVE SUMMARY (Continued)

12.10 Servicing of the Site does not present a problem as all mains facilities are in close proximity to the area concerned. This aspect has been pursued with the appropriate Statutory Authorities and appropriate details are provided as an Appendix to this Report.

12.11 The Site gives the appearance of being low lying and wet and accordingly it would benefit from a cut and fill operation to provide a revised plateau as shown on the proposed Advance Preparation Works drawing attached herein. The addition of associated landscaping to make the area more attractive would also be of benefit.

12.12 With regard to the associated costing for the proposed A.P. Works, these are summarised below:-

### (1) Option One - Comprising Plateau Development (with no landscaping Works)

Development of plateau, with capping layer provision of access roadway and drainage, allowance for some shrub planting works, demolition of the existing building and SWALEC and Gas servicing. £281,000.00

Additional allowance for mulch and seeding to capping layer. £ 19,000.00

**Option One TOTAL** £300,000.00

### (2) Option Two - Comprising Plateau Development and Earth Mounds C & D.

Development of plateau and associated works as outlined above, together with additional landscaping works. £288,000.00

Additional allowance for mulch and seeding to capping layer. £ 19,000.00

**Option Two TOTAL** £307,000.00

### (3) Option Three - Comprising Plateau Development and Earth Mounds A, B, C & D.

Development of plateau and associated works as outlined above, together with all landscaping works. £321,000.00

Additional allowance for mulch and seeding to capping layer. £ 19,000.00

**Option Three TOTAL** £340,000.00

*Note: Exclusions to Options One, Two & Three*

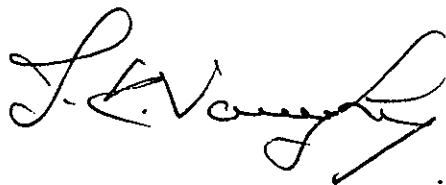
- a) *Professional Fees and Supervision*
- b) *Value Added Tax*
- c) *Site Servicing (Welsh Water)*

12.0 EXECUTIVE SUMMARY (Continued)

12.13 With regard to the landscaping, as indicated in Appendix 'H', it is appreciated that the associated costings are substantial and we would therefore advocate that a reduced scheme be prepared which will achieve a reasonable degree of benefit at an affordable cost. Suitable costs in this respect are included in the Estimates attached herein.

12.14 We hope that our findings, conclusions and recommendations are to your general approval but if any clarification is required, then please do not hesitate to contact us.

Yours faithfully,

A handwritten signature in black ink, appearing to read "J. E. Vaughan". The signature is written in a cursive style with a large, sweeping initial "J".

Thomas, Morgan & Associates



WELSH DEVELOPMENT AGENCY

REPORT ON  
17 ACRE SITE AT THE HIRWAUN INDUSTRIAL ESTATE

APPENDICES  
'A', 'C', 'D', 'E', 'G' & 'H'

MISCELLANEOUS DATA

- APPENDIX 'A' - MINING SUBSIDENCE REPORTS
- APPENDIX 'C' - CORRESPONDENCE WITH STATUTORY AUTHORITIES
- APPENDIX 'D' - ESTIMATES OF COSTS
- APPENDIX 'E' - BUILDING OPTIONS
- APPENDIX 'G' - DETAILS OF HIGHWAY ADOPTIONS
- APPENDIX 'H' - FEASIBILITY REPORT ON LANDSCAPE IMPROVEMENTS

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Mid Glamorgan. CF37 2BD

Reference: P329.02

September 1995

**APPENDIX 'A'**

**MINING SUBSIDENCE REPORT**  
**PREPARED BY**  
**MINERAL VALUER (WALES)**

Valuation Office



Thomas Morgan & Associates  
20 Gelliwastad Road  
PONTYPRIDD  
Mid Glamorgan  
CF37 2BD

G D Lloyd F.R.I.C.S  
Mineral Valuer (Wales)  
Ground Floor  
Phase 2  
Ty Glas  
Llanishen  
CARDIFF  
CF4 4YN



Tel : (0222) 753271  
Ext : 2564  
Fax : (0222) 762443  
Date: 30 December 1993

Your request dated 17.12.93 refers .

Your Ref: EP/JJ/P.329  
Our Ref : C48205/BP/NH  
Please ask for: MR B PADFIELD

TOWN AND COUNTRY PLANNING ACT 1990  
PROPOSED INDUSTRIAL DEVELOPMENT  
DEVELOPMENT AREA '8' HIRWAUN INDUSTRIAL ESTATE

MINING SUBSIDENCE REPORT

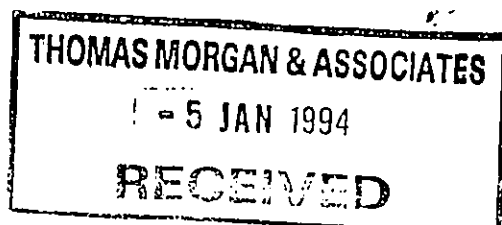
This report has been prepared for the assistance of the Local Planning Authority in its consideration of this planning application and should not be used for any other purpose. It relates only to the risk of damage by subsidence caused by underground mining operations and does not address the question of any of the other forms of ground instability outlined in PPG 14 "Development On Unstable Land". It is valid for a period of twelve months only.

The site rests on superficial deposits overlying Coal Measures strata of the Carboniferous System.

Based on the information researched it appears unlikely that any underground mining operations have been prosecuted hereabouts in the past and on current information the prospect of the site being disturbed by such operations in the future is considered to be remote.

In the above circumstances I am of opinion that the risk of damage from underground mining subsidence to the proposed development is minimal.

  
MINERAL VALUER (WALES)



APPENDIX 'C'

CORRESPONDENCE WITH  
STATUTORY AUTHORITIES



DŴR CYMRU  
WELSH WATER

Plans etc. in  
Report folder.

Thomas, Morgan & Associates  
20 Gelliwastad Road  
PONTYPRIDD  
Mid Glam CF37 2BD

Dyddiad/Date:  
21 February 1995

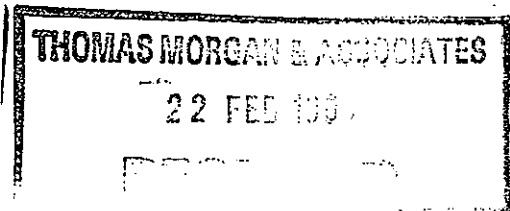
Ymholiadau/Enquiries:  
Stuart Davies

Ein Cyf/Our Ref:

LSD/SP  
Eich Cyf/Your Ref:

AKV/SM/P329.07/9

FAO: A K VAUGHAN ESQ



Dear Sir

RE: HIRWAUN INDUSTRIAL ESTATE  
REVIEW OF 17 ACRE SITE

Your letter dated 6 February has been passed to me from Acer Wallace Evans, who are dealing with the development of the new Water Treatment Works at Hirwaun.

Penderyn is an operational reservoir built sometime between 1865/1910, it has an earth embankment with a clay core on three sides and a maximum height of 10.66 metres. It has a capacity of 600 Ml and thus comes under the Reservoirs Act 1975, its last Statutory Inspection on 30 November 1990 when the Inspector made no recommendation in the "interest of safety". The next scheduled inspection under the Act is November 2000. It is also inspected quarterly by the Company's Reservoirs Supervising Engineer.

Damp patches have appeared on the face of the embankment over the years and these have been dug out and stone placed to drain the areas through french drains into the stream which runs along the toe of the embankment. These drains are regularly monitored.

Mr Lyn Parsons, Design Engineer with Acer Wallace Evans, has asked me to pass on the enclosed plans, on which he has marked the approximate position of the new sludge main to Hirwaun STW. Also enclosed is drawing No 1B486/C11 which indicates the development which is being carried out at present. It also indicated the proposed demolition of the buildings and tank on the 17 acre site.

Rhanbarth y De Ddwyrain Heol Pentwyn  
Nelson Treharris Morgannwg Ganol CF46 6LY  
Ffôn: Nelson (01443) 450577 Teleffacs:(01443) 451748

Dŵr Cymru Cyf, cwmni cyfyngedig wedi'i gofrestru yng Nghymru Rhif 2366777  
Un o grŵp cwmnïau Welsh Water PLC  
Swyddfa Gofrestredig: Plas y Ffynnon Ffordd Cambria Aberhonddu Powys LD3 7HP



South Eastern Division Pentwyn Road  
Nelson Treharris Mid Glamorgan CF46 6LY  
Tel: Nelson (01443) 450577 Telefax:(01443) 451748

Dŵr Cymru Cyf, a limited company registered in Wales No 2366777  
One of the Welsh Water PLC group of companies  
Registered Office: Plas y Ffynnon Cambrian Way Brecon Powys LD3 7HP

Should you require any further information please contact me on the telephone number below.

Yours faithfully

L. *Stuart Davies*

Stuart Davies  
Water Resources Manager

Welsh Water,  
Pentwyn Road,  
Nelson,  
Mid Glamorgan.

AKV/SH/P329.07/G  
6th February 1995

For the attention of Mr. Lyn Parsons  
Reservoirs Division)

Dear Sirs,

**WELSH DEVELOPMENT AGENCY**  
**HIRWAUN INDUSTRIAL ESTATE**  
**REVIEW OF 17 ACRE SITE**

Further to our telephone conversation regarding the above, we would advise you that our Clients have asked us to submit a full Study for the area concerned and as explained, it is the intention to include details of the adjacent reservoir and the works which you are currently undertaking in the area.

We should therefore be grateful if you could provide a very brief statement on the reservoir and its construction, and provide any information that you may have on the bank stabilisation works which appear to have been undertaken on the face abutting the site. As you may remember, a mention was made in a previous Study Report of the possibility of bank leakage in this vicinity but you kindly indicated to the writer that this was not the case and any stabilisation works had in fact been incorporated to deal with surface water flows over the external bank profile.

With regard to your proposals in the area, we shall be most grateful if you could supply us with a layout plan to indicate the overall extent of the works and if possible, your comments on the existing building and tank on the 17 Acre Site would be most appreciated. A copy of our Drawing No.P329/III is enclosed herein for your information in relation to the Site being examined.

Our Clients are most anxious that our Study Report should be submitted in the near future and accordingly, your early attention to the foregoing would be most appreciated. If any clarification is required, then please do not hesitate to contact the undersigned.

Yours faithfully,



Thomas, Morgan & Associates

1 227/G. J



# British Gas

TransCo

Our Ref: DSS 4128

THOMAS MORGAN & ASSOCIATES  
CIVIL & STRUCTURAL ENGINEERS  
QUANTITY SURVEYORS  
20 GELLIWASTED ROAD  
PONTYPRIDD  
MID GLAM

British Gas plc  
South Wales District  
Ferry Road  
Cardiff CF1 7XR  
  
Telephone (01222) 223290  
Telex 497057  
Fax (01222) 588021/588088

16 March 1995

Re: 17 acre site study W.D.A. Hirwaun Industrial Estate

Dear sir

Thank you for your enquiry to supply 250 therms per hour to the above site from Fifth Avenue.

The budget figure is £1091 and is to lay a supply from Fifth Ave. at an approximate central location to the site terminating at the curtilage of the proposed 17 acre developments as per your drawing no P329/III.

I hope this information is sufficient for your requirements at present, if you require any further information please contact me at the above .

Yours Faithfully

*D. Spencer*

D. Spencer  
Planning Officer

THOMAS MORGAN & ASSOCIATES  
17 MAR 1995



*COSTS TO BE INCLUDED  
IN 17 ACRE SITE REPORT*

P.329

**NETWORK SERVICES**  
Newport Road, St. Mellons  
Cardiff CF3 9XW  
Phone: (01222) 792111  
Fax: (01222) 777759

**GWASANAETHAU RHWYDWAITH**  
Heol Casnewydd, Llanelwrg  
Caerdydd CF3 9XW  
Ffôn: (01222) 792111  
Ffacs: (01222) 777759



Your Ref / Eich Cyf:  
AKP/SH/P329.03/G

Our Ref / Ein Cyf:  
E/KE/01C8809/HL

Telephone Enquiries to / Ymholiadau i:  
Keith Evans

Direct Line / Llinell Uniongyrchol:

Thomas Morgan Associates  
Civil & Structural Engineers  
20 Gelliwastad Road  
PONTYPRIDD  
Mid Glamorgan  
CF37 2PD

(01222) 771 184.....

26 May 1995

Dear Sirs

Re: 17 Acre Site, Hirwaun Industrial Estate

Thank you for your enquiry for a 1 megawatt supply to this site.

Supply can be afforded from the existing 11,000 volt main on the opposite side of Fifth Avenue to the site.

The budget cost for providing supply to the site boundary is £4,000 (Four Thousand Pounds) plus V.A.T. This budget price is based on present day costs and charging policy which may alter with time, as may our system. This budget estimate must not be used as a basis for placing an order for the work. A firm quotation for the supply will be provided upon receipt of detailed information.

Should you wish to discuss this matter please contact Mr Keith Evans whose direct line telephone number is 01222 771184.

Yours faithfully

*Keith Evans*

**KEITH EVANS**  
Production Organiser  
Merthyr/West Gwent Production Unit  
Network Services (East)



**South Wales Electricity plc**

Registered in Wales Registered Number. 2366985  
Registered Office: Newport Road St Mellons Cardiff CF3 9XW  
VAT Number: 542 6869 16

**Trydan De Cymru ccc**

Cofrestrwyd yng Nghymru Cofrestrwyd Rhif. 2366985  
Swyddfa Cofrestrddig: Heol Casnewydd Llanelwrg Caerdydd CF3 9XW  
Rhif Iteih Gwerth 542 6869 16

Welsh Water,  
Pentwyn Road,  
Nelson,  
Mid Glamorgan.

AKV/SH/P329.04/G  
1st February 1995

For the attention of Mr. Nigel Moon

Dear Sirs,

**WELSH DEVELOPMENT AGENCY**  
**HIRWAUN INDUSTRIAL ESTATE**  
**17 ACRE SITE STUDY**

We would advise you that we are presently examining the above Site for our Clients, the Welsh Development Agency, and as part of the Study we have been requested to obtain information in relation to servicing costs to supply the anticipated requirements for the development area concerned.

It is anticipated that 200 cubic metres per day will be required in this connection with termination presently taking place immediately off Fifth Avenue at an approximate central location to the Site. For your information in this respect, we enclose herein a copy of our Drawing No.P329/III and it is anticipated that a short section of roadway will be constructed prior to your works taking place in order to allow for initial access to the Site.

We are anxious to supply our Clients with this information in the near future and accordingly it would be much appreciated if you could provide us with budget figures initially in this respect. If any additional information is required to allow you to initiate this matter, then please do not hesitate to contact the undersigned.

Yours faithfully,



Thomas, Morgan & Associates

encl.

Mr. Dilwyn Evans,  
Engineering Manager,  
Wales Gas,  
Transco,  
Ferry Road,  
Grangetown,  
CARDIFF.

AKV/SH/P329.05/G  
1st February 1995

Dear Sirs,

**WELSH DEVELOPMENT AGENCY**  
**HIRWAUN INDUSTRIAL ESTATE**  
**17 ACRE SITE STUDY**

We would advise you that we are presently examining the above Site for our Clients, the Welsh Development Agency, and as part of the Study we have been requested to obtain information in relation to servicing costs to supply the anticipated requirements for the development area concerned.

It is anticipated that 250 therms per hour will be required in this connection with termination presently taking place immediately off Fifth Avenue at an approximate central location to the Site. For your information in this respect, we enclose herein a copy of our Drawing No.P329/III and it is anticipated that a short section of roadway will be constructed prior to your works taking place in order to allow for initial access to the Site.

We are anxious to supply our Clients with this information in the near future and accordingly it would be much appreciated if you could provide us with budget figures initially in this respect. If any additional information is required to allow you to initiate this matter, then please do not hesitate to contact the undersigned.

Yours faithfully,



Thomas, Morgan & Associates

encl.

SWALEC,  
Network Services,  
Newport Road,  
St. Mellons,  
Cardiff. CF3 9XW

AKV/SH/P329.03/G  
1st February 1995

Dear Sirs,

**WELSH DEVELOPMENT AGENCY**  
**HIRWAUN INDUSTRIAL ESTATE**  
**17 ACRE SITE STUDY**

We would advise you that we are presently examining the above Site for our Clients, the Welsh Development Agency, and as part of the Study we have been requested to obtain information in relation to servicing costs to supply the anticipated requirements for the development area concerned.

It is anticipated that one Megawatt of electricity will be required in this connection with termination presently taking place immediately off Fifth Avenue at an approximate central location to the Site. For your information in this respect, we enclose herein a copy of our Drawing No.P329/III and it is anticipated that a short section of roadway will be constructed prior to your works taking place in order to allow for initial access to the Site.

We are anxious to supply our Clients with this information in the near future and accordingly it would be much appreciated if you could provide us with budget figures initially in this respect. If any additional information is required to allow you to initiate this matter, then please do not hesitate to contact the undersigned.

Yours faithfully,



Thomas, Morgan & Associates

encl.

**APPENDIX 'D'**

**ESTIMATES OF COSTS**

WELSH DEVELOPMENT AGENCY  
17 ACRE SITE AT THE HIRWAUN INDUSTRIAL ESTATE

ESTIMATE OF COSTS  
OPTION ONE - PLATEAU DEVELOPMENT WITH NO LANDSCAPING  
(Inclusive of General Items)

	£
1.0 Earthworks, provision of cut and filling operations to form plateau.	100,000.00
2.0 Disposal of unsuitable excavated material off site.	30,000.00
3.0 Capping layer to plateau: 75mm thick.	65,000.00
4.0 Access roadway.	20,000.00
5.0 Drainage works, provision of surface water connection and land drainage.	45,000.00
6.0 Landscaping:	
6.1 Formation of earth mounds, covered with imported topsoil	Not included
6.2 Provisional allowance for Tree and Shrub planting.	5,000.00
7.0 Provisional allowance for the demolition of the underground tank and surface building to the Northern Area of the site. ( <i>Subject to Welsh Water approval</i> )	10,000.00
8.0 Provisional allowance for site servicing of SWALEC, British Gas and British Telecom.	6,000.00
	<hr/>
	281,000.00
9.0 Additional allowance for mulch and seeding to capping layer.	19,000.00
	<hr/>
<b>TOTAL</b>	<b>£300,000.00</b>
	<hr/> <hr/>

*Exclusions:*

- (a) Professional Fees and Supervision
- (b) Value Added Tax
- (c) Site Servicing (Welsh Water)

**WELSH DEVELOPMENT AGENCY**  
**17 ACRE SITE AT THE HIRWAUN INDUSTRIAL ESTATE**

**ESTIMATE OF COSTS**  
**OPTION TWO - PLATEAU DEVELOPMENT & EARTH MOUNDS C & D**  
(Inclusive of General Items)

	£
1.0 Earthworks, provision of cut and filling operations to form plateau.	100,000.00
2.0 Disposal of unsuitable excavated material off site.	20,000.00
3.0 Capping layer to plateau: 75mm thick.	65,000.00
4.0 Access roadway.	20,000.00
5.0 Drainage works, provision of surface water connection and land drainage.	45,000.00
6.0 Landscaping:	
6.1 Formation of earth mounds, covered with imported topsoil	12,000.00
6.2 Provisional allowance for Tree and Shrub planting.	10,000.00
7.0 Provisional allowance for the demolition of the underground tank and surface building to the Northern Area of the site. <i>(Subject to Welsh Water approval)</i>	10,000.00
8.0 Provisional allowance for site servicing of SWALEC, British Gas and British Telecom.	6,000.00
	<hr/>
	288,000.00
9.0 Additional allowance for mulch and seeding to capping layer.	19,000.00
	<hr/>
<b>TOTAL</b>	<b>£307,000.00</b>
	<hr/> <hr/>

*Exclusions:*

- (a) Professional Fees and Supervision*
- (b) Value Added Tax*
- (c) Site Servicing (Welsh Water)*

**WELSH DEVELOPMENT AGENCY**  
**17 ACRE SITE AT THE HIRWAUN INDUSTRIAL ESTATE**

**ESTIMATE OF COSTS**  
**OPTION THREE - PLATEAU DEVELOPMENT WITH EARTHMOUNDS A, B, C & D**  
(Inclusive of General Items)

	£
1.0 Earthworks, provision of cut and filling operations to form plateau.	100,000.00
2.0 Disposal of unsuitable excavated material off site and importation of structural fill material	10,000.00
3.0 Capping layer to plateau: 75mm thick.	65,000.00
4.0 Access roadway.	20,000.00
5.0 Drainage works, provision of surface water connection and land drainage.	45,000.00
6.0 Landscaping:	
6.1 Formation of earth mounds, covered with imported topsoil	45,000.00
6.2 Provisional allowance for Tree and Shrub planting.	20,000.00
7.0 Provisional allowance for the demolition of the underground tank and surface building to the Northern Area of the site. <i>(Subject to Welsh Water approval)</i>	10,000.00
8.0 Provisional allowance for site servicing of SWALEC, British Gas and British Telecom.	6,000.00
	<hr/>
	321,000.00
9.0 Additional allowance for mulch and seeding to capping layer.	19,000.00
	<hr/>
	<b>TOTAL £340,000.00</b>
	<hr/> <hr/>

*Exclusions:* (a) Professional Fees and Supervision  
(b) Value Added Tax  
(c) Site Servicing (Welsh Water)



**APPENDIX 'E'**

**BUILDING OPTIONS**  
**(Reference Drawings**  
**Numbered P329/IV, V, VI, & VII)**

**APPENDIX 'G'**

**DETAILS OF HIGHWAY ADOPTIONS**



MID GLAMORGAN  
 CYNGOR SIR  
 MORGANNWG GANOL

HIGHWAYS AND  
 TRANSPORTATION DEPARTMENT

County Council Offices  
 Greyfriars Road  
 Cardiff, CF1 3LJ

D.G. Evans M.A.,  
 Chartered Engineer  
 County Engineer and Surveyor

P320/G

Thomas Morgan & Associates,  
 20, Gelliwastad Road,  
 Pontypridd,  
 Mid Glamorgan,  
 CF37 2DD.

**THOMAS MORGAN & ASSOCIATES**  
 31 JUL 1995

Facsimile Cardiff (01222) 820672  
 Telephone Cardiff (01222) 820672

Please ask for Mr R. Milsom

My Ref. E3/29/RM/BLH

Your Ref.

Date 27th July 1995

Dear Sir,

Highways Act 1980 – Section 228  
Adoption of Streetworks

Street : Access Roads at Hirwaun Industrial Estate, Hirwaun.

District : Cynon Valley Borough Council.

I refer to your request for adoption of the above named street which was considered by the Council at their meeting on 27th April 1995.

In respect of the area shown coloured pink on the enclosed plan together with any highway retaining wall shown thereon and also that part of the surface water drainage system which conveys highway water only.

Notices were consequently prepared and displayed in the street declaring the street to be a highway which for the purposes of this Act is a highway maintainable at public expense. No objections were received from the owner(s) of the street within one month from the day on which the notice was first displayed and consequently it became adopted and maintainable at public expense on 10th July 1995.

Yours faithfully,

for County Engineer and Surveyor

hirindes.rm





KEY  
 [Green line symbol] ROADS ORIGINALLY ADOPTED  
 [Thick green line symbol] ADDITIONAL ROADS NOW ADOPTED

**PRELIMINARY**

Keep on the Balance Sheet and  
 with the plans of the Engineer  
 of the Planning Office  
 from the Survey Office

PARA 62

P320 / / / 14

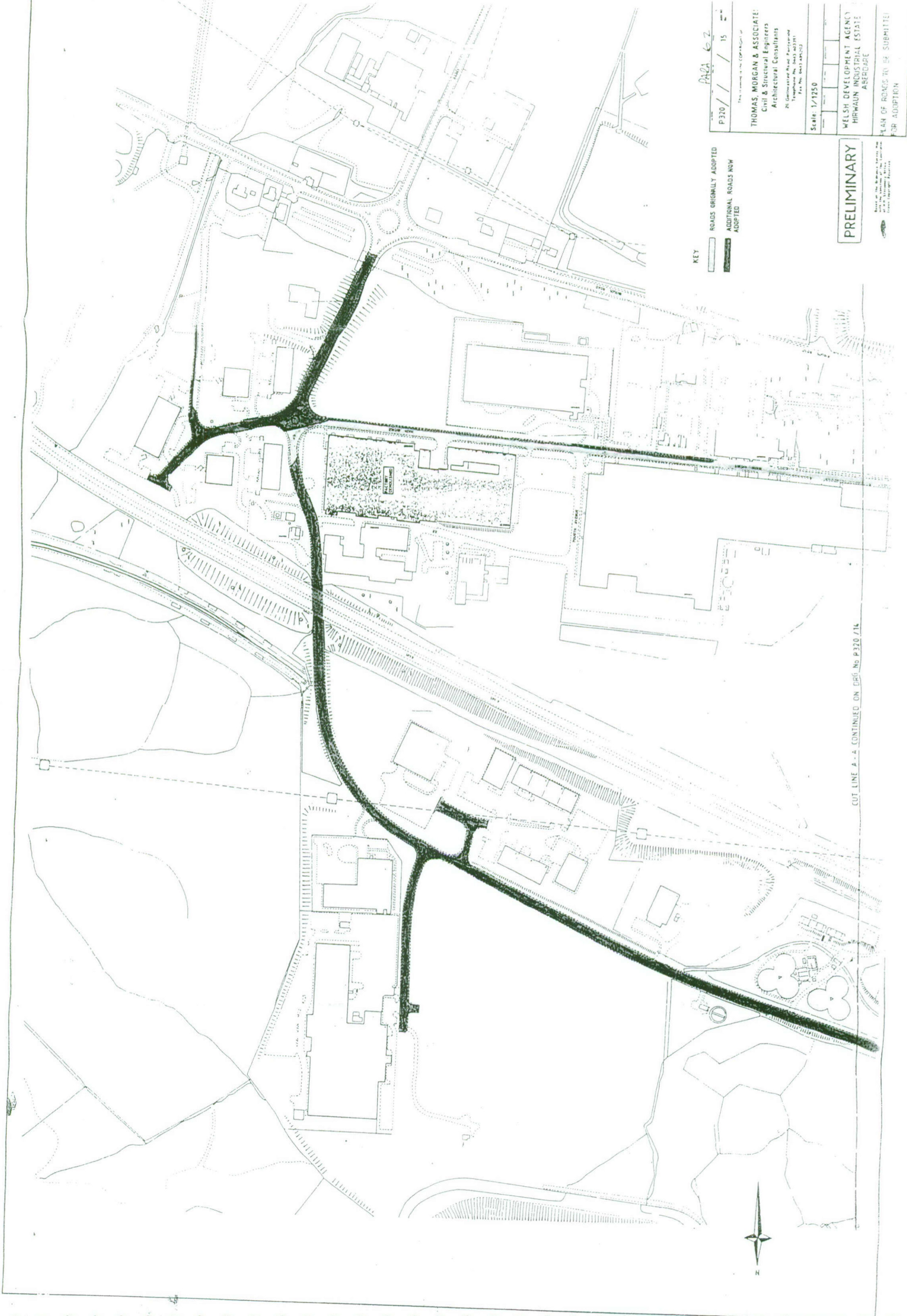
This drawing is the copyright of  
**THOMAS, MORGAN & ASSOCIATES**  
 Civil & Structural Engineers  
 Architectural Consultants  
 25 Galloway Road, Pen-y-bont  
 Telephone No. 0442 403291  
 Fax No. 0442 401203

Scale 1/1250

--	--	--	--

WELSH DEVELOPMENT AGENCY  
 HIRWAUN INDUSTRIAL ESTATE  
 ABERDARE

PLAN OF ROADS TO BE SUBMITTED  
 FOR ADOPTION



KEY  
 [Green line] ROADS ORIGINALLY ADOPTED  
 [Dashed line] ADDITIONAL ROADS NOW ADOPTED

P320 / / 15

PAPA 62

This is a copy of the original plan.

**THOMAS, MORGAN & ASSOCIATE:**  
 Civil & Structural Engineers  
 Architectural Consultants  
 20 Galloway Road, Parkside  
 Telephone No. 0443 40331  
 Fax No. 0443 48103

Scale: 1/1250

**WELSH DEVELOPMENT AGENCY**  
 HIRWAUN INDUSTRIAL ESTATE  
 ABERDARE

PLAN OF ROADS TO BE SUBMITTED FOR ADOPTION

**PRELIMINARY**

CUT LINE A-A CONTINUED ON DRG No P320/16



APPENDIX 'H'

FEASIBILITY REPORT  
ON  
LANDSCAPE IMPROVEMENT SCHEME

**CONTENTS:-**

- SECTION 1. INTRODUCTION AND BRIEF
- SECTION 2. PROPOSALS
- SECTION 3. COSTINGS
- SECTION 4. ILLUSTRATIONS

## SECTION 1.0.

### INTRODUCTION AND BRIEF.

- 1.1. Development Area 8 is situated to the Northern extremity of Hirwaun Industrial Estate and covers an area of 4.1 hectares. During December 1993 Lingard + Styles were approached by Thomas Morgan and Partners Engineers to advise on the feasibility of implementing a landscape improvement scheme in conjunction with proposed civil engineering works.
- 1.2. This brief report sets out a range of landscape proposals and the methodology for implementing these proposals, within the current financial year and planting season. The site is low lying, poorly drained and has a high peat content. It is understood that the area has been previously reclaimed from ordnance workings which would further contribute towards the poor drainage.

The site is covered with damp meadow ground vegetation including rushes, rough grasses and gorse, with sparse regeneration of Goat Willow, Alder and Birch. There is no significant tree cover but the North West corner of the site, separated from the main area by a water course, has substantial cover of pioneer trees including Birch, Alder, Oak and Willow.

To the North and West the surrounding land form rises dramatically, visually enclosing the site and giving protection from the Westerly and Northerly winds. The Westerly aspect consists of light native woodland clothing the escarpment and providing an attractive backdrop to the site.

- 1.3. It has been confirmed with the National Parks Officer that the boundary of the Brecon Beacons National Park transverses the site from East to West and this has been located on the attached Fig 1.

The fact that over 50% of the site falls within the National Park will be consideration for any planning application particularly in respect of the proposed landscape scheme.



## SECTION 2.0.

It is proposed that the existing peat that is excavated as part of the site development works is used to create a screen mound to the Southern boundary approximately 1.5 metres high and 6 metres wide. This can then be planted to produce an effective screen using a variety of plant species to create diversity.

Two options are available for this Southern boundary.

- 2.1. Option 1, illustrated in Fig. 2 section A, option 1 retains the existing drainage channel, creating a 7m wide band of planting and a 6m wide mound to be North of the existing drainage ditch and a 3.5m wide strip of low shrub planting adjacent to the road. Using a total 15.5m wide strip of the site. By retaining the ditch this creates an opportunity for the introductions of species along the banks of the ditch and minimizes the scope of these initial works.

Option 2, illustrated in Fig.2 Section A, option 2 provides a drainage pipe for the ditch and a 9m strip for planting and mounding adjacent to the road. This option maximizes the developable site.

Costs for these options are summarized in section 3. Both options provide an effective screen using a variety of tree and shrub species and mounding.

- 2.2. Landscape screening of the site is concentrated in the four corners as these have been identified as visually sensitive areas. The south West and South eastern corners are to be mounded and planted with a dense shrub and tree screen with a mix of species as follows:-

12%	T2 Acer campestre (Field maple)
12%	T3 Alnus glutinosa (Alder)
10%	T4 Betula pendula (Silver birch)
15%	S1 Crataegus monogyna (Hawthorn)
5%	T5 Fraxinus excelsior (Ash)
15%	S2 Prunus spinosa (Blackthorn)
7%	T6 Sorbus acuparia (Rowan)
12%	S3 Corylus avellana (Hazel)
12%	S4 Viburnum opulus (Water elder)

These 15 - 20 metre wide areas of planting will establish tall and dense screens at these vulnerable points of the site.

The North eastern corner is also to be planted with a dense tree and shrub screen mix but without mounding. This will establish dense vegetation at this junction between the site, existing industrial land, the Penderyn Reservoir and farmland.

The North western corner, which adjoins existing light woodland is to be planted with a light woodland mix as follows:-

23%	T4 Betula pendula (Silver birch)
6%	T2 Acer campestre (Field maple)
20%	T3 Alnus glutinosa (Alder)
15%	T1 Populus tremula (Aspen)
15%	T7 Salix caprea (Willow)
6%	T6 Sorbus acuparia (Rowan)
5%	S5 Cornus sanguinea (Dog wood)
5%	S4 Viburnum opulus (Water elder)
5%	T8 Quercus rodur (English oak)

This is to be established to the North West of the existing stream on site, which shall be retained.

- 2.3. The Western boundary is to be secured by paladin fencing and planted with a 6 metre wide strip of light woodland mix as above. This is illustrated by Section D on Fig. 2.

The Northern boundary is also to be secured by a paladin fence and a 3 metre wide shrub screen with occasional tree planting along the existing farm track and right of way which is to be retained. The shrub screen is as follows:-

30%	S4 Viburnum opulus (Water elder)
20%	S6 Rosa canina (Dog rose)
30%	S5 Cornus sanguinea (Dog wood)
20%	S2 Prunus spinosa (Blackthorn)

This is illustrated by Section C on Fig. 2.

The Eastern boundary is also to be secured by a paladin fence and a mass planting screen as follows:-

10%	T2 Acer campestre (Field maple)
15%	T3 Alnus glutionsa (Alder)
5%	T4 Betula pendula (Silver birch)
15%	S1 Crataegus monogyna (Hawthorn)
5%	T5 Fraxinus excelsior (Ash)
15%	S2 Prunus spinosa (Blackthorn)
5%	T6 Sorbus acuparia (Rowan)
15%	S3 Corylus avellana (Hazel)
15%	S4 Viburnum opulus (Water elder)

This planting will screen both the entrance to the site and view to and from the existing industrial unit to the east.

- 2.4. It is envisaged that the main body of the site shall be sown with a low maintenance grass mix until areas are developed with integral landscape proposals.

## 2.5. SUMMARY

These screen planting proposals aim to create effective screening of the site with a minimum use of land, resources and a limited spend, to maintain a flexible site which can be used to house a variety and development options.

SECTION 3.0.

APPROXIMATE COSTINGS FOR OPTION 1. (Open drainage)

1)	Site clearance prior to work	£ 3,000.00
2)	Creation of Screen mounding	£ 8,970.00
3)	Tall screen planting along Fifth Avenue	£11,670.00
4)	Shrub screen planting along Fifth Avenue	£ 1,200.00
5)	Grass seeding over main body of site	£36,000.00
6)	Screen planting of the Eastern boundary	£15,500.00
7)	Light woodland screen planting of the Western boundary	£10,000.00
8)	Shrub screen planting of the Northern boundary	£ 1,800.00
9)	Stock proof fencing of planting within the site	£ 6,900.00

---

APPROXIMATE TOTAL COST FOR OPTION 1 £95,040.00

---

APPROXIMATE COSTINGS FOR OPTION 2 (Underground drainage)

1)	Site clearance prior to work	£ 3,000.00
2)	Creation of screen mounding and land fill of ditch	£ 21,000.00
3)	Drainage pipe for existing ditch	£ 840.00
4)	Tall screen planting along Fifth Avenue	£ 11,600.00
5)	Shrub screen planting along Fifth Avenue	£ 920.00
6)	Grass seeding over main body of site	£ 36,000.00
7)	Screen planting of the Eastern boundary	£ 15,500.00
8)	Light woodland screen planting of the Western boundary area	£ 10,000.00
9)	Shrub screen planting of the Northern boundary	£ 1,800.00
10)	Stock proof fencing of planting within the site	£ 6,900.00

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APPROXIMATE TOTAL COST FOR OPTION 2 £107,560.00

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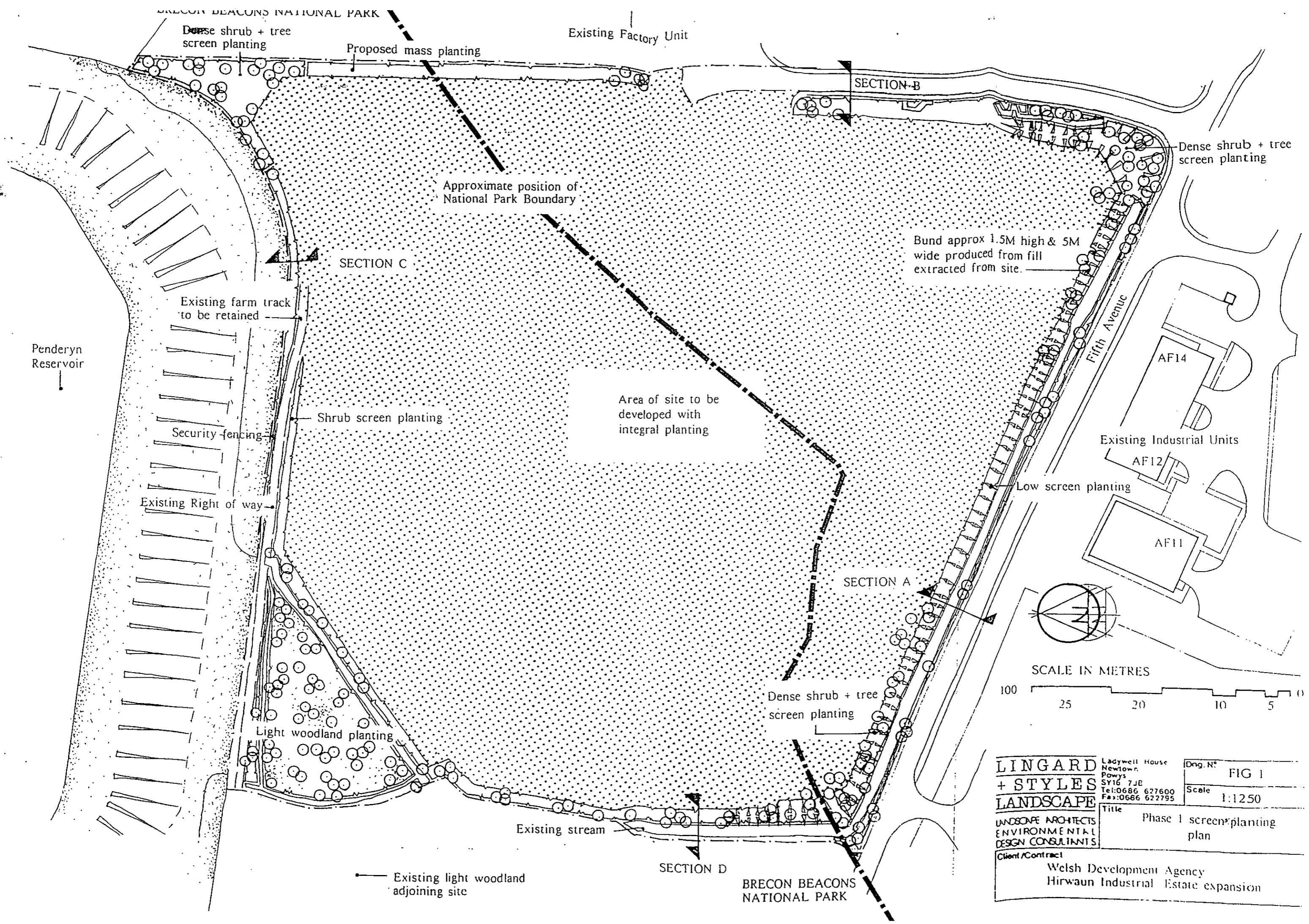
SECTION 4.0

ILLUSTRATIONS

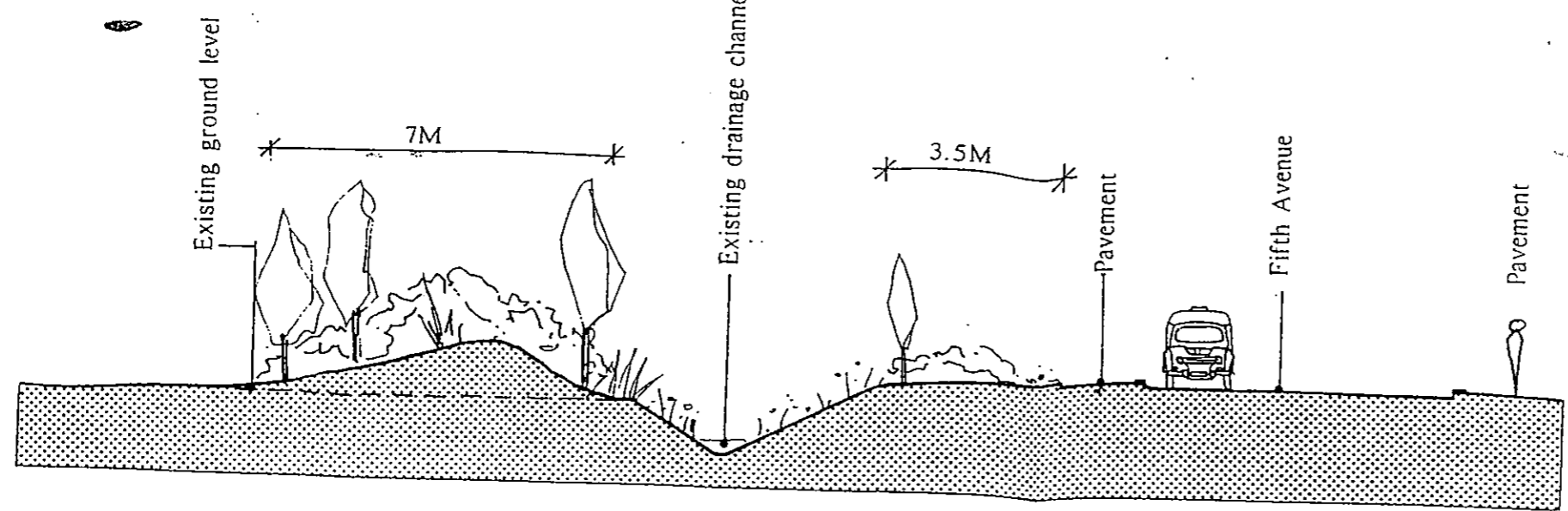
4.1. The following drawings illustrate detailed landscape proposals for the site.

Figure 1. Phase 1 screen planting plan

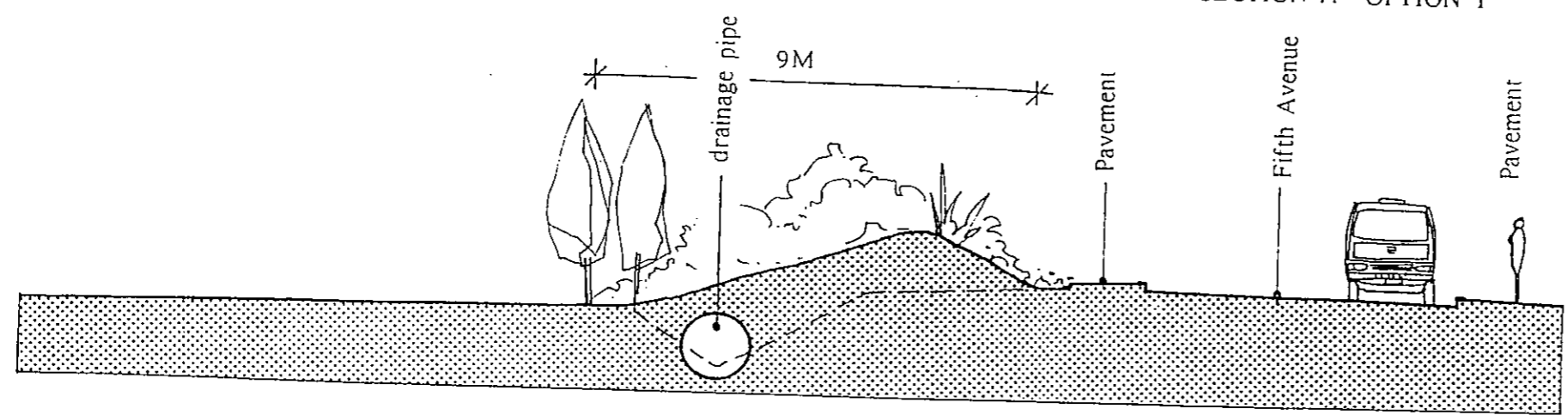
Figure 2. Phase 1 screen planting typical sections.



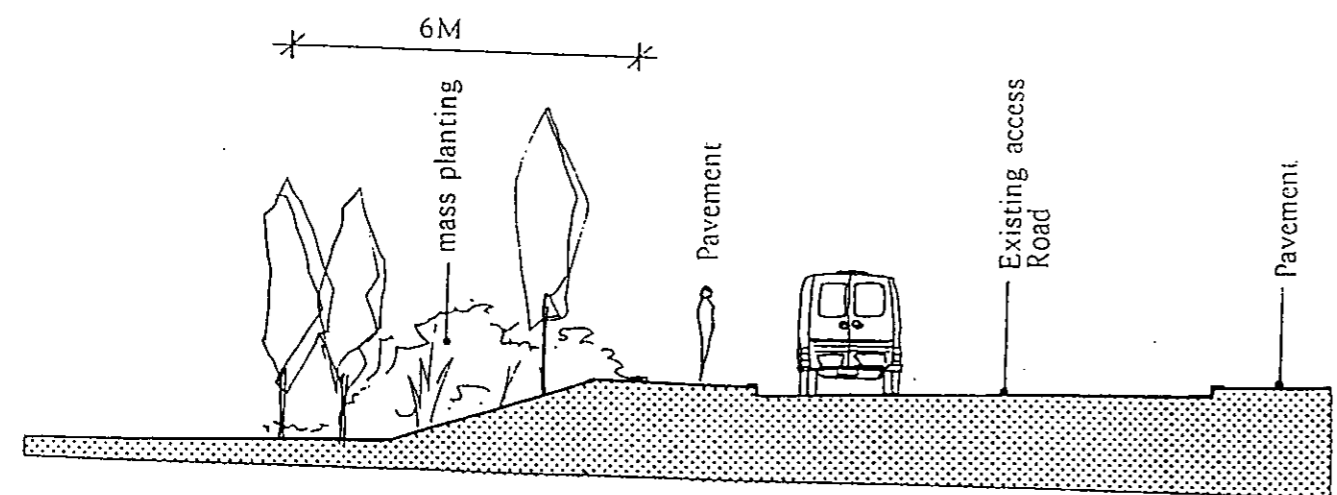
<b>LINGARD + STYLES LANDSCAPE</b> LANDSCAPE ARCHITECTS ENVIRONMENTAL DESIGN CONSULTANTS	Ladywell House Newtown Powys SY16 7JE Tel: 0686 627600 Fax: 0686 622795	Dwg. No. <b>FIG 1</b>
	Title <b>Phase 1 screen planting plan</b>	Scale <b>1:1250</b>
Client/Contract <b>Welsh Development Agency          Hirwaun Industrial Estate expansion</b>		



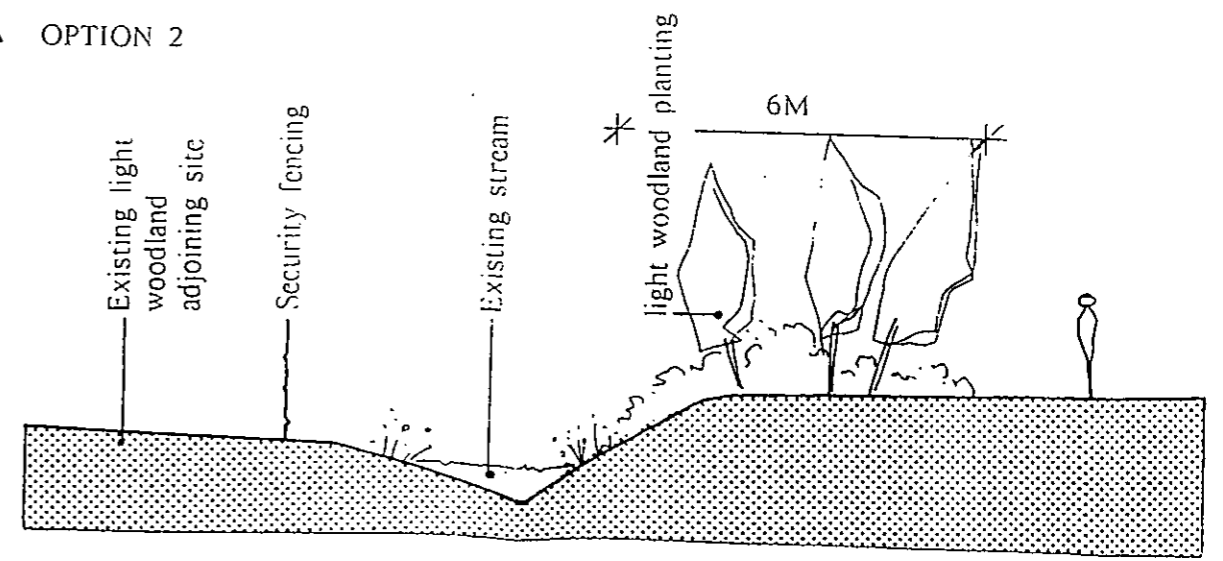
SECTION A OPTION 1



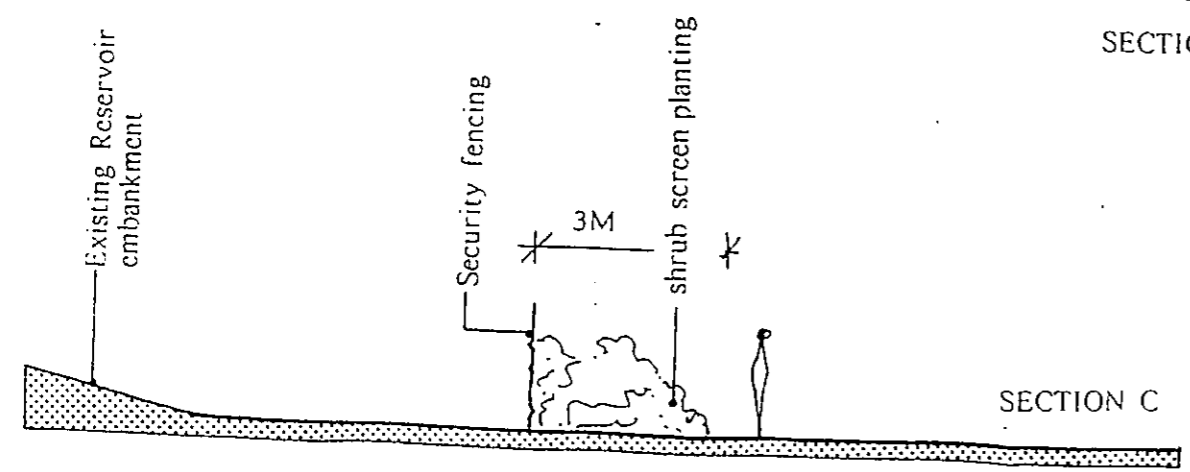
SECTION A OPTION 2



SECTION B



SECTION D

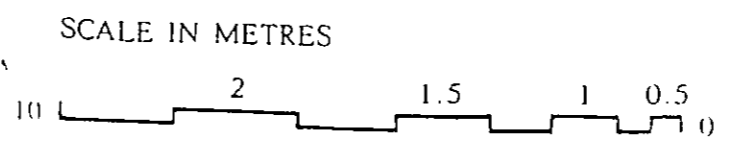


SECTION C

### PLANT LIST

CODE	TREE	PLANTING SIZE
T1	Populus tremula	900MM
T2	Acer campestre stake + tie	1500MM
T3	Alnus glutinosa	1200MM
T4	Betula pendula stake + tie	2400MM
T5	Fraxinus excelsior stake + tie	2400MM
T6	Sorbus acuparia stake + tie	1800MM
T7	Salix caprea	1200MM
T8	Quercus robur stake + tie	1800MM

CODE	SHRUBS	PLANTING SIZE
S1	Crataegus monogyna	600MM
S2	Prunus spinosa	600MM
S3	Corylus avellana	900MM CUT BACK TO 600MM
S4	Viburnum opulus	600MM
S5	Cornus sanguinea	600MM
S6	Rosa canina	600MM



<b>LINGARD + STYLES LANDSCAPE</b> LANDSCAPE ARCHITECTS ENVIRONMENTAL DESIGN CONSULTANTS Client/Contract	Ladywell House Newtown Powys SY16 7JB Tel: 0686 627600 Fax: 0686 622795	Dwg. N° <b>FIG 2</b>
	Title <b>Phase 1 screen planting</b> Typical sections	Scale <b>1:125</b>
Welsh Development Agency Hirwaun Industrial Estate expansion		