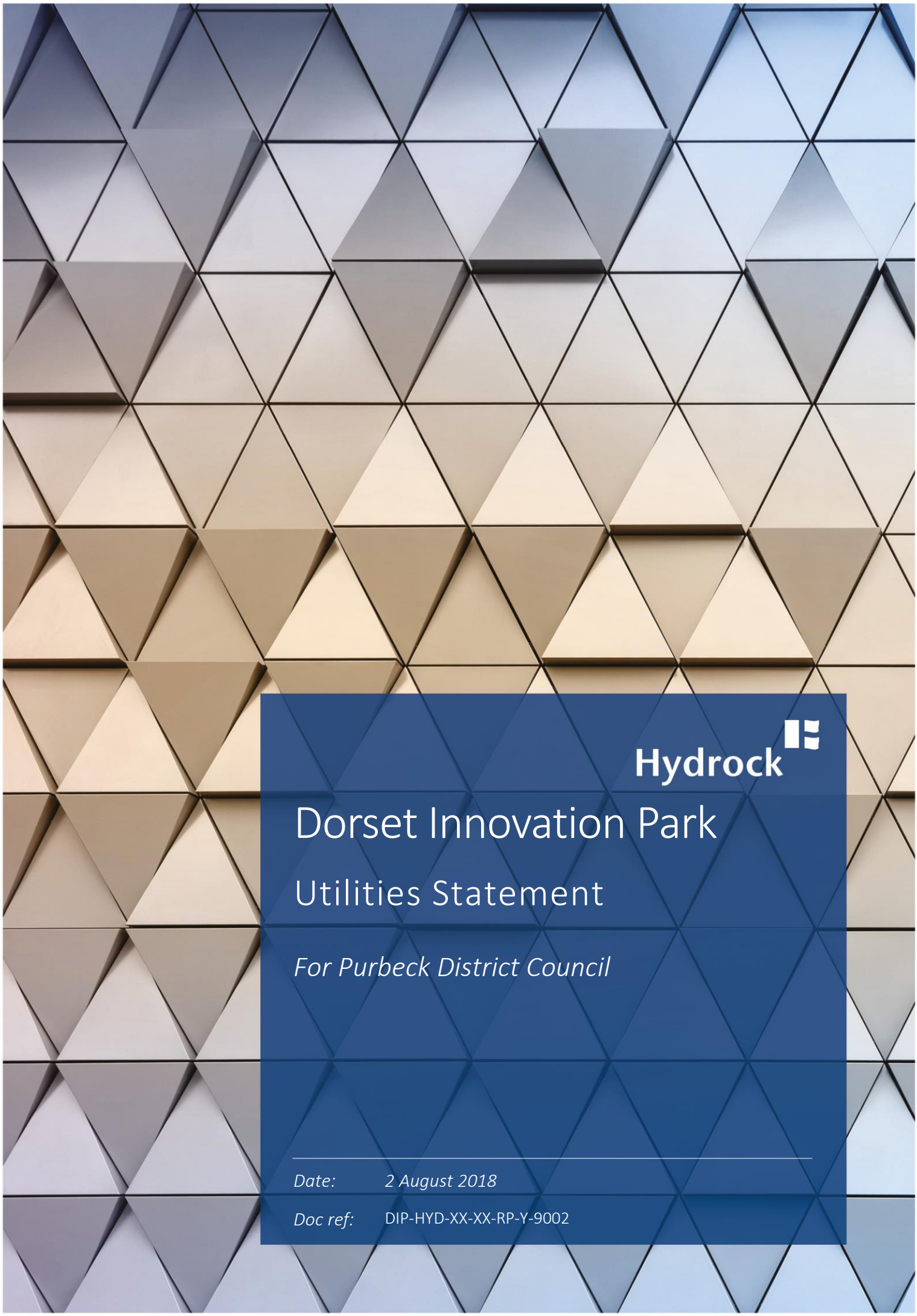

Hydrock

Dorset Innovation Park

Utilities Statement

For Purbeck District Council

Date: *2 August 2018*

Doc ref: DIP-HYD-XX-XX-RP-Y-9002

DOCUMENT CONTROL SHEET

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CONTENTS

1. TERMS OF REFERENCE & OBJECTIVES

Hydrock Consultants have been appointed by Purbeck District Council (PDC) to provide planning stage advisory services in relation to the design and construction of the proposed Dorset Innovation Park (DIP). This document is intended to inform part of the Local Development Order and detail findings of an initial utilities assessment to the PDC planning department.

Hydrock were tasked to investigate whether the existing nearby utility infrastructure could support the redevelopment of the Innovation Park. The document is provided to give an overview of existing utility services, provision for new connections and establish any underlying requirements for diversionary works.

In consideration of the site size and potential phasing/build duration, an initial options appraisal has been undertaken to establish an indicative new connections strategy. This report will aim to establish the pros and cons of centralised plant with localised building services equipment that could be used to provide heating, hot water, cooling and electricity to the new development.

2. SITE INFORMATION

2.1 Site Location:

Dorset Innovation Park is located centrally within South Dorset, within the Purbeck District Council locality. The site has access from the A352 which is main route connecting the towns of Wareham and Dorchester.

The site is approximately 1km west of the town of Wool, with Winfrith Heath, Dorset Heaths and Dorset Heathlands also located west of the site. Immediately north of the site is the railway line between Dorchester and Bournemouth.

The full address and Ordnance Survey Grid Reference are given in Table 1 below.

Table 1 - Site referencing information

Site referencing information	
Site address	Site grid reference
Dorset Innovation Park, Winfrith Newburgh, Wool, Dorchester DT2 8ZB	XY: 382133, 086851

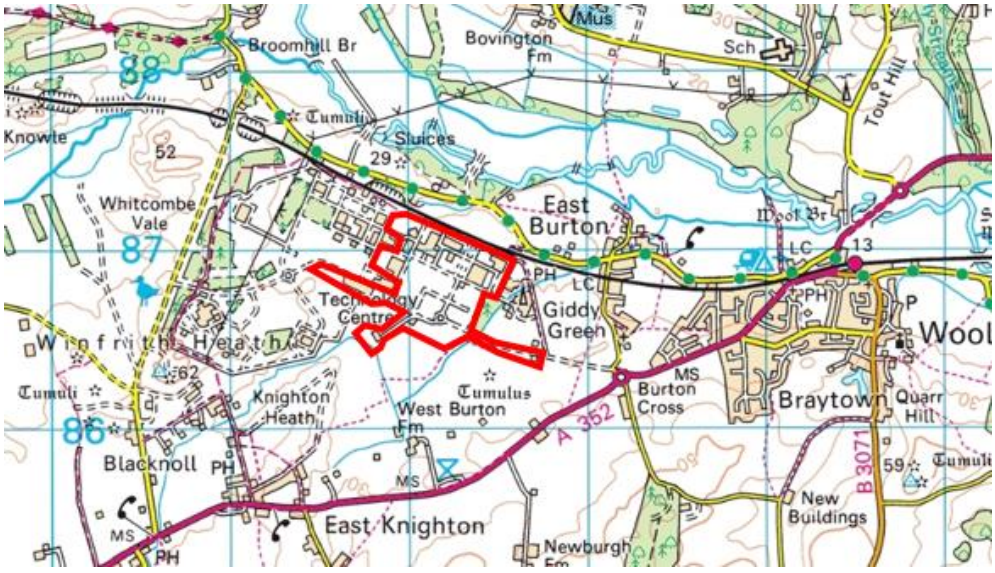


Figure 1 – Site location plan with redline boundary

2.2 Existing Land Use:

The DIP is a 50 hectare Brownfield site comprising a mix of B-class commercial/industrial units; including defence technology leaders Atlas Elektronik and QinetiQ. Access into the site is from the south-east and south-west corners of the site.

From the east, via the Burton Cross Roundabout and A352, Monterey Avenue spans the southern boundary of the site. There is a spur of road running north from Monterey Avenue at the site entrance, continuing west to form part of the wider on-site road network. The second route into the site is via a roundabout fed from Gatemore Road.

The DIP site itself is located adjacent to a former nuclear energy test facility site, known as AEE Winfrith. This is shown starred in Figure 2 below.

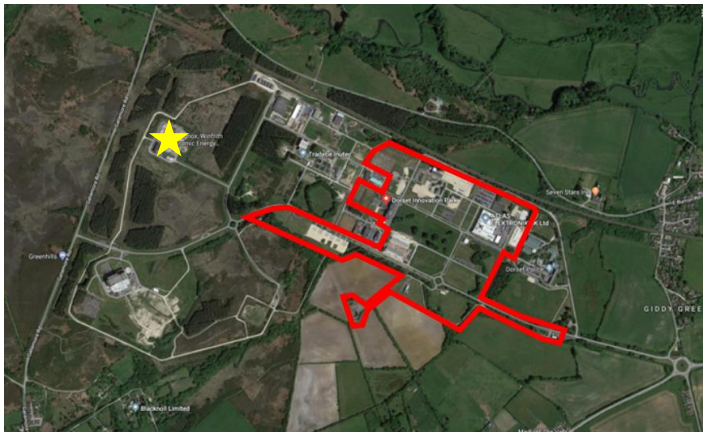


Figure 2 - Satellite view of the existing site with redline boundary and AEE Winfrith starred

Decommissioning of the site within the redline boundary has also been undertaken, leaving a number of brown sites across the Park. Currently there are a number of small ancillary buildings, structures and car parking areas that remain present throughout the site. The existing road network has and will also be retained on-site. Existing infrastructure is shown in grey below;

Figure 3 - Demolished building plan

It is assumed that all utility service disconnections were undertaken prior to demolition. It is however anticipated that the mains infrastructure remains present on-site to service the remaining buildings with the DIP.

2.3 Proposed Development:

Dorset Innovation Park will be redeveloped (over a 25-year period) with the aspiration of being an advanced engineering Enterprise Zone. The development will comprise a mixture of buildings with a total floor space spanning approx. 52,355m_2. The building uses will comprise light industrial, research & design, industrial and distribution. Build type massing for the site is as follows;

Planning use class	Percentage of site
B1a Offices	10%
B1b Research and Development	50%
B1c Light Industrial	10%
B2 General Industrial	15%
B8 Storage and Distribution uses	10%
Other (ancillary uses)	5%

Table 2 - Proposed build-type massing

The Dorset Innovation Park site is being recognised as a major focus for the economic regeneration of South Dorset and is expected to facilitate 2,000 new jobs as well as attract new businesses to the area. The DIP enterprise zone will therefore be a flagship scheme and will undoubtedly be expected to provide high levels of sustainable design and innovation. In consideration of this aspiration, Hydrock Utilities have worked closely with Hydrock sustainability consultants to explore strategies for servicing the site.

This report refers to the entire development shown in Figure 4 below, which covers 26 buildings over 14 zones. Table 3 below details the proposed area schedule for each plot. This should be read in conjunction with Figure 4 (masterplan) for reference to main plot names.

Main Plot	Sub-Plot	**B1(a)** Offices (GEA)	**B1(b)** R+D (GEA)	**B1(c)** Light Ind (GEA)	**B2** Industrial (GEA)	**B8** Distribution (GEA)	Other *[social, collaborative space etc]* (GEA)
Steam	STE-01					3,720	
	STE-02				1,430		
Nero	NER-01				4,180		
Juno	JUN-01				2,800		
	JUN-02						
Dimple	DIM-01		5,530				
	DIM-02	2,475					
Zebra	ZEB-01		3,100				
	ZEB-02			2,560			
Dragon	DRA-01		2,090				
	DRA-02	2,160					
Hector	HEC-01		4,800				
Nestor	NES-01			3,400			
Zenith	ZEN-01				2,580		
	ZEN-02					3,745	
Quadrant	QUA-01			2,400			
Chapman	CHA-01			450			
	CHA-02		515				
Atlas	ATL-01		14,875				
	ATL-02		2,100				
	ATL-03		825				
	ATL-04		825				
	ATL-05		2,590				
The Nucleus	NUC-01	2,540					
	NUC-02						2,220
Pavilion	PAV-01						1,300

Table 3 - Area schedule, by plot

There is currently no defined phasing plan for building construction. Figure 4 below does however outline an indicative strategy, which highlights The Nucleus building as a favourable option for P1. Wider development plot delivery thereafter will be dictated by commercial market considerations.

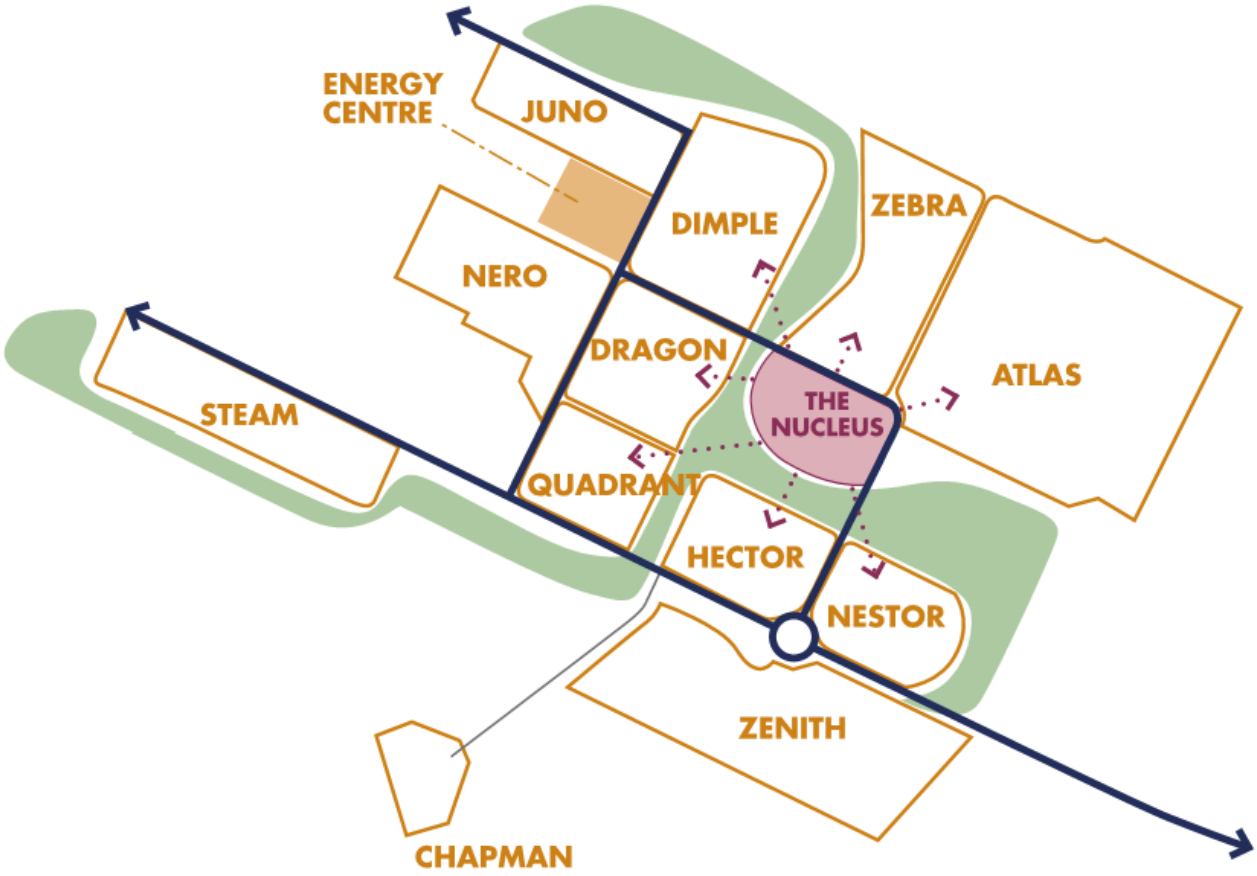
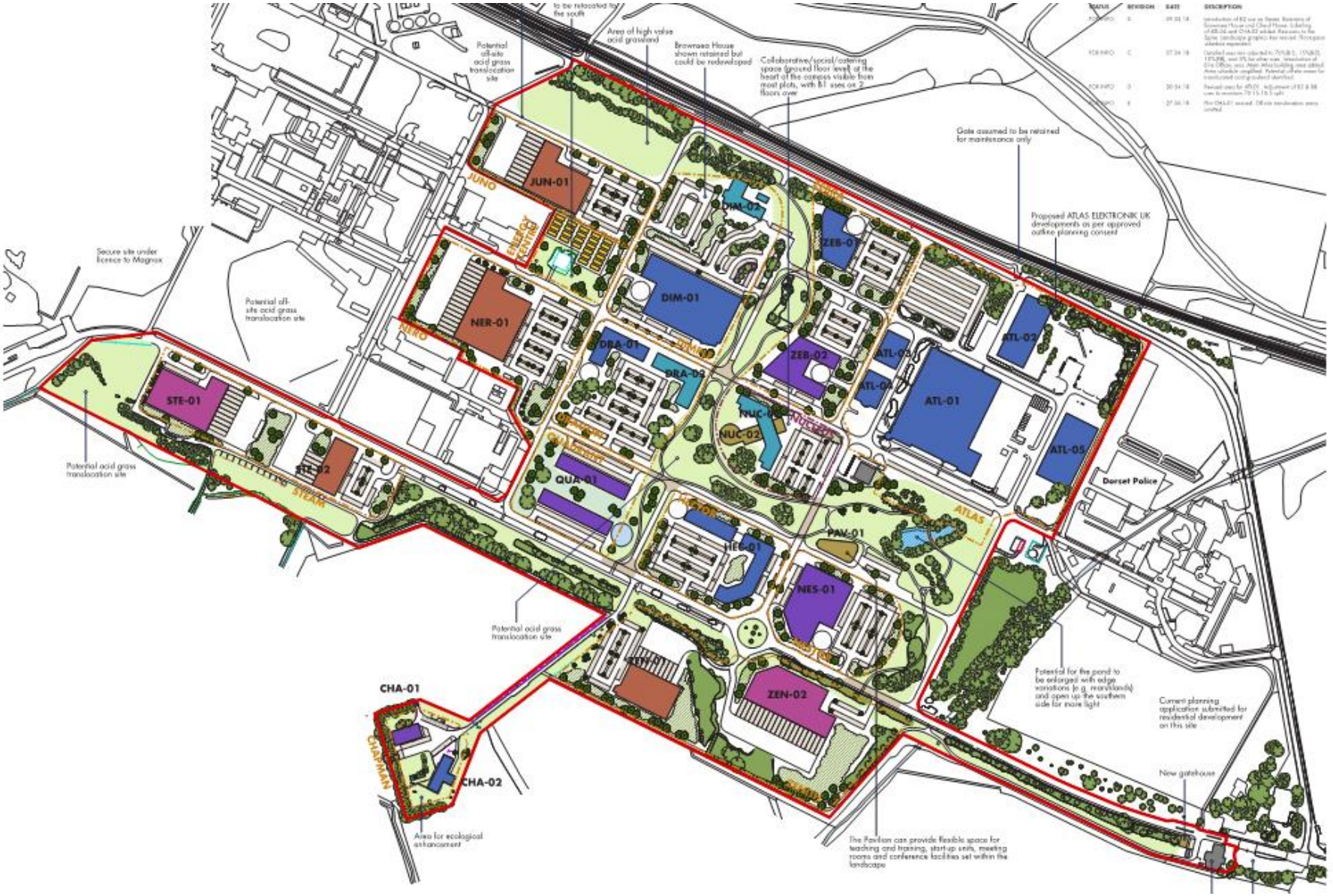


Figure 4 - Plot zoning plan

It should be noted at this stage that this assessment is based upon an Illustrative Masterplan only and presents one potential development scenario that is reflective of the urban design and development plot principles set out within the Design Guide. Hydrocks utility report is provided for information only at this stage.

Figure 5 - Proposed masterplan



3. EXISTING SERVICES

This Utilities Statement is based upon utility information that has been provided by the respective utility companies in relation to the services within the vicinity of the development site. Hydrock has taken all reasonable steps to obtain the information from the respective utility companies. The information received has been summarised within this report. In the event that the information is relied upon and is subsequently found to be incorrect, Hydrock Consultants Ltd accepts no responsibility for any direct and/or consequential loss that may occur as a result.

The utility services that exist either within the site or its immediate surrounds are detailed below.

3.1 Gas – Southern Gas Networks (SGN)

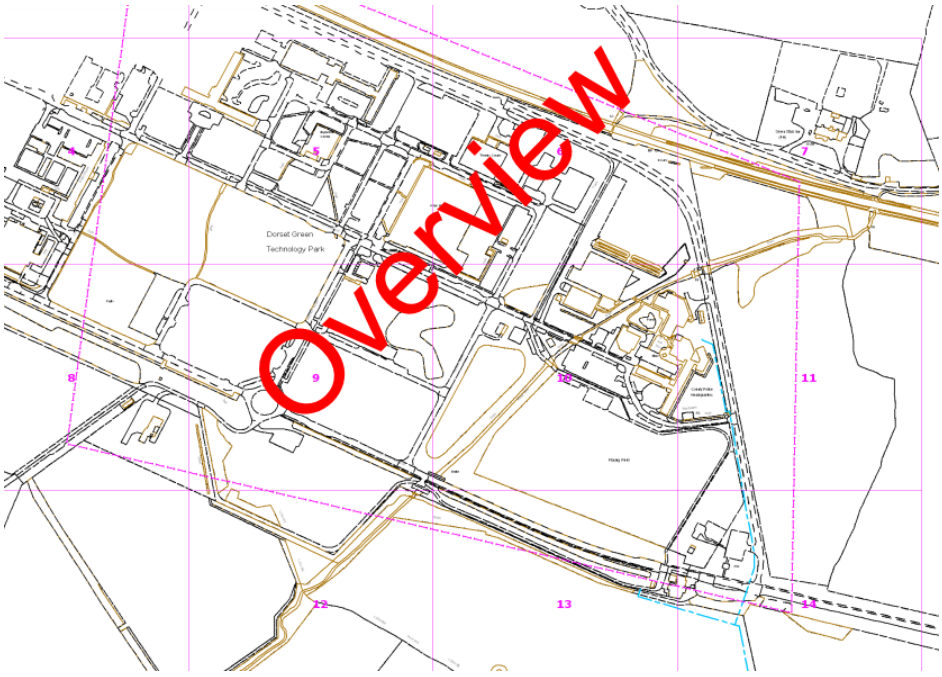


Figure 6 - Existing SGN apparatus

Southern Gas Networks are the incumbent distribution network operator for this service area. Records received from SGN show a 63mm polyethylene (PE) medium pressure (MP) gas main running north from Monterey Avenue at the location of the access road that serves the County Police Headquarters. The main terminates at the Police HQ building.

Records received from SGN also show a 125mm PE MP pipe running west along the south of Monterey Avenue, terminating at the Dorset Green Technology Park Building located to the south-east corner of the site. This main provides a point of connection for the existing DIP via a pressure reduction installation (PRI.) The PRI is owned by SGN but was installed to provide a low pressure (LP) point of connection (POC) for the independent gas transporter GTC Pipelines. From the PRI, GTC have installed a LP mains network around the DIP, providing a LP service to each of the buildings.

Both the 63mm and 125mm mains detailed above are fed from a 180mm PE MP main that runs from the fields to the south of the site.

In terms of establishing a point of connection (POC) to the local network, the size and locality of existing infrastructure does not pose a constraint for connection. Further information on network capacity, connection design and cost are detailed in section 5.3.1.

3.2 Gas - GTC Pipelines Ltd

Independent gas transporter (IGT) GTC Pipelines own and operate the low-pressure network within the DIP.

A ground penetrating radar (GPR) survey was undertaken in 2015, which was managed by Peter Brett Associates. The survey results show low pressure (LP) apparatus running west from the SGN POC into the site to distribute gas to each of the units via a LP network running within, and adjacent to the on-site road networks.

GTC apparatus is anticipated to be buried at a depth of 600mm within the on-site footpaths and at a depth of 750mm in the verge and/or carriageway, as per NJUG guidelines.

Figure 7 overleaf; Hydrock drawing reference DOR-HYD-XX-XX-DR-Y-9101, shows the existing on-site LP gas network.

Note: All Hydrock co-ordinated services drawings are based on information taken from the PBA constraints plan drawings, references; 32364/2001/001 - 014.

Figure 7 - Hydrock co-ordinated gas drawing, reference DOR-HYD-XX-XX-DR-Y-9101

NOTES:

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Rev	Date	Description	By	Ckd
P01	03/08/18	For Information	CS	LB

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Client :

Purbeck District Council

Project Title:

Dorset Innovation Park

Drawing Title:

Existing Gas
Existing Site

Drawing Status:

S2

Hydrock Job No:

C-087277-C

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CS	LB	1:2000	30.07.18	03.08.18

Drawing Number:

DIP-HYD-XX-XX-DR-Y-9101

Revision:

P01

3.3 Power – Scottish and Southern Electric (SSE)

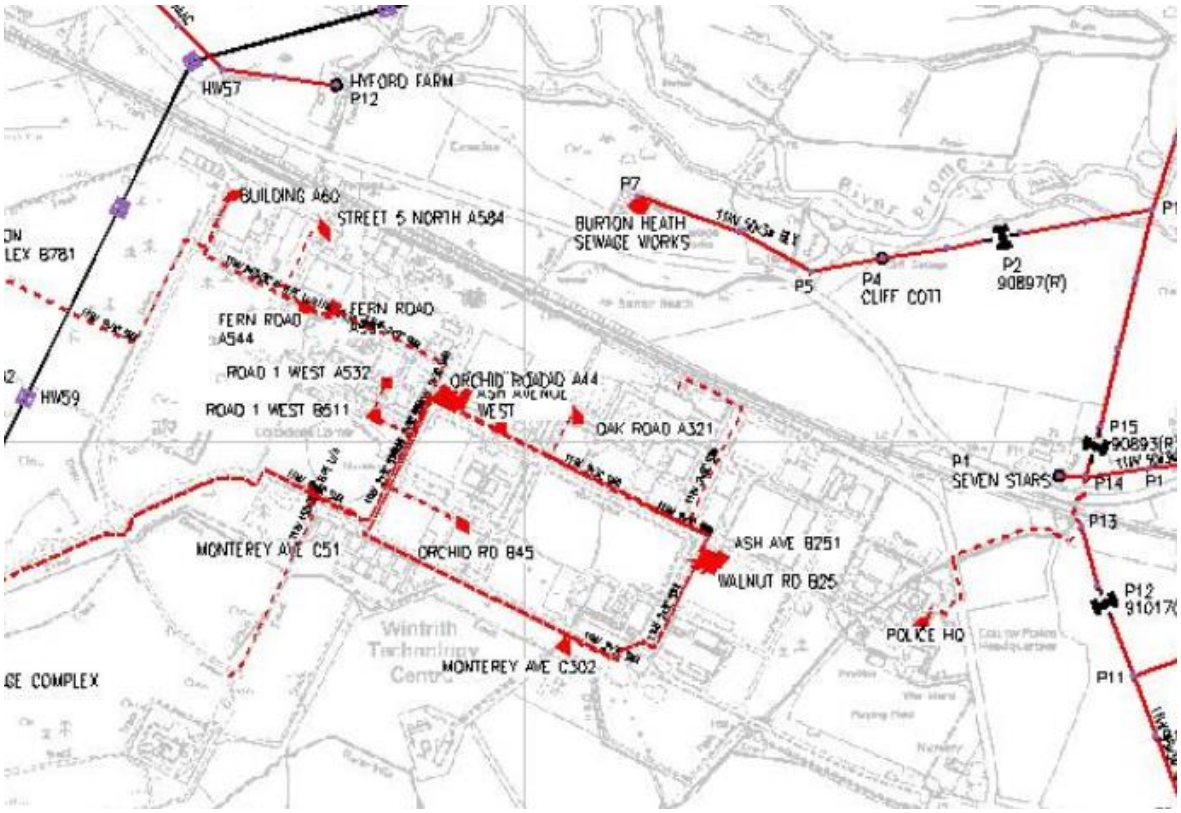


Figure 8 - Existing SSE apparatus

SSE are the incumbent distribution network operator for this service area. Records received from SSE show a network of buried 11kV high voltage (HV) cables running into the Innovation Park from a primary substation to the south-west corner of the site, outside of the site boundary.

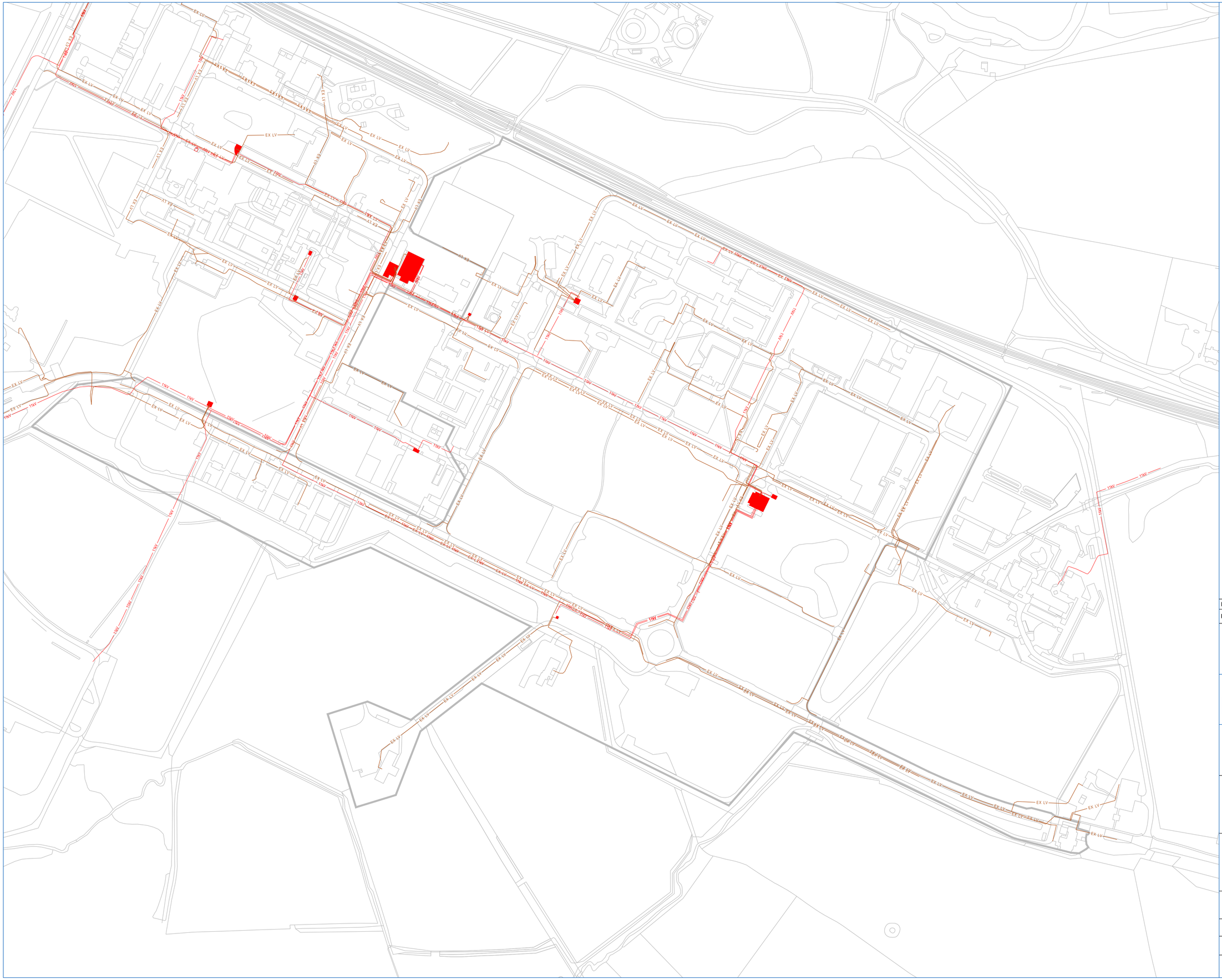
A HV ring main is shown to loop around the central spine road networks, supporting a number of distribution substations.

Extra-high voltage (EHV) transmission cables are shown to span overhead on pylons to the west of the site.

Figure 9 overleaf; Hydrock drawing reference DOR-HYD-XX-XX-DR-Y-9201, shows the existing on-site HV and LV networks in detail.

In terms of establishing a point of connection to the local network, the size (v) and locality of existing infrastructure does not pose a constraint for connection. Further information on network capacity, connection design and cost are detailed in section 5.3.2.

Figure 9 - Hydrock co-ordinated electric drawing, reference DOR-HYD-XX-XX-DR-Y-9201



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Client :

Purbeck District Council

Project Title:

Dorset Innovation Park

Drawing Title:

Existing Electric
Existing Site

Drawing Status:

S2

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CS	LB	1:2000	30.07.18	03.08.18

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Revision:

P01

3.4 Water – Wessex Water

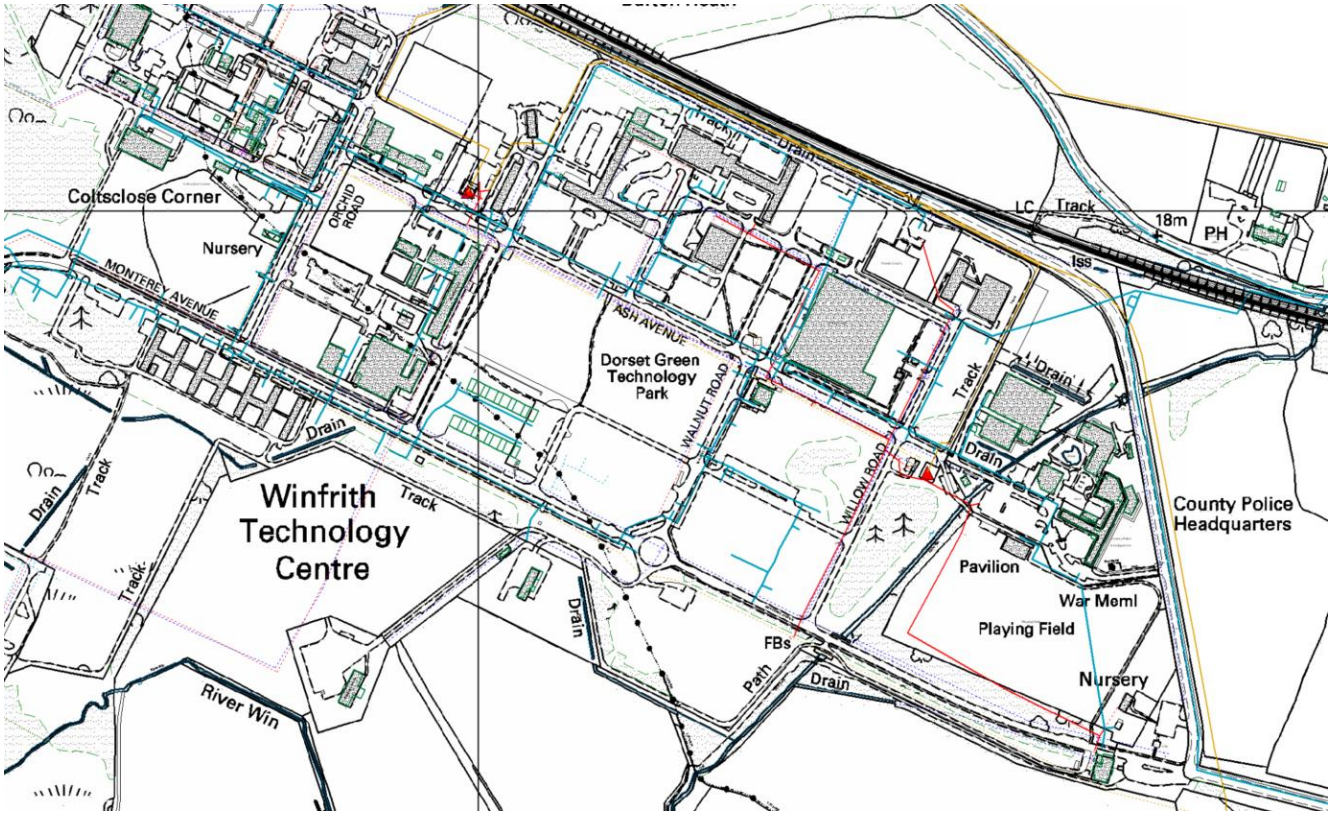

Figure 10 - Existing Wessex Water apparatus

Wessex Water are the incumbent distribution network operator for this service area. Records received from WW show a 300mm cast iron (CI) potable water distribution pipe running in within the verge/footpaths of the main spine roads around the site to provide a ring. From this, there are a number of 150mm CI connections distributing to each zonal area throughout the site.

Wessex Water records show legs of buried infrastructure to terminate within parcels of unoccupied land within the site boundary, suggesting that provision for future supplies has been made.

Figure 11 overleaf; Hydrock drawing reference DOR-HYD-XX-XX-DR-Y-9301, shows the existing on-site water network in detail.

Wessex Water's existing apparatus will be buried at a minimum depth of 750mm in a footpath and verge, increasing to 900mm in the carriageway.

In terms of establishing a point of connection to the local network, the size and locality of existing infrastructure does not pose a constraint for connection. Further information on network capacity, connection design and cost are detailed in section 5.3.3.

Figure 11 - Hydrock co-ordinated water, drawing reference DOR-HYD-XX-XX-DR-Y-9301

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Drawing Title:

Existing Water
Existing Site

Drawing Status:

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Drawing Number:

DIP-HYD-XX-XX-DR-Y-9301

Revision:

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3.5 Telecommunication – British Telecoms

Figure 12 - Existing BT apparatus

BT provides telecommunication services in the UK. Records received from BT show existing buried apparatus and associated chambers running from either side of Monterey Avenue to the approach of the Park. At the junction, a span of buried cable is shown to run north in the vehicular access road that serves the County Police Headquarters. A second span of cable is also shown running west from the junction into the Dorset Green Technology Park building. From this building, buried cable is shown to cross the road and loop into a second span of cable that runs parallel to the south of Monterey Avenue in the single lane vehicular track.

BT records show a network of buried apparatus running within the footpaths and verges of the on-site road network as well as legs of buried infrastructure terminating within parcels of unoccupied land within the site boundary, suggesting that provision for future supplies has been made.

Figure 13 overleaf; Hydrock drawing reference DOR-HYD-XX-XX-DR-Y-9401, which shows the existing on-site telecoms and fibre network in detail.

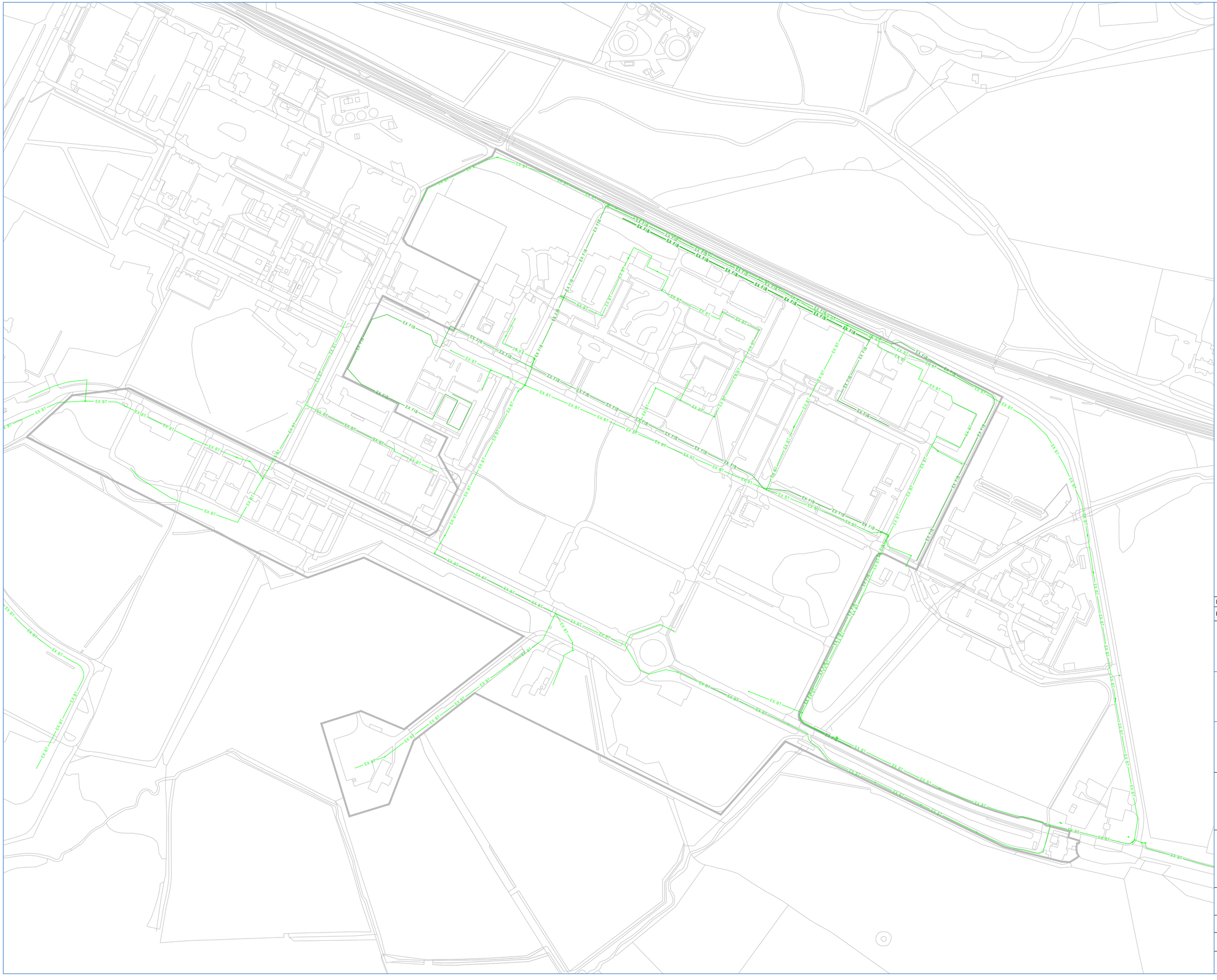
BT's existing apparatus will be buried at a minimum depth of 350mm in a footpath and verge, increasing to between 450mm and 600mm in the carriageway.

In terms of establishing a point of connection to the local network, the locality of existing infrastructure does not pose a constraint for connection.

3.6 Data/Fibre

See Figure 13 overleaf; Hydrock drawing reference DOR-HYD-XX-XX-DR-Y-9401, which shows the existing on-site fibre network in detail, and section 4.2.5, which provides commentary on the network.

Figure 13 - Hydrock co-ordinated telecoms drawing, reference DOR-HYD-XX-XX-DR-Y-9401



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Drawing Title:
Existing Telecoms and Fibre
Existing Site

Drawing Status:
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Drawing Number:
DIP-HYD-XX-XX-DR-Y-9401

Revision:
P01

3.7 Other Independent Utility Companies

Hydrock has undertaken a utility enquiry search using the Linesearch.org website. The results of the search conclude that the following companies do not have plant and equipment in 'zone of interest.'

AWE Pipeline	Marchwood Power Ltd (Gas Pipeline)
BOC Ltd (A Member of the Linde Group)	Melbourn Solar Limited
BP Exploration Operating Company Limited	NPower CHP Pipelines
BPA	Oikos Storage Limited
Carrington Gas Pipeline	Orsted
CATS Pipeline c/cWood Group PSN	Perenco UK Limited (Purbeck Southampton Pipeline)
Cemex	Petroineos
Centrica Storage Ltd	Phillips 66
CLH Pipeline System Ltd	Premier Transmission Ltd (SNIP)
Concept Solutions People Ltd	Prysmian Cables & Systems Ltd (c/o Western Link)
ConocoPhillips (UK) Ltd	Redundant Pipelines - LPDA
DIO (MOD Abandone Pipelines)	RWEnpower (Little Barford and South Haven)
E-ON UK CHP Limited	SABIC UK Petrochemicals
EirGrid	Scottish Power Generation
ENI & Himor c/c Penspen Ltd	Seabank Power Ltd
EnQuest NNS Limited	Severn Trent (Chester area only)
EP Langage Limited	Shell (St Fergus to Mossmorran)
ESSAR	Shell Pipelines
Esso Petroleum Company Limited	SSE (Peterhead Power Station)
Fulcrum Pipelines Ltd	TATA
Gamma	Total (Colnbrook & Colwick Pipelines)
Gateshead Energy Company	Total Finaline PIpelines
Gigaclear PLC	Transmission Capital
Gtt	UK Power Networks
Hafren Dyfrdwy	Uniper UK Ltd

INEOS FPS Pipelines and INEOS Manufacturing (Scotland and TSEP)	Vattenfall
IGas Energy	Veolia ES SELCHP Limited
INOVYN Enterprises Limited	Western Power Distribution
Intergen (Coryton Energy or Spalding Energy)	Westminster City Council
Mainline Pipelines Limited	Wingas Storage Uk Ltd
Manchester Jetline Limited	Zayo Group UK Ltd c/o JSM Group Ltd
Manx Cable Company	

Please note that Hydrock Consulting is unable to guarantee the accuracy of information provided by others. This report is based on information available at the time.

4. CONFLICT ASSESSMENT (DISCONNECTIONS/DIVERSIONS) AND POCS

4.1 Gas

See Hydrock co-ordinated existing services drawing (reference number DOR-HYD-XX-XX-DR-Y-9001) which shows existing SGN and GTC apparatus in relation to the proposed site.

An assessment has been undertaken to identify any conflicts/risk from the existing apparatus, as well as to establish potential POCs for the proposed buildings. Consideration of retaining supplies to the wider site has been included. Atlas will be excluded from all assessments.

POCs are based on loads required for a decentralised (grid connection) network only. They are therefore excluding any efficient technologies, such as CHP.

4.1.1 *Nucleus*

A LP main (size tbc) runs to the north of a strip of hardstanding ground (pedestrian footpath / cycle path) to the north of Ash Avenue, within the parameters of the Zebra zone boundary. No apparatus is shown to run within the near-side verges of Ash Avenue, Walnut Close, or within the Nucleus boundary itself.

Subject to the preferred new connection strategy, a POC for NUC-01 and NUC-02 could be made from this main; running into the Nucleus zone via a (new) duct crossing in Ash Avenue.

4.1.2 *Nestor*

A LP main (size tbc) runs south of Monterey Avenue in the existing Greenfield site that will accommodate Zenith. No mains infrastructure is shown to run within the nearside verge of Monterey Avenue, Walnut Road or within the Nestor zone site itself. To the east, a LP main is shown to run within the eastern (far-side) of Willow Road to supply the Police Station.

Subject to the preferred new connection strategy, a POC for NES-01 could be made from this existing main; running into the Nestor zone via a (new) duct crossing in Monterey Avenue.

4.1.3 *Hector*

As per the Nestor assessment (4.1.2), the LP main running to the south of Monterey Avenue continues west along the spine road to the south of the site zone. No mains are shown to run to the north, east or west of the zone, nor within the boundary itself.

Subject to the preferred new connection strategy, a POC for HEC-01 could be made from this existing main; running into the Hector zone via a (new) duct crossing in Monterey Avenue.

4.1.4 *Zenith*

There is an existing LP main (size tbc) that runs south of Monterey Avenue in the existing Greenfield site that will accommodate Zenith. An overlay of the surveyed pipe and proposed site plan highlights a conflict, shown overleaf in figure 14 (an extract from drawing DOR-HYD-XX-XX-DR-Y-9001).

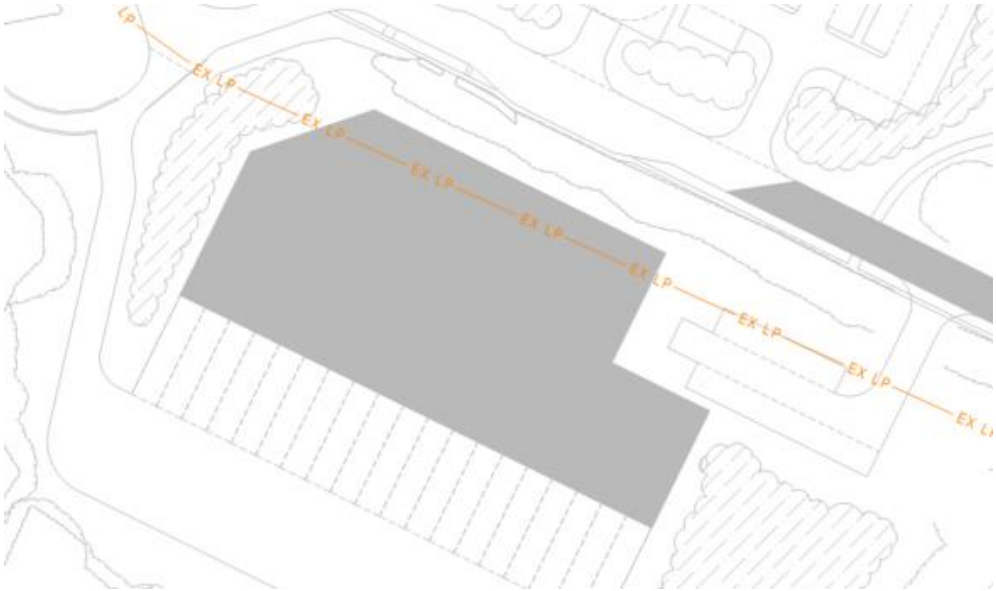

Figure 14 - Existing GTC apparatus and proposed ZEN-02 building

Measurements of the ZEN-02 building and the existing length of pipe that is shown to run within its boundary have been undertaken. The length of ZEN-02 building at this location is c.66m. Allowing a 2m buffer either side of the building, approx. 70m of LP main would need to be abandoned. 84m of new LP pipe would be required, which will run approx. 7m north from its current location, 70m along the building frontage, before returning to join the existing infrastructure.

Alternatively, to avoid diversionary works, the location of ZEN-02 could be set back further the road; bringing the proposed car parking spaces forward. As car parking is not deemed a 'permanent structure' (due to it being easily penetrable, and so offering easy access for maintenance) there would not be a constraint in building a car park above the main.

Subject to the preferred new connection strategy, a POC for ZEN-02 could be made from the existing main as part of the diversion strategy; installing a spur from the relocated main at the building boundary.

4.1.5 *Chapman*

From the main running to the south of Monterey Avenue, there is a spur of LP main that is shown to run south from the footpath / cycle track, through a small section of existing Greenfield and across the existing access road, continuing along the fence-line to supply the existing building located here. This building will be retained to accommodate building reference CHA-02.

Co-ordination works will be required when stopping up the existing access road to this road but it is not anticipated that diversionary works will be required.

Subject to the preferred new connection strategy, a POC for CHA-01 could be made from the existing main supplying CHA-02 via the installation of a spur.

4.1.6 *Quadrant*

From the main running to the south of Monterey Avenue, there is a spur of LP main that is shown to run north along the eastern verge of Oak Road, within the parameters of the Quadrant zone boundary. The main enters the site approx 12m east of the centreline of the Oak Road junction and continues north. The location of the apparatus does not impact on the proposal and will not require relocating.

Subject to the preferred new connection strategy, a POC for the QUA-01 buildings could be made from the existing main via the installation of a spur.

4.1.7 *Steam*

After Oak Avenue, the LP main running along the south of Monterey Avenue follows the direction of the existing trees, running south-west past the former building. The main crosses the existing track (assumed footpath) and continues west through the Greenfield. There was a spur from this main that provided a supply to the former building. This would have been disconnected from the network prior to demolition so is assumed to be redundant.

The proposed locations of STE-01 and STE-02 will not impact upon the apparatus.

Subject to the preferred new connection strategy, a POC for STE-01 and STE-02 could be made from the existing main via the installation of a spur.

4.1.8 *Nero*

The former building located on the Nero site is shown to have had 2No service connections to the mains network; 1No at the south of the building from a spur running from the main in the eastern verge of Oak Road and 1No to the north, from the same main, but via apparatus connected at the corner of the Dimple zone. Both supplies would have been isolated prior to demolition. The remaining pipework on-site will not constrain development of NER-01.

Subject to the preferred new connection strategy, a POC for NER-01 could be made from the existing on-site apparatus via the installation of a spur.

4.1.9 *Dragon*

The existing main running along the verge of Oak Road is shown to continue north from Nero into the Dragon zone. An overlay of the surveyed pipe and proposed site plan highlights a conflict, shown in figure 15 below (an extract from drawing DOR-HYD-XX-XX-DR-Y-9001).

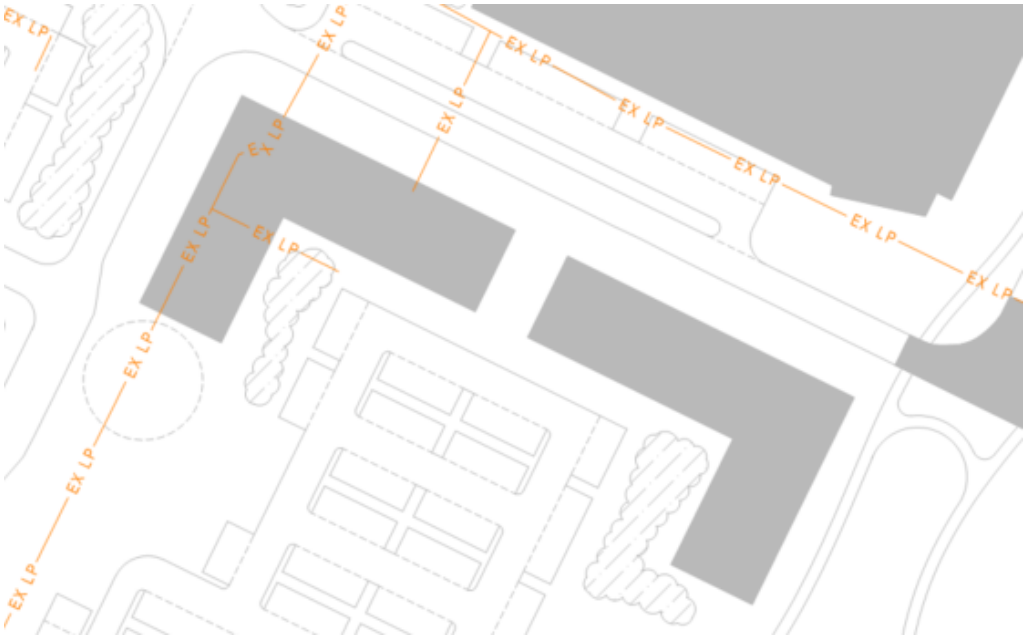

Figure 15 - Existing GTC apparatus and proposed DRA-01 building

Measurements of the DRA-01 building and the existing length of pipe that is shown to run within its boundary have been undertaken. The length of DRA-01 building at this location is c.38m. Allowing a 2m buffer either side of the building, approx. 42m of LP main would need to be abandoned.

58m of new LP pipe would be required, which will run approx. 6m and 10m north from its current location, 42m along the building frontage, before returning to join the existing infrastructure.

Alternatively, to avoid diversionary works, the orientation of DRA-01 could be re-designed to avoid the existing infrastructure.

Subject to the preferred new connection strategy, a POC for DRA-01 and DRA-02 could be made from the main running on-site, or from an existing main running in the northern verge of Ash Avenue; via existing road crossings for apparatus that supplied the building within the Dimple zone.

4.1.10 *Dimple*

4.1.10.1DIM-01

Continuing west from ZEB-02, the LP main that runs north of the strip of hardstanding ground (pedestrian footpath /cycle path) to the north of Ash Avenue, also runs within the parameters of the Dimple zone boundary. There are 2No disconnected spurs that run south from this main to supply the former building located in the Dragon zone.

At the south-west corner of the Dimple site, the main is shown to continue west, across Orchid Road to supply the former building located within Nero zone, and further west into the wider site. A spur of main also runs north at the corner, along and within a section of the western boundary of the Dimple zone. It is anticipated that this section of pipe has however been disconnected as it fed a now demolished building and may no longer be present.

Subject to the preferred new connection strategy, a POC for NUC-01 could be made from the apparatus running along the southern boundary, via a spur.

4.1.10.2DIM-02

The existing building, proposed as DIM-02, has been retained on-site and is currently live. The existing gas service to this unit runs east from the wider DIP site, north of JUN-01 within Greenfield.

4.1.11 *Juno*

There is an existing main running north of the proposed JUN-01 building which runs east from the wider DIP site, to the west of the redline boundary. This main currently supplies the building proposed as DIM-02.

Subject to the preferred new connection strategy, a POC for NUC-01 could be made from this apparatus, via a spur.

4.1.12 *Zebra*

4.1.12.1 ZEB-01

There is an existing span of main that runs from the DIP west site, past JUN-01 and DIM-02, to supply the former building on the site of ZEB-01. The span from DIM-02 is assumed to have been isolated prior to demolition. No further mains are within present within the proximity of this building.

A POC for ZEB-01 is anticipated to be established from the former supply currently supplying DIM-02.

4.1.12.2 ZEB-02

The main running north of Ash Avenue along the main spine of the site is shown to run within the Zebra zone, along the southern boundary. There is a former service supply pipe shown running north through the proposed ZEB-02 building to supply a former building. This is assumed to have been disconnected prior to demolition, and as such, will not constrain development of ZEB-02.

Subject to the preferred new connection strategy, a POC for ZEB-02 could be made via a spur from the apparatus running along Ash Avenue.

Notes:

1. ALL DIMENSIONS ARE TO BE CHECKED ON SITE BEFORE THE COMMENCEMENT OF WORKS. ANY DISCREPANCIES ARE TO BE REPORTED TO THE ARCHITECT & ENGINEER FOR VERIFICATION. FIGURED DIMENSIONS ONLY ARE TO BE TAKEN FROM THIS DRAWING.
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INFORMATION ONLY

Rev	Date	Description	By	Ckd
P01	13/07/18	Existing Gas and Proposed Site Layout	JG	LB

Architect:
n/a

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Client:
Purbeck District Council

Project Title:
Dorset Innovation Park

Drawing Title:
Existing Gas
Proposed Site

Drawing Status:
S2

Hydrock Job No.: C-087277-C

Drawn	Checked	Scale @ A0	Date	Issue Date
JG	LB	1:1000@A0	13.07.18	13.07.18

Drawing Number: DOR-HYD-XX-XX-DR-Y-9001
Revision: P01

4.2 Power

4.2.1 *High Voltage*

See Hydrock co-ordinated existing services drawing (**reference number DOR-HYD-XX-XX-DR-Y-9002**) which shows existing SSE HV apparatus in relation to the proposed site.

An assessment has been undertaken to identify any conflicts/risk from the existing apparatus, as well as to establish potential POCs for the proposed buildings. Consideration of retaining supplies to the wider site has been included. Atlas will be excluded from all assessments.

POCs are based on loads required for a decentralised (grid connection) network only. They are therefore excluding any efficient technologies, such as chiller absorption units and CHP.

4.2.1.1 Nucleus

Adjacent to the Nucleus zone are the 'Walnut Road B25' and 'Ash Avenue B251' substations. There are 2No 3-core 11kV cables shown to run from the south-west corner of the site, around the main spine roads of the site (Ash Avenue and Monterey Avenue), forming a ring.

There are 11kV cables running in both directions from the Walnut Road substation. One cable is shown to run into the Ash Avenue substation, which is located next to the Walnut Road asset, with 2No cables running north along Ash Avenue and 2No cables running south along Walnut Road.

The 11kV cable running in Ash Avenue runs within the strip of hardstanding ground (pedestrian footpath / cycle path) to the north of Ash Avenue, and within the parameters of the Zebra zone boundary. This apparatus is shown in the same location as existing fibre and water, suggesting that they run in a shared trench.

No apparatus is shown to run within the near-side verges of Ash Avenue, Walnut Close, or within the Nucleus boundary itself.

In terms of establishing a new connection, a HV POC will be required to sufficiently support NUC-01 and NUC-02 with a load of 981kVA. It is anticipated that a connection may be able to be established to the 'Walnut Road B25' substation.

4.2.1.2 Nestor

2No 3-core 11KV cables are shown to run along the east of Walnut Road, in the existing footpath/cycle path. The location of NES-01 does not conflict with this apparatus, and as such, no diversionary work is required.

In terms of establishing a new connection NES-01, a POC would be provided from the LV network. See 4.2.2.2.

4.2.1.3 Hector

The 2No HV cables running south from Walnut Road substation, continue running within in the footpath/cycle track past the Nestor zone and cross the road (within the pedestrian/cycle path) running parallel to the roundabout before crossing Monterey Avenue in duct. The cables continue to run west along the southern verge of Monterey Avenue (also running alongside existing BT, water and LV)

The location of HEC-01 does not conflict with the HV apparatus, and as such, no diversionary work is required.

In terms of establishing a new connection, to sufficiently support HEC-01 with a load of 1400kVA, a HV POC will be required. This will require a 2No new substations.

4.2.1.4 Zenith

No HV cabling or associated infrastructure runs within the Zenith zone boundary, or within close proximity.

In terms of establishing a new connection, a POC for ZEN-01 would be provided from the LV network. See 4.2.2.4.

4.2.1.5 Chapman

No HV cabling or associated infrastructure runs within the Chapman zone boundary, or within close proximity.

In terms of establishing a new connection, a POC for CHA-01 and CHA-02 would be provided from the LV network. See 4.2.2.5.

4.2.1.6 Quadrant

The HV cables that run west from the Monterey Avenue/Walnut Road roundabout continues within the footpath/cycle track to the south of Monterey Avenue. No HV cabling or associated infrastructure runs within the Quadrant zone boundary.

In terms of establishing a new connection, a POC for QUA-01 would be provided from the LV network. See 4.2.2.6.

4.2.1.7 Steam

The HV cables that runs along the southern verge of Monterey Avenue continues west to the Steam site. There is a HV cable that is shown to straddle the proposed building boundary of STE-02 before running north in Orchid Road to the 'Orchid Road A44' substation. Figure 16 below shows the conflict.

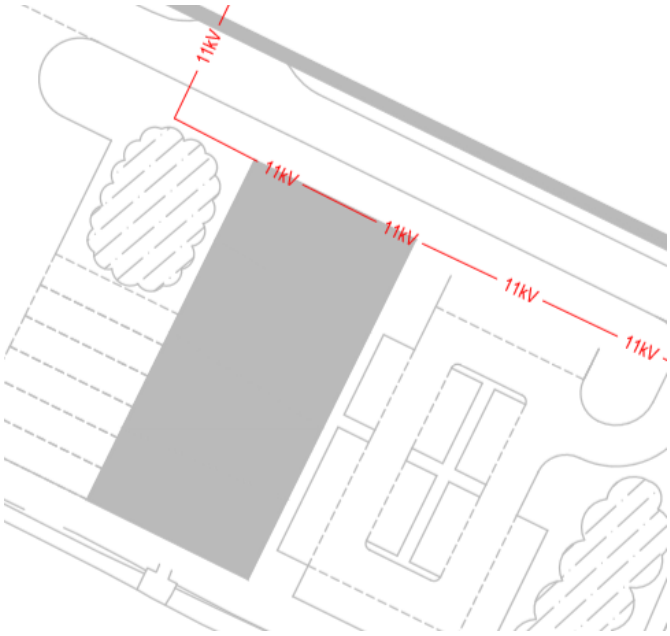

Figure 16 - Existing SSE HV apparatus and proposed STE-02 building

It would be recommended to either alter the orientation or size of STE-02 to avoid diversionary works.

In addition to the HV running from Monterey Avenue, there are HV cables entering the Steam zone from the south and south-west, running into the 'Monterey Ave C51' substation, located to the north of STE-01. Neither span of HV conflicts with STE-01 or STE-02, and as such, no diversionary work is required.

In terms of establishing a new connection, a POC for the Steam buildings would be provided from the LV network. See 4.2.2.7.

4.2.1.8 Nero

There are a number of HV cables running to the north of the Nero zone, located in the far-side footpath/cycle track. Cabling is shown to run east from the 'Orchid Road A44' substation, into the 'Ash Avenue West' substation located to the north of NER-01 within Juno. HV cables also run south and west from the 'Orchid Road A44' substation to support the wider DIP site.

No HV cabling or associated infrastructure runs within the Nero zone boundary.

In terms of establishing a new connection, a POC for the NER-01 would be provided from the LV network. See 4.2.2.8.

4.2.1.9 Dragon

The HV cables that run in the northern footpath/cycle track of Ash Avenue pass the north of the Dragon site. No HV cabling or associated infrastructure runs within the zone boundary.

In terms of establishing a new connection, to sufficiently support DRA-01 and DRA-02 with a load of 1191kVA, a HV POC will be required. This will require a 2No new substations.

4.2.1.10 Dimple

The 'Oak Road A321' substation is located within the Dimple zone, just north of the proposed DIM-01 building. This substation forms part of the sites ring main. The location of the substation and its associated HV cabling do not conflict with DIM-01, and as such, no diversionary work is required.

There is no HV infrastructure present within close proximity to DIM-02.

In terms of establishing a new connection, to sufficiently support DIM-01 and DIM-02 with a load of 2278kVA, a HV POC will be required. This will require a 2/3No new substations, subject to the available capacity within the 'Oak Road A321' sub.

4.2.1.11 Juno

The 'Ash Avenue West' substation is located on the southern boundary of the Juno site. There is a small span of HV running to/from the substation from infrastructure in Ash Avenue. No further HV infrastructure is present within the Juno zone. The location of the substation and HV cabling will not impact JUN-01.

In terms of establishing a new connection, a POC for the Steam buildings would be provided from the LV network. See 4.2.2.11.

4.2.1.12 Zebra

There is a span of HV cabling running north from Ash Avenue along the east of the existing car park and proposed ZEB-02 building. The HV is shown to continue north to the sites northern boundary before running west into a former substation. It is currently unclear as to the extent of isolated cable. As the substation has been decommissioned, it is assumed that the entire span of cable running north from the corner of ZEB-02 is dead. The location of the cabling does not impact upon the proposed ZEB-01 and ZEB-02 buildings.

In terms of establishing a new connection, to sufficiently support ZEB-01 and ZEB-02 with a load of 954kVA, a HV POC will be required. This will require a new substation.

Notes:

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INFORMATION ONLY

Rev	Date	Description	By	Ckd
P01	13/07/18	Existing HV and Proposed Site Layout	JG	LB

Architect:
n/a

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7 Barossa Place
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0117 945 9025
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Client:
Purbeck District Council

Project Title:
Dorset Innovation Park

Drawing Title:
Existing High Voltage
Proposed Site

Drawing Status:
S2

Hydrock Job No:				
C-087277-C				
Drawn: JG	Checked: LB	Scale @ A0: 1:1000@A0	Date: 13.07.18	Issue Date: 13.07.18

Drawing Number:	Revision:
DOR-HYD-XX-XX-DR-Y-9002	P01

4.2.2 *Low Voltage*

See Hydrock co-ordinated existing services drawing (reference number **DOR-HYD-XX-XX-DR-Y-9003**) which shows existing SSE apparatus in relation to the proposed site.

An assessment has been undertaken to identify any conflicts/risk from the existing apparatus, as well as to establish potential POCs for the proposed buildings. Consideration of retaining supplies to the wider site has also included. Atlas will be excluded from all assessments.

POCs are based on loads required for a decentralised (grid connection) network only. They are therefore excluding any efficient technologies, such as chiller absorption units and CHP.

4.2.2.1 The Nucleus

There are a number of LV cables running in both directions from the 'Walnut Road' substation. LV cable is shown to run west from the substation along the southern verge of Ash Avenue and within the Nucleus zone boundary, as shown in Figure 17 below. The location of the cable does not directly conflict with the NUC-01 or NUC-02 buildings however and will not therefore require relocating.

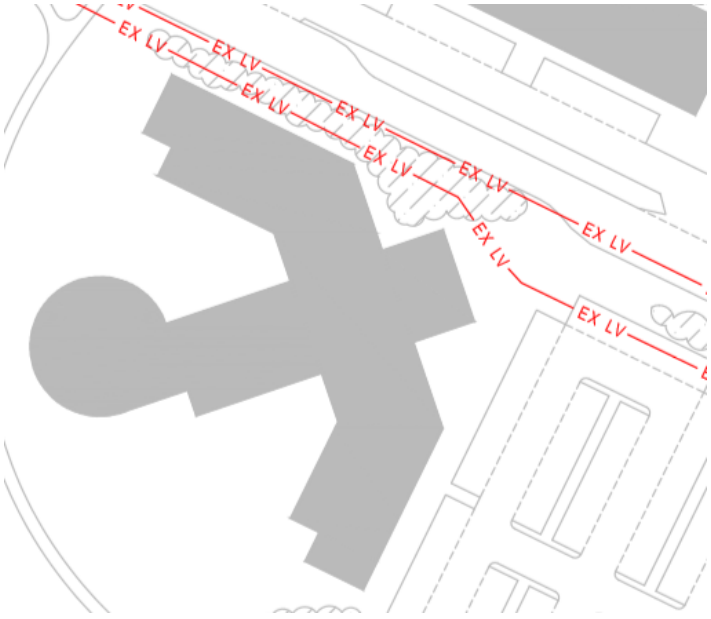

Figure 17 - Existing SSE LV apparatus and proposed NUC-01 and NUC-02 buildings

4.2.2.2 Nestor

LV cables that run south from the 'Walnut Road' substation are shown to run along the east of Walnut Road, in the existing footpath/cycle path (as per the HV). The location of NES-01 does not conflict with this apparatus, and as such, no diversionary work is required.

In terms of establishing a new connection, a LV POC could sufficiently provide a load of 89kVA to NES-01.

4.2.2.3 Hector

LV cables are shown to run along the southern verge of Monterey Avenue (running alongside existing BT, water and HV). There is a span of LV also shown to run within the Hector zone from the apparatus running in Walnut Road. This runs along the northern and western boundary of the site but does impact upon the proposed design for HEC-01.

4.2.2.4 Zenith

There are a number of LV cables running in the verge of Monterey Avenue, to the north of ZEN-01. No LV apparatus is located within the zone boundary, and as such, no diversionary work will be required.

In terms of establishing a new connection, a LV POC could sufficiently provide a load of 212kVA to ZEN-01. A HV POC may however be required subject to cable size.

4.2.2.5 Chapman

Existing LV cable runs south from Monterey Avenue, along the verge of the access track into the existing building.

Co-ordination works will be required when stopping up the existing access road but it is not anticipated that diversionary works will be required. Subject to the available capacity, a second cable may need to be installed should a joint into the existing not be viable.

In terms of establishing a new connection, a LV POC could sufficiently provide a load of 159kVA to Chapman.

4.2.2.6 Quadrant

LV cable is shown to run in the southern verge of Monterey Avenue to the south of the site, as well as along the verge of the unnamed road and eastern verge of Oak Road to the west of the site. No LV mains are shown to conflict with the proposed buildings.

In terms of establishing a new connection, a LV POC could sufficiently provide a load of 62kVA to QUA-01.

4.2.2.7 Steam

LV cable is shown to run from the southern verge of Monterey Avenue into the 'Orchid Road A44' substation. There is cabling shown at conflict with STE-01 and STE-02 but it is believed that this was disconnected from the substation upon decommissioning of the existing unit there.

In terms of establishing a new connection, a LV POC could sufficiently provide a load of 128kVA to STE-01 and STE-02.

4.2.2.8 Nero

There is cable shown to run through the Nero zone and into the 'Orchid Road' substation from LV running in the southern verge of Ash Avenue.

From the 'Ash Avenue West' substation there is a span of LV cable shown running south into the site to fed the former building. It is assumed that this connection is no longer live.

The location of SSEs LV apparatus does not pose a constraint for development of NER-01.

In terms of establishing a new connection to NER-01, a LV POC could sufficiently provide a load of 158kVA. This is anticipated to come from the 'Ash Avenue West' substation.

4.2.2.9 Dragon

The LV cables that run in the southern verge of Ash Avenue are shown to run within the boundary line of the Dragon zone. LV cabling runs along the northern boundary of the site before running south along the western boundary in Oak Road. The location of DRA-01 and DRA-02 does not however affect the apparatus.

4.2.2.10 Dimple

There is a span of LV apparatus running into the Dimple boundary from buried LV running along the western boundary, north from Oak Road. It is anticipated that as the building that formally occupied this space has been demolished, this service is no longer live.

There are a number of LV feeds running from the 'Oak Road A321' substation, just north of the proposed DIM-01 building; one of which runs into DIM-02. It is assumed that the substation, and associated LV feed to the existing building are live. There locations do not impact the proposed site design.

4.2.2.11 Juno

There are a number of spans of LV cable running from the 'Oak Road A321' substation into the Juno site. It is anticipated upon demolition of the former building; all existing on-site infrastructure was disconnected.

In terms of establishing a new connection, a LV POC could sufficiently provide a load of 106kVA to JUN-01 building.

4.2.2.12 Zebra

A span of LV cable runs to the north of the proposed ZEB-01 building but, as it borders the site and is believed to be disconnected, is not at conflict. There are 2No spans of LV cable that cross the ZEB-02 site however. As the former substation supporting this area of development has been decommissioned, it is unclear whether this apparatus is live. Further investigation is needed.

Figure 18 - Existing SSE LV apparatus and proposed ZEB-02 building

Notes:

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INFORMATION ONLY

Rev	Date	Description	By	Ckd
P01	13/07/18	Existing LV and Proposed Site Layout	JG	LB

Architect:
n/a

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Client:
Purbeck District Council

Project Title:
Dorset Innovation Park

Drawing Title:
Existing Low Voltage
Proposed Site

Drawing Status:
S2

Hydrock Job No: C-087277-C

Drawn	Checked	Scale @ A0	Date	Next Date
JG	LB	1:1000@A0	13.07.18	13.07.16

Drawing Number: DOR-HYD-XX-XX-DR-Y-9003
Rev: P01

4.3 Water

See Hydrock co-ordinated existing services drawing (reference number DOR-HYD-XX-XX-DR-Y-9004) which shows existing Wessex Water apparatus in relation to the proposed site.

An assessment has been undertaken to identify any conflicts/risk from the existing apparatus, as well as to establish potential POCs for the proposed buildings. Consideration of retaining supplies to the wider site has also included. Atlas will be excluded from all assessments.

4.3.1 The Nucleus

There is a 300mm cast iron (CI) potable main running within the strip of hardstanding ground (pedestrian footpath / cycle path) to the north of Ash Avenue. From this infrastructure, a connecting 300mm main is shown to run south along the far-side verge of Walnut Road, to the east of the zones boundary.

There are 2No spurs shown running from the 300mm main in Walnut Road, across the road (to the north and south) and into the Nucleus zone. As this zone of the park is Greenfield, it is anticipated that the service connections were installed prior to development so that NUC-01 and NUC-02 could be connected to the grid, when required, without opening the road. As Wessex Waters record does not provide detail as to what size service pipe has been installed, an engineering exercise at detailed design stage will be required to ensure that the apparatus has been sufficiently sized.

The location of existing water apparatus does not pose a constraint for development of NUC-01 and NUC-02 and as such, no diversionary work will be required.

4.3.2 Nestor

There is a 150mm CI main shown to run east from the 300mm pipe in Walnut Road, through the existing car park on the unnamed road between Walnut Road and Willow Road, and south, across the road into the existing field earmarked for development by NES-01.

There will be a minimum stand-off distance of 5m applicable to either side of the pipe which will prevent any permanent structure from being built within these parameters without agreement. As the main is shown to run within a proposed car park; a construction not to be deemed to be 'permanent', Wessex Water will have no objection to the apparatus being accommodated here. For maintenance reasons, access to the apparatus must be easily achievable when required. The location of landscape features, lighting and kerb-lines should therefore be considered at detailed design stage.

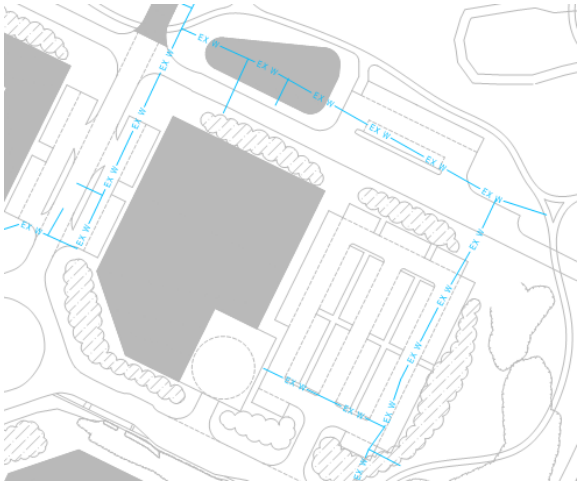

Figure 19 - Existing Wessex Water apparatus and proposed Nestor zone

4.3.3 Hector

The 300mm CI main running south in Walnut Road (to the east of the zone) follows the route of the existing cycle path / footway, crossing the road just north of the roundabout and entering the corner of the Hector site. The main is shown to straddle the existing track to the north, continuing alongside the path before crossing Monterey Avenue and running west along the southern verge.

The main will have a **5m easement** applicable either-side of the apparatus, which is measured from its centreline. The proposed HEC-01 building will therefore need to be located outside of this parameter.

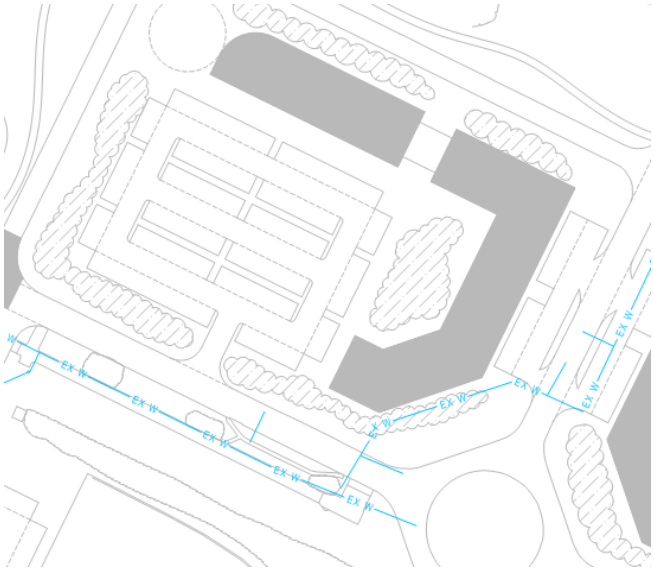

Figure 20 - Existing Wessex Water apparatus and proposed Hector zone

There are 2No spurs shown from the pipe; one to the north and one to the west of the roundabout. Each leg is shown to supply a fire hydrant. A new connection to the building/s is therefore anticipated from the apparatus running on-site.

4.3.4 Zenith

No apparatus is shown to run within the Zenith site boundary. There is a continuation of the 150mm main that runs within the Hector zone that is shown to cross Monterey Avenue and terminate in the road/southern verge, to the north of the proposed ZEN-02 building. It is likely that a new connection would be established from this apparatus. To the west of the site there is a 300mm CI main running in the southern verge of Monterey Avenue, west of the roundabout. There is a spur shown running south from the 300mm CI main in Monterey Avenue, through the green space to the south of the road, terminating at the north of the existing access road to the Chapman site and north-west corner of Zenith.

Subject to the size of this existing apparatus, a POC to ZEN-01 may be established. Should the main be insufficient to support ZEN-01 (as well as CHA-01 and CHA-02) then an upgrade of the pipe will be required. A detailed assessment of the strategy should be undertaken once firm loadings are established.

4.3.5 Chapman

The span of main that runs south from the 300mm CI main in Monterey Avenue, through the green space to the south of the road, terminates at the north of the existing access road to the Chapman site. A service connection is anticipated to run alongside the existing road to supply the existing building; although this is not shown on Wessex Waters record.

The proposed road running from Monterey Avenue to the ZEN-01 building conflicts with the location of this main and will require co-ordination prior to excavation to establish whether protectionary measures will be required.

Subject to the size of the existing main, a POC for CHA-01 and CHA-02 would be established from this infrastructure. A supply to ZEN-01 would also likely come from this main.

A detailed assessment of the strategy should be undertaken once firm loadings are established.

4.3.6 Quadrant

Wessex Water records show the former supplies to the site; comprising a 90mm pipe running north from the 300mm CI in Monterey Avenue to provide individual 90mm mains connections to each of the existing buildings. This infrastructure was however disconnected from the network prior to demolition of the former buildings. The GPR survey has identified that the 90mm main still exists within Monterey Avenue, terminating at the south-west corner of the site.

Subject to a detailed assessment of the building loads, a POC may be established from this apparatus. Alternatively, a new supply would be established from the 300mm CI in Monterey Avenue.

4.3.7 Steam

The 300mm CI main that runs along the southern verge of Monterey Avenue continues west into the Steam zone. The main will an **easement of 5m** applicable to either side of the pipe, measured from the centreline of the main. Currently, buildings STE-01 and STE-02 conflict with the location of the pipe, as the northern extents of both buildings are shown to straddle the main.

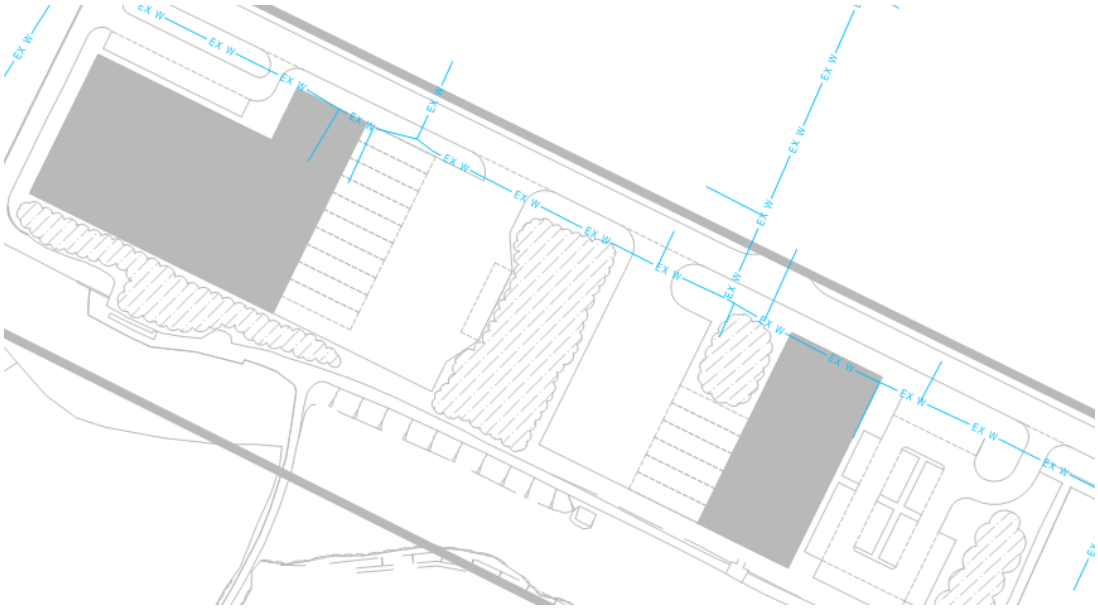

Figure 21 - Existing Wessex Water apparatus and proposed Steam zone

As this infrastructure runs to/from the wider Wessex Water network, it will need to be retained. To avoid diversionary works, it would be recommended that the building orientations, or size, are revised slightly to avoid running within the easement no-build zone.

Further assessment of this conflict should be undertaken at detailed design stage.

In terms of new connections, the size and locality of the existing infrastructure does not pose constraint.

4.3.8 Nero

The 300mm CI main running within the northern verge of Ash Avenue runs to the north of the Nero site, continuing west into Orchard Road. There is a 150mm main shown running south from the 300 in Ash Avenue, through the Nero site to supply the existing building located on the corner of Oak Road and Monterey Avenue (opposite Quadrant.) The main is assumed to be live.

The proposed NER-01 building has been designed in a way that accommodates the existing infrastructure, and as such, no diversionary work is required. The NER-01 building also appears to be located outside of the easement area, which is 3m for a 150mm main.

Formerly, the on-site apparatus is shown to run beneath the now-demolished building previously accommodated within this zone. The new location, within a proposed car park, is better suited and will not require approval from Wessex Water.

Access into the site is provided via an existing bellmouth from Ash Avenue, which currently enables access to the car park. The 150mm main runs within the road here as it enters the site. There is a span of paving shown running through the road at this location (likely forming part of the cycle link) which accommodates a spur from the 150mm. Subject to the size of this leg, a POC is anticipated to be established to the network via this infrastructure.

4.3.9 Dragon

The 300mm CI main running within the northern verge of Ash Avenue runs to the north of the Dragon site and is shown to provide 2No spurs for individual connection into each building. The 2no mains, of unknown size, are shown to run south from the 300, crossing the road at the eastern and western extents of the Dragon site. A POC for DRA-01 and DRA-02 will be made to each of these mains.

No other mains infrastructure is shown to run within the Dragon site boundary or to its surrounds.

4.3.10 Dimple

To the south of DIM-01 is the 300mm CI main running within the cycleway / footpath to the north of Ash Avenue. From this main there are 2No 300mm mains, reducing to 150mm dia., that run alongside the existing road infrastructure to the east and west of the site. There are a number of spurs shown running into the site from each main, to supply either fire hydrants or the former building. The supply to the former building, from the 150mm main to the west of the zone, has been disconnected. Fire supplies are assumed to be live.

In addition to the spurs from the infrastructure to the east and west, there is a span of service pipe shown running north from the 300mm main into the site from Ash Avenue, to provide a POC for DIM-01.

To the north of the Dimple site is the existing Brownsea House building, which will be retained and re-developed (forming DIM-02.) A new POC, if required, would be established from the 150mm CI main running alongside the road to the west of the site, as this continues to run adjacent to the road along the northern boundary of the wider DIP boundary.

No diversionary work is required.

4.3.11 Juno

There is a spur shown to terminate at the Juno site boundary from the 150mm main running to the west of Dimple (and east of Juno). This supply has been installed to provide a POC to the JUN-01 building. No further mains infrastructure is located within the site boundary or to its surrounds.

4.3.12 Zebra

The 150mm main that runs north from the 300mm in Ash Avenue (to the east of the Dimple zone,) runs to the west of the proposed ZEB-02 building, continuing north to the location of the proposed ZEB-01 building.

As all existing on-site infrastructure within this zone has been demolished, disconnection of the services to the former buildings would have been undertaken. The 150mm main itself however is anticipated to have remained to provide a POC to the new buildings.

The location and design of ZEB-01 and ZEB-02 accommodate the existing infrastructure in a way that will not require any diversionary work or further disconnections to be undertaken.

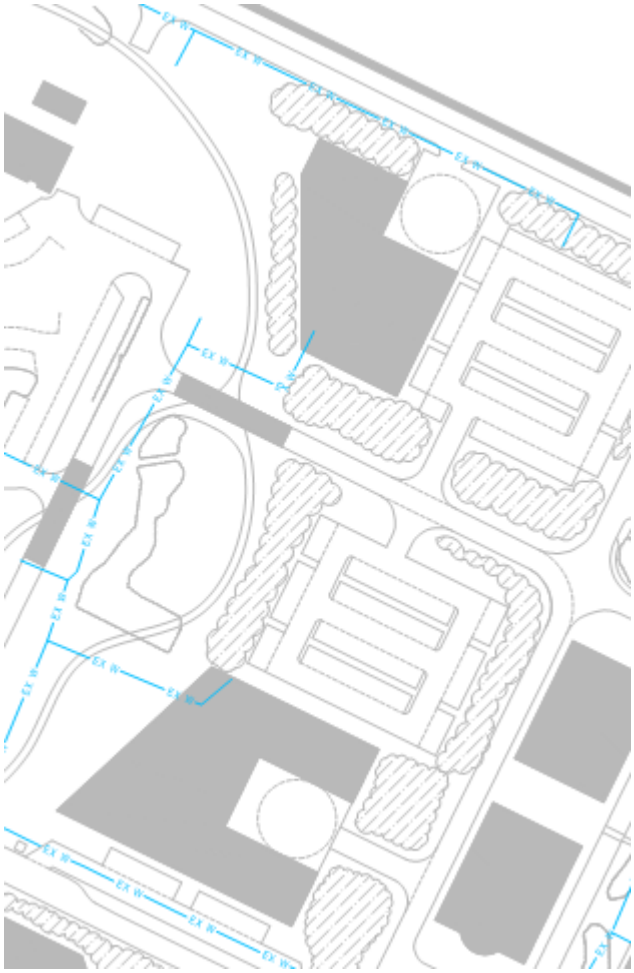

Figure 22 - Existing Wessex Water apparatus and proposed Zebra zone

Notes:

1. ALL DIMENSIONS ARE TO BE CHECKED ON SITE BEFORE THE COMMENCEMENT OF WORKS. ANY DISCREPANCIES ARE TO BE REPORTED TO THE ARCHITECT & ENGINEER FOR VERIFICATION. FIGURED DIMENSIONS ONLY ARE TO BE TAKEN FROM THIS DRAWING.
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INFORMATION ONLY

Rev	Date	Description	By	Ckd
P01	13/07/18	Existing Water and Proposed Site Layout	JG	LB

Architect:
n/a

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Client:
Purbeck District Council

Project Title:
Dorset Innovation Park

Drawing Title:
Existing Water
Proposed Site

Drawing Status:
S2

Hydrock Job No.: C-087277-C

Drawn	Checked	Scale @ A0	Date	Issue Date
JG	LB	1:1000@A0	13.07.18	13.07.18

Drawing Number: DOR-HYD-XX-XX-DR-Y-9004
Revision: P01

4.4 Telecoms - BT

See Hydrock co-ordinated existing services drawing (reference number DOR-HYD-XX-XX-DR-Y-9005) which shows existing BT apparatus in relation to the proposed site.

An assessment has been undertaken to identify any conflicts/risk from the existing apparatus, as well as to establish potential POCs for the proposed buildings. Consideration of retaining supplies to the wider site has also included. Atlas will be excluded from all assessments.

4.4.1 The Nucleus

BT records show buried cable running along the northern verge of Ash Avenue within the shared service trench alongside the existing cycleway / footpath. The GPR survey has however established that the cables run within the northern verge for a short span before crossing the road, east of Nucleus, to run west along the southern verge of Ash Avenue. In both plans, no apparatus is shown within the zone boundary.

As this plot is Greenfield, there are no distribution points present.

Chambers located in Ash Avenue to the north and north-east of the site could provide a POC for the Nucleus buildings. Alternatively, a chamber located in Walnut Road to the east of the site could also provide a supply. Note: this infrastructure is shown on BT plans only, as it was not picked up in the survey, so confirmation of whether the cables are still energised is required. The chamber box and ducting are still anticipated to be present.

4.4.2 Nestor

BT records show buried apparatus running south from Ash Avenue alongside the cycle track and pedestrian footpath of Walnut Road, to the sites western boundary. Buried apparatus is also shown in Willow Road to the east and Monterey Avenue to the south.

There is a small span of cable shown running into the site from a chamber located in Walnut Road. As this site is Greenfield, it is assumed that the infrastructure was installed to provide a POC for a serviced parcel.

No diversionary work is required.

4.4.3 Hector

The buried infrastructure running within the shared services corridor along Walnut Road, continues to follow the route of the cycle path, across the road north of the roundabout and into the corner of the site. There is a chamber located in the south-east corner of the site, whereby cable changes direction and crosses Monterey Avenue. From the chamber, cable is also shown to run west along the southern boundary of the site into a chamber located in the unnamed road between Hector and Quadrant. From this location, cables run north into another chamber before running east into the site. A distribution point with 2No cables terminates at the location of the proposed HEC-01 and HEC-02 buildings.

4.4.4 Zenith

Buried cable is shown to run within the southern verge of Monterey Avenue, to the north of ZEN-01. BT records show 2No spans of cabling; 1No within the cycle track / footway adjacent to the road and 1No within the green space to the south of the path. There are 3No chambers located on these runs, offering potential POCs for the building.

No infrastructure is shown to run within the site boundary.

4.4.5 Chapman

A span of buried cable is shown to run south from Monterey Avenue alongside the verge of the existing road leading into the Chapman site.

A conflict has been identified to the north of the site, where there are proposals to stop-up the existing access road and run a new road into site. Due to the depth that telecoms apparatus is typically buried (350mm) alteration works will be required.

Subject to whether the existing supply will be retained or not, a strategy to disconnect and provide a new connection may be more efficient than diverting the existing apparatus. When detailed cross section plans for the new road have been drafted, an assessment should be undertaken to establish the extent of conflict.

No diversionary work will be required within the main realm of the site itself.

4.4.6 Quadrant

Buried apparatus is shown to run from the southern verge of Monterey Avenue, north, along the eastern verge of Oak Road. The cable is shown to run within the zone boundary but is not at conflict with the proposed buildings. Buried LV and LP gas are also present within the same area.

BT records show joint boxes located either side of Monterey Avenue to allow for the road crossing, and a further 5No chambers on-site. Each chamber is shown to have 2No cables running north and 2No cables south. New connections for QUA-01 and QUA-02 would be made from this infrastructure.

Diversionary work will not be required.

4.4.7 Steam

The buried cable that runs along the southern verge of Monterey Avenue continues west into the Steam zone. It is anticipated that disconnection of the service supply to the former building was undertaken at the chamber located opposite to the Quadrant site, as the GPR survey has not picked up on the cable route running from this location in Monterey Avenue into the site, shown as per BT records.

To ensure continuity of supply with the wider network, cabling runs from the cycle track adjacent to Orchard Road and west through the site.

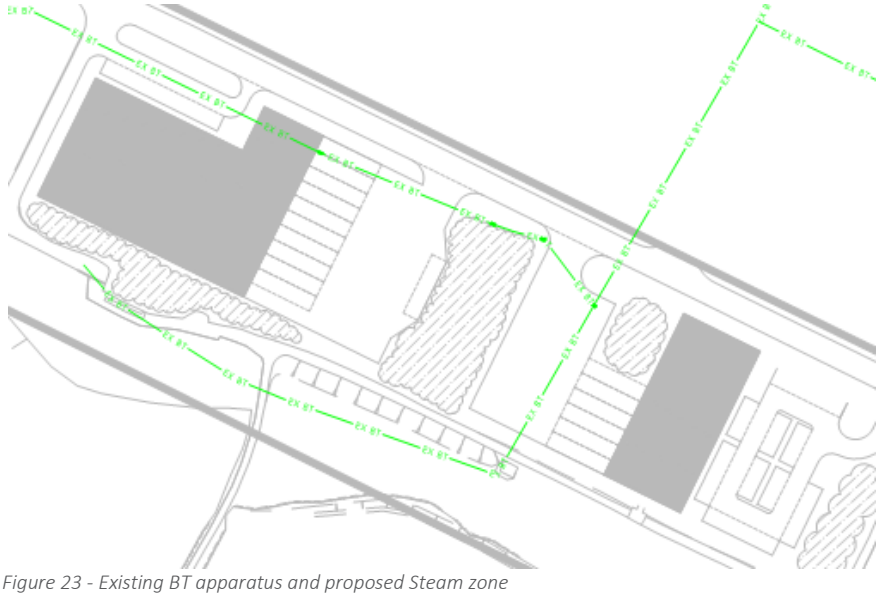

Figure 23 - Existing BT apparatus and proposed Steam zone

There is a conflict identified with STE-01, where the building is shown to encroach upon the existing run of cable. Diversionary works will be required. Alternatively, the building orientation and/or size could be revised slightly to avoid this service.

The locality of infrastructure to the site does not pose a constraint for connection.

4.4.8 Nero

The apparatus running within the verge of Ash Avenue is shown to continue west, joining infrastructure present within Oak Road. The survey information shows that a run of BT cable is still present within the site boundary, which connects into the network within both roads. BT records show that 5No chambers are located along this small span of cable entering site, which is anticipated to remain on-site. The cable supplying the former building has been disconnected, leaving 2No tails for connection.

No diversionary work will be required.

4.4.9 Dragon

Buried cable in Ash Avenue runs to the north of the Dragon site, with infrastructure located in Oak Road, to the west. There are 2No chambers shown at the north-west corner of the site connecting the wider site network. The location of the cable running in Ash Avenue requires confirming, as the BT record and GPR survey information differ. Diversionary work is not anticipated in either scenario however.

A POC for both buildings would be established via the chambers located at the NW boundary.

4.4.10 Dimple

To the south of DIM-01 is buried cable within Ash Avenue. From this apparatus, cable is shown to run alongside the existing road infrastructure to the east and west of the site. There were a number of spans of cable and associated chambers shown running into the site to supply the former buildings which have been disconnected.

To the north of the Dimple site is the existing Brownsea House building, which will be retained and re-developed (forming DIM-02.) Existing buried cable is shown to run around the building from infrastructure in the unnamed road to the west of the zone boundary. This supply will need to be retained.

No diversionary work is required.

4.4.11 Juno

The GPR survey record has confirmed that all existing on-site infrastructure has been disconnected, bar 1No span of cable that is shown entering the south-east of the zone. The cable terminates before the proposed building and is assumed to offer a POC for the new JUN-01 building.

4.4.12 Zebra

There is a span of buried cable that is shown to run north from Ash Avenue alongside the unnamed road between the Zebra and Dimple zones. The cable runs through the Zebra site, conflicting with the proposed ZEB-01 and ZEB-02 buildings, before running west to DIM-02 and joining the network in the unnamed road to the west of the Dimple zone boundary. See figure 24 overleaf.

It is anticipated that the supply to the Brownsea House building (DIM-02) can be retained via the existing network to the west. The cable running within the Zebra zone can then be disconnected between the Brownsea House building and the infrastructure in Ash Avenue that enters the site west of the Dimple zone.

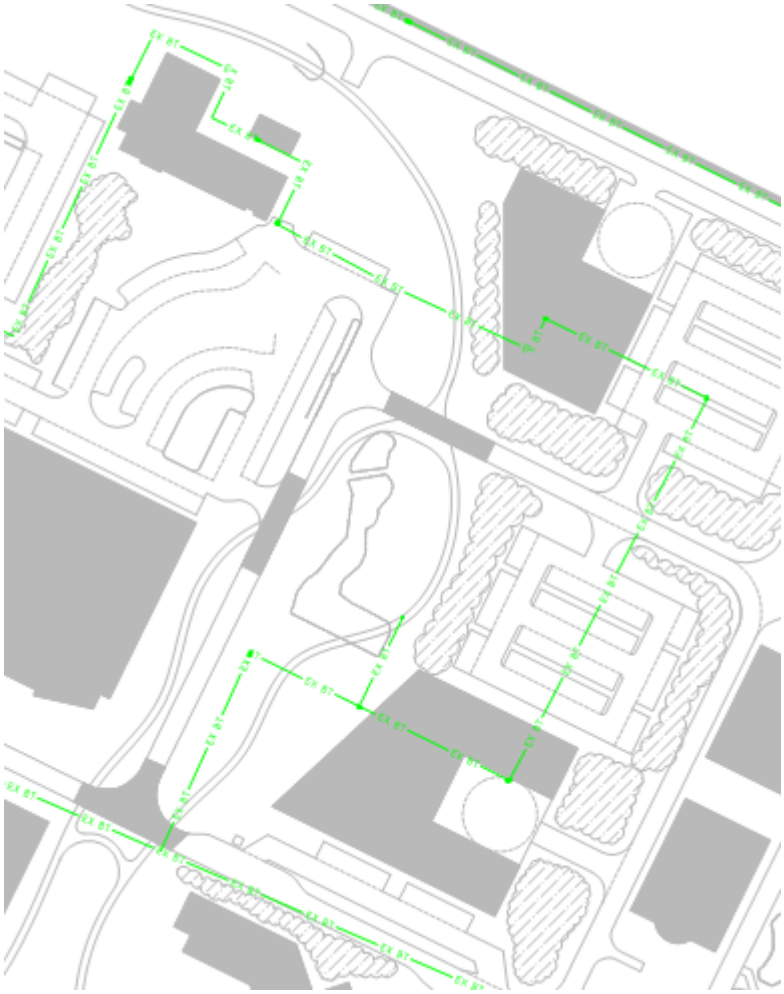

Figure 24 - Existing BT and proposed Zebra zone

Notes:

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INFORMATION ONLY

Rev	Date	Description	By	Ckd
P01	13/07/18	Existing BT and Proposed Site Layout	JG	LB

Architect
n/a

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Client
Purbeck District Council

Project Title:
Dorset Innovation Park

Drawing Title:
Existing BT
Proposed Site

Drawing Status:
S2

Hydrock Job No:				
C-087277-C				
Drawn:	Checked:	Scale @ A0:	Date:	Next Date:
JG	LB	1:1000@A0	13.07.18	13.07.18

Drawing Number:	Rev:
DOR-HYD-XX-XX-DR-Y-9005	P01

4.5 Fibre

See Hydrock co-ordinated existing services drawing (reference number DOR-HYD-XX-XX-DR-Y-9006) which shows existing fibre apparatus in relation to the proposed site.

An assessment has been undertaken to identify any conflicts/risk from the existing apparatus, as well as to establish potential POCs for the proposed buildings.

The existing fibre network is shown to run in a ring around the northern extent of the site, entering the site from Monterey Avenue via the site entrance into the park, and heading north along the eastern boundary of the DIP to Ash Avenue. Fibre cable is shown to run within the same service trench as existing LP gas, water, LV electric and BT (in part,) along the existing cycle track / footway to the north of the road. Following the unnamed road to the west of Dimple, the fibre cable continues to run alongside the road running along the northern boundary of the DIP site, before running south along the eastern boundary and linking back into Ash Avenue.

Fibre extends from the cables in Ash Avenue, west, into the Nero site. Fibre is shown to run into the site from the northern boundary, continuing west, and south, along the western boundary. The supply is shown to terminate at the location of the former building.

The location of the existing fibre cables do not pose a constraint to any of the development zones, and as such no diversionary works will be required.

See section 6.2 for further information on telecoms and fibre supplies to the new site.

Notes:

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INFORMATION ONLY

Rev	Date	Description	By	Ckd
P01	13/07/18	Existing Fibre and Proposed Site Layout	JG	LB

Architect:
n/a

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Client:
Purbeck District Council

Project Title:
Dorset Innovation Park

Drawing Title:
Existing Fibre
Proposed Site

Drawing Status:
S2

Hydrock Job No:				
C-087277-C				
Drawn: JG	Checked: LB	Scale @ A0: 1:1000@A0	Date: 13.07.18	Issue Date: 13.07.18

Drawing Number:	Revision:
DOR-HYD-XX-XX-DR-Y-9006	P01

5. CAPACITY/LOADINGS

An exercise was undertaken to calculate what utility loads the proposed development will require. The total number of units used in the assessment was 26No buildings.

Hydrock has used its experience in designing buildings as the basis of this assessment. It has also drawn from the following guidance documents; CIBSE Guide F – Energy Efficiency in Buildings, BSRIA – BSRIA Rule of Thumb, BS/EN 806.3

The following loads are the expected requirements (from the grid) to support the whole site development area (excluding Atlas)

5.1 Decentralised - Whole site - Grid connections

Utility	Load	Notes
Electric	9.6MW peak	Based on; 4.4MW for Cooling, 2.5MW Ventilation/lighting, 1.7MW Servers, Plus, Electric Vehicle Car Charging (EVC) [assumed @10% of the total car parking spaces; based on 1576 spaces] = 158 charge points. EVC unit @7.5kW per unit = 1185kW peak. Diversity of EVC at 0.8 = 948kW
Gas	5.5MW peak	Based on: 5288kW Heating and Hot Water (boilers at 0.95% efficiency = 5552kW)
Water	3.1l/s	Based on: Occupants (2000No) @45l/ppd = 90,000 litres daily Recommended storage @50% daily demand = 45,000 litres /26 buildings = 1,730 litres storage per building per day 15 mins storage per building tank (1710 litres tank) = 1.9l/s 45,000 litres over 10 hours = 1.25l/s

Table 2 - Calculated energy loads

5.2 Centralised - Central site only - Energy Centre

The following loads are the expected requirements to support the central site development area (**excluding** Atlas, Chapman, Pavilion, Zenith, Juno, Nero, Steam) from a CHP/Tri-Gen energy centre. Non-central buildings would need to be supported by the grid.

Calculated energy loads		
Utility	Load	Notes
Electric	3.2MW peak	Based on: 1MW for Chillers (1 unit elec = 3.9 units cooling), 2.1MW Ventilation/lighting, 1.7MW Servers, EVC @ 632kW (2/3) Subtotal = 4.4MW CHP = -1.2MW (3 units gas = 1 unit elec)
Electric top up from grid **(non-central)**	1.5MW	Chapman, Pavilion, Zenith, Juno, Nero, Steam + 316kVA EVC
Gas	3.9MW	Based on: 2.55MW Heating and 1.4MW Hot Water
Individual gas supplies **(non-central)**	1.4MW	Chapman, Pavilion, Zenith, Juno, Nero, Steam + 316kVA EVC
Water	3.1l/s	As per decentralised

5.3 SGN/GTC

It is anticipated that, given the size and locality of existing mains infrastructure, and the design efficiencies that will be provided to the new development (compared to the former DIP buildings), that no network reinforcements will be required, at least for the first phase (5 year build out).

5.4 SSE

Figure 25 below is an extract of SSE's network capacity map for this service area. The blue pins are the locations of primary and bulk-supply point (BSP) substations (unconstrained).

Figure 25 - SSE network capacity map (south)

Figure 26 below shows the location of a BSP (132kV) and primary substation (33kV) in proximity to the site (starred) and provides an overview of distributed capacity of the BSP.

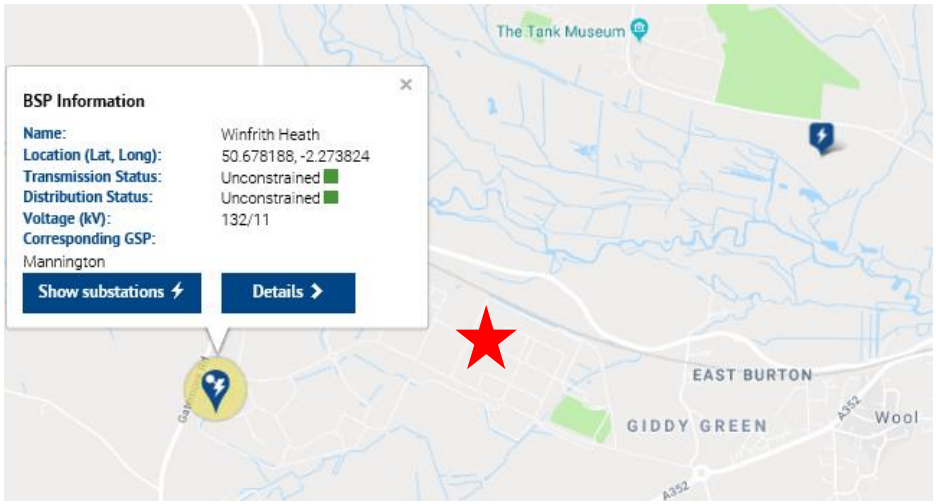

Figure 26 - SSE local BSP substation location (DIP site starred)

The BSP substation located to the south-west of the site is a 132kV EHV - 11kV HV substation. The substation, named Winfrith Heath, currently supports the DIP site. The transformer rating within this substation is 60MVA. The current maximum distributed load is noted as 9.3MW; meaning that the substation is unconstrained in terms of available capacity.

Figure 27 below shows the location of the local primary station; Bovington. The transformer rating within this substation is 9.8MW. The current maximum distributed load is 5.3MW, meaning that there is available capacity.

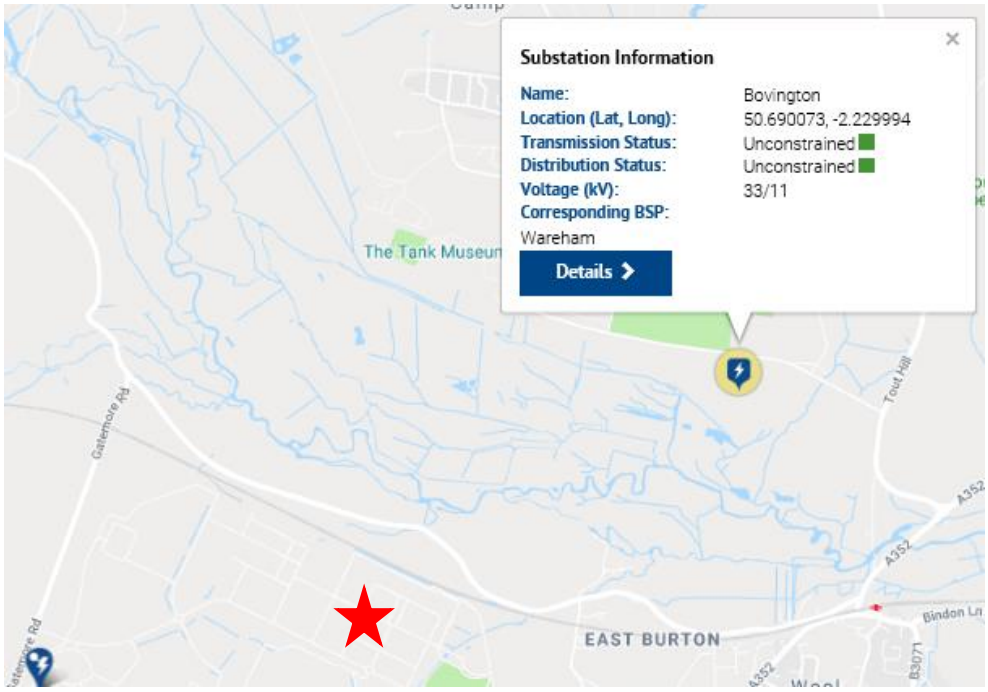

Figure 27 - SSE local primary substation location (DIP site starred)

The Winfrith Heath substation would be utilised for the site-wide connections to the DIP due to locality and capacity.

In terms of feeding back into the grid, figure 28 below is the local heat map showing generation availability, which identifies the area as constrained.

Figure 28 - SSE heat map for distributed generation (south)

The heat map providing detail of Winfrith Heath details that the substation has constrained capacity in terms of accepting distributed generation back into the grid. The transformer (60MW) has a reverse power-flow capacity of 50% (30MW) but has a current maximum load of 9.2MW and contracted generation load of 25.3MVA.

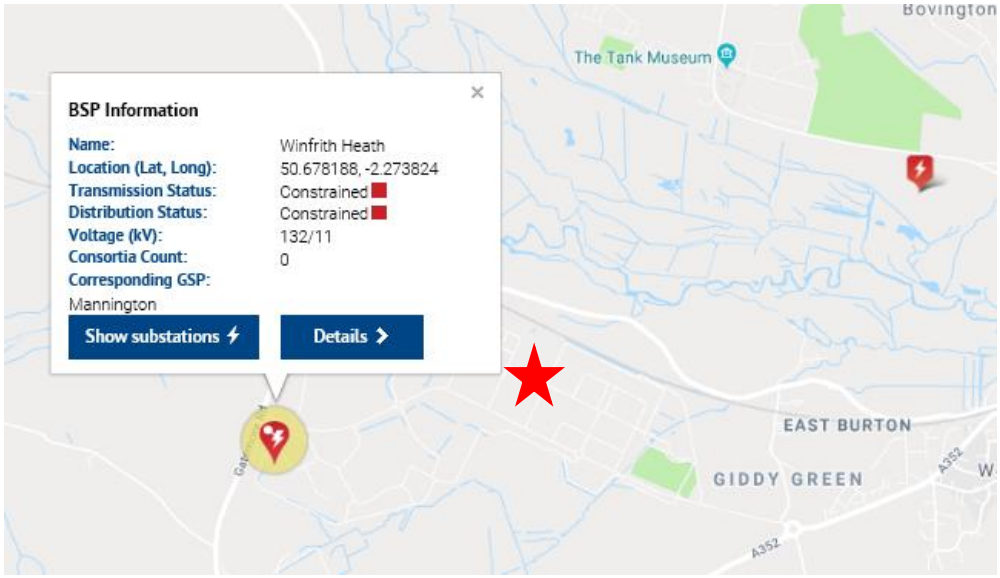

Figure 29 - SSE heat map for distributed generation at BSP

The grid supply point (GSP) substation feeding Winfrith Heath (named Mannington) has a transformer rated at 885MVA with 100% reverse power-flow capacity. The maximum load is however 694MW and the contracted generation 571MVA. The transmission network at this location is constrained by the National Grid, whose reinforcement completion date is currently set at 31/10/2024.

Figure 30 below is the heat map for Bovington primary. This substation is also constrained in terms of connecting distributed generation. The transformer, rated at 9.8MVA has a reverse power-flow of 50% but no available capacity for further export.

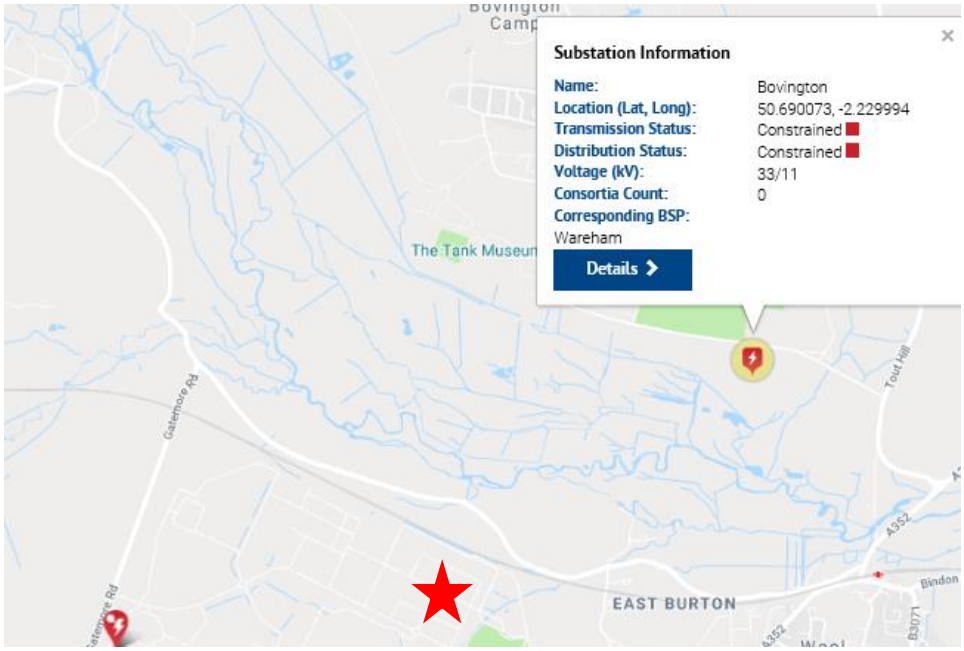

Figure 30 - SSE heat map for distributed generation at primary substation

In conclusion, there is currently no scope to export any power back to the grid until 2024. A new investigation should be undertaken thereafter.

5.5 Wessex Water

It is anticipated that, given the size and locality of mains infrastructure, the number of proposed storage tanks, and phasing of build programme, that no network reinforcements will be required, at least for the first phase (5 year build out).

5.6 BT Business

The local BT exchange, Bindon Abbey, is located 2.8km from the DIP site (near the station of Wool) and is broadband enabled.

Figure 31 - BT local exchange location and DIP site

An ADSL (copper) connection currently provides speeds of up to 2Mb. High speed copper phone line broadband (ADSL2+) is available, supporting up to 3Mb.

Superfast fibre optic broadband to the street cabinet (FTTC) is available at the Bindon Abbey exchange and may be available at a street cabinet serving this postcode area. Speeds in FTTC are up to 80Mb.

BT have confirmed that there is at least one other broadband supplier that has installed equipment in the Bindon Abbey exchange, providing competition through local loop unbundling.

A broadband speed check for the DIP has returned the following fibre providers offering speeds of 66Mb (average); EE, PlusNet and BT. TalkTalk, Vodafone, SSE Fibre and Sky offer fibre with an average speed of 63Mb.

Ultrafast broadband represents the next step up in broadband technology, with typical speeds usually 1Gb. There are two ways of achieving ultrafast speeds; one, by installing fibre optic cable all the way up to the property (FTTP) or secondly, by upgrading the technology used in existing FTTC services to get faster speeds out of the same fibre optic cabling. The companies Hyperopic and Gigaclear typically provide gigabit connections.

6. NEW CONNECTION STRATEGY OPTIONS

6.1 Heating, Cooling, Hot Water and Power

6.1.1 *Decentralised system; Connections via a DNO or ICP*

A local system is when each plot has an individual incoming gas, electric, water and telecommunications service provided from the grid network via a distribution network operator (DNO). This is/was the existing arrangement for site services.

In this scenario, each building is billed separately by a utility provider.

Due to the availability of on-site services, and in consideration of the provisions that appear to have been implemented to offer serviced parcels, it is anticipated that this strategy will be adopted moving forward.

6.1.2 *Decentralised Power; Ownership via Building Network Operator (BNO) arrangement*

A BNO arrangement would see the mains infrastructure installed as above, but with the network installed within each building owned and managed by the building/site owner thereafter. This approach offers more flexibility in terms of design and allows for income generation.

6.1.3 *Centralised system; Connections via an Energy Centre*

A central system is fed from a dedicated building on-site which houses all of the energy generation plant and distributes it to each building that is part of that energy network. The central energy generating building on-site is referred to as an energy centre. This typically distributes heating, hot water, cooling and power.

An energy centre is normally operated by an independent energy provider. The independent company will then meter the energy usage of each building on-site and bill accordingly. These rates differ from standard utility company rates and will be the only option for tenants on the site. These rates are however cheaper than the equivalent utility provider rates. There are also distributed generation companies that, subject to export capacity and available land, would offer to install all infrastructure at nil cost to the developer (including any off-site network reinforcements] which could potentially save a substantial capital cost.

In terms of modelling the energy centre, there are a number of options in terms of equipment. A typical energy centre would comprise of a CHP unit to provide heat and power, as well as accommodate water tanks and chillers. The CHP would run on gas (natural or bottled) and operate at approximately 33% efficiency; meaning that for every 3MW of gas input, a 1MW electric output would be provided. The remaining heat (55%) would be used as its purpose, to provide space heating and hot water. A small percentage is waste product.

As a guide only, the following electric loads could be provided from the gas network via the use of generators; low pressure: up to 7MW and medium pressure, between 20-40MW.

It would typically be recommended that a form of storage is installed, namely a battery, which would help manage peaks in the site consumption and reduce/eliminate a large draw from the network at busy times. Operationally, this would also provide cost savings; as the price per kWh varies at peak times of the day, often peaking for business customers at over £100 per kWh.

When installing a CHP unit or gas gen-sets, associated electrical equipment is required, i.e. a substation. The existing HV network on-site could be used to transfer this power.

If running at a surplus, power could be fed back into the grid. National Grid upgrades would enable this after 2024.

6.2 Telecoms and Data

It is anticipated that the provision of infrastructure to the commercial occupiers will be dependent on each occupier's own requirements. Typically, BT is installed as standard due to the security arrangements that can be provided. We would therefore recommend that BT is installed throughout the commercial zones as a minimum.

As BT are the main provider of fibre in the UK, and have an open network, BT infrastructure could be used as the back bone for a number of independent service providers (ISPs). Virgin Media, Hyper Optic, Gigaclear and Grain Fibre are examples of ISPs that could also provide data and comms to the site.

6.2.1 *Dark Fibre*

In addition to the options above, there may be potential to install a dark fibre network on-site.

A dark fibre network is a privately-operated fibre network that is run directly by its operator over fibre that is leased or purchased from another supplier. This is in contrast to purchasing bandwidth or leased capacity on an existing network. Dark fibre would only be possible however if extra duct has been laid.

In this option, a client would lease unused strands of 'dark' fibre optic cable to create their own privately-operated fibre network, rather than just leasing bandwidth. The dark fibre network would be separate from the main network and controlled by the client rather than the network provider.

Dark fibre networks can be set up in a variety of ways, including; dark fibre rings, point to point or point-to-multipoint configurations.

A dark fibre network would provide high levels of performance, a highly secure network and superfast speeds; namely via dense wavelength division multiplexing (DWDM).

[DWDM is where multiple data signals are transmitted simultaneously over the same optical fibre at different wavelengths to keep the data signals separate. DWDM is therefore a method of increasing bandwidth and allowing more data to be sent via the fibre. A single optical fibre cable can therefore provide the function of multiple virtual fibres.]

There are many benefits to using dark networks; namely that they require less power and have a higher capacity, better signal strength and are more immune to interference.

7. SUMMARY

In consideration of existing services, the proposed site layout is a well-co-ordinated and designed site. The zones appear to be offered as serviced parcels; with the location of all mains/cables within close proximity to the boundaries for any zones that do not have POCs already available within the boundary.

The existing infrastructure may require upgrading/replacing subject to site requirements. This is namely anticipated for telecoms and data. The detailed M&E design of each building will also establish whether the gas and water networks will require upgrading to support the site, as the introduction of storage tanks and CHP (respectively) will impact upon loadings significantly. Currently however, the on-site network is anticipated to be sufficiently sized to support the proposed scheme.

No major diversionary work is required.

APPENDIX A - CO-ORDINATED COMBINED SERVICES DRAWINGS