Multi-Utility Infrastructure Feasibility Study
Excluding Electric Vehicle Charging (EV)

Proposed Residential Development

A48, Pyle
Bridgend

September 2020

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1 Scope and Objectives

This desktop feasibility study covers both on-site and off-site elements for each utility and specifically includes the following information:

- Details of the location of all statutory network apparatus in close proximity to and within the development boundary.
- Assess the existing services for disconnections and diversions.
- Determine the need of and budget costs for any diversions and disconnections required.
- Assess the requirements of and provide budgetary costs for suitable electricity, gas, potable water and telecommunications to the development excluding EV.
- Investigate and report on any potential wayleave issues.
- Energy Strategy Input.

The findings in this study are therefore based upon published record and other information obtained from the statutory utilities, together with our knowledge and experience of the UK utility connections marketplace, regulatory obligations and utility network capabilities.

2 Executive Summary

This desktop feasibility study has been commissioned by Phil Stokes of Development & Technical Solutions Ltd (the client) to appraise the availability of electricity, gas, potable water and telecommunications services with regards to the proposed development, Site A 1,508 and Site B 792, totalling 2,300 dwellings, 1 x School, Local Centre, Employment, Sports Area, Children's Play Area and Allotments excluding EV charging.

The proposed Site A is a green field development located to the north and south of the A48 and to the east of Pyle. The development will consist of:

Option 1: 18 x Parcels, 1,508 properties, 1 x School, Local Centre, Employment, Sports Area, Children's Play Area and Allotments.

Option 2 16 x Parcels, 1,508 properties, 1 x School, Local Centre, Employment, Sports Area, Children's Play Area and Allotments.

Option 3 17 x Parcels, 1,464 properties, 1 x School, Local Centre, Employment, Sports Area, Children's Play Area and Allotments.

Budget Costs have not been included within this Feasibility Study for Site B. However, the infrastructure has been suitably sized to accommodate the construction of Site B in the future.

The development is shown on the following drawings & documents:

Drawing Owner	Title	Document no	Rev	Date
The Urbanists	**Red Line Plan**	17 60 - URB - UD - SK - 90 - 003	-	19/10/2018
	Indicative Option 1	XX – XX – SK – 90 - 10	-	29/10/2018
	Indicative Option 1 Land Budget	XX – XX – SK – 90 - 11	-	29/10/2018
	Indicative Option 2	XX – XX – SK – 90 - 12	-	29/10/2018

	Indicative Option 2 Land Budget	XX – XX – SK – 90 - 13	-	29/10/2018
	Indicative Option 3	XX – XX – SK – 90 - 14	-	29/10/2028
	Indicative Option 3 Land Budget	XX – XX – SK – 90 - 10	-	29/10/2018
Stuart Michael Associates	Utilities	6139	-	01/10/2018
	Underground Utilities Search Report	6139 Ref2	-	02/10/2018
	Existing Utilities Network	6139.002	-	02/10/2018

Network plans show that all utilities are available close to the development, there are no disconnections, however, diversionary works are anticipated.

Based on the available information, the overall budget costs are as follows based on Option 1:

Site A – Northern Development

Site A Northern – Infrastructure Developer	Connections	Diversions	Disconnections	Total
POC	£4,800,000	£0	£0	**£4,800,000**
Electricity	£510,300	£79,400	£0	**£589,700**
Gas	£197,000	£0	£0	**£197,000**
Water	£80,000	£0	£0	**£80,000**
Telecommunications	£2,000	£32,000	£0	**£34,000**
Total	**£5,589,300**	**£111,400**	**£0**	**£5,700,700**
Site A Northern – Parcel Developer	**Connections**	**Diversions**	**Disconnections**	**Total**
Electricity	£377,900			**£377,900**
Gas	£448,500			**£448,500**
Water	£1,147,200			**£1,147,200**
Telecommunications	£20,000			**£20,000**
Total	**£1,993,900**			**£1,993,900**

Site A – Southern Development

Site A Southern – Infrastructure Developer	Connections	Diversions	Disconnections	Total
Electricity	£364,500	£80,600	£0	**£445,100**
Gas	£182,300	£0	£0	**£182,300**
Water	£58,500	£0	£0	**£58,500**
Telecommunications	£2,000	£16,000	£500	**£18,500**
Total	**£607,300**	**£96,600**	**£500**	**£704,400**
Site A Southern – Parcel Developer	**Connections**	**Diversions**	**Disconnections**	**Total**
Electricity	£294,800			**£294,800**
Gas	£350,100			**£350,100**
Water	£877,800			**£877,800**
Telecommunications	£24,000			**£24,000**
Total	**£1,546,700**			**£1,546,700**

Site A – Infrastructure Developer Total

Site A - Infrastructure Developer Total	Connections	Diversions	Disconnections	Total
Electricity & POC	£5,674,800	£160,000	£0	**£5,834,800**
Gas	£379,300	£0	£0	**£379,300**
Water	£138,500	£0	£0	**£138,500**
Telecommunications	£4,000	£48,000	£500	**£52,500**
Total	**£6,196,600**	**£208,000**	**£500**	**£6,405,100**

Site A –Parcel Developer Total

Site A - Parcel Developer	Connections	Diversions	Disconnections	Total
Electricity	£672,700			**£672,700**
Gas	£798,600			**£798,600**
Water	£2,025,000			**£2,025,000**
Telecommunications	£44,000			**£44,000**
Total	**£3,540,300**			**£3,540,300**

Site A – Grand Total

Site A - Grand Total	Connections	Diversions	Disconnections	Total
Electricity	£6,347,500	£160,000	£0	**£6,507,500**
Gas	£1,177,900	£0	£0	**£1,177,900**
Water	£2,163,500	£0	£0	**£2,163,500**
Telecommunications	£48,000	£48,000	£500	**£96,500**
Total	**£9,736,900**	**£208,000**	**£500**	**£9,945,400**

All prices are exclusive of VAT.

Important areas of concern to be considered

- EHV 33/11 kV Primary Substation will be required on-site.
- EHV 33kV Overhead Line located within the Habitat Zone.
- MP gas main located within Habitat and to the north of Parcel 11 & 13 and to the south of the allotment.
- Water Hydraulic Modelling Assessment will be required to confirm if reinforcement is required.

Moving forward / removal of risk

It is our belief that additional works / procurement is required in order to de-risk the project further. The timings of when these works are to be carried out would form part of the review of this study between SMS, the client and the greater design team.

1. Procure diversion quotations from WPD, BT and VM.
2. Procure new connection quotations for Electricity, Gas and Water.
3. Register the development with BT Openreach new sites.

Following on from these works, SMS would provide further cost and programme advice to the client.

All on-site excavations for the utilities are assumed to be provided by the client's contractors and have not been included in the above costs. Indicative cable / pipe routes for the on-site works require more planning information to be in place and will obviously have a major impact on the on-site costs.

The estimated time for the delivery of these major utilities to the new development will need to be provided by the individual utility providers due to the reinforcement identified, upon acceptance of firm quotations, the clearance of all necessary wayleave consents and dependent upon the overall construction programme.

3 Electricity

Existing Infrastructure

Extra High Voltage (EHV)

The Western Power Distribution (WPD) network plans of the area show extra high voltage (EHV) 33kV overhead lines crossing the north eastern corner of the proposed Site A North development over the habitat Zone.

High Voltage (HV)

The network plans also shows a high voltage (HV) underground cable within the southern verge of the A48, where it continues in a south easterly direction. At the junction with the roundabout to the north there is a further HV underground cable that crosses the A48 carriageway, entering the development in a southerly direction before exiting through the southern boundary of the development where it continues across the M4.

A further HV overhead line enters through the northern boundary crossing the northern development where it exits under the A48 before entering the southern development. The HV cable continues across the southern development before exiting the southern boundary and continuing across the M4. At the southern boundary a HV spur follows the boundary line in an easterly direction where it terminates at a pole mounted transformer (PMT) designated '56/3433 STORMY DOWN COMMUNICATION' and LV service.

A further HV overhead line spur, exits the southern development crossing the A48 where it enters the

Northern development to a PMT designated '56/3434 STORMY DOWN A48', the HV overhead line continues across the northern development where it terminates at a PMT designated '56/3432 STORMY FARM' and for there an LV service to the Farm Buildings.

Low Voltage (LV)

The WPD network plans only shows the LV services to the Farm to the east and the Communication site to the south east, no other LV is sown within the development.

However, it is evident that the A48 has street lighting and therefore a Highways LV cable could be present in both the north and south verges.

Disconnections

Northern Development

None anticipated.

Southern Development

None anticipated.

Diversions

Northern Development

Two HV diversions have been noted from the WPD network plans, the first is a diversion required to the existing HV underground cable that crosses Parcels 9 & 10 at the north west of the Northern Development.

The second diversion is required to the HV overhead line that services PMT '56/3434 STORMY DOWN A48' and PMT '56/3432 STORMY FARM' that cross Parcels 14, 15 and 18 at the south eastern part of the Northern Development.

Infrastructure Developer Budget Cost: £79,400

Southern Development

Three further diversions may be required within the Southern Development.

The first is an underground HV cable at the western part of the Southern Development, the HV cable crosses the southern development through Parcels 2, 4, Local Centre and School parcels.

The second diversion is an HV overhead line at the south eastern part of the Southern Development, the overhead line dissects Parcels 7 & 8.

The third diversion is to the underground HV cable at the Southern Development Entrance. The HV cable may require diversion / lowering.

Infrastructure Developer Budget Cost: £80,600

New Connections

Load Assessment

The estimated After Diversity Maximum Demand (ADMD) for 1,508 dwellings, School, Local Centre, Sports, Employment (sub-station in place & connected) and Allotments is approximately 8,864kVA, this capacity excludes for future electric vehicle charging within the development, trickle charging is assumed.

Northern Development	Electrical Load (kVA)
Residential - 856 dwellings	1,856
Allotments	25
Sports	69
Total	**1,950**
Southern Development	**Electrical Load (kVA)**
Residential - 652 dwellings	1,160
School	258
Local Centre	218
Total	**1,636**
Site A - Total	**3,390**

Infrastructure Requirements

A point of connection (POC) quotation has been received from WPD (Appendix 4). Within the Budget POC it is proposed that WPD will provide via a new EHV 33/11kV Primary Substation being built on the land (shown in the Geographic plan) or a suitably agreed location, within the proposed development.

The Primary substation would consist of a 5 panel 33kV switchboard, two 12/24MVA 33/11kV transformers, a 9 panel 11kV switchboard and associated ancillary equipment to provide the connection. However, this would be reduced should the option of no EV is utilised and reflected in the budget cost below.

The 33kV switchboard would consist of two incomer circuit breakers, a bus section circuit breaker and two transformer feeder circuit breakers. To provide connection to the 33/11kV transformers and provide as firm a connection as possible.

The 33kV switchboard at the proposed new substation would be connected to Pyle Primary's 33kV switchboard via two new 33kV circuits, terminating onto two new circuit breakers on the Pyle Primary 33kV switchboard. Each circuit is approximately 1.6 km in length. For the purposes of this budget it has been assumed that the circuits will be constructed of 300mm² EPR 33kV underground cable for the entirety of their length.

It has been assumed that both circuits will follow identical routes with sufficient separation to ensure both cables could not be damaged at the same time.

The 11kV switch board would comprise of two incomer circuit breaker, one from each transformer, a bus section circuit breaker and six feeder circuit breakers. It has been assumed that all outgoing 11kV circuits for the development are to be installed by others.

The customer would be responsible for making available land for the purposes of the new substation, the budget reflects WPD carrying out all civil works associated with the primary substation. These being the 33kv and 11kV switchrooms, transformer plinth, security fencing etc.

It has been assumed that there is sufficient space at Pyle Primary 33kV switchboard to extend the board to accommodate the additional circuit breakers required for this connection.

The estimated route has a rail crossing along it. It has been assumed that the bridge can accommodate two 33kV circuits. Detailed route surveying will be required to establish this. Should the bridge not be suitable then directional drilling under the railway lie will likely be required. This has not been costed for in this budget and may also mean increased circuit lengths to find a suitable crossing point.

The Primary Substation will be suitably sized to accommodate the capacity identified above for 3.4MVA and also for the future development Site B to the south, with an estimated capacity of 1.6 MVA totalling 5MVA for the whole development.

The POC cost of circa. £4,700,000 ex VAT is included within the Budget Cost below. A full application to WPD would need to be obtained to confirm the cost once capacities have been confirmed.

Northern Development

From the WPD PoC, WPD or an ICP would provide two underground HV cables laid from the POC within the footway of the new spine road of the Southern Development, continuing across the carriageway of the A48 to the Northern Development.

These two HV underground cables would then continue to the proposed Northern Development entrance, continuing within proposed new footways and service strip provided via a number of WPD distribution sub-stations strategically located within the Northern Development.

Infrastructure Developer Budget Cost: £510,300

Each individual Parcel developer would make separate applications from WPD or an ICP to facilitate the LV connections to each parcel. As the design for each parcel has not been designed, the cost below is indicative of the likely budget costs for the number of properties per parcel.

Parcel Developer Budget Cost: £377,900

Southern Development

From the two HV underground cables that pass through the Southern Development to the Northern Development, a further two loops of underground HV cable would be laid around the roadways via a number of WPD distribution sub-stations strategically located within the Southern Development.

Infrastructure Developer Budget Cost: £364,500

Each individual Parcel developer would make separate applications from WPD or an ICP to facilitate the LV connections to each parcel. As the design for each parcel has not been designed, the cost below is indicative of the likely budget costs for the number of properties per parcel.

Parcel Developer Budget Cost: £294,800

General

A full connection application and network design would have to be undertaken by WPD / ICP in order to confirm how the requirements will be met.

The time scales for the completion of the above works would need to be provided by WPD due to the complexity of the works from the completion of leases / wayleaves and be dependent upon the overall construction programme.

Budget Summary

Northern Development

Site A Northern - Infrastructure Developer	Connections	Diversions	Disconnections	Total
POC	£4,800,000	£0	£0	**£4,800,000**
Electricity	£510,300	£79,400	£0	**£589,700**
Total	**£5,310.300**	**£79,400**	**£0**	**£5,389,700**

Site A Southern - Parcel Developer	Connections	Diversions	Disconnections	Total
Electricity	£377,900			**£377,900**

Southern Development

Site A Southern - Infrastructure Developer	Connections	Diversions	Disconnections	Total
Electricity	£364,500	£80,600	£0	**£415,100**

Site A Southern - Parcel Developer	Connections	Diversions	Disconnections	Total
Electricity	£294,800			**£294,800**

Site A – Infrastructure Developer Total

Site A - Infrastructure Total	Connections	Diversions	Disconnections	Total
POC	£4,800,000	£0	£0	£4,800,000
Electricity	£874,800	£160,000	£0	**£1,034,800**
Total	**£5,674,800**	**£160,000**	**£0**	**£5,834,800**

Site A – Parcel Developer Total

Site A - Parcel Developer	Connections	Diversions	Disconnections	Total
Electricity	£672,700			**£672,700**

Site A – Grand Total

Site A - Grand Total	Connections	Diversions	Disconnections	Total
Electricity	£6,347,500	£160,000	£0	**£6,507,500**

4 Gas

Existing Infrastructure

Medium Pressure (MP)

The Wales and West Utilities (WWU) Network plans shows a 10" diameter medium pressure (MP) spun iron (SI) gas main entering the northern boundary within the north eastern part of the northern development, where it continues in an easterly direction before exiting through the eastern boundary.

No other gas main are shown within or in the vicinity of the north and south developments.

Disconnections

Northern Development

None anticipated.

Southern Development

None anticipated.

Diversions

Northern Development

None anticipated. The MP gas main will continue in its current location through the LEAP, to the south of the Allotments and continuing through the Habitat Area.

Southern Development

None anticipated.

New Connections

Load Assessment

Northern Development	Estimated Peak Load (kW/hr)	Nominal Peak Flow Rate (m^3/hr)	AQ (MWh)
Residential - 856 dwellings	27,392	2,522	60,232
Sports	152	14	456
Total	**27,544**	**2,536**	**60,688**
Southern Development	**Estimated Peak Load (kW/hr)**	**Nominal Peak Flow Rate (m^3/hr)**	**AQ (MWh)**
Residential - 652 dwellings	20,864	1,921	45,878
School	500	46	1,500
Local Centre	76	7	228
Total	**21,440**	**1,974**	**47,606**
Site A - Total	**48,984**	**4,510**	**108,294**

Infrastructure Requirements

A Land Enquiry has been issued by WWU (appendix 4) and has confirmed that the connection will be made from the 10" diameter SI MP gas main located within the north eastern part of the northern

development. WWU has confirmed that the addition of the development load may trigger a requirement for reinforcement of the gas network. An element of this reinforcement may be chargeable to the customer.

A further full application for the total capacity will be required with to be made to WWU / IGT to confirm the reinforcement works required.

Connections

Northern Development

For the purpose of this feasibility study a new MP gas main would need to be constructed from the existing 10" diameter SI MP gas main at the LEAP, following the hedge line to the east of Parcel 10 and dissecting Parcel 13 to the southern boundary of the Northern Development.

At the southern boundary a PRI MP/LP will need to be constructed to enable the northern development to be supplied by LP gas mains.

A new LP gas main will need to be constructed around the Northern Development to provide passing mains to each parcel.

Infrastructure Developer Budget Cost: £197,000

New LP gas mains would then be constructed within in each parcel to suit the parcel requirements.

New services will then be installed from the LP main to the meter positions in each property and Sports Pavilion to suit the requirements of the proposed Northern Development.

Parcel Developer Budget Cost: £448,500

Southern Development

The MP gas main will continue across the A48 carriageway, continuing within the soft ground to the south east of the Southern Development entrance to the boundary to the boundary of Site B for future connections.

Additionally, the new LP gas main will cross the A48 carriageway through the Southern Development entrance, before continuing around the Southern Development to provide passing mains to each parcel.

Infrastructure Developer Budget Cost: £182,300

New LP gas mains would then be constructed within in each parcel to suit the parcel requirements.

New services will then be installed from the LP main to the meter positions in each property to suit the requirements of the proposed Southern Development.

Parcel Developer Budget Cost: £350,100

General

It is assumed that the client will provide suitable meter locations within the individual properties.

The time scales for the completion of the above works would need to be advised by WWU/IGT due to the complexity of the development, from the completion of leases / wayleaves and dependent upon the overall construction programme.

Budget Summary

Northern Development

Site A Northern - Infrastructure Developer	Connections	Diversions	Disconnections	Total
Gas	£197,000	£0	£0	**£197,000**

Site A Southern - Parcel Developer	Connections	Diversions	Disconnections	Total
Gas	£448,800			**£448,800**

Southern Development

Site A Southern - Infrastructure Developer	Connections	Diversions	Disconnections	Total
Gas	£182,300	£0	£0	**£182,300**

Site A Southern - Parcel Developer	Connections	Diversions	Disconnections	Total
Gas	£350,100			**£350,100**

Site A – Infrastructure Developer Total

Site A - Infrastructure Total	Connections	Diversions	Disconnections	Total
Gas	£379,300	£0	£0	**£379,300**

Site A – Parcel Developer Total

Site A - Parcel Developer	Connections	Diversions	Disconnections	Total
Gas	£798,600			**£798,600**

Site A – Grand Total

Site A - Grand Total	Connections	Diversions	Disconnections	Total
Gas	**£1,177,200**	**£0**	**£0**	**£1,177,200**

5 Water

Existing Infrastructure

The Dwr Cymru Welsh Water (DCWW) network plans of the area shows a 3" diameter cast iron (CI) water main within the verge of the A48 where it enters the Employment development at the north western part of the Northern Development.

No other water mains are shown within the northern or southern developments. It is thought that the Farm Buildings are supplied via a bore hole / well. However, this will need to be confirmed.

Disconnections

Northern Development

None anticipated.

Southern Development

None anticipated.

Diversions

Northern Development

None anticipated.

Southern Development

None anticipated.

New Connections

Load Assessment

Northern Development	l/s	l/day	M^3/day
Residential - 856 dwellings	4	342,400	342
Sports	1	84,800	85
Allotments	0.3	10,000	10
Total	**5.3**	**409,900**	**437**
Southern Development	**l/s**	**l/day**	**M^3/day**
Residential - 652 dwellings	3	26,800	261
School	1.2	107,100	107
Local Centre	0.5	42,000	42
Total	**4.7**	**491,500**	**410**
Site A - Total	**10**	**847,100**	**847**

Infrastructure Requirements

A Pre-Planning application has been issued to DCWW (Appendix 4), to determine if there are water supply problems or improvements planned within DCWW's Capital Investment Programme AMP6 (years 2015 to 2020).

In order to establish what would be required to serve the site with an adequate water supply, it is anticipated that it will be necessary for the client to fund the undertaking of a hydraulic modelling assessment (HMA) on the water supply network.

For the client to obtain a quotation for the hydraulic modelling assessment, DCWW will require a fee of £250 plus VAT to enable them to provide a quotation to carry out the HMA. The HMA will provide a point of connection and any anticipated reinforcement required.

However, for the purpose of this feasibility study it has assumed an anticipated connection will be made to a 12" diameter CI distribution main that is located on Pyle Road some 1.2km from the Northern & Southern Development entrances on the A48.

New water distribution mains will need to be installed for both the Northern Development and Southern Development.

Further water distribution mains will be also be required within each parcel. From these water mains new services will be installed to each of the properties to suit the requirements of the proposed development.

Northern Development

Based upon 856 properties and a total construction period of 12 years, an estimated budget cost for the works is set out below, including expected infrastructure charges and water connection costs.

Description	Cost
Mains laying cost (commuted sum basis)	£80,000

Infrastructure Developer Budget Cost: £80,000

Description	Cost
Mains laying cost (commuted sum basis)	£6,700
Service costs:	£469,300
Water / sewerage Infrastructure costs	£671,200
Total	**£1,147,200**

Parcel Developer Budget Cost: £1,147,200

Southern Development

Based upon 652 properties and a total construction period of 12 years, an estimated budget cost for the works is set out below, including expected infrastructure charges and water connection costs.

Description	Cost
Mains laying cost (commuted sum basis)	£58,500

Infrastructure Developer Budget Cost: £58,500

Description	Cost
Mains laying cost (commuted sum basis)	£6,000
Service costs:	£360,600
Water / sewerage Infrastructure costs	£511,200
Total	**£877,800**

Parcel Developer Budget Cost: £877,800

Fire Hydrants

Detailed advice should be obtained from the local Fire Authority to establish suitable locations of hydrants within the proposed development phases.

General

A full network study would have to be undertaken by DCWW in order to confirm how the requirements will be met.

The time scales for the completion of the above works would need to be confirmed by DCWW due to the extent of the new water mains to be constructed, from the completion of leases / wayleaves and dependent upon the overall construction programme.

Budget Summary

Northern Development

Site A Northern - Infrastructure Developer	Connections	Diversions	Disconnections	Total
Water	£80,000	£0	£0	**£80,000**

Site A Northern - Parcel Developer	Connections	Diversions	Disconnections	Total
Water	£1,147,200			**£1,147,200**

Southern Development

Site A Southern - Infrastructure Developer	Connections	Diversions	Disconnections	Total
Water	£58,500	£0	£0	**£58,500**

Site A Southern - Parcel Developer	Connections	Diversions	Disconnections	Total
Water	£877,800			**£877,800**

Site A – Infrastructure Developer Total

Site A - Infrastructure Total	Connections	Diversions	Disconnections	Total
Water	£138,500	£0	£0	**£138,500**

Site A – Parcel Developer Total

Site A - Parcel Developer	Connections	Diversions	Disconnections	Total
Water	£2,025,000			**£2,025,000**

Site A – Grand Total

Site A - Grand Total	Connections	Diversions	Disconnections	Total
Water	**£2,163,500**	**£0**	**£0**	**£2,163,500**

6 Sewerage

Existing Infrastructure

The DCWW Water network plans of the area doesn't show any foul sewers or public surface water drains within the proposed Northern or Southern Development.

A Pre-Planning document has been received from DCWW (Appendix 4), it is advised that this is reviewed and an HMA carried out by DCWW.

7 Telecommunications

Openreach (BT)

Existing Infrastructure

The BT network plans of the area shows an underground line of ducts and chambers located within the north eastern verge of the A48 where they pass the development entrance to the Northern Development.

At the north eastern boundary of the Northern Development there is an overhead line and support poles entering the boundary, following the eastern boundary to the Farm House.

A further underground line of ducts crosses the carriageway of the A48 at the roundabout to the north west and enters the development northern boundary of the Southern Development. The line of ducts continues within the development and terminates at what will be Parcel 1.

Disconnections

Northern Development

None anticipated.

Southern Development

A potential disconnection may be required to the BT service located within Parcel 1, further investigation will be required to confirm this requirement.

Infrastructure Developer Budget Cost: £500

Diversions

Northern Development

There is a potential diversion / lowering of the BT underground line of ducts at the proposed entrance to the Northern Development.

Infrastructure Developer Budget Cost: £16,000

Southern Development

None anticipated.

New Connections

A Land Enquiry has been received from BT which states that;

> *'BT will deploy FTTP, free of charge, into all new housing developments of 30 or more homes.*
>
> *Openreach can provide your development with Fibre to the Premises, free of charge.*
>
> *Fibre to the Premises provides estimated speeds of up to 1Gbps enabling your home owners to stream HDTV, play computer games and write emails simultaneously providing the best communications experience*
>
> *At this time your site has not been registered, if you would like to proceed to register your site with Openreach, please use the appropriate form on our website.'*

Northern Development

A connection will be made at the proposed entrance to the Northern Development to the BT underground line of ducts located within the northern footway of the A48.

A dedicated ducted BT service route will need to be provided around the proposed new footway / roadways of the Northern Development as required, to allow connections to the proposed new parcels.

Infrastructure Developer Budget Cost: £2,000 (Survey Fee Estimate Only)

A dedicated ducted BT service route will need to be provided around the proposed new footway / roadways of each parcel of the Northern Development as required, to allow connections to the proposed new properties, a design fee will be required for Openreach Newsites for each parcel.

Parcel Developer Budget Cost: £24,000 (Survey Fee Estimate Only)

Southern Development

A road crossing will be required to facilitate a connection to the BT line of ducts within the north eastern footway of the A48.

A connection will be made at the proposed entrance to the Northern Development to the BT underground line of ducts located within the northern footway of the A48.

A dedicated ducted BT service route will need to be provided around the proposed new footway / roadways of the Southern Development as required, to allow connections to the proposed new parcels.

Infrastructure Developer Budget Cost: £2,000 (Survey Fee Estimate Only)

A dedicated ducted BT service route will need to be provided around the proposed new footway / roadways of each parcel of the Southern Development as required, to allow connections to the proposed new properties, a design fee will be required for Openreach Newsites for each parcel.

Parcel Developer Budget Cost: £20,000 (Survey Fee Estimate Only)

Infrastructure Requirements

As BT apparatus is adjacent to the development, no abnormal costs are currently envisaged. However, a design fee is normally required for BT to produce a network design. However, this is subject to survey by BT.

Virgin Media (VM)

Existing Infrastructure

The VM network plans of the area shows an underground line of ducts and chambers located within the north eastern verge of the A48 where they pass the development entrance to the Northern Development.

Disconnections

Northern Development

None anticipated.

Southern Development

None anticipated.

Diversions

Northern Development

There is a potential diversion / lowering of the VM underground line of ducts at the proposed entrance to the Northern Development.

VM networks use fibre optic as well as copper cables. At this stage, it is not possible to determine how many cables are contained with the ducts, their routing, use or any operational constraints. Our budgetary price below is thus based upon only the civil engineering costs involved and excludes any alternations to the network cables themselves, which can only be established by application to C&W themselves.

Infrastructure Developer Budget Cost: £32,000

Southern Development

None anticipated.

Vodafone (VF)

Existing Infrastructure

The VF network plans of the area shows an underground line of ducts and chambers located within the north eastern verge of the A48 where they cross the carriageway, continuing within the southern eastern verge where they pass the development entrance to the Southern Development.

Disconnections

Northern Development

None anticipated.

Southern Development

None anticipated.

Diversions

Northern Development

None anticipated.

Southern Development

There is a potential diversion / lowering of the VF underground line of ducts at the proposed entrance to the Southern Development.

VM networks use fibre optic as well as copper cables. At this stage, it is not possible to determine how many cables are contained with the ducts, their routing, use or any operational constraints. Our budgetary price below is thus based upon only the civil engineering costs involved and excludes any alternations to the network cables themselves, which can only be established by application to C&W themselves.

Infrastructure Developer Budget Cost: £32,000

Budget Summary

Northern Development

Site A Northern - Infrastructure Developer	Connections	Diversions	Disconnections	Total
BT	£2,000	£16,000	£0	**£18,000**
Virgin Media	£0	£16,000	£0	**£16,000**
Vodafone	£0	£0	£0	**£0**
Total	£2,000	£32,000	£0	**£34,000**

Site A Northern - Parcel Developer	Connections	Diversions	Disconnections	Total
BT	£24,000			**£24,000**

Southern Development

Site A Southern - Infrastructure Developer	Connections	Diversions	Disconnections	Total
BT	£2,000	£0	£500	**£2,500**
Virgin Media	£0	£0	£0	**£0**
Vodafone	£0	£16,000	£0	**£16,000**
Total	£2,000	£16,000	£500	**£18,500**

Site A Southern - Parcel Developer	Connections	Diversions	Disconnections	Total
BT	£20,000			**£20,000**

Site A – Infrastructure Developer Total

Site A - Infrastructure Total	Connections	Diversions	Disconnections	Total
BT	£4,000	£16,000	£500	**£20,500**
Virgin Media	£0	£16,000	£0	**£16,000**
Vodafone	£0	£16,000	£0	**£16,000**
Total	£4,000	£48,000	£500	**£57,500**

Site A – Parcel Developer Total

Site A - Parcel Developer	Connections	Diversions	Disconnections	Total
BT	£44,000			**£44,000**

Site A – Grand Total

Site A - Grand Total	Connections	Diversions	Disconnections	Total
BT	**£48,000**	**£16,000**	**£500**	**£64,500**
Virgin Media	**£0**	**£16,000**	**£0**	**£16,000**
Vodafone	**£0**	**£16,000**	**£0**	**£16,000**
Grand Total	**£48,000**	**£48,000**	**£500**	**£96,500**

Other Utility Infrastructure Providers

Please refer to Appendix 2 of this document for details of the results of HAUC surveys.

8 Legal Report

For the purpose of this report the development site is taken as being that shown on the Urbanists Planning and Design plan with Drawing Title: Red Line Plan, Drawing Number: 1760 – URB – UD – SK – 90 – 003, Project: Land East of Pyle, Date 19.10.2018.

The development site straddles the A48 highway as two discrete parcels. The development area itself comprises a number of different parcels, some of which are registered at Land Registry: to the north-east of the A48, our research at Land Registry indicates that only a small proportion of landownership in this area is registered – this is under titles WA398879 and WA140839. However, the Mines and Minerals of all of this area and beyond are registered under title CYM595403.

We have not established the extent of highway adoption within the vicinity.

We have examined the title registers as follows:

Title WA405033

The land in this Freehold title is described in the register as Ty Draw Bungalow, Pyle (CF33 4AG). The Proprietor is given as ROBERT MALCOLM GRANT and HAYLEY GRANT of Ty Draw Bungalow, Pyle, Bridgend CF33 4AG. The land lies at the extreme western end of the development area.

By virtue of a Conveyance dated 26 November 1945, there are reserved out of the property various rights regarding water and the maintenance, enlargement etc of associated apparatus serving other properties relating to the Margam Estate. The 'Prescribed Period' during which these rights exist is dependent upon archaic terms detailed in the register.

No statutory utility rights are recorded against the title.

Title WA583900

The land in this Freehold Title is described in the register as Land lying on the south side of the road leading from Margam to Laleston. The Proprietor is given as JANE CATHERINE ANNE NAYLOR of Tymawr Farm, Llangan, Bridgend CF35 5DW. The land in this title lies towards the western end of the development area.

By virtue of a Conveyance dated 26 August 1942, there are reserved out of the property various rights regarding water and the maintenance, enlargement etc of associated apparatus serving other properties.

By virtue of a Conveyance of other land dated 27 November 1981 made between (1) Mansel Joseph (Vendor) and (2) David Lynn Thomas and Joan Margaret Thomas (Purchasers), the land in this title is subject to a right to supply water via a pipe located in the north-western corner of the title.

No statutory utility rights are recorded against the title.

Title WA198549

The land in this Freehold title is described in the register as Land on the South West side of the road leading from North Cornelly to Bridgend, Pyle. The Proprietor is given as HYWEL LYNN THOMAS of Stormy Farm, Stormy Down, Pyle, M Glam. The land is located centrally within the overall development area, adjacent to the south-western boundary of the A48.

No statutory utility rights are recorded against the title.

Development land to the north-east of the A48

Our research at Land Registry indicates that only a small proportion of the land this area is recorded at Land Registry – this is under titles WA398879 and WA140839. However, the Mines and Minerals of all of this area and beyond are registered under title CYM595403 (see on).

Title WA398879

The land in this Freehold title is described as Land and buildings on the North Side of the A48 at Pyle, Bridgend. The Proprietor is given as DAVID BRACE of Tranch, Laleston, Bridgend. Only the very extreme north-eastern point of this title falls within north-western corner of the development area and it lies adjacent to the old Mineral Railway line.

By virtue of a Conveyance dated 26 November 1945, there are reserved out of the property various rights regarding water and the maintenance, enlargement etc of associated apparatus serving other properties relating to the Margam Estate. The 'Prescribed Period' during which these rights exist is dependent upon archaic terms detailed in the register.

No statutory utility rights are recorded against the title.

Title WA140839

The land in this Freehold title is described in the register as Land lying to the North of a road leading from Stormydown to Pyle, Pyle. The Proprietor is given as DAVID LYNN THOMAS and JOAN MARGARET THOMAS of Stormy Farm, Pyle, M Glam. The land in the title forms a crescent running through the northern part of the development area to the north-east of the A48.

By virtue of a Conveyance of the land in this title dated 10 December 1979 made between (1) British Railways Board [now Network Rail] and (2) David Lynn Thomas and Joan Margaret Thomas the land is subject to the following rights as stated in the Conveyance:

- The existing cables and wires belonging to the South Wales Electricity Board [now Western Power Distribution] affecting the property;

- The right to maintain, repair, cleanse, remove, etc any drains, pipes, wires etc over or under the property which are used for the benefit of any adjoining property of the Board, as well repairing railway works at 5 ¾ mile post.

No further statutory utility rights are recorded against the title.

Title CYM595403

This Freehold title is described in the title register as follows:

The Freehold mines and minerals other than those vested in the Coal Commission pursuant to the Coal Act 1938 being sand gravel and stone (not being ironstone) lying at whatever depth within the Lordship of the Manor of Stormy and all other minerals (including ironstone and fireclay) above a depth of two hundred feet from the surface land shown edged with red on the plan of the above title filed at the Registry and being land at the Manor of Stormy, Stormy Down, Bridgend.

It is stated in the register that the description of the registered estate is an entry made under rule 5(a) of the Land Registration Rules 2003 and it is not a note to which paragraph 2 of Schedule 8 to the Land Registration Act 2002 refers that the registered estate includes the mines or minerals under the land.

It is further stated that the inclusion of all or any of the mines and minerals and powers of working and getting them in this title does not affect or prejudice the enforcement of any estate right or interest therein existing before 14 August 2013.

The Proprietor of the title is given as WILLIAM HOPKIN JOSEPH of 20 Wind Street, Laleston, Bridgend CF32 0HU.

We imagine the Client is aware of the status of this land – SMS is not a firm of property lawyers and we suggest the Client seeks further legal advice on the implications of this land's status.

No statutory utility rights are recorded against the title.

We have examined the network plans of statutory utilities as follows:

Electricity – Western Power Distribution (WPD)

Land to the north of the A48

Network plans show what appears to be an isolated stretch of 11kV cable running east-west within the western section of this area. The western end of this cable is annotated CONTINUATION UNKNOWN. An additional 11kV cable runs parallel and to the south of this, connected to the HAWES FACTORY substation REF 56/3466 which is located to the west of and outwith the development area.

Plans show further 11kV cables running broadly north-south through this area.

Finally an 11kV overhead line is shown running from the A48 in a north-easterly direction towards the Stormy Farm buildings within the proposed development area.

We have found no evidence at Land Registry of legal rights of retention for this apparatus. Where the apparatus serves parties outwith the development area the cost of diversion should be challenged.

Land to the south of the A48

Network plans show an underground low voltage service cable supplying the bungalow in title WA405033 running within the title along its western boundary. As a supply the cost of diversion would fall to the developer.

Plans show an underground 11kV cable running broadly north-south through title WA583900 and a further 11kV cable running also broadly north-south through the eastern third of title WA198549.

Gas – Wales and West Utilities (WWU)

Network plans show a medium pressure gas main running broadly east-west in the north-eastern area of the overall development site. The route of the pipe lies within both title WA140839 and the unregistered land to the north of that title.

We have found no legal rights of retention recorded against title WA140839 and we cannot comment if any rights are held over the unregistered land. In any event WWU can claim statutory powers of

retention via the Gas Act 1986 (as amended) but in addition referencing the Acquisition of Land Act 1981 (as amended) and the Compulsory Purchase Act 1965 (as amended) for compensation.

Potable Water – Dwr Cymru Welsh Water (DCWW)

Network plans show no water apparatus within the development area.

Foul Water – Dwr Cymru Welsh Water (DCWW)

Network plans show no drainage apparatus within the development area.

Telecommunications – BT Openreach

Network plans show overhead apparatus supplying Stormy Farm, running just within the north-eastern boundary of the development area to the north of the farm buildings.

Plans also show underground apparatus within title WA405033, supplying the property therein.

The cost of diverting supply apparatus would fall to the developer.

Plans show underground apparatus subsisting along the north-eastern verge of the A48 between the two discrete development parcels. We do not believe that this apparatus falls within the development parcel but if, in fact, it does we suggest the cost of diversion is borne by the developer.

This is because the process to challenge the location of statutory telecommunications apparatus under the Telecommunications Act 1984 (as amended) is heavily weighted in favour of the statutory body.

Network Rail

A response to our enquiry to Network Rail states that no records of buried services for the development area have been found.

9 Energy Strategy Input

Introduction and Context

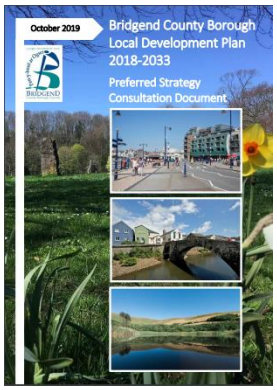
As part of its Utility Services to DTS for a planned development east of Pyle, SMS has been asked to provide a review of future decentralised energy options to act as the basis of a future energy strategy report should the development as a whole proceed.

The new development is at feasibility stage located east of Pyle between the railway and M4 either side of the A48. It is proposed to have around 2,300 homes with supporting non-domestic buildings such as a primary school and a local centre.

The main requirements for the development's energy performance are stipulated by Planning Policy and Building Regulations. Bridgend Borough Council is collaborating with BEIS and the Energy Systems Catapult in the Smart Systems and Heat Programme (SSH) to unlock the commercial opportunity of low carbon heating. As part of this project, a Local Area Energy Strategy has been developed and Bridgend is currently aligning its planning policy with this strategy. The relevant elements of the Preferred Strategy Consultation Document are summarised below.

Bridgend County Borough Local Development Plan 2018-2033

Preferred Strategy Consultation Document



The preferred strategy identifies new detailed planning policies for the Replacement Local Development Plan relevant to the development's energy strategy:

- **Low Carbon Heating Technologies for New Development** – *proposals will need to be accompanied by an 'Energy Assessment' which investigates the potential to incorporate on-site zero and low carbon equipment and establish connections to existing sources of renewable energy. Opportunities for linking with district heating networks and where appropriate sharing renewable energy with the wider public should also be explored.*
- **Energy Efficiency Provision within the Design of Buildings**
  - *The design and standard of any new development should aim to meet a high level of sustainable design and construction and be optimised to achieve energy efficiency and zero carbon emissions.*
  - New development should incorporate *energy generation technologies to meet as a minimum 25% of the energy needs of the development.*

Alongside planning policy, large-scale, phased developments, such as that planned east of Pyle, need to consider evolving Building Regulations. In Wales, the regulations directly relevant to energy and carbon performance (Part L) are expected to become more demanding in 2020 and then tighten further in 2025, as summarised below.

Building Regulations Part L and F Review Llywodraeth Cymru Welsh Government	• More demanding energy carbon standards in building regulations (Approved Document L1A) will become applicable in 2020. • From 2025 onwards "very high fabric standards that limit heat loss" are envisaged. • It is anticipated that an average semi-detached home built to meet the Part L 2025 standard would produce 75-80% less carbon dioxide emissions than one built to current (2014) Part L requirements. • It is anticipated that new homes from 2025 will make use of heat pumps and/or district heating.

As well as the planning policy and building regulations context, large building developments need to consider the wider context of the UK's energy system, including markets, incentives and infrastructure transformation. This is going to change significantly within both the medium term before 2030 (i.e. the period of the site's development) and the long term up to 2050 (during the first decades of the buildings' occupancy). A helpful framework for considering potential changes is the National Grid's Future Energy Scenarios report (2020), which models four scenarios as summarised below.

	Steady Progression	Consumer Transformation	System Transformation	Leading the Way
Summary	Slowest credible decarbonisation	Primarily demand changes to decarbonise	Primarily supply changes to decarbonise	Demand and supply change at fastest credible rate to decarbonise.
Heating and Hot Water	• District heating in 1.5 million homes in 2050. • Net reduction in gas grid connected homes by 2050.	• District heating in 5 million homes in 2050. • No new homes connected to gas grid from 2025.	• District heating in 3 million homes in 2050. • New homes have electric heating or hydrogen-ready boiler from 2025.	• District heating in 4 million homes in 2050. • No new homes connected to gas grid from 2025.
Electricity	• 40% reduction in supply carbon intensity by 2033. • 23% of homes have smart appliances by 2050.	• Carbon neutral supply by 2033. • 73% of homes have smart appliances by 2050.	• Carbon neutral supply by 2033. • 47% of homes have smart appliances by 2050.	• Carbon neutral supply by 2033. • 83% of homes have smart appliances by 2050.

The four scenarios summarised above illustrate the range of potential risks and opportunities for new development energy strategies. There is also significant uncertainty in the context of planning and building regulations requirements. Early consideration of options for the development is needed to navigate this context and it is recommended that the following elements of assessment are prioritised:

1. **Whole life value** – maximising the development's whole life value by minimising:
    a. Development costs, e.g. by avoiding the installation of infrastructure which becomes redundant and conversely avoiding the need for future upgrades of infrastructure due to inadequate initial provision.
    b. Operational costs, e.g. ensuring homes' energy bills will be affordable and energy technologies do not have high maintenance or replacement costs.
2. **Risk Minimisation** – prioritise low regret or no regret measures which will be beneficial irrespective of future energy scenarios, as well as measures which provide flexibility.

The next section summarises whole life value and risk considerations for a range of energy systems and technologies and the final section proposes next steps for the energy strategy.

Technology & System Evaluation

An energy assessment should be undertaken for the development as part of concept design. Two key aspects of energy strategy should be included in the assessment:

	1. Passive Design & Energy Efficiency	2. Energy Supply Technologies & Systems
Recommended Energy Assessment Contents	Principles and standards to support elements of architectural design and to form the basis of predictions of the energy consumption of the development and its phases.	Evaluation of technologies and systems to provide carbon reduction based on whole life value and risk minimisation.
Example Whole Life Value Considerations	Balance the increased development cost associated with higher standards of fabric insulation with reduced costs for energy supply systems and infrastructure + reduced energy bills for residents.	See below for examples for each category of technology/system.
Examples of Risk Minimisation Consideration	Passive design measures are typically regarded as low regrets or no regrets options for minimising carbon emissions as they work irrespective of the type of energy supply systems and future changes to infrastructure and markets.	Risks can be managed through an appropriate energy services company (ESCo) delivery model, to manage on-site energy generation, distribution, storage and supply flexibly with agreed requirements for affordability and carbon emissions.

In addition to the examples above, the following considerations are applicable to all energy types, technologies and systems:

- **Carbon emissions** – predictions of carbon emissions – using the Standard Assessment Procedure (SAP) – must meet specific targets set in the Building Regulations and reductions in actual operational carbon emissions should provide an effective long-term strategy for minimising residents' energy bills as markets increasingly support the transition to net zero carbon.
- **Impacts on infrastructure connections to development** – the on-site energy strategy will affect the connection required to the electricity distribution network and potential connections to the gas distribution network and planned neighbouring district heating networks.

The table below highlights technical, economic and other considerations that should be included in an energy assessment for specific energy technologies and systems for the new development.

Energy Type	Technology/ System	Considerations
Heating and Hot Water	District Heating (DH)	• Cost of distribution network, which is strongly affected by the density of dwellings. • Phasing of any distribution network and central plant installation. • Heat generation – e.g. air source heating, CHP or alternatives for central plant, heat interface units or water source heat pumps for buildings. • Location(s) of energy centre(s). • Potential connections with district heating systems in neighbouring areas.
	Building Level Systems	• Energy source – e.g. electricity (e.g. for heat pumps), natural gas (expected to be discouraged) or hydrogen. • Heat generation technology – e.g. direct electric, air source heating, gas boilers or hybrid heat pump / boilers. • Heat distribution – e.g. radiators, underfloor heating, direct electric, air-based.
Electricity	Solar Photovoltaic (PV)	• Roof area, form and orientation for building-integrated solar PV. • Land available for new ground mounted solar installation. • Operation and control – e.g. balancing within the development via a private wire network. • The development site is on the edge of an area identified by Welsh Government as high priority for solar developments. • Engagement with the operators of neighbouring existing solar farms should be considered – 3.7 MW farm beside the M4 and 2.5 MW beside the Severn Trent AD plant and Stormy Down wind turbine.
	Wind	• Wind generation is most effective at large scale. Bridgend County has more than 70 MW of wind generation already installed and parts of the county (to the north and east of the development site) have been identified as priority areas for wind energy. • There is an operational 1.5 MW wind turbine across the M4 from the development with a typical capacity factor of greater 30% (currently operated by Stormy Down Energy).

	Combined Heat and Power (CHP)	• Applicable as part of a DH system. • Gas CHP could be cost-effective, but its carbon impact is dependent on the fraction of natural gas in the fuel vs non fossil fuel derived gases (e.g. hydrogen or biogas). Wales and West is encouraging the entry of gas from renewable sources like biomethane into its network. • Other CHP technologies – incl. solid biomass and fuel cells – are less well proven but could be retained as options as part of DH systems. • Severn Trent should be engaged regarding the scope for recovering heat and power from its 2.8 MW_e anaerobic digestion facility on the other side of the M4 from the development.
	Battery	• Potentially increases the benefits of on-site electricity generation such as solar PV. • Can be installed at building level or development level as part of a private wire network. • Potential savings in electrical infrastructure costs as batteries could reduce peak demand.

Next Steps

As concept designs start to be developed for the site, an energy assessment should be undertaken, considering the measures and following the principles described above. The two key objectives of the energy assessment are:

- To provide the developer and other members of the project team with:
    - A whole life cost and risk assessment of energy strategy options for the site.
    - Design recommendations for the development.
- To provide the local planning authority with evidence of how the development complies with local and national planning regulations (as part of an outline planning application).

10 Conclusions and Recommendations

The total budget estimate for delivering disconnections, diversions and new connections to the development is approximately **£9,945,400**

All prices quoted are exclusive of VAT.

These costs are based on information obtained from statutory utilities and SMS' knowledge and professional experience of the utilities market. The budget estimates are based on the client's contribution to the capital costs of undertaking the required works.

The on-site infrastructure costs are based on the layout and plans provided for the study, which are indicative at this stage. These costs are subject to variation, particularly if the development specification and / or layout change.

Please refer to Appendix 1 for details of the general assumptions and considerations applied by SMS whilst compiling this study.

Moving forward / removal of risk

It is our belief that additional works / procurement is required in order to de-risk the project further. The timings of when these works are to be carried out would form part of the review of this study between SMS, the client and the greater design team.

1. Procure diversion quotations from WPD, BT and VM.
2. Procure new connection quotations for Electricity, Gas and Water.
3. Register the development with BT Openreach new sites.

Following on from these works, SMS would provide further cost and programme advice to the client.

Health, Safety and Environmental Considerations

In line with the Construction (Design and Management) Regulations 2015 (CDM) and as part of the internal procedures contained within our safety management system, we have undertaken the early identification of any potential significant risks to health and safety that may need further consideration at the detailed design stage. Additionally, in conjunction with this study and in adherence to SMS's Environmental Management System, we have also given consideration to any potential environmental issues that may also arise.

From the information given by the client to date SMS cannot see the presence of any abnormal or significant risk within the development other than the 500mm diameter trunk water main, EHV 66kV and 11kV HV overhead lines.

Should you consider this study to represent a feasible option and wish to progress this further, please request information relating to the outcomes of our assessment in order that you can communicate this to other relevant parties. Additionally, please download HSE leaflet INDG411 "*Want construction work done safely?*" from the HSE website www.hse.gov.uk, which will provide you with guidance relating to client responsibilities under the CDM Regulations.

We recommend that all activities be carried out in accordance with Health and Safety legislation, particularly HS(G)47 "Avoiding Danger from Underground Services" and GS6 "Avoidance of Danger from Overhead Electric Power Lines". We further recommended that all development contractors obtain the latest utility network drawings from the host utility asset owner.

Appendix 1 – General Assumptions and Considerations

Assumptions

In view of the limited information currently available, several assumptions have been made in order to produce this study:

1. The demand for the development has been based on the information provided and SMS' experience of developments of a similar nature and will need to be re-assessed as part of the final design process.
2. EV charging has been excluded from this Feasibility Study.
3. Unless otherwise specified, space / water heating for all developments will be by gas.
4. Excavations are in unmade ground and no special measures, such as those that would be required by ground contamination, are needed.
5. The client will carry out all on-site excavations.
6. The proposed service routes have been assumed and will require to be agreed.
7. The existing adjacent utilities in the vicinity of the development have sufficient capacity to provide the required loads (unless stated in this study). This can only be confirmed after network studies by the various utility companies are carried out at the design stage to establish the actual capacity available.
8. It is assumed that the landowner will grant any easement or wayleave that may be required.
9. As details of load structure, demand type or size of properties becomes clearer a further study would be required to review the estimates before submitting a firm application to the host network operator. However, we have assumed the above to be the worst-case scenario for purposes of this study.
10. Utility plans such as those that have been used for this desktop study, do not always show service connections to buildings.

Special Considerations

The utility plan extracts attached to this study are based on utility plans supplied to SMS under license conditions or separately purchased and are not to be used for excavation purposes. They have been included for indicative purposes only. They may have been superseded since the completion of the study.

The cost estimates in our study assume that there are no special conditions applied to any construction works including:

a) No restricted working hours.

b) No specific planning conditions to be met.

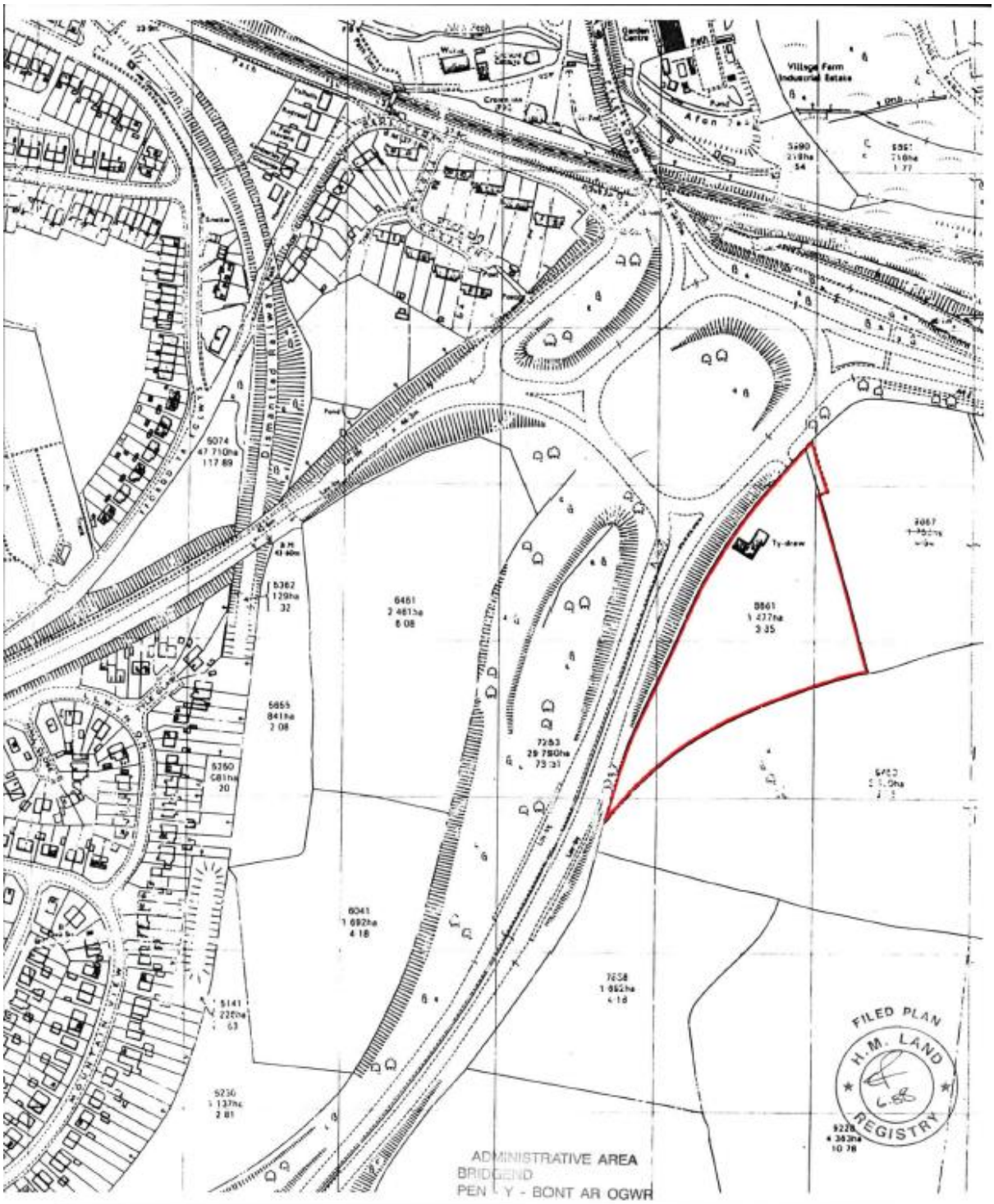
c) Any land utilised for development extensions or new developments will not contain contaminated soil.

Appendix 2 – HAUC Survey Results

Results of HAUC enquiries to utility companies based upon information provided by Linesearch.

Utility Provider	Date of Response	Response / Comment
Century Link Communications UK Ltd	23/07/2020	Not Affected
City Fibre	23/07/2020	Not Affected
Colt	23/07/2020	Not Affected
Energetics Electricity	23/07/2020	Not Affected
Engie	23/07/2020	Not Affected
GTC	23/07/2020	Not Affected
KPN / Instalcom	23/07/2020	Not Affected
Interoute	23/07/2020	Not Affected
Mobile Broadband Network	23/07/2020	Not Affected
Network Rail	23/07/2020	Not Affected
Sky UK	23/07/2020	Not Affected
SOTA	23/07/2020	Not Affected
Utility Assets Ltd	23/07/2020	Not Affected
Traffic Master	23/07/2020	Not Affected
Utility Assests	23/07/2020	Not Affected
Verizon Business	23/07/2020	Not Affected
Virgin Media	23/07/2020	Affected
Vodafone	23/07/2020	Affected

Appendix 3 – Title Plans



H.M. LAND REGISTRY		TITLE NUMBER WA405033	
ORDNANCE SURVEY PLAN REFERENCE	SS 8281		Scale 1/2500
~~COUNTY~~ MID GLAMORGAN	~~DISTRICT~~ OGWR		© Crown copyright

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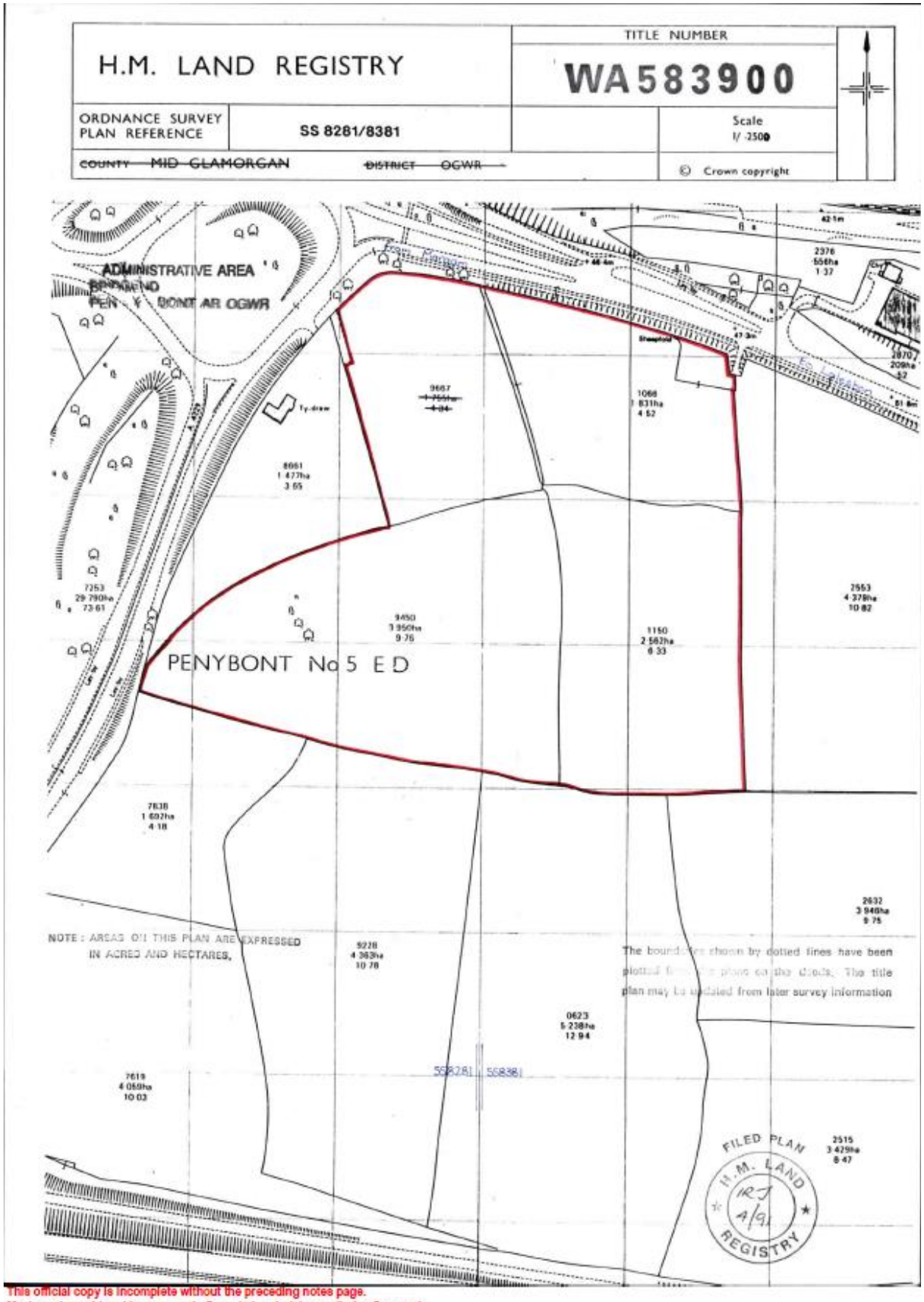

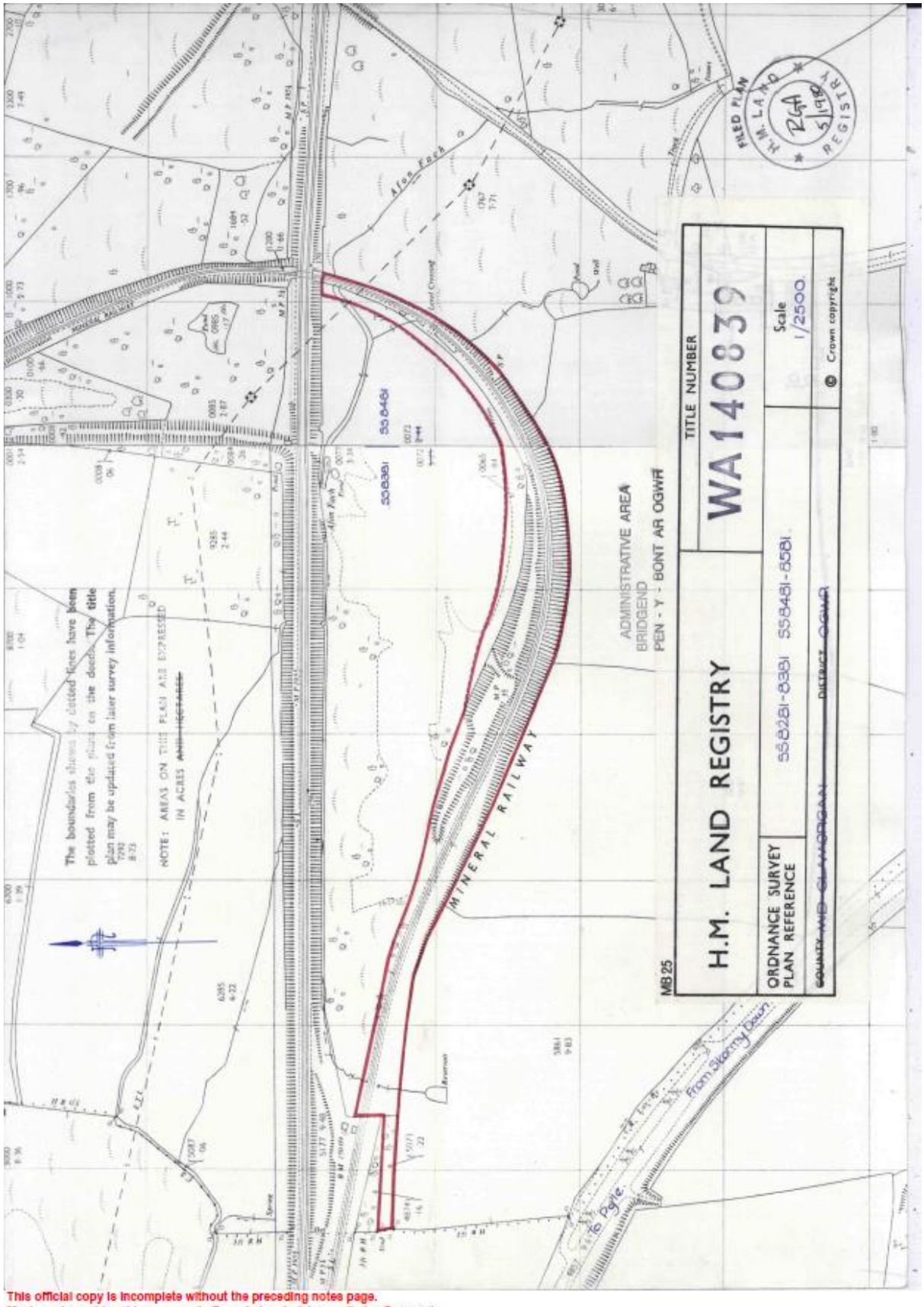

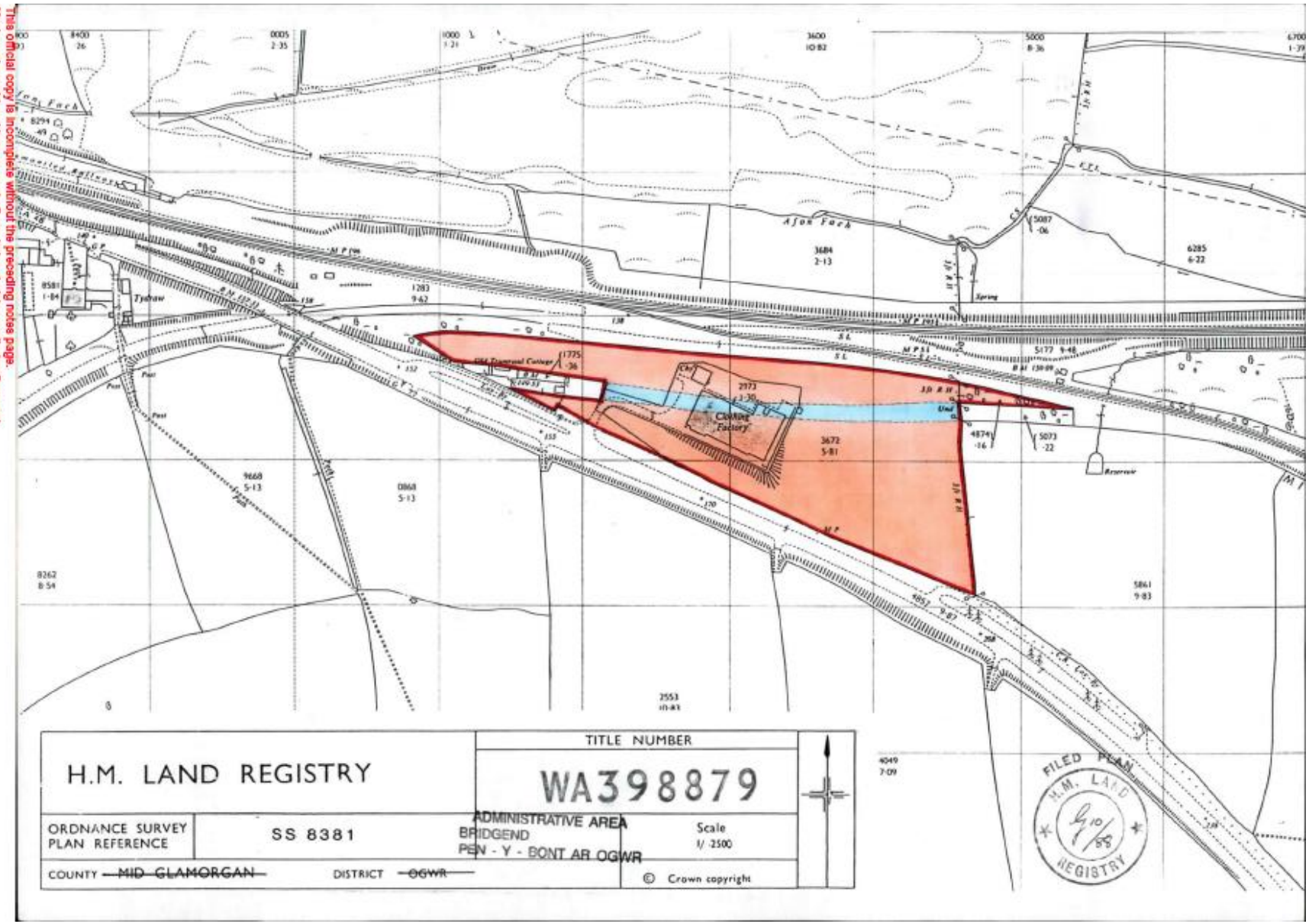

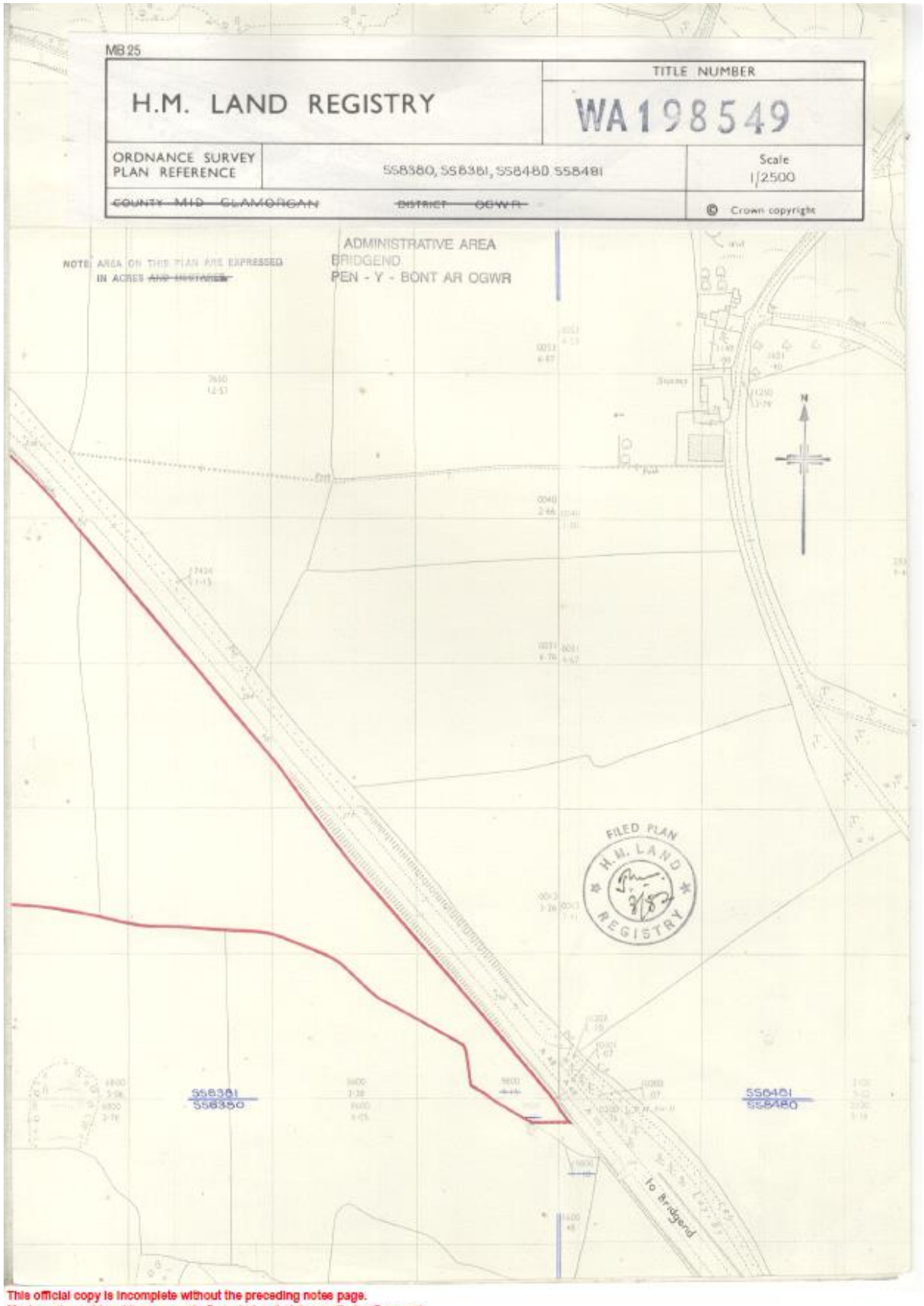

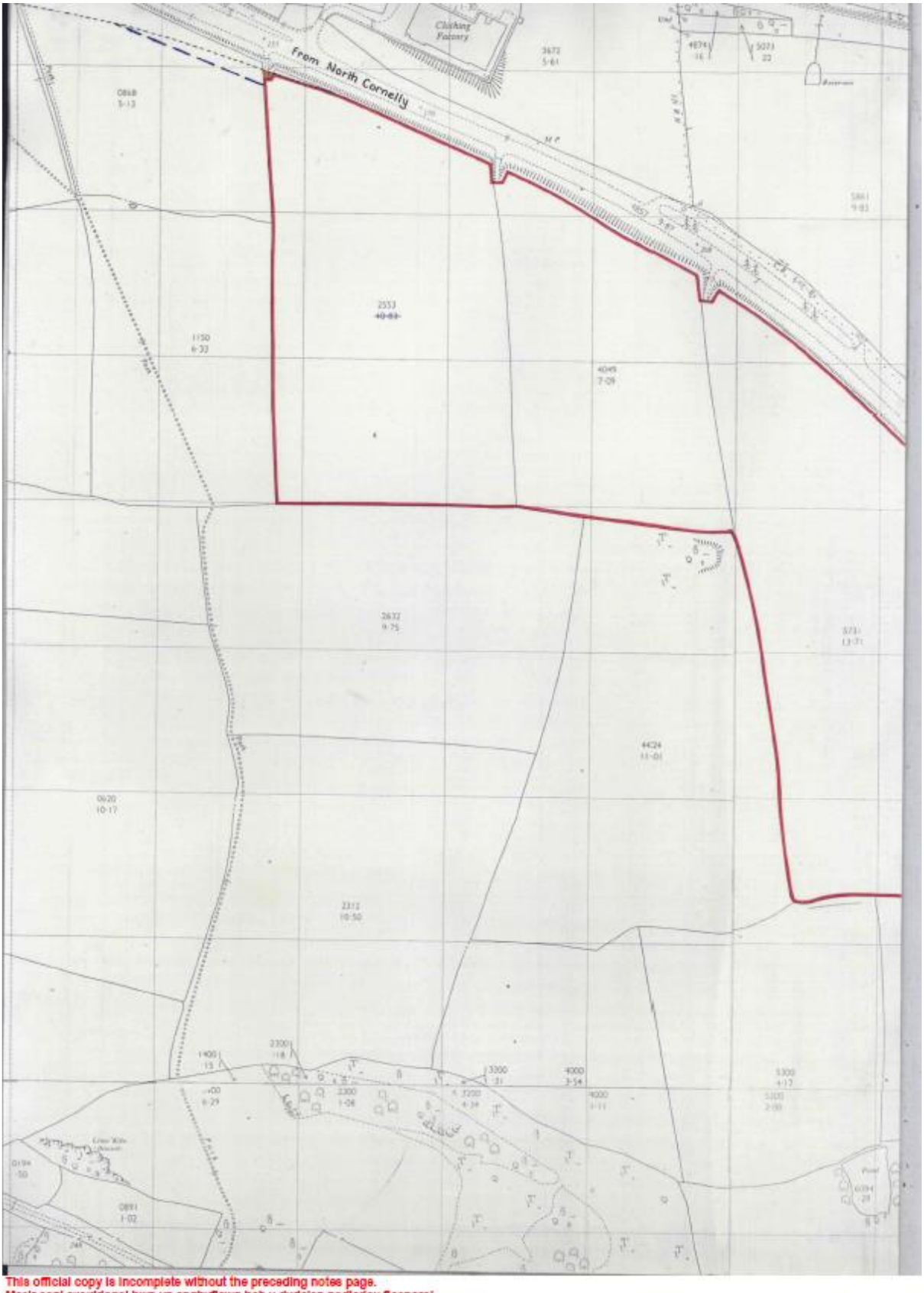

Appendix 4 – Utilities Pre-Planning Enquiries

Electricity – Western Power Distribution (WPD)

Document: 3719173 & 3720107 - Pyle Dev & Tech 11.85MVA - Budget Estimate

Drawing: Geographic Plan

Gas – Wales and West Utilities (WWU)

Document: 7100005638-Land Enquiry Response Letter

Drawing: 7100005638_WWU Plan

Water – Dwr Cymru Welsh Water (DCWW)

Document: PPA0005107

Drawing: PPA0005107 Water, PPA0005107 Sewer