MONKERTON ENERGY CENTRE PLANNING AND DESIGN AND ACCESS STATEMENT

DECEMBER 2015

WSP | PARSONS BRINCKERHOFF

MONKERTON ENERGY CENTRE PLANNING AND DESIGN AND ACCESS STATEMENT

EON

For Planning

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1 INTRODUCTION

1.1 OVERVIEW

1.1.1 This Planning and Design & Access Statement has been prepared by WSP | Parsons Brinckerhoff on behalf of E.ON, in respect of a proposed Energy Centre near Monkerton, Exeter (see Drawing No. AL(0-)001). The proposed Energy Centre will form part of the district heating system via a local grid connection, which will serve new housing developments at Monkerton Farm, Tithebarn Green and Mosshayne, along with the new Science Park.

1.2 THE PLANNING APPLICATION

1.2.1 The planning application comprises the following documents:

- Planning and Design & Access Statement;
- Transport Statement;
- Air Quality Assessment;
- Phase 1 Preliminary Risk Assessment;
- Phase 1 Habitat Survey Technical Note;
- Heritage Statement;
- Landscape and Visual Impact Assessment; and
- Noise Impact Assessment.

1.2.2 The following drawings are also submitted in support of the planning application.

- Proposed Site Plan AL(0-)001
- Site Model View AL(0-)002
- Proposed Elevations – Sheet 1 AL(0-)003
- Proposed Elevations – Sheet 2 AL(0-)004
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- Sections Through Proposed Site AL(0-)006
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- Western Boundary Sections (0-)012
- External Lighting EL(63)-EX-01
- Transfer Plan – Monk/Energy01

1.3 STRUCTURE OF STATEMENT

1.3.1 Section 1 (this part) of this Statement provides an overview. Section 2 provides a description of the proposed development. Section 3 provides a description of the site and surroundings including planning history. Section 4 provides an analysis of the scheme's goals and their compliance with national and local planning policy. Section 5 provides an assessment of the social and economic context. Section 6 summarises the findings of the environmental assessment work. Section 7 provides an evaluation of the scheme. Section 8 provides the detailed design of the scheme. Finally, Section 9 presents the conclusion, and demonstrates the case for the proposed Energy Centre.

1.4 COMMUNITY INVOLVEMENT

1.4.1 The development closest to the Energy Centre will comprise residential development currently being built by Linden Homes. Therefore, WSP | Parsons Brinckerhoff contacted Linden Homes to obtain their views in an email dated 27/07/2015. No response has been received, but Linden will have a further opportunity to comment on the application during the planning application process.

2 PROPOSED DEVELOPMENT

2.1 THE ENERGY CENTRE

2.1.1 The EON Monkerton Energy Centre (see Drawing No. AL(0-)006) is needed to accommodate the plant and equipment required to provide heat to the wider Monkerton district heating network.

2.1.2 The Energy Centre is intended to be the sole source of heat to the district heating network and as such is required to be available to operate at all times whenever there is heat demand from the network customers.

2.1.3 Upon the full build out of the district heating network, anticipated in 2022, the energy centre will provide low carbon heat to approximately 2,780 homes.

2.1.4 The energy centre will house the following plant:

Table 2.1 Heat Generation Equipment

Quantity	Duty	Plant Item	Description
2No.	1.5MWe	Combined Heat and Power Engines (CHP).	The CHP engines provide the simultaneous generation of heat and electricity and are the main source of low carbon heat to the district heating network, each CHP engine will be available to operate 24 hours a day 365 Days a year.
1No.	500kWth	Biomass Pellet Boiler	The biomass pellet boiler provides a source of renewable, low carbon heat to the district heating network
2No. 2No.	9MWth 3.5MWth	Natural Gas Boilers Natural Gas Boilers	Natural gas boilers will operate when the heat demand of the district heating network exceeds the heat generation capacity of the low carbon energy sources alone. The natural gas boilers will be available to operate 24 hours per day 365 days per year

2.1.5 The energy centre will also contain the following ancillary equipment:

- Equipment to maintain the required pressure of the water within the district heating network and to accommodate changes in water volume resulting from thermal expansion within the district heating network.
- Pumping equipment to circulate the water within the district heating network.
- Welfare facilities for visiting operations staff.
- 2 No. Thermal storage vessels to store heat generated by low carbon sources during periods of low network demand for use during periods of high network heat demand.
- Electrical switchgear to supply electrical equipment located within the energy centre and to provide the interface between the combined heat and power units and the electrical distribution network.

2.1.6 Access to the rear of the energy centre will be provided to allow continuing maintenance of an existing attenuation pond by Devon County Council. A turning area for maintenance vehicles will also be provided.

2.2 DISTRICT HEATING

2.2.1 District heating systems are typically comprised of a central source of heat and a network of hot water distribution pipework. The heat network is used to distribute heat from the central source to distributed heat customers.

2.2.2 The central heat source or energy centre is commonly a source of low carbon heat. The low carbon heat sources are often accompanied by other conventional sources of heat such as gas boilers to provide flexibility and resilience of heat supply.

2.2.3 The district heating network is intended to be the sole source of heat to all of its connected heat customers. Some heat customers may, by exception provide their own backup or supplementary heat generation.

2.2.4 District Heating is regarded as the most financially economic way of achieving Code for Sustainable Homes Levels 5 and 6 as well as anticipated Building Regulation changes for 2016.

2.2.5 The Exeter Growth Point aspirations set out in Exeter City Council's Exeter Vision: our city, our future Local Area Agreement (LAA) priorities, identify district heating as a preferred strategy for providing a low carbon/renewable energy solution.

3 SITE AND SURROUNDINGS

3.1 MONKERTON

3.1.1 Monkerton forms part of the Exeter suburban area of Pinhoe, formerly a village on the outskirts of the city. Monkerton is situated approximately 4 miles (6.4 km) east from the centre of Exeter adjacent (to the west) to Junction 29 of the M5.

3.1.2 East of the M5, development in the corridor between the A30 and the London-Waterloo railway line includes Exeter International Airport and business park, Skypark, Exeter Science Park, the Multi-Modal Interchange facility and Cranbook new town.

3.2 THE SITE

Figure 3.1 Site Location

3.2.1 The application site comprises an open field forming part of wider arable farmland that is consented for residential development, and encompasses part of the Pin Brook watercourse and associated flood plain. The site largely falls within land designated as Flood Zone 2 (land assessed as having between a 1 in 100 and 1 in 1,000 annual probability of river flooding in any one year (1% – 0.1%)). The topography of the northern end of the site is steeply undulating (see Drawing No. AL(0-)007). The M5 runs directly adjacent to the east of the site and embankment to the motorway forms the eastern site boundary. The unclassified road Tithebarn Lane forms the southern site boundary from which access is gained. The site is relatively well screened by mature trees and hedgerows from nearby residential development and roads.

3.3 PLANNING HISTORY

3.3.1 A review of Exeter City Council's online planning application archive provided no planning history for the site. However, as mentioned the proposed new Energy Centre will form part of the district heating system which will serve new housing developments in the local area. The following applications for residential development are relevant.

3.3.2 NB. Some of these applications cross local authority boundaries.

EXETER CITY COUNCIL

- 14/1090/02 (Approved) – Tithebarn Green: 350 dwellings (approval of reserved matters for appearance, landscaping, layout and scale, Ref No 12/0802/01 granted 29 November 2013)
- 13/4984/01 (Approved) – Monkerton Farm: Residential development scheme of up to 400 dwellings including new access to Cumberland Way and internal roads to accommodate two

way public transport link between Cumberland Way and Harts Lane, and associated infrastructure

- 12/0858/29 (East Devon District Council consultation – Raise No Objection) – Tithebarn Green: Tithebarn Green: Development of site to provide up to 930 dwellings, link road, employment area (B1(a) use class), park and ride facility, local retail area and community facility, health and fitness centre, creche, public and private open space and car and cycle parking, together with landscaping and associated servicing.
- 12/0802/01 (Approved) – Tithebarn Green: Development of site to provide up to 930 dwellings, link road, employment area (B1(a) use class), park and ride facility, local retail area and community facility, health and fitness centre, creche, public and private open space and car and cycle parking, together with landscaping and associated servicing.

EAST DEVON DISTRICT COUNCIL

- 14/2761/MOUT (Awaiting Decision) – Mosshayne: Development of the site to provide up to 900 dwellings and a primary school with car and cycle parking, public and private open space together with landscaping and associated servicing.
- 12/1291/MOUT (Approved) – Tithebarn Green: Development of the site to provide up to 930 dwellings, a new link road, employment area (B1a Use Class), park and ride facility, local centre/square, health and fitness centre, creche, public and private open space and car and cycle parking, together with landscaping and associated servicing.

4 PLANNING POLICY ANALYSIS

4.1 INTRODUCTION

4.1.1 This section reviews relevant national and local spatial planning policy for the proposed Energy Centre and examines how the statutory Development Plan and other policy guidance have been taken into account in developing the design for project. It is not the intention of this assessment to address every document that could have some bearing on the proposed project, but rather to identify those matters that are particularly relevant to assessing the compatibility of the principle of the proposed project with key elements of policy or guidance.

4.2 NATIONAL PLANNING POLICY FRAMEWORK (NPPF)

4.2.1 The NPPF (March 2012) sets out the Government's principles for economic, environmental and social planning policy for England. The Framework articulates the national strategy for sustainable development. The Government intends that this vision should be interpreted and applied to meet local aspirations.

4.2.2 The NPPF outlines that local authorities should adopt proactive strategies to mitigate and adapt to climate change and that to support the move to a low carbon future local authorities should:

- Plan for new development in locations and ways which reduce greenhouse gas emissions;
- Actively support energy efficiency improvements to existing buildings; and
- When setting any local requirement for a building's sustainability, do so in a way consistent with the Government's zero carbon buildings policy and adopt nationally described standards.

4.2.3 The NPPF stresses that the importance of sustainability in new developments is to ensure that during construction and operation the development poses no significant environmental impact.

The Government is keen to limit the environmental impact of new construction projects through the reduction of CO2 emissions.

4.2.4 Additional national policy goes on to specify standards and solutions in achieving further criteria associated with sustainable development, such as CO2 and energy use reductions.

4.2.5 The significance of renewable energy, low carbon and energy efficiency technologies is stressed throughout national policy with the intention of introducing into local policy to accord with the national consensus.

4.2.6 Paragraph 19 states that the Government is committed to ensuring that the planning system does everything it can to support sustainable economic growth - planning should operate to encourage rather than impede sustainable growth and significant weight should be placed on the need to support economic growth. Paragraph 20 proposes that to achieve economic growth, local planning authorities should plan proactively to meet development needs of business and support an economy fit for the 21st century.

4.2.7 The Government's support for good design is reiterated in paragraph 56 which states that good design is a key aspect of sustainable development and is indivisible from good planning. Paragraph 60 indicates that architectural design should not be stifled by a need to conform to certain styles, but recognises the need to promote or reinforce local distinctiveness.

4.2.8 The sections of this Statement that form the Design and Access Statement set out how the scheme follows the principles of good design to create a sustainable development entirely in keeping with its local context.

4.2.9 The NPPF maintains the sequential approach of PPS25 to locate development outside areas at high risk of flooding. Paragraph 103 requires local authorities to only consider development in appropriate areas and to ensure that flood risk is not increased elsewhere informed by a site specific flood risk assessment.

4.2.10 The section of this report on flood risk demonstrates that development has been excluded from the Pin Brook flood plain which is at higher risk of flooding and demonstrates that by utilising SUDS the proposed development will not have an adverse impact on flood risk elsewhere. With the exception of the areas of the Pin Brook flood plain, where development has been omitted, the application site is a suitable location for development.

4.2.11 National policy goes on to specify standards and solutions in achieving further criteria associated with sustainable development, such as CO2 and energy use reductions.

- National policy for low carbon and renewable energy technology is informed by:
- National Planning Policy Framework (2012);
- Code for Sustainable Homes (2010) by the Building Research Establishment (BRE);
- The Energy White Paper (2003 & 2007);
- The Renewable Energy Strategy (2009);
- Building Regulations PART L (2010).

4.2.12 The main aim of these documents is to improve policy and provide guidelines to reduce the UK CO2 emissions, as this is currently considered to be the largest contributor to climate change. The UK Government has set challenging targets for generating electricity from renewable sources. By 2015 15% of electricity generation must be from renewable sources and by 2020 a total of 20% (Energy White Paper 2003). The new Energy Centre will contribute to electricity generation from renewable energy source in turn helping to meet UK renewable energy targets whilst reducing CO2 emissions.

4.3 LOCAL PLANNING POLICY

4.3.1 The Development Plan for the proposed project comprises:

- → Exeter Local Plan First Review 1995-2011 'saved' policies
- → Exeter City Core Strategy 2012

EXETER LOCAL PLAN FIRST REVIEW 'SAVED' POLICIES

4.3.2 The Exeter Local Plan Frist Review was adopted on 31st March 2005 and covered the period until 2011. It sets out detailed policies and specific proposals for the development and use of land. The Planning & Compulsory Purchase Act 2004 allowed local planning authorities to 'save' local planning policies for an initial three-year period until replaced by new policies in the Exeter City Core Strategy. However, the Act allowed the Secretary of State to extend the saving of policies beyond this date where it was not feasible or desirable to replace them.

4.3.3 Table 4.1 below lists and analyses 'saved' policies relevant to the planning application.

Table 4.1: Relevant Exeter Local Plan First Review 'saved' Policies

Policy	Content	Analysis
AP1	Development should be designed and located to raise the quality of the urban and natural environment and reduce the need for car travel. Proposals should be located where safe and convenient access by public transport, walking and cycling is available or can be provided.	Due to the nature of the proposed development, design and use of materials is driven by the technical specification of each of the elements of the Energy Centre. The building and site design has sought to minimise the impact on the surrounding environment. The development has been set as low as possible, the stack is located on the east side of the side adjacent to the M5 motorway and cladding materials will be dark and light grey to minimise adverse visual impacts. A landscape planting scheme has also been proposed to soften the development whilst screening and creating a buffer to surrounding development. The Energy Centre will have two parking spaces for maintenance vehicles (standard parking spaces). The only vehicles visiting site once operational will be periodic maintenance staff and regula biomass deliveries. .
T1	Development should facilitate the most sustainable and environmentally acceptable modes of transport, having regard to the following hierarchy: 1. Pedestrians 2. People with mobility problems 3. Cyclists 4. Public transport users	Due to the nature of the proposed development it is not intended that site will be accessible by the public or is likely to be permanently manned by staff therefore sustainable modes of transports are not relevant in this case. The Energy Centre will have two parking spaces for maintenance vehicles (standard parking spaces) but

Table 4.1: Relevant Exeter Local Plan First Review 'saved' Policies

Policy	Content	Analysis
	5. Servicing traffic 6. Taxi users 7. Coach borne visitors 8. Powered two wheelers 9. Car borne shoppers 10. Car borne commercial/ business users 11. Car borne visitors 12. Car borne commuters.	is also accessible via other modes of transport. Pinhoe Train is 0.3miles away (approximately 7minute walk) and Gipsy Hill Lane Bus Stop is within 500metres of the site (approximately 9minute walk).
T10	Development will not be permitted with more parking than the standards set out in Schedule 3 except as part of a phased development, guided by a travel plan and incorporated into a legal agreement. Car parking provision should also be made for people with mobility problems in accordance with the standards set out in Schedule 4, which will be applied throughout the City.	The Energy Centre will have two parking spaces for maintenance vehicles (standard parking spaces) that are only likely to be visiting the site on a temporary basis. The standard parking spaces are in compliance with the standards set out in Schedule 3 of the Exeter City Councils Local Plan First Review 'saved' Policies.
C5	Development will not be permitted which would cause harm to a site, monument or structure of national archaeological importance, whether scheduled or unscheduled, or which would cause harm to its setting. Proposals should preserve nationally important archaeological remains in situ and, where appropriate, make arrangements for their enhancement and display. Where the proposal will affect remains of regional or local importance, the desirability of preserving the remains in situ will be weighed against the need for the development. If preservation in situ is not feasible or appropriate the developer must undertake archaeological recording works in accordance with a scheme to be agreed in advance.	There are no known heritage assets on site. There is evidence of wide prehistoric and medieval activity within the surrounding area. The Exeter City Council Archaeology Officer has specified that an archaeological strip, map and record investigation may be required; however, this is to be determined at a later date.
LS1	Development which would harm the landscape setting of the city will not be permitted. proposals should maintain local distinctiveness and character and: (A) Be reasonably necessary for the purposes of agriculture, forestry, the rural economy, outdoor recreation or the provision of infrastructure; or (B) Be concerned with change of use, conversion or extension of existing buildings:	The development has been set as low as possible, the stack is located on the east side of the side adjacent to the M5 motorway and cladding materials will be dark and light grey to minimise adverse visual impacts. No effect on the setting of the city will arise A Landscape Scheme has also been proposed in order to soften the development whilst screening and creating a buffer to surrounding development. It is not anticipated that the proposed development would have

Table 4.1: Relevant Exeter Local Plan First Review 'saved' Policies

Policy	Content	Analysis
		a negative impact on the landscape setting of the city.
EN1	Development that may be liable to cause pollution, including proposals which allow the use, movement or storage of hazardous substances, will only be permitted if: (A) the health, safety and amenity of users of the site or surrounding land are not put at risk; and (B) the quality and enjoyment of the environment would not be damaged or put at risk. development on or in the vicinity of the site that may be liable to cause pollution will only be permitted if there is no unacceptable risk to the health and safety of its users.	It is not anticipated that that the proposed development will need to use, move or store hazardous materials. Best Practice measures will be used if this case may arise. The Air Quality Assessment predicts that the Energy Centre will not have a significant effect on human health as a result of emissions.
EN3	Development that would harm air or water quality will not be permitted unless mitigation measures are possible and are incorporated as part of the proposal.	The Air quality Assessment concludes that the proposed development is will not to interfere with or prevent the compliance of local air quality with EU/UK objectives. It is not predicted that water quality would be significantly affected as a result of the energy centre. The proposed attenuation pond will be protected from pollutants oil and silt separators.
EN4	Development will not be permitted if: (A) it would increase the likelihood of flooding (i) by reducing the capacity of, or increasing flows within, a flood plain, or (ii) through the discharge of additional surface water, or (iii) by harming flood defences; (B) It would be at risk itself from flooding; (C) It would require additional public finance for flood defence works; (D) Adequate provision is not made for access to watercourses for maintenance; (E) It would threaten features of landscape or wildlife importance by reducing the recharge of local water tables.	The proposed development includes an attenuation pond as part of SuDs and overall drainage scheme. The proposals will not increase flood risk to the downstream receiving watercourse and the surface water drainage system will include pollution prevention measures so that downstream water quality is not adversely affected.
EN5	Noise-generating development will not be permitted if it would be liable to increase adversely the noise experienced by the users of existing or proposed noise-sensitive development nearby. Noise-sensitive development will not be permitted if its users would be affected by noise from existing or proposed noise-	It is likely that there will be adverse impacts from noise during the construction stage, but this will be temporary. The noise assessment concludes that operational noise can be managed and that no significant adverse effects will arise. A detailed scheme of insulation and attenuation

Table 4.1: Relevant Exeter Local Plan First Review 'saved' Policies

Policy	Content	Analysis
	generating uses unless adequate mitigation works can be implemented to achieve an acceptable environment.	measures for specific plant to be used will need to be submitted for approval as part of planning conditions.
DG2	New development should be laid out and designed to maximise the conservation of energy. proposals should: (A) Retain and refurbish existing buildings on site except where retention is unviable or the buildings are detrimental to the character of the site or would prejudice the best use of land; (B) Aim to gain maximum benefit from solar gain; (C) Be subject to landscape schemes which provide landform and planting that acts as a shelter for buildings.	The proposed development is an energy centre that will target the objectives of this policy. A Landscape Scheme has been proposed in order to soften the development with appropriate planting whilst screening and creating a buffer to surrounding development
DG7	The design of development should aim to achieve a safe and secure environment. proposals should: (A) Ensure pedestrian routes and public spaces are overlooked and subject to natural surveillance; (B) Provide enclosure of properties, so that private spaces are well defined and fulfil the role of defensible space; (c) Ensure that lighting is located and designed in such a way as to deter and reduce the fear of crime; (d) Ensure that schemes for landscape design, including new planting, do not create opportunities for crime and that, where appropriate, species of plants are used to deter criminal or anti- social behaviour; (A) Integrate crime prevention measures in an unobtrusive manner, such that the fear of crime is not raised, and that there is no detrimental effect upon townscape and amenity.	It is not intended that site will be accessible by the public. The proposed development incorporates an external lighting scheme controlled by a timelock and photocell system. A security fence will be erected at the site boundary. The landscape scheme has been design in a way which maximise the buffer and screening of the development from the surrounding area. Best practice anti-social behaviour and criminal deterrents will be utilised.

EXETER CITY CORE STRATEGY 2012

4.3.4 The Core Strategy was formally adopted by Exeter City Council on 21 Feb 2012. The Core Strategy sets out policies to guide future development and change in Exeter City for the period up to 2026.

4.3.5 Table 4.2 below lists and analyses Core Strategy policies relevant to the planning application.

Table 4.2: Relevant Exeter City Core Strategy Policies

Policy	Content	Analysis
CS Objective 10	Ensure that infrastructure is in place, when required, that will enable the proposals for development within the urban area, and the Monkerton and Hill Barton, Newcourt and Alphington urban extensions, to be delivered successfully.	The proposed Energy Centre is key low carbon infrastructure to enable sustainable residential growth at Monkerton and in the surrounding locale.
CP1	The spatial strategy identifies the opportunities for Exeter to grow within its environmental limits. Development will be guided to the most sustainable locations, recognising the contribution to be made to growth by the existing urban area, particularly the City Centre, and ensuring that the necessary infrastructure, including low and zero carbon energy, transport and green infrastructure, is in place to allow for sustainable urban extensions to the east and south west of the city.	The proposed Energy Centre is key low carbon infrastructure to enable sustainable residential growth at Monkerton and in the surrounding locale.
CP11	Development should be located and designed so as to minimise and if necessary, mitigate against environmental impacts. Within the Air Quality Management Area shown on the following map, measures to reduce pollution and meet air quality objectives, that are proposed by the Local Transport Plan and the Air Quality Action Plan, will be brought forward.	The proposed development is not predicted to have significant impacts on the environment. The site is not located within or in close proximity to an Air quality Management Area (AQMA). The Air Quality Assessment concludes that the proposed development will not interfere with or prevent the compliance of local quality with EU/UK objectives.
CP13	Decentralised Energy Networks will be developed and brought forward. New development (either new build or conversion) with a floorspace of at least 1,000 square metres, or comprising ten or more dwellings, will be required to connect to any existing, or proposed, Decentralised Energy Network in the locality to bring forward low and zero carbon energy supply and distribution. Otherwise, it will be necessary to demonstrate that it would not be viable or feasible to do so. Where this is the case, alternative solutions that would result in the same or better carbon reduction must be explored and implemented, unless it can be demonstrated that they would not be viable or feasible	The proposed development directly responds to this policy and is fully in accord with it.
CP14	New development (either new build or conversion) with a floorspace of at least 1,000 sq. metres, or comprising ten or more dwellings, will be required to use decentralised and renewable or low	As above.

Table 4.2: Relevant Exeter City Core Strategy Policies

Policy	Content	Analysis
	carbon energy sources, to cut predicted CO^2 emissions by the equivalent of at least 10% over and above those required to meet the building regulations current at the time of building regulations approval, unless it can be demonstrated that it would not be viable or feasible to do so.	
CP15	Proposals for development are expected to demonstrate how sustainable design and construction methods will be incorporated. All development must be resilient to climate change (particularly summer overheating) and optimise energy and water efficiency through appropriate design, insulation, layout, orientation, landscaping and materials, and by using technologies that reduce carbon emissions. Due to their scale the Monkerton/Hill Barton, Newcourt and Alphington urban extensions should achieve levels of sustainability in advance of those set out nationally.	The proposed Energy Centre is key low carbon infrastructure to enable sustainable residential growth at Monkerton and in the surrounding locale.
CP17	All proposals for development will exhibit a high standard of sustainable design that is resilient to climate change and complements or enhances Exeter's character, local identity and cultural diversity. Development at Monkerton and Hill Barton will: employ high quality design to create a distinctive sense of place that relates well to existing communities; reinforce the east west ridgeline and provide a strategic greenway that links to developments to the east of the city, including Cranbrook; integrate green lanes, hedgerows and trees and provide open space, playing fields and allotments; be orientated on the sustainable movement network and designed so as to reduce the dominance of vehicles within the public realm; create a safe and secure environment that encourages social interaction and inclusion and promotes healthy living and a sense of well-being; retain and enhance the biodiversity of the	As above.

Table 4.2: Relevant Exeter City Core Strategy Policies

Policy	Content	Analysis
	site and adjacent areas; apply innovative design to overcome constraints, such as noise, pollution and topography; Aim to install low and zero carbon energy provision (for example, Combined Heat and Power (CHP)).	

5 ASSESSMENT

5.1 PHYSICAL CONTEXT

5.1.1 The Physical Context of the site and surrounding area is provided in Section 3 and see Figure 3.1.

5.2 SOCIAL CONTEXT

5.2.1 Exeter has a population of approximately 121,800, which is increasing year on year. Therefore it requires the necessary infrastructure to support sustainable growth. As well as the new Science Park within close proximity to Monkerton, there are a number of future residential developments such as Monkerton Farm, Tithebarn Green and Mosshayne. The proposed Energy Centre will form the key part of the district heating system to serve new housing developments, which will require district heating to be in place prior to construction.

5.2.2 It is a policy objective of Exeter City Council to have district heating in place as part of the delivery of new residential housing schemes in the Monkerton area.

5.3 ECONOMIC CONTEXT

5.3.1 The Energy Centre will provide jobs during construction. It will provide a limited number of jobs during operation, as it will not need to be manned at all times. Jobs will also be supported through routine maintenance of the facility.

6 SUMMARY OF ENVIRONMENTAL ASSESSMENTS

6.1 AIR QUALITY

6.1.1 Dispersion modelling has been used to assess the potential local air quality impacts of the operation of the Monkerton Energy Centre. The assessment considered the installation of 2 x 1.5MW CHPs, 1 x 500kW Biomass Boiler, 2 x 9MW Gas boilers and 2 x 3.5MW Gas Boilers.

6.1.2 Impacts of the energy centre on ambient concentrations of nitrogen dioxide, being the pollutant of greatest concern, were assessed. Impacts were considered at ground level to a distance of greater than 1km from the proposed stack location and are detailed for existing receptors in the area, new receptors to be introduced with future development and for impacts on the Exeter Air Quality Management Area (AQMA). Contributions of the energy centre to pollutant concentrations at height on the façade of nearby buildings were also evaluated.

6.1.3 The acceptability of impacts was assessed with reference to UK/EU air quality objective values and IAQM/EPUK guidance with a target of generally negligible impacts across the study area, with slight adverse impacts at worst at any location.

6.1.4 The assessment demonstrates that under the conditions tested, changes in short and long term nitrogen dioxide concentrations associated with emissions from the Monkerton Energy Centre are:

6.1.5 Likely to:

- → Be of 'imperceptible' magnitude and 'negligible' significance where concentrations exceed or are at risk of exceeding an air quality objective;
- → Have a 'negligible' significance in general;
- → Have at worst a 'slight' impact on short term concentrations at greater than 8m elevation on the nearest buildings to the energy centre;
- → Have a magnitude of impact 'Small' or less.

6.1.6 Unlikely to:

- → Interfere with or prevent the compliance of local air quality with EU/UK objectives; or
- → Have a significant effect on human health as a direct result of energy centre emissions.

6.1.7 It is, therefore, the conclusion of this assessment that air quality considerations do not present a constraint to the operation of the Monkerton Energy Centre.

6.2 LANDSCAPE

6.2.1 The construction of the energy centre would generate a combination of impacts on landscape and visual amenity which would result in some temporary significant effects.

6.2.2 The location adjacent to the M5 sets the development in a context of highway infrastructure, including large gantries, bridges, and also a communication mast and the campus buildings of the Science Park to the immediate east of the motorway. New planting and the establishment of a grass and scrub mosaic on the steeper slopes will help integrate the scheme into the local setting

adjacent to the M5 cuttings. Tree planting within the west side of the energy centre site will help screen the building and retaining walls from adjacent houses in Tithebarn Green. Tree planting and climbing plants will help visually 'soften' the engineering structures along the northern edge of the site.

6.2.3 Overall the effects on visual amenity are predicted to reduce from moderate or slight adverse effects at construction to sight adverse or neutral once mitigation has been implemented. For some residential receptors in Lower Pinhoe and the new housing at Tithebarn Green at near to middle distance from the application site, the adverse effect on visual amenity will remain as moderate as the impact of the stack would not be mitigated.

6.3 HERITAGE

6.3.1 A desk-based assessment produced by Exeter Archaeology in 2011 identified potential for prehistoric and later activity within the general area of the proposed Scheme. To the north of Tithe Barn Lane, a number of possible north/south aligned field boundaries were identified. To the south of Tithe Barn Lane archaeological evidence suggested the site of an orchard located to the west of a hollow-way and a number of low-lying earth-fast banks – probably representing former field boundaries. More widely evidence was found for medieval field systems. To the east of the Scheme area, the assessment identified a crop mark adjacent to the Pinn Brook representing part of putative prehistoric enclosure.

6.3.2 Two archaeological evaluations were undertaken by Cotswold Archaeology at Tithebarn Green (Monkerton), Devon in February 2012 and August/September 2013. These evaluations were used to inform these baseline conditions of the historic environment for this assessment.

6.3.3 The Exeter City Council Archaeology Officer (ECCAO) has specified that an archaeological strip, map and record investigation could be required prior to any enabling or construction works taking place. This should be undertaken within the proposed footprint of the energy centre and located so as to target the positive geophysical anomalies. The detail of the investigation should be discussed with the ECCAO.

6.4 ECOLOGY

6.4.1 A Phase 1 Habitat survey has been carried out to inform the baseline ecological conditions within the site boundary of the proposed new energy centre. A desk based study was undertaken to collect records of protected and notable species and habitats within 2 km from the central grid reference of the site. A site walk over survey was also undertaken in accordance with best practice, the assessment covered all protected and notable fauna that may be present within the survey area.

6.4.2 The assessment included the identification of non-statutorily sites within a 2km of the site and various protected species within close proximity of the site. The assessment concluded that the ecological quality of the site was low and therefore adverse impacts on biodiversity are unlikely to be significant.

6.5 NOISE

6.5.1 The Noise Impact Assessment has considered the existing baseline noise environment, the expected range of noise-generating sources associated with the proposal, and available mitigation measures.

6.5.2 Using this information, predictions have been made of likely noise levels, based on the adoption of a suitable noise mitigation scheme. Noise limits have been proposed that would be expected to avoid significant adverse noise impacts at nearby sensitive receptors.

6.5.3 The assessment concludes that, in view of the relevant local and national planning policies, the proposal can be made acceptable in terms of noise impact. Controls are available to the planning authority to secure appropriate design, and a recommended approach has been proposed, comprising the submission of a detailed scheme of insulation and attenuation measures for approval, prior to commencement of the use.

6.6 CONTAMINATED LAND

6.6.1 A Phase 1 desk study has assessed the geo-environmental information pertaining to the site based on readily available desktop/published sources and a site reconnaissance.

6.6.2 The objective of the assessment has been to collate and review available geo-environmental information to determine any potential geo-environmental risks associated with the site in its current condition and evaluate potential geo-environmental constraints with regard to the proposed development.

6.6.3 The site appears to be relatively free from land contamination constraints, with limited evidence of past development. The initial appraisal of the site, in its current condition and with no mitigation measures considered, is that there is a LOW risk to receptors from contamination and hence no further evaluation is required.

6.7 FLOOD RISK

6.7.1 A formal Flood Risk Assessment (FRA) was not considered necessary for this site as it is already covered within the following documents:

- FRA and Drainage Strategy for the whole 'Tithebarn Green' site was prepared by Pell Frischmann and submitted by Eagle One as part of a development Outline application;
- Tithebarn Green FRA, Drainage Strategy from Cumberland Way to Tithebarn Bridge Briefing Note, Revision 2, Devon County Council (DDC); and
- Drainage Strategy for the Tithebarn Link Road developed by DCC.

6.7.2 Based upon drawing 3513921A Sk Dr 01, the proposed Energy Centre has a building footprint of some 1,004m2. Combined with the access road and hard-standing, the proposed impermeable areas amount to 3,100m2. Based upon this area, the allowable runoff from this site to the DCC attenuation basin would be 1.8l/s in a 1:100 year event including 30% climate change allowance. DCC has confirmed agreement to this flow rate.

6.7.3 Using XP Solutions Microdrainage software v14, to accommodate this allowable outflow rate, attenuation volumes to accommodate a 1:100 year storm, including 30% climate change, would need to be approximately 220m3. The critical storm is of 720 minute duration.

6.7.4 There is a distinct lack of space for a SuDS pond storage feature and infiltration rates in the soils are minimal. The green landscape area to the east within the red-line boundary was considered, but is too narrow and steep.

6.7.5 Attenuation is therefore proposed to be accommodated in a sealed cellular storage system to the south of the building. This requires a standard unit depth of 1.32m and footprint of approximately 200m2. Cover needs to be at least 1m, depending upon the proprietary system requirements, to protect it from heavy vehicular loading.

6.7.6 This attenuation feature will be protected from pollutants with a Hydro "Downstream Defender" or similar, or a bypass interceptor. A hydro-brake is proposed to restrict out-flow rates to 1.8l/s. Long-term storage is not considered further as the runoff rates are based upon Qbar.

6.7.7 This out-flow will then pass along 30m of grassed swale and underlying filter drain within the landscaped area to the east. This will provide additional stages in the SuDS treatment train to further improve water quality. At the red-line boundary, these low flows would then be able to spill 20m overland across the grassed area to the DCC attenuation basin.

6.7.8 Flows from the hard-standing and roof areas will be captured and routed to the attenuation system

6.7.9 Flows from the south of the site should be intercepted by Tithebarn Lane and any residual flows from the south should bypass the attenuated site drainage via the green area to the east. Flows from Tithebarn Lane should be prevented from entering the site through highway geometric design.

6.7.10 The site drainage proposals (see Figure 6.1) will not be affected by high groundwater levels, or impact upon ground water quality.

6.7.11 Exceedance flows should be directed north towards the Pinn Brook.

6.7.12 During the construction phase, appropriate measures will need to be put in place to protect the permanent works and downstream receiving waters from pollution.

6.7.13 These proposals will not increase flood risk to the downstream receiving water course and are designed to provide suitable treatment stages so that downstream water quality is not adversely affected.

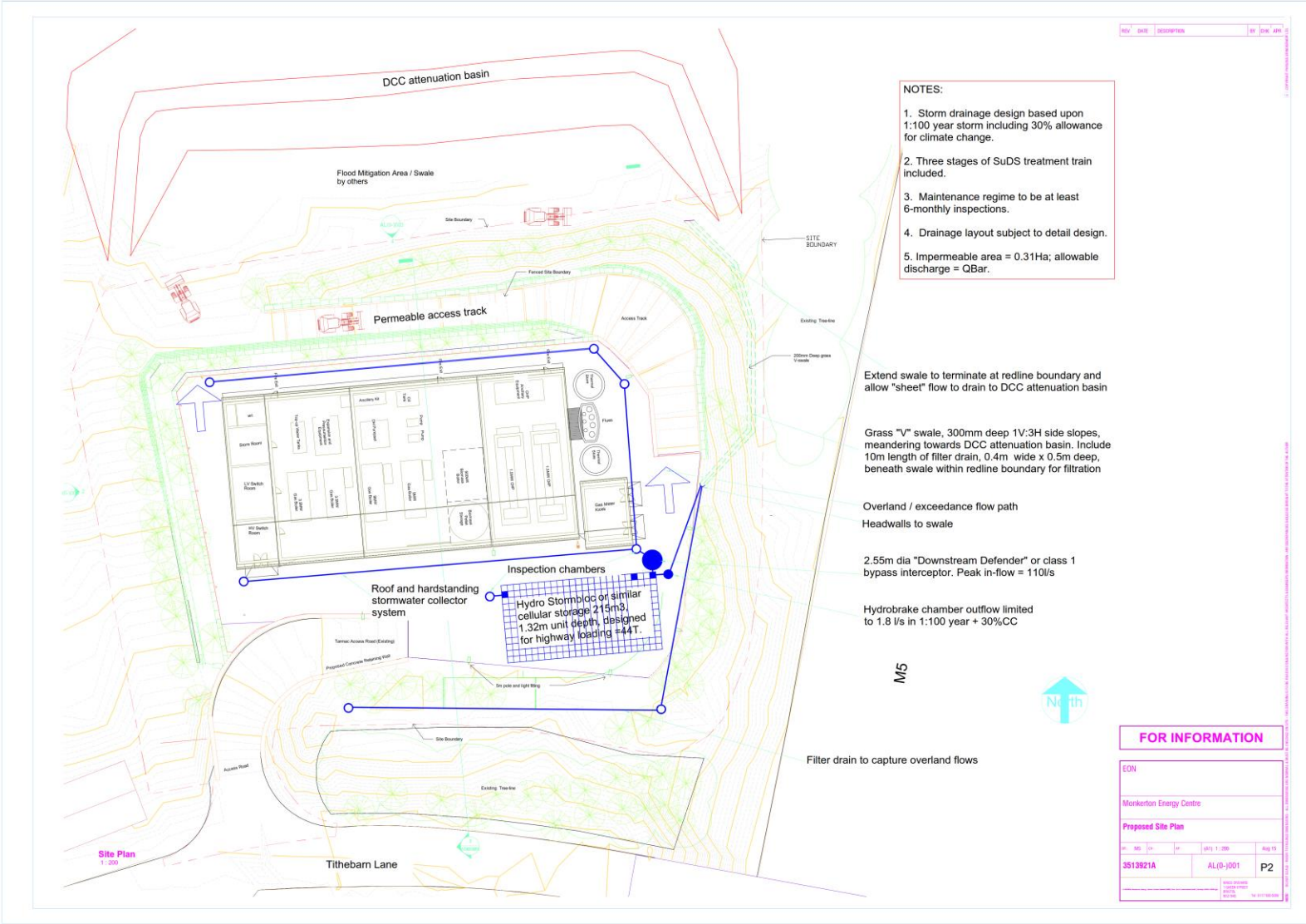

Figure 6.1 Drainage Proposals

7 EVALUATION

7.1.1 The application site was chosen due to its proximity to new residential development sites and the opportunities that provides. The Energy Centre will form part of Exeter's district heating systems providing the base central heating load for nearby development (hot water supply), with conventional gas boilers responding to the peak demands (winter space heating).

7.1.2 The proposed development does not require formal Environmental Impact Assessment, but a range of detailed environmental assessment work has been undertaken in accordance with national local planning policy.

7.1.3 A review of national and local planning policy has been undertaken for the proposed Energy Centre, which is compliant with relevant policies. The proposed development will also contribute positively towards wider national renewable energy and electricity generation targets, as well as local energy objectives.

8 DESIGN

8.1 USE

8.1.1 The new Energy Centre has been designed to accommodate the plant and equipment required to provide heat to the wider Monkerton district heating network.

8.1.2 The Energy Centre is intended to be the sole source of heat to the district heating network, and is required to to operate at all times, providing head whenever there is demand from the network customers.

8.1.3 Upon the full build out of the district heating network anticipated in 2022, the Energy Centre will provide low carbon heat to approximately 2,780 homes in the local community and across Exeter.

8.1.4 District heating systems comprise a centralised heating facility, in this case fired by biomass with back up natural gas, feeding a distribution network of insulated water pipes which circulate hot water in a closed system (i.e. water is not drawn off as hot tap water for example) . Where they operate as CHP, then electricity is generated at the same time as the heat output

8.2 AMOUNT

8.2.1 The site area is 5,594m^2 (0.5594ha) which is sufficient to deliver the Energy Centre. The total gross footprint of the buildings and structure is 1,004m^2 (See Figure 8.1 and Drawing No. AL(0-)003 and AL(0-)003).

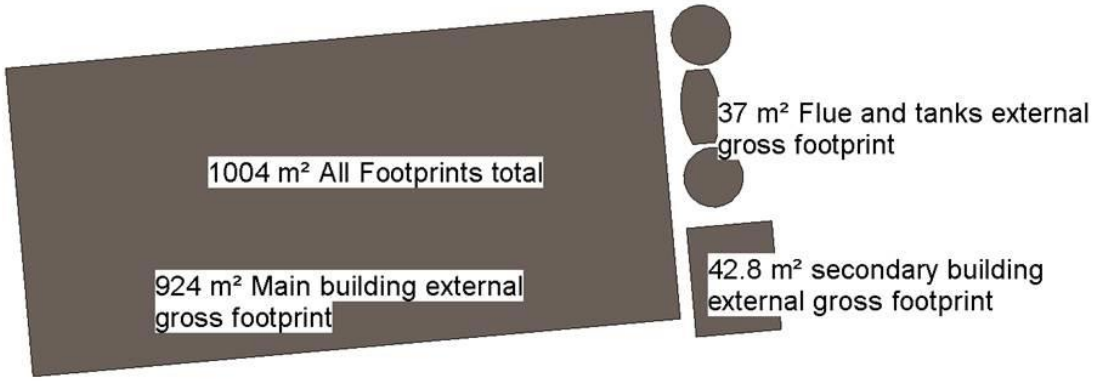

Figure 8.1 Individual and Gross Footprint of the Buildings and Structures (M2)

8.3 LAYOUT AND FUNCTION

8.3.1 The layout (see Drawing No. AL(0-)005 and AL(0-)009) locates all access from the forecourt which is screened by the building. Single, large up and over door will be used for maintenance access. The building location is toward the front of the site overlooking the slopes due to the position for vehicular access ramp from Tithebarn Lane.

8.3.2 The location of the flue is to minimize its visual impact by locating close to the motorway. Views from the motorway are mostly screened by an existing tree line with the flue and tallest roof form nestling against this tree line.

8.3.3 The Energy Centre will have two parking spaces (standard parking spaces) for maintenance vehicles and biomass deliveries, which is the likely capacity requirement at any one time on the site.

8.3.4 External louvers are required to permit supply and extract air for the CHP engine, biomass boiler and natural gas boilers. The dimensions and locations of each louver have been selected to provide the specified air flow rates and the most efficient ductwork distribution routes within the energy centre

8.3.5 Access panels have been provided on the front elevation of the building to permit the installation and replacement of the CHP, biomass boiler and natural gas boilers.

8.3.6 Biomass fuel supply and ash removal ports are indicated in the centre on the front elevation of the energy centre immediately adjacent to the biomass boiler's internal position.

8.3.7 Minimum entrance and roof heights have been dictated by the required plant height clearances of the major heat generation plant. The required clearances for each plant item are indicated on the Drawing No. 3513921A – A101.

EXTERNAL LIGHTING

8.3.8 The lighting on site (see Figure 8.2 and/or Drawing No. EL(63)-EX-01) will be controlled via a timelock and photocell system. The photocell will prevent the lighting operating in normal daylight; however in the event that this failed the time will prevent illumination during daytime hours. The philosophy is as follows; at sun set the solar time clock switch closes its contact, causing the

start/stop units to become energised and switching on the lighting. The solar time clock will open its internal switch at sunrise. Manual override switches are provided for the maintenance / testing of the lights.

Figure 8.2 External Lighting Scheme

8.4 SCALE

8.4.1 The approach to design of building form and location/orientation has responded to the highly constrained site, and the size of the plant to be accommodated (see Drawing No. AL(0-)003 and AL(0-)003). The setting is currently rural on the edge of a local conurbation but will soon be set within a wider area of residential development. The domestic built forms follow the local topography, rising and falling in response to this land form. The proposed roof form of the building emulates this context by stepping the roof down the hill from Tithebarn Lane and the motorway towards the consented residential development.

8.5 APPEARANCE

8.5.1 The range of building materials (See Drawing No. AL(0-)003 and AL(0-)004) are kept to a minimum with dark grey to the main portion of the façade and light grey upper portion and mill finished aluminium for the roof. This enables the building form bulk to recede into the landscape whilst the roof forms and flue become part of the sky-scape, depending on lighting to blend with this back drop. The bulk of the façade is broken up on the structural grid module. All cladding is vertically orientated metal colour coated cladding.

8.5.2 The timber crib-lock retaining wall between the building and proposed housing is designed to reduce the impact of this large form and to promote greenery to creep upwards and fall over the parapet planter.

8.5.3 The tall retaining timber planted crib-lock wall seeks to blend the elevated flue structure into the landscape. This will be planted both top and bottom with trees to break up its elevations. Site fencing will be painted green and visually open.

8.6 ACCESS

8.6.1 The permanent access into the site will be from the existing access from Tithebarn Lane and via a new 1:12 road ramp, for access by foot and vehicles. The site will be enclosed by security fencing and gates for safety, security and restricting any public access. Access to the building will be level from the forecourt. Internal access of the Energy Centre will be controlled under E.ON's Management. It is anticipated that one or two people will be in attendance of the buildings.

8.6.2 Access shall be required for planned maintenance of all equipment during normal working hours. On exception access may also be required to rectify failures of key plant outside of these periods.

8.6.3 Wood pellet boiler fuel deliveries are calculated to be required with a frequency one delivery per week, by a 37m3 capacity vehicle.

8.6.4 The site will be used for access to the attenuation pond directly adjacent (north) for maintenance purposes. Maintenance vehicles will access the site via the access road off Tithebarn Lane through the first gate, round to the eastern side of the site, through the second gate, down the access tack to the north of the site and through the third gate.

8.7 LANDSCAPE AND VISUAL

8.7.1 The principal objective is to integrate the proposed scheme into the setting. The flues are contained within a casing giving a stack 14m high. As the energy centre comprises a large building with 14m high stack the intention has been to set the development as low on the site as possible and to step the roof line. The stack is located on the east side of the site adjacent to the motorway, away from the residential development of Tithebarn Green to the west. The colour of the building cladding will be dark and light grey.

8.7.2 The primary objectives of the proposed landscape scheme are summarised below and shown in Figure 8.3 (and/or Figure 4 of the Landscape and Visual Assessment):

- To integrate the proposed planting with the existing wider vegetation pattern and the species composition of hedges, woodland/scrub as well as local tree cover of a more parkland nature characteristic of the lower slopes of the Pin Brook valley and the Redhayes ridge
- To respond to local landscape character as the proposed energy centre site represents a change in character from the residential area to the north and west to the campus of the Exeter Science Park to the east of the motorway
- To provide connectivity with the existing woodland planting on the motorway embankment slope to the immediate north east, the existing dense scrub on the bank on the southern boundary, the proposed riparian, woodland and native hedge planting of the new Tithebarn Green development to the north and southwest
- To provide a buffer between the new housing to the immediate west of the site area and the energy centre building, retaining walls and access road
- To provide planting of a scale to help 'anchor' the new development in its surroundings and limit the visual impact from sensitive viewpoints
- To provide a partial screen to moving heavy vehicles accessing the service yard

8.7.3 Species to comprise the following;

- Betula pendula (birch)
- Pinus radiata (Monterey pine)
- Pinus sylvestris (Scots pine)
- Quercus robur (oak)
- Salix alba (white willow)
- Corylus avellana (hazel)
- Crataegus monogyna (hawthorn)
- Euonymus europaeus (spindle)
- Prunus spinosa (blackthorn)
- Salix caprea (goat willow)
- Salix cinerea (grey willow)
- Viburnum opulus (guelder rose)

8.7.4 The steepest slopes will have limited access for planting and maintenance and will therefore be hydro seeded with a mix comprising grass and wildflowers. The aim is to integrate the slopes with the grass and scrub mosaic characteristic of the local area, such as that on the cutting slopes within the vicinity of junctions 29 and 30 of the M5. Gorse, blackthorn and scrubby willow are expected to colonise the steep slopes and provide connectivity with adjacent scrub and woodland.

8.7.5 On 1:2 slopes, or shallower, planting will comprise groups of trees and native shrubs. A number of trees will be planted as specimens to mirror the character of Redhayes ridge.

8.7.6 Ground covering ivy and snowberry will be planted at the top of the retaining wall and encouraged to scramble down the north facing structure and ivy will be planted at the base of the wall to grow up. It is expected that the face will have a partial green appearance within a few years which will help reduce the visual impact of the engineered feature.

Figure 8.3 Landscape Scheme Proposals

9 CONCLUSION

9.1.1 The proposed Energy Centre will form part of the district heating system which will serve electricity via a local grid connection and heating to new housing developments at Monkerton Farm, Tithebarn Green and Mosshayne, along with the Science Park. The energy centre is intended to be the sole source of heat to the district heating network and as such is required to be available to operate at all times whenever there is heat demand from the network customers. District Heating is regarded as the most financially economic way of achieving Code for Sustainable Homes Levels 5 and 6 as well as anticipated Building Regulation changes for 2016.

9.1.2 The application site is well located in relation to Exeter City (and forms part of the Exeter and East Devon Growth Point, as well as East Devon's 'West End' corridor which is a focus for growth in the District. The planning history for the surrounding area confirms the extensive scale of approved residential development, which requires the Energy Centre for the delivery of low carbon energy.

9.1.3 Based on the review of the proposed development against national and local planning policy it is considered that the Energy Centre will be compliant, whilst helping achieve wider government energy and low carbon emissions objectives.

9.1.4 The environmental assessment studies confirm that the proposed development will not have a significant adverse effect. There are likely to be some adverse impacts during construction, however these will be temporary. Where necessary mitigation measures have been proposed.

9.1.5 The design of the Energy Centre is considered to accommodate the necessary plant and equipment required to heat the wider Monkerton district, whilst being sensitive to the surrounding area.