Barratt & David Wilson Homes
(East & West Scotland)

Cockburn Crescent, Balerno

Transport Assessment

October 2015

Modus
Transport Solutions Ltd

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1. Introduction

1.1 Background

Modus Transport Solutions Ltd was commissioned by Barratt & David Wilson Homes (East & West Scotland) to prepare a Transport Assessment (TA) in support of a Planning Application in Principle (PiPP) for the development of up to 150 residential units with associated access arrangements at Cockburn Crescent, Balerno, Edinburgh.

The site at Cockburn Crescent was subject to a previous planning application (ref.13/02787/PPP) which was registered by City of Edinburgh Council in July 2013 and sought permission in principle for a residential development of approximately 280 units. This application was refused by the Council in November 2013 on Green Belt and prematurity grounds.

An appeal was submitted to the Scottish Government in January 2014 and subsequently dismissed by the Government appointed reporter in March 2014.

The current application seeks planning permission in principle for a residential development based on a significantly lower number of units than previously proposed and is based upon new planning policy at national level and the findings of a recent appeal decisions in Balerno which post-dated the previous application and appeal.

The TA was prepared in line with the guidelines set out in the Scottish Government's publication 'Transport Assessment and Implementation: A Guide' and takes account of the policies within the Scottish Planning Policy document with an assessment of the accessibility of the site by car and non-car transport modes including walking, cycling and public transport. The TA also take account of specific City of Edinburgh Council (CEC) transport policy including the Edinburgh Local Development Plan Transport Appraisal.

1.2 Development Setting

The village of Balerno is situated approximately eight miles to the southwest of Edinburgh City Centre and currently benefits from frequent and high quality sustainable transport links to the City Centre. The development site benefits from its close proximity to the centre of the village, which is only a short 13 minute walk from the site. The village of Balerno and the surrounding area benefits from good quality pedestrian and cycle facilities which provide linkages to local amenities and schools. Access to these existing pedestrian amenities will be incorporate into the proposed development layout and where required improvements to linkages will be made. These existing and improved linkages to pedestrian and cycling facilities, along with easy access to bus facilities, will mean that future residents will have the opportunity and choice to use sustainable transport modes. The development will provide an extension to the village of Balerno and complete the village's southern boundary in a similar character and layout to the surrounding residential developments.

Clarendon Planning and Development conducted two pre-app consultation events at Balerno Community Centre, the first on the 27th of July between 4 and 8pm, and the second on the 28th of July between 12 and 4pm. The pre-application consultation provided local residents with the opportunity to view and comment on the development proposals.

A Masterplan for the development was subsequently prepared which responded to local residents comments and concerns raise through the community consultation. The Masterplan also considers national and local planning policy guidance, including the Scottish Government's document 'Designing Streets', placing an emphasis on sustainable travel over the private car. This Masterplan has subsequently been used within this TA.

1.3 Scoping Study

The scope of the TA to support the development proposals, including all technical parameters, were agreed with The City of Edinburgh Council prior to commencing with the study. **Appendix 1** provides a copy of the scoping correspondence with The City of Edinburgh Council.

1.4 Report Structure

Chapter 2 of this report describes the development proposals for the site. **Chapter 3** provides an assessment of the development proposals in relation to current national and local transport planning policy. **Chapter 4** reviews existing transport provision and accessibility in the vicinity of the site. **Chapter 5** quantifies the travel demands associated with the development proposals and **Chapter 6** provides an outline of a Residential Travel Plan framework for the site. **Chapter 7** details the key findings of the traffic impact assessment and a summary of the study is presented in **Chapter 8** with the conclusions presented in **Chapter 9**.

2. Development Proposals

2.1 Site Location and development context

The site is located on the southern edge of Balerno and is bounded to the north by Cockburn Crescent, Mansfield Road to the east and open fields and farmland to the south and west. Figure 2.1 below show the location of the site in the general context of Balerno and the surrounding area.

The development proposals include for the construction of 150 new residential units along with associated access and infrastructure to form the new southern boundary to the village of Balerno.

Figure 2.1: Site Location Plan

2.2 Site layout and sustainable infrastructure

The Masterplan for the site has been prepared by EMA Architects with the landscape design undertaken by Open. A copy of the Masterplan is presented in **Appendix 2**.

The development proposals will integrate with existing walking and cycling infrastructure in the area and provide for access to public transport. This will ensure that residents of the new development are given the opportunity to make informed travel choices and will therefore hopefully be encouraged to travel by sustainable modes.

2.3 Masterplan road hierarchy

The Masterplan has been designed to reflect the key design principles set out within the Scottish Governments document "Designing Streets" and The City of Edinburgh Council's – Edinburgh Street Design Guidance 2015 and Edinburgh Design Guidance 2013. The Masterplan has been developed such that it creates a core street network which encompasses all travel modes. The Masterplan ensures that the function of the street takes precedence and is not dominated by the requirements of the private car. This has been achieved through a variety of geometric layouts as well as street design and materials. The following paragraphs provide more detail on the approach to establishing the movement hierarchy.

2.4 Walking and cycling

The development will link directly to the existing walking and cycling facilities which run along the northern boundary of the site on Cockburn Crescent. A new footway will be provided on the southern side of Cockburn Crescent linking to the existing facilities to the north. Internally the residential roads will be designed to ensure that pedestrians have priority over the private car and on this basis both the geometric road layout and traffic calming measures will be such that a safe and inviting pedestrian environment will be created. All the residential areas will be linked by a comprehensive network of footways and footpath which in turn will link to the main pedestrian / cycleway which runs along the northern boundary of the site. This will mean that safe walking and cycling routes will be achievable from any point within the proposed development to key amenities including the local schools, Balerno village centre, local shops and bus stops on Cockburn Crescent.

2.5 Public transport

Local bus services are provided on Cockburn Crescent and the whole of the development site can access these services within a 3 minute walk (250m). This achieves an accessibility better than the recommendations set out in PAN 75 and SPP 2014 and meets with the criteria set out in The City of Edinburgh Council's Bus-Friendly Design Guide. Additionally local school bus services also pass along Cockburn Crescent on route to the local High School. Further information on bus services and facilities serving the site are discussed in **Chapter 4**.

2.6 Vehicle access

It is proposed that the development will be served by potentially three new access points on Cockburn Crescent. These access points will be located in order to minimise the impact upon existing residential properties and driveways while at the same time complying with the City of Edinburgh Councils standards in respect of junction spacing, junction visibility and overall junction geometry. The Masterplan provides details of the indicative location for these access points and these will be designed in detail at the appropriate stage in the planning process.

2.7 Parking

The development is located in Zone 6 of the City of Edinburgh Councils Parking Standards for Development Management (Approved December 2009). Table 2.1 below sets out the appropriate parking standards subject to the number of rooms contained within each residential unit. As the application if for Planning Permission in Principal and therefore the final mix of the development is still to be determined the final parking provision will be provided according to the final mix of residential units.

City of Edinburgh Council Car Parking Requirements			
Standard spaces per unit	1 to 2 rooms Habitable rooms only – exclude kitchens and bathrooms	3 rooms Habitable rooms only – exclude kitchens and bathrooms	4 + rooms Habitable rooms only – exclude kitchens and bathrooms
Car Parking (min)	1	1.5	2
Visitor Parking (per unit)	0.2	0.2	0.2

Table 2.1: The City of Edinburgh Council Parking Standards

3. Policy Context

3.1 Introduction

In order to demonstrate that the development of the site complies with current national and local transport planning policy, a review was undertaken of the following documents:

- Scottish Planning Policy (SPP 2014);
- Planning Advice Note (PAN) 75 – Planning for Transport;
- Transport Assessment and Implementation: A Guide;
- Designing Streets – A Policy Statement for Scotland;
- Edinburgh Local Transport Strategy 2014-2019 (LTS)
- Let's get Scotland Walking - The National walking Strategy;
- Edinburgh City Council - Bus Friendly Design Guide

3.2 Scottish Planning Policy (SPP 2014)

The Scottish Government's planning policies are set out in a number of documents including Scottish Planning Policy (SPP), PAN 75 and Designing Streets.

SPP (2014) Scottish Planning Policy sets out national planning policies which reflect Scottish Ministers' priorities for operation of the planning system and for the development and use of land. The SPP promotes consistency in the application of policy across Scotland whilst allowing sufficient flexibility to reflect local circumstances. It directly relates to:

• the preparation of development plans;

• the design of development, from initial concept through to delivery; and

• the determination of planning applications and appeals.

SPP states that new developments should consider place and the needs of people before the movement of the motor vehicles. SPP promotes the need for active travel and to reduce the reliance on the private car through the increase use of walking, cycling and public transport.

New developments should include paths and routes which connect places directly and provide means of access to the wider environment beyond the boundary of the development.

3.3 Planning Advice Note (PAN) 75 – Planning for Transport

Planning Advice Note (PAN) 75 accompanies SPP and acts as a good practice guide on measures that planning authorities, developers and others should carry out in their policy development, proposal assessment and project delivery.

PAN 75 provides guidance on accessibility thresholds and walking distances. It recommends that walking distances to bus stops from new developments should generally be not greater than 400metres and up to 800metres for rail services. PAN 75 states that the maximum acceptable walking distance to local facilities is 1,600metres.

3.4 Transport Assessment and Implementation – A Guide

This document accompanies SPP and PAN 75 and aims to provide a good practice guide for the preparation of a Transport Assessment (TA) in support of a planning application for a new development. As with PAN 75, the document sets out some general guidance in respect of accessibility criteria and thresholds while also providing guidance in the preparation of a Transport Assessment.

The document states that public transport journey times should be assessed through a combination of timetable information, maps and observed journey times to actual (or potential) bus stops serving the proposed development. The documents sets out criteria for potential door to door journey times for home to work journeys of between 30 and 45 minutes. These guidelines have been followed in the preparation of the Transport Assessment supporting the proposed Cockburn Crescent residential development.

3.5 Designing Street – A Policy Statement for Scotland

Designing Streets - A Policy Statement for Scotland, places emphasis on providing well designed streets at the heart of sustainable communities and demonstrates the benefits available by assigning a higher priority to pedestrians and cyclists from good street design.

Designing Streets provides an update to the link between existing planning policy and guidance and transport policy and street design. It is based upon the Manual for Streets document published in England and Wales in 2007 while at the same time incorporating the recommendations and principles as set out in PAN 76 New Residential Streets.

Designing Streets focuses the street design process towards place making rather than a system based upon the dominance of the private car. It is intended to be used alongside the Designing Places (2001), which sets the role of the planning system in creating successful and sustainable places.

Designing Streets has now generally been adopted by most Scottish local authorities and indeed some Local Authorities have developed their own guidance in respect of Designing Streets.

The core values and aspirations of Designing Streets are to create a successful place which is distinctive, safe, easy to move around and once which is welcoming. The underlying philosophy of Designing Streets is a collaboration between the developer of the place / street and the Local

Authority. This collaboration is intended to start at the planning stage of a new development such that the environment, materials and future maintenance are all taken into account in the design as early as possible.

Through collaboration and good design, streets can be made to be a safe, welcoming environment delivering the needs of all users while at the same time reducing the costs associated with long term maintenance for Local Authorities through appropriate material choices and design.

3.6 Edinburgh Local Transport Strategy 2014-2019 (LTS)

The Edinburgh Local Transport Strategy for 2014 - 2019 (LTS) was approved by Edinburgh City Council, Transport and Environment Committee in January 2014.

The new LTS re-affirms the policies and aspiration set out in the LTS 2007 – 2012 and is consistent with the Council's overall Transport 2030 Vision. The new LTS is not a fundamental change to policy approach and instead focuses on a number of key areas where policy change was already being considered such as speed limits. From the Consultation exercise for the 2030 Vision the LTS 2014 – 2019 developed nine areas where Edinburgh's transport system should make change or improve. These areas were set out such that Edinburgh transport system should;

1. Be green;
2. Be healthy
3. Be accessible and connected;
4. Be smart and efficient;
5. Be well planned;
6. Be safe, secure and comfortable;
7. Be inclusive and integrated;
8. Be customer focussed;
9. Be effectively maintained.

The 2014 – 2019 LTS clearly sets out guidance and policy in relation to these nine areas of change or improvement. Policies such as Thrive2 and Thrive3 set out Developers obligations to providing sustainable developments which focus on sustainable transport modes and Travel Planning. There are policies in relation to the environment which consider noise and air quality as policies to help improve road safety for all users.

SESplan Strategic Development Plan

As part of the Scottish Government's reform of the planning system, the Edinburgh and South East Scotland Strategic Development Plan Authority (SESplan) was designated by Scottish Ministers on

the 25th June 2008. It comprises City of Edinburgh, East Lothian, Fife, Midlothian, Scottish Borders and West Lothian Councils. The role of SESplan is to prepare and maintain and up to date Strategic Development Plan (SDP) for the Edinburgh and South East Scotland area.

The SDP will replace the existing Edinburgh and Lothians Structure Plan, the Fife Structure Plan and the Scottish Borders Structure Plan. The SDP will provide steer for the future development and growth across the Edinburgh City regions from 2012 to 2032.

A development plan scheme (DPS) has been prepared by SESplan which sets out the programme for preparing and reviewing the SDP. The end of May 2010 saw the beginning of public consultation of the Main Issues Report (MIR), with the publication of a formal response to the comments on the MIR in autumn 2010.

The proposed SDP was published in February 2011, which saw the beginning of the formal objection phase. Submission of the proposed SDP to Scottish Ministers, including SESplan response to formal objections was made in March 2012.

3.7 Let's get Scotland Walking - The National walking Strategy

This Scottish Government document seeks to encourage walking as a part of the people of Scotland's life style with everyday journeys undertaken on foot. This includes walking to a place of work, walking to shops and schools and recreational walking.

The three strategic aims of the document are;

- To create a culture of walking where everyone walks more often as part of their everyday travel and for recreation and well-being;
- to create better quality walking environments with attractive, well designed and managed built and natural spaces for everyone;
- to enable easy, convenient and safe independent mobility for everyone.

3.8 Edinburgh City Council - Bus Friendly Design Guide

The bus friendly design guide 2006, although a somewhat dated document, is still used by The City of Edinburgh Council and indeed was recently quoted by the Council in a recent planning appeal in Balerno. The bus friendly design guide seeks to ensure that new developments adequately cater for access to public transport facilities. The guidelines seek to ensure that bus stops are appropriately located in relation to residential developments and that appropriate facilities are provided to give the public transport user the best possible experience in respect of public transport access.

The bus friendly design guide recommends a walking distance of between 200 – 250m to a local bus stop from a residential property. This is lower than the recommendations set out in PAN 75 for 400m and in some respects goes against the reconditions set out in Let's get Scotland Walking,

which sets out to get the population of Scotland walking more in order to combat obesity and improve the Nation's health.

3.9 Assessment of site in relation to policy context

The proposed development at Cockburn Crescent, Balerno complies well with the criteria as set out within SPP and PAN75 given its proximity to public transport facilities. The site also benefits from accessibility to local infrastructure such as local schools and shopping facilities and as part of the development proposals additional pedestrian infrastructure will be provided both within and externally to the site.

The development is located such that it can provide easy and safe direct links for pedestrians and cyclists to existing walking, cycling and public transport infrastructure as specified in paragraph 168 of SPP (2014).

The development location also accords with The City of Edinburgh Councils Bus Friendly Design Guide with local bus stops located within 250m of all of the development site.

Door to door journey times for home to work journeys from the development site can easily be achieved within the 30 and 45 minutes guidelines set by the Scottish Government. This has been demonstrated as part of the Accession assessment provided in **Chapter 4.**

Internally the development site has been designed to encompass the principles set out within 'Designing Streets' and The City of Edinburgh Council's – Edinburgh Street Design Guidance 2015 and Edinburgh Design Guidance 2013. The development is laid out such that priority will be given to pedestrians and cyclists where appropriate, to achieve an appropriate balance between place and movement. Good quality links to Cockburn Crescent will be provided for access to bus stops and onwards to local amenities.

The development site has been laid out such that it will encourage active travel and use of public transport and assist in achieving Edinburgh City Council's vision for sustainable developments and a healthier population.

The Residential Travel Plan which is to be provided as part of the development proposals will assist in educating future residents of the travel choices available to them and therefore potentially reduce their reliance on the use of the private car.

4. Accessibility Review

4.1 Introduction

The development site is located on the southern boundary of the village of Balerno and benefits from access to existing walking, cycling and public transport networks, providing good access to the surrounding residential areas, local amenities and beyond. While national and local transport policy seeks to reduce reliance on private car travel, it will remain an important mode of travel to and from the development site.

This chapter provides an accessibility assessment for travel by all modes of transport and verifies the existing transport provision serving the site and the areas around the site. This assessment provides details of existing physical infrastructure as well as public transport service provision.

In order to undertake the accessibility review an audit of existing walking, cycling and public transport facilities in the vicinity of the development site was undertaken in October 2015. The following sections within this chapter set out the findings of this accessibility assessment.

4.2 Walking and cycling

The following section sets out the existing walking and cycling infrastructure provision in the vicinity of the site and sets this within the context of the overall provision within the village of Balerno.

Walking

Both National and Local Transport Planning Policy seeks to ensure that new developments are accessible by a range of sustainable transport modes. National Transport Policy PAN 75 sets out recommended criteria for walking distances to local bus stops and public transport facilities. This is typically 400metres to local bus stops. The development site is well placed in relation to public transport facilities with bus service provision being made on Cockburn Crescent to the north of the development site. All of the proposed development site lies within the 250m walking distance to the bus stop on Cockburn Crescent. The development therefore achieves shorter walking distances as set out in PAN 75 and meets with The City of Edinburgh Councils Bus Friendly Design Guidance of 250m.

The local schools, Dean Park Primary School and Balerno High School are also both located within a short walk of the development site and can be accessed by safe routes to school with crossing patrols on the main routes.

As part of the accessibility audit Modus Transport Solution Ltd staff undertook on site checks to determine actual walking times to local amenities. Starting on Cockburn Crescent, near the centre of the proposed development site, the time taken to walk to each individual local amenity was recorded to the nearest minute. The walking audit was undertaken by a healthy, able bodied person using all appropriate and available pedestrian facilities on all the streets surrounding the development site. Table 4.1 below provides a summary of these approximate walking distances and times.

Destination	Approximate walking distance (Able bodied person, good weather conditions)
Cockburn Crescent bus stop	1 minute
Bus terminus at eastern end of Cockburn Crescent	4 minutes
Dean Park Primary School	6 minutes
Local shops	13 minutes
Post Office	15 minutes
Balerno High School	18 minutes

Table 4.1: Walking Journey Times

The nearest existing pedestrian facilities are located along the northern side of Cockburn Crescent and are segregated by a grass verge and drive way access points. This existing footway is 2m wide and has street lighting provided along its full length. See Figure 4.1 below.

Figure 4.1: View of Cockburn Crescent

As part of the development proposals, a new footway is to be provided on the south side of Cockburn Crescent running along the frontage of the development site. As part of the new pedestrian facilities associated with the development new pedestrian crossing facilities in the form of dropped kerbs and tactile paving will be provided at key points and pedestrian desire lines. This type and form of pedestrian crossing facility is similar to those already provided on the existing streets surrounding the development site.

Pedestrian access to the village centre, and indeed the local schools, is provided either via Mansfield Road to the east of the development site or through the existing residential streets and the network of footways and footpaths to the north of the site. See Figure 4.2 below.

Figure 4.2: View of typical existing footpaths within existing residential development.
(This route form a direct link from the development site to the primary school.)

The pedestrian facilities on Mansfield Road are typical of those provided throughout the village of Balerno with 2m wide footways provided on both sides of Mansfield Road with street lighting and dropped kerb crossing points. The footways on Mansfield Road, like those on Cockburn Crescent, are segregated from the main carriageway by a 2m grass verge. This helps to create a safe and desirable pedestrian environment. See Figure 4.3 below.

Figure 4.3: View of typical existing footpaths on Mansefield Road

The surrounding residential streets to the north of the site all have footways on both sides of the carriageway and have appropriate street lighting and dropped kerb crossings. Many of the streets are subject to a 20mph speed limit which helps to create a safe and desirable environment for pedestrians.

The area surrounding the development site is part of The City of Edinburgh Councils "Safer Routes to Schools" programme. As part of the proposed development site a principle safer route to school link, or series of links, will be agreed with The City of Edinburgh Council within the proposed development. These will in turn link to the existing safer routes to school to the north of the site thereby providing children form the proposed new development the opportunity to access both the primary and secondary schools safely on foot.

Cycling

Balerno currently benefits from its location close to some excellent cycling facilities which include the Water of Leith Walkway and the Forth and Clyde cycle route which forms part of National Cycle Route 75 (NCR75). NCR 75 is accessed from Bridge Street at the northern side of the village and provides access from Balerno to Edinburgh in the east and Glasgow in the west. It is generally accepted that a 30 to 40 minute cycle journey time to centres of employment of other facilities is acceptable and this is set out in Scottish Government guidance. A 30 – 40 minute cycle is equivalent to an 8km (5mile) cycle ride. Based upon this cycle distance it is possible to reach Heriot Watt and the south western areas of Edinburgh including South Gyle Park all of which offer employment opportunities which are accessible by bicycle

4.3 Public transport access

Bus provision

Local bus services are provided on Cockburn Street and are typically a 250m walk from the whole of the development site. The main bus operator serving Balerno is Lothian Buses with some other services being provided by E&M Horsburgh and Waverley Travel of Broxburn, see Figure 4.4 below.

Figure 4.4: Cockburn Crescent bus services

The bus stops on Cockburn Crescent are provided with bus shelters and timetable information. The bus shelters also benefit from street lighting which is provided on Cockburn Crescent. The main bus terminus is provided on the north eastern boundary of the development site as shown in Figure 4.5 below with Figure 4.6 showing the other bus stops on Cockburn Crescent.

Figure 4.5: Cockburn Crescent bus terminus

Figure 4.6: Cockburn Crescent bus stops

Modus Transport Solutions Ltd has taken the opportunity to assess the accessibility to the proposed development site at Balerno by public transport using Accession™, a GIS based public transport modelling software package.

Accession™ maps accessibility to a destination point via all public transport modes including the time taken for walking to a bus or rail interchange. The package is equipped with every UK public transport stop and the service route and frequency at that stop, thus effectively providing real time journey planning. It includes bus, rail, subway, air and ferry information. Accession™ maps direct and interchange journeys by public transport and therefore provides real and reliable journey time mapping.

Figure 4.7 provides the morning peak journey times by public transport for the development site between 7am - 9am. As can be seen from Figure 4.7 the 20 minute journey time from the site encompasses all of the A71 Lanark Road West corridor as far down as Craiglockhart. The 40 minute journey time encompasses all of the City Centre and the eastern side of Livingstone. Finally the 60 minute journey time encompasses all of Edinburgh including the airport, Granton and Leith as well as the remaining areas of Livingston. Figure 4.7 shows that journeys to / from the development site of up to 40 minutes can reach the main centres of employment within Edinburgh and the surrounding area.

Figure 4.8 provides the evening peak journey times by public transport for the development site between 4pm and 6pm. As can be seen from Figure 4.8 the 20 minute journey time from the site once again encompasses all of the A71 Lanark Road West corridor as far down as Craiglockhart. Similarly the 40 minute journey time contour encompasses all of the City Centre however due to

service provision at this time of day the eastern side of Livingston is not as accessible within 40 minutes.

Finally the 60 minute contour once again encompasses all of Edinburgh including the airport, Granton and Leith as well as Edinburgh University at The Bush but again only covers parts of Livingston, once again due to service provision at this time of day.

Overall Figures 4.7 and 4.8 clearly demonstrate that the proposed development site is highly accessible by public transport.

Rail Services

The closest railway station to the development site is Curriehill station which is located approximately 4.5Km north east of the development. Curriehill Station is located on the Edinburgh to Glasgow Central rail line. There are five services operating from Curriehill to Edinburgh in the morning peak and two services operating to Glasgow in the morning peak. Journey times from Curriehill to Edinburgh are typically 25 minutes with journey times to Glasgow of approximately 70 minutes.

Lothian Bus service 44 provides a link from the development site to Currierhill Road which is then just a short walk to Curriehill Station. This means it is possible for a resident of the new development to use service 44 in order to access the train station with a short walk in-between.

It is also possible to cycle to Curriehill Station which is only a short 18 minute cycle.

4.4 Access by road

The following section provides a brief description of the local road network and the junctions considered within the traffic impact assessment for this Transport Assessment.

Cockburn Crescent

Cockburn Crescent is a standard two-way residential access road, approximately 6m wide with a 2m segregated footway running along the north side of the carriageway. Cockburn Crescent runs in an east / west direction and runs along the full frontage of the proposed development site. Driveways to existing residential properties are provided along the northern side of Cockburn Crescent along with a number of parking laybys and the two bus stops. Cockburn Crescent is subject to a 30mph speed limit. See Figure 4.9 below.

Figure 4.9: Cockburn Crescent

Mansfield Road / Bravelaw Green

Mansfield Road , which in turn become Bravelaw Green, is a two-way single carriageway road which provides one of the main link roads on the eastern side of the village of Balerno. Footways are provided on both sides of Mansfield Road and Bravelaw Green and these are generally segregated from the main carriageway by a grass verge. Mansfield Road is subject to a 30mph speed limit, see Figures 4.10 and 4.11 below.

Figure 4.10: Mansfield Road

Figure 4.11: Bavelaw Road

Bridge Road

Bridge Road forms the main route out of Balerno to Lanark Road West (A70). It connects with Lanark Road West (A70) via a signal controlled junction at the northern most boundary of the village. Bridge Road is a standard two-way road of varying width but typically 7.3m wide with footways on both sides.

A speed limit restriction operates during school morning and afternoon periods when the speed limit is reduce to 20mph. The remainder of the time the speed limit on Bridge Road is 30mph. Advisory cycle lanes are also provided on both sides of the carriageway, see Figure 4.12 below.

Figure 4.12: Bridge Road

Lanark Road West (A70)

The A70 Lanark Road west provides a main link from Edinburgh in the east to Ayr in the west. The A70 is two-way singles carriageway road which is subject to a 30mph speed limit as it passes to the north of Balerno. The A70 is also the main bus corridor serving Balerno with all local services using this route. Footways are provided on both side of the A70 and there are a number of signalised pedestrian crossings at key points in the vicinity of the village of Balerno.

4.5 Accident Analysis

A review of accident data for Balerno and specifically Cockburn Crescent, Mansfield Road, Bavelaw Road, Bavelaw Green and Bridge Road indicate the following;

Cockburn Crescent	1 Slight Injury Accident 01/03/2014
Bravelaw Road	1 Slight Injury Accident 19/07/2013 1 Fatal Injury Accident 10/12/2014 1 Serious Injury Accident 07/10/2014
Bridge Road / A70	4 Slight Injury Accidents 2010, 2012, 2013 & 2014

The four slight injury accidents at the Bridge Road / A70 junction from the accident data available indicates that these accidents were a direct result of driver error. On the basis that these accidents occurred once a year it is reasonable to conclude that there is no inherent accident issue at the Bridge Road / A70 signalised junction.

The one accident on Cockburn Crescent can also be attributed to driver error and given the lack of any other accidents along this section of the local road network it is reasonable to assume that there is no existing accident issue which would be exacerbated by the increase in traffic volumes associated with the development proposals.

Finally the accidents recorded on Bravelaw Road show no correlation in respect of their location and therefore is it reasonable to assume that there is no fundamental issue with the general road safety of Bravelaw Road. The fatal accident which occurred in December 2014 involved a 75 year old woman who step off the footway to cross the road and was struck by a passing vehicle. The pedestrian was not crossing at a designated crossing point and was crossing from the driver's nearside.

Given the nature of the accident and the age of the pedestrian involved it is reasonable to assume that this accident was a combination of error by both parties and not as a result of the layout of Bravelaw Road.

5. Travel Demand

5.1 Background

In order to determine the potential travel demands of the proposed residential development reference was made to the existing traffic movements associated with established residential developments in the vicinity of the proposed development site. These established residential developments have the same access to walking, cycling and public transport facilities in the area and therefore represent a very similar robust and realistic means of determining traffic generation for the proposed development.

In order to determine the trip rate from the existing residential developments, classified traffic counts were undertaken at both the Cockburn Crescent / Greenfield Crescent and Cockburn Crescent / Whitelea Road. Greenfield Crescent and Whitelea Road contain residential properties similar in character to those proposed within the development site. This therefore allowed bespoke local trip rates to be established which would take into account the access to local walking, cycling and public transport facilities and the general location of the residential properties in respect of Balerno as a whole.

In order to determine trips by each mode of transport the vehicle trips obtained from the traffic surveys were then compared to data extracted from the Scottish Census Results Online (SCROL) 2011 for travel to work / study in Balerno.

5.2 Vehicle Trip Generation

The traffic counts undertaken at the Cockburn Crescent / Greenfield Crescent and Cockburn Crescent / Whitelea Road provide a good and representative indication of the likely traffic generation from the proposed development. They have access to the same level of sustainable transport options and have a similar character in terms of their residential characteristics. Table 5.1 below sets out the existing peak hour arrivals and departures associated with the Greenfield Crescent and Whitelea Road residential developments and the corresponding vehicle trip rates.

	Number of Units	Morning Peak		Inter- Peak		Evening Peak	
		Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
Greenfield Crescent and Whitelea Road	90	7	23	27	16	43	15
Existing Trip Rate	-	0.078	0.256	0.300	0.178	0.478	0.167

Table 5.1: Bespoke Trip Rates

Applying these trip rates to the development proposals gives the vehicle trip generation as shown in Table 5.2 below.

	Number of Units	Morning Peak		Inter- Peak		Evening Peak	
		Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
Bespoke Trip Rate		0.078	0.256	0.333	0.178	0.489	0.167
Trip Generation	150	12	38	50	27	73	25

Table 5.2: Trip Generation

These vehicle trip generation estimates were subsequently used within the traffic impact assessment for the proposed development as set out in **Chapter 7**.

5.3 Person Trips

The information obtained from the traffic surveys has been used to determine car based trips from the proposed development. However, in order to establish the potential trips made by walking, cycling and public transport reference has been made to the SCROL 2011 data. In particular reference has been made to the method of travel to work or study for the Balerno area and resident population.

Table 5.3 provides a summary of the SCROL analyser results for method of travel to work for Balerno.

UV40 Method of travel to work or study - resident population (Scotland)
All people resident in area
Geographical level : Census Area Statistic Ward

	TOTAL 'NIGHT TIME' POPULATION	Not currently working or studying	Works or studies mainly at or from home	Underground, tube, metro or light rail	Train	Bus, minibus or coach	Taxi or minicab	Driving a car or van	Passenger in a car or van	Motorcycle, scooter or moped	Bicycle	On foot	Other
Balerno	7905	2308	292	2	61	779	33	2539	625	32	61	1144	29

Footnotes:

1 No fixed place: counted as if working or studying in the area and are classified according to the means of transport used.
2 'Working or studying' includes all people of any age who work or study mainly at or from home, at no fixed place or travel to a place of work or study.

Table 5.3 - Modal Split for Journey to Work Trips

Based upon the total number of units proposed for the development and the number of car base trips predicted as set out in Table 5.1 an estimation of other modes of travel during the peak periods

was established using the SCROL data. Table 5.4 provides a summary of the overall mode of travel for the proposed development site.

Mode	%	Morning peak		Inter-peak		Evening peak	
		Arrive	Depart	Arrive	Depart	Arrive	Depart
Car driver	48%	12	38	50	27	73	25
Car passenger	12%	3	10	13	7	18	6
Rail	1%	0	1	1	1	2	1
Bus	15%	4	12	16	8	23	8
Taxi	1%	0	1	1	1	2	1
Motorcycle	1%	0	1	1	1	2	1
Bicycle	1%	0	1	1	1	2	1
Walk	22%	6	17	23	12	33	11
Other	1%	0	1	1	1	2	1
Total	**100%**	25	79	104	56	152	52

Table 5.4 - Predicted People Trips for the Proposed Residential Development

As can be seen from Table 5.4 a total of 100 people trips (two-way) are predicted during the weekday AM peak hour and 204 people trips during the weekday PM peak hour.

5.4 Vehicle Trip Distribution

Although the development site is ideally located to support walking, cycling and public transport trips made by the residents of the new development, it is recognised that there will of course be an element of trips made by the private car. The results shown in Table 5.4 indicate that approximately 60% (48% car driver & 12% car passenger) of residents from the new development may choose to travel to work or study by private car.

It was agreed with The City of Edinburgh Council during the scoping meeting for the development that an 80% / 20% distribution split of trips from the development to the east and west at the main A70 Lanark Road / Bridge Street junction. The remaining distribution closer to the development site should be made on the basis of existing turning movements noted from the recent traffic counts.

Figure 5.1, 5.2 and 5.3 in **Appendix X** provide details of the distribution of the development traffic on the local road network with Figures 5.4, 5.5 and 5.6 showing the subsequent development traffic on the local road network.

6. Residential Travel Plan Framework

6.1 General

As part of this Transport Assessment a Travel Plan Framework has been prepared. The Travel Plan Framework within the Transport Assessment is intended to provide a framework to encourage travel by sustainable modes of transport instead of the private car for residents of the proposed development at Cockburn Crescent, Balerno. It considers the sustainable modes of transport available to future residents of the Cockburn Crescent development and considers means by which residents can be encourage to consider change their traffic behaviour.

An effective residential travel plan can achieve the following benefits;

- Educate residents with respect to their travel choices and sustainable modes of travel;
- Reduce the use of the private car and in turn reduce residents carbon footprint;
- Increase the attractiveness of a development through reduce car use, this can be done in conjunction with Designing Streets and the layout of the development;
- A sustainable development can in turn increase the attractiveness and marketability of a development to future residents;
- Encouraging residents to walk and cycle will in turn improve their overall health and wellbeing;

6.2 Aims and Objectives

The primary aim of the Residential Travel Plan is to assist in minimising the transport impacts of the development on the local road network through an illustration of sustainable transport alternatives through the delivery of the following objectives:

- to enable and encourage resident to access the development by sustainable modes of transport;
- to minimise the need for residents travel to and from the site by private vehicle;
- to ensure residents are aware of the health and environmental benefits of travel by non-car modes;
- to encourage a transition away from private vehicle dependence; and
- to ensure residents are aware of the Travel Plan and kept informed in its development and in the instance of change.

6.3 The Travel Plan

At an appropriate stage in the development of the site the Travel Plan Framework and the measures identified below will be developed into a Travel Plan Leaflet. This leaflet will set out all the sustainable travel choices for residents to the new development and will be provided to them as part of the welcome pack which is typically provided by house builders to the purchasers of new houses.

The Travel Plan Leaflet will be developed on the basis of the existing and future travel choices available to residents of the new development. Listed below are some of the measures which will be considered when preparing the Travel Plan Leaflet.

6.4 Walking

The proposed development will include excellent on-site pedestrian links. The internal pedestrian provision will be constructed in accordance with both Designing Streets.

The Travel Plan Leaflet will also include measures to take full advantage of the walking links surrounding the site. There are footways linking the site to surrounding neighbourhoods and facilities. All of these routes are of a good quality and well lit.

The following measures should be included in the Travel Plan Leaflet with regard to walking:

- information in the form of leaflets or signs regarding walking distances routes and travel times;
- linking of on-site pedestrian footways to existing footpaths adjacent to the site; and
- encouraging residents to walk to local amenities or public transport interchanges (where possible) through advertising the health, social and economic benefits.

6.5 Cycling

The development site benefits from excellent cycling facilities and routes which would offer both the commuter cyclists and the recreational cyclist the potential to cycle to their place of work or to local shops and schools. With regard to cycling, the following measures should be included in the Travel Plan Leaflet;

- encouraging residents to cycle to work (where possible) through advertising the health, social and economic benefits of cycling and through the production of mapped cycle routes;
- negotiation with local cycle shops to provide a discount for new residents to the development; and
- improved signage where appropriate to indicate routes to the National Cycle Network.

6.6 Public Transport

As noted in **Chapter 4**, there is good public transport provision within the vicinity of the site. Bus services provide an excellent opportunity for sustainable travel to work within the surrounding area. The following measures should be included within the Travel Plan Leaflet to encourage further and / or potential use of public transport:

- investigate the potential to provide bus vouchers within the residents 'Welcome Park' to promote sustainable travel and provide residents with the chance to try the bus as an alternative modes of travel for free;
- the provision of information on how to travel to and from the development site by bus and rail, this should include timetable information, bus catchments, travel costs and pedestrian provisions to the nearest bus stops.

6.7 Private Vehicles

It is unrealistic to expect walking, cycling and public transport to be the only travel modes to the site by residents of the proposed development. The following measures should be included in the Travel Plan Leaflet;

- provide residents with information regarding the benefits of car sharing and provide details of internet based sites such as https://liftshare.com/
- provide residents information in relation to their individual carbon footprint through internet based sites such as

7. Traffic Impact Assessment

7.1 Methodology

This chapter sets out the methodology used to assess the potential traffic impact of the proposed development on the local road network. The scope of the traffic impact and junctions to be considered was agreed with The City of Edinburgh Council during the scoping exercise for the development.

The assessment has been prepared in accordance with the guidance as set out in the Scottish Government's document *'Transport Assessment and Implementation: A Guide'.* For the purposes of the traffic impact assessment it has been assumed that the development will be completed by 2020 and therefore this has formed the basis for the future year assessment.

7.2 Scope of Study Area

Residential developments typically generate the largest amount of traffic in the weekday morning and evening peak periods. Due however to the proximity of both Dean Park Primary School and Balerno High School an inter-peak period assessment was also undertaken as part of the overall traffic impact assessment.

It was agreed with The City of Edinburgh Council that the following junctions should form the extent of the study area for the traffic impact assessment;

1. Mansfield Road / Cockburn Crescent;
2. Bavelaw Green / Bridge Road;
3. Main Street / Bridge Road Roundabout;
4. Bridge Road / Lanark Road West Signals;
5. Riccarton Mains Road / Lanark Road West.

7.3 Base traffic flows

Classified turning counts were undertaken on Thursday 3rd September 2015 between 07:00 and 10:00 in the morning and between 14:00 and 19:00 in the afternoon/ evening.

The weekday morning peak hour was found to occur between 08:15 and 09:15 while the weekday evening peak hour was between 17:15 and 18:15. The inter peak, when the schools were most active, occurred between 15:15 and 16:15. These identified peak hours form the assessment periods within the TA. Diagrams 7.1, 7.2 and 7.3 in **Appendix X** show the 2015 Base traffic.

7.4 Years of Assessment

In accordance with the guidance offered in Transport Assessment and Implementation: A Guide, junction assessment will be completed for the year of opening for the development which has been assumed to be 2020.

7.5 Design Years and Traffic Growth

The City of Edinburgh Council requested that "a reasonable growth rate" be applied to the base traffic to take this to the design year of 2020. Taking into consideration the character of the local road network the use of the Department of the Environment, Transport and the Regions (DETR) National Roads Traffic Forecast (NRTF) 'low' growth estimates is considered appropriate in order to project the 2015 surveyed traffic flows to the design year 2020. The 'low' growth factor between the years of 2015 and 2020 corresponds to an overall growth of 1.044% or an equivalent of 4.4% which equates very well to the growth rate suggested by The City of Edinburgh Council which was 3.9% based upon recent developments in the area.

The 2020 weekday morning, evening and inter peak projected traffic flows are shown in Figures 7.4, 7.5 and 7.6 in **Appendix x.**

7.6 Committed Developments

The City of Edinburgh Council confirmed that committed developments are generally taken as those having planning permission. The only development in the area which has planning permission is the Ravelrig Road development which lies on the north western boundary of the village of Balerno. While there are a number of sites in the local area which has been identified within the Local Plan, none of these have planning permission and therefore need not be included within the traffic impact assessment.

Figures 7.7, 7.8 and 7.9 in **Appendix X** shows the committed development traffic which has been taken into account within the TA.

7.7 Total Traffic

The combination of the 2020 base traffic, the committed development traffic and the proposed development traffic are shown in Figures 7.10, 7.11 and 7.12 as the total traffic flows used within the TA.

7.8 Junction Analysis

The junction analysis was undertaken using the industry standard computer modelling package Junctions 9 which contains PICADY 9 for the priority junctions and ARCADY 9 for roundabouts. Linsig 3 was used for the assessment of the traffic signal controlled junctions.

Critical geometric parameters of the junctions were measured on-site, with the physical layouts confirmed by OS mapping.

The performance of the junctions has been measured using three standard outputs for ARCADY 9 and PICADY 9 these are Ratio of Flow to Capacity (RFC), Maximum Queuing (Q) and Inclusive Queuing Delay (IQD). For the Linsig 3 assessments the standard outputs are Degree of Saturation (DoS), Mean Maximum Queue (MMQ), Total Delay (Delay) and Practical Reserve Capacity (PRC).

In total twelve scenarios have been tested as part of the TA and these are as follows:

1. 2015 weekday morning peak base;
2. 2015 weekday inter peak base;
3. 2015 weekday evening peak base;
4. 2020 weekday morning peak project base;
5. 2020 weekday inter peak project base;
6. 2020 weekday evening peak project base;
7. 2020 weekday morning peak project base + committed development;
8. 2020 weekday inter peak project base + committed development;
9. 2020 weekday evening peak project base + committed development;
10. 2020 weekday morning peak project base + committed development + development;
11. 2020 weekday inter peak project base + committed development + development;
12. 2020 weekday evening peak project base + committed development + development.

7.9 Mansfield Road / Cockburn Crescent Priority Junction

Table 7.1 below summarises the PICADY 9 results for Mansfield Road / Cockburn Crescent priority junction for all test scenarios

Scenario	Cockburn Crescent			Mansfield Road		
	RFC	Queue (pcu)	Delay (s/ pcu)	RFC	Queue (pcu)	Delay (s/ pcu)
2015 weekday morning peak base	0.09	0.1	5.84	0.03	0	6
2015 weekday inter peak base	0.08	0.1	5.83	0.06	0.1	6.26
2015 weekday evening peak base	0.08	0.1	5.79	0.10	0.1	6.42
2020 weekday morning peak base	0.09	0.1	5.87	0.03	0	6.01
2020 weekday inter peak base	0.08	0.1	5.86	0.07	0.1	6.29
2020 weekday evening peak base	0.08	0.1	5.81	0.10	0.1	6.44
2020 weekday morning peak base + com	0.09	0.1	5.87	0.03	0	6.01
2020 weekday inter peak base + com	0.08	0.1	5.86	0.07	0.1	6.29
2020 weekday evening peak base + com	0.08	0.1	5.81	0.10	0.1	6.44
2020 weekday morning peak base + com + dev	0.11	0.1	6.03	0.04	0	6.06
2020 weekday inter peak base + com + dev	0.10	0.1	6.00	0.10	0.1	6.5
2020 weekday evening peak base + com + dev	0.11	0.1	5.96	0.16	0.2	6.85

Table 7.1 – Summary of PICADY 9Results
Mansfield Road / Cockburn Crescent Priority Junction

The assessment indicates that the Mansfield Road / Cockburn Crescent priority junction is predicted to operate satisfactorily during the weekday morning, inter peak and evening peak periods under all future year scenarios. The proposed development therefore has no impact upon the safe operation of this junction.

7.10 Bavelaw Green / Bridge Road Priority Junction

Table 7.2 below summarises the PICADY 9 results for the Bavelaw Green / Bridge Road priority junction for all test scenarios.

Scenario	Bavelaw Green			Bridge Road		
	RFC	Queue (pcu)	Delay (s/ pcu)	RFC	Queue (pcu)	Delay (s/ pcu)
2015 weekday morning peak base	0.53	1.1	18.94	0.06	0.1	6.76
2015 weekday inter peak base	0.41	0.7	14.76	0.06	0.1	6.92
2015 weekday evening peak base	0.46	0.8	16.45	0.05	0.1	7.25
2020 weekday morning peak base	0.56	1.3	20.45	0.06	0.1	6.81
2020 weekday inter peak base	0.43	0.7	15.51	0.06	0.1	6.97
2020 weekday evening peak base	0.49	0.9	17.48	0.05	0.1	7.33
2020 weekday morning peak base + com	0.57	1.3	20.92	0.06	0.1	6.847
2020 weekday inter peak base + com	0.43	0.8	15.73	0.06	0.1	6.99
2020 weekday evening peak base + com	0.49	0.9	17.73	0.05	0.1	7.35
2020 weekday morning peak base + com + dev	0.62	1.6	24.08	0.06	0.1	6.85
2020 weekday inter peak base + com + dev	0.48	0.9	17.72	0.07	0.1	7.13
2020 weekday evening peak base + com + dev	0.55	1.2	21.10	0.05	0.1	7.65

Table 7.2 – Summary of PICADY 9 Results
Bavelaw Green / Bridge Road priority junction

The assessment indicates that the Bavelaw Green / Bridge Road priority junction is predicted to operate satisfactorily during the weekday morning, inter peak and evening peak periods under all future year scenarios. The proposed development therefore has no impact upon the safe operation of this junction.

7.11 Main Street / Bridge Road / Johnsburn Road / Larchfield Roundabout

Table 7.3 below summarises the ARCADY 9 results for the Main Street / Bridge Road / Johnsburn Road / Larchfield Roundabout for all test scenarios

Scenario	Bridge Road			Main Street			Johnsburn Road			Larchfield		
	RFC	Queue (pcu)	Delay (s/pcu)	RFC	Queue (pcu)	Delay (s/pcu)	RFC	Queue (pcu)	Delay (s/pcu)	RFC	Queue (pcu)	Delay (s/pcu)
2015 weekday morning peak base	0.16	0.2	4.10	0.14	0.2	3.79	0.15	0.2	4.10	0.01	0	4.34
2015 weekday inter peak base	0.20	0.3	4.24	0.12	0.2	3.79	0.08	0.1	3.74	0.01	0	4.09
2015 weekday evening peak base	0.28	0.4	4.75	0.12	0.2	3.93	0.09	0.1	0.09	0.01	0	0.01
2020 weekday morning peak base	0.17	0.2	4.13	0.14	0.2	3.83	0.16	0.2	4.15	0.01	0	4.38
2020 weekday inter peak base	0.20	0.3	4.28	0.13	0.1	3.83	0.09	0.1	3.76	0.01	0	4.11
2020 weekday evening peak base	0.29	0.5	4.84	0.13	0.2	3.97	0.10	0.1	3.79	0.01	0	4.11
2020 weekday morning peak base + com	0.22	0.3	4.44	0.16	0.2	4.11	0.16	0.2	4.17	0.01	0	4.40
2020 weekday inter peak base + com	0.21	0.3	4.32	0.13	0.2	3.86	0.09	0.1	3.78	0.01	0	4.41
2020 weekday evening peak base + com	0.30	0.5	4.89	0.14	0.2	4.01	0.10	0.1	3.81	0.01	0	4.14
2020 weekday morning peak base + com + dev	0.18	0.2	4.22	0.15	0.2	3.87	0.18	0.2	4.28	0.01	0.2	4.47
2020 weekday inter peak base + com + dev	0.24	0.3	4.47	0.14	0.2	3.93	0.10	0.1	3.84	0.01	0	4.17
2020 weekday evening peak base + com + dev	0.34	0.6	5.21	0.14	0.2	4.11	0.11	0.1	3.85	0.01	0	4.16

Table 7.3 – Summary of ARCADY 9 Results
Main Street / Bridge Road / Johnsburn Road / Larchfield Roundabout

The assessment indicates that the Main Street / Bridge Road / Johnsburn Road / Larchfield Roundabout is predicted to operate satisfactorily during the weekday morning, inter peak and evening peak periods under all future year scenarios. The proposed development therefore has no impact upon the safe operation of this junction.

7.12 Bridge Road / Lanark Road West Traffic Signals

Tables 7.4, 7.5 and 7.6 below summarises the Linsig 3 results for the Bridge Road / Lanark Road West Traffic Signals for all test scenarios

A number of modelling assumptions were used in the preparation of the LinSig 3 model, these were;

- Saturation flows calculated from lane geometry (RR67 predictions);
- Bridge Road treated as two full lanes, due to observed traffic behaviour;
- Cycle time used based on VA Max times as provided by CEC;
- All red pedestrian stage assumed to be demanded once every other cycle based upon on site observations.

For the purposes of the LinSig 3 assessment all the scenarios outlined above have been optimised for Practical Reserve Capacity. For the Base 2015 all scenarios have used the VA Max timing information provided by CEC to assess the current operation of the traffic signals at Bridge Street.

Tables 7.1, 7.2 and 7.3 below summarise the results of the LinSig 3 assessment

AM Peak	2015 Base (VA Max)		2015 Base		2020 + Com		2020 Total	
	DoS	MMQ	DoS	MMQ	DoS	MMQ	DoS	MMQ
Lanark Rd W (West)	34.0	6.8	46.1	8.3	50.9	9.4	53.0	9.8
Lanark Rd W (East)	60.1	10.9	47.2	8.9	48.7	9.2	51.1	9.7
Bridge Road	L 19.3 R 74.8	L 2.6 R 14.1	L 12.2 R 47.5	L 1.9 R 9.4	L 14.0 R 50.5	L 2.1 R 10.1	L 14.9 R 53.5	L 2.3 R 11.0
PRC	20.3		89.5		76.8		68.3	
Total Cycle Time (s)*	244		244		244		244	

* Cycle time runs Traffic Stages 1, 2 and 3 twice, and all red pedestrian Stage 4 once (i.e. Stage 4 assumed to run once every other cycle)

Table 7.4 – Summary of Linsig 3 Results
Bridge Road / Lanark Road West Traffic Signals

Inter Peak	2015 Base (VA Max)		2015 Base		2020 + Com		2020 Total	
	DoS	MMQ	DoS	MMQ	DoS	MMQ	DoS	MMQ
Lanark Rd W (West)	27.1	2.6	22.9	2.0	26.4	2.2	29.4	2.3
Lanark Rd W (East)	74.1	16.0	51.3	10.7	54.4	11.7	58.7	12.9
Bridge Road	L 21.7 R 45.9	L 3.0 R 7.4	L 24.3 R 51.4	L 2.8 R 7.1	L 27.9 R 54.6	L 3.2 R 7.5	L 28.6 R 57.9	L 3.3 R 8.2
PRC	21.4		75.2		65.0		53.3	
Total Cycle Time (s)*	222		222		222		222	

* Cycle time runs Traffic Stages 1, 2 and 3 twice, and all red pedestrian Stage 4 once (i.e. Stage 4 assumed to run once every other cycle)

Table 7.5 – Summary of Linsig 3 Results
Bridge Road / Lanark Road West Traffic Signals

PM Peak	2015 Base (VA Max)		2015 Base		2020 + Com		2020 Total	
	DoS	MMQ	DoS	MMQ	DoS	MMQ	DoS	MMQ
Lanark Rd W (West)	50.3	4.3	34.3	2.5	39.8	2.9	49.8	3.5
Lanark Rd W (East)	88.4	23.1	62.1	13.9	66.2	15.2	70.5	17.0
Bridge Road	L 17.4 R 46.9	L 2.1 R 6.8	L 23.5 R 62.4	L 2.2 R 7.2	L 27.9 R 66.6	L 2.7 R 8.0	L 28.1 R 70.4	L 2.8 R 8.9
PRC	1.9		44.1		35.0		27.7	
Total Cycle Time (s)*	210		210		210		210	

* Cycle time runs Traffic Stages 1, 2 and 3 twice, and all red pedestrian Stage 4 once (i.e. Stage 4 assumed to run once every other cycle)

Table 7.6 – Summary of Linsig 3 Results
Bridge Road / Lanark Road West Traffic Signals

The 2015 Base (VA Max) results show the junction operates with PRC values of 20.3%, 21.4% and 1.9% during the AM, Inter and PM peak periods. The mean max queues predicted by the model calibrate well with the queues observed during the surveys which demonstrates the model provides an accurate representation of the operation of the signals. A junction would be considered at capacity once the PRC reaches 0%. Therefore it can be seen from the results of the 2015 Base (VA Max) modelling that the junction is not performing well during the evening peak period this can be attributed to the fixed signal timings used during these periods and the lack of flexibility in the operation of the traffic signal timings.

The results of the 2015 Base show the performance of the signals with the timings optimised for Practical Reserve Capacity based upon the current traffic flows observed at the junction. This means that rather than using the VA Max timings the LigSig 3 model has optimised the signal timings to improve the overall efficiency of the junction bases upon the traffic flow information obtained from the surveys. The 2015 Base results show the junction operates well within capacity, with PRC values of 89.5%, 75.2% and 44.1% for the AM, Inter and PM peaks respectively. Importantly the queue lengths predicted are reduced as a result of the optimisation and the overall of performance of the junction, especially in the PM peak, is significantly improved.

The 2015 Base assessment therefore clearly demonstrates that the signal timings currently used at the junction, the VA Max, are not set to provide the most optimum performance for the junction and these can be improved as and demonstrated by the 2015 Base assessment. It is clear that the signal timings for the junction have not been upgrade for a considerable time and do not therefore take account in changes in traffic patterns over the years.

It is understood that as part of the recent planning permission for the Ravelrig Road residential development the existing signal control equipment at the Bridge Road / Lanark Road West signals will be upgraded to a MOVA control system. MOVA provides a significant improvement to standard VA as it allows the signal timing to be altered in real time through additional on-street detection equipment and the MOVA software. The introduction of MOVA has the potential to improve the overall operation of the junction by 15 – 20%.

Tables 7.4, 7.5 and 7.6 show that optimising the signals for both the Ravelrig Road development and the proposed Cockburn Crescent development the traffic signals will operate with significant practical reserve capacity with a level of queueing less than is experience at the moment under the VA signal set up.

7.13 Riccarton Mains Road / Lanark Road West

Table 7.7 below summarises the PICADY 9 results for the Riccarton Mains Road / Lanark Road West priority junction for all test scenarios.

Scenario	Riccarton Mains Road			Lanark Road West		
	RFC	Queue (pcu)	Delay (s/ pcu)	RFC	Queue (pcu)	Delay (s/ pcu)
2015 weekday morning peak base	0.22	0.3	13.59	0.13	0.2	8.19
2015 weekday inter peak base	0.37	0.6	15.47	0.10	0.1	6.96
2015 weekday evening peak base	0.59	1.4	23.85	0.06	0.1	6.72
2020 weekday morning peak base	0.23	0.3	14.30	0.13	0.2	8.31
2020 weekday inter peak base	0.39	0.6	16.50	0.11	0.1	7.00
2020 weekday evening peak base	0.63	1.6	27.39	0.06	0.1	6.75
2020 weekday morning peak base + com	0.23	0.3	14.52	0.14	0.2	8.37
2020 weekday inter peak base + com	0.39	0.6	16.76	0.11	0.1	7.00
2020 weekday evening peak base + com	0.64	1.7	28.49	0.06	0.1	6.76
2020 weekday morning peak base + com + dev	0.24	0.3	14.99	0.14	0.2	8.48
2020 weekday inter peak base + com + dev	0.43	0.7	18.20	0.11	0.1	7.02
2020 weekday evening peak base + com + dev	0.70	2.2	35.10	0.07	0.1	6.81

Table 7.7 – Summary of PICADY 9 Results
Riccarton Mains Road / Lanark Road West priority junction

The assessment indicates that the Riccarton Mains Road / Lanark Road West priority junction is predicted to operate satisfactorily during the weekday morning, inter peak and evening peak periods under all future year scenarios. The proposed development therefore has no impact upon the safe operation of this junction.

It was noted during the traffic surveys that short term parking was taking place adjacent to the post office. While this parking was very sporadic, when it did occur it interrupted the free flow of traffic at the junction. In order to address this problem it is recommended the double yellow lines at this junction are extended on the northern side in order to deter on street parking and improve the operation of the junction.

7.14 Traffic Impact Assessment Summary

The traffic impact assessment set out above has demonstrated that the proposed development can adequately be accommodated at all the junctions considered within the traffic impact assessment.

8. Summary

Modus Transport Solutions Ltd was commissioned by Barratt & David Wilson Homes (East & West Scotland) to prepare a Transport Assessment (TA) in support of a Planning Application in Principle (PiPP) for the development of up to 150 residential units with associated access arrangements at Cockburn Crescent, Balerno, Edinburgh.

The site at Cockburn Crescent was subject to a previous planning application (ref.13/02787/PPP) which was registered by City of Edinburgh Council in July 2013 and sought permission in principle for a residential development of approximately 280 units. This application was refused by the Council in November 2013 on Green Belt and prematurity grounds.

An appeal was submitted to the Scottish Government in January 2014 and subsequently dismissed by the Government appointed reporter in March 2014.

The current application seeks planning permission in principle for a residential development based on a significantly lower number of units than previously proposed and is based upon new planning policy at national level and the findings of a recent appeal decisions in Balerno which post-dated the previous application and appeal.

The TA was prepared in line with the guidelines set out in the Scottish Government's publication 'Transport Assessment and Implementation: A Guide' and takes account of the policies within the Scottish Planning Policy document with an assessment of the accessibility of the site by car and non-car transport modes including walking, cycling and public transport. The scope of the Transport Assessment was agreed with The City of Edinburgh Council prior to commencing with the study.

The site is located on the southern edge of Balerno and is bounded to the north by Cockburn Crescent, Mansfield Road to the east and open fields and farmland to the south and west. The development proposals include for the construction of 150 new residential units along with associated access and infrastructure to form the new southern boundary to the village of Balerno.

The development site complies well with both National and Local Transport Policy given its strong links to existing walking, cycling and public transport facilities in the area.

An accessibility review was undertaken to assess opportunities for travel to and from the development site by all relevant transport modes including a review the surrounding walking, cycling and public transport provision. This accessibility review confirmed that the site was highly accessible and provided future residents of the development to undertake informed and sustainable travel choices.

A Travel Plan Framework was prepared which outlines a number of measures to support sustainable travel.

A full traffic impact assessment for the development was undertaken and considered the local road network surround the site along with a number of junctions as agreed with The City of Edinburgh Council.

9. Conclusions

The site complies well with the guidance set out within current national and local transport policy. The site is very well located in relation to existing walking, cycling and public transport facilities and lies within close proximity to local amenities, shops and schools in accordance with PAN 75 and Scottish Planning Policy. The site is accessibility by all modes of transport and therefore the proposal have the potential to provide a development which will give its residents a full range of travel choices in the future.

The potential exists for up to three new access points to be created on Cockburn Crescent which will provide a safe and direct access into the site for both vehicles and pedestrians.

A residential travel plan will be provided as part of the development proposals and this will seek to encourage residents of the new development to consider their travel choices and provide information and support to encourage them to choose sustainable modes of travel.

The traffic impact assessment has demonstrated that the development will have no detrimental impact upon the safe operation of the local junctions considered and that no mitigation measures are required.

Appendix 1 - Scoping

Modus Transport Solutions Ltd

1 The Round
Dunfermline
KY12 7YH

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E: duncan@modustransportsolutions.co.uk
W :www.modustransportsolutions.co.uk

Matthew Simpson
City of Edinburgh Council
Transport Policy and Planning
Services for Communities
Business Centre C2
Waverley Court
4 East Market Street
Edinburgh
EH8 8BG

4th September 2015

Dear Matthew,

Cockburn Crescent, Balerno, Residential Development
Transport Assessment - Scoping

We refer to the above site and our recent meeting and subsequent e-mail correspondence in relation the development proposals and in particular the scope of the Transport Assessment to be prepared to support the latest Planning Application for the site.

At this stage we are currently progressing the preparation of the Transport Assessment (TA) to support the application and, on the basis of our discussions, we are writing to agree the remaining scope of the TA.

As you are aware a previous application was submitted for this development site in 2013 which was accompanied by a supporting TA, prepared by SKM Colin Buchanan. The scope of the 2013 TA was agreed with The City of Edinburgh Council and as we discussed at our recent meeting the scope of the revised TA, which is being prepare by Modus Transport Solutions Ltd (MTS), and that it should generally follow the same agreed scope as the 2013 TA.

We intend to undertake new traffic surveys to update the information being used in the latest TA. We also intend to take account of the recently consented Gladman development at Ravelrig Road, Balerno. We will also take cognisance of The Second Proposed Local Development Plan - Action Programme Updated May 2015 and any proposals which may affect the development at Cockburn Street, Balerno.

The latest development proposals for site are for up to 150 units which are to be accessed from a new junction (s) on Cockburn Crescent.

The TA will be undertaken in accordance in the Scottish Governments publication 'Transport Assessment and Implementation: A Guide' and takes account of the policies within the Scottish Planning Policy document with an assessment of the accessibility of the site by car and non-car transport modes including walking, cycling and public transport. A full accessibility review for the site will also be undertaken, this will consider pedestrian accessibility to local amenities.

It is proposed that MTS staff will walk the relevant routes surrounding the development and provide commentary on the appropriateness of pedestrian facilities and relevant walking times to local amenities. Any issues in relation to pedestrian access or safety will be highlighted and mitigation proposed where required.

A comprehensive review of public transport facilities will also be undertaken as part of the TA and this will consider bus stop locations and facilities at the bus stops in respect of the potential usage by residents of the proposed development. In addition we will also prepare Accession public transport accessibility mapping to demonstrate the travel times from and to the site by public transport.

Trip Generation

In order to determine the appropriate trip generation characteristics for the proposed residential development we intend to re-survey the existing residential developments used within the original SKM Colin Buchanan 2013 TA, namely Whitelea Road and Greenfield Crescent. These junctions provide access to adjacent residential developments with similar characteristics to the proposed development and therefore allow bespoke local and relevant trip rates to be established. We will provide this information to you as soon as it becomes available. However, as this methodology was agreed previously CEC we do not foresee any issues using the same methodology.

In accordance with the Scottish Governments publication 'Transport Assessment and Implementation: A Guide' a people trip assessment will be determine from information taken from the SCROL database and the results of the traffic surveys.

Trip Distribution

It is proposed that the development trips will be distributed on the local road network on the basis of 80% towards Edinburgh and 20% towards West Lothian. This was the previously agreed distribution for the 2013 SKM Colin Buchanan TA and as there have been no significant network changes in the local area this distribution is still deemed appropriate.

Traffic Surveys

As agreed traffic surveys will be undertaken at the junctions listed;

1. Mansfield Road / Cockburn Crescent;
2. Bavelaw Green / Bridge Road;
3. Main Street / Bridge Road Roundabout;
4. Bridge Road / Lanark Road West Signals;
5. Riccarton Mains Road / Lanark Road West.

The junction traffic counts will be undertaken in both the morning (0700 – 1000) and evening (14:30 – 19:00) peaks and an appropriate local peak for both periods determined from the results.

Committed Development

We will take into account the recent planning permission granted for the Ravelrig Road development and the traffic associated with this development. It is our understanding however that there are no other committed developments in either Balerno or Currie which should be taken into account. We are aware of allocated Local Development Plan sites in Currie but these do not have Planning Permission nor an accompanying Transport Assessment and therefore we have assumed that these do not need to be taken into account within the Cockburn Crescent TA. Your clarification on this matter would be appreciated.

Assessment Year and Traffic Growth

Based upon information provided by the Planning Consultant for the project we have assumed an opening year for the development of 2020. This assumes full development of all 150 units. Based upon our recent discussions and the previous TA we have assume that zero traffic growth should be applied to the 2015 base traffic as the development proposals, and the Ravelrig Road development, will effectively account for the potential background growth within the study area.

Travel Plan Framework

A Travel Plan Framework will be prepared as part of the TA. This will set out a series of measures which could be implemented to encourage residents of the new development to choose to use sustainable travel modes for their journey to work in the peak periods.

Developer Contributions towards Transport Improvements

We would be grateful if you could confirm any current Policies within The City of Edinburgh Council which relate to any developer contributions of local / strategic transport initiatives which may impact upon the development proposals at Balerno. We are aware of The Second Proposed Local Development Plan - Action Programme Updated May 2015 however if there are any other initiative applicable to the Balerno site we would be grateful if you could inform us at your earliest convenience.

We trust that the above scope for the Transport Assessment meets with your agreement at this stage. We would be grateful for your early agreement to the scope of the Transport Assessment as set out in this letter and your confirmation in relation to committed developments.

We look forward to hearing from you at your earliest convenience.

Yours sincerely
On behalf of Modus Transport Solutions

Duncan Birrell
Director

Phone: 07816902730
E-mail: duncan@modustransportsolutions.co.uk

Duncan Birrell

From: Matthew Simpson
Sent: 05 October 2015 16:03
To: 'Duncan Birrell'
Subject: RE: Cockburn Crescent , Balerno - Scoping Letter

Duncan

I confirm that the proposed scope is generally acceptable with the following comments.

You should note that the Second LDP Action Programme (2015) does not include this site specifically but that contributions will be required in relation to Gillespie Crossroads and Hermiston Park and Ride (Section 5b South West Edinburgh).

Committed developments are normally taken as those having planning permission. You may wish to acknowledge the proposed sites set out in the local plan but it is agreed that there is no meaningful data in existence for many of these.

Zero growth to 2020 looks a little unreasonable given that we have been assuming that since about 2008. The development at Newmills Road is predicted to increase am peak traffic by about 3.9% at Gillespie Crossroads. I think a reasonable growth rate should be applied.

Trust that addresses the points.

Regards

Matthew Simpson
Transport Policy and Planning, Services for Communities, Business Centre C2, Waverley Court, 4 East Market Street, Edinburgh EH8 8BG - Tel 0131 529 3426

From: Duncan Birrell [mailto:duncan@modustransportsolutions.co.uk]
Sent: 04 September 2015 14:57
To: Matthew Simpson
Subject: Cockburn Crescent , Balerno - Scoping Letter
Importance: High

Dear Mathew,

Further to our recent meeting and e-mail correspondence please find attached a scoping letter for Cockburn Street Balerno which sets out the agree parameters to be used with the TA. There a few points of clarification required and these are set out within the letter.

I look forward to hearing from you at your earliest convenience.

Regards

Duncan

Duncan Birrell
BEng(Hons), C.Eng, MICE, MCIHT

Modus Transport Solutions Ltd
1 The Round,
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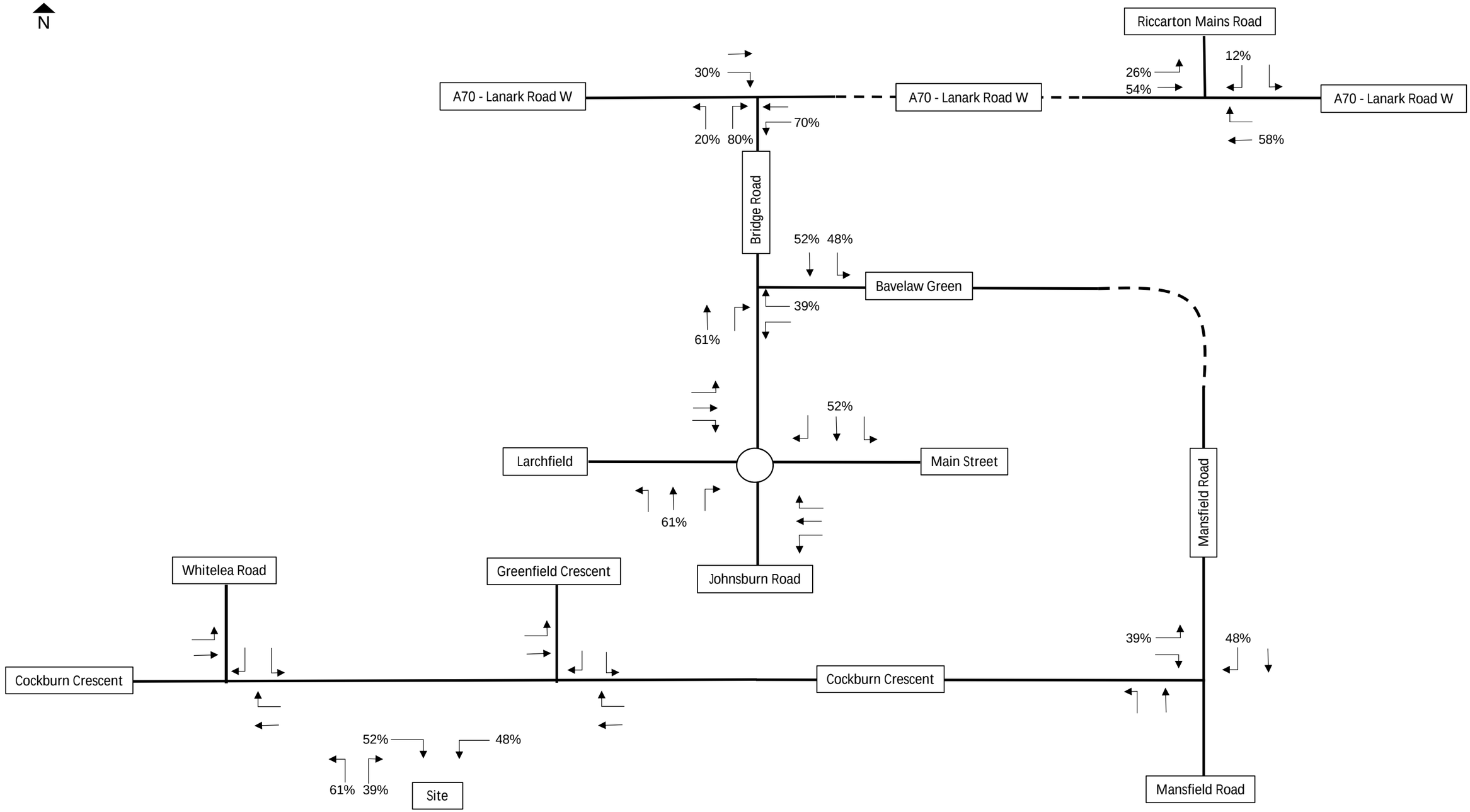
Mobile: 07816 902730
Email: duncan@modustransportsolutions.co.uk

Appendix 2 - Materplan

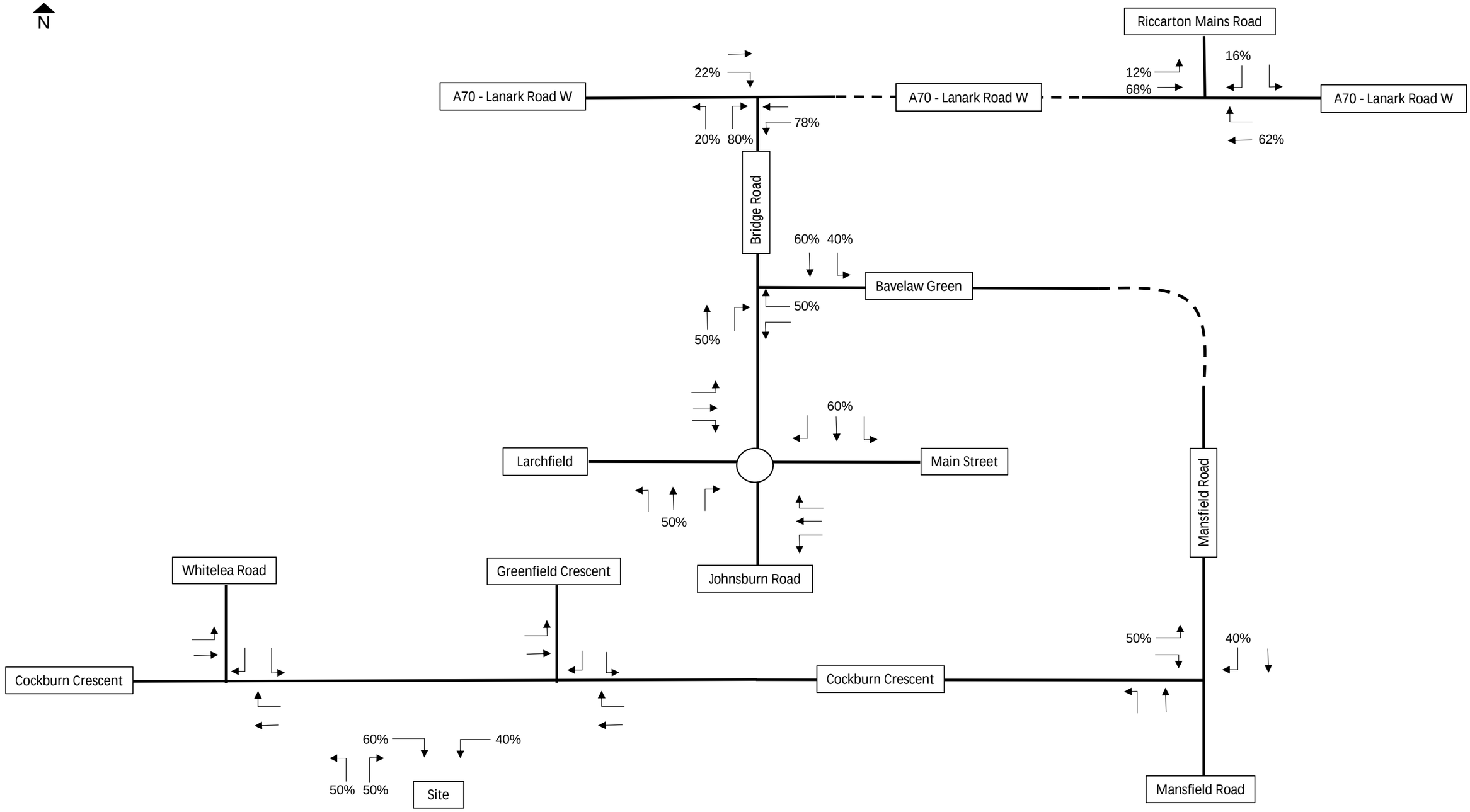
ema
architects + masterplanners

Cockburn Crescent, Balerno
Proposed Site Layout

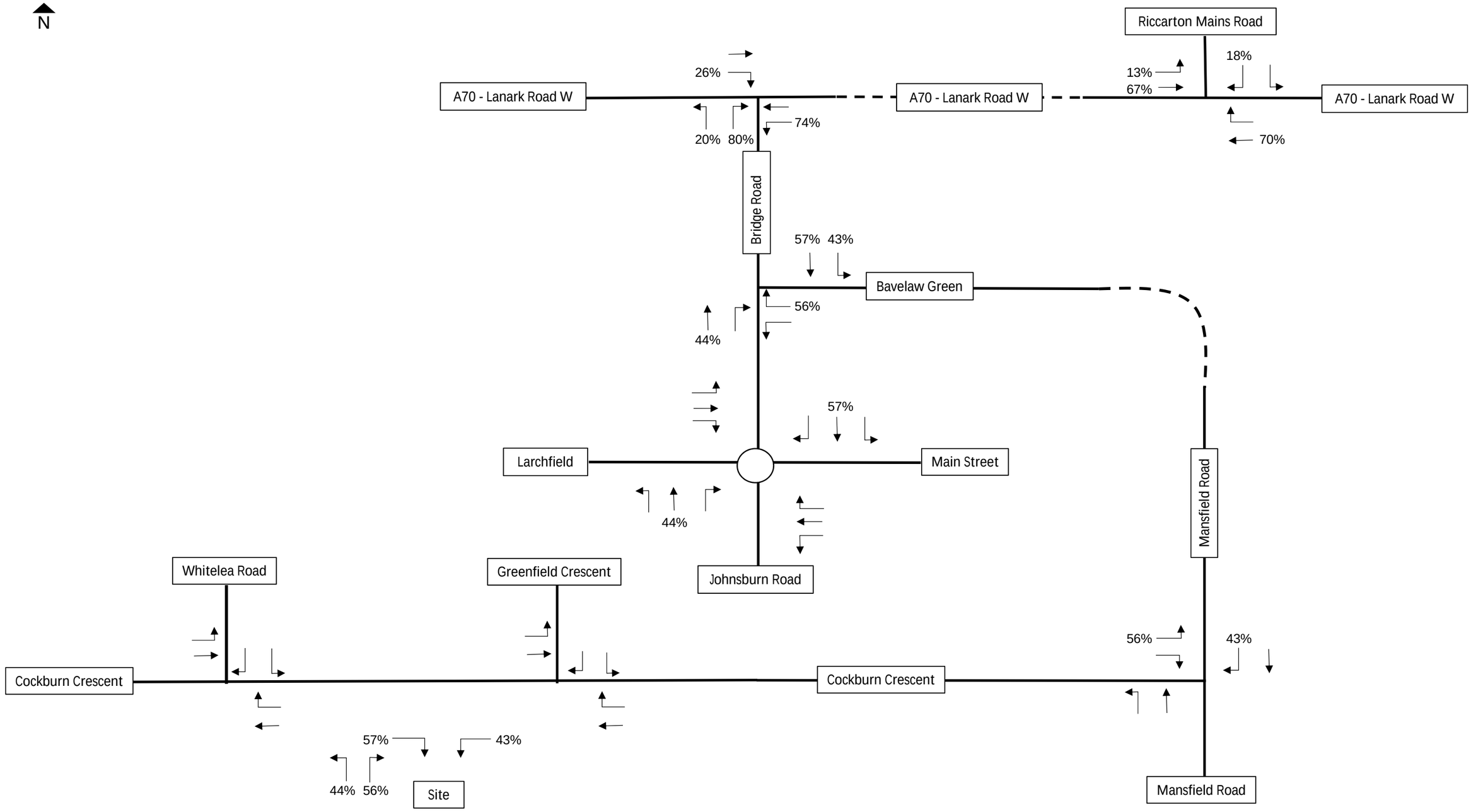
Appendix 3 – Traffic Flows



Title 2020 Morning Peak Development Distribution	**Client** Barratt East Scotland	**Project** Proposed Residential Development, Balerno
	PROJECT NUMBER MTS 3017	**Drawn by** DRB **Date** October 2015
	Modus Transport Solutions Ltd	**Drawing No.** FIGURE 5.1



Title 2020 Inter Peak Development Distribution	**Client** Barratt East Scotland	**Project** Proposed Residential Development, Balerno
	PROJECT NUMBER MTS 3017	**Drawn by** DRB **Date** October 2015
	Modus Transport Solutions Ltd	**Drawing No.** FIGURE 5.2



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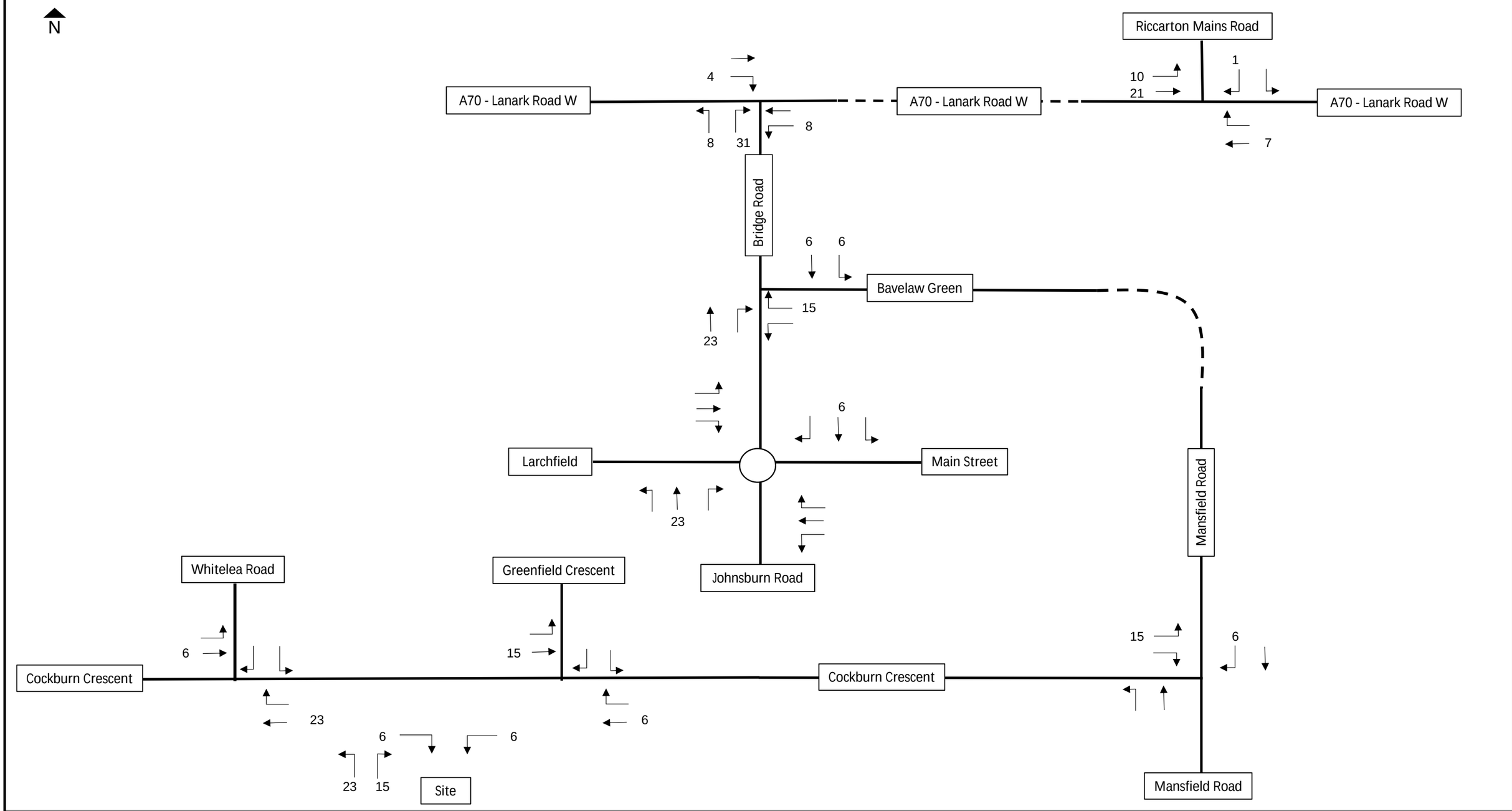
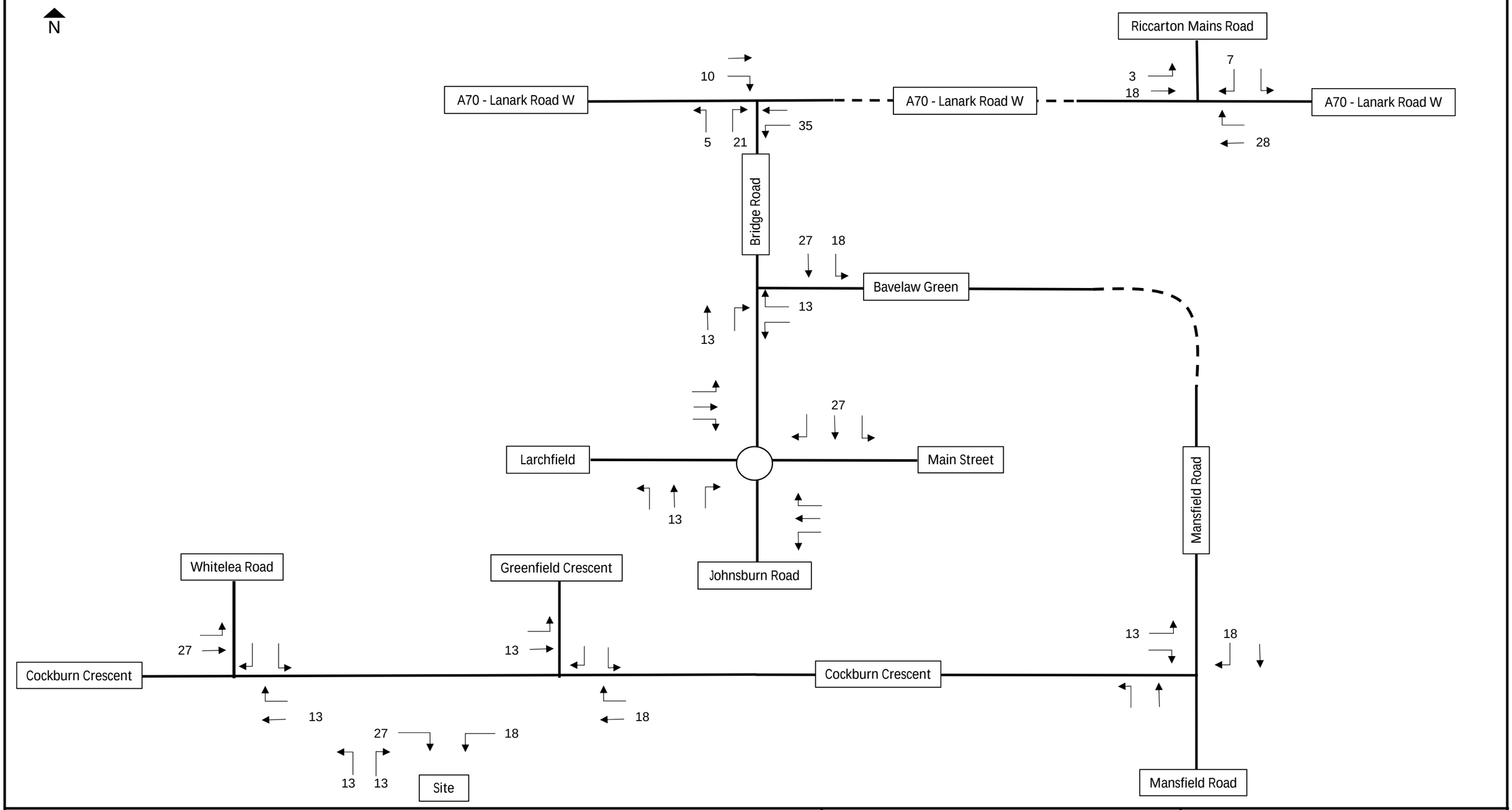
	PROJECT NUMBER MTS 3017	**Drawn by** DRB **Date** October 2015
	Modus Transport Solutions Ltd	**Drawing No.** FIGURE 5.3



Title 2020 Morning Peak Development Traffic Flows (PCU's)	**Client** Barratt East Scotland	**Project** Proposed Residential Development, Balerno
	PROJECT NUMBER MTS 3017	**Drawn by** DRB **Date** October 2015
	Modus Transport Solutions Ltd	**Drawing No.** FIGURE 5.4



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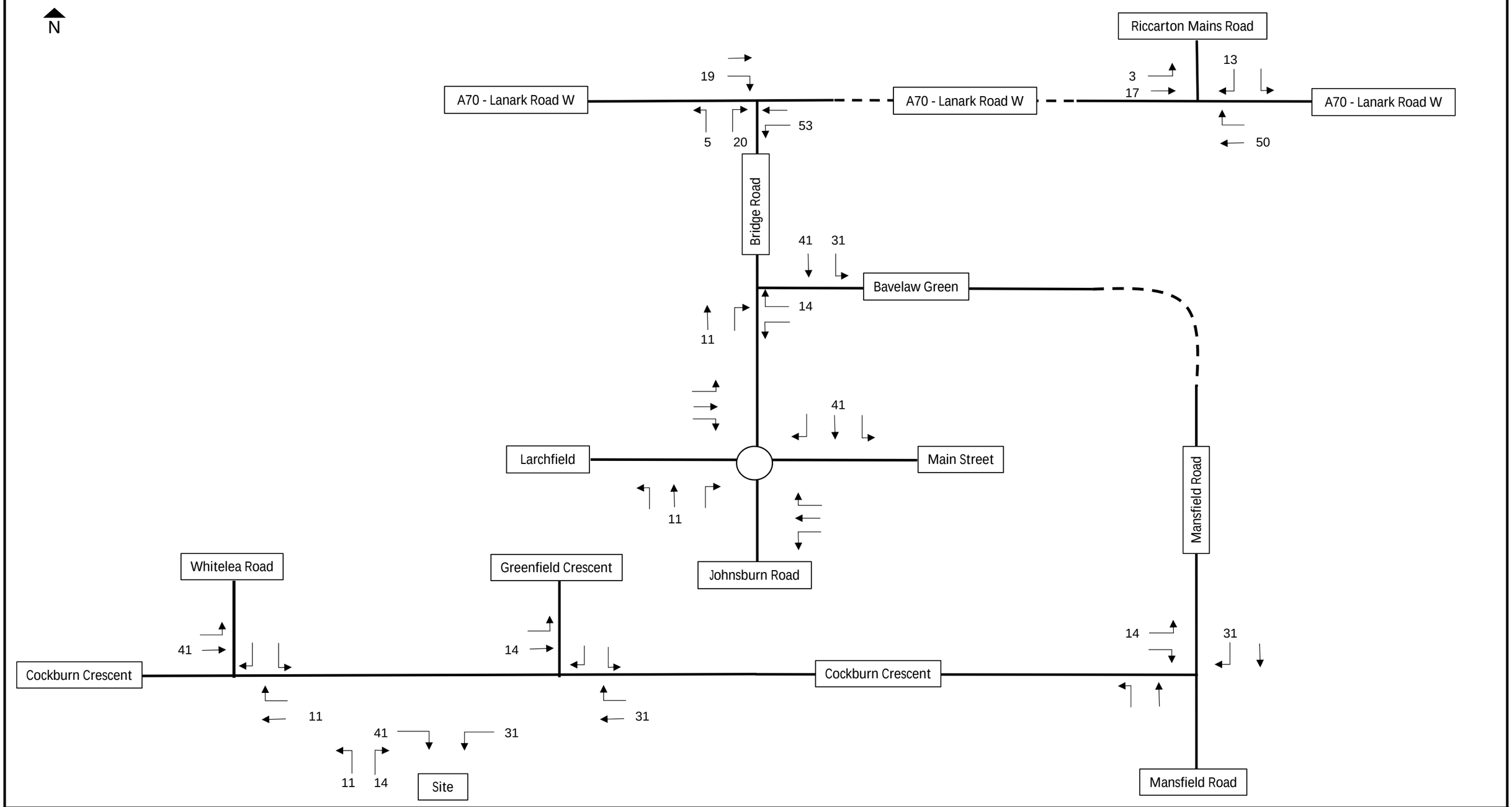
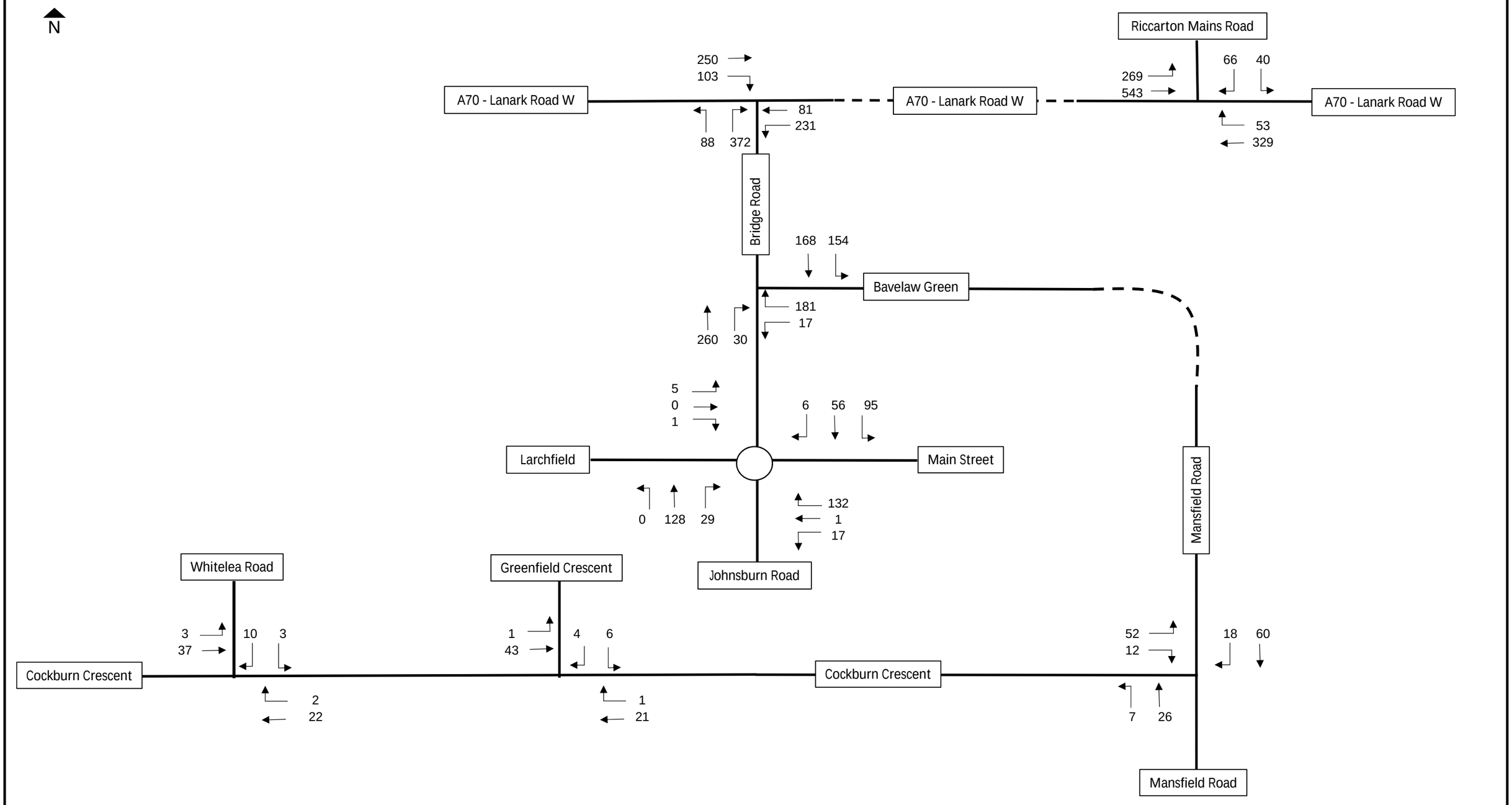
	PROJECT NUMBER MTS 3017	**Drawn by** DRB **Date** October 2015
	Modus Transport Solutions Ltd	**Drawing No.** FIGURE 5.5



Title 2020 PM Peak Development Traffic Flows (PCU's)	**Client** Barratt East Scotland	**Project** Proposed Residential Development, Balerno
	PROJECT NUMBER MTS 3017	**Drawn by** DRB **Date** October 2015
	Modus Transport Solutions Ltd	**Drawing No.** FIGURE 5.6



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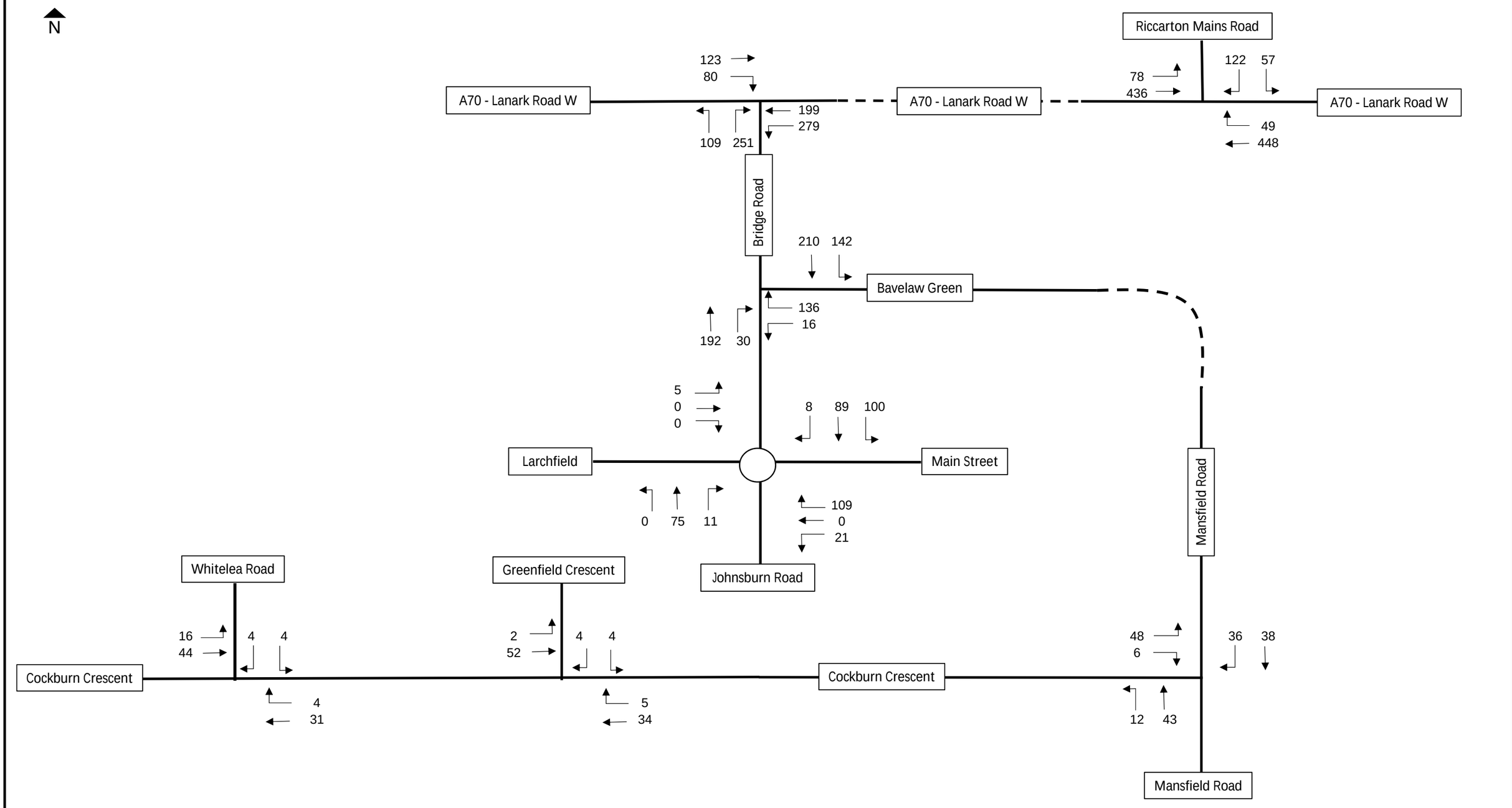
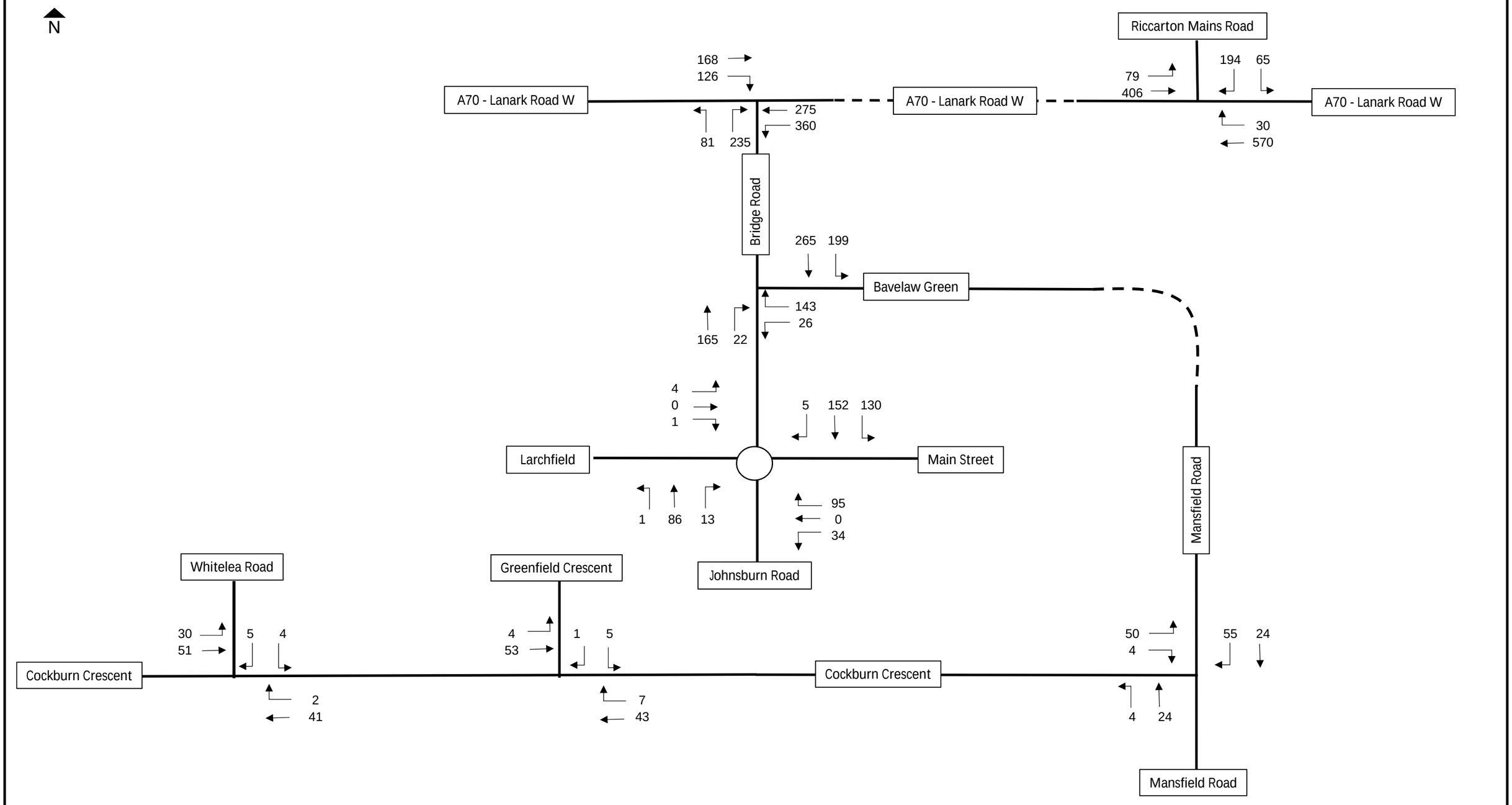
	PROJECT NUMBER MTS 3017	**Drawn by** DRB **Date** October 2015
Modus Transport Solutions Ltd	**Drawing No.** FIGURE 7.1	



Title 2015 Inter Peak Traffic Flows (PCU's)	**Client** Barratt East Scotland	**Project** Proposed Residential Development, Balerno
	PROJECT NUMBER MTS 3017	**Drawn by** DRB **Date** October 2015
	Modus Transport Solutions Ltd	**Drawing No.** FIGURE 7.2



Title 2015 Evening Peak Traffic Flows (PCU's)	**Client** Barratt East Scotland	**Project** Proposed Residential Development, Balerno
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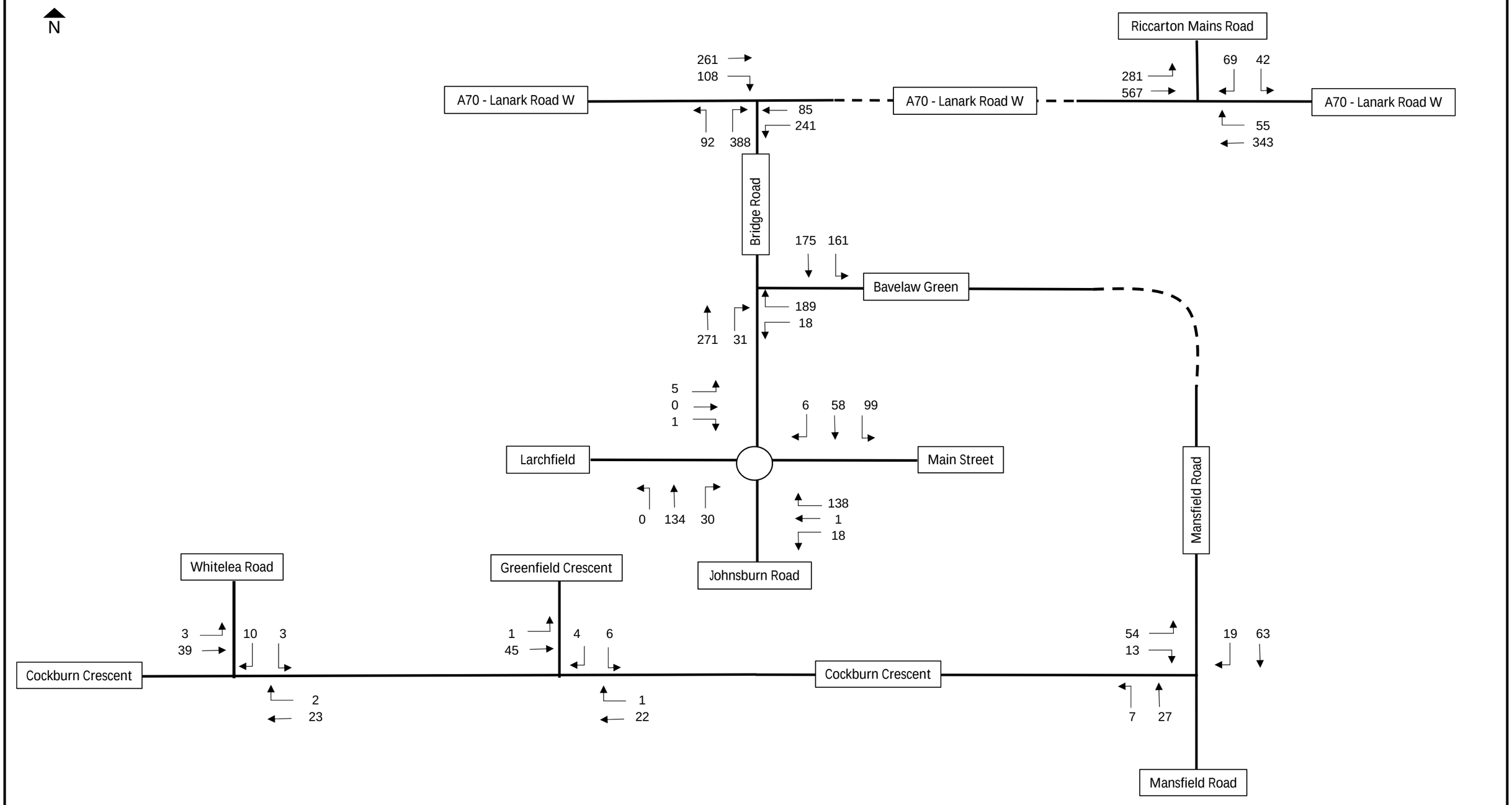
	Modus Transport Solutions Ltd	**Drawing No.** FIGURE 7.3



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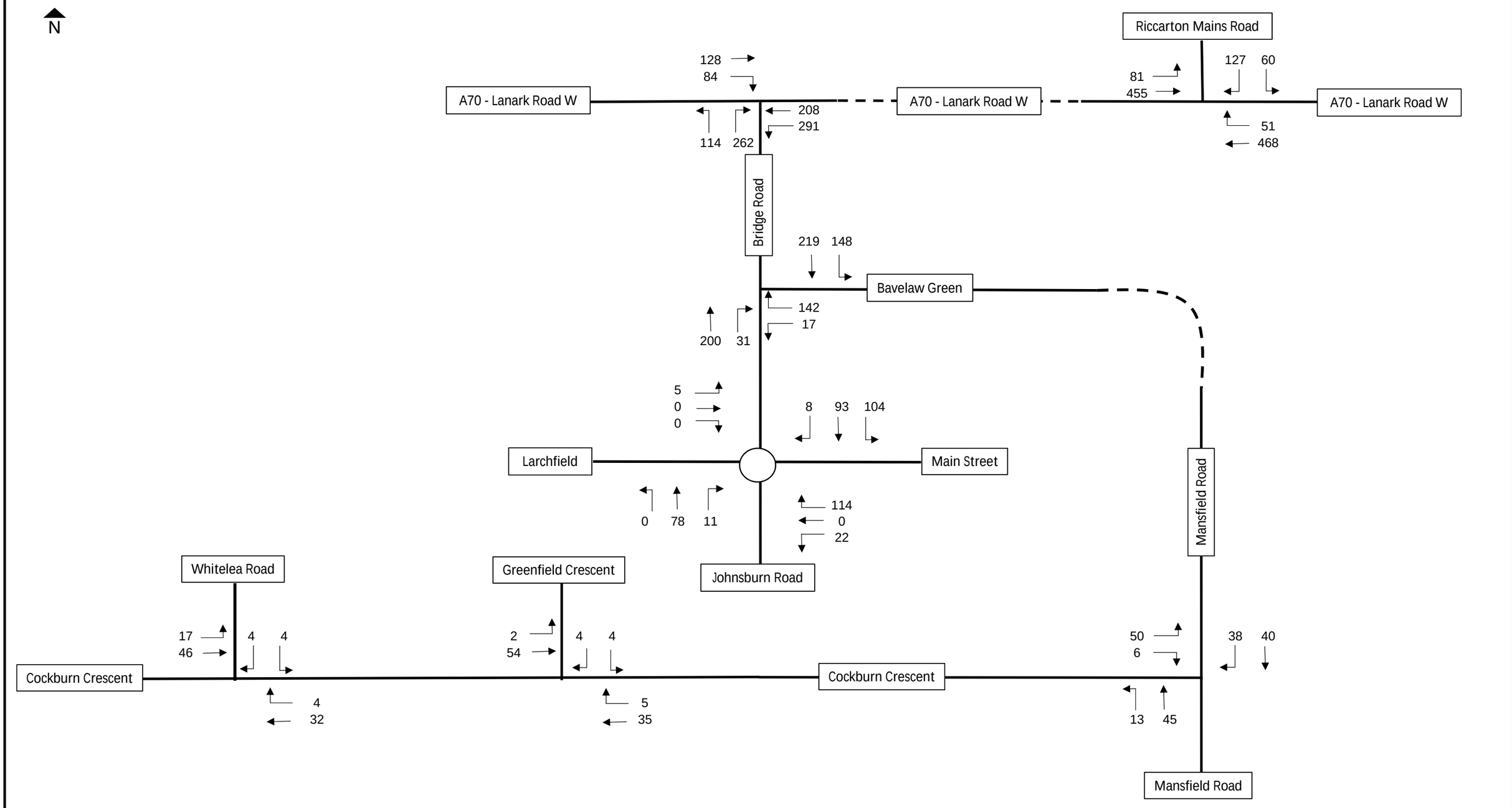
	PROJECT NUMBER MTS 3017	**Drawn by** DRB **Date** October 2015
	Modus Transport Solutions Ltd	**Drawing No.** FIGURE 7.4



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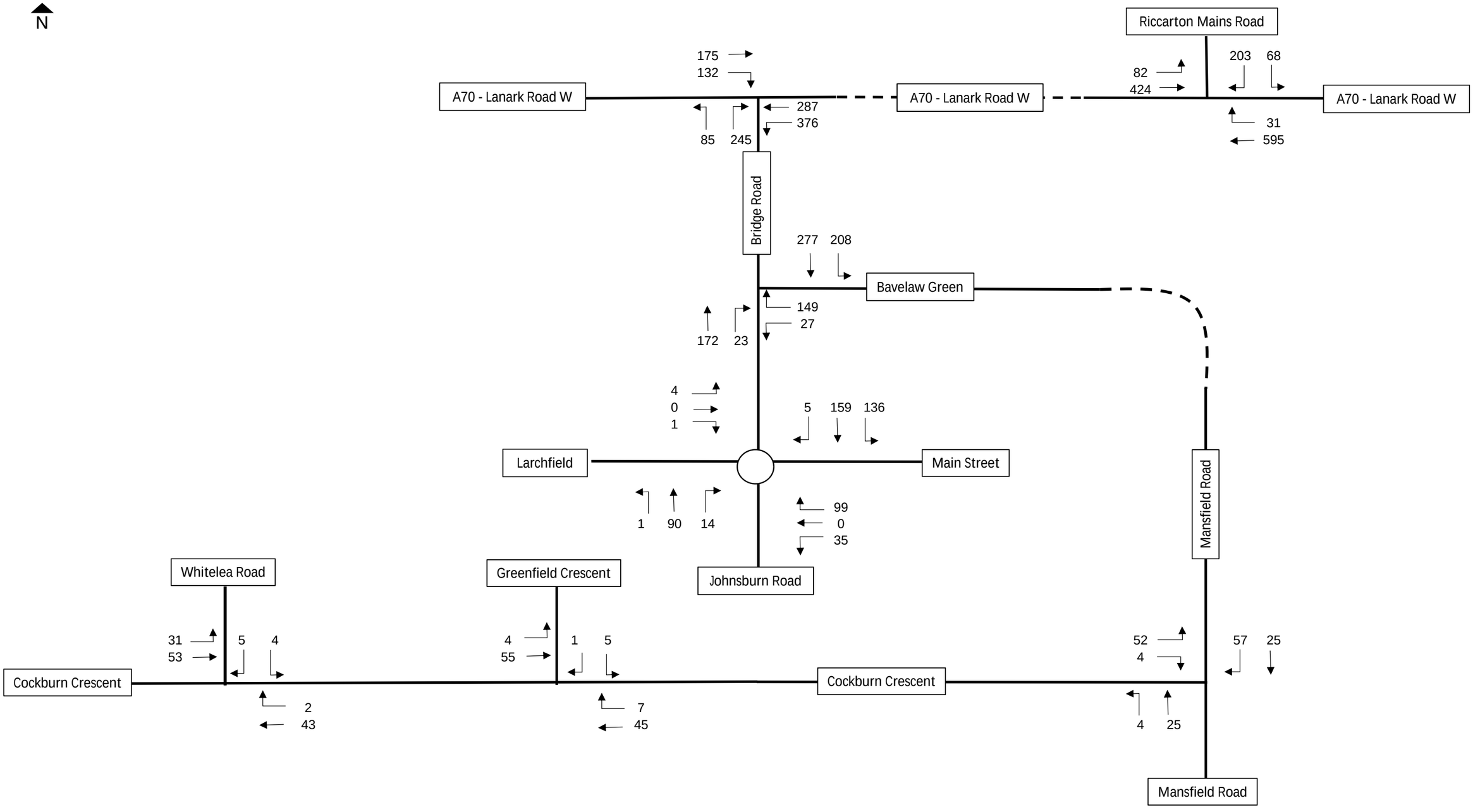
	PROJECT NUMBER MTS 3017	**Drawn by** DRB **Date** October 2015
	Modus Transport Solutions Ltd	**Drawing No.** FIGURE 7.5



Title 2020 Evening Peak Traffic Flows (PCU's)	**Client** Barratt East Scotland	**Project** Proposed Residential Development, Balerno
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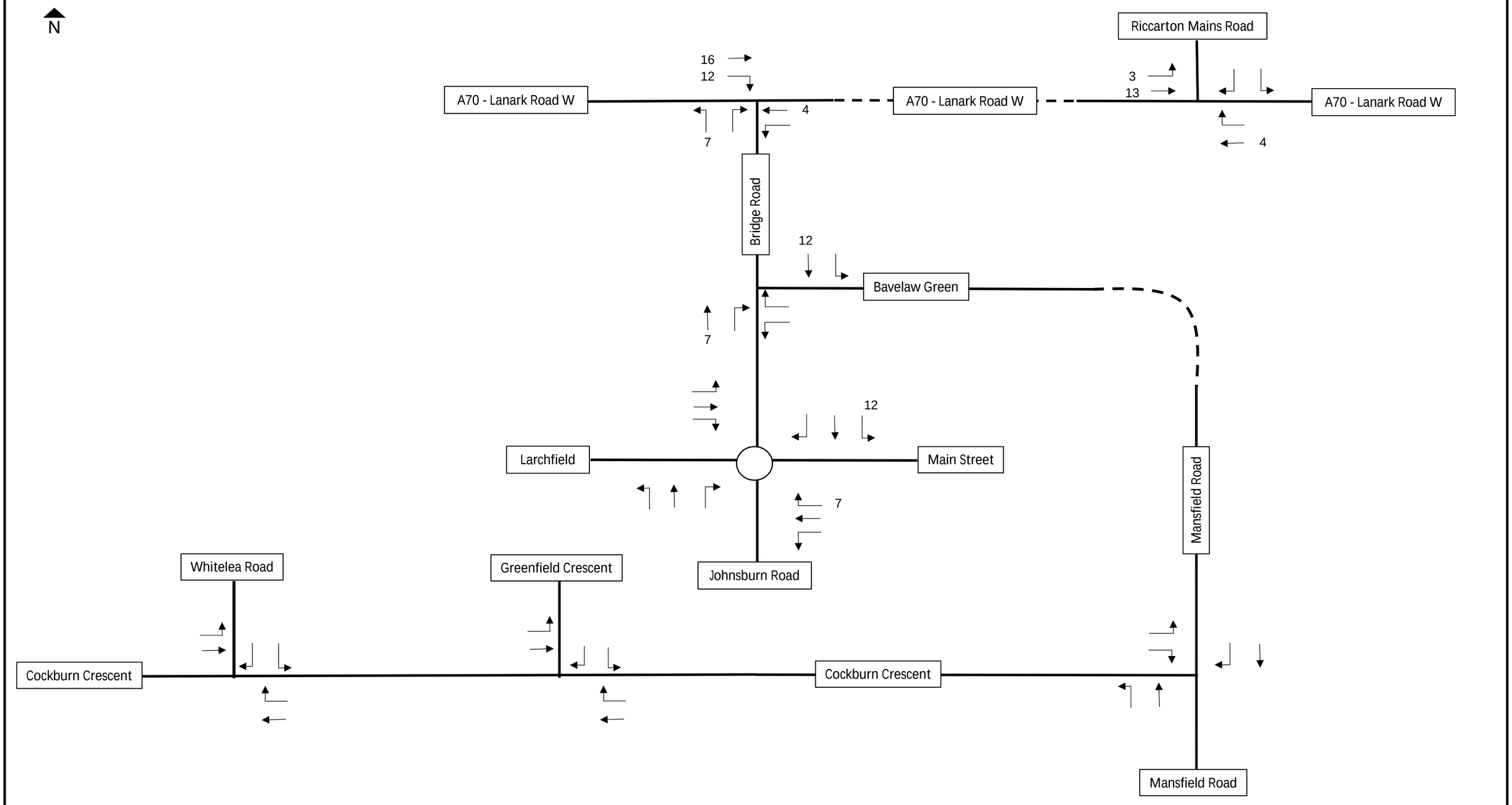

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	PROJECT NUMBER MTS 3017	**Drawn by** DRB **Date** October 2015
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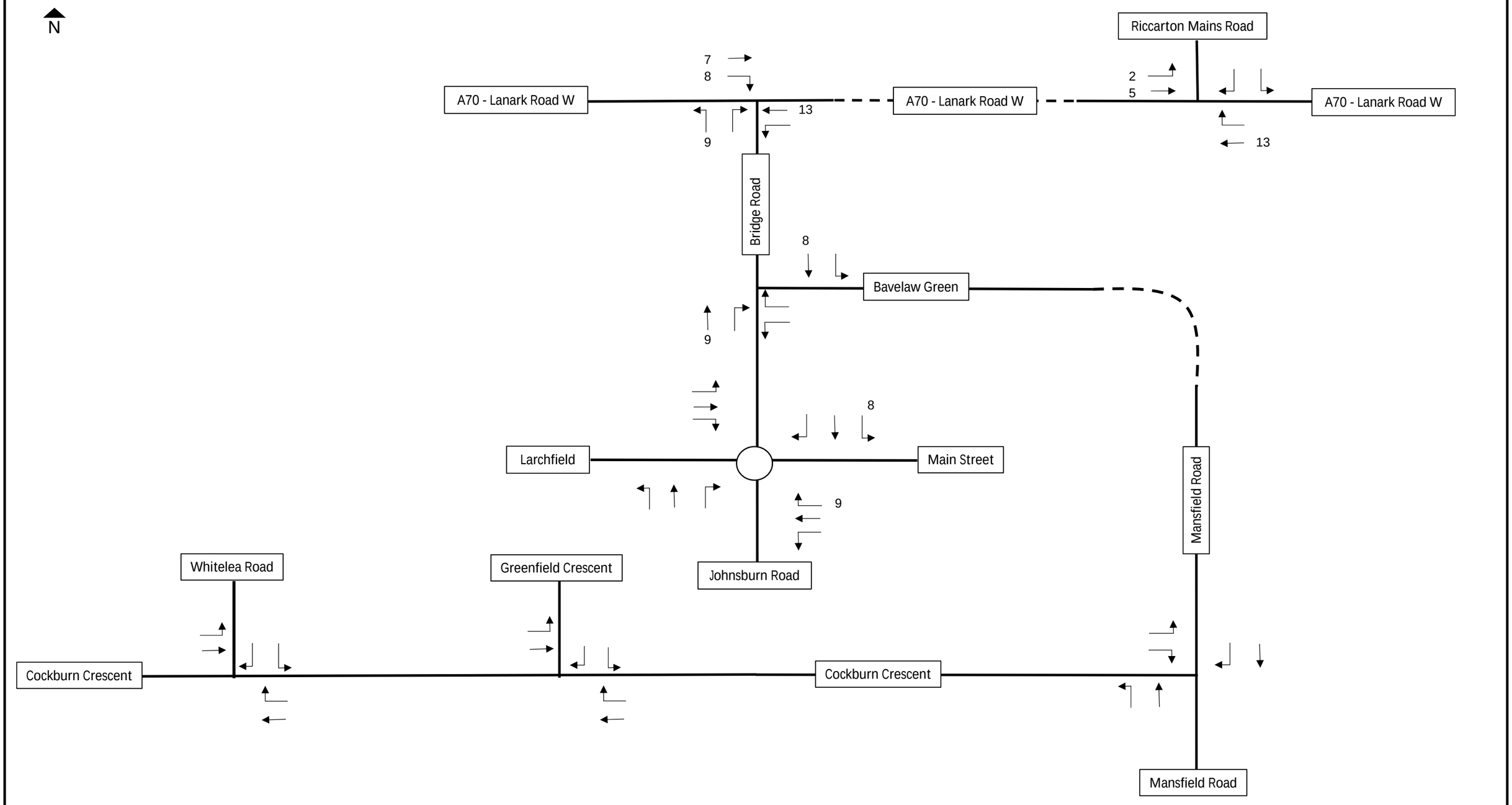

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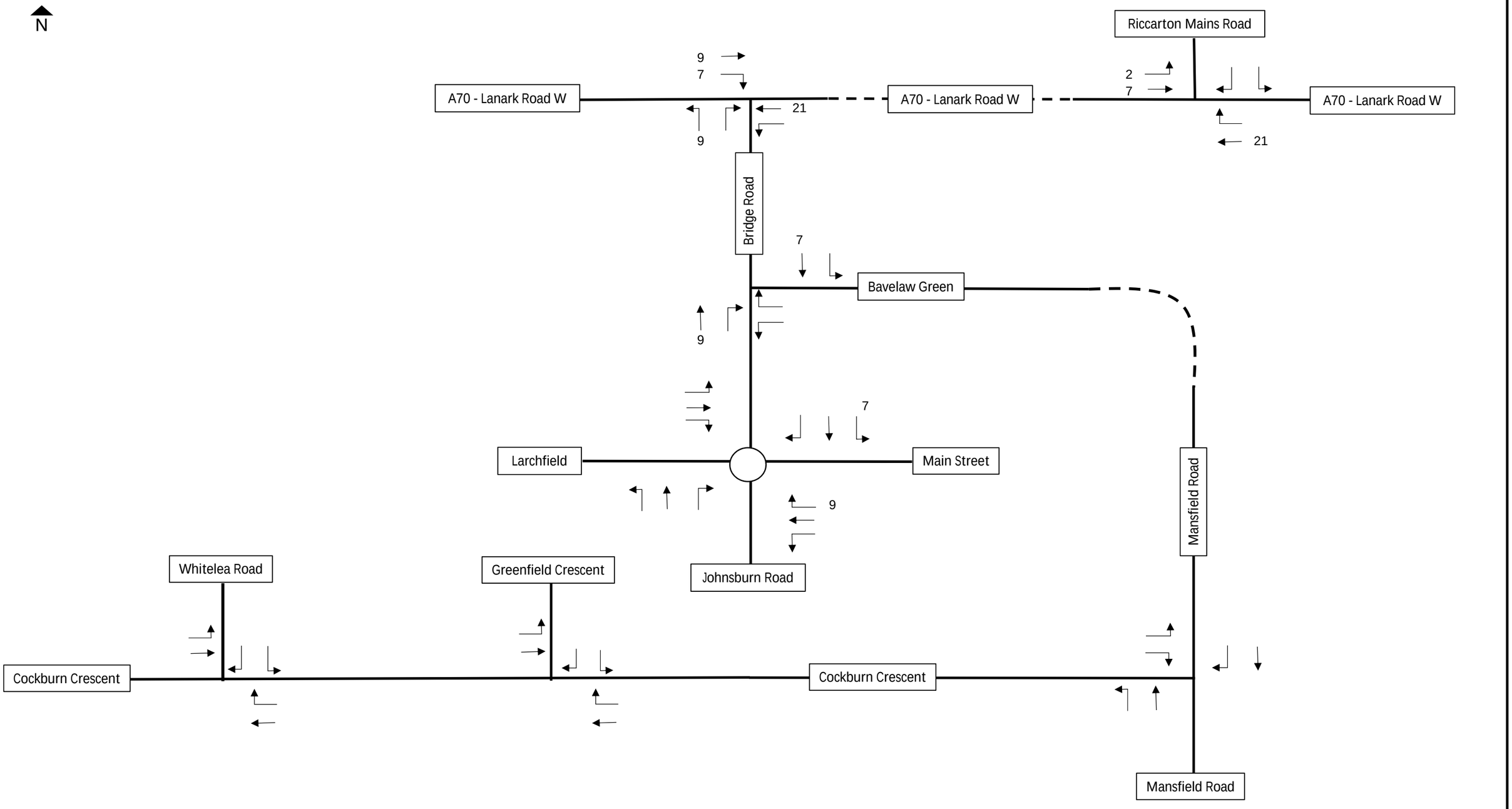

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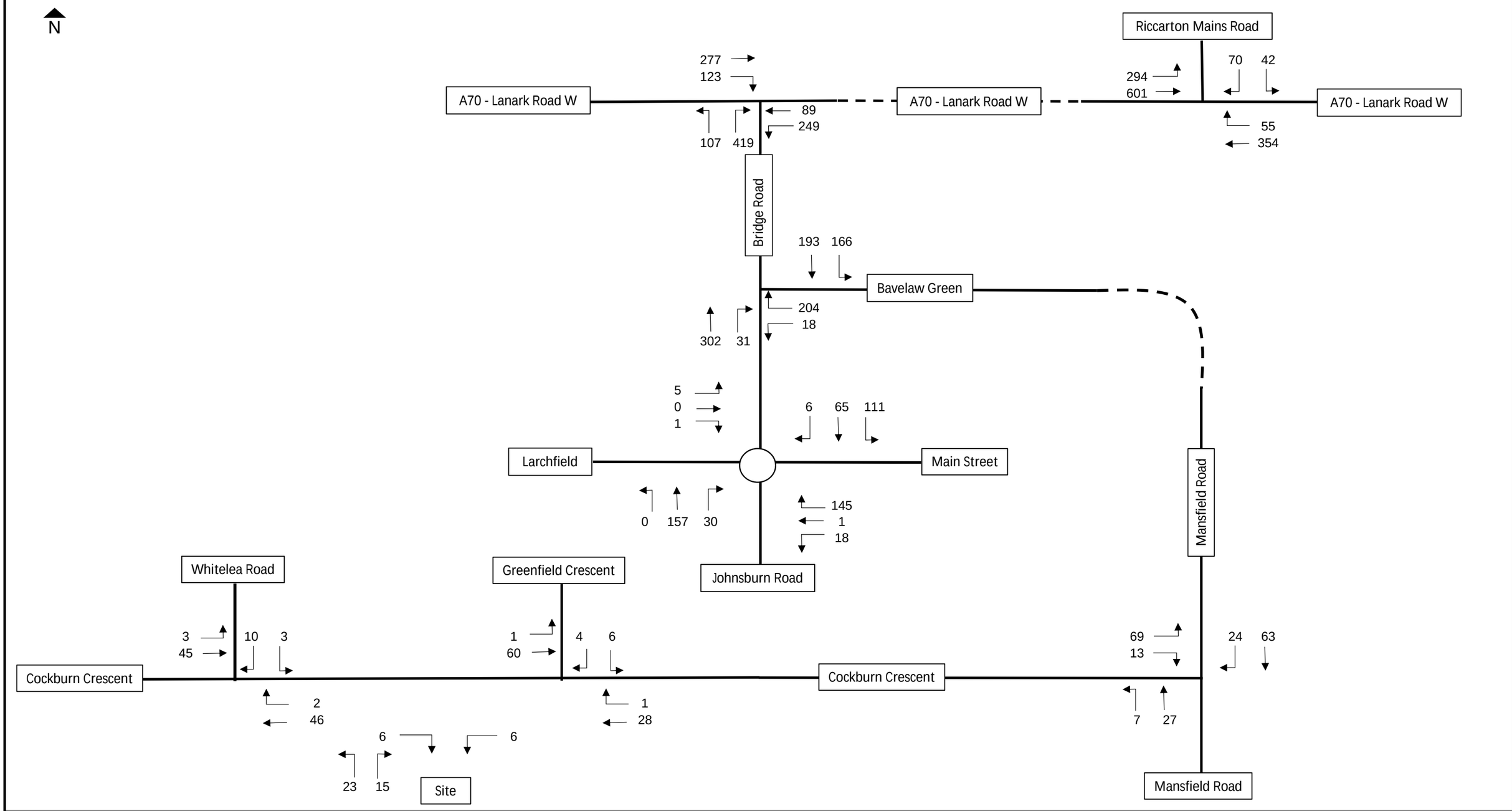
	PROJECT NUMBER MTS 3017	**Drawn by** DRB / **Date** October 2015
	Modus Transport Solutions Ltd	**Drawing No.** FIGURE 7.9



Title 2020 Morning Peak Total Traffic Flows (PCU's)	**Client** Barratt East Scotland	**Project** Proposed Residential Development, Balerno
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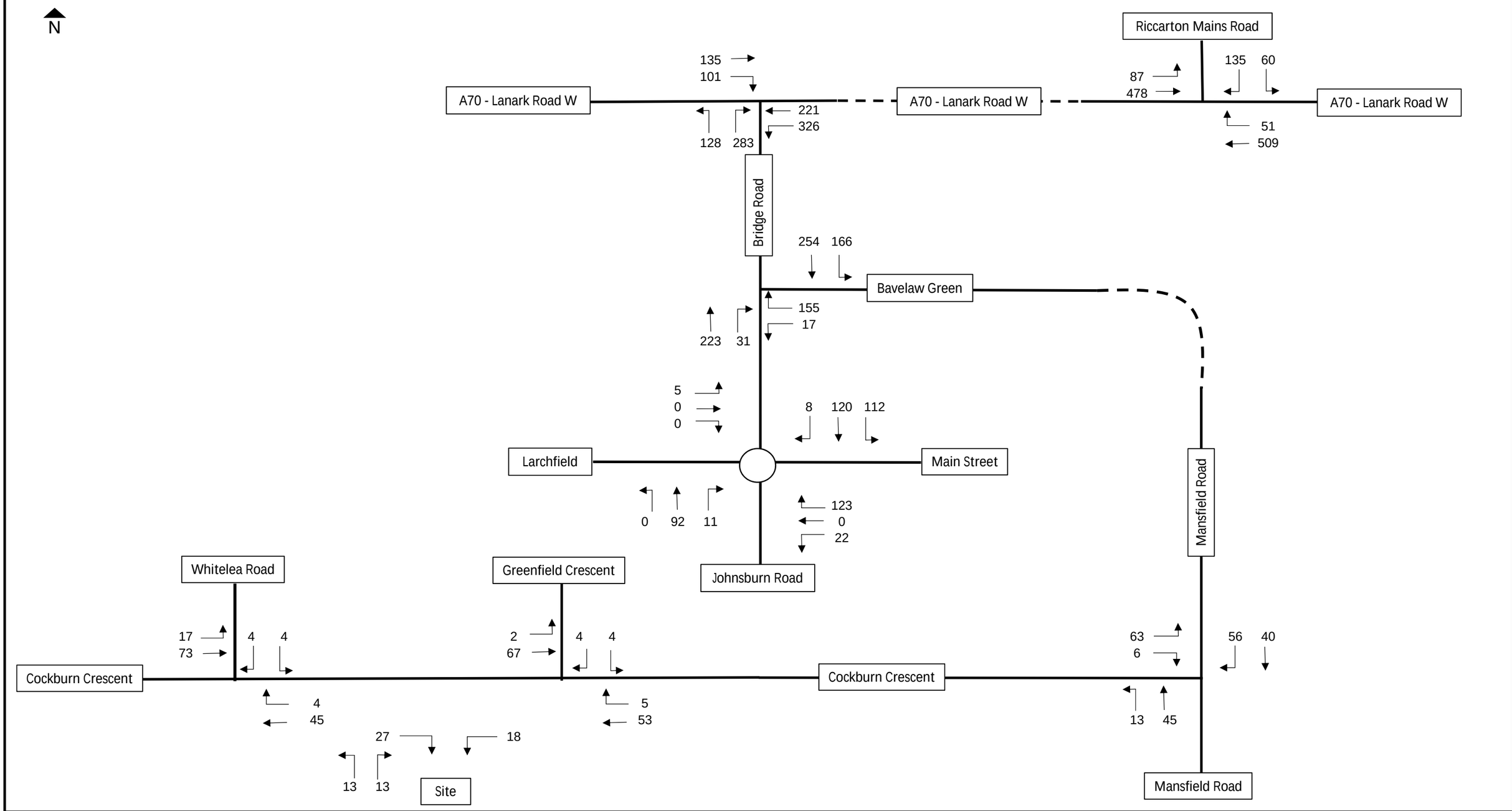

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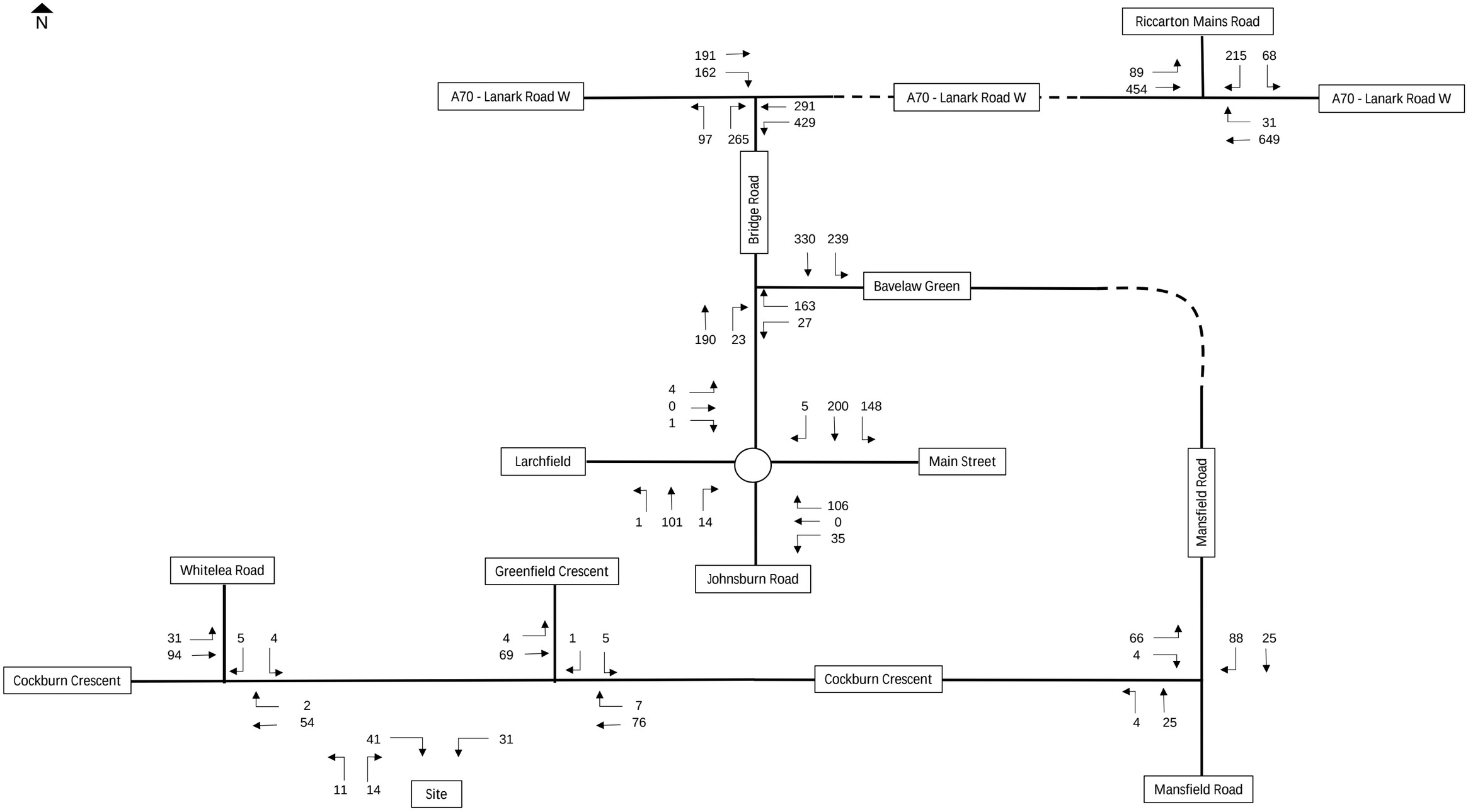


Title 2020 PM Peak TotalTraffic Flows (PCU's)	**Client** Barratt East Scotland	**Project** Proposed Residential Development, Balerno
	PROJECT NUMBER MTS 3017	**Drawn by** DRB **Date** October 2015
	Modus Transport Solutions Ltd	**Drawing No.** FIGURE 7.12

Education Capacity Appraisal

In Support of

Cockburn Crescent, Balerno, Edinburgh

Prepared by

Clarendon Planning & Development Ltd

on behalf of

Barratt David Wilson Homes

October 2015

Contents

1.0 Introduction

1.1 This Education Capacity Assessment has been prepared on behalf of Barratt David Wilson Homes by Clarendon Planning and Development, Chartered Town Planning Consultants, in support of a planning application for residential development at Cockburn Crescent, Balerno, Edinburgh.

1.2 The report assesses education capacity within the relevant school catchment areas and the impact that this new development will have on existing and planned education provision within the area. In particular, the report seeks to ascertain the necessity of financial contributions as a result of the proposed development and the timing of such contributions if they are included as a planning condition of any potential application approval.

2.0 Methodology & Approach

2.1 This assessment utilises information relating to school rolls and capacity as at August 2015, as per City of Edinburgh Council data, Freedom of Information Act Request EDIR: 7830 (Appendix 1), planned housing land supply information contained within both the 2014 Housing Land Audit, recent approvals and the proposed site programming at Cockburn Crescent.

2.2 The assessment examines the existing school capacities and rolls within the relevant catchment areas followed by an assessment of the housing land supply and associated demands on these schools to ascertain education capacity in relation to programmed housing supply, as relating to non-denominational schooling only (it is understood there are no capacity issues relative to denominational schools within the locality). In particular, the following key points will be examined:-

- confirmation of the catchment of non-denominational primary and secondary schools
- confirmation of the notional capacities, current school rolls and spare capacity of each school
- indication of pupil places generated by proposed housing land supply and the Cockburn Crescent site, utilising the Council's established formula, by calculating housing site capacity based on information within the 2014 Housing Land Audit (and approvals)
- confirmation of whether programmed and proposed housing land supply can be accommodated within existing school capacity or whether new educational accommodation is required
- the level and timing of developer contribution for providing additional school capacity if required

3.0 Proposed Development

3.1 The submission relates directly to the proposed residential development (application for Planning Permission in Principle) on land extending to 12.5 hectares (gross) at Cockburn Crescent, Balerno, Edinburgh. The location of this site is highlighted on Figure 1 below.

Figure 1. Location Plan

3.2 The proposal is for an urban extension with the Planning Permission in Principle application indicating a capacity of 150 No. units (subject to detailed layout design). Indicative programming below in 3.4 (based on dual Barratt and David Wilson brand output similar to other sites currently under construction by the applicant within the Edinburgh area).

3.3 This is based upon approval of the PPP application by the Council in March 2016, approval of matters specified in conditions by July 2016 and first completions in January 2017. The site would be completed by 2020 based on this programming.

3.4 Indicative Programmed completions

2017/18	**50**
2018/19	**50**
2019/20	**50**
Total	**150** (subject to detailed design)

4.0 Education Requirement

4.1 Site capacity will be assessed utilising formulas contained within the Proposed Edinburgh Local Development Plan (LDP) and applying a standard split of housing to flats. It is noted that proposed development at Balerno may focus more on housing but this assessment will allow for a fair comparison with appraisals undertaken for other parts of the city (West Edinburgh and South-East Edinburgh Strategic Development Areas).

4.2 In this regard, the split between houses and flats is proposed as 80/20 within the LDP's Education Appraisal, given the requirement for greenfield sites to focus on delivery of family housing.

4.3 The LDP Education Appraisal states the Council's formula for generating pupil space requirements for non-denominational schools from new housing as:-

- Primary School: 0.26 per house & 0.06 per flat
- Secondary School: 0.17 per house & 0.026 per flat

Edinburgh Council's Developer Contributions and Affordable Housing Supplementary Guidance states the latest calculations in pupil generation from residential development. The date of approval by City of Edinburgh Council Elected Members for consultation was the 6th of August 2015. The consultation period for the supplementary guidance will run from the 17th of August for 6 weeks. Only the 'approved' ratios and methods of capacity calculation will be used for the assessment of education. City of Edinburgh Council aim for approval of the supplementary guidance in November 2015.

4.4 Based on this formula, the site would generate the following educational requirement:-

- Primary School: 33 Pupils (33)
- Secondary School: 22 Pupils (21.18)

These gross figures will be assessed further in terms of programming.

5.0 Education Capacity Appraisal

5.1 In terms of non-denominational schooling, the site at Cockburn Crescent falls within the catchment areas of the following schools, indicated on Figure 2a and 2b below:-

- Dean Park Primary School
- Balerno High School

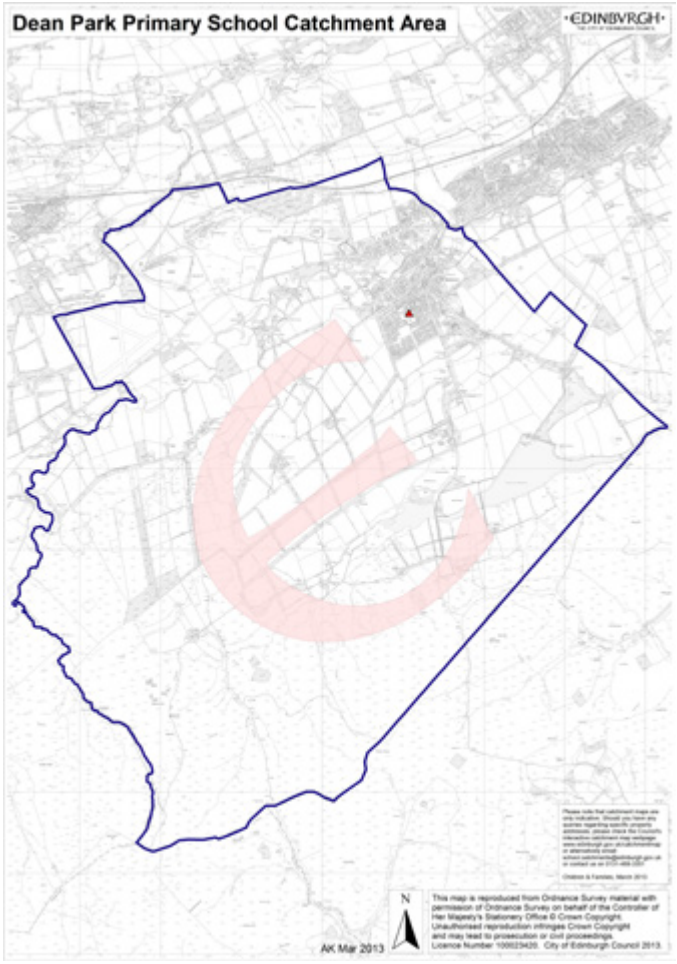


Figure 2a. Dean Park Primary Catchment Area

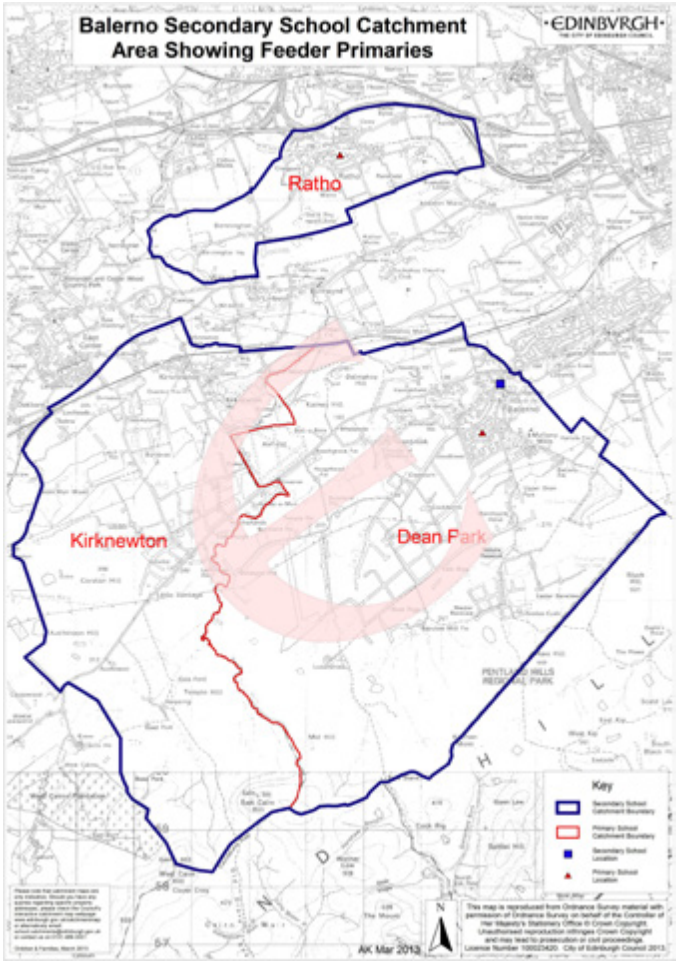


Figure 2b. Balerno High School Catchment Area

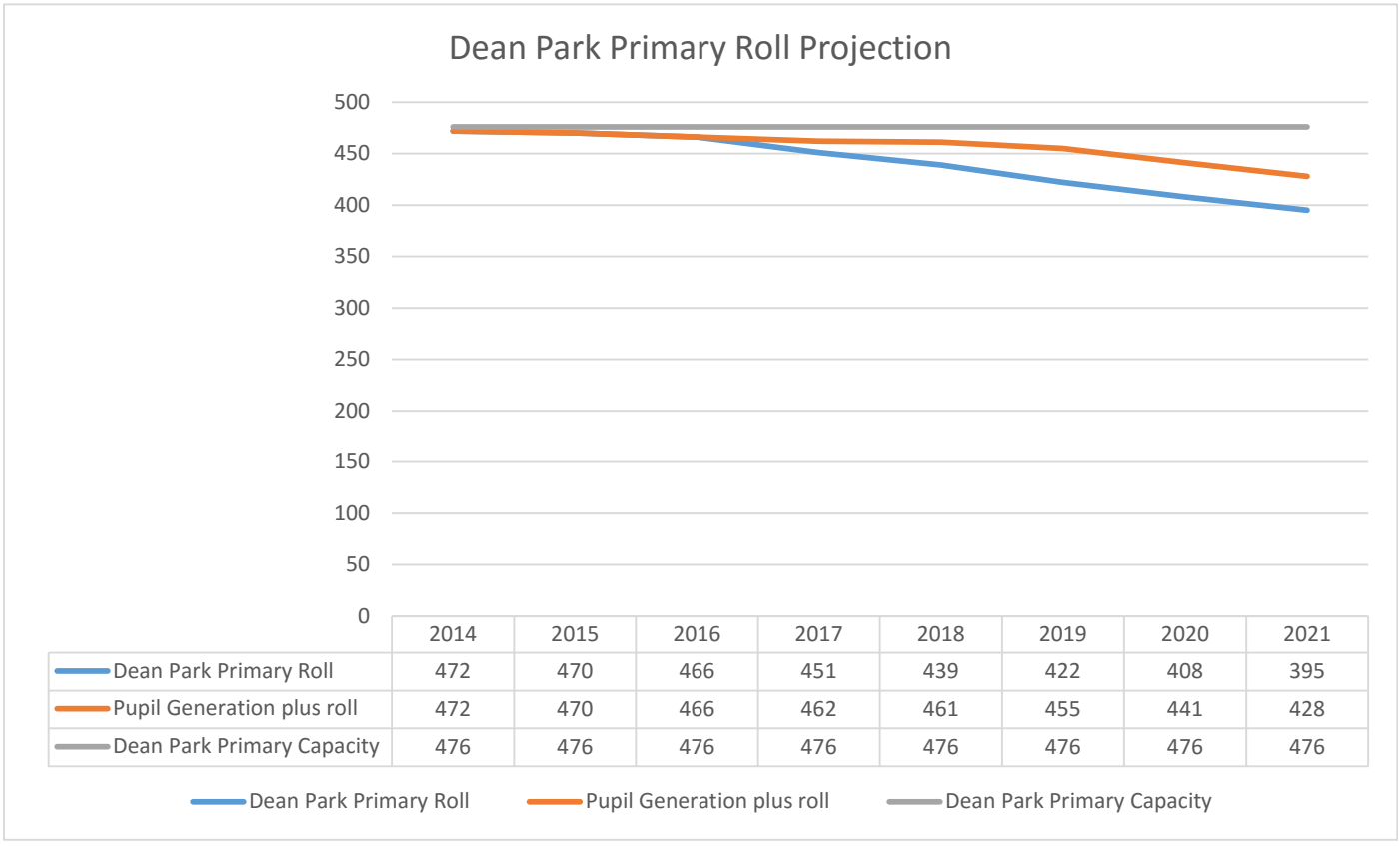
5.2 As per the Council's LDP2 Education Appraisal, the capacities, August 2014 rolls and occupancy rate of these schools are below. The second table notes roll projections as forecast by CEC.

School	Capacity	2014 Roll	Occupancy
Dean Park Primary	476	472	99%
Balerno High School	800	566	70%

City of Edinburgh Council school roll projections.

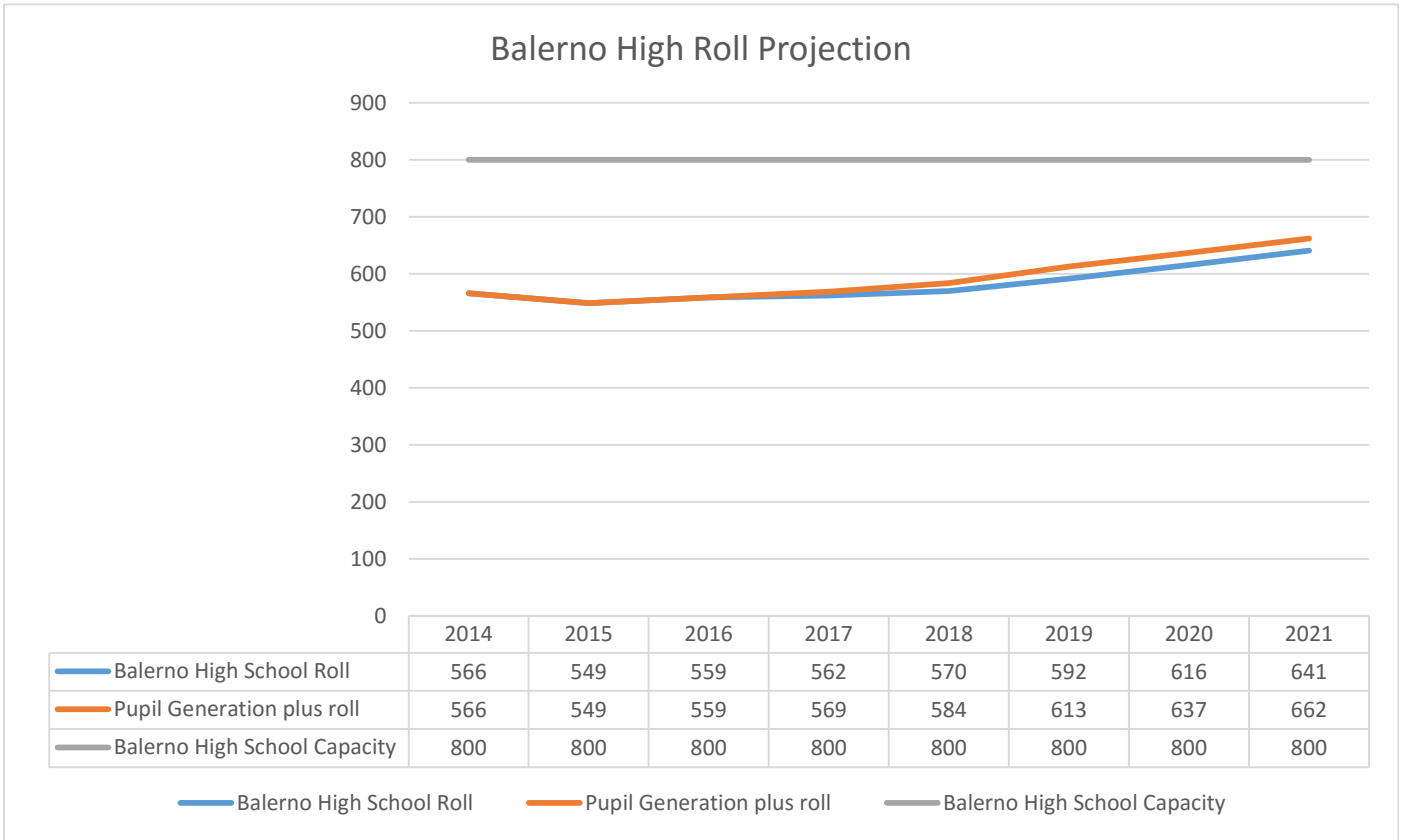
School	2015	2016	2017	2018	2019	2020	2021
Dean Park Primary School	470	466	451	439	422	408	395
Balerno High School	549	559	562	570	592	616	641

5.3 Figures 3a and 3b demonstrate City of Edinburgh Council's school roll projections at Dean Park Primary and Balerno High School from 2014 to 2021. Figures 3a and b also show the projected school roll with the inclusion of the proposed development. The method for calculating the pupil generation from the proposed development is explained in 4.0 Education Requirement. The detailed breakdown is provided in Section 7.4 and 7.5 of this report.



	2014	2015	2016	2017	2018	2019	2020	2021
Dean Park Primary Roll	472	470	466	451	439	422	408	395
Pupil Generation plus roll	472	470	466	462	461	455	441	428
Dean Park Primary Capacity	476	476	476	476	476	476	476	476

Figure 3a. Dean Park Primary School Roll Projections



	2014	2015	2016	2017	2018	2019	2020	2021
Balerno High School Roll	566	549	559	562	570	592	616	641
Pupil Generation plus roll	566	549	559	569	584	613	637	662
Balerno High School Capacity	800	800	800	800	800	800	800	800

Figure 3b. Balerno High School Roll Projections

6.0 Effective Housing Land Supply Sites

6.1 The schools require to cater for housing sites coming forward from the current Effective Housing Land Supply. Based on the 2014 Housing Land Audit, Table 3 provides a breakdown of the effective sites and the programmed output over the next five year effective period (this contains all sites within the Housing Land Audit within the Balerno High catchment area which includes Dean Park Primary and Ratho Primary within Edinburgh and Kirknewton Primary within West Lothian).

TABLE 3	14/15	15/16	16/17	17/18	18/19	19/20	20/21
Craigpark Quarry (RWELP HSP 6)	0	0	17	50	50	0	0
Freelands Road (RWELP HSP 7)	23	0	0	0	0	0	0

6.2 There are no housing allocations within the catchment areas of Dean Park Primary, Ratho Primary or Balerno Secondary School in the City of Edinburgh Council Proposed Local Development Plan.

6.3 The 2014 HLA identifies the build programme of residential sites from the Rural West Edinburgh Local Plan, Proposed Local development Plan, and also sites with planning consent for housing. The 2014 HLA identifies the following sites and the expected housing delivery programme;

6.4 The recent appeal at Ravelrig Road, Balerno has not been considered in the 2014 HLA and should be programmed into the school roll projection figures.

Ravelrig Road (Appeal Ref: PPA-230-2140) was approved at appeal for 120 homes with an indicative build programme of;

YEAR	UNITS
2017/18	30
2018/19	30
2019/20	30
2020/21	30
Total	120 units

6.5 Table 4 shows all expected housing completions within the Balerno High School catchment area to 2021.

TABLE 4	14/15	15/16	16/17	17/18	18/19	19/20	20/21	
Craigpark Quarry (RWELP HSP 6)	0	0	17	50	50	0	0	(Ratho PS)
Freelands Road (RWELP HSP 7)	23	0	0	0	0	0	0	(Ratho PS)
Ravelrig Road (PPA-230-2140)	0	0	0	30	30	30	30	(Dean Park PS)
Total	**23**	**0**	**17**	**80**	**80**	**30**	**30**	

The above committed housing sites, excluding Ravelrig Road, have been incorporated into City of Edinburgh Council's school roll projection figures.

7.0 Education Figures

7.1 Primary school pupils generated from Ravelrig Road appeal. (Dean Park Primary Catchment)

2017/18	30 total completions (24 houses, 6 flats) = (24 x 0.26) + (6 x 0.06) = 6.6
2018/19	30 total completions (24 houses, 6 flats) = (24 x 0.26) + (6 x 0.06) = 6.6
2019/20	30 total completions (24 houses, 6 flats) = (24 x 0.26) + (6 x 0.06) = 6.6
2020/21	30 total completions (24 houses, 6 flats) = (24 x 0.26) + (6 x 0.06) = 6.6
TOTAL	**(26.4) 27 primary school pupils**

7.2 Secondary school pupils expected from Ravelrig Road appeal. (Balerno High School)

2017/18	30 total completions (24 houses, 6 flats) = (24 x 0.17) + (6 x 0.026) = 4.236
2018/19	30 total completions (24 houses, 6 flats) = (24 x 0.17) + (6 x 0.026) = 4.236
2019/20	30 total completions (24 houses, 6 flats) = (24 x 0.17) + (6 x 0.026) = 4.236
2020/21	30 total completions (24 houses, 6 flats) = (24 x 0.17) + (6 x 0.026) = 4.236
TOTAL	**(16.944)17 secondary school pupils**

7.3 Indicative programming for Cockburn Crescent is noted above as being 50-50-50 from 2017/18. This would generate the following phased primary and secondary school place requirement:-

7.4 Primary school pupils generated from Cockburn Crescent (Dean Park Primary)

2017/18	50 total completions (40 houses, 10 flats) = (40 x 0.26) + (10 x 0.06) = 11
2018/19	50 total completions (40 houses, 10 flats) = (40 x 0.26) + (10 x 0.06) = 11
2019/20	50 total completions (40 houses, 10 flats) = (40 x 0.26) + (10 x 0.06) = 11
TOTAL	**33 primary school pupils**

7.5 Secondary School Pupils Generated from Cockburn Crescent (Balerno High school)

2017/18	50 total completions (40 houses, 10 flats) = (40 x 0.17) + (4 x 0.026) = 7.06
2018/19	50 total completions (40 houses, 10 flats) = (40 x 0.17) + (4 x 0.026) = 7.06
2019/20	50 total completions (40 houses, 10 flats) = (40 x 0.17) + (4 x 0.026) = 7.06
TOTAL	**(21.18) 22 secondary school pupils**

7.6 The Ravelrig Road appeal site has been included in the final school roll projection figures (Tables 5 and 6) in order to provide the most up-to-date assessment. Tables 5 and 6 show the original school roll projection by City of Edinburgh Council, then the updated version including Ravelrig Road, and finally the projected school roll with the proposed development at Cockburn Crescent plus Ravelrig Road and the Council's original projection.

TABLE 5

DEAN PARK PRIMARY	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
Capacity	476	476	476	476	476	476	476	476
CEC Roll Projection	472	470	466	451	439	422	408	395
Roll Projection W/Ravelrig	472	470	466	458	452	442	434	421
CEC / Ravelrig / Cockburn	**472**	**470**	**466**	**469**	**474**	**475**	**467**	**454**

TABLE 6

BALERNO HIGH SCHOOL	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
Capacity	800	800	800	800	800	800	800	800
CEC Roll Projection	566	549	559	562	570	592	616	641
Roll Projection W/Raverig	566	549	559	566	578	605	633	658
CEC / Ravelrig / Cockburn	**566**	**549**	**559**	**573**	**593**	**626**	**654**	**679**

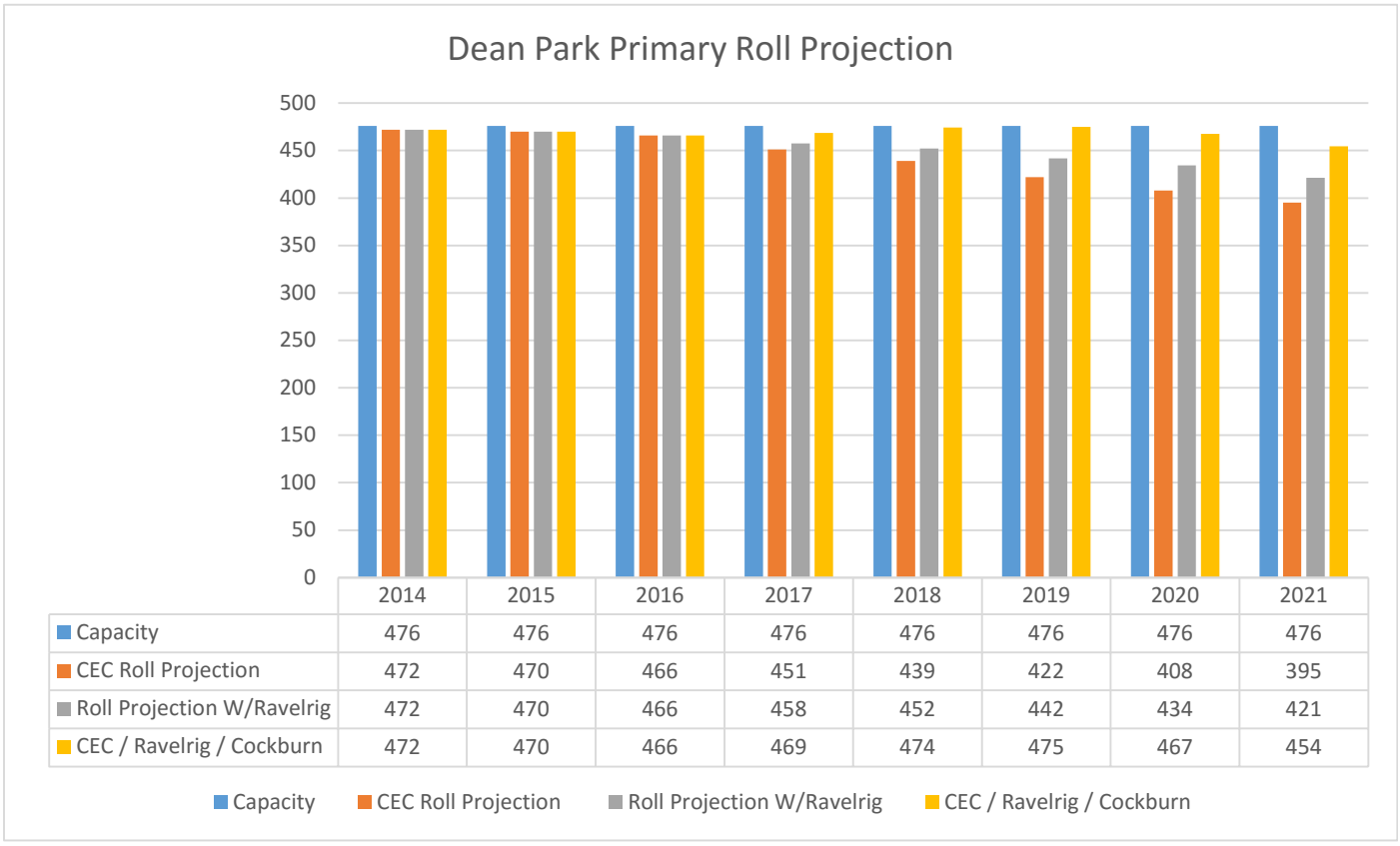
Figures 4a and b show the above school roll projections in chart from.

7.7 At no point during the construction of the proposed development does the projected school roll exceed the capacity of Balerno High School or Dean Park Primary School. 2 classrooms are proposed as part of the appeal at Ravelrig Road with contributions to education facilities expected from S75 agreements between City of Edinburgh Council and Gladman.

7.8 The capacities at both Balerno High school and Dean Park Primary were recently reduced by City of Edinburgh Council, as Education Authority. The previous capacities were as follows;

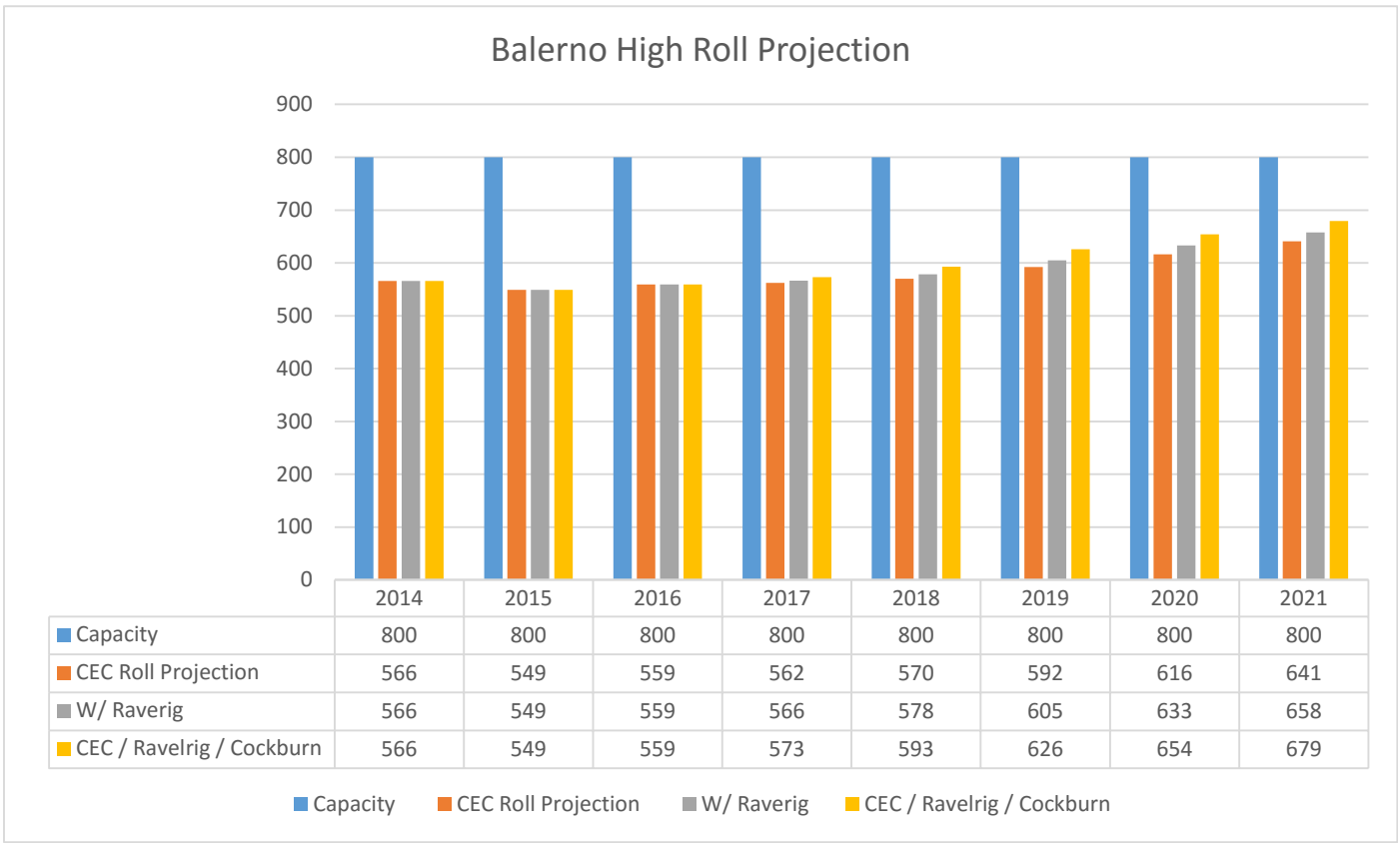
Dean Park Primary School
Pre 2014 Capacity = 495
Post 2014 Capacity = 476

Balerno High School
Pre 2014 Capacity = 850
Post 2014 Capacity = 800



	2014	2015	2016	2017	2018	2019	2020	2021
Capacity	476	476	476	476	476	476	476	476
CEC Roll Projection	472	470	466	451	439	422	408	395
Roll Projection W/Ravelrig	472	470	466	458	452	442	434	421
CEC / Ravelrig / Cockburn	472	470	466	469	474	475	467	454

Figure 4a. Dean Park Primary School Roll Projection



	2014	2015	2016	2017	2018	2019	2020	2021
Capacity	800	800	800	800	800	800	800	800
CEC Roll Projection	566	549	559	562	570	592	616	641
W/ Raverig	566	549	559	566	578	605	633	658
CEC / Ravelrig / Cockburn	566	549	559	573	593	626	654	679

Figure 4b. Balerno High school Roll Projections

8.0 Summary

The site currently falls within the catchment area of Dean Park Primary and Balerno High School, both of which have capacity for committed development in the catchment area and the proposed development at Cockburn Crescent.

Dean Park Primary and Balerno High School both have sufficient capacity to accommodate the children generated from the proposed development.

City of Edinburgh Council forecast a falling roll at Dean Park Primary and a rising roll at Balerno High school.

A two class extension has been committed following the Ravelrig Road appeal decision (Appeal Ref: PPA-230-2140).

Proposed development at Cockburn Crescent will generate 33 primary school pupils and 22 secondary school pupils, utilising the same formula as used to assess the proposed LDP greenfield housing allocations.

Ross Manson

From: David Howel <dhowel@clarendonpd.co.uk>
Sent: 04 August 2015 16:36
To: rmanson@clarendonpd.co.uk
Subject: FW: Information Release EDIR:7830

Follow Up Flag: Follow up
Flag Status: Flagged

David Howel MA (Hons) MSc MRTPI
Senior Consultant
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From: Iain Burden [mailto:Iain.Burden@edinburgh.gov.uk] **On Behalf Of** Information Compliance 5
Sent: 29 June 2015 15:38
To: dhowel@clarendonpd.co.uk
Subject: Information Release EDIR:7830

Mr David Howel

Date: 29/06/2015

Our ref: 7830

Dear Mr Howel

Freedom of Information (Scotland) Act 2002 - Partial Release of Information

Subject: Dean Park Primary School, Ratho Primary School, and Balerno High School

Thank you for your request for information of 03/06/2015, which has been processed under the terms of the Freedom of Information (Scotland) Act 2002. Unfortunately, the Council is only able to meet part of your request; this information is released to you now in the format requested.

For ease of reference I have replicated your information request below followed by our response.

Q1. The current capacity and roll for Dean Park Primary School, Ratho Primary School, and Balerno High School

Q2. Future roll and capacity projections/forecasts for Dean Park Primary School, Ratho Primary School, and Balerno High School (all available years)

A1 and A2.

		Actual Roll	Roll Projections (NB: updated every year. Projections are estimates only and only include predicted pupil generation from committed development (i.e. those where planning permission is in place and development is likely to proceed)						
School	Capacity at August 2015*	2014	2015	2016	2017	2018	2019	2020	2021
Dean Park Primary School	476	472	470	466	451	439	422	408	395
Ratho Primary School	259	164	183	199	225	256	276	298	293

*Capacity of all primary schools currently under review as a result of new Scottish Government Guidelines

		Actual Roll	Catchment Projections (NB: Projections are updated every year. Secondary projections are estimates only of catchment pupils (not roll projections) including pupil generation estimates from committed development (i.e. those where planning permission is in place and development is likely to proceed)						
School	Capacity	2014	2015	2016	2017	2018	2019	2020	2021
Balerno High School	800	566	549	559	562	570	592	616	641

Q3. Current child product ratio per house and flat utilised by City of Edinburgh Council in education forecasting for denominational and non-denominational schooling

A3. This part of your request is classed as ‘Information otherwise available’. The current child product ratio per house and

flat utilised by City of Edinburgh Council in education forecasting for denominational and non-denominational schooling is
available in the Education Infrastructure Appraisal produced in accordance with the second proposed Local Development
Plan and published online at the following link:

http://www.edinburgh.gov.uk/downloads/file/3838/revised_education_appraisal_june_2014_corrected_september_2014

If you do not have access to the Internet at home, you may be able to use facilities at your local public library or access a hardcopy version in your local council office. Under the terms of the Act, a request for information can be refused where one or more of the exemptions listed in the Act apply. In this instance, the Council is claiming an exemption under section 25 of the Act because the information is 'otherwise accessible'.

Q4. Any planned or recently conducted catchment area reviews affecting Dean Park Primary School, Ratho Primary School, or Balerno Secondary School.

A4. There are no planned or recently conducted catchment area reviews affecting Dean Park Primary School, Ratho Primary School, or Balerno Secondary School.

Q5. Copies of any feasibility plans for extension of Dean Park Primary School, Ratho Primary School or Balerno High School, with particular regard to two-class extension of Dean Primary School referred to in current Planning Appeal Ref. PPA-230-2140

A5. Ratho primary school is currently being extended with a new 4 classroom block due to open in August 2015. This project is being delivered through the hub South East Scotland procurement route.

There was no feasibility study carried out as the design was developed through an informal working group with the school community. The best information about this project can be found online through the planning portal http://www.edinburgh.gov.uk/planning. The planning application reference is 14/04592/FUL.

There has been no feasibility studies carried out in relation to the extension of Dean Park Primary School.

Q6. City of Edinburgh Council policy on General Purpose room requirements for Primary Schools

A6. The latest policy on General Purpose room requirements for Primary Schools is contained within the recently published Scottish Government Guidance available at the following link:
http://www.gov.scot/Publications/2014/10/6749

To promote transparency and accountability, please note it is the Council's policy to publish all request details and responses made under the freedom of information legislation. This information will be made available through the Council's website and will not include your personal details. The disclosure log is available at the following link: http://www.edinburgh.gov.uk/homepage/175/foi_disclosure_log

Your right to seek a review

I appreciate that our decision may disappoint you and I am sorry that we have not been able to release all the information you requested on this occasion. If you are unhappy with the way we have dealt with your request, you can ask us to review our actions and decisions by writing to:

Head of Legal Risk and Compliance
The City of Edinburgh Council
Waverley Court Business Centre 2:1
4, East Market Street
Edinburgh
EH8 8BG or,
Email: legal.foi@edinburgh.gov.uk

Please note that your request must be in a recordable format (email, letter, audio tape etc.), and that you have 40 working days upon receipt of this letter to ask for a review. You will receive a full response to your review request within 20 working days of its receipt. Please quote the reference number above in any future communications.

If you are not content with the outcome of the review, you can ask the Scottish Information Commissioner to review our decision. You must submit your complaint to the Commissioner within 6 months of receiving our review response. The Commissioner can be contacted at:

The Office of the Scottish Information Commissioner
Kinburn Castle
Doubledykes Road
St Andrews
Fife
KY16 9DS
Telephone: 01334 464610
Fax: 01334 464611
Website www.itspublicknowledge.info
Email: enquiries@itspublicknowledge.info

Yours sincerely

Clayton Pratt
Information Compliance Officer

Information Governance Unit
Level 2:1, Waverley Court, Edinburgh EH8 8BG Tel 0131 200 2340
foi@edinburgh.gov.uk www.edinburgh.gov.uk

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Landscape and Visual Appraisal

October 2015

open
optimised environments

Cockburn Crescent, Balerno, Edinburgh

Barratt & David Wilson Homes

Contents

Figures

1. Introduction

1.1 Introduction

This appraisal has been prepared by chartered landscape architects at Optimised Environments Ltd (OPEN) as part of the Applicant's planning application for the residential development of the Cockburn Crescent site in Balerno near Edinburgh (hereafter referred to as 'the proposed development'). This landscape and visual appraisal undertakes an evaluation of the landscape and visual effects of the residential development of the Cockburn Crescent site. The site and study area are shown in Figure 1.

1.2 Content

This appraisal contains the following sections:

- Section 1: Introduction - setting out the content of the appraisal, the approach taken, outline of the project, the site and the context, and the extents of the study area;
- Section 2: Planning context - summarising the relevant policies and highlighting their relevance to the appraisal;
- Section 3: Baseline conditions - describing those landscape and visual receptors to be appraised in detail;
- Section 4: Development design mitigation - description of the project and summary of the measures taken to avoid or minimise the landscape and visual effects of the proposed development through the design;
- Section 5: Assessment of effects on landscape character - identifying the residual effects on landscape character areas and designations;
- Section 6: Assessment of effects on visual amenity - identifying the residual effects on selected viewpoints and principal visual receptors;
- Section 7: Conclusions - summarising the potential effects of the proposed development on landscape character and visual amenity.

Plans and photographs accompany this LVA and are referenced in the text where relevant.

1.3 Approach

There is no requirement for a formal Environmental Assessment to support the Planning Application for the development. A landscape and visual appraisal has, however, been prepared to support the Planning Application and follows best practice guidance produced by the Landscape Institute in its Guidance for Landscape and Visual Impact Assessment (GLVIA) (3rd Edition 2013). The LVA evaluates the likely effects of the proposed development on the landscape character and visual amenity of the site and its surroundings.

The following extract, taken from the GLVIA Statement of Clarification (Jan 2013), gives guidance on the terminology to be used in non EIA Landscape and Visual Impact Appraisals, such as this.

'In carrying out appraisals, the same principles and process as LVIA may be applied but, in so doing, it is not required to establish whether the effects arising are or are not significant given that the exercise is not being undertaken for EIA purposes. The reason is that should a landscape professional apply LVIA principles and processes in carrying out an appraisal and then go on to determine that certain effects would be likely be significant, given the term 'significant' is enshrined in EIA Regulations, such a judgement could trigger the requirement for a formal EIA. The emphasis on likely 'significant effects' in formal LVIA stresses the need for an approach that is proportional to the scale of the project that is being assessed and the nature of its likely effects. The same principle - focussing on a proportional approach – also applies to appraisals of landscape and visual impacts outside the formal requirements of EIA.'

Whilst it has been agreed with The City of Edinburgh Council that a formal EIA is not required for the proposed development, it has been agreed that a Landscape and Visual Appraisal will be required to demonstrate the potential effects. As it is not a formal EIA, significant and not significant effects are terms not to be used, OPEN considers it useful to set out the level of the effect. In this appraisal, effects are assessed to be either 'minor', 'moderate' or 'major'. The level of effect is assessed through a combination of two considerations - the sensitivity of the landscape element, landscape character receptor, or view, and the magnitude of change that will result from the proposed development. This evaluation is carried out for each of the receptors appraised in detail in the report.

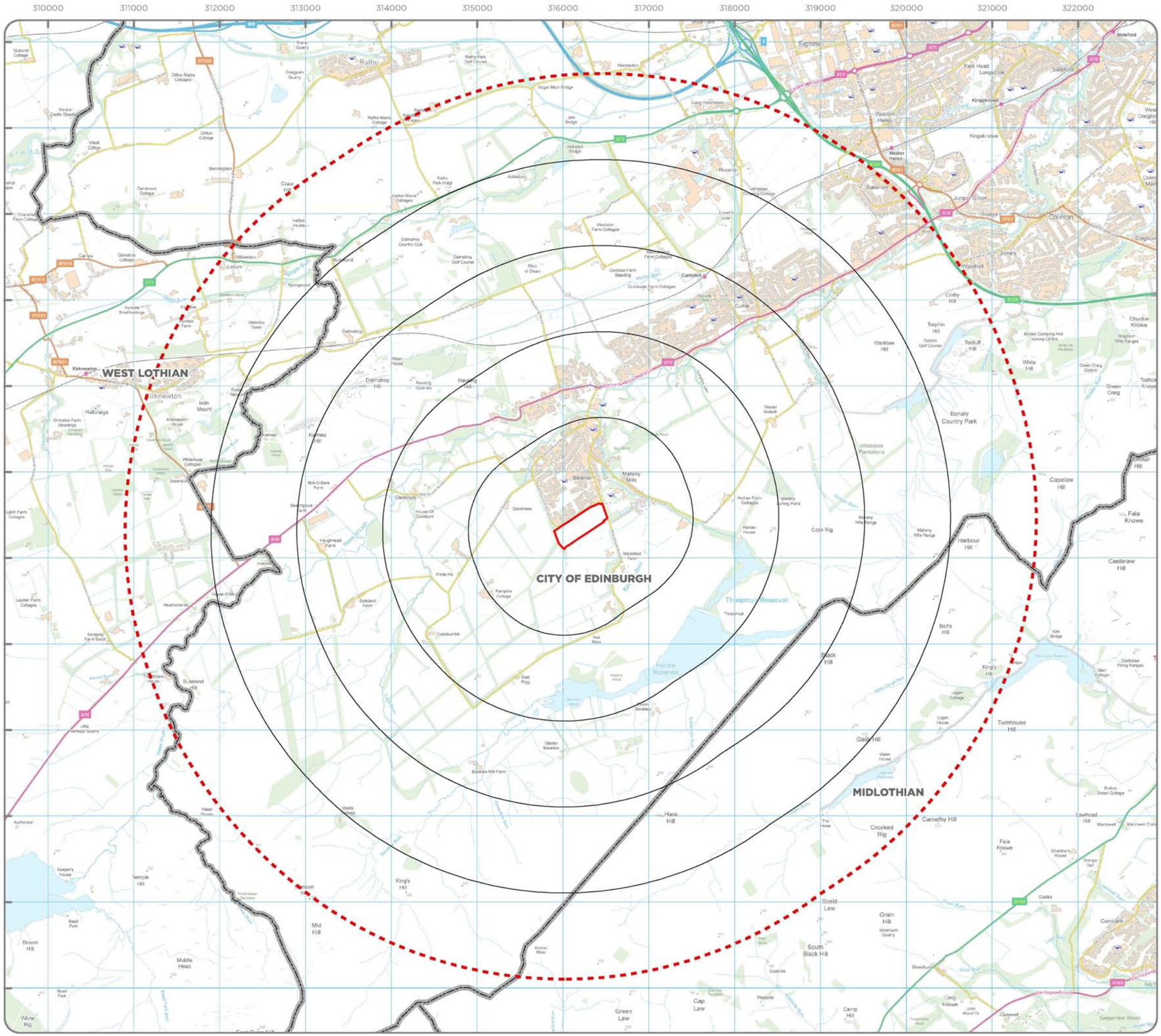


Figure 1: Study Area

1.4 Project description

The term ‘proposed development’ used in this appraisal, refers to all the components of the development of the Cockburn Crescent site and therefore includes infrastructure and landscape planting, as well as the residential development. Presented below is a brief description of the key components that make up the proposed development. A full project description is presented in the Masterplan Report.

The site comprises 12.5Ha of non-prime agricultural land, laid out as two fields divided internally by a mature tree belt. The proposed development will consist of 150 dwellings. These will comprise a mix of detached, semi-detached and terraced houses laid out around traditional street spaces and, in some locations, public open space. This will create a positive frontage onto the public spaces and ensure a better level of privacy to back garden spaces. The dwellings will provide family housing with a 25% inclusion of affordable housing on the site. The site will be accessed via street connections to Cockburn Crescent. The structure of development, frontage to Cockburn Crescent and path connections will ensure the development is well integrated as part of Balerno with good connections to the surrounding countryside.

The design of the layout has been largely landscape led with a substantial woodland framework providing a setting to the development and a good level of tree planning and open space integrated throughout the residential layout. In respect of the hydrology of the site, two SUDS ponds are proposed, one at the north-west and one at the north-east corners. These will form centre pieces to the surrounding public open space.

1.5 The site

The site is located on the southern edge of the settlement of Balerno, to the south-west of the City of Edinburgh. The site comprises two fields, which are currently used for arable farming and which are enclosed on all four sides by a combination of hedgerows and tree belts. A row of mature trees also separates the fields internally. The landform of the site is gently undulating, falling away from a height of approximately 222m AOD in the south-west corner to 207m AOD in the north-east corner. This follows the trend of the wider landform which generally falls from the Pentland Hills in the south towards the Water of Leith in the north.

To the west and south of the site, lies the wider farmed landscape, typically comprising small and medium sized fields of crops or improved pasture set within a strong framework of tree lined enclosures. To the north lies the existing settlement boundary of Balerno with the properties on Cockburn Street fronting onto the street (and site) to create a positive frontage. The houses are modern and mostly two-storey and detached with front gardens, garages and driveways. To the east lies a wooded area with a long driveway leading to Harmeny School, a school for children with special needs, run by a charitable trust.

The site is well enclosed within its local context with visibility only arising within the immediate vicinity. The site marks the southern edge of the settlement, the arable farmland presenting a rural character distinct to the urban character of the adjacent residential area.

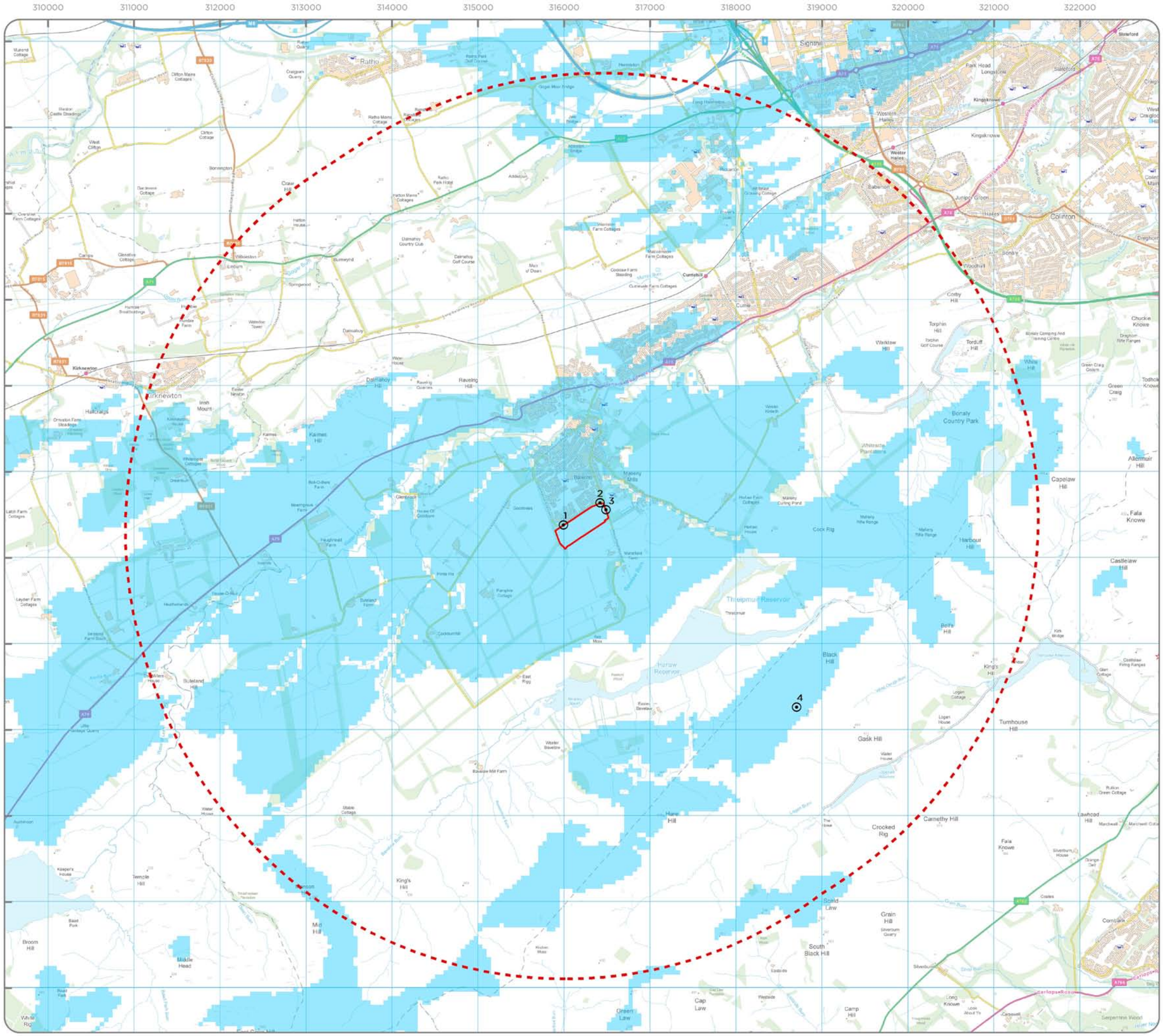
1.6 The context

Balerno is a small, outlying settlement to the south-west of the City of Edinburgh. Its name is derived from the Scottish Gaelic ‘Baile Airneoch’ which means ‘town of the Hawthorns’. While the earliest written records of Balerno date back to the late 13th Century, it was not until the 18th Century that the settlement started to expand, as flax, snuff and paper mills were developed along the Water of Leith and Bavelaw Burn. These mills remained a feature of the town up until the end of the 20th Century. After WW1 residential development occurred which expanded the town to the south. This expansion continued through the latter part of the 20th Century to form the southern settlement boundary at Cockburn Crescent.

Balerno is located to the south-west of Edinburgh, beyond the residential areas of Juniper Green and Currie which extend along the A70. While Ravelrig continues the linear development along the A70, the main part of Balerno is set to the south of the main road and has evolved as more of a square, rather than linear, settlement.

Balerno lies on the southern slopes of the valley of the Water of Leith. The surrounding landscape is agricultural with a predominance of arable crops and improved pasture. A well-defined geometric pattern of mature tree-belts enclose the fields and give the landscape a sense of enclosure. Farmsteads occur intermittently across this landscape, typically comprising clusters of farm buildings and large sheds. Development is also evident in the form of an electricity transmission line, routed across the lower slopes, parallel to the north-east to south-west alignment of the Pentland Hills. There is also a Water Treatment Works next to Marchbank House although this is a more discreet feature in the landscape.

Intensive farming has encroached onto the fringes of the Pentland Hills, and although some small and well enclosed fields occur to the south of Bavelaw Marsh, Threipmuir Reservoir and Harlaw Reservoir, this series of water bodies mark the transition between the farmland and the moorland, and the start of the Pentland Hills. Some enclosed rough pasture occurs across the lower slopes, while the upper slopes and summits are mostly blanketed in heather moorland with broadly spaced stone dykes forming more intermittent boundaries. Black Hill (501m AOD) and Hare Hill (449m AOD) form the first tier of hills to the south of Balerno and the reservoirs. They comprise steep slopes and smoothly rounded summits and form enclosure to the landscape to the north-west.



Legend

- Red Line Boundary
- 5km Study Area

Proposed Development Theoretical Visibility

- No Theoretical Visibility
- Some Theoretical Visibility
- Viewpoint Location:

1. Cockburn Crescent (west)
2. Cockburn Crescent (east)
3. Mansfield Road
4. Black Hill

Assumed Height:	8.5m	Observer height:	2m
DTM:	OS T50	Surface features:	Excluded
DTM resolution:	50m	Earth curvature:	Included

0 0.5 1 2 km

Figure 2: Zone of Theoretical Visibility (ZTV) map

The hills are largely undeveloped with access tracks, grouse butts and sheepfolds forming the most evident human interventions, other than the management of the moorland and small blocks of forestry. Although natural elements predominate in this landscape, it is a landscape managed for recreational and commercial land uses.

1.7 The study area

The Zone of Theoretical Visibility (ZTV) map, shown in Figure 2, provides a useful starting point in the appraisal process by highlighting those areas across which the proposed development would be theoretically visible. It is important to note that in this ZTV theoretical visibility is based purely on landform modelling and does not take into account the screening effect of built form and vegetation, which in a context such as this, where there is enclosure from extensive tree cover and urban areas, makes an appreciable difference.

Site visits have confirmed that, although visibility extends beyond a 5km radius from the proposed development, it would be unlikely for notable effects to arise from these distances, especially when there is already an influence from the presence of the existing settlement in those same areas that would gain actual visibility. The study area has therefore been set at a radius of 5km.

2. Planning Context

2.1 Overview

Presented here is a brief summary of planning policy and guidance which is of particular relevance to the LVA. The following table sets out the relevant documents and associated policy and guidance. The following text highlights their relevance to this appraisal. Landscape designations are shown in Figure 3.

Development Plans / Guidance Documents	Relevant Policies / Guidance
Rural West Edinburgh Local Plan (June 2006)	E5: Green Belt E8: Areas of Great Landscape Value and Areas of Outstanding Landscape Quality E14: Historic Gardens and Designed Landscapes
Edinburgh Local Development Plan - Second Proposed Plan (June 2014)	Env 7: Historic Gardens and Designed Landscapes Env 10: Development in the Green Belt and Countryside Env 11: Special Landscape Areas
Review of Local Landscape Designations (2010)	Citations detailing the special qualities of the city's candidate Special Landscape Areas.
Edinburgh Landscape Character Assessment (2010)	Citations classifying the landscape character types in the Edinburgh Council area.
Edinburgh Green Belt Landscape Character Assessment (2008)	Citations classifying the landscape character types of the Green Belt.
An Inventory of Gardens and Designed Landscapes	Citations detailing the special qualities of Historic Gardens and Designed Landscapes.

2.2 The Rural West Edinburgh Local Plan (2006) / Second Proposed Plan (2014)

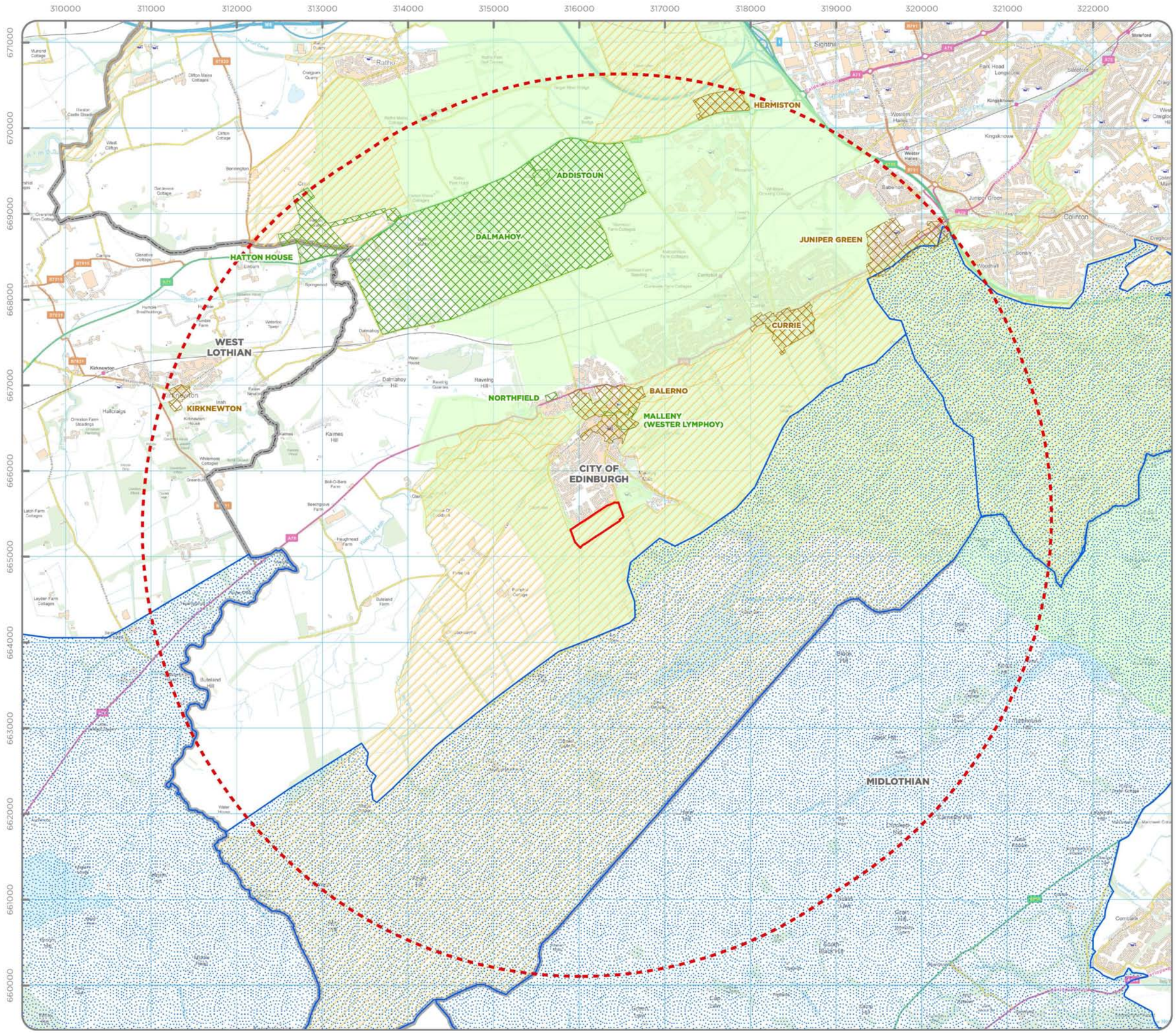
'The Rural West Edinburgh Local Plan' (2006) is the adopted local plan, while the 'Second Proposed Plan' (2014) is the emerging local plan - this has been approved by Planning Committee and is currently at examination. While the policies in the adopted plan may take precedence in the determination of applications, the emerging plan will form a material consideration. The adopted and emerging policies relevant to the appraisal are set out below. In respect of landscape designations, reference is made to the Second Proposed Plan (2014) as this reflects the update of the Areas of Great Landscape Value (AGLVs) to proposed Special Landscape Areas (SLAs) as approved by Planning Committee through the 'Review of Local Landscape Designations' (2010).

2.3 Green Belt

The Edinburgh Green Belt was first established in 1957, since then it has undergone numerous alterations. Its principal aim has been to contain urban areas and maintain their separation. The Edinburgh Green Belt covers areas around the city as well as areas within the city. The site is currently situated in the Edinburgh Green Belt, which extends across the surrounding agricultural landscape between the Water of Leith to the north and the foot of the Pentland Hills to the south.

While the extent of the adopted Edinburgh Green Belt across the west of the city is defined in 'The Rural West Edinburgh Local Plan' (2006), the emerging 'Edinburgh Local Development Plan: Second Proposed Plan' (2014) provides more up-to-date boundaries in the Proposals Map. In terms of development plan policy protecting the Edinburgh Green Belt, the adopted Policy E5 in 'The Rural West Edinburgh Local Plan' is similar in wording to the emerging Policy Env 10 in the 'Second Proposed Plan', both making a presumption against development apart from in the specific circumstances cited.

In both the adopted and emerging plans, those countryside areas which are not designated green belt are afforded the same level of protection as they are considered to be of equal environmental importance. Ultimately, all proposals in the green belt and countryside areas will be required to demonstrate that the proposed development does not detract from the landscape quality or rural character of the area. The Second Proposed Plan highlights the more detailed guidance contained in the Council's 'Development in the Countryside and Green Belt'. The 'Edinburgh Green Belt Landscape Character Assessment' (2008) is also supplementary to Local Plan policy and sets out citations describing the landscape character of each area. Both these documents have been used to inform the baseline study and appraisal of effects.



Legend

- Red Line Boundary
- 5km Study Area
- Local Authority Boundary
- Conservation Area
- Garden & Designed Landscape
- Area of Great Landscape Value
- (Candidate) Special Landscape Area
- Greenbelt

Data Sources:
Edinburgh Local Plan, 2010
Edinburgh Local Development Plan, 2014
Midlothian Local Plan, 2008
West Lothian Local Plan, 2009

0 0.5 1 2 km

Figure 3: Landscape Designations

Policy E5: Development in Green Belt and Countryside Areas

'To protect the landscape quality, rural character and amenity of the Green Belt and Countryside Policy Areas, development in those areas will not be permitted except:

A. *where necessary for the purposes of agriculture, including farm diversification, horticulture, forestry, countryside recreation or other uses appropriate to the rural character of those areas, or where a countryside location is essential;*

B. *where acceptable under the policies covering the uses of strategic economic importance identified on the Proposals Map (Policies ED5-7);*

C. *where proposals are for minor extensions and alterations to existing buildings and it can be demonstrated that:*

- *there would be no materially adverse effect on the openness of the area or its landscape quality or character; and*
- *it would not lead to an unacceptable intensification of an existing non-conforming use; or*

D. *where proposals are for a change of use of existing buildings and it can be demonstrated that:*

- *there is no reasonable prospect of achieving a use which conforms to those specified in criterion (a);*
- *the building(s) is(are) of architectural merit or is (are) a valuable element in the landscape, and is(are) considered worthy of retention; and*
- *the building(s) is(are) of domestic scale, substantially intact and would require no significant demolition.'*

Env 10: Development in the Green Belt and Countryside

'Within the Green Belt and Countryside shown on the Proposals Map, development will only be permitted where it meets one of the following criteria and would not detract from the landscape quality and/or rural character of the area:

a) *For the purposes of agriculture, woodland and forestry, horticulture or countryside recreation, or where a countryside location is essential and provided any buildings, structures or hard standing areas are of a scale and quality of design appropriate to the use.*

b) *For the change of use of an existing building, provided the building is of architectural merit or a valuable element in the landscape and is worthy of retention. Buildings should be of domestic scale, substantially intact and structurally capable of conversion.*

c) *For development relating to an existing use or building(s) such as an extension to a site or building, ancillary development or intensification of the use, provided the proposal is appropriate in type in terms of the existing use, of an appropriate scale, of high quality design and acceptable in terms of traffic impact.*

d) *For the replacement of an existing building with a new building in the same use provided*

1) *the existing building is not listed or of architectural / historic merit;*

2) *the existing building is of poor quality design and structural condition,*

3) *the existing building is of domestic scale, has a lawful use and is not a temporary structure; and*

4) *the new building is of a similar or smaller size to the existing one, lies within the curtilage of the existing building and is of high design quality.'*

2.4 Special Landscape Areas

Special Landscape Areas (SLAs) are a local landscape designation made by Planning Authorities in relation to the scenic qualities of the landscape. Following SNHs 'Guidance on Local Landscape Designations' (2005), The City of Edinburgh Council and Midlothian Council have undergone a review of local landscape designations. Through The City of Edinburgh Council's emerging Second Proposed Plan, candidate SLAs are in the process of replacing the existing Areas of Great Landscape Value (AGLVs). Candidate SLAs are covered by Policy Env 11 of the Second Proposed Plan.

315000

316000

317000

666000

665000

Legend

Red Line Boundary

0 0.125 0.25 0.5 km

Figure 4: Aerial Context

Policy Env11: Special Landscape Areas

'Planning permission will not be granted for development which would have a significant adverse impact on the special character or qualities of the Special Landscape Areas shown on the Proposals Map.'

The map of candidate Special Landscape Areas (cSLAs) identifies those landscapes which have been designated across the Council area for their special landscape qualities and the contribution they make to the distinctive character of the city. Reference is made to the 'Review of Local Landscape Designations' (2010) which contains 'The Statements of Importance' for each of the cSLA. In these, the special qualities and characteristics of each area are described, along with opportunities for enhancement. Their purpose is to guide development proposals and they will form a material consideration in assessing planning applications. The site lies in the Pentlands cSLA and the Statement of Importance for this cSLA has been used to inform the baseline study and appraisal of effects.

The other SLA of relevance to this study is the Pentlands cSLA which lies in the Midlothian Council area abutting The City of Edinburgh Council area and adjoining the Pentlands cSLA to the east. This is also currently an AGLV which, through the emerging local plan is being proposed as an SLA. For the purposes of this appraisal, and as the cSLAs share the same aims and objectives, both these cSLAs will be considered as one designated area.

2.5 Historic Gardens and Designed Landscapes

Historic Scotland is responsible for recording Gardens and Designed Landscapes (GDLs), which are contained in an Inventory. The GDLs are afforded protection under Scottish Planning Policy (SPP). The descriptions contained in the Inventory identify the special qualities which merit the designation of each GDL. There are four Inventory Gardens and Designed Landscapes in the study area as shown on Figure 3. These comprise Malleny, Northfield, Dalmahoy and Hatton House. The Inventory citations for Malleny and Northfield describe the extent of enclosure by tree cover which will prevent visibility of the site. Dalmahoy covers a larger area from which open views towards the south occur and Hatton House has some enclosure although the structure planting is in poor condition. The location of the site on the southern edge of Balerno, furthest from Dalmahoy and Hatton House, and set behind the existing built-up area means that the proposed development will have a very limited effect on the GDL.

Policy Env 7: Historic Gardens and Designed Landscapes

'Development will only be permitted where there is no detrimental impact on the character of a site recorded in the Inventory of Gardens and Designed Landscapes, or upon component features which contribute to its value. Elsewhere, adverse effects on historic landscape features should be minimised. Restoration of Inventory sites and other historic landscape features is encouraged.'

This policy aims to protect sites included in the national Inventory of Gardens and Designed Landscapes and other historic landscape features elsewhere across the Council area. Initial desk-based and site-based research suggests that the proposed development will have a limited effect on the four GDLs in the study area and therefore a detailed appraisal will not be required.

3. Baseline Conditions

3.1 Baseline and sensitivity of landscape character receptors

The baseline study describes the existing conditions of those receptors in the study area that are to be appraised in detail. The process of this study helps to gain an understanding of what makes the landscape and visual receptors distinctive and what their important components or characteristics are. It also helps to understand how each receptor relates to the site and the proposed development, and in so doing, helps to determine the sensitivity of the receptor in terms of their intrinsic value and susceptibility to the proposed development.

In order to identify those receptors that require to be assessed in detail, an initial appraisal of all the receptors in the 5km study area has been undertaken, through a combination of desk based research of maps, Landscape Character Assessments and planning policy, combined with site based reconnaissance.

Landscape receptors include Landscape Character Types (LCT) as identified in the national suite of Landscape Character Assessment documents produced by Scottish Natural Heritage (SNH). Those relevant to this assessment include the 'Lothians Landscape Character Assessment' and the 'Edinburgh Landscape Character Assessment'. As the latter is more recent and provides a more detailed classification of the landscape, the Landscape Character Types (LCTs) it identifies are used as the landscape character receptors appraised in this report.

The LCTs identified in the 'Edinburgh Landscape Character Assessment' are shown in Figure 5. Site visits have shown that those LCTs with the potential to undergo significant effects as a result of the proposed development include the following:

- Pentland Flanks: Cockburn Geometric Wooded Farmland LCT;
- Pentland Hills: Pentland Heights LCT; and
- Uplands: Pentland Hills LCT.

Despite the proximity of the Bavelaw Geometric Wooded Farmland LCT to the site, the dense woodland which surrounds Harmeny House along the east side of the site will screen the development from the closer range parts of the LCT. Where visibility does occur at a greater range, the scale of the proposed development will be seen to be smaller and this, combined with its association with the existing settlement, will moderate its influence on the character of this LCT. This LCT has, therefore, not been appraised in detail.

The landscape designations which occur in the area are mostly associated with the Pentland Hills. These are shown in Figure 3. Owing to the division of the hills by administrative boundaries, the Edinburgh Council Pentlands cSLA covers the western half of the hills, and the Midlothian Council Pentlands cSLA covers the eastern half of the hills. As both these designations share the same aims and objectives, and in order to ensure continuity in the appraisal, these areas are assessed as one. Reference is also made to the Pentland Hills Regional Park which covers a similar area, albeit not including the site.

As the principal aim of the Green Belt designation is to contain the extent of the city and maintain separation with surrounding settlements, the Green Belt is primarily a planning designation and not a landscape designation. There are, however, elements of the designation that do relate to the special qualities and characteristics of the landscape contained in the Green Belt and this is demonstrated through the 'Green Belt Landscape Character Assessment' (2008) which describes the different LCTs that occur in the Green Belt. The site and the area around the site lies in the Edinburgh Green Belt.

Those designated areas which are to be appraised in detail include the following;

- Pentlands cSLA (The City of Edinburgh Council and Midlothian Council areas); and
- Edinburgh Green Belt.

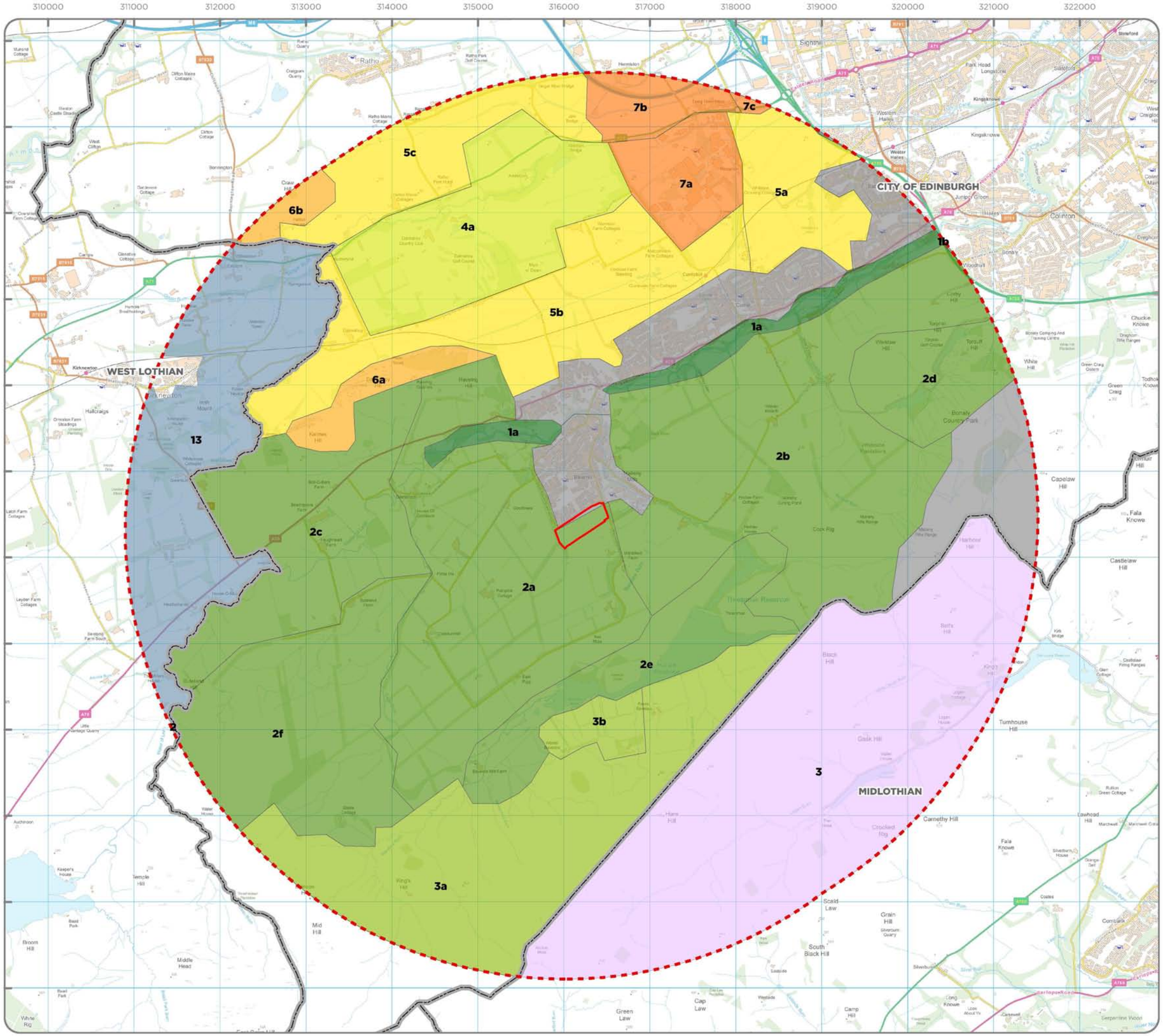
Baseline descriptions and ratings of value for these LCTs, the cSLA and the Green Belt are presented below.

Pentland Flanks: Cockburn Geometric Wooded Farmland

Baseline: The Cockburn Geometric Wooded Farmland LCT forms part of the Pentland Flanks on the western side of the Pentland Hills. The Pentland Flanks follow the same north-east to south-west alignment of the Pentland Hills and lie between the Rolling Farmlands to the north and the Pentland Hills to the south. The Cockburn Geometric Wooded Farmland LCT lies to the west and south-west of Balerno and as the site sits on the southern side of the settlement, it forms part of this LCT.

The landform comprises north-west facing slopes, which are broad in scale and fall gently towards the north. Their southern extent is marked by a low ridge of 260-270m AOD beyond which, to the north, the landform dips down into the Redford Basin which is occupied by Bavelaw Marsh, and Threipmuir and Harlaw Reservoirs. These have been constructed through the use of dams and retaining walls and are evident as a human intervention. The northern extent of the LCT is marked by the incised river valley of the Water of Leith and while lower in the landform, its presence is marked by the density of the riparian woodland. Tributaries to the Water of Leith come in the form of small burns, cutting shallow channels through the hills slopes, and following the orientation of the down-slope from south to north.

As the name of the LCT denotes, it is the geometric pattern of the wooded shelter-belts that define the character of this landscape. The shelter belts are laid out to enclose medium sized fields of arable and pasture, and their breadth and maturity establishes them as a prominent feature in the landscape. They generally comprise a mix of tree species, albeit with coniferous species predominant in some areas. The screening effect of the shelter-belts reduces inter-visibility across this LCT, making views often contained, albeit with the presence of the Pentland Hills as the most apparent external feature.



Legend

- Red Line Boundary
- 5km Study Area
- Local Authority Boundary

Edinburgh Landscape Character

- 1. Incised River Valley
  - a. Water of Leith Colinon to Balerno
  - b. Water of Leith Slateford to Colinton Dell
- 2. Pentland Flanks
  - a. Cockburn Geometric Wooded Farmland
  - b. Curie Sloping Wooded Farmland
  - c. Leith Plateau Farmland
  - d. North Pentland Slopes
  - e. Redford Basin
  - f. West Pentland Fringe
- 3. Pentland Hills - Upper Slopes and Summit
  - a. Pentland Heights
  - b. Bavelaw Geometric Wooded Farmland
- 4. Policy Landscape
  - a. Dalmahoy Policies
- 5. Rolling Farmland
  - a. Baberton Farmland
  - b. Gowanhill Farmland
  - c. Ratho Farmland
- 6. Rural Outcrop Hills
  - a. Kaimes Hill
  - b. RathoHill
- 7. Settled Farmland
  - a. Riccarton Institutional Landscape
  - b. Gogar Farmland and Institutions
  - c. East Hermiston Farmland
- Urban

West Lothian Landscape Character

- 13. Lowland Plains: Kirknewton Plain

Midlothian Landscape Character

- 3. Uplands: Pentland Hills

Data Sources:
Edinburgh Landscape Character Assessment, Jan 2010
West Lothian Landscape Character Classification, Aug 2014
Landscape Capacity Study for Wind Turbine Development in Midlothian, Jan 2007

0 0.5 1 2 km

Figure 5: Landscape Character

Development in this LCT is limited to occasional farmsteads and other isolated dwellings, accessed by quiet minor roads that follow the geometric pattern. Many of the farmsteads include a complex of out-buildings and large scale sheds, although their prominence in the landscape is often moderated by the enclosure of the tree cover, as is the Water Treatment Works, close to Marchbank House. A more visible feature is the electricity transmission line which crosses this LCT, as well as the existing settlement boundary of Balerno.

Value: The value of this LCT is medium. Those factors which contribute to the value of this LCT include its location in the Pentlands cSLA, and the unique character inherent in the geometric woodland pattern. Those factors which detract from the value include the extent to which this landscape has been modified by agricultural practices and the intervention the wooded shelterbelts make within the natural landform, especially where there is a predominance of coniferous species. The landscape is also influenced by settlement, most notably the larger settlements of Balerno.

Pentland Hills: Pentland Heights

Baseline: The Pentland Heights LCT falls within the Edinburgh Council area, to the north-west of the administrative boundary with the Midlothian Council Area. The LCT occurs across two separate areas; one to the north which covers the steep hills that define the northern edge of the Pentland Hills; and one to the west which covers the lower hill slopes of Hare Hill and Black Hill. The administrative boundary between the Edinburgh Council area and the Midlothian Council Area forms an arbitrary line through the western flank of the Pentland Hills.

Although much of the LCT description in the Edinburgh Landscape Character Assessment refers to the importance of the hills on the northern side of the LCT, some reference is made to the hills on the western side, namely Black Hill and Hare Hill, and their local importance in providing a backdrop to views from the outlying settlements on this south-western side of the city. At 501m and 449m respectively, Black Hill and Hare Hill are relatively low, but their prominence is emphasised by their scale relative to the lowland plain to the north. The hills have steep slopes that round across the summits and the landcover is predominantly heather moorland.

Tributaries to the Water of Leith come in the form of small burns, cutting shallow channels through the hills slopes, and following the orientation of the down-slope from south to north. Larger water features occur in the form of a series of reservoirs, set along the base of the Pentland Hills, in the neighbouring Redford Basin LCT, those closest to the site comprising Bavelaw Marsh, Threipmuir and Harlaw. These have been constructed through the use of dams and retaining walls and are evident as a human intervention.

Development in the Pentland Heights LCT is typically scarce, limited to very occasional farmsteads and access tracks. Development in the settled lowlands to the north has an influence on the character of this landscape by presenting the wider urban context, with the closer range features of the electricity transmission line and settlement boundaries having the most notable influence.

Value: The value of this LCT is medium to high. It forms a part of the Pentland Hills which are valued for the contribution they make to the setting of Edinburgh and its outlying settlements. It is made distinct by the general absence of development and presence of open moorland, in contrast to the settled and cultivated character of the neighbouring lowlands. The LCT forms part of the Pentland Hills cSLA. The LCT is prevented from being rated high as it is not a nationally designated landscape and is influenced by development in the surrounding lowlands.

Uplands: Pentland Hills

Baseline: The Pentland Hills LCT falls within the Midlothian Council area, to the south-east of the administrative boundary with The City of Edinburgh Council area. As such, the LCT is defined to the north by a straight lined boundary that has no relation to the underlying landform, cutting across the upper slopes of the north-western tier of hills. The LCT includes the ridgeline of these hills which extends from Hare Hill 449m (AOD) in the south-west through Black Hill 501m (AOD) and Bell's Hill 406m (AOD) to Harbour Hill 421m (AOD) in the north-east. This ridgeline forms a natural view-shed between the lowland landscape to the north-west and the upland landscape of the Pentland Hills to the south-east. This means that to the south-east of the ridge, the lowlands and the site will be screened by the ridgeline and therefore will not have an influence on the character of the LCT. Visibility from the Pentland Hills LCT will resume across the upper slopes of the next tier of hills, where the site will be visible, albeit at a greater distance and with a comparatively lesser influence owing to the stronger influence of the intervening Pentland Hills themselves.

The Pentland Hills LCT is characterised primarily by the rounded hills and their heather moorland ground cover. There is very little built development within this LCT with the exception of the dams associated with the upland reservoirs and occasional isolated properties. The heather moorland is largely featureless, with the exception of occasional access tracks and grouse butts, which along with the patterns of muirburn denote the management of this landscape for recreational shooting. Woodland is also sparse, with small scale forestry blocks occurring intermittently across lower slopes.

The elevation of the landform means that the character is also influenced by the wider landscape, with a clear distinction apparent between the upland and lowland landscapes. The lowland landscapes to the north-west are characterised by the mix of farmland and urban areas. The geometric pattern of enclosed farmland denotes the extent to which this landscape has been modified by agricultural practices, while the urban areas mark the settled nature of the lowlands.

Balerno is the closest of the settlements, although appearing from the Pentlands to be well contained within the lowlands landscape. The site is seen on the south side of the settlement and would therefore bring development marginally closer to the LCT, although in a location where it will be clearly associated with the existing settlement.

Value: The value of the Pentland Hills LCT is medium to high. The LCT is covered by the cSLA designation and the upland landscape is valued for the setting it provides to the city of Edinburgh and other outlying settlements. The LCT is prevented from being rated high as it is not a nationally designated landscape and is influenced by development in the surrounding lowlands.

Pentlands cSLA

Baseline: The Pentland Hills fall within the areas of five different planning authorities; The City of Edinburgh Council, Midlothian Council, West Lothian Council, North Lanarkshire Council and the Scottish Borders. The northern part of the Pentland Hills is closest to the site and, therefore, of most relevance to this assessment. This is covered by the Development Plans for The City of Edinburgh Council and Midlothian Council, both of which identify their part of the Pentland Hills as a proposed or candidate SLA. The boundary between these candidate SLAs follows an arbitrary administrative boundary. For the purposes of the assessment, therefore, both of these cSLAs will be assessed together as one cSLA. Visibility of the proposed development will extend across the north-western slopes of the Pentland Hills, beyond which, on the south-east facing slopes, visibility will be screened by the ridge itself. It is the north-western slopes and the ridgeline that will be the focus of this assessment as this is where effects are most likely to occur.

The area of the Pentlands cSLA to be assessed extends from the urban edge of Currie and Balerno to the north-western ridgeline of the hills. In the north, this extends from the urban edge of the City by-pass and the wooded edge of the Water of Leith, southwards across the rising slopes to the summits and ridgelines of the north-western hills. In respect of the site, the boundary of the proposed cSLA largely coincides with the existing settlement boundary of Balerno, such that it currently includes the site within the designated area of the cSLA.

The 'Local Landscape Designation Review' (2010) produced by The City of Edinburgh Council provides a citation for the Pentlands cSLA (the area that lies within its administrative boundary). This highlights the importance of the Pentland Hills as a backdrop in views from the city. 'They are one of the most prominent features of the city skyline and dominate the surrounding landscape.'

The citation then goes on to state 'The Pentlands SLA provides an identifiable setting and containment to the city and surrounding settlements of Juniper Green, Currie and Balerno.' It is evident that the principal importance of the Pentland Hills relates to their relationship with the city and outlying settlements. As the citation puts it, 'Despite their modest elevation, rising to just less than 500m within the cSLA, the hills command a prominent position above the surrounding coastal margin and gently undulating lowlands.'

The citation contains a description of the features and characteristics of the cSLA but without highlighting their special qualities. Many of these features and characteristics relate to past and present land use practices including farming, forestry, designed landscapes and moorland management, as well as the presence of the reservoirs. It describes this area as follows, 'The well managed agricultural landscape and reservoirs backed by the hill range are of high scenic value and offer a sense of isolation.'

Value: As assessed above, the value of the component LCTs varies with the Cockburn Geometric Wooded Farmland LCT having a medium value and the Pentland Heights and Pentland Hills LCTs having a medium to high value. This variation reflects the greater influence in the lowlands of intensive agricultural practices and existing settlement compared to the less modified and less developed upland landscape, where the distinctive landform adds to the intrinsic character. These ratings apply also to the SLA, with a medium value across the part that coincides with the Cockburn Geometric Wooded Farmland LCT and a medium to high value across the part that coincides with the Pentland Heights and the Pentland Hills LCTs. The cSLA is prevented from being rated high as it is not a national designation and is influenced by development in the lowland parts.

Edinburgh Green Belt

Baseline: The Edinburgh Green Belt covers a substantial area both around and within the city of Edinburgh. The part of the Edinburgh Green Belt of relevance to this appraisal lies to the south-west of the city, where it covers the site and surrounding area. The Edinburgh Green Belt encompasses the settlements of Currie and Balerno, wrapping around their boundaries and extending into the adjacent rural areas.

The outer boundary of the Green Belt lies approximately 1km to the west and south of the settlement boundary of Balerno, covering an area categorised as the Cockburn Geometric Wooded Farmland LCT and including the two fields that comprise the site. The Green Belt does not include Hare Hill or Black Hill in the Pentland Hills, the boundary falling short of the reservoirs that occupy the Redford Basin, although to the north of Harlaw Reservoir, extending onto the slopes of Bells Hill and Harbour Hill and including the higher hills on the northern side of the Pentland Hills.

The Edinburgh Landscape Character Assessment (2011) is based on the same LCTs as used in the Edinburgh Green Belt Landscape Character Assessment (2008), with the descriptions of the LCTs worded similarly. The Cockburn Geometric Wooded Farmland LCT is of most relevance to this appraisal as the site is located in this area. The criteria considered in the assessment of this area includes 'character' and 'visibility' as components of 'scenic qualities', and 'remoteness' and 'wildness' as components of naturalness. In respect of the former, character and visibility is described as 'gently sloping arable and pasture farmland with strong shelterbelt patterns overlaying the landform which creates enclosure and restricts views'. In respect of the latter, the sense of remoteness is considered to be moderated by limited inter-visibility, despite the proximity to Balerno, and wildness is considered to be moderated by the extent of modification by human influences as evident in the regular pattern of shelterbelts and farming activity.

Value: The value of the Green Belt in the area of the site and its surroundings is medium. The Green Belt is not a scenic designation and therefore does not necessarily denote landscape value. The area is relatively introverted on account of the enclosure of the mature and dense shelter-belts and therefore lacks any special association with the wider landscape. The wooded farmland presents an intensively managed landscape that moderates any sense of wildness.

3.2 Baseline and Value of Representative Viewpoints

Site visits of the site and surrounding area have concluded that visibility of the proposed development will be largely limited by the enclosure of tree cover and built form. Four viewpoints have been identified, which are representative of the surrounding visual receptors which have the potential to be affected by the proposed development. Their locations are shown in conjunction with the ZTV in Figure 2, and viewpoint plans and photographs shown in Figures 8 to 15. Baseline descriptions and ratings of value for these principal visual receptors are presented below.

Viewpoint 1: Cockburn Crescent east (Figures 8 and 9)

Baseline: This viewpoint is located at the corner of Mansfield Road and Cockburn Crescent. It is representative of the views experienced by road-users, pedestrians and residents of the local area. It is also representative of visitors to the area, some of whom may be visiting the Pentland Hills Regional Park, which can be accessed from the Red Moss car park at the end of the continuation of Mansfield Road southwards. The bus loop is located on this corner, where the No. 44 Lothian Regional Transport buses are often seen waiting.

The view looks south-west across the site, such that it features the farm fields and the hedgerows and trees which define their boundary. The extent of the view is largely contained by the enclosure of the boundary trees to the south and west, except where filtered views through the tree cover expose glimpses of the wider landscape. To the east (left of the view), the mature and dense woodland of Harmeny House screens views in this direction. To the north (right of the view), the urban edge of Balerno is visible in the form of the semi-detached, two-storey dwellings which front out onto Cockburn Crescent and overlook the site. This urban edge forms enclosure to the view in this direction.

The view is characterised by the interface between the urban and rural boundaries, both of which have an influence on the character of the view. The influence of both the rural and urban areas is limited by the extent to which they are visible. While the farm fields present an attractive rural character, the containment of the view to within the local area means that the association of the site with the wider landscape is not evident. In a similar way, as only the northern edge of Balerno is visible, the influence of the wider urban context is also moderated.

Value: The value of the view from this viewpoint is medium to high. It is not a formal viewpoint that people visit with the intention of enjoying views, but is experienced incidentally by road-users and pedestrians as they pass along Mansfield Road and Cockburn Crescent, and from residents in their homes and gardens. The view is of farm fields which are typical of the wider landscape and which are separated from the wider landscape by the tree belt.

Viewpoint 2: Cockburn Crescent west (Figures 10 and 11)

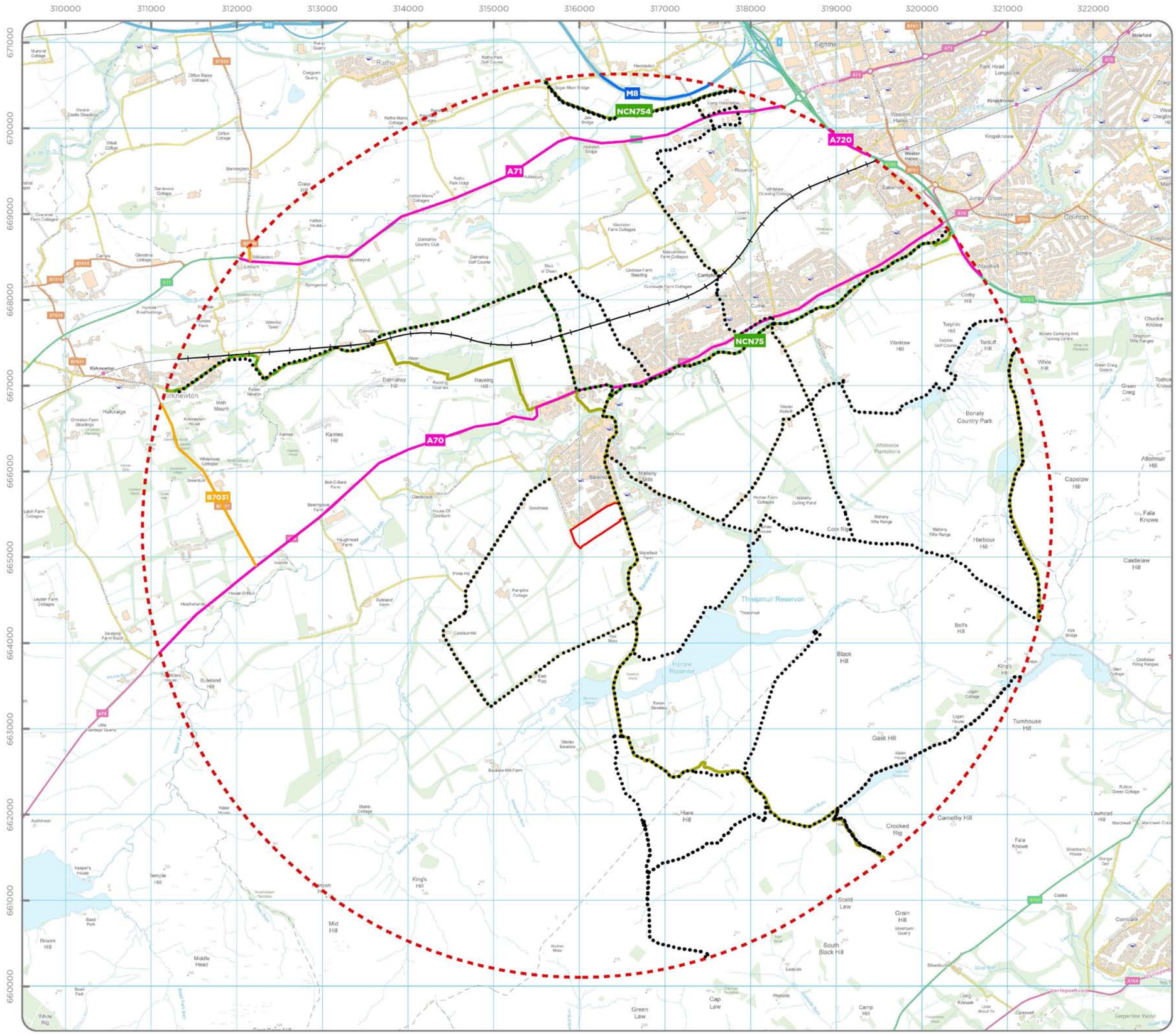
Baseline: This viewpoint is located at the western end of Cockburn Crescent and is representative of the views of local road-users, pedestrians and residents. The view looks south-east across the site towards the Pentland Hills, and is largely open in aspect with some partial screening from intervening tree cover and hedgerow. To the north (left of the view), the enclosing edge of the Balerno contains views in this direction.

The view features two tiers of landform. The first tier comprises the foreground which is seen to rise gently towards the south, and which gives a sense of enclosure to the settlement edge. This enclosure is further accentuated by the row of mature trees which form the boundary planting along the first tier ridge, albeit with intermittent gaps occurring in the cover. The first tier landform largely screens the second tier which comprises Black Hill 501m (AOD) to the left and Hare Hill 449m (AOD) to the right, such that only the upper slopes and the summits are visible. This reduces the prominence of these hills in the view, although they, nonetheless, form an important reference to the wider landscape.

While the existing development is evident to the rear of this view, the view to the north is predominantly rural in character. A number of features detract from this rural character, most notably the electricity transmission line which extends along the first tier ridgeline, as well as the pole-mounted line, which crosses the adjacent fields. In contrast to the relatively unmodified appearance of the hills that form the background, the modified and managed nature of the agricultural landscape is readily evident.

The site is separated from the dwellings on Cockburn Crescent by a dense, but low hedgerow such that views are relatively open in aspect. The intermediate field boundary of mature trees separates the two fields of the site, such that the more distant field is not readily apparent.

Value: The value of the view from this viewpoint is medium to high. The viewpoint is not a formal viewpoint in the sense that it is not a location which people would visit with the purpose of enjoying the views. It is an incidental view, experienced by local road-users and pedestrians passing by, and by residents from their home and gardens. The view is of farm fields which are typical of the wider landscape albeit with some visibility of part of the Pentland Hills in the background.



Legend

- Red Line Boundary
- 5km Study Area
- Motorway
- A Road
- B Road
- Railway
- National Cycle Route
- Core Path
- Central Scotland Green Network Long Distance Walking Route

Data Sources:
OS © Crown Copyright. All rights reserved 2015
Historic Scotland © Crown Copyright. All rights reserved 2015
SUSTRANS © Crown Copyright. All rights reserved 2014

0 0.5 1 2 km

Figure 6: Principal Visual Receptors

Viewpoint 3 – Mansfield Road (Figures 12 and 13)

Baseline: This viewpoint is located on Mansfield Road at a position on the edge of the eastern site boundary. The view looks west across the site towards Cockburn Crescent, which forms the northern settlement boundary of Balerno. Mansfield Road provides access from Balerno to the car park at Red Moss from where the Pentland Hills and reservoirs can be accessed, forming part of Core Path CEC19. The relatively narrow carriageway and leafy road-side enclosure gives Mansfield Road a rural character, although the engineered bus loop at Cockburn Crescent detracts from this.

The eastern site boundary is enclosed by the mature and dense woodland of Harmeny House which occupies the land to the east of Mansfield Road. To the west of Mansfield Road there is a band of long grasses and wild flowers covering the mounds either side of the drainage ditch. While this may partially screen the views of some road users, the views from this eastern edge are generally open.

The open view does not, however, extend far. This is partly due to the landform, which falls away to the south, such that the view is largely contained by the immediate ridgeline. It is also partly due to the extent of mature tree cover along the field boundaries, which although fragmented in sections, largely forms enclosure to the adjacent field. To the north (right of the view) the dwellings which line the northern edge of Cockburn Crescent are visible, although their lower elevation means that it is mostly only rooftops and upper floors that can be seen. These denote the presence of the settlement and although only the front row of dwellings is visible, their modern and semi-detached appearance denotes that they form an extension to a relatively substantial settlement.

Value: The value of the view from Mansfield Road is medium. It is not a formal viewpoint that people would visit with the purpose of enjoying the view. It is experienced mostly by road-users, but also pedestrians, as an incidental view typical of other views in and around the site and does not include any special features which would otherwise add to its value.

Viewpoint 4 – Black Hill, Pentlands (Figures 14 and 15)

Baseline: This viewpoint is located just below the summit of Black Hill 501m (AOD). From the summit, the rounded landform blocks the view towards the site, while from just below the summit, the site and its local context are more clearly seen. The viewpoint is representative of the views of walkers, cyclists and other recreational users in the Pentland Hills. The view looks north-west towards the site and is extensive in all directions with the exception of to the south-east where the summit partly blocks the wider view.

The view to the north-west comprises a foreground characterised by the heather moorland of the upper slopes of Black Hill. The landform drops steeply away, such that the hill slopes are concealed and beyond the edge of the foreground, the central lowlands are revealed which extend from the middle-ground of the Pentland Flanks to the distant background of the Ochils, and on a clear day all the way to the Trossachs.

The view to the north extends across the urban area of Edinburgh, to the Firth of Forth and Fife beyond. This sector of the view establishes the existing influence of urban development which appears from this viewpoint to be contained by a band of farmland along the western edge. The continuation of development which extends through Currie to Balerno is screened by intervening landform and this makes Balerno appear disassociated from the city. To the south, the view extends along the ridgeline of the Pentland Hills and its adjacent flanks, to present a less developed and more rural landscape.

In the sector of the view towards the site, there is a mix of both urban and rural areas. Balerno is evident as the closest range settlement to the viewpoint, although seen well integrated within its landscape setting, largely owing to its relatively low-lying location and the extent of dense woodland cover that surrounds it. The woodland helps to reduce the perceived scale of the settlement by making it look well contained. The most exposed part of the settlement is the northern edge, which in the absence of any tree cover, is readily evident from this viewpoint. While there is a shelter belt along the southern boundary of the site, this appears fragmented and only offers partial screening. An electricity transmission line is also evident to the south of Balerno, which further detracts from the rural character.

Value: The value of the view is medium to high. Black Hill is a location people will visit with the purpose of enjoying the view and this raises the value of the viewpoint. It is also representative of views from the designated landscapes of the Pentlands cSLA and the Pentlands Regional Park. The view is expansive with the main features being the Pentland Hills to the south and the city of Edinburgh to the north. Although there are scenic qualities that add to the value of the view, development is also an established part of the view.

4. Development Design Mitigation

4.1 Project description

The development of the Cockburn Crescent site will involve the construction of 150 dwellings, the installation of infrastructure and the implementation of a woodland structure, open space and two SUDS ponds.

4.2 Development design mitigation

The following key features of the proposed development contribute to the embedded mitigation of the potential landscape and visual effects.

- The recessed location of the residential dwellings on all aspects to ensure sufficient space is allowed for mitigation planting and open space;
- The orientation of many of the dwellings to ensure they address and overlook streets and open spaces;
- The use of two storey dwellings to ensure that their appearance is commensurate with the existing properties on adjacent Cockburn Crescent;
- The use of a similar density to the areas on adjacent Cockburn Crescent to ensure an integration of characteristics;
- The implementation of a strong geometric wooded framework to ensure the site appears well integrated with the existing characteristics of the baseline landscape; and
- The integration of a finer framework of tree planting through the proposed development to create an attractive setting and reduce the comparative scale of the dwellings.

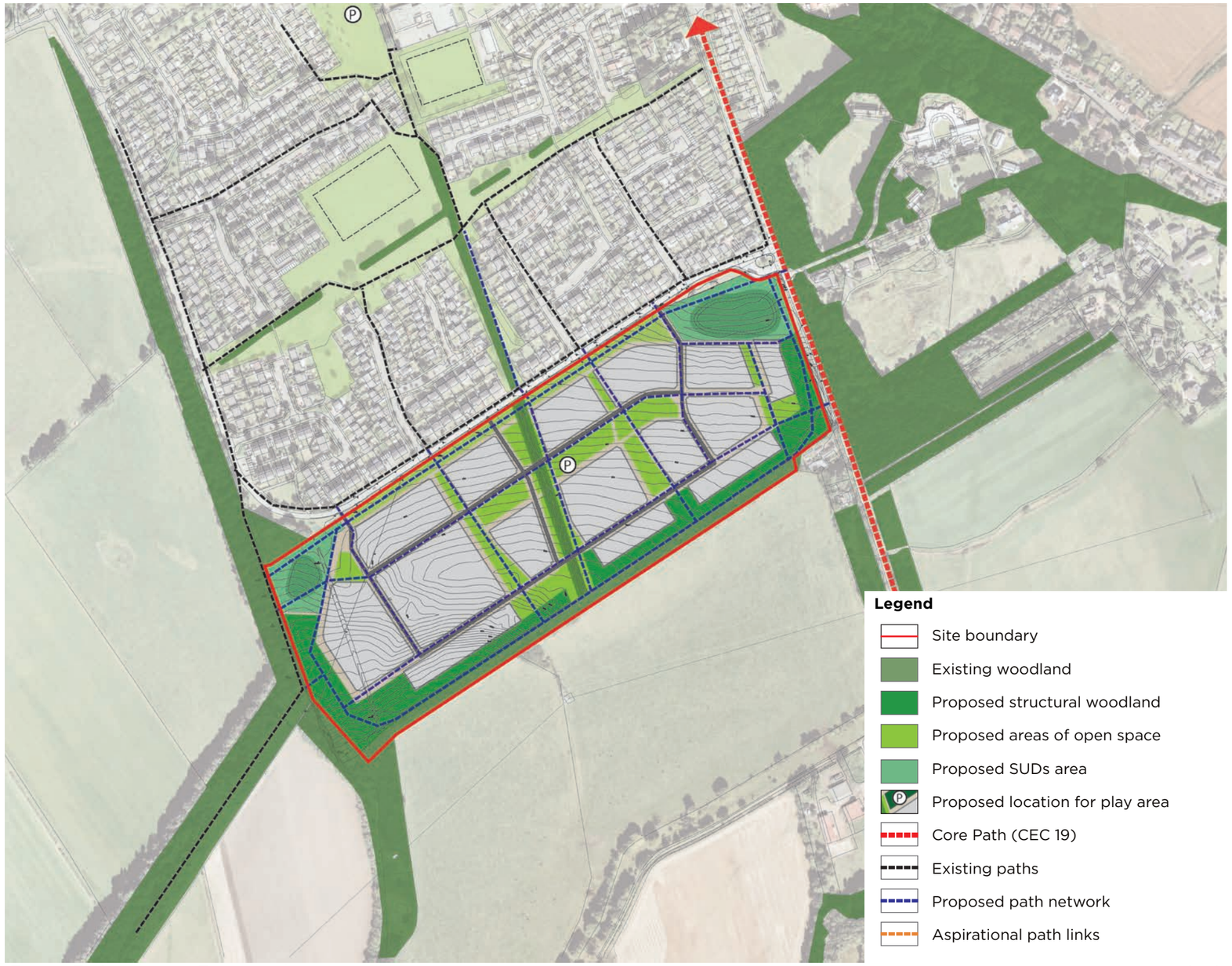


Figure 7: Landscape Framework (nts)

5. Effects on Landscape Character

5.1 Effects on landscape character types

The baseline descriptions and value ratings for the three LCTs and one cSLA being appraised in detail are set out in Section 3. The effects of the proposed development on these receptors are set out below, based on an appraisal of the sensitivity, magnitude of change and level of effect for each receptor.

Generally, the level of effect experienced from a landscape receptor will be less than that experienced from a viewpoint. The viewpoints have been selected to represent those points which are most sensitive to the proposed development as well as which gain fullest visibility of the proposed development. Viewpoints, by their very nature, focus the viewer's attention towards specific features. It is, therefore, often likely that viewpoints will undergo higher levels of effect than the broader surrounding areas. Across a landscape area, where the influence of the proposed development will typically be more variable and there is not the same strong association that is often formed through a formal view, the effects will typically be lower.

Cockburn Geometric Wooded Farmland LCT

Sensitivity: The value of the Geometric Wooded Farmland LCT was assessed in Section 3 as medium.

The susceptibility of the LCT to the proposed development is considered to be medium. The LCT is a lowland landscape which is characterised by intensive agricultural land uses. The enclosure of fields creates an insular character, albeit with limited influences from the wider landscape, such as views of the elevated Pentland Hills. The LCT is located around the settlement edge of Balerno, such that residential development has an existing influence on the character and creates a context in which further development would not introduce a new feature. Parts of the LCT do, however, lie between the existing settlement boundary and the Pentland Hills and, while distinctly part of the lowland landscape, they do contribute to the setting of the hills.

The combination of the medium value and medium susceptibility gives rise to an overall **medium** sensitivity.

Magnitude of change: The proposed development will be located in this LCT, occupying the two adjacent fields to the south of Cockburn Crescent. It will comprise 150 dwellings and associated infrastructure. Mitigation of potential effects has been taken into account with the provision of substantial boundary planting along the south, west and east, in-keeping with the character of the existing geometric woodland enclosures.

The site forms a small proportion of the wider LCT, the broad majority of which will remain undeveloped. The enclosure provided by the residential development to the south and existing mature trees to the west, north, and especially to the east, ensures that the influence of the proposed development will be limited in geographical extent to the local area. Furthermore, mitigation planting designed to bolster the existing shelter belts around the site, will gradually add to this sense of enclosure as the planting matures.

The development of the site will give rise to a loss of part of this LCT, which is characteristic of the wider LCT in the sense that it comprises arable farmland enclosed by geometric tree belts. Its importance as part of the wider LCT is limited owing to the limited inter-visibility as a result of the enclosure as described above. Furthermore, it is a part of the LCT that is already influenced by the existing settlement boundary of Balerno and, therefore, appears as a logical location for an extension.

The magnitude of change on the LCT as a result of the proposed development will be **low**. This is on account of the limited influence of the proposed development, owing to the enclosure of the extensive woodland and shelter-belt structure across the LCT. In the localised area immediately around the site, the magnitude of change will be **medium to high**. This is on account of the notable difference to the character of the LCT which will occur in this localised area, as open farmland is replaces with built development. The magnitude of change is prevented from being high owing to the vertical containment of the development to two storeys and the extent of mitigation planting that will add to the existing screening around the site.

Level of effect: The overall level of the effect of the proposed development on the LCT will be **minor**. The proposed development will occupy a small proportion of the much wider LCT and the influence of the proposed development will be contained by the extent of enclosure. There will, however, be a **major** effect in the localised part of the LCT where the proposed development will be located. The geographic extent of the major effect will be limited to the immediate area owing to the enclosure of existing and mitigation planting.

Pentland Heights LCT

Sensitivity: The value of the Pentland Heights LCT was assessed in Section 3 as medium to high.

The susceptibility of the LCT to the proposed development is considered to be medium to low. The proposed development is located outwith this LCT, such that there will be no direct effect on the character of the LCT, and although there is the potential that the character of the LCT will be influenced indirectly through visibility of the proposed development, it will be seen at a range beyond 2km and as part of the settled lowlands where development is already an existing feature of the baseline character. This moderates the susceptibility of the LCT to the proposed development.

The combination of the medium to high value and medium to low susceptibility gives rise to an overall **medium** sensitivity.

Magnitude of change: The magnitude of change on the LCT, as a result of the proposed development, will be **low**. The proposed development will be located in the neighbouring Cockburn Geometric Farmland LCT, which, in relation to the Pentland Heights LCT, appears comparatively low-lying and relatively settled. The proposed development will, therefore, appear similar in character to the existing settlements which define the baseline character of this LCT, as currently experienced from the Pentland Heights LCT. It will be seen associated with the existing settlement of Balerno, and although increasing the extent of the settlement, at this range beyond 2km, this increase will appear incremental in scale.

The elevated landform of the Pentland Heights LCT, relative to the Cockburn Geometric Farmland LCT, means that a good level of inter-visibility occurs, with views extending across the close range parts of the adjacent LCT. Balerno will continue to appear well enclosed by woodland and the proposed development site will be partially screened by the existing mature tree belt that defines the southern boundary. As mitigation planting matures, over time, it will add to the screening effect of the southern boundary to create a more robust edge.

Level of effect: The overall level of the effect of the proposed development on the Pentland Heights LCT will be **minor**. The proposed development will

be located in the neighbouring Cockburn Geometric Farmland LCT and associated with the existing settlement of Balerno, such that from the range of beyond 2km, the effect on the character of the LCT will not be notable. This assessment also takes into account the existing and proposed planting along the southern boundary that will partially and eventually fully screen the proposed development.

Pentland Hills LCT

Sensitivity: The value of the Pentland Heights LCT was assessed in Section 3 as medium to high.

The susceptibility of the LCT to the proposed development is considered to be medium to low. The proposed development is located outwith this LCT, such that there will be no direct effects on the character of the LCT, and although there is the potential that the character of the LCT will be influenced indirectly through visibility of the proposed development, it will be seen at a range beyond 2.5km and as part of the settled lowlands where development is already an existing feature of the baseline character. This moderates the susceptibility of the LCT to the proposed development.

The combination of the medium to high value and medium to low susceptibility gives rise to an overall **medium** sensitivity.

Magnitude of change: The magnitude of change on the LCT, as a result of the proposed development, will be low. The proposed development will be located in the Cockburn Geometric Farmland LCT. As this LCT is distinctly different in character and geographically separate from the Pentland Hills LCT, the proposed development, which is located in it, will also appear disassociated. As settlement already forms part of the baseline character of the Cockburn Geometric Farmland LCT, the proposed development will not appear out of character.

The elevated landform of the Pentland Hills LCT, relative to the Cockburn Geometric Wooded Farmland LCT, means that a good level of inter-visibility occurs, with views extending across the close range parts of the adjacent LCT. Balerno will continue to appear well enclosed by woodland and the proposed development site will be partially screened by the existing mature tree belt that defines the southern boundary.

The proposed development will be visible and will form an addition to the existing extent of development. This will bring development closer to the Pentland Hills LCT and, in so doing, reduce the separation that currently exists. Despite these factors, the magnitude of change on the LCT will be **low** for the following reasons. The proposed development will be seen at a range of beyond 2.5km, such that it will appear relatively small in scale, especially in the context of the much wider landscape. Although located on the southern edge of the existing settlement, there is still sufficient containment of the proposed development within the Cockburn Geometric Farmland LCT that it will not appear to encroach into the Pentland Hills. Furthermore, the enclosure provided by the existing tree belt along the southern boundary, coupled with the proposed mitigation planting that will bolster the screening effect over time, will further accentuate the containment of tis development and its separation form the Pentland Hills.

Level of effect: The overall level of the effect of the proposed development on the Pentland Hills LCT will be **minor**. The proposed development will be located in the separate Cockburn Geometric Wooded Farmland LCT, from where its influence on the Pentland Hills LCT will be limited by distance as well as the wider influence of built development across the lowland landscape. While the existing southern boundary will form some degree of containment, the residual effects will be mitigated over time as the additional woodland planting along this boundary matures.

Pentland Hills cSLA

Sensitivity: The value of the Pentland Hills cSLA was assessed in Section 3 as medium to high.

The susceptibility of the majority of the cSLA to the proposed development is considered to be low. The distance of the proposed development from the majority of the cSLA, combined with the small proportion of the much wider lowland context which surrounds the Pentland Hills, means that it will have a limited influence on the character of the cSLA. The majority of the cSLA will gain no visibility of the proposed development. In the closer range parts of the cSLA, which coincide with the LCTs described above, a higher susceptibility will occur. This will typically be medium in the close range parts of the Cockburn Geometric Wooded Farmland in which the site is situated.

The combination of the medium to high value and low susceptibility gives rise to an overall **medium** sensitivity. In the closer range parts of the cSLA, the overall sensitivity will be **medium to high**.

Magnitude of change: The Pentlands cSLA covers an extensive area extending south from the A70 across the Pentland Hills and surrounding farmland. The location of the proposed development on the south side of Balerno and its enclosure by existing mature woodland to the west and east, and shelter belt to the south, means that its influence on the surrounding landscape character will be largely contained within the local area.

There will be very little visibility of the proposed development to the west or east, while to the south, owing to the more permeable nature of the tree cover and the rising elevation of the landform, an influence will occur across parts of the Pentland Hills. The combination of distance, with the existing influence of the lowland context and presence of existing development, with which the proposed development will be associated, reduces the magnitude of change to **low** in these parts of the cSLA. The proposed development will be seen to extend the southern boundary of Balerno towards the Pentland Hills, albeit, seen well contained within the Cockburn Geometric Wooded Farmland LCT which characterises this part of the lowland landscape and such that it does not appear to encroach into the upland landscape. As mitigation planting along the southern boundary of the site matures, it will add to the screening effect of the proposed development in views from the south.

The majority of the cSLA will, therefore, undergo either a **low**, or no magnitude of change. The small proportion of the cSLA that makes up the site and its immediate surroundings will undergo a **medium to high** magnitude of change. This is on account of the introduction of the proposed development in this area and the complete change this will bring to the character of the landscape, albeit in a localised area.

Level of effect: The overall level of the effect of the proposed development on the Pentland Hills cSLA will be **minor.** The vast majority of the cSLA will not be influenced by the proposed development owing to no or very limited visibility. It will be located in the Cockburn Geometric Farmland LCT, from where its influence on the Pentland Hills cSLA will be limited by distance as well as the wider influence of built development across the lowland landscape. Within the localised area of the site and its immediate surroundings the effect will be **major.** This is to be expected as the proposed development will notably alter

the character of the landscape in this area. This effect will be well contained by existing and proposed tree cover such that its influence will occur across only a very small proportion of the wider cSLA.

Edinburgh Green Belt

Sensitivity: The value of the Edinburgh Green Belt was assessed in Section 3 as medium.

The susceptibility of the majority of the Edinburgh Green Belt to the proposed development is considered to be low. The distance of the proposed development from the majority of the Green Belt, combined with the small proportion of the much wider lowland context surrounding the Pentland Hills, which it occupies, means that it will have a limited influence on the character of the Edinburgh Green Belt. The majority of the Green Belt will gain no visibility of the proposed development. In the closer range parts of the Green Belt, which coincide with the LCTs described above, a higher susceptibility will occur. This will typically be medium in those close range parts in and around the site, and then typically low beyond this.

The combination of the medium value and low susceptibility gives rise to an overall **medium to low** sensitivity. In the closer range parts of the cSLA, the overall sensitivity will be medium.

Magnitude of change: The overall magnitude of change of the proposed development on the Edinburgh Green Belt will be **low**. From the majority of the south-west part of the Edinburgh Green Belt, there will be no visibility of the proposed development and therefore there will be no effect. The enclosure of existing residential development along the northern site boundary, mature woodland to the west and east, and a shelter belt to the south, means that the proposed development will be concealed from much of the surrounding Edinburgh Green Belt.

As the site itself forms part of the Edinburgh Green Belt, here the magnitude of change will be **medium to high** as the farmed landscape will be notably altered by the new residential development. This rating will also apply to the immediate surroundings to the site, albeit marginal in extent apart from to the south where filtered views through the tree belt will extend the influence to some small degree. The enclosure of other tree belts and the falling away of the landform to the south, means that this effect will be contained within the local area.

Level of effect: The overall level of the effect of the proposed development on the Edinburgh Green Belt will be **minor.** The majority of the south-west part of the Edinburgh Green Belt will remain unaffected, with the exception of the especially close range parts in and around the site, where the level of effect will be **major.**

Summary of Landscape Effects

The effect of the proposed development on three LCTs and two designated areas has been appraised and shows that the level of effect will be mostly minor or there will be no effect. This finding relates chiefly to the relatively small area which the proposed development occupies, its containment by existing built form and tree cover and the design of the layout to ensure residual effects are to some degree mitigated by the use of two storey dwellings and the substantial provision of mitigation planting.

The proposed development will give to a major level of effect in the coinciding part of the Cockburn Geometric Wooded Farmland LCT, Pentlands cSLA and Edinburgh Green Belt. This occurs across the site area and the immediate margins around it and relates to the change that the introduction of the new residential development will bring to the landscape character of these immediate and close range parts.

Landscape Character Type (LCT)	Sensitivity	Magnitude of change	Level of effect
Cockburn Geometric Wooded Farmland	medium	low for overall LCT medium to high in local area	minor for overall LCT major in local area
Pentland Heights	medium	low	minor
Pentland Hills	medium	low	minor
Landscape Designation	**Sensitivity**	**Magnitude of change**	**Level of effect**
Pentland Hills cSLA	medium overall medium to high - site	low for overall cSLA medium to high in local area	minor for overall LCT major in local area
Edinburgh Green Belt	medium to low overall medium - site	low for overall Green Belt medium to high in local area	minor for overall LCT major in local area

The baseline descriptions and value ratings for the four viewpoints being assessed in detail are set out in Section 3. The effects of the proposed development on these receptors is set out on the following pages and identifies the sensitivity, magnitude of change and level of effect at each location.

The photographs comprise a 180 degree field of view (2x90 degree images spread over 2 pages). These photographs are a composite image made up of 50mm photographs joined together horizontally to form an overall field of view which is wider than that seen in detail by the human eye. These images should be viewed at a comfortable arms length.

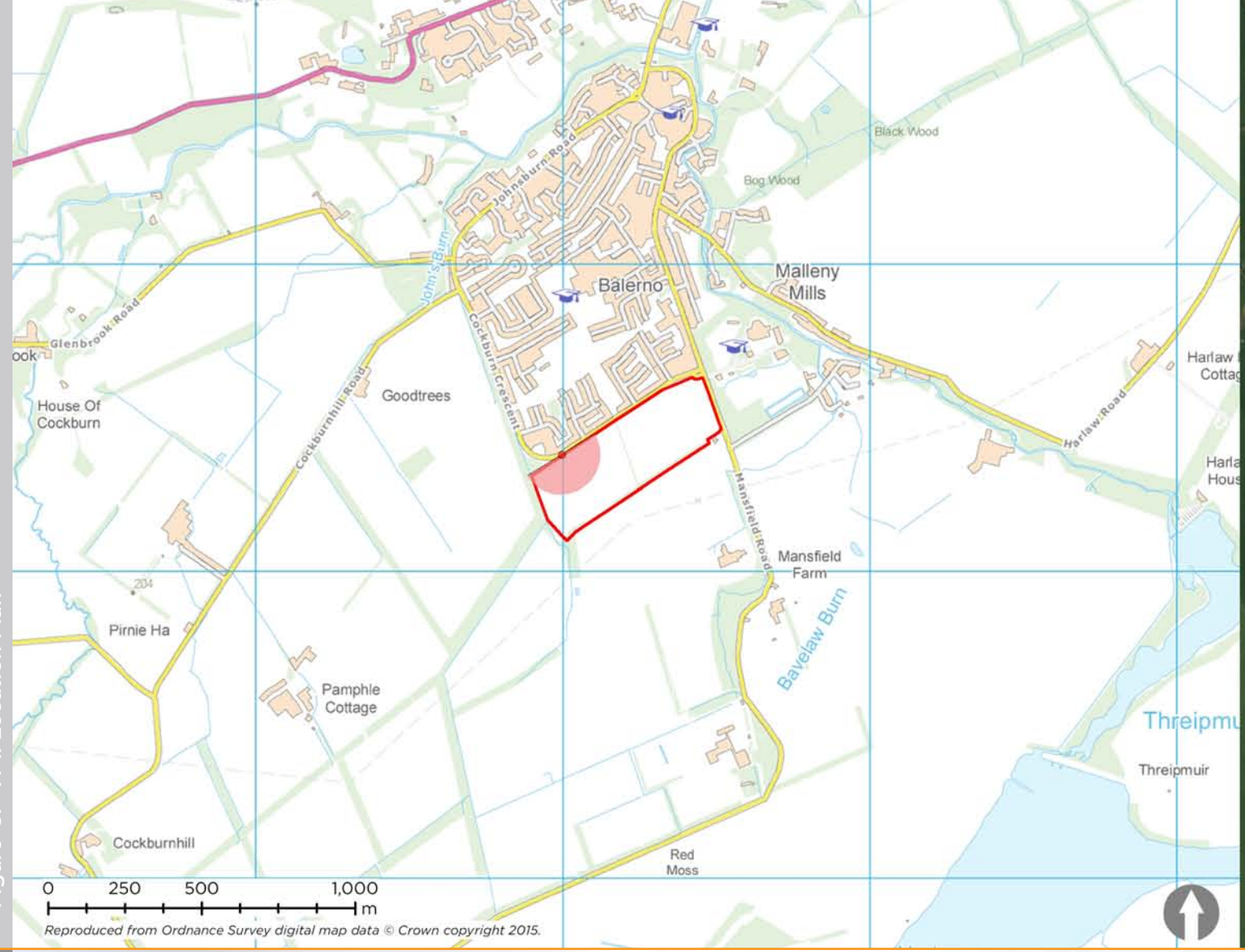


Figure 8: VP1: Location Plan

Figure 9: VP1: Existing Photograph

Viewpoint Details: Cockburn Crescent west	Coordinates: X: 315994 Y: 665379	Viewpoint Elevation : 210m AOD	Distance to Proposals: 3.4m	Camera: Canon EOS 5D II	Camera Height: 1.5 m
	Viewpoint Direction : 148 degrees	Horizontal Field of View : 180 degrees (2 x 90)	Date/Time of Photograph: 11/08/15 08:33	Focal length: 50 mm	

6.1 Viewpoint 1: Cockburn Crescent west

Sensitivity: The value of the view from Cockburn Crescent west is assessed in Section 3 as medium.

The susceptibility of the viewers to the proposed development will be high in respect of residents, medium to high in respect of pedestrians and medium in respect of road-users. Residents of the existing properties on Cockburn Crescent will be most susceptible as their longer term views from internal living spaces and garden grounds have the potential to be affected. The baseline view looks out across the open fields, with the upper parts of the Pentland Hills partially visible between the mature trees marking the southern site boundary, albeit possibly not visible from ground level internal living space owing to the screening effect of the intervening hedgerows and slight rise in ground levels. Views of pedestrians will be more impermanent than those of residents, while the views of road-users will be transitory and their views will be partially obscured by the intervening hedgerow.

The combination of the susceptibility ratings with the medium value of the view, gives rise to an overall **high** sensitivity for residents and **medium to high** sensitivity for pedestrians and road-users.

Magnitude of change: The magnitude of change on this view as a result of the proposed development will be **medium to high**. This relates principally to the close proximity of the viewpoint to the proposed development, whereby the new houses will be readily apparent, occupying the adjacent fields to the viewpoint and drawing the extent of the view to within the close range.

The proposed development will comprise two storey residential dwellings which will be set back from the northern site boundary by 17m. This strip will contain sort landscaping and form a separation between the existing and proposed development. The residential dwellings will front onto this space to create a more positive appearance than if they were to back on. These mitigation measures help to reduce the overall magnitude of change and prevent it from being rated high.

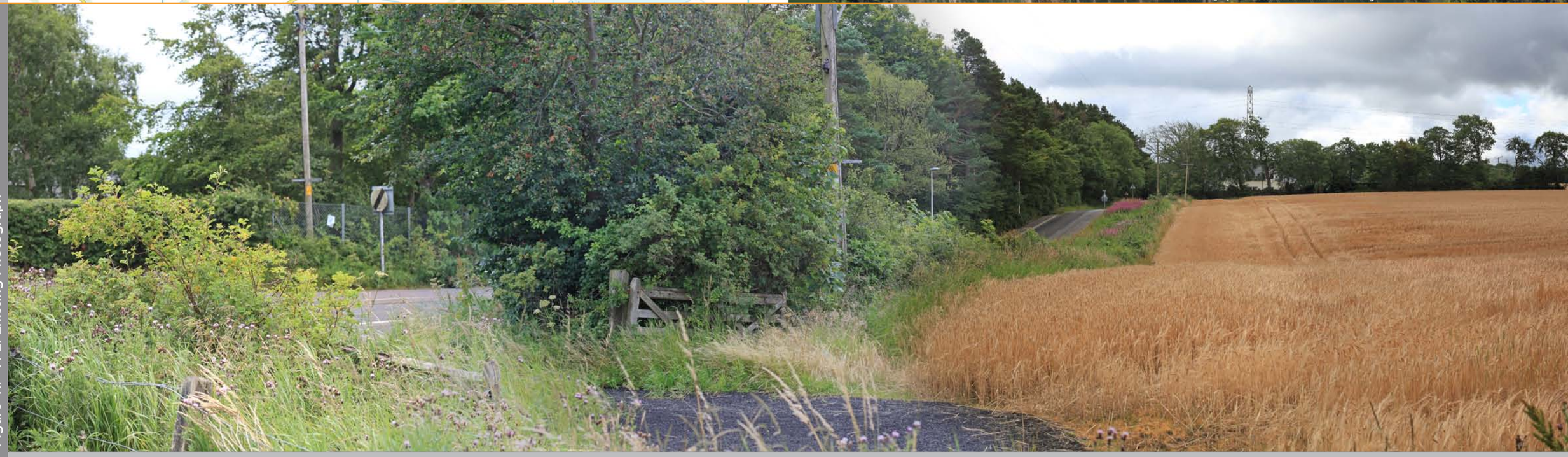
The proposed development will, none-the-less, reduce the extent of the view by enclosing it with built form. This will screen the existing feature of the Pentland Hills and replace it with a view of residential dwellings in a landscape setting.

Level of effect: The level of the effect as a result of the proposed development will be **major** for residents, pedestrians and road-users. This relates chiefly to the close proximity of the viewpoint and the magnitude of change that will arise as a result of the new development. The character of the view will be altered from an open and rural aspect to an enclosed and urban aspect. Mitigation measures embedded in the masterplan will help to reduce the overall effect, by creating a positive frontage and a landscape setting for the residential dwellings.

Important Viewing Instructions
These photographs are a composite image made up of 50mm photographs joined together horizontally to form an overall field of view which is wider than that seen in detail by the human eye. These images should be viewed at a comfortable arms length and should only be assessed in the real landscape from the same viewpoint.

Figure 10: VP2: Location Plan

Figure 11: VP2: Existing Photograph



Viewpoint Details: Cockburn Crescent east	Coordinates: X: 316418 Y: 665635	Viewpoint Elevation : 204m AOD	Distance to Proposals: 4.5m	Camera: Canon EOS 5D II	Camera Height: 1.5 m
	Viewpoint Direction : 195 degrees	Horizontal Field of View : 180 degrees (2 x 90)	Date/Time of Photograph: 11/08/15 08:46	Focal length: 50 mm	

6.2 Viewpoint 2: Cockburn Crescent east

Sensitivity: The value of the view from Cockburn Crescent east is assessed in Section 3 as medium.

The susceptibility of the viewers to the proposed development will be high in respect of residents, medium to high in respect of pedestrians and medium in respect of road-users. Residents of the existing properties on Cockburn Crescent will be most susceptible as their longer term views from internal living spaces and garden grounds have the potential to be affected. The baseline view looks out across the open fields, towards the mature trees marking the southern site boundary, albeit possibly not visible from ground level internal living space owing to the screening effect of the intervening hedgerows. Views of pedestrians will be more impermanent than those of residents, while the views of road-users will be transitory and their views will be partially obscured by the intervening hedgerow.

The combination of the susceptibility ratings with the medium value of the view, gives rise to an overall **high** sensitivity for residents and **medium to high** sensitivity for pedestrians and road-users.

Magnitude of change: The magnitude of change as a result of the proposed development will be **medium to high**. This relates principally to the close proximity of the proposed development, whereby the new houses will be readily apparent, occupying the adjacent fields to the viewpoint and drawing the extent of the view to within the close range.

The masterplan shows that the north-east corner of the site, adjacent to the viewpoint, will be occupied by a substantial area of open space. This will mean that the residential dwellings will be recessed by 70m from Cockburn Crescent and will therefore have a much lesser impact than if they were set along the immediate northern site boundary. A SUDS pond will be located in this area and the space around designed with plants and trees. Furthermore, this north-eastern edge of the proposed development will be separated by blocks of woodland planting to further soften the effects of the residential dwellings.

While the broader extent of the open view will be lost, the retention of open space and the recessed position of the residential dwellings will help to retain some sense of openness in this north-east corner. From the majority of Cockburn Crescent, the relationship between the existing and proposed development will be similar to that described in Viewpoint 1, whereby the residential dwellings will be positioned 17m behind an intervening strip of open space.

While the Pentland Hills are not readily apparent from this viewpoint, they are from the central part of Cockburn Crescent and in both instances the rural character of the view will be changed to an urban character with the introduction of the proposed development.

Level of effect: The level of the effect as a result of the proposed development will be **major**. This relates chiefly to the close proximity of the viewpoint and the magnitude of change that will arise as a result of the new development. The character of the view will be altered from an open and rural aspect to an enclosed and urban aspect. Mitigation measures embedded in the masterplan will help to reduce the overall effect, by creating a positive frontage and a landscape setting for the residential dwellings.

Important Viewing Instructions
These photographs are a composite image made up of 50mm photographs joined together horizontally to form an overall field of view which is wider than that seen in detail by the human eye. These images should be viewed at a comfortable arms length and should only be assessed in the real landscape from the same viewpoint.

Figure 12: VP3: Location Plan

Figure 13: VP3: Existing Photograph

Viewpoint Details: Mansfield Road	Coordinates: X: 316488 Y: 665555	Viewpoint Elevation : 202m AOD	Distance to Proposals: 5.35m	Camera: Canon EOS 5D II	Camera Height: 1.5 m
	Viewpoint Direction : 248 degrees	Horizontal Field of View : 180 degrees (2 x 90)	Date/Time of Photograph: 11/08/15 08:12	Focal length: 50 mm	

6.3 Viewpoint 3: Mansfield Road

Sensitivity: The value of the view from Mansfield Road is assessed in Section 3 as medium.

The susceptibility of the viewers to the proposed development will be medium to high in respect of residents and pedestrians, and medium in respect of road-users. Although this southern section of Mansfield Road is undeveloped, there are a few rural properties located to the south-east corner of the site, which the viewpoint is representative of. Residents of the existing properties will be most susceptible as their longer term views from internal living spaces and garden grounds have the potential to be affected, although their baseline views are largely enclosed by surrounding tree cover. The transitory nature of the views of road-users as they pass the proposed development at speed and with views occurring at a perpendicular angle, will reduce its prominence. While there are no pavements, pedestrians use this road to access the Pentland Hills. The views of pedestrians will be longer in duration than road-users and the proposed development will, therefore, be more apparent.

The combination of the susceptibility ratings with the medium value of the view, gives rise to an overall **medium to high** sensitivity for residents and pedestrians and **medium** sensitivity for road-users.

Magnitude of change: The magnitude of change experienced by residents in the south-east corner will be **low**. Despite the proximity of the dwellings to the site boundary, the combination of existing planting, the recessed position of the proposed residential dwellings and the substantial extent of the proposed mitigation planting, will all act to reduce the visibility of the proposed development.

The magnitude of change experienced by pedestrians along Mansfield Road will be **medium to high** over the short term of the first ten years after construction, as views from the road extend into the site and the residential dwellings are seen to extend the settlement into a previously rural area. The dwellings will be recessed by approximately 25m from the eastern boundary edge, with a woodland strip occupying the separation space. As this mitigation planting matures the dwellings will become screened and the magnitude of change will be reduced to low or negligible after 10 years.

A similar effect will be experienced by road-users, although the magnitude of change in the first ten years will be **medium** as visibility of the proposed development will be further reduced by the landform bund that marks the eastern site boundary. This will then reduce to **low** or negligible after 10 years as the mitigation planting matures.

Level of effect: The level of effect of the proposed development on residents close to the south-east corner will be **minor**. The level of effect on pedestrians and road-users will be **major** on pedestrians and **moderate** on road-users during the first ten years, and then **minor** or negligible beyond this time as the screening effect of the mitigation planting increases.

Important Viewing Instructions
These photographs are a composite image made up of 50mm photographs joined together horizontally to form an overall field of view which is wider than that seen in detail by the human eye. These images should be viewed at a comfortable arms length and should only be assessed in the real landscape from the same viewpoint.

Figure 14: VP4: Location Plan

Figure 15: VP4: Existing Photograph

Viewpoint Details: Black Hill, Pentland Hills	Coordinates: X: 318707 Y: 663261	Viewpoint Elevation : 492m AOD	Distance to Proposals: 3102m	Camera: Canon EOS 5D II	Camera Height: 1.5 m
	Viewpoint Direction : 310 degrees	Horizontal Field of View : 180 degrees (2 x 90)	Date/Time of Photograph: 17/08/15 12:24	Focal length: 50 mm	

6.4 Viewpoint 4: Black Hill, Pentland Hills

Sensitivity: The value of the view from Black Hill in the Pentland Hills is assessed in Section 3 as medium to high.

Viewers on Black Hill will predominantly be walkers. Typically, the susceptibility of walkers is increased by the extent to which they are aware of their surroundings, especially at a hill top viewpoint such as this, where they often take time to appreciate the view. In respect of their susceptibility to the proposed development, its distance from the viewpoint combined with its location in a part of the view where development already occurs, limits their overall susceptibility to a rating of medium to low.

The combination of the medium to high value with the medium to low susceptibility, gives rise to an overall **medium** sensitivity for walkers on Black Hill.

Magnitude of change: The magnitude of change as a result of the proposed development will be **low**. The proposed development will be seen at a distance of approximately 3km from the viewpoint such that it will appear as a relatively small scale feature occupying only a small proportion of a much wider view. Furthermore, the proposed development will be seen in a relatively unremarkable section of the view, with the main draw of walkers being the wider Pentland Hills or the longer range views to the Ochils or Fife. The prominence of the development is reduced by its location adjacent to existing development and its containment in a cultivated lowland landscape.

The proposed development will, none-the-less, be visible form this viewpoint, largely owing to the incomplete nature of the tree belt along the southern boundary. It will be seen to increase the extent of the settlement into the rural landscape, albeit by only an incremental amount and well contained within the farmed landscape. The settlement of Balerno is well contained by mature and fairly substantial woodland on every aspect other than to the south. Substantial mitigation planting along the southern side of the proposed development will complete the enclosure and provide a robust boundary to the settlement. As this matures over time, this will eventually screen visibility of the proposed development from Black Hill.

Level of effect: The level of the effect on walkers will be **minor**. While the proposed development will be visible from the viewpoint, it will be seen at distance and in a context where it is associated with an existing settlement. While the existing southern boundary of the site is fragmented, mitigation planting proposes to create a more substantial boundary that will eventually screen the proposed development completely from the Pentland Hills.

Important Viewing Instructions
These photographs are a composite image made up of 50mm photographs joined together horizontally to form an overall field of view which is wider than that seen in detail by the human eye. These images should be viewed at a comfortable arms length and should only be assessed in the real landscape from the same viewpoint.

6.5 Summary of Visual Effects

The selection of potential viewpoints has been limited by the limited extent to which the proposed development will be visible. Mature woodland occurs to the west and east of the site and residential development occurs to the north. While there is some partial screening to the south, the fragmented condition of the tree belt means that visibility does extend into middle range views in the Pentland Hills. The generally enclosed nature of the site limits the possibility of viewpoints to within the margins of the site to the north, west and east, and to the middle range to the south.

Receptors along Cockburn Crescent, adjacent to the northern site boundary, will experience a major level of effect, as would be expected, owing to the close proximity of the proposed development. The magnitude of change in these areas, is moderated by the provision of mitigation measures embedded in the masterplan, whereby the residential dwellings are recessed from the northern site boundary and a landscape setting is created in the foreground, along with substantial woodland planting in the background.

On Mansfield Road, there is not the same presence of residential receptors and therefore it will be pedestrians who will experience the most notable effects, while the views of road-users will be partially screened by the existing embankment. The recessed position of the proposed development and the depth of proposed woodland planting will reduce visual effects as the planting matures.

In the Pentland Hills, while views of the proposed development will be visible through the fragmented shelter-belt, the distance from which these views occur means that the proposed development will not appear as a prominent feature, especially as it is seen an extension to an existing settlement. Again, the substantial mitigation planting along the southern edge of the site will mitigate these visual effects over time until eventually the proposed development will be screened and a more robust and defensible boundary will be created.

Viewpoint	Sensitivity	Magnitude of change	Level of effect
1. Cockburn Crescent West	High – residents Medium to high – pedestrians / road-users	Medium to high	Major
2. Cockburn Crescent East	High – residents Medium to high – pedestrians / road-users	Medium to high	Major
3. Mansfield Road	Medium to high – pedestrians Medium – road-users / residents	Medium / medium to high Minor or negligible after 10 years	Moderate / Major Minor or negligible after 10 years
4. Black Hill, Pentland Hills	Medium - walkers	Low	Minor

Figure 16: Illustrative Landscape Masterplan

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Barratt Homes and David Wilson Homes

Proposed Development on Land South of Cockburn Crescent, Balerno

Flood Risk Assessment

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Barratt Homes and David Wilson Homes

Proposed Development on Land South of Cockburn Crescent, Balerno

Flood Risk Assessment

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1	17.05.2013	M Stewart	Y Kaya	M Stewart	Draft
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Contents

1 Introduction

Kaya Consulting Ltd. was commissioned by Barratt Homes and David Wilson Homes to carry out an assessment of the risk of flooding of a proposed development in Balerno. The site is greenfield consisting of two agricultural fields. The site is located at the southern side of Balerno in Edinburgh, to the west of Mansfield Road and south of Cockburn Crescent.

John's Burn flows along the western boundary of the site from south to north. The nearest other watercourse is Bavelaw Burn located roughly 300 meters east of the site.

A flood risk assessment is required to assess the risk from John's Burn, groundwater and from surface runoff, including surcharging of the local drainage system.

The scope of work outlined in the Kaya Consulting Ltd. proposal letter included the following:

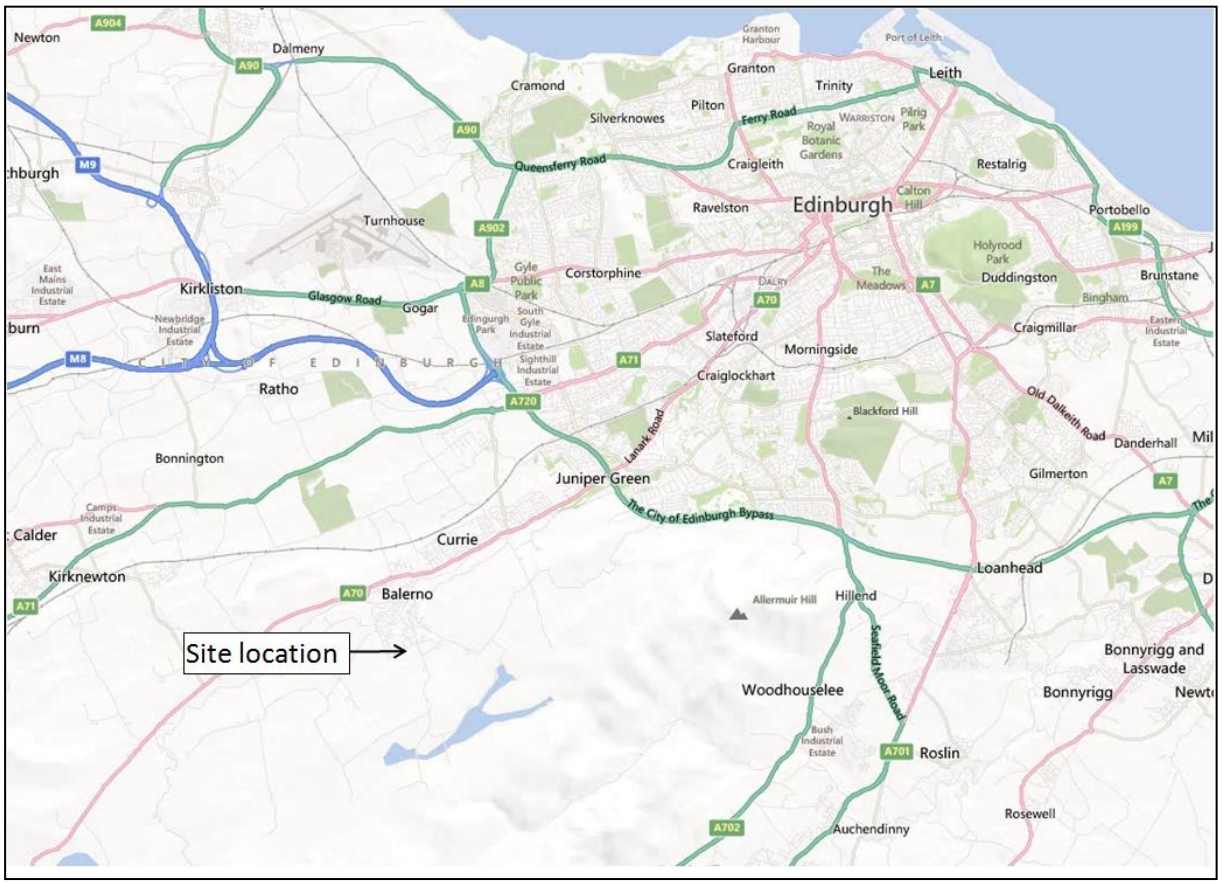
a) Site visit and walkover;
b) Liaise with local Council with a view of obtaining any relevant information held by the Council;
c) Hydrological analysis of John Burn's using standard methods;
d) Assessment of flood risk from John's Burn using simple calculations;
e) Assessment of risk of flooding from surface runoff from adjacent land;
f) Assess the risk from groundwater;
g) Flood Risk Assessment based on the above;
h) Development of outline drainage strategy; and
i) Preparation of a technical report.

Information made available to Kaya Consulting Ltd for the study includes the following:

- Location plan showing layout of existing site; and
- Topographic survey of site.

A general location map of the site is shown in Figure 1. The work carried out to assess the flooding risk of the site and main findings of the study are summarised in the following sections.

Figure 1: General Site Location Map



2 Legislative and Policy Aspects

2.1 National Planning Policy

Scottish Planning Policy (SPP) was published in February 2010 (and supersedes a number of Scottish Planning Policy documents, including SPP 7: Planning and Flooding and other National Planning Policy Guidance documents). SPP retains the main principle of SPP7 - that is new development should not have a significant probability of being affected by flooding and should not increase the probability of flooding elsewhere.

Some extracts from SPP are listed below:

> "*Planning authorities must take the probability of flooding from all sources – (coastal, fluvial (water course), pluvial (surface water), groundwater, sewers and blocked culverts) and the risks involved into account when preparing development plans and determining planning applications.*"
>
> *"Development which would have a significant probability of being affected by flooding or would increase the probability of flooding elsewhere should not be permitted."*
>
> *"Prospective developers should take flood risk into account before committing themselves to a site or project. The responsibility of the planning authority is to have regard to the risk of flooding when preparing development plans and determining the planning applications, but this does not affect the liability position of applicants and occupiers who have responsibilities for safeguarding their property. Planning authorities should avoid any indication that a grant of planning permission implies the absence of flood risk."*
>
> *"Although ultimate responsibility for avoiding and managing flood risk still lies with land and property owners, certain public bodies are expected to take a proactive role in managing and, where achievable, lowering overall flood risk. The Flood Risk Management (FRM) (Scotland) Act 2009 places a duty on Scottish Ministers, SEPA, local authorities, Scottish Water and other responsible authorities to exercise their functions with a view to managing and reducing flood risk and to promote sustainable flood risk management. The main elements of flood risk management relevant to the planning system are assessing flood risk and undertaking structural and non-structural flood management measures."*
>
> *"Section 42 of the FRM (Scotland) Act 2009 will, once commenced, amend the Town and Country Planning (Development Management Procedure) Regulations (Scotland) 2009 so that planning authorities will require applicants to provide an assessment of flood risk where a development is likely to result in a material increase in the number of buildings at risk of being damaged by flooding."*
>
> *"For planning purposes the functional flood plain will generally have a greater than 0.5% (1:200) probability of flooding in any year. Built development should only take place on the functional flood plains where it will not affect the ability of the flood plain to store and convey water, where the development will not be at risk of flooding and where the development will not increase the risk of flooding elsewhere. There may be exceptions for infrastructure if a specific location is essential for operational reasons or it cannot be located elsewhere."*

"The risks associated with rising sea levels and coastal flooding should be taken into account when identifying areas that are suitable for development."

Similar to SPP7, SPP also proposes a Risk Framework approach which identifies flood risk in three main categories:

a. **Little or no risk area** (annual probability of flooding less than 0.1% (i.e. one in 1000 year flood). No constraints to development due to flood risk.

b. **Low to medium risk area** (annual probability between 0.1% and 0.5% (i.e. between one in 1000 and 200 year floods). Usually suitable for most development.

c. **Medium to high risk area** (annual probability greater than 0.5% (i.e. one in 200 year flood). Generally not suitable for essential civil infrastructure such as hospitals, fire stations, emergency depots etc., schools, care homes, ground-based electrical telecommunication equipment unless subject to an appropriate long term flood risk management strategy. The policy for development on functional flood plain applies. Land raising may be acceptable.

If built development is permitted, appropriate measures to manage flood risk will be required and the loss of flood storage capacity mitigated to produce a neutral or better outcome.

Residential, institutional, commercial and industrial development within built-up areas may be acceptable if flood prevention measures to the appropriate standard already exist, are under construction or are planned as part of a long term development strategy.

Undeveloped or sparsely developed areas are generally not suitable for additional development unless the location is essential for operational reasons and an alternative lower risk location is not achievable. Such infrastructure should be designed and constructed to remain operational during floods. These areas may also be suitable for some recreation, sport, amenity and nature conservation uses provided adequate evacuation procedures are in place. Job-related accommodation (e.g. caretakers and operational staff) may be acceptable. New caravan and camping sites should not be located in these areas.

"Landraising, which involves permanently elevating a site above the functional flood plain, may have a role in some circumstances."

Proposals for landraising should satisfy five strict criteria (as listed in Para 208 of SPP).

"*Major proposals for landraising should be promoted through the development plan."*

"Watercourses should not be culverted as part of a new development unless there is no practical alternative, and existing culverts should be opened where possible. If culverts are unavoidable, they should be designed to maintain or improve existing flow conditions and aquatic life. A culvert may be acceptable as part of scheme to manage flood risk or where it is used to carry a watercourse under a road or railway."

"The Water Environment (Controlled Activities) (Scotland) Regulations 2005 requires all surface water from new development to be treated by a sustainable drainage system (SUDS) before it is discharged into the water environment, except for single houses or where the discharge will be

made into coastal water. Surface water drainage measures proposed as part of a planning application should have a neutral or better effect on the risk of flooding both on and off the site. Where flooding is an issue, SUDS should be designed to mitigate the adverse effects of a storm inflow into the watercourse or sewer."

Guidance on best practice in urban drainage in Scotland is given in Planning Advice Note (PAN) 61: Planning and Sustainable Urban Drainage Systems (2001) and PAN 69: Planning and Building Standards Advice on Flooding (2004).

2.2 National Indicative River and Coastal Flood Map (Scotland)

The SEPA second generation flood map shows the likely extent of flooding for the 0.5% AEP event. Consultation of the map shows that the site is outside the indicative floodplains of any known watercourses in the area included in the SEPA map.

2.3 SEPA Technical Flood Risk Guidance & Flood Risk Management (Scotland) Act 2009

The latest SEPA technical flood risk guidance for stakeholders was consulted when undertaking this flood risk assessment (v5, April 2010). In addition, SEPA's Interim Position Statement on Planning and Flooding (July 2009) was consulted. This details SEPA's role and policy position on flooding relative to land use planning and also the responsibility on the developer. In keeping with this statement, this flood risk assessment considers all types of flood risk, presents an evidenced assessment of flood risk and suggests mitigation measures where required.

2.4 Controlled Activities Regulations

The Water Environment (Controlled Activities) (Scotland) Regulations 2005 (CAR) which came into force in April 2006 brings new controls for discharges, abstractions, impoundments and engineering works in or near inland waters. Any such work requires authorisation (licence) from the Scottish Environment Protection Agency (SEPA) who are responsible for the implementation of the Act.

2.5 Climate Change

SPP (2010) states that:

"The design of new development should address the causes of climate change by minimising carbon and other greenhouse gas emissions and should include features that provide effective adaptation to the predicted effects of climate change. The changing climate will increase the risk of damage to buildings and infrastructure by flood, storm, landslip and subsidence. Development should therefore normally be avoided in areas with increased vulnerability to the effects of climate change, particularly areas at significant risk of flooding, landslip and coastal erosion and highly exposed sites at significant risk from the impacts of storms."

The most recent Scottish Government guidance with respect to climate change and flooding is contained in the Research Report *Climate Change: Review of Levels of Protection Offered by Flood Prevention Schemes UKCIP02 update (2003).* The analyses contained in this report suggest that river

flows in the West and South of Scotland could increase by up to 20% over the next 50 to 75 years. It is therefore suggested that the above design flows are increased by 20% to obtain estimated peak flows resulting from the effects of climate change over the next 50 to 75 years.

More recent climate change predictions (UKCP2009) are now available. However, more research is required before practical guidance can be provided as to the impact that UKCP2009 have on extreme rainfall and flooding across Scotland. Hence, at present this flood risk assessment utilises the results of the Scottish Government's 2003 report (outlined above) to provide estimates of the impact on climate change on flood flows.

The Climate Change (Scotland) Act 2009 also makes reference to adaptation to climate change. It is recommended that any site drainage design considers these future estimates of increased precipitation and adopts an adaptive approach.

2.6 Return Period

The concept of return period is commonly used to describe the severity of a flood event. Return period can be defined as the average number of years between the occurrences of events of a specified magnitude. A 200 year event is likely to be equalled or exceeded once in 200 years when averaged over a long period of time (hundreds of years). However, it can occur more than once or not at all in any given 200 year period.

A better description of flood risk can be expressed in terms of probability. Statistically there is 0.5% chance of the 200 year event occurring in any one year, 4.9% chance of occurrence in any 10 year period, 22.2% chance of occurrence in any 50 year period, and 63.3% chance of occurrence in any 200 year period. Probability of exceedance for return periods varying from 2 year to 1000 year over design life periods varying from 1 to 200 years are shown in table below.

It is important to note that the concept of return period in flood studies assumes that the conditions associated with flooding (catchment use, river and flood plain characteristics, hydrology, etc.) remain largely unchanged with time. In practice, this is not necessarily the case when considered over long periods of time. Therefore, return period predictions require to be treated with caution, and updated regularly when additional relevant data becomes available, or significant changes take place in the catchment, or when predictive tools are improved.

Probability (chance) of exceedance							
Return Period (years)	**Design Life (years)**						
	1	**10**	**30**	**50**	**60**	**100**	**200**
2	0.500	0.999	1.000	1.000	1.000	1.000	1.000
5	0.200	0.893	0.999	1.000	1.000	1.000	1.000
10	0.100	0.651	0.958	0.995	0.998	1.000	1.000
50	0.020	0.183	0.455	0.636	0.702	0.867	0.982
100	0.010	0.096	0.260	0.395	0.453	0.634	0.866
200	0.005	0.049	0.140	0.222	0.260	0.394	0.633

3 Site Location and Description

The proposed development site is located at the southern end of the village of Balerno, Figure 1. The site is currently greenfield and comprises two agricultural fields, Photo 1. The site is bounded to the north by Cockburn Crescent (Photo 2), to the east by Mansfield Road, to the south by a vegetated field boundary and to the west by John's Burn, Figure 2.

The highest point of the site is towards the south-west corner of the site, where ground levels are at around 223 m OD. However, there is a local high point at the south-central part of the site, Figure 3, which acts as a drainage divide within the site. Ground levels in this area reach 217 m OD. Land to the north-east of the high point drains to the north and north-east, with part of this area of the site draining towards Cockburn Crescent and the rest to a low point located at the north-east corner of the site. Land to the south-west and north-west of the high point drains to the north-west towards John's Burn and the field access point near the north-western corner of the site.

John's Burn sits in a steep-sided hollow along the western boundary of the site. The bottom of the hollow is at least 2 m wide, increasing to 3 m near the mid-point of the site. The channel sits around 1.5 m below ground levels to the north of the site (Photo 3), but along the western boundary of the site the channel is around 2 – 2.5 m below the site level (Photos 4 and 5). The hollow opens out to the south of the site (Photo 6). The hollow has vertical sides in places with evidence of bank erosion on both sides of the hollow.

Water ponding in the north-eastern corner of the site appears to either infiltrate into the ground or drain to the east under Mansfield Road. There is a ditch and culvert along the eastern side of the site, between the site and Mansfield Road (Figure 3) and Mansfield Road falls to a local low point opposite the low-lying part of the site (Photos 7 and 8). There are two road gullies at the low point in the road. To the east of Mansfield Road there is a culvert outlet (around 150 mm diameter) discharging to wet ground to the east of the road. To the east of the wet ground there is a pond and open channel within the grounds of Harmeny School. This channel enters a culvert within the school grounds and flows to Bavelaw Burn. Even if there is no direct piped connection between the north-eastern part of the site and the unnamed channel, water infiltrating into the ground within the north-eastern corner of the site would be expected to flow subsurface to the east towards the channel and Bavelaw Burn.

There are known flood risks in this part of Balerno. In 2011 John's Burn overtopped a culvert located to the north of the site (Photo 9 and Figure 2) causing flooding of Johnsburn Road and some properties. Based on discussions with the local council it would appear that this flooding was caused by a blockage of the John's Burn culvert at its entrance. Discussions with the local council also highlighted that surface runoff from the site flows onto Cockburn Crescent causing concerns for properties to the north of the road. A site visit was undertaken following heavy rainfall on 19th May 2013 and surface runoff from the site was observed flowing onto Cockburn Crescent from the north-west corner of the site and from a field access point near the mid-point of the site boundary with Cockburn Crescent. Surface water runoff was entering the road drainage system.

Figure 2: Detailed site location plan

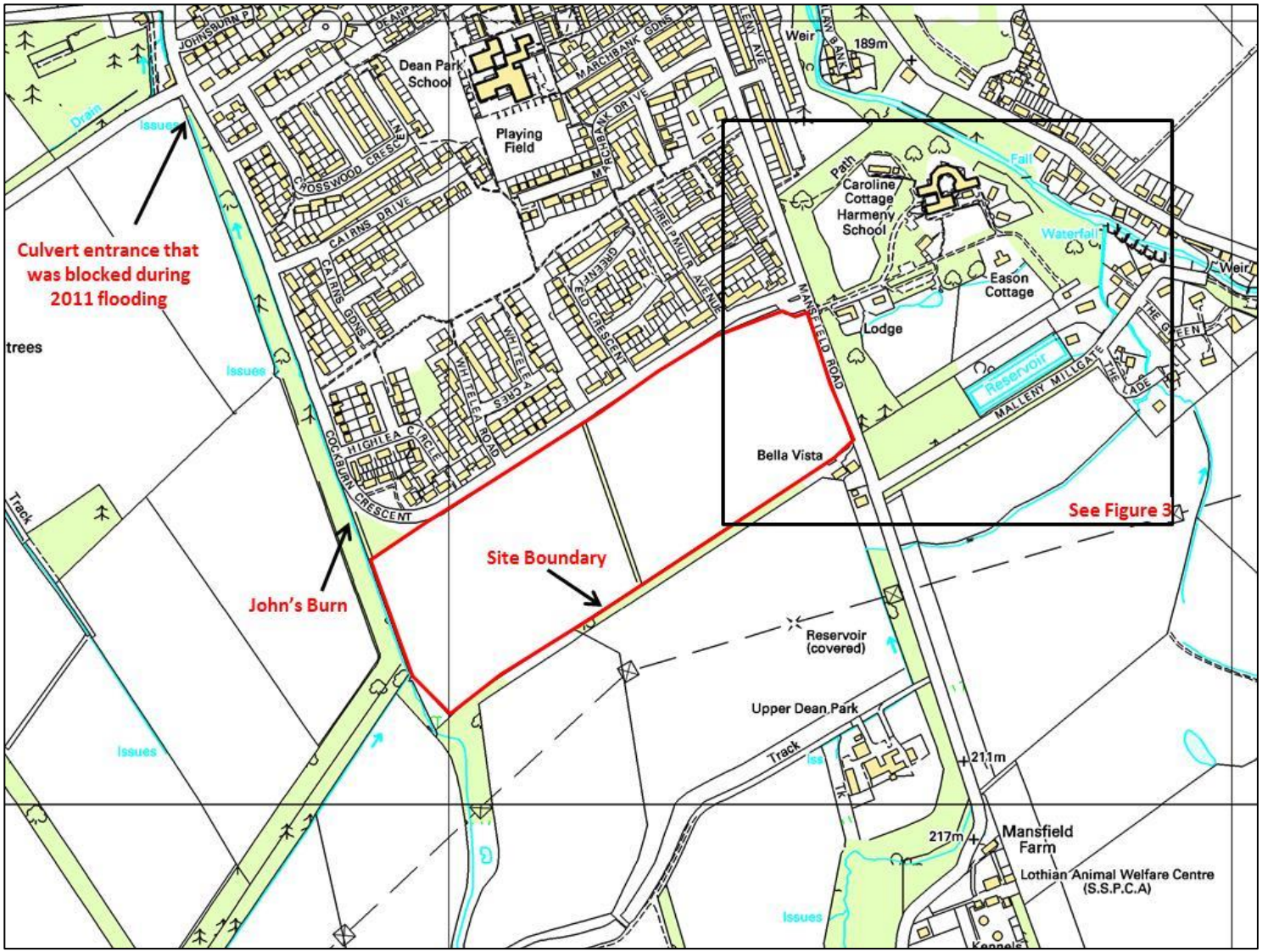


Figure 3: Details of eastern part of site and site topography

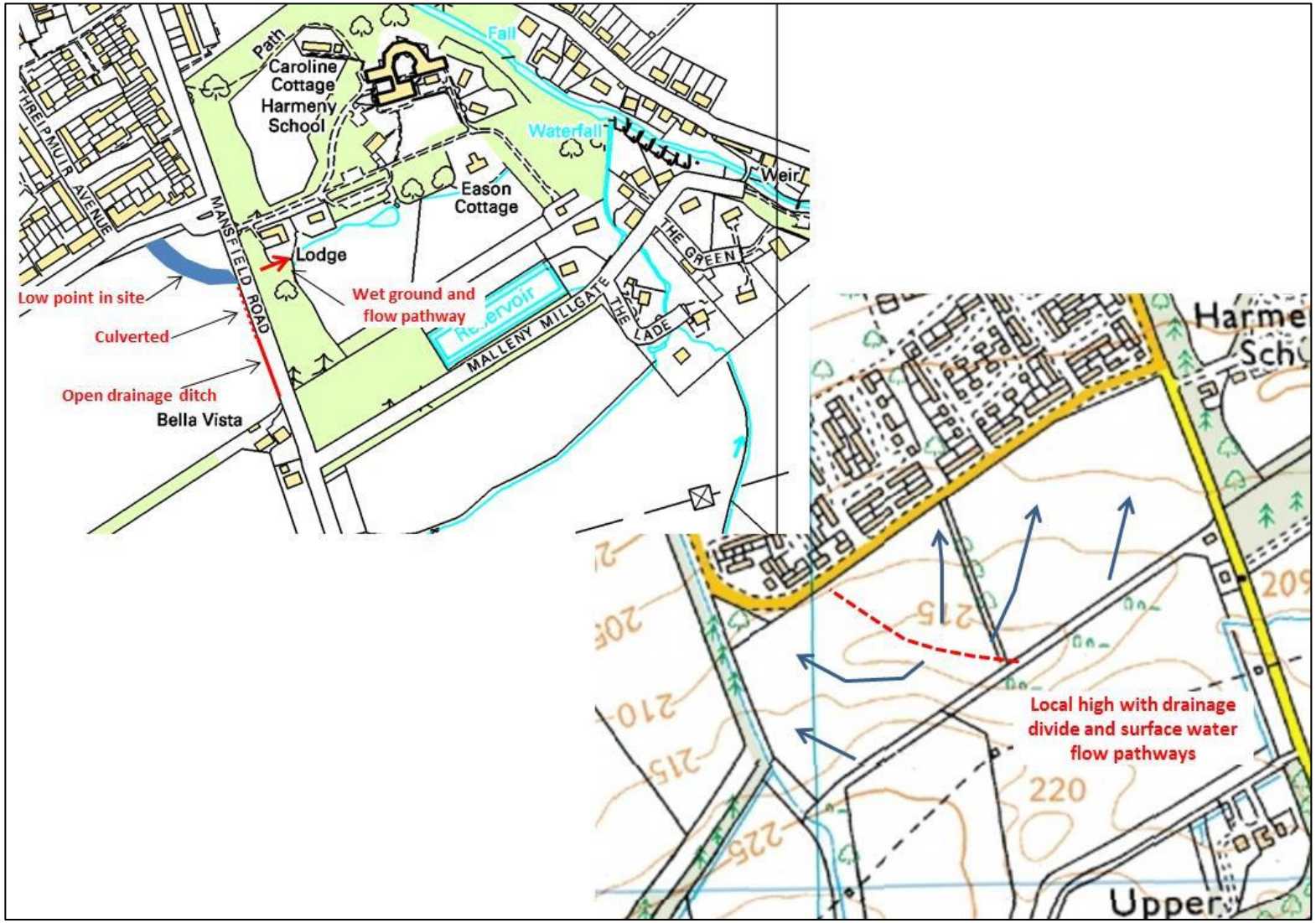


Photo 1: View of site, looking east from Cockburn Crescent towards north-east corner of site

Photo 2: View along Cockburn Crescent looking east

Photo 3: John's Burn to the north of the site boundary

Photo 4: John's Burn near mid-point of site. Fence along western edge of site is visible at top of picture

Photo 5: Western boundary of site looking north

Photo 6: John's Burn close to upstream boundary of site

Photo 7: Low point on Mansfield Road

Photo 8: Open ditch alongside eastern boundary of the site

Photo 9: Inlet of John's Burn culvert located to the north of the site (see Figure 2)

4 Hydrological Analysis

The hydrological assessment makes estimates of;

- Design flows for John Burn adjacent to site; and
- Greenfield runoff rate.

4.1 Estimation of design flows for John's Burn

The catchment area of John's Burn at the downstream boundary of the site was calculated to be 0.54 km^2, extracted from the Flood Estimation Handbook (FEH) CD-Rom Version 3. The catchment area of the burn was reviewed with reference to Ordnance Survey 1:25,000 scale mapping of the area. Based on these maps it is clear that drainage patterns upslope of the site are complex, with a number of field drainage channels cutting across contour and routing a larger total catchment to John's Burn than would be predicted from the topography alone. The total catchment draining to John's Burn at the downstream end of the site could be around 0.85 km^2, although this assumes that all the drainage channels are able to convey design flows without overtopping. If drainage channels were to overtop flood waters would not all flow to John's Burn. Hence, the catchment area at the downstream end of the site is likely between 0.54 and 0.85 km^2.

At the upstream end of the site the catchment area is between 0.2 and 0.3 km^2.

Other catchment characteristics are shown in Table 1.

Table 1: Catchment characteristics for John Burn

Parameter	Value
Easting (m)	315400
Northing (m)	665700
AREA (km^2)	0.54 – 0.85
ALTBAR (m)	228
ASPBAR (^{o})	338
ASPVAR	0.91
BFIHOST	0.321
DPLBAR	1.15
DPSBAR	38.1
FARL	1
FPEXT	2.1
LDP	2.1
PROPWET	0.49
SAAR (mm)	858
SAAR4170 (mm)	923
SPRHOST	40.76
URBCONC1990	-
URBEXT1990	0
URBLOC1990	-

For small ungauged watercourses, the FEH recommends that return period flows are estimated based on standard rainfall-runoff methods. For the purpose of this assessment we have considered the FEH Rainfall-Runoff method, Institute of Hydrology (IH) small catchment method (Report 124) and Revitalised Flood Hydrograph (ReFH) method. It should be noted that the ReFH has not been fully calibrated for Scottish catchments; it is provided for comparison purposes only.

The results for each method are provided in Table 2.

Table 2: Return period flow estimates for John's Burn

Catchment	Method	Q_{200} (m^3/s)	Q_{200} + climate change (m^3/s)
Downstream end of site (0.54 km^2)	FEH Rainfall-Runoff	1.1	1.3
	IH124	1.0	1.2
	ReFH	1.0	1.2
Downstream end of site (0.85 km^2)	FEH Rainfall-Runoff	1.7	2.0
	IH124	1.6	1.9
	ReFH	1.6	1.9
Downstream end of site (0.25 km^2)	FEH Rainfall-Runoff	0.5	0.6
	IH124	0.5	0.6
	ReFH	0.5	0.6

All methods produce similar return period flow estimates for the catchment. To be conservative, the 200 year design flow for John's Burn at the downstream end of the site is estimated to be 1.7 m^3/s, based on the FEH Rainfall-Runoff method, which produced the highest design flow.

Scottish Government guidelines suggest that the magnitude of extreme flood events will increase by 20% in southern and western Scotland in the next 50 to 75 years. Estimates of 1 in 200 year flow + 20% are also provided in Table 2.

4.2 Estimation of Greenfield Runoff Rate for Site

The development site comprises of greenfield. The total site area is around 14 ha.

Greenfield runoff rates for the existing site were estimated using the Institute of Hydrology (IH) small catchment method (IH124). The IH124 gave a 2-year greenfield runoff rate of around 5.5 l/s/ha. This is based on SAAR value of 923 mm and soil type 4 (i.e. SOIL=0.45). It should be noted that Edinburgh City Council typically require site drainage systems to be designed for a 2-year runoff rate

of 4.5 l/s/ha. Requirements for Edinburgh City Council should be discussed and agreed with the council.

5 Flood Risk Assessment

This chapter assess flood risk from;

- St John's Burn;
- Surface Runoff from Adjacent Land;
- Groundwater;
- Scottish Water System; and
- Site Drainage.

This assessment also considers flood risk associated with the site access.

5.1 Flood Risk from John's Burn

John's Burn sits in a hollow adjacent to the western boundary of the site. Based on site observations and topographical survey of the site, the channel of the burn is around 2 – 2.5 m below the site level. The hollow is around 2 to 3 m wide adjacent to the site, with a general bed slope of around 1 in 25. As outlined in Section 4 the 200 year design flow in the stream at the downstream end of the site is estimated as 1.7 m^3/s, with a flow of 0.5 m^3/s at the upstream end of the site.

Based on simple Manning's equation, if a conservative 2 m wide by 2 m high box channel is considered, with Manning's n of 0.06 and bed slope of 1 in 25, the 200 year design flow for the stream could be passed with a depth of around 0.5 m, which would be significantly below the site level. Even if the channel were blocked by 50% the predicted flood depth within the channel would be around 1.1 m, again well below the site level. A further calculation was undertaken with a lower channel slope of 1 in 50 and this also predicted flood levels below the site level.

At the upstream end of the site the catchment of John's Burn is around 0.25 km^2, with a 200 year flow of 0.5 m^3/s. The channel is around 1 m wide with the channel bed surveyed as being around 1.5 m below the site level. Simple Manning's calculations show that the channel can pass the 200 year flow without overtopping onto the site (e.g., Manning's n of 0.06 and slope of 1 in 50 gives flood depth of 0.5 m).

Hence, the site is not considered at direct risk of flooding from overtopping of John's Burn along the western boundary of the site. However, there are the following risks from the burn that would need to be considered during detailed design of the site;

- To the north of the site the burn does not sit in as deep a hollow as observed along the site boundary. In the case of blockage of this channel water could flow within open woodland to the north of the site. Hence, ground and/or Finished Floor Levels for any properties located towards the north-western corner of the site should be raised an appropriate height above ground levels outside of the site to the north.
- To the south of the site the John's Burn also does not sit in a deep hollow (Photo 6). Calculations indicate that the channel is able to pass the 200 year flow without overtopping and it is likely that even if there were blockage of the channel flood waters would not be able to enter the site. However, as the elevation difference between this section of the channel and the site is lowest at this point it would be prudent to consider either raising ground levels along the north-eastern corner of the site, or providing a buffer strip of lower lying land along the western edge of the site to allow any flood waters to flow along the western boundary of the

site without flooding properties. Finished Flood Levels of properties in the west of the site would need to be raised an appropriate level above any flow pathway.

- There is evidence of bank erosion along the western boundary of the site. Hence, there may be a risk of ground instability in this part of the site. These issues would need to be inspected by a suitably qualified professional during detailed design and it may be that a buffer strip is provided between the edge of the developed site and John's Burn. Given the vegetation growing alongside John's Burn and the potential for bank erosion we would suggest a buffer strip be left alongside the burn to allow for access for maintenance and blockage removal along the channel in any case.

5.2 Flood Risk from Surface Water Runoff from Adjacent Land

There is a very small to negligible (possibly 1 ha) catchment lying upstream of the site along its southern boundary. To the south of the site ground levels fall to the east towards an open channel that drains towards Bavelaw Burn, Figure 2. As a result, there is no significant risk of flooding of the site from surface runoff from adjacent land.

5.3 Flood Risk from Groundwater

At this stage of the development there is no information on groundwater levels within the site. Based on available information there are no springs or issues identified within the site. In addition, there is no permanent standing water in low-lying areas of the site. Hence, this would suggest that the groundwater table is generally below the site, although ponding is observed on site in low lying areas following rainfall, suggesting local drainage issues. Hence, the site is not considered at significant risk of groundwater flooding, although it is recommended that groundwater levels are assessed during site investigations, and if elevated groundwater levels are identified they are taken into account in the site and foundation design.

5.4 Flood Risk from Site Drainage

An outline drainage strategy for the site is provided in Section 6.

5.5 Flood Risk from Scottish Water system

The site is greenfield so there is no existing Scottish Water infrastructure within the site. A Scottish Water sewer flows along Cockburn Crescent. As ground levels within this area of Balerno generally fall to the north it is unlikely that flooding from the sewer would result in a significant risk of flooding within the site. In addition, as there is no development to the south of Cockburn Crescent, the only inflow to the Scottish Water system would appear to be from road drainage in this area.

5.6 Site Access

The location of the proposed site access is not known at present; however we would assume that it will be from Cockburn Crescent. There is known surface water flooding along Cockburn Crescent adjacent to the site, but these appear to result from uncontrolled runoff from the site onto the road. Post-development, with appropriate site drainage measures, this risk should be decreased. As ground levels generally fall to the north the site access would not be expected to act as a route for

surface waters to enter the site. Flood waters would also not be expected to pond on Cockburn Crescent to a depth that would prevent access to the site.

6 Outline Drainage Strategy

As the current proposals are for a Planning Application in Principle, outline drainage proposals are presented to provide evidence that the site will be able to be effectively drained consistent with Planning Policies. Further work will be required to produce final drainage plans suitable for submission with a detailed planning application.

6.1 Current Onsite Drainage

The site is currently a greenfield site. Surface water flow pathways within the site, based on the site topographical survey are shown in Figure 4. At present the site drains in three parts;

- Area 1: The south-western part of the site (around 4.1 ha) lies within the John's Burn catchment. In general site runoff would tend to flow towards the north-west corner of the site (near existing gate entrance) from where it would flow into a small section of open grass and woodlands. Surface runoff from this area will either flow through woodlands making its way to John's Burn, or overtop the grassed area onto Cockburn Crescent. Surface runoff observed following heavy rainfall on 19th May 2013 was seen flowing onto the road and into the road drainage system. It is assumed that road drainage in this area would discharge into John's Burn, although this will need to be confirmed at detailed design stage.
- Area 2: The central part of the site (3.6 ha) drains towards Cockburn Crescent, with excess runoff flowing onto the road and entering the road drainage system, which we expect is connected to a Scottish Water sewer that flows along Cockburn Crescent.
- Area 3: The north-eastern part of the site (5.9 ha) drains toward a low-lying area of the site towards the north-east corner of the site. The slope of land indicates that water accumulating in this area would flow to the east. There is a culvert (or culverts) under Mansfield Road that pass road drainage and runoff in a culverted drainage ditch (see Figure 3) to the east. It is assumed (but not confirmed) that there will be a field drainage connection between the low-lying part of the site and one of these culverts. Runoff flowing east would reach an open watercourse within the grounds of Harmeny School, which itself drains to Bavelaw Burn. If there is no piped connection to the east under Mansfield Road, then surface runoff would be expected to pond I the low-lying area of the site before evaporating or infiltrating into the ground. Infiltrated water would be expected to flow in the sub-surface to the east towards the unnamed stream. Surface water could pond to a level of around 202.5 m OD, before it would overtop onto Mansfield Road and flow to the east. The overtopping level to the north onto Cockburn Crescent is higher at 203.0 m OD.

Greenfield runoff rates for the site were calculated in Section 4.2.

6.2 Outline Drainage Proposals

Two general site drainage proposals are suggested and described below.

6.2.1 Drainage Option 1: Two SuDS ponds option

Option 1 proposes two SUDS ponds, one located in the north-eastern corner of the site and the other in the north-west corner of the site. Within this option we would propose two alternatives depending on the relative catchment areas that flow to each of the ponds.

In Option 1a the natural flow catchments are retained so that runoff from Areas 2 and 3 are routed to the pond in the north-east of the site and runoff from Area 1 is routed to the pond in the north-west of the site. The pond in the north-east corner of the site would discharge to either the Scottish Water system on Cockburn Crescent or to the unnamed stream to the east of the site. The pond in the north-west of the site would drain to John's Burn.

Due to known flooding issues in Balerno, we would suggest that SuDS ponds are designed to attenuate surface water runoff for events up to and including the 200 year event to the 2 year greenfield runoff rate. For the western SuDS pond this would be the greenfield runoff rate for the area of the site that currently flows towards John's Burn (i.e., 4.1 ha x 4.5 L/s/ha = 18.4 L/s). For the eastern SuDS pond this would either be;

- If the outfall is directed towards the unnamed tributary of Bavelaw Burn; the greenfield runoff rate should be equivalent to that for the area of the site that currently drains towards Bavelaw Burn (i.e., 5.9 ha x 4.5 L/s/ha = 26.6 L/s), unless an alternative flow rate can be agreed with the council.
- If the outfall is directed towards Scottish Water system; the greenfield runoff rate should be equivalent to that for the area of the site that currently drains towards Cockburn Crescent (i.e., 3.6 ha x 4.5 L/s/ha = 16.2 L/s), unless an alternative flow rate can be agreed with the council..

In Option 1b a larger percentage of the site area would drain to the SuDS pond to the north-west of the site. This pond would need to be larger in this case, as the discharge rate to John's Burn would need to be as above, unless a higher rate can be agreed with the council. The SuDS pond to the north-east would be smaller. The reason for doing this would be if there are issues related to discharging water to the Scottish Water system, or constraints on the flow rate able to be passed to the unnamed stream towards Bavelaw Burn (e.g., related to obtaining permissions to discharge water towards Bavelaw Burn and/or constraints on the existing flow rate from the site to the unnamed stream).

If Option 1a or 1b were to be progressed during detailed design the following would need to be assessed;

- Whether there is a connection (piped or subsurface flow) between the site and the unnamed tributary to Bavelaw Burn. A CCTV survey of the existing culverted drainage ditch parallel to Mansfield Road is recommended.
- Whether Scottish Water would accept any surface water runoff from the site into their system.
- The impact of discharge of water into the tributary of Bavelaw Burn would need to be undertaken. An initial site investigation was undertaken for this study indicated that the unnamed stream within Harmeny School is set within a broad area of low-lying ground within the school. It would appear that flow could be discharged to the stream without increasing flood risk; however, this would need to be investigated further and if it was determined that additional flow (above current greenfield rates) were to be discharged into the watercourse, permissions would need to be obtained with the school and any other landowners between the school and the Bavelaw Burn.
- The impact of discharge into John's Burn, although if discharge rates are retained at greenfield rates the development would not be expected to increase flood risk downstream and for events in excess of 1 in 2 years, the attenuation on site would be expected to decrease the risk of flooding downstream.

It is noted that around 60% of the site can be drained to the north-western corner of the site without the need for land raising.

A schematic of Drainage Option 1 is provided as an Appendix to this report as David R Murray and Associates Drawing No. E9819/0901.

6.2.2 Drainage Option 2: One SuDS ponds option

The second drainage option has a single SuDS pond located towards the north-western corner of the site, outfalling to the Scottish Water system or unnamed stream to Bavelaw Burn. As above, we would suggest that SuDS pond is designed to attenuate surface water runoff for events up to and including the 200 year event to the 2 year greenfield runoff rate, with calculations outlined above. Issues related to discharging of water to the Scottish Water system or the unnamed stream were outlined in the previous section.

A schematic of Drainage Option 2 is provided as an Appendix to this report as David R Murray and Associates Drawing No. E9819/0902.

6.3 Other General Drainage Advice

Development of the site will improve the current situation in that runoff from the development will be routed towards SuDS ponds and will not flow unimpeded towards Cockburn Crescent. However, given the existing risk of surface runoff from the site flowing onto Cockburn Crescent, we would suggest that additional drainage features are provided along key sections of the boundary of the site with Cockburn Crescent. These would act to divert any excess surface runoff from the site; however, the provision of additional drainage features is suggested to away from Cockburn Crescent, to be treated within the site drainage system, in the case of blockage of the site drainage system or rain events in excess of the design condition. Such features may not be required along the whole site frontage.

It is good practice to design finished floor levels an appropriate height above surrounding ground levels and arrange finished ground levels sloping away from buildings. General ground levels should be finished in a way not to allow ponding of surface water within the site where it could increase the risk of flooding of properties.

Emergency flood flow pathways should be provided within the site so in the case of blockage of the site drainage system or rainfall in excess of design, surface water runoff would be able to flow through the site without ponding or flooding properties.

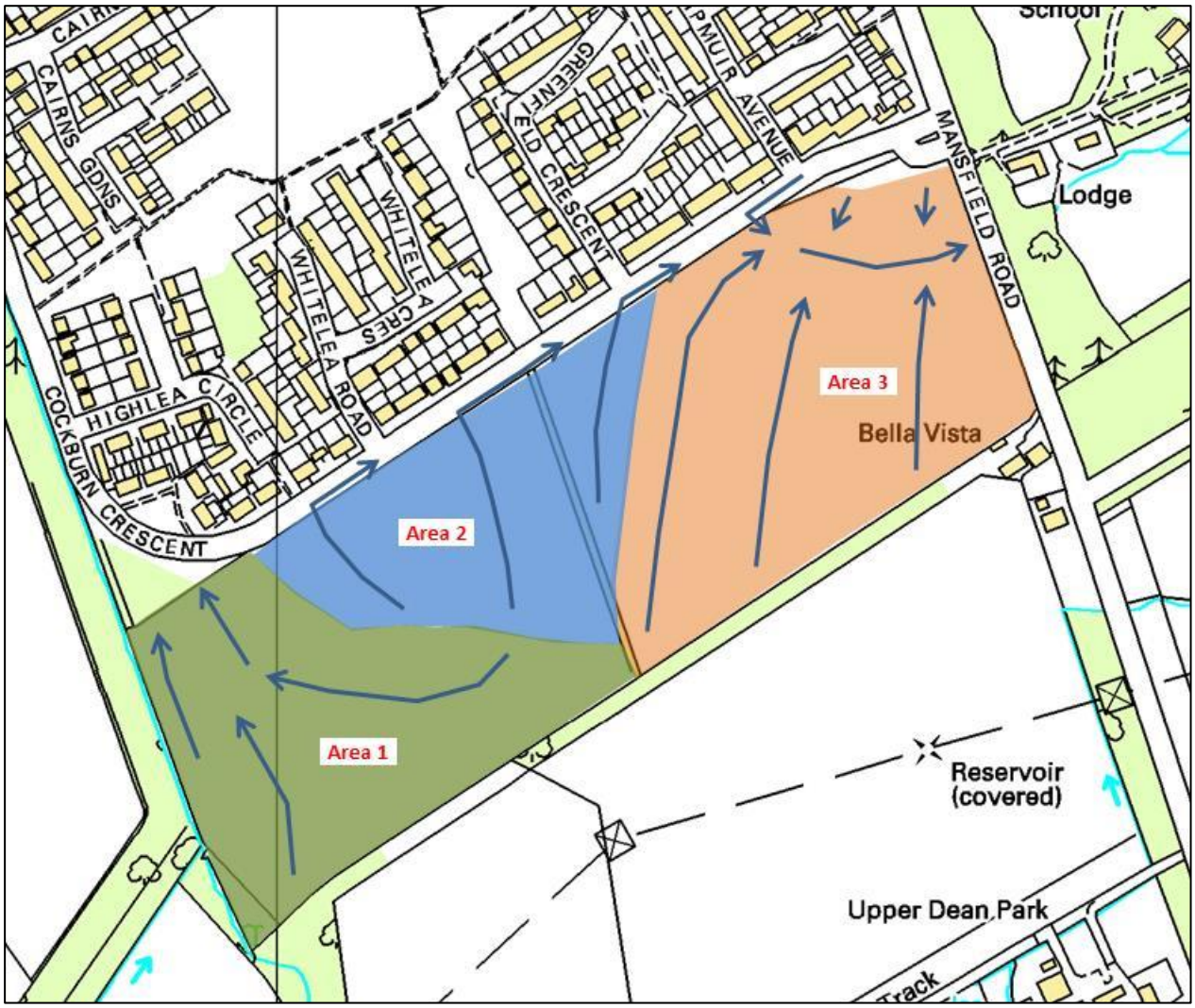
It should be noted that design of the site drainage system is not part of this commission, although an outline drainage strategy has been proposed. Final requirements for SuDS should be discussed and agreed with local council and SEPA.

This report has not considered infiltration as a SuDS management option. Given observed ponding of water on site after heavy rainfall, this is thought unlikely to be a workable solution for the whole site; however, it may be an alternative to be considered during site investigations, especially if applied to selected areas of the site.

6.4 Summary

In summary three outline drainage options are identified for the site. Additional work will be required at the detailed design stage to identify the most appropriate option for the final development. However, given the proximity of a number of potential sinks for surface water runoff from the site and the available space on the site for SuDS features, it is clear that a solution will be able to be found consistent with current polices and best practise.

Figure 4: Surface flow pathways on site



7 Summary and Conclusions

This report describes a flood risk assessment for a proposed development site in the south of Balerno. The report also provides an outlined drainage strategy for the site. This report is in support of a Planning Application in Principle.

The site is not considered at significant risk of flooding from John's Burn, surface water runoff from adjacent land, groundwater or existing surface water infrastructure. However, it is noted that runoff from the site has been known to contribute to existing flooding risk to roads and properties in Balerno. With effective on-site surface water management measures there is the potential for development to reduce this risk.

Three drainage options are identified for the site (Options 1a, 1b and 2). Additional work will be required at the detailed design stage to identify the most appropriate option for the final development and additional work required to assess the options is identified in Section 6 of this report. However, given the proximity of a number of potential sinks for surface water runoff from the site and the available space on the site for SuDS features, it is clear that the site will be able to be drained consistent with current polices and best practise.

A number of recommendations are made in terms of flood risk management at the site and these should be incorporated into the detailed design stage of the development.

It should be noted that the risk of flooding can be reduced but not totally eliminated given the potential for events exceeding design conditions and given the inherent uncertainty associated with estimating hydrological parameters for any given site.

Appendix : Outline Drainage Strategies

David R Murray Drawings

- SuDS Proposals Option 1, Drawing No. E9819/0901
- SuDS Proposals Option 2, Drawing No. E9819/0902