5.	Site Details	
5.1	What name would you like the site to be known by? (Please note if the site is currently included within the ALDP2017 please use the OP site number)	INCHGARTH ROAD
5.2	Site Address	INCHGARTH ROAD PITFODELS
5.3	Postcode	
5.4	Have you any information for the site on the internet? If so please provide the web address:	NO
5.5	Is the site currently being marketed?	NO Details: THE SITE IS UNDER OPTION TO CULTS PROPERTY DEVELOPMENT COMPANY LIMITED
5.6	Site Location Map (Please include an OS Map with the Boundary of the site clearly marked)	Details: SEE INDICATIVE LAYOUT PLAN
5.7	Please provide the National Grid reference of the site.	NJ9051403257
5.8	What is the current use of the site?	UNKEMPT FIELDS AND SCRUBLAND
5.9	Has there been any previous development on the site? If yes please provide details	YES Details: OVERHEAD TRANSMISSION LINE DISSECTS THE SITE. SEE ENVIRONMENTAL DESK STUDY FOR FURTHER INFORMATION.

6.	Legal and Planning History		
6.1	Please indicate the relationship to the Proposer or Person / Organisation they are working on behalf of, has with the site.	Sole owner	
		Part owner	
		Option to purchase	✓
		No legal interest	
6.2	Is the site under option to a developer?	YES Details: UNDER OPTION TO CULTS PROPERTY DEVELOPMENT COMPANY LIMITED	
6.3	Is the proposed site included in the ALDP2017?	NO	

6.4	Is the proposed site included in the Aberdeen City Centre Masterplan?	NO
6.5	Has the site been subject of previous discussions with the Council or any agent there of?	YES Details: PRE-APPLICATION REFERENCE 161227/PAN. DISCUSSIONS/CORRESPONDENCE WITH LUCY GREENE IN PLANNING RE SCOPING ENVIRONMENTAL STATEMENT AND VARIOUS OFFICERS INVOLVED IN DISCUSSIONS AS PART OF PREPARATION OF ENVIRONMENTAL STATEMENT
6.6	Has the site been subject of previous Planning Applications? (Please provide a planning reference)	YES Details: PROPOSAL OF APPLICATION NOTICE 161227/PAN
6.7	Has the site been subject of a previous Bid to a previous LDP? (Please provide the bid reference number)	YES Details: RESPONDENT REFERENCE 142 / PRE-MIR REF: B0912
6.8	Are there any legal restrictions on the title deeds such as rights of way, way leaves etc.	Yes / No Details: THERE IS A WAYLEAVE FOR THE OVERHEAD TRANSMISSION LINE. THE DEESIDE WAY IS A CORE PATH. BOTH MATTERS HAVE BEEN TAKEN INTO ACCOUNT IN THE INDICATIVE LAYOUT.
6.9	Are there any other legal factors that might prevent or restrict development? (e.g. ransom strips / issues with accessing the site etc.)	NO

7.	**Your Proposal** (Please provide as much detail as possible on your site proposal)		
7.1	Proposed Use	Housing (RETIREMENT)	✓
		Employment (DOCTOR'S SURGERY)	✓
		Mixed Use	
		Retail (PHARMACY)	✓
		Other (Please Specify) (CARE HOME)	✓
7.2	Do you have a specific occupier in mind for the site?	NO	
7.3	Site Area (hectares)	9.87 hectares or thereby	
	Housing		
7.4	Approx. no of units.	95 DWELLINGS	
7.5	Proposed Mix and Number (Number of Flats / Terraced / Semi-detached / detached etc.)	12 x HOUSES (53 NO. APARTMENTS) 16 X 2 BEDROOM SEMI-DETACHED APARTMENTS 12 X 2 BEDROOM APARTMENTS 14 X AMENITY HOUSING	

7.6	Affordable Housing Percentage	25.2%
7.7	Affordable Housing Partner (Details of any partner organisation, Registered Social Landlord etc.)	NO Details: NOT YET DETERMINED
7.8	Tenure (Details of tenure type, Private Rental Sector / private sale / Housing for the elderly etc.)	HOUSING FOR THE RETIRED/ELDERLY, INCLUDING AFFORDABLE HOUSING
	Employment	
7.9	Business and Office	m^2
7.10	General Industrial	m^2
7.11	Storage and distribution	m^2
7.12	Other Please specify	m^2
	Mixed Use (Please provide as much detail as possible on each use class)	
7.13	Housing	No of units and type: 95 UNITS (SEE ABOVE)
7.14	Employment	m^2
7.15	Retail	$500m^2$ (5 X MIXED RETAIL @ $100m^2$/UNIT)
	Retail	
7.16	Approx. floor area	m^2
	Other (Please Specify examples could include retailing, tourism, renewable energy, sports, leisure and recreation, institutions and education.)	
7.17	Details of proposal	50 bedroom care home
7.18	Approx. floor area	m^2

8.	**Engagement and Delivery**	
8.1	Has the local community been given the opportunity to influence/partake in the development proposal?	If there has been any community engagement please provide details of the way in which it was carried out and how it has influenced your proposals. If no consultation has yet taken place please detail how you will do so in the future.
		YES Details: TWO PUBLIC CONSULTATION EVENTS HAVE BEEN HELD ON 14 SEPTEMBER AND 9 NOVEMBER 2016. AT THE FIRST EVENT, MEMBERS OF THE PUBLIC WERE INVITED TO COMMENT ON WHETHER THEY WOULD PREFER TO SEE A SPORTS FACILITY, HOUSING, RETIREMENT VILLAGE, RELIEF

		ROAD ON THE SITE. USING THE RESPONSES RECEIVED, TWO DIFFERENT PROPOSALS (ONE INCLUDING SPORTS FACILITIES AND ONE WITHOUT) WERE PUT FORWARD FOR COMMENT AT THE SECOND EVENT AND PROPOSALS FOR COMMUNITY RELATED AMENITIES WERE INVITED. THE ATTACHED INDICATIVE MASTERPLAN AND PROPOSED MIX OF DEVELOPMENT RESPONDS TO THE COMMENTS RECEIVED AT BOTH EVENTS.
8.2	Will the proposed development be phased?	YES Details: TO BE DETERMINED IN FUTURE DISCUSSION WITH COUNCIL OFFICIALS
8.3	Expected development **start** post adoption of the plan in 2022	Year: 0-5
8.4	Expected development **completion**	Year: 0-5 TO 6-10
8.5	Is finance in place and if so what form? (Secured Loan, Grant Funding etc.)	NO Details: AN APPROPRIATE FUNDING PACKAGE WILL BE PUT IN PLACE AT THE RELEVANT TIME WITH FUNDING BEING FORTHCOMING FROM SHAREHOLDERS AND BANK FINANCE
8.6	Are there any other issues with the delivery of the site that we should be made aware of? (These should include any issues which may prevent or impact on the deliverability of the site.)	NO

9.	**Sustainable Development and Design**		
9.1	Have you applied principles of sustainable siting and design to your site? The City Council has produced a Sustainability Checklist which provides guidance on the principles of sustainable siting and design and other issues which can be found on www.aberdeencity.gov.uk. Please provide the following information:		
	Orientation - MORE INFORMATION IS PROVIDED IN THE DESIGN & ACCESS STATEMENT.		
9.2	Exposure:- (does the site currently have)	Little shelter from northerly winds	
		Some shelter from northerly winds	
		Good shelter from northerly winds	✓
9.3	Aspect:- (is the site mainly)	North facing	
		East or west facing	
		South, south west or south east facing	✓

9.4	Slope:- (do any parts of the site have a gradient greater than 1 in 12?)	Yes	
		If yes approx. what area (hectares or %)	
		No THERE IS A DROP OF 21m FROM N DEESIDE ROAD TO INCHGARTH ROAD. THE DESIGN STATEMENT EXPLAINS HOW THE INDICATIVE LAYOUT RESPONDS TO THE CONTOURS OF THE SITE.	
	Flooding & Drainage		
9.5	Flooding (is any part of the site at risk of flooding or has it previous flooded, if so provide detail You can view the SEPA flood maps at http://map.sepa.org.uk/floodmap/map.htm)	Yes (If yes please use the SEPA flood maps to determine the risk)	
		Little or No Risk	
		Low to Medium Risk Details: THERE IS SLIGHT, SPORADIC INDICATION AND SOME HISTORICAL EVIDENCE OF SMALL SCALE PLUVIAL (SURFACE) FLOODING TOWARDS THE NORTH AND WEST OF THE SITE, CAUSED BY SURFACE WATER ENTERING THE SITE AND/OR RAINFALL PONDING AT CERTAIN LOCATIONS, BUT THIS IS VERY LOCALISED.	✓
		Medium to High Risk	
		If yes approx. what area (hectares or %)	
		No	
9.6	Has a flooding strategy been developed for the site?	YES Details: SEE DRAINAGE AND FLOODING ASSESSMENT	
9.7	Have discussions been had with the Council's flooding team?	NO Details: TYPICALLY THE COUNCIL'S FLOODING TEAM WILL REVIEW THE DRAINAGE ASSESSMENT AND THE CONCEPTUAL DRAINAGE DRAWINGS BEFORE MAKING COMMENT.	
9.8	Have discussion been had with Scottish Water?	YES Details: A PDE WAS MADE TO SCOTTISH WATER TO CONFIRM CAPACITY OF THE EXISTING WATER AND SEWER NETWORKS. DISCUSSIONS HAVE ALSO BEEN HAD WITH REGARDS TO THE REQUIREMENT OF A DIA (DEVELOPMENT IMPACT ASSESSMENT), WITH SCOTTISH WATER CONFIRMING THAT THIS SITE HAS BEEN INCLUDED AS PART OF THEIR STRATEGIC DIA. EARLY TALKS HAVE ALSO BEEN HAD WITH SCOTTISH WATER REGARDING THE DIVERSION OF THEIR ASSETS WITHIN THE SITE BOUNDARY.	

9.9	Is there **waste water** capacity for the proposed development? http://www.scottishwater.co.uk/business/Connections/Connecting-your-property/Asset-Capacity-Search)?	YES Details: SEE DRAINAGE ASSESSMENT	
9.10	Is there **water** capacity for the proposed development? http://www.scottishwater.co.uk/business/Connections/Connecting-your-property/Asset-Capacity-Search)?	YES Details: PDE RESPONSE FROM SCOTTISH WATER CONFIRMS THAT THERE IS CAPACITY IN THE WATER NETWORK TO SERVE THIS DEVELOPMENT.	
	Land Use, Built and Cultural Heritage		
9.11	Built and Cultural Heritage (would the development of the site lead to the loss or disturbance of archaeological sites or vernacular or listed buildings?)	Significant loss or disturbance	
		Some potential loss or disturbance	
		No loss or disturbance (SEE ARCHAEOLOGY ASSESSMENT)	✓
9.12	Natural conservation (would the development of the site lead to the loss or disturbance of wildlife habitats or species?)	Significant loss or disturbance	
		Some potential loss or disturbance (SEE ENVIRONMENTAL WALKOVER SURVEY WHICH CONFIRMS THAT HABITATS PRESENT ON SITE DO NOT REPRESENT AN IMPORTANT ECOLOGICAL RESOURCE. THE DEVELOPMENT WILL NOT ADVERSELY AFFECT ANY PROTECTED SPECIES. PROPOSED TREE AND SHRUB PLANTING AND CREATION OF WILDLIFE CORRIDORS WILL HELP TO IMPROVE THE BIODIVERSITY OF THE AREA AND IMPROVEMENT HABITAT POTENTIAL.)	✓
		No loss or disturbance	
9.13	Landscape features (would the development of the site lead to the loss or disturbance of linear and group features of woods, tree belts, hedges and stone walls?)	Significant loss or disturbance	
		Some potential loss or disturbance (SEE TREE SURVEY DETAILING PROPOSED TREE FELLING AND LANDSCAPE AND VISUAL ASSESSMENT FOR PROPOSED EXTENSIVE TREE AND SHRUB PLANTING AND LANDSCAPING.)	✓
		No loss or disturbance	

9.14	Landscape fit (would the development be intrusive into the surrounding landscape?)	Significant intrusion	
		Slight intrusion (SEE LANDSCAPE AND VISUAL ASSESSMENT WHICH CONCLUDES THAT THE PROPOSED DEVELOPMENT IS VISUALLY ACCEPTABLE AND WILL NOT SIGNIFICANTLY ALTER THE CHARACTER OF THE LANDSCAPE IN THE AREA.)	✓
		No intrusion	
9.15	Relationship to existing settlements (how well related will the development be to existing settlements?)	Unrelated (essentially a new settlement)	
		Partially related	
		Well related to existing settlement (THE SITE IS BORDERED BY EXISTING RESIDENTIAL DEVELOPMENT ON ALL BOUNDARIES.)	✓
9.16	Land use mix (will the development contribute to a balance of land uses, or provide the impetus for attracting new facilities?)	No contribution	
		Some contribution	
		Significant contribution (IT WILL PROVIDE MUCH NEEDED HOUSING FOR ELDERLY, AFFORDABLE HOUSING, CARE HOME AND COMMUNITY AMENITIES.)	✓
9.17	Contamination (are there any contamination or waste tipping issues with the site?)	Significant contamination or tipping present	
		Some potential contamination or tipping present	
		No contamination or tipping present (SEE ENVIRONMENTAL DESK STUDY. THE CONTAMINATED LAND UNIT CONFIRMED NO KNOWN SOURCES OF POTENTIAL CONTAMINATION AT THE SITE OR SURROUNDING AREA)	✓
9.18	Will the site impact on any water courses?	NO	
9.19	Does the development site contain carbon-rich soils or peatland? http://www.snh.gov.uk/planning-and-development/advice-for-planners-and-developers/soils-and-development/cpp/	NO	
9.20	Is the development site within the airport safety exclusion zone?	NO	

9.21	Is the development site within the airport 57dB LAeq noise contours?	NO			
9.22	Land use conflict (would the development conflict with adjoining land uses or have any air quality or noise issues?)	Significant conflict			
		Some potential conflict			
		No conflict (SEE NOISE IMPACT ASSESSMENT)			✓
9.23	If there are significant conflicts, what mitigation measures are proposed?	N/A			
	Transport and Accessibility				
9.24	Has contact been made with the Council's transport team?	YES Details: TRANSPORT ASSESSMENT SCOPED WITH TRANSPORT TEAM, ALONG WITH STREET ENGINEERING REVIEW/QUALITY AUDIT. SEE BOTH ATTACHED.			
9.25	Is access required onto a Trunk road and if so has contact been made with Transport Scotland?	NO			
9.26	Accessibility (is the site currently accessible to bus, rail, or major road network?)		Bus Route	Rail Station	Major Road
		More than 800m		✓	
		Between 400-800m			
		Within 400m	✓ (7 services)		✓
9.27	Proximity to services and facilities (How close are any of the following?)	(SEE TRANSPORT ASSESSMENT)	400m	400-800m	>800m
		Community facilities			✓
		Local shops			✓
		Sports facilities			✓
		Public transport networks	✓		
		Primary schools (Not applicable as proposal is for retirement housing)			✓
		NOTE: IT IS PROPOSED THAT COMMUNITY AND LOCAL SHOPS ARE INCLUDED WITHIN THE DEVELOPMENT – SEE MASTERPLAN			
9.28	Footpath and cycle connections (are there any existing direct footpath and cycle connections to community and recreation facilities or employment? Give the Core Path number if core path is present https://www.aberdeencity.gov.uk/services/environment/core-paths-plan)	No available connections			
		Limited range of connections			
		Good range of connections (DEESIDE WAY (CORE PATH 66 and NCR 195) DISSECTS THE SITE)			✓

9.29	Proximity to employment opportunities (are there any existing employment opportunities within 1.6km for people using or living in the development you propose?)	None	
		Limited (But proposal is for retirement village)	✓
		Significant	
	Infrastructure		
9.30	Physical Infrastructure (does the site have connections to the following utilities?)	Electricity	NOT AT THIS TIME, BUT AVAILABLE NEARBY.
		Gas	NOT AT THIS TIME, BUT AVAILABLE NEARBY.
9.31	Does the development have access to high speed broadband?	TO BE PROVIDED AS PART OF THE DEVELOPMENT.	
9.32	Does the development include a Heat Network/District Heating Scheme?	THIS WILL BE EXAMINED AT THE APPROPRIATE STAGE.	
9.33	How is the development proposing to satisfy the Councils Low and Zero Carbon Policy?	Details: THE DESIGN STATEMENT CONFIRMS THAT THE SITE IS SOUTH FACING AND CONSIDERATION WIL BE GIVEN TO USING SOLAR/PHOTOVOLTAIC PANELS. AN INSULATED PANEL SYSTEM IS PROPOSED FOR CONSTRUCTION WHICH MAXIMISES SUSTAINABILITY AND REDUCES SITE CONSTRUCTION TIME.	
9.34	Are there any further physical or service infrastructure issues affecting the site?	NO	
	Public open space		
9.35	Will the site provide the required level of open space as per the current LDP (Please provide details of your calculations)	YES Details: THE INDICATIVE LAYOUT INCLUDES 3.1 HECTARES OF PUBLIC OPEN SPACE - SEE LANDSCAPE & VISUAL IMPACT ASSESSMENT AND DESIGN STATEMENT.	

9.36	What impact will the development have on the Green Space Network?	Enhance the Network	✓
		No impact on the Network	
		Negatively impact the Network	
		Please justify your response: SEE LANDSCAPE AND VISUAL ASSESSMENT. THE MAJORITY OF TREES ON THE SITE WILL BE RETAINED AND SUPPLEMENTED WITH ADDITIONAL PLANTING. THIS WILL INCREASE CURRENT BIODIVERSITY AND HABITAT CONNECTIVITY. ACCESSIBLE ROUTES TO THE DEESIDE WAY WILL BE PROVIDED. OVER 3 HECTARES OF PUBLIC OPEN SPACE/WILDLIFE CORRIDOR WILL BE PROVIDED AS PART OF THE DEVELOPMENT.	

10.	**Education**	
10.1	Have discussions been had with the Council's Education Department?	NO Details: NOT APPLICABLE – HOUSING FOR ELDERLY
10.2	Is there currently education capacity for the proposed development? https://www.aberdeencity.gov.uk/ services/education-and- childcare/schools-and-education/schools-pupil-roll-forecasts	N/A

11.	**Community benefits** Community benefits can include new community facilities (such as local shops, health, education, leisure and community facilities), affordable housing, green transport links and open spaces. Include elements which you anticipate may be required as developer contributions from the development. (Please note, specific contributions will have to be negotiated with the Council on the basis of the proposal.)	
11.1	Does the development proposal give any benefits to the community? If so what benefits does the development bring, and how would they likely be delivered?	YES Details: THE PROPOSAL IS FOR HOUSING FOR THE ELDERLY, INCLUDING AFFORDABLE HOUSING AND A CARE HOME ALONG WITH RETAIL UNITS WHICH SUPPORT THE PROPOSED USE, SUCH AS PHARMACY, DOCTOR'S SURGERY, NEWSAGENT, CAFÉ. IT ALSO INCLUDES OVER 3 HECTARES OF PUBLIC OPEN SPACE AND ACCESSIBLE LINKS TO THE DEESIDE WAY. THE LINK ROAD WILL REMOVE TRAFFIC FROM SUB STANDARD SIDE ROADS IN THE AREA.

12.	Masterplan Development Framework	
12.1	If you have prepared a framework or masterplan showing a possible layout for the site, please include it with this form.	YES Details: SEE INDICATIVE MASTERPLAN AND RELATED DESIGN & ACCESS STATEMENT.

13.	Additional attachments		
	No site is going to be perfect and the checklist above will inevitably raise some potential negative impacts from any development. Where negative impacts are identified, please provide details of their nature and extent and of any mitigation that may be undertaken. Listed below are examples of further information that may be included in your submission;		
		Included	Not Applicable
13.1	Contamination Report	✓	
13.2	Flood Risk Assessment	✓	
13.3	Drainage Impact Assessment	✓	
13.4	Habitat/Biodiversity Assessment	✓	
13.5	Landscape Assessment	✓	
13.6	Transport Assessment	✓	
13.7	Other as applicable (e.g. trees, noise, dust, smell, retail impact assessment etc. please state) • TREES • NOISE • STREET QUALITY AUDIT • SUPPORTING STATEMENT	✓	

14.	Development Viability		
14.1	Taking into account all the information provided above, and the requirements of the Aberdeen Local Development Plan 2017 and supporting Supplementary Guidance, please confirm that you have assessed the financial viability of your proposed development and found it to be viable for development in the timeframe set out above.	I confirm that I consider the site to be viable as per the details provided above.	✓
		Please provide details of viability:	

Overview and Supporting Statement on behalf of Cults Property Development Company Ltd

In relation to bid for proposed retirement village at Inchgarth Road, Cults

Contents

1 **INTRODUCTION**

1.1 To help meet the anticipated requirement for housing land in the review of the Strategic Development Plan, Aberdeen City Council has invited landowners/developers to come forward with greenfield and brownfield sites within the city which are capable of being developed for up to 100 dwellings.

1.2 In response to this call for sites, Cults Property Development Company Ltd (CPDC) seeks the allocation of land at Inchgarth Road, Cults for the construction of a residential development aimed entirely at the retired/elderly. An indicative layout has been prepared which demonstrates how the site can be sensitively developed for approximately 95 units (including affordable housing), a 50 bedroom care home, approximately 500 square metres of ancillary retail/community use appropriate to a retirement village (such as café, doctors' surgery, pharmacy) and open space.

1.3 This Overview and Supporting Statement draws together a summary of the key issues raised in the bid form and should be read in conjunction with the detailed assessments which have been submitted in support of the bid and are detailed below:

- Design & Access Statement
- Transport Assessment
- Drainage Assessment
- Environmental Desk Study
- Street Engineering Review & Quality Audit
- Archaeology Desk–based Assessment
- Noise Assessment Report
- Landscape & Visual Assessment
- Survey of Trees for Bats
- Environmental Walkover Survey
- Tree Survey.

2 **THE SITE AND ITS SURROUNDS**

2.1 The bid site extends to approximately 9.87 hectares and is located between North Deeside Road and Inchgarth Road, Cults. The site comprises two unkempt fields and scrubland, split by the Deeside Way.

2.2 Access to the site would be taken from both North Deeside Road and Inchgarth Road via a new distributor road crossing the Deeside Way.

2.3 Although currently identified as Green Belt in the 2017 Local Development Plan, the site is surrounded by existing residential development on all sides. Indeed, considerable residential development has taken place in close proximity to the bid site in recent years, including 60 dwellings at North Garthdee Farm and 3 dwellings on land to the south of North Deeside Road.

2.4 There are also hotels and Robert Gordon University in close proximity to the site.

3 **THE PROPOSED USE**

3.1 The site should be allocated for a residential-led development for the retired/elderly (including affordable housing), a care home and ancillary retail use, together with public open space and associated infrastructure. Public consultation has taken place which identified support for this type of development in the Cults area.

3.2 An indicative masterplan has been prepared which demonstrates that the site can be sensitively developed for approximately 95 residential units for the retired/elderly, a 50 bedroom care home, 500 square metres of ancillary retail/community uses. Over 3 hectares of public open space/wildlife corridor is included as part of the development.

3.3 The residences would include a mix of 1 and 2 bedroom properties, of differing sizes, including townhouses and apartments. An appropriate percentage of units would be made available as affordable units for retired/elderly occupants.

3.4 Located at the heart of the development will be retail/community facilities (which would potentially include a doctors' surgery, pharmacy, café and newsagent). As well as serving residents within the development, the facilities would be open to the public, providing new facilities in this part of the city.

3.5 The proposed development has been the subject of a Pre-application Forum and two public consultation events, all of which have helped to shape the mix and indicative layout.

4 DELIVERY

4.1 CPDC has an option to purchase the land and submitted a pre-application notice on 22 August 2016. The Council indicated that an Environmental Statement will be required to support any planning application for development of the site. The scope of the Statement has been agreed with the Council and the Statement is currently being finalised.

4.2 CPDC will submit a planning application in principle for the proposed development later this year. Development will commence as soon as planning consent is issued, helping the Council to meet its strategic requirement at the earliest opportunity.

5 SUSTAINABLE DEVELOPMENT AND DESIGN

5.1 As noted above, this bid is supported by a number of assessments, all of which demonstrate the suitability of the site for the proposed development. Reference should be made to the findings of the assessments. Key points are summarised below.

5.2 Located approximately 2.5 km from the west end of Union Street, the site is only 3 miles from the railway and bus stations and 8 miles from the airport.

5.3 Although ancillary facilities are proposed within the development, the site is within 400 metres of public transport and within 1600 metres of the Cults retail centre. There is a cycle way on North Deeside Road, but the Deeside Way which dissects the site provides an off road cycle route to the city centre (NCR 195) and also to destinations to the west of the site. The development will provide improved accessibility to the Deeside Way for all users as demonstrated in the Street Engineering Review & Quality Audit.

5.4 The Transport Assessment concludes that the traffic associated with the development can be accommodated within the local road network and that the proposed link road will relieve routes that have sub-standard geometry and poor junction visibility. The link road will have particular benefits for pedestrians and cyclists who currently use routes in the area, such as Pitfodels Station Road which is narrow, has poor visibility and no footways. The link road is included within the Council's approved Strategic Infrastructure Plan.

5.5 The Landscape and Visual Assessment concludes that the proposed development will not significantly alter the character of the landscape.

5.6 The majority of trees on the site will be retained and these will be supplemented by extensive tree and shrub planting. The western third of the site, extending to over 3 hectares, would remain as green space and wildlife corridors.

5.7 The Survey of Trees for Bats discloses that only two trees to be felled for the development have bat roost potential and these will be aerially inspected before felling to check whether there are roost present.

5.8 The Environmental Walkover Survey reveals that the habitats on site do not represent an important ecological resource and that no protected species will be adversely affected by development on the site. Rather, the proposed tree and shrub planting and creation of wildlife corridors as part of the development will help improve the biodiversity of the area and will improve the habitat potential.

5.9 The Drainage and Flooding Assessment, Archaeology Assessment, Noise Assessment and Environmental Desk Study all confirm that there are no technical issues with the site which would prevent development.

5.10 The Design and Access Statement explains how the proposed layout has been designed to respond to the constraints and opportunities presented by the site. The site provides a fabulous opportunity for innovative designs, with the fall of the land from north to south enabling all the proposed properties to have outstanding views.

5.11 The development will include low and zero carbon generating technology and will use an insulated panel construction system which maximises sustainability and reduces site construction time.

5.12 It is submitted that the considerable assessment work which has been carried out by CPDC demonstrates how the bid site can be brought forward for a high quality, innovative development which fits within the landscape character of the area and provides specialist housing and community facilities. The development will also enhance the green space network in the area through increased habitat connectivity and accessible routes to the Deeside Way.

6 DOCUMENTS

CUL 1 Indicative Overall Masterplan

CUL 2 Design & Access Statement

CUL 3 Transport Assessment

CUL 4 Drainage Assessment

CUL 5 Environmental Desk Study

CUL 6 Street Engineering Review & Quality Audit

CUL 7	Archaeology Desk–based Assessment
CUL 8	Noise Assessment Report
CUL 9	Landscape & Visual Assessment
CUL 10	Survey of Trees for Bats
CUL 11	Environmental Walkover Survey
CUL 12	Tree Survey

BURNESS PAULL LLP
Solicitors, Aberdeen

AGENTS FOR CULTS PROPERTY DEVELOPMENT GROUP LIMITED

28 May 2018

Rev : | Date : | Comments :

COMMUNITY RETIREMENT VILLAGE - NORTH DEESIDE ROAD / INCHGARTH ROAD, ABERDEEN

2

1	6 NO. HOUSES - CONTAINING 4 / 5 APARTMENTS PER HOUSE [27 NO.]	[46 Spaces - 23 Surface + 23 Undercroft]
2	16 NO. 2 BEDROOM SEMI-DETACHED APARTMENTS	[36 Spaces - All Surface]
3	6 NO. HOUSES - CONTAINING 4 / 5 APARTMENTS PER HOUSE [26 NO.]	[44 Spaces - All Surface]
4	50 BEDROOM CARE HOME	[26 Spaces - All Surface]
5	5 NO. RETAIL UNITS [MIXED]	[22 Spaces - All Surface]
6	14 NO. AMENITY HOUSING	[14 Spaces - All Surface]
7	12 NO. 2 BEDROOM APARTMENTS	[20 Spaces - All Surface]
8	ARCHITECTURAL FEATURE INCLUDING SUDS POND	

- INDICATIVE SUDS LOCATION
- EXISTING SURVEYED TREES TO BE RETAINED
- INDICATIVE NEW TREE PLANTING
- DISABLED ACCESS FROM INCHGARTH ROAD TO NORTH DEESIDE ROAD
- 3.0M WIDE CYCLE PATH

INDICATIVE OVERALL MASTERPLAN

FITZGERALD ASSOCIATES
ARCHITECTURAL + INTERIOR DESIGNERS
53 ALBERT STREET ABERDEEN AB25 1XT
+44 (0)1224 633375
info@fitzgeraldassociates.co.uk
CIAT Registered Practice

Client :	Cults Development Co. Ltd	
Project :	New Development North Deeside Road / Inchgarth Road	
Description :	Planning Details Overall Masterplan	
Drawn By : Ewan Campbell	Scale : A1=1-1000	Date : June 2017
Project No : 3847	Drawing No : 102	Rev : C

FITZGERALD + ASSOCIATES

Proposed Community Retirement Village
North Deeside Road / Inchgarth Road Aberdeen
May 2018

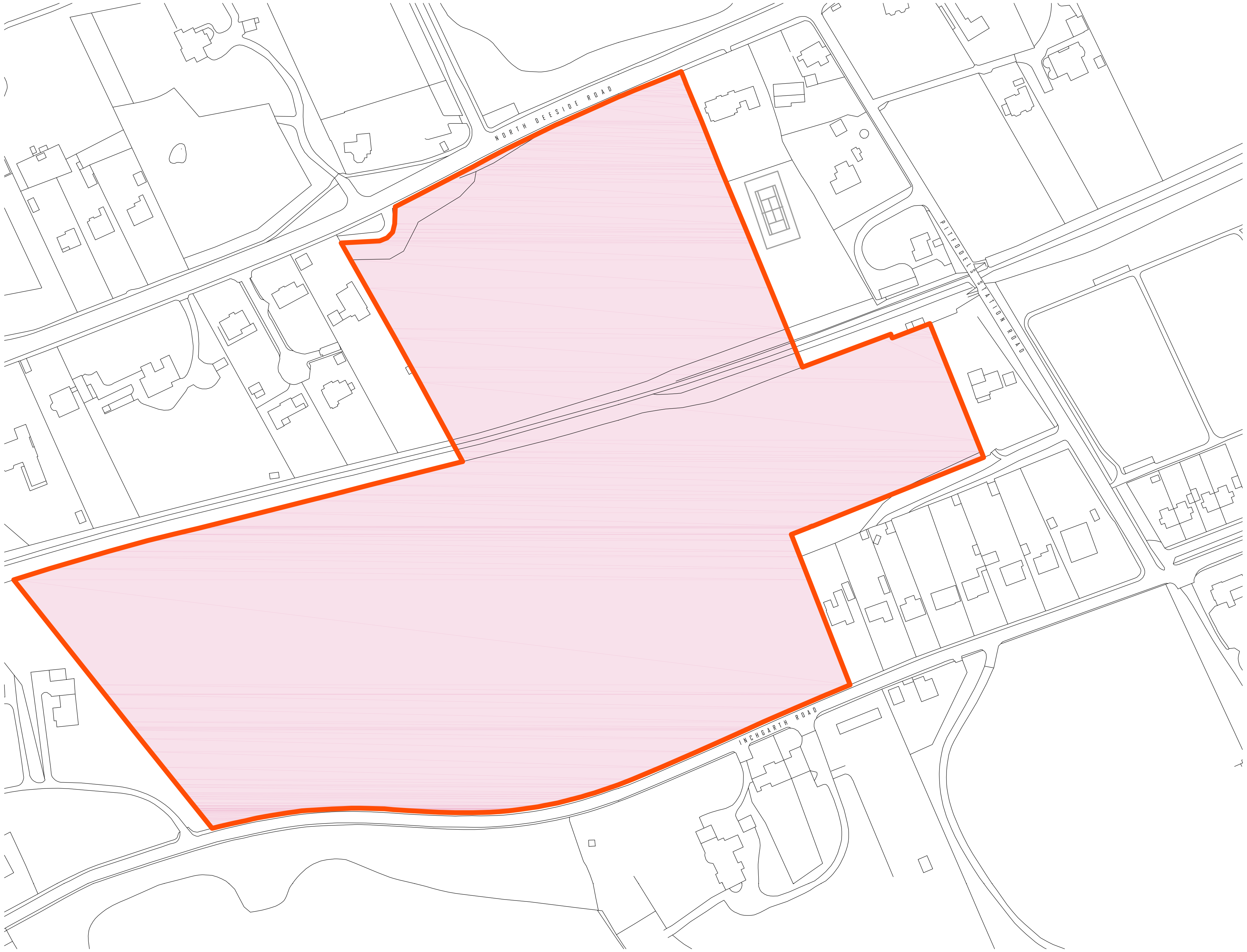
CIAT
Registered Practice

Site Location

CONTENTS

SCOPE

Scope of Document



Plan of the Site, highlighting the application boundary

DESIGN AND ACCESS STATEMENT

This statement has been prepared to accompany an application for Planning Permission in Principle to be made to Aberdeen City Council for a proposed Retirement Village at North Deeside Road / Inchgarth Road Aberdeen. It addresses the principal planning issues of visual impact, landscaping use, layout and appearance of the proposed high quality development.

The document records the stages of design including Site analysis, massing studies and design proposals. In addition, it provides an explanation of the final proposals, demonstrates appropriateness, and offers a background to the principles and concepts that have informed the design.

It is intended that this Design and Access Statement is read in conjunction with all supporting documents submitted as part of the Planning Application.

Development Site

Site Location

Site Context

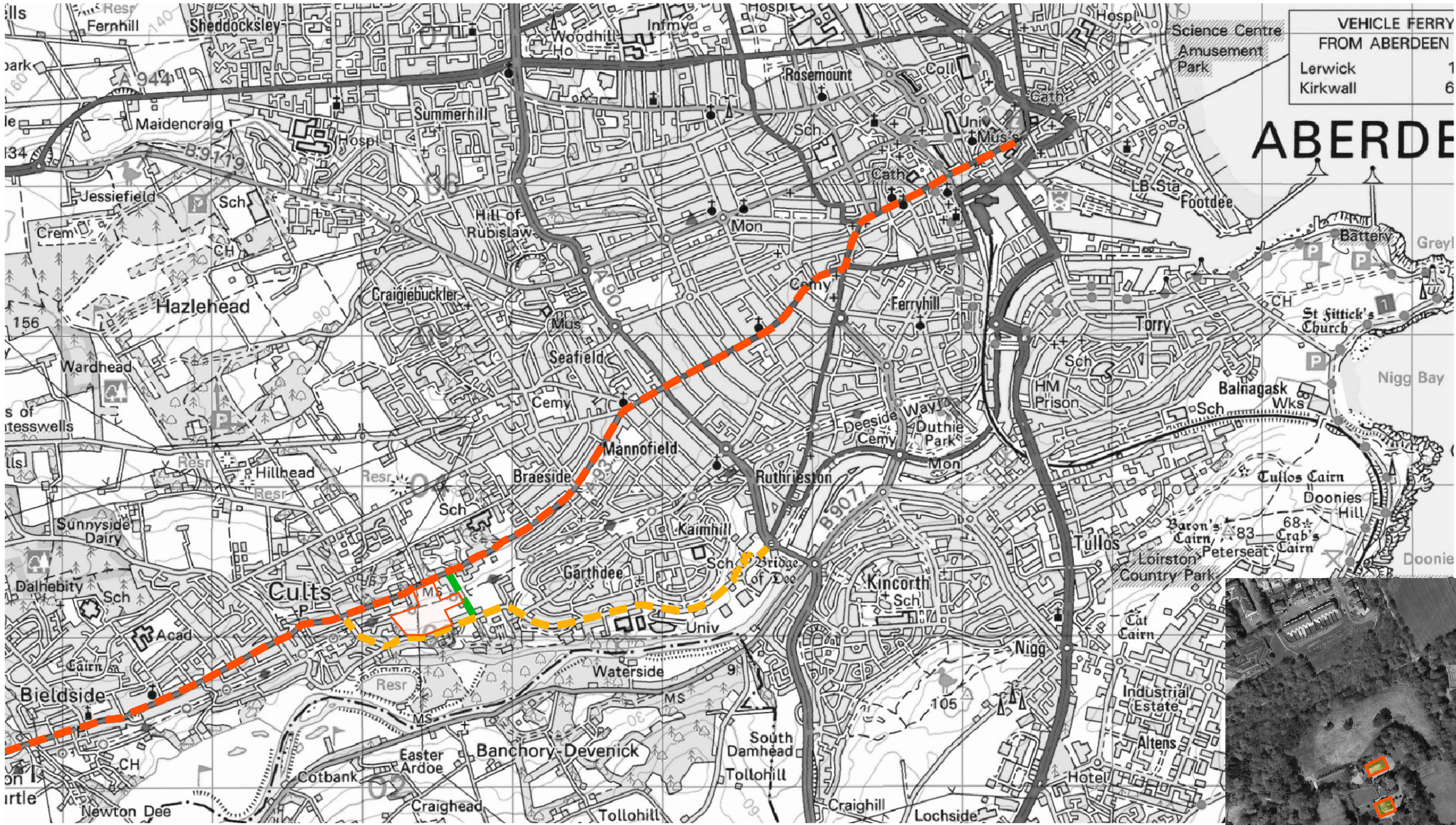
Located to the West of Aberdeen City Centre and just to the east of Cults, the Site sits between North Deeside Road to the north, and Inchgarth Road to the south, with the "Deeside Way" intersecting from east to west Pitfodels Station Road lies to the east of the Site. Westerton Road lies to the west of the Site

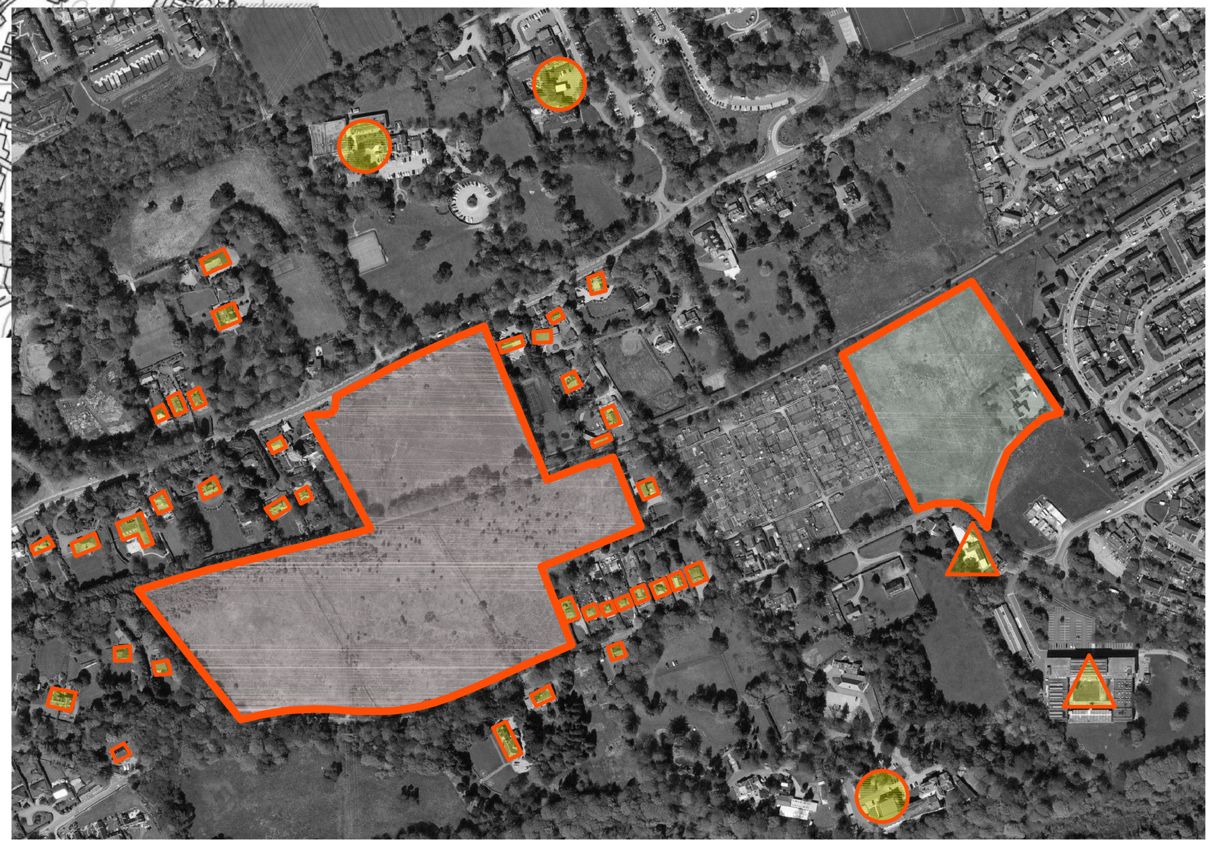
North Deeside Road is itself an arterial route offering direct access to both the city centre to the east and to Cults and the western suburbs of the city.

To the north of the Site sits both Woodbank Hotel - Sports Complex and the Marcliffe Hotel and Norwood Hall Hotel and Robert Gordon University Campus are located to the south and east.

South of the Site lies the Inchgarth Reservoir just above the River Dee with open land beyond the city boundaries.

Development Site





Development Context

The Site lies between the residential areas of Cults to the west and Garthdee to the east. Both areas include a variety of house types. There are hotels to he north and south.

This area is well populated and there are good transport links into the city centre.

Large retail chains, such as B&Q, Asda, Sainsbury's and Boots pharmacy occupy the eastern end of Garthdee Road, towards the city centre, with more local shops available to the west in Cults within a 15 minute walk.

Site Location

North Deeside Road - major route to city centre

Inchgarth Road, onto Garthdee Road and leading to the Bridge of Dee - local route

Pitfodels Station Road - local route

Hotels

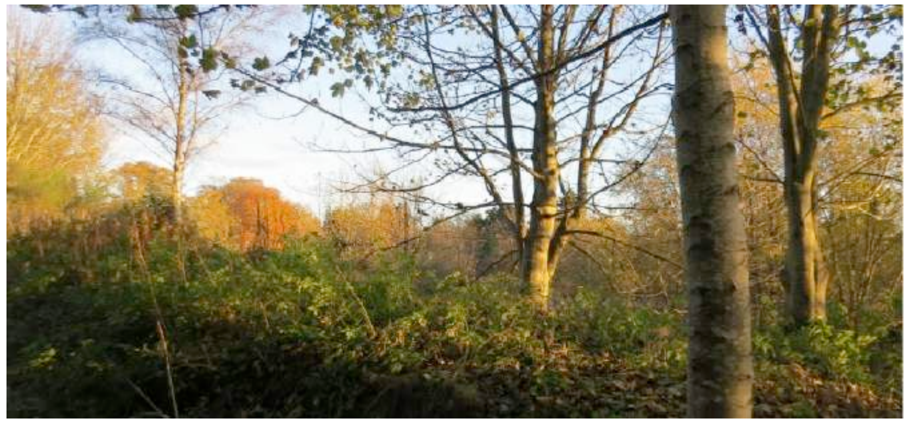
Residential

RGU Campus

Site recently developed as residential

Development Site

Site Photographs


View East on Deeside Way


View from Inchgarth Rd into retained Open Space


View North East along Deeside Way

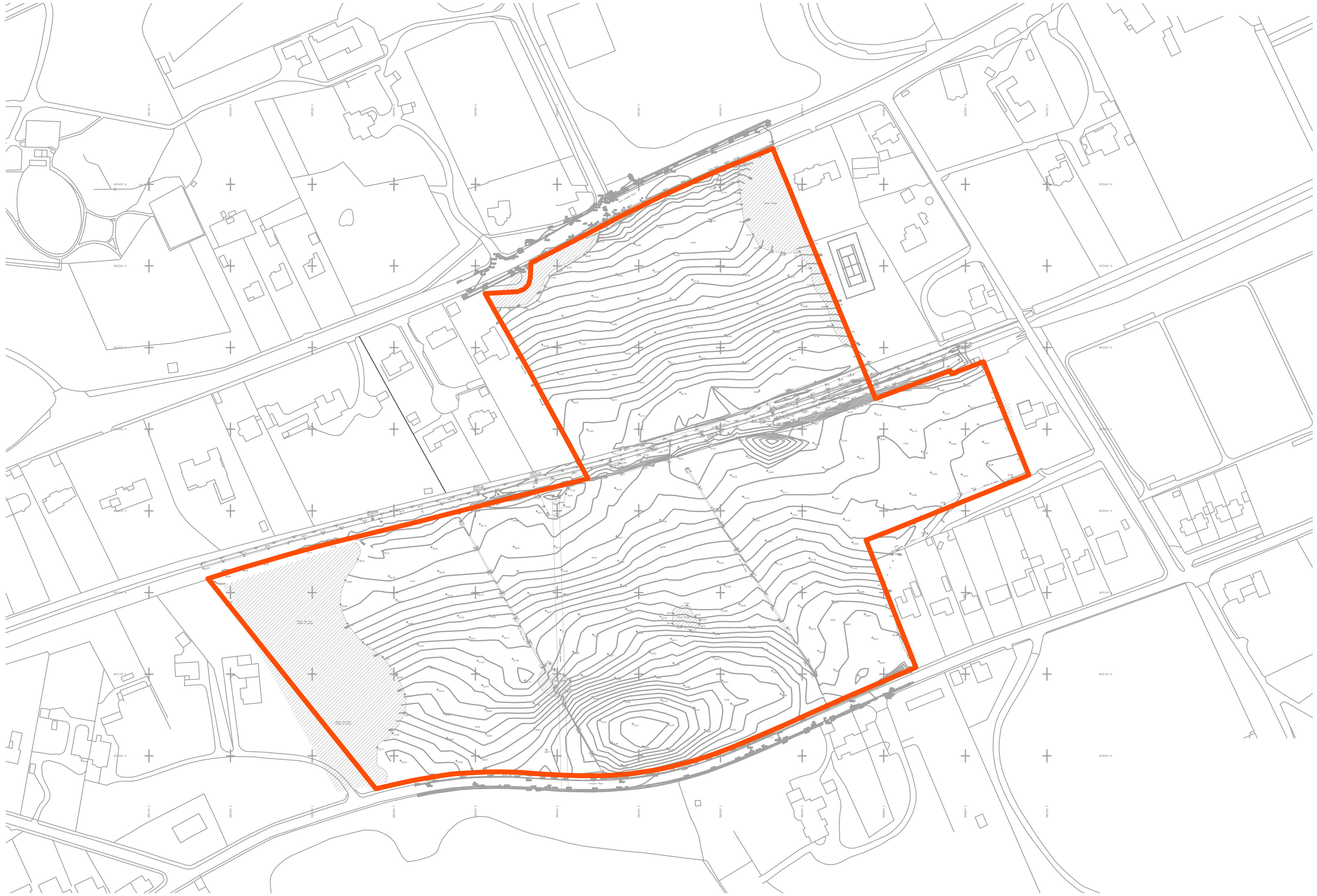

View North West from Deeside Way


View South East from Deeside Way


View South from Deeside Way into Retained Amenity Space


View South from Deeside Way

Development Site



Contextual Analysis

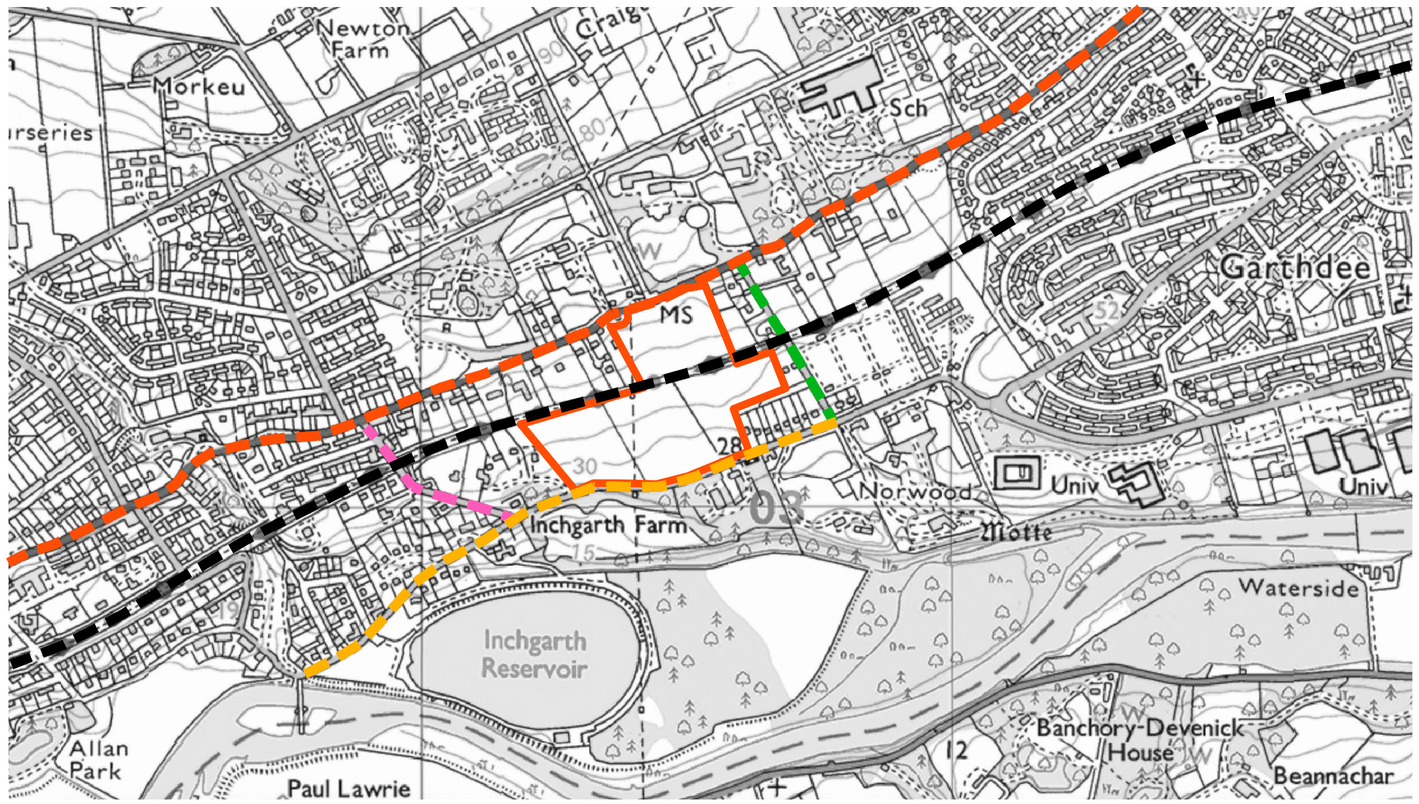
The area is made up of two private unkempt fields and scrubland divided by the Deeside Way / Old Deeside Railway line. The northern field is bordered on the south and east by old beech hedges which have grown to maturity. On the northern edge of this field there is a row of mature, mixed, deciduous trees, immediately adjacent to the North Deeside Road.

The southern field has scattered semi-mature and mature broadleaved trees immediately to the south of the Deeside Way. There are also dense areas of sycamore sapling regrowth and some pockets of scrub further down the slope. This field extends down to Inchgarth Road. There are two drystane dykes which run north to south, which originally divided this area into three fields. Sporadic mature sycamore trees grow adjacent to the dyke along Inchgarth Road.

Both fields are bordered to the east and west by private, residential gardens.

The Deeside Way which is part of the Aberdeen Core Path Route 66 / Route 195 of the National Cycle Network will be retained / protected and enhanced with new access provided via the new fully compliant over pass.

Development Site



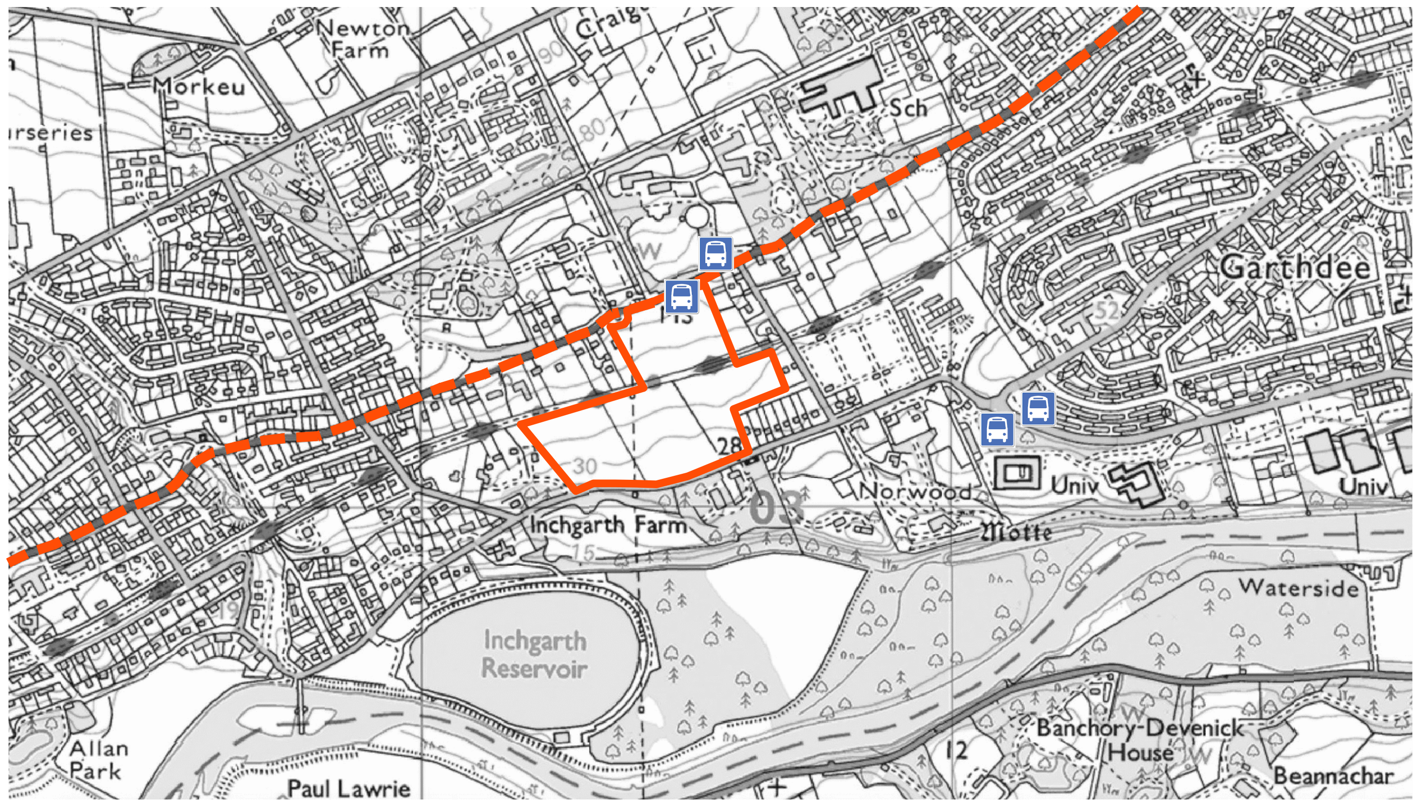
North Deeside Road - major route to city centre

Inchgarth Roaad, local route

Pitfodels Station Road - local route "short-cut"

Westerton Road - local route "short-cut"

Route 195 of the National Cycle Network
Aberdeen Core Path Route 66



Bus Stop

Bus Route 119 - 201 - 202 - 203 -
N19 + National 19

A bus route at the top of Garthdee
is also within walking distance.

North Deeside Road and Inchgarth Road provide direct access to the city centre. The Site, in general, is easily accessible from outlying areas of the city and the A90. Pitfodels Station Road which is not fit for its current use is heavily used by the commuters of the western suburbs. Westerton Road is also not fit for its present use and is heavily used by commuters.

The Site is linked to the main road network by well lit, safe and pleasant footways and paths for pedestrians. It has a traffic free, dedicated National Cycle Network (Route 195) running through the Site. A disabled access and stair access is provided to the Deeside Way. (Refer to the supporting Transport Assessment)

Transport

The Site is serviced by frequent bus routes that run on a loop to and from the city centre, with at least 1 bus in each peak time quarter hour. These buses serve the commuting needs of the local residents.

There are two bus stops within a short walking distance of the Site on the North Deeside Road. There is also a bus route at Garthdee Road, again a short walking distance from the Site.

Development Site

GREEN SPACE
The area has a high ratio of green space to built environment and the majority of properties in the area have large garden spaces.
The green verges bordering the Site act as a buffer to the surrounding roads and adjacent housing.
The Site has clear accessibility to the western suburbs and open countryside beyond.

SUNPATH
The south facing Site benefits from an open, tree lined outlook as well as the majority of the sunlight, which will extend to the East and West during the summer months.

SUSTAINABILITY

All new buildings to be installed with low and zero carbon generating technology. The buildings will be fitted with the most up to date high efficient gas boiler conforming with current energy requirements, consideration will also be given to the use of solar / photovoltaic panels at a later stage and relevant consents sought where required in due course.

In order to provide maximum energy efficiency, an insulated panel system of construction is proposed. To maximise sustainability, the system has been chosen to provide an airtight, yet breathable solution. It is also a rapid form of construction and reduces site construction times.

Application Site - private green space

Allotments

Private

Urban Green Space

Green Belt

Development Site

TYPOLOGY
The Site sits on the edge of a mainly residential area which is varied in style and typology. With Woodbank Hotel Sports Complex and Marcliffe Hotel located to the north and Norwood Hotel and Robert Gordon University Campus to the south and east.

HEIGHTS
The residential area mainly consists of 2 storey houses, with some non residential buildings being 2½ storey.

Residential layout has a more random form to the north, with a more regular form to the south. Building lines would be followed to both the north and south.

Residential footprints - generally 2 storey

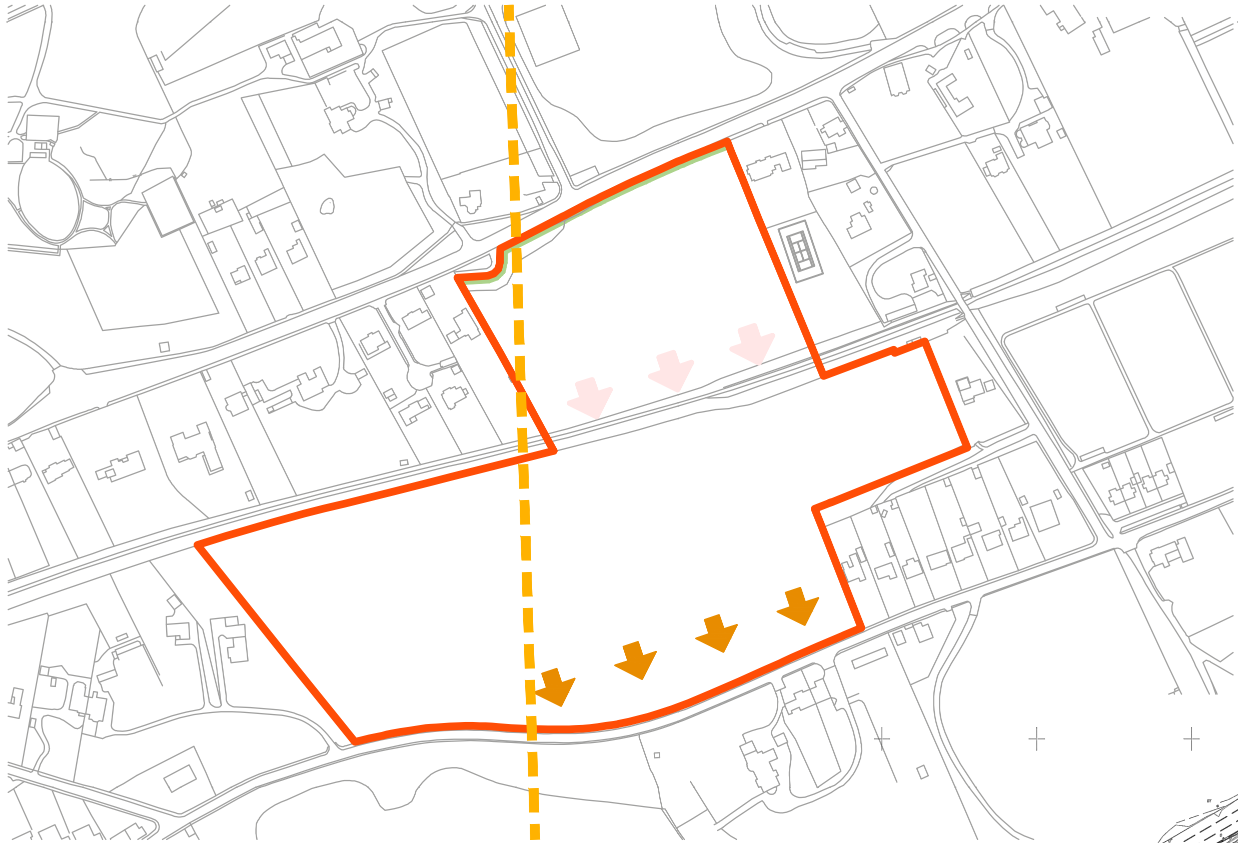


Fig_01

- Frontage to North Deeside Road
- Views south and onto Deeside Way
- Views south
- Overhead Power Line

Developed Site kept to the east of new relief road - Wildlife Corridor / Green Space Retained to the west

Fig_02

Approach

OPPORTUNITIES + CONSTRAINTS

As it exists, the Site currently has a drop of some 21m from North Deeside Road to Inchgarth Road. There is an existing power line runing north to south on the western edge of the site [see Fig_01]

Pitfodels Station Road and Western Road linking north traffic to the south, but both routes are currently not fit for purpose.

There is an opportunity to provide a new "relief road" though the Site, which opens up development possibilities, [see Fig_02] with open space for public use to the west of the Site.

With the constraints of the different levels on the Site, it is not possible to have a straight road linking the North to South main roads. The constraints of the Site dictated that the road required detailed design considerations which developed over a period of time. The initial road design took the shape of a snake like appearance. It was important to try to contain the east to west spread of the road across the Site.

The road layout and design evolved following detailed consideration by the design team of architects, road engineers and land surveyors.

Throughout the consultation process, the design team has been in detailed discussions with Aberdeen City Council Roads Department relative to the road design. Initial discussions centred upon geometry and cut-and-fill issues and after considerable liaison and consultation a design for the road which reduced curvature and cut-and-fill requirements, agreement was reached which has been included within the indicative layout.

It was important to have the development at the east side of the new road, leaving the west side as open green space and thereby avoiding coalescence.

The natural balance of the Site lends itself to southerly uninterrupted tiered views. [See Fig 02]

Taking account of the above issues led to considering how to split the development area into small land parcels reminiscent of the individual house plots that bound the Site.

The design concept proposes individual plots which will contain what appears to be large homes, but in reality are designed as low height, 4 or 5 apartment blocks in the north, with higher buildings restricted to the bottom of the Site. This makes best use of the south facing opportunity for sustainability.

Approach

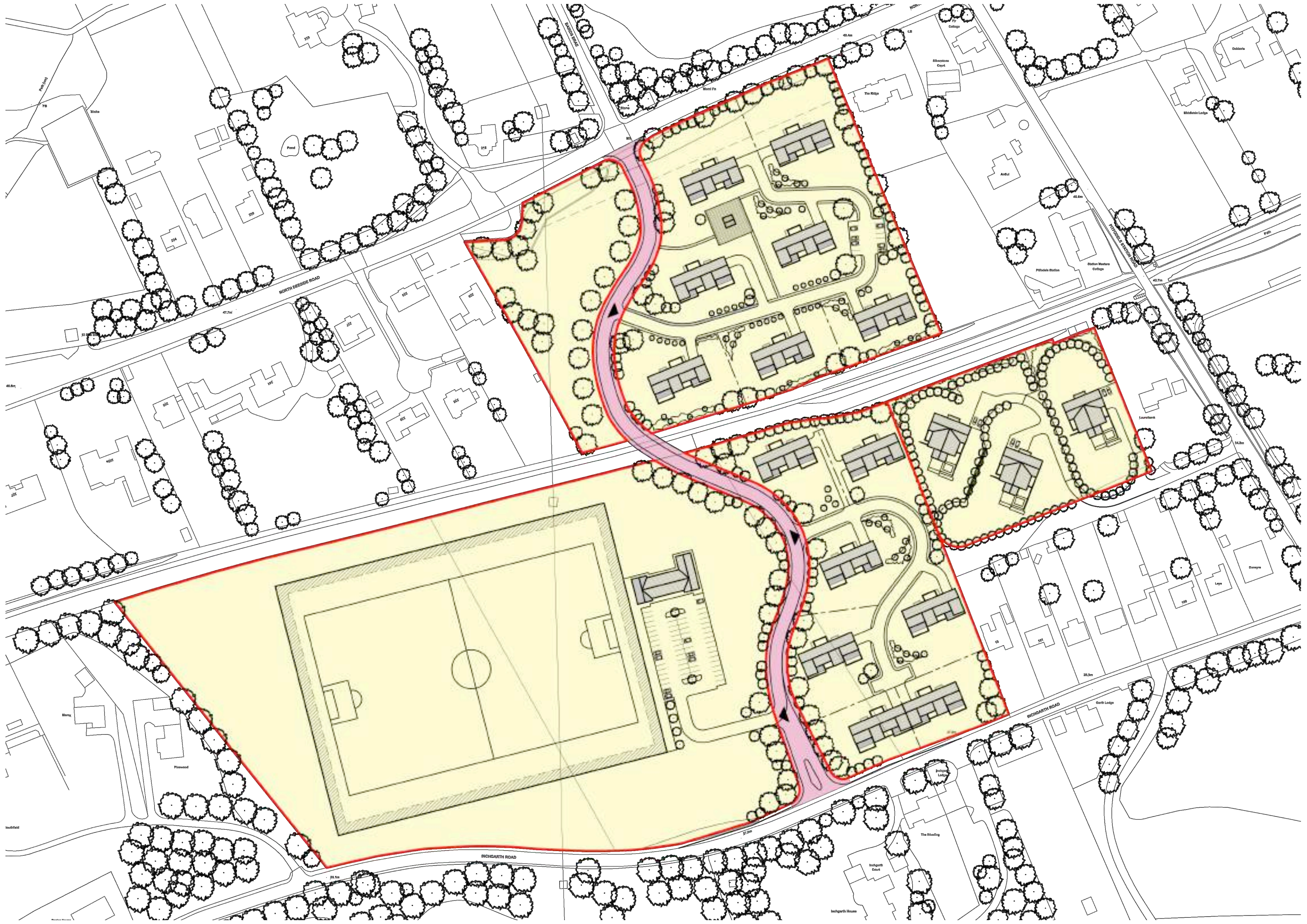


Fig_03

INITIAL IDEAS / MASSING / DEVELOPED CONCEPT

Initially consideration was given to a number of uses for the Site. The close proximity of The Robert Gordon University on Inchgarth Road and further east on Garthdee Road, led to initially considering student accommodation and then to consider leisure facilities.

Residential [Fig 03] and retirement homes were also considered. These options were evaluated on their individual merits and also on a mixed-scheme basis. The options were discussed with the various departments at Aberdeen City Council including Planning and Roads.

Following these discussions, attention focused on two options namely; a mixed scheme of leisure and retirement homes or alternatively the creation of a new concept retirement village.

The Design Team engaged in a process of Public consultation over a long period, involving Proposal of Application Notice and two Public Consultations at the nearby Marcliffe Hotel.

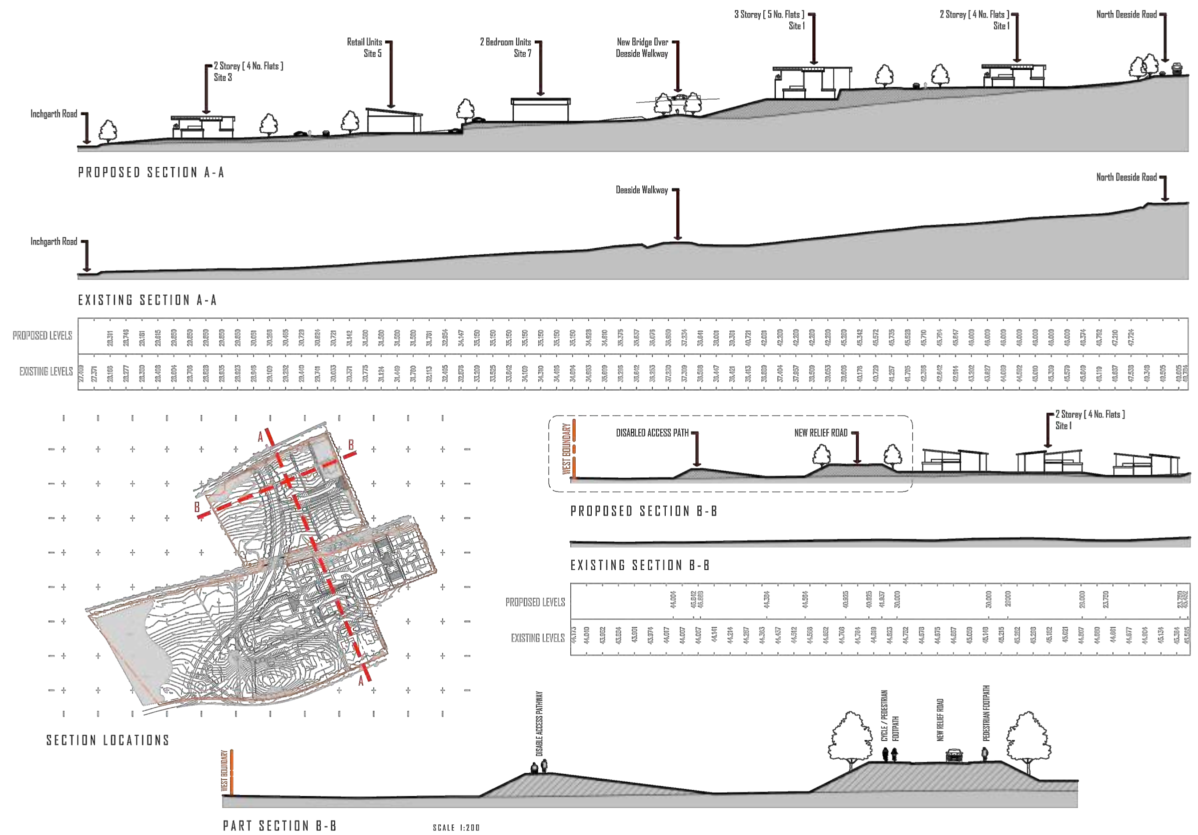


Fig_04

Approach

DEVELOPED CONCEPT

The feedback from the public consultation led to the conclusion that the most attractive option was the provision of a new concept retirement village. The particular land area lends itself ideally to such a proposal and there is undoubtedly a demand in the area.

The Site creates a fabulous opportunity for innovative designs on a south facing Site with the fall in the land from north to south enabling all the properties to have outstanding views to the south.

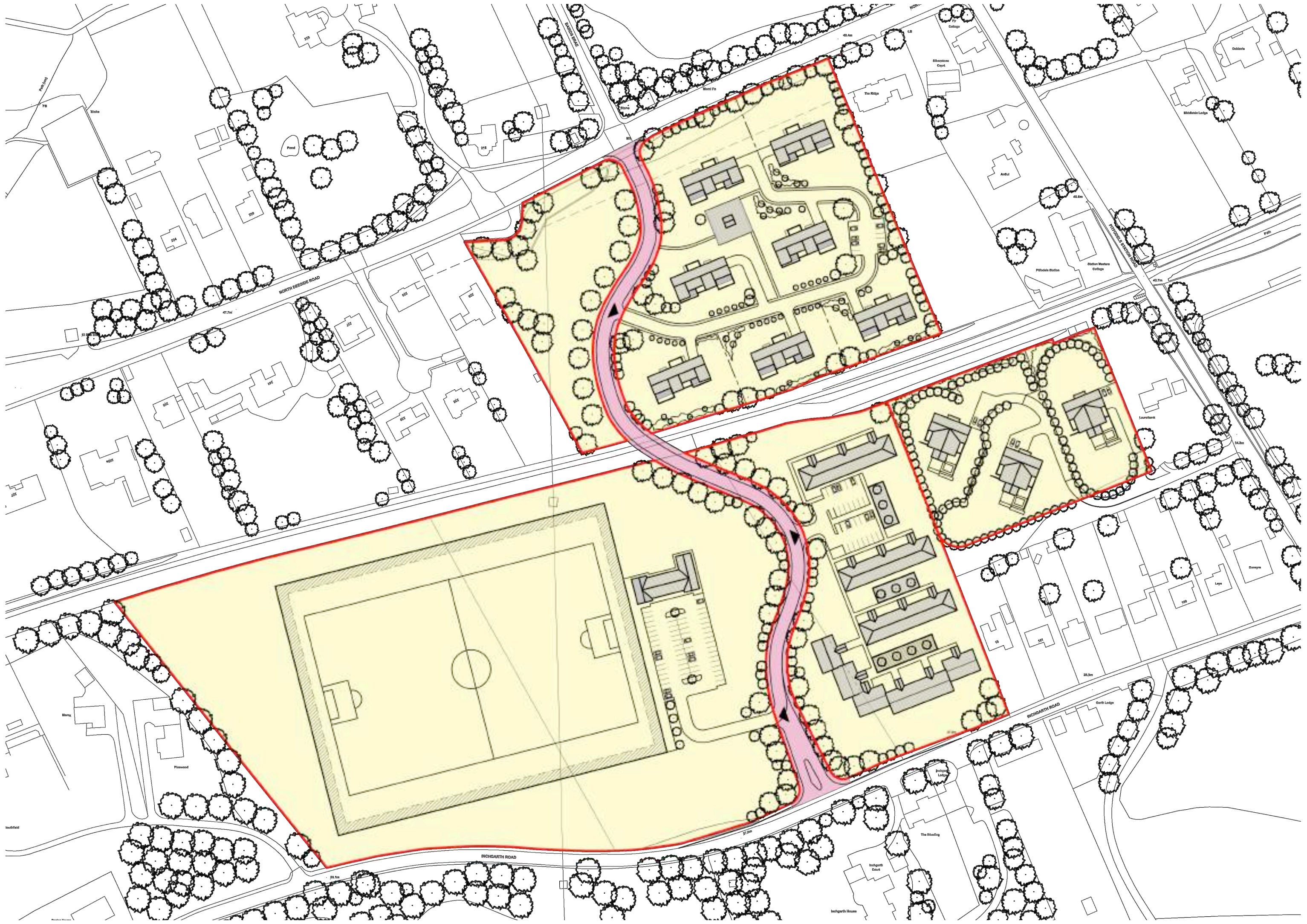


Fig_05

Fig_06

Approach

FINAL CONCEPT

It is submitted that the final development proposal will sit well within the landscape and with sensitive siting and design and landscaping, will enhance the area and provide innovative new facilities which are clearly in demand. As part of the development a new relief road will be provided at no cost to the Council, which will materially improve access and connectivity and public safety in the area

The large range of different sizes of properties will be provided to cater for different needs. The development will also include an appropriate percentage of affordable housing. All properties will have full provision for internal vertical (lift) access meaning that residents will be able to remain in their homes throughout their retirement.

Different levels/scale of care will be available on Site through the Care Home so that all residents can be provided with the appropriate level of care they need.

Small shops will be provided on Site to create a heart for the overall scheme. A south facing coffee shop with outside seating will be a feature. Other opportunities include a Doctors' Surgery, Chemist, Hairdresser and Physiotherapist.

Parking has been provided in "pockets" to reduce its massing appearance with suitable landscaping to further reduce visual impact.

Fig_07

Design

Fig_08

PROPOSED SITE PLAN.

Proposed Site Plan

- New relief road from North Deside Road to Incgarth Road.
- Orientation of buildings continues a residential form / massing.
- Creates minimal frontage to North Deeside Road and Inchgarth Road.
- Use type keeps parking to a minimum to promote "low and no car development". Alternative transport options will be encouraged.
- Semi-private courtyards created, with incorporated parking.
- Provision for 50 bedroom care home.
- Provision for a single group of mixed retail units.

SCHEDULE OF ACCOMMODATION

1. 6 NO. HOUSES - CONTAINING 4 / 5 APARTMENTS PER HOUSE [27 NO.]
2. 16 NO. 2 BEDROOM SEMI-DETACHED UNITS
3. 6 NO. HOUSES - CONTAINING 4 / 5 APARTMENTS PER HOUSE [26 NO.]
4. 50 BEDROOM CARE HOME
5. 5 NO. RETAIL UNITS [MIXED]
6. 14 NO. AMENITY HOUSING
7. 12 NO. 2 BEDROOM APARTMENTS

Materials

The palette of materials will reflect and complement the local vernacular and conservation area.

astell associates
arboricultural, environmental and landscape consultants

Inchgarth Retirement Community

Landscape & Visual Assessment

23rd May 2018

Ref: IRC-1805-VIA

26 Binghill Crescent, Milltimber, Aberdeen, AB13 0HP
Tel: (01224) 868458, email: info@astellassociates.co.uk
www.astellassociates.co.uk

LANDSCAPING.

Astell Associates arboricultural, environmental and landscape consultants have provided comprehensive reports on the following -

1. Environmental Walkover Survey
2. Survey of bats in trees
3. Tree Survey
4. Landscape & Visual Assessment

These are all to be read in conjunction with the statement.

Access

Fig_09

ACCESS TO SITE.

EXTERNAL ACCESS

The new relief road from North Deeside Road leading to Inchgarth Road, provides a compliant vehicular route for bus and car with shared cycle and pedestrian footpaths, access to the Deeside Way at the overpass is provided via stair. The roundabout at Inchgarth Road is seen as a traffic calming gain to help reduce speed along this stretch of road.

INTERNAL ACCESS

A fully compliant disabled path, shown dotted yellow on the adjacent figure allows access from the development to both North Deeside Road and Inchgarth Road, and to the wildlife corridor / green space retained to the west. This for the first time also provide access to the Deeside Way.

FITZGERALD (+) ASSOCIATES

(+)

Architectural Interior Designers
53 Albert Street Aberdeen Ab25 1XT
tel [+] 44 01224 633 375
www.fitzgeraldassociates.co.uk
email - info@fitzgeraldassociates.co.uk

CIAT
Registered Practice

Proposed Inchgarth Retirement Community, Inchgarth, Aberdeen

Transport Assessment

May 2018

FAIRHURST

FAIRHURST

CONTROL SHEET

CLIENT: **Cults Property Development Company Ltd**

PROJECT TITLE: **Proposed Inchgarth Retirement Community, Inchgarth, Aberdeen**

REPORT TITLE: **Transport Assessment**

PROJECT REFERENCE: **106859**

DOCUMENT NUMBER: **106859 / TA01**

Issue & Approval Schedule	Issue 3	Name	Signature	Date
	Prepared by	M Peters	[redacted]	15/05/2018
	Checked by	R McDonald	[redacted]	15/05/2018
	Approved by	R McDonald	[redacted]	15/05/2018

Revision Record	Rev.	Date	Status	Description	Signature	
	1	23/05/18	FINAL	Update report to refer to a total of 95 retirement units rather than 105 units.	By	M Peters
					Checked	M Peters
					Approved	M Peters
	2	25/05/18	FINAL	Update report to reflect client changes and new masterplan..	By	M Peters
					Checked	M Peters
					Approved	M Peters

This document has been prepared in accordance with procedure OP/P02 of the *Fairhurst Quality and Environmental Management System*

Contents

Appendices

1 Introduction

1.1 Background

1.1.1 This Transport Assessment (TA) has been prepared on behalf of Cults Property Development Company Ltd. to support a planning application in principle for the development of a retirement community. The proposed development site is located in the Pitfodels area on land between the A93 North Deeside Road and Inchgarth Road just to the east of the residential area of Cults.

1.1.2 The proposed development is illustrated by the site Masterplan included within Appendix A and will consist of the following:

- Site 1: 27 No. 2 bedroom Apartments (6 blocks containing 4 / 5 Apartments per block)
- Site 2: 16 No. 2 bedroom Townhouses
- Site 3: 26 No. 2 bedroom Apartments (6 blocks containing 4 / 5 Apartments per block)
- Site 4: 14 No. 1 bedroom Amenity Housing
- Site 7: 12 No. 2 bedroom Apartments
  TOTAL RETIREMENT UNITS = 95
- Site 5: 50 Bedroom Care Home
- Site 6: 5 No. Mixed Retail Units @ circa 100m² / unit. Total GFA = circa 500m²

1.2 Site Location

1.2.1 The site is located to the west of Aberdeen City, bound to the north by North Deeside Road (A93) and to the south by Inchgarth Road. The site lies to the south west of the International Business School and the Marcliffe Hotel whilst the remainder of the surrounding area is predominately made up of established residential areas with Cults, found to the west of the site and Mannofield and Garthdee found to the east of the site.

1.2.2 National Cycle Network Route 195 ‘The Deeside Way’, dissects the site and allows segregated bicycle travel, not only in to the city centre, but to the west to Peterculter. The Deeside Way follows the line of the old Deeside Railway between Aberdeen and

Ballater and is mostly level and traffic free, although there are some short on road sections.

1.2.3 Robert Gordon University is situated to the south-east of the site within the residential suburb of Garthdee. Just to the east of Robert Gordon University there is Garthdee Retail Park comprising of a Sainsbury's and ASDA supermarket, B&Q Warehouse, Boots and Currys / PC World. There are also leisure facilities located adjacent to the retail park which include David Loyd fitness and tennis club, Aberdeen Snowsports Centre and Garthdee Football Centre. Figure 1-1 below shows the site location.

Figure 1-1: Proposed Development Location Plan

1.3 Correspondence

1.3.1 In advance of this report being prepared a scoping note has been submitted to and agreed with Aberdeen City Councils Road Development Service (ACC). The scoping note outlined the methodology and parameters for use within this report. All relevant scoping correspondence is contained within Appendix B.

1.4 Transport Assessment Structure

1.4.1 This report has been prepared in accordance with the 'Transport Assessment Guidance' document issued by Transport Scotland, and will be structured as follows:

- Planning Policy Context
- Site Accessibility
- Development Proposals
- Trip Generation and Distribution
- Traffic Impact Analysis
- Residential Travel Plan Framework
- Employer Travel Plan Framework
- Summary and Conclusions

2 Planning Policy Context

2.1 National Planning Policy

2.1.1 The National Planning Policy Context is principally defined by 'Scottish Planning Policy' (SPP) and Designing Streets. Scottish Planning Advice Note 75 (PAN 75) 'Planning for Transport' also provides good transport planning guidance. The Scottish Government document 'Transport Assessment Guidance' provides advice on appropriate matters for consideration within a transportation report to support a planning application. Road design standards are contained within the Design Manual for Roads and Bridges (DMRB) and the National Roads Development Guide, with some local variations.

2.1.2 The Scottish Government's 'Scottish Planning Policy' (SPP) issued in June 2014 identifies the Scottish Government's overarching aim to increase sustainable economic growth within Scotland.

2.1.3 SPP revolves around the principal policies – sustainability and placemaking. In considering how planning should support the vision, the document outlines the key outcomes that developments need to contribute to:

- 'A successful, sustainable place – supporting sustainable economic growth and regeneration, and creation of well-designed, sustainable places.
- A low carbon place – reducing our carbon emissions and adapting to climate change.
- A natural, resilient place – helping to protect and enhance our natural and cultural assets, and facilitating their use.
- A more connected place – supporting better transport and digital connectivity.'

2.1.4 The 'Promoting Sustainable Transport and Active Travel' section of SPP stresses the importance of efficient transport connections within Scotland and to international markets, and the crucial role that planning plays to improving such infrastructure. The section goes on to identify, within paragraph 270, that the planning system should support developments that:

- 'optimise the use of existing infrastructure;
- reduce the need to travel;
- provide safe and convenient opportunities for walking and cycling for both active travel and recreation, and facilitate travel by public transport;

- enable the integration of transport modes'.

2.1.5 Paragraph 273 notes that 'the spatial strategies set out in plans should support development in locations that allow walkable access to local amenities and are also accessible by cycling and public transport. Plans should identify active travel networks and promote opportunities for travel by more sustainable modes in the following order of priority: walking, cycling, public transport, cars.'

2.1.6 SPP notes in paragraph 287 that 'Planning permission should not be granted for significant travel-generating uses at locations which would increase reliance on the car and where:

- direct links to local facilities via walking and cycling networks are not available or cannot be made available;
- access to local facilities via public transport networks would involve walking more than 400m'

2.1.7 PAN75 identifies the need for the integration of land use planning with transport, taking into account policies on economic growth, education, health and the objective of a more inclusive society.

2.1.8 PAN 75 identifies in Annex B the undernoted thresholds:

- 'For accessibility of public transport the recommended guidelines are less than 400m to bus services;
- A maximum threshold of 1600m for walking is broadly in line with observed travel behaviour'.

2.1.9 PAN 75 indicates that 'Travel Plans are documents that set out a package of positive and complementary measures, for the overall delivery of more sustainable travel patterns for a specific development.' It further states that 'their ability and success in influencing travel patterns is dependent upon the commitment of the developer and occupier of a development.'

2.1.10 For residential land uses, PAN 75 notes at paragraph 43 that 'travel plans may set out measures which will be used as an incentive to house purchasers to use non-car travel modes, but setting targets is generally not practicable for this land use. Sustainability in housing should come through design in relation to walking, cycling and public transport networks'.

2.1.11 Transport Assessment Guidance (TAG) has been published by Transport Scotland to guide the preparation of Transport Assessments (TA) for development proposals in Scotland. Paragraph 1.8 notes that the TA process "*is directed towards successful delivery of development-related transport measures aimed at achieving sustainable transport outcomes*." It further notes that the "*process incorporates scoping, transport assessment and implementation including travel plans and monitoring*." Paragraph 2.2 provides some guidance on the principles of the assessment and states *"the TA deals with person-trips, not car trips."*

2.1.12 TAG identifies that Journey times of up to 20-30 mins are appropriate for walking and 30-40 mins for cycling.

2.1.13 'Designing Streets' sets out Scottish Government policy to be followed in designing and approving the layout of settlements. The Scottish Government's policy emphasises that street design should meet the six qualities of successful places, as set out in Designing Places. The six qualities and key considerations are summarised as follows:

- Distinctive – street design should respond to local context to deliver places that are distinctive
- Safe and pleasant – streets should be designed to be safe and attractive place
- Easy to move around – streets should be easy to move around for all users and connect well to existing networks
- Welcoming – streets layout and detail should encourage positive interaction for all members of the community
- Adaptable – street networks should be designed to accommodate future adaptation
- Resource Efficient – street design should consider orientation, the integration of sustainable drainage and use attractive, durable materials that can be easily maintained.

2.2 Regional Policy

2.2.1 Regional Policy for the proposed development is largely defined by:

- Approved Aberdeen City & Shire Strategic Development Plan (March 2014)
- NESTRANS Regional Transport Strategy Finalised Strategy 2021 (June 2008)

2.2.2 The Approved Aberdeen City & Shire Strategic Development Plan (SDP) identifies *'four strategic growth areas'* (SGA) which will be the focus of development in the area up to 2035. The SDP notes, "*The strategic growth areas are centred on Aberdeen and the main public transport routes*." The SDP also aims to "*make the most efficient use of the transport network, reducing the need for people to travel and making sure that walking, cycling and public transport are attractive choices*."

2.2.3 The Strategic Development Plan identifies the undernoted objectives:-

- 'To be a city region which takes the lead in reducing the amount of carbon dioxide released into the air, adapts to the effects of climate change and limits the amount of non-renewable resources it uses
- To make sure that new development meets the needs of the whole community, both now and in the future, and makes the area a more attractive place for residents and business to move to.
- To make sure that all new developments contribute towards reducing the need to travel and encourage people to walk, cycle or use public transport by making these attractive choices'.

2.2.4 The SDP endorses the role of 'sustainable mixed communities' in making sure that 'new development meets the needs of the whole community, both now and in the future, and makes the area a more attractive place for residents and businesses to move to'.

2.2.5 The NESTRANS Regional Transport Strategy Finalised Strategy 2021 (RTS) identifies within its four Strategic Objectives the requirements to:

- 'to enhance and exploit the North East's competitive economic advantages, and to reduce the impacts of peripherality
- enhance choice, accessibility and safety of transport, particularly for disadvantaged and vulnerable members of society and those living in areas where transport options are limited
- support transport integration and a strong, vibrant and dynamic city centre and town centres across the north east'

2.2.6 In identifying an 'Internal Connections Strategy' the RTS sets out key initiatives aimed at improving transport infrastructure within the City and Shire. These are focused on improvements to public transport aimed at delivering economic, environmental and social inclusion benefits, with construction of the Western Peripheral Route facilitating the delivery of complementary transport measures as well as contributing *'to the* *economy and sustainable communities across the north east'.* It also sets out a detailed programme for the delivery of additional park and ride sites and improved bus services aimed at maximising the identified benefits of reducing congestion, improving air quality and broadening travel choices.

2.3 Local Policy

2.3.1 Local Policy that can be used to guide the development is largely defined by:

- The Adopted Aberdeen Local Development Plan – (January 2017)
- ALDP Planning Advice - Topic Area 5 – Transport and Accessibility (2017)
- Aberdeen Local Transport Strategy 2016 – 2021

2.3.2 The **Aberdeen Local Development Plan** (LDP) was adopted in 2017. It sets out how the council aims to work towards the vision for Aberdeen to be *a "sustainable city at the heart of a vibrant and inclusive city region"*.

2.3.3 With regards to transportation it is stated within the plan that delivery of supporting infrastructure is important in mitigating the impact of development and helping to create balanced, accessible and sustainable communities. This can be delivered either through the direct provision of the required infrastructure, or through financial contributions made by the developer.

2.3.4 The ALDP 2017 Planning Advice **Topic Area 5 – Transport and Accessibility** is Supplementary Guidance (SG). It comments on car parking standards for all types of developments. At Section 4, it notes that *'Transport Assessments can help to identify and tackle issues of concern and determine whether further infrastructure or service improvements are required to support the development proposed.'*

2.3.5 It further states that 'the TA should provide a comprehensive and consistent review of all the potential transport impacts relating to a proposed development or redevelopment and its immediate surroundings. It should consider travel-related issues such as safety, trip generation, access junction design and new infrastructure requirements'

2.3.6 The SG comments that all developments requiring a TA will also require to submit a Travel Plan in support of the development. The SG states that '*A Travel Plan is a general term for a package of measures aimed at promoting more sustainable travel* *choices to and from a site, with an emphasis on reducing reliance on the private car, thereby lessening the impact of that site on the surrounding road network'.*

2.3.7 Specific reference is made to ACC's Technical Advice Note Travel Plans: A Guide for Developers, which will contain detailed guidance on preparing Travel Plans and any associated documentation.

2.3.8 The **Local Transport Strategy** 2016 – 2021 (LTS) outlines the policies and interventions adopted by Aberdeen City Council to guide the planning and improvement of the local road network over a five year period.

2.3.9 The LTS sets out five high level aims, as follows:

- *'A transport system that enables the efficient movement of people and goods;*
- *'A safe and more secure transport system';*
- *'A cleaner, greener transport system;*
- *'An integrated, accessible and socially inclusive transport system'; and*
- *'A transport system that facilitates healthy and sustainable living'.*

2.3.10 A number of specific objectives detailed within the LTS also support the previously listed aims. Key considerations among these objectives include:

- 'minimise and improve reliability of journey times for people and goods through Aberdeen's transport networks
- improve the condition of road, footway and cycle road network
- increase the share of travel by the most sustainable modes to promote economic growth without the associated traffic growth
- continue to reduce road casualties
- reduce carbon emissions from road transport
- improve accessibility (network and cost) to jobs and services to support social inclusion,
- to facilitate and support land use development adjacent to sustainable transport corridors and nodes
- to promote healthy living by encouraging safe walking and cycling'

3 Site Accessibility

3.1 General Accessibility

3.1.1 The site is located within the Pitfodels area between Cults and Garthdee, to the south-west of the City Centre and approximately 2.5 miles from the west end of Union Street. The site is approximately 3 miles from Aberdeen Rail / Bus Stations and 8 miles to Aberdeen Dyce International Airport. The existing site is un-used farmland and access can be gained via North Deeside Road and Inchgarth Road.

3.1.2 North Deeside Road is a section of the A93 which is a major arterial route traversing east to west between Aberdeen City Centre and Peterculter before continuing westwards through Deeside to Braemar and on to Perth. The route serves a number of established settlements along its length such as Cults, Bieldside, Milltimber, Peterculter, Drumoak, Banchory, Aboyne, Ballater and Braemar.

3.1.3 North Deeside Road facilitates both commuter and leisure trips by multiple modes of travel, particularly cyclists and public transport. Users benefit from on and off road cycle facilities and from public transport services as it is a principal bus corridor.

3.1.4 Inchgarth Road links Garthdee and Westerton Road. To the east it provides access to Bridge of Dee, and to the west via Westerton Road it provides a link to North Deeside Road. Between those points Garthdee Road serves Robert Gordon University, David Lloyd, Aberdeen Snow Sports Centre and the Garthdee Retail Parks.

3.2 Walking Accessibility

3.2.1 A walking catchment of up to 2400 metres (30 minutes) is recognised in Transport Planning Guidance as being appropriate. PAN 75 also states that the quality of walking and cycling networks within 800 metres of a development can influence accessibility on foot. Figure 3-1, included in Appendix C, shows walking isochrones that represent 400, 1600 and 2400 metres walk distances from the centre of the site; these distances relate to walking times of approximately 5, 20 and 30 minutes respectively (measured along formal footway connections to and from the existing site). Residential neighbourhoods such as Cults, Seafield, Mannofield and Garthdee are within the 2400 metre walking catchment area of the site.

3.2.2 Figure 3-2 included in Appendix C, illustrates the existing bus stops on North Deeside Road, confirming that they are within 400m of the site. Further bus stops are illustrated on Garthdee Road and Auchinyell Road, which are located within 800m and 900m respectively.

3.2.3 North Deeside Road accommodates well used formal pedestrian footways along either side of its carriageway directly past the site. The Deeside Way, dissects the site and allows segregated bicycle travel in to the city centre and to areas to the west such as Cults and Peterculter.

3.2.4 North Deeside Road is well lit at regular intervals along its length, which gives an existing environment that is conducive to safe walking. Where side roads meet North Deeside Road dropped kerbing provides crossing opportunities and ensures connectivity for all pedestrians along the route.

3.2.5 Direct access will be provided from the development site onto the Deeside Way. A disabled access route is provided that routes from the North Deeside Road through the development site to Inchgarth Road. The route also connects with the Deeside Way. This is illustrated on the site Masterplan included within Appendix A.

3.2.6 Inchgarth Road provides access to Bridge of Dee via Garthdee Road and to the west via Westerton Road and Pitfodels Station Road it provides a link to North Deeside Road. Garthdee Road serves Robert Gordon University, David Lloyd, Aberdeen Snow Sports Centre and the Garthdee Retail Park which are all significant trip generating land uses.

3.2.7 Pedestrian access to the site can be gained from North Deeside Road, Inchgarth Road and the Deeside Way. Footways are provided to the east and west along both North Deeside Road and Inchgarth Road. The site is currently unmanaged and inaccessible to the general public.

3.2.8 Figure 3-1 in Appendix C also identifies the locations of local amenities and facilities within a 2400m walking distance from the site.

3.2.9 Pedestrian access to Cults Primary School and Cults Academy (the local catchment schools) would be achieved via footways on North Deeside Road or via the Deeside Way which both provide direct links to Quarry Road that leads to both schools. Opportunities to cross North Deeside Road are present at the Kirk Brae signalised junction and the Puffin crossing located just to the east of Cults Avenue. Both locations are illustrated on Figure 3-1 in Appendix C. A drop kerb crossing with traffic island is also provided just to the east of Quarry Road.

3.2.10 Pedestrian access to Airyhall Primary School, which although is not within the school catchment area of the site but is closer than Cults Primary School, would be achieved via footways on North Deeside Road which affords direct links to the provisions on Springfield Road to the east. Formal pedestrian crossing points on the route to the school include an integrated pedestrian crossing phase at the Springfield Road / Craigton Road signal controlled junction.

3.2.11 To the west, the settlement of Cults is within 20 minutes (1600m) walking distance from the development. The settlement centre is along North Deeside Road between Millden Road and School Road where retail, banking, pharmacy and restaurant facilities can be found within a reasonable walking distance from the development. There is also a post office and small retails units to the east of the Cults Hotel on North Deeside Road. The existing local facilities and amenities at Cults are also accessible by cycling and public transport facilities on North Deeside Road.

3.2.12 Robert Gordon University (RGU), a major employment and educational centre in Aberdeen, is located approximately 1600 metres from the site which is a walk of approximately 20 minutes. There is a good pedestrian link to RGU using existing footways on Inchgarth Road and Garthdee Road with further opportunities to connect via the Deeside Way with footways on to Morrisons Drive, Auchinyell Road, and Devenicks Place through to Garthdee Road at the RGU access junction. However as a retirement development it is considered that walking trips to RGU would be minimal.

3.3 Cycling Accessibility

3.3.1 Transport Planning Guidance generally identifies a 30 to 40 minutes cycle time as a maximum threshold within which cycle trips remain attractive. The site is located 2.5 miles from Aberdeen City Centre, and much of Aberdeen together with some smaller nearby settlements are within a 5 mile radius of the site, which could be reached by bicycle within 40 minutes. This makes travel by bicycle feasible to much of Aberdeen and outlying areas.

3.3.2 An Aberdeen Cycle Map has been produced by the Aberdeen Cycle Forum with support from Aberdeen City Council and shows existing cycle facilities such as cycle lanes, as well as cycle shops, places to lock bikes, recommended quiet routes and recreational routes around Aberdeen.

3.3.3 The map is produced as a leaflet opening out as a large scale map and is available in the City libraries and most public Council buildings. Alternatively it can be viewed and downloaded via the Aberdeen City Council's website at the following address:

http://www.aberdeencity.gov.uk/planning_environment/planning/transport/pla_cycle_maps.asp

3.3.4 A more localised cycle accessibility plan is included as Figure 3-3 within Appendix C and highlights the area within reasonable cycle distance and the facilities available to accommodate trips by bicycles.

3.3.5 North Deeside Road is a route that is popular with cyclists. The route benefits from the provision of on road advisory cycle lanes along much of its length on both sides of the carriageway (as shown in Photograph 3.1), and it has a relatively flat gradient. It forms a direct route to the city centre.

Photo 3.1 - North Deeside Road Cycle Provision

3.3.6 The Deeside Way offers a further off-road route between the site and the city centre and runs parallel to North Deeside Road, connecting to Duthie Park. The Deeside Way is accessible directly via the site and routes from Aberdeen City through to Ballater via Cults, Bieldside, Milltimber, Peterculter and Banchory. The Deeside Way is included on Figure 3-3 within Appendix C.

3.4 Public Transport

3.4.1 The closest bus stops, served by frequent local bus routes, are located on North Deeside Road within a 400m walking distance of the existing site. Figure 3-2 in Appendix C shows the existing bus stop locations.

3.4.2 First Service 19 (Culter to Tillydrone) and Stagecoach Services 201, 202 and 203 (Aberdeen City Centre to Braemar / Lumphanan / Banchory) are accessible from the bus stops within 400 metres walking distance from the site. These operate a combined frequency of about 7 services per hour or one service every 8 – 9 minutes.

3.4.3 Additional services can be accessed at further stops situated to the southeast of the site on Garthdee Road and Auchinyell Road, within an 800m walking distance. First Services 1 and 2 serve these stops and provide access to a wider range of destinations, including the retail parks at Garthdee. Figure 3-2 in Appendix C identifies the service routes described above which are summarised further in Table 3-2 overleaf.

3.4.4 All services identified within the vicinity of the site route to, or through, the City Centre and so offer interchange opportunities with several other bus services operating via Union Street. In addition, Union Square acts as an interchange point with bus and train services routing to local, regional and nationwide destinations.

3.4.5 Service 19 operates under the 'Platinum' brand, introducing a high quality public transport service aimed at customer comfort. Features include leather seats, TV screens which feature BBC News broadcasts and service updates, and free WiFi for internet access.

Operator	Service	Route	Weekly Service	Nearest Bus Stop
First Group	19	Culter – Tillydrone *via Bon Accord Centre and Union Street*	**Monday to Saturday** Every 12 minutes **Sunday** Every 30 minutes	A93
Stagecoach	201	Aberdeen to Braemar via *Cults, Peterculter, Drumoak, Banchory, Aboyne and Ballater*	**Monday to Saturday** Every Hour **Sunday** Every Two Hours	A93
Stagecoach	202	Aberdeen to Lumphanan via *Cults, Peterculter, Drumoak and Banchory*	**Monday to Saturday** Every Hour **Sunday** Every Two Hours	A93
Stagecoach	203	Aberdeen to Ballater via *Cults, Peterculter, Drumoak, Banchory and Aboyne*	**Monday to Saturday** Two Daily Services *(Only from Ballater and Banchory)*	A93
First Group	1	Danestone – Robert Gordon University – Danestone *via City Centre – Bridge of Dee – Auchinyell – City Centre*	**Monday to Friday** Every 15 minutes **Saturday & Sunday** Every 20 minutes	Auchinyell Road Garthdee Road
First Group	2	Ashwood – Robert Gordon University – Ashwood *via City Centre – Auchinyell – Bridge of Dee – City Centre*	**Monday to Friday** Every 15 minutes **Saturday & Sunday** Every 20 minutes	Auchinyell Road Garthdee Road

Table 3-2: Local Bus Service Information

3.5 Local Road Network

3.5.1 There is currently no vehicular access to the site, other than for farm vehicles if required. Access is taken from North Deeside Road and Inchgarth Road, however the site is currently unmanaged and inaccessible to the general public.

3.5.2 North Deeside Road is a section of the A93 which effectively runs between the City Centre and Peterculter before continuing westwards through Deeside to Braemar and on to Perth. To the east it intersects with the A90 via a signalised junction, approximately 2km from the site. The A90 is a strategic Trunk Road which routes between Fraserburgh and Dundee and is therefore the main route used by vehicles accessing Aberdeen from the South. The A90 routes north to south through Aberdeen

City, serving Bridge of Don, Ellon and Peterhead to the north and settlements such as Stonehaven, Portlethen and Montrose to the south.

3.5.3 To the east of the A90 junction, Great Western Road provides access into the City Centre and adjoins Holburn Street / Willowbank Road.

3.5.4 To the west of the site, the A93 North Deeside Road serves a number of settlements including Cults, Bieldside, Milltimber, Peterculter, Drumoak, Banchory, Aboyne, Ballater and Braemar. The route continues through Deeside to Braemar, before passing through to Blairgowrie and on to Perth.

3.5.5 Inchgarth Road links Garthdee and Westerton Road. To the east it provides access to Bridge of Dee, and to the west via Westerton Road it provides a link to North Deeside Road. Much of the traffic on Inchgarth Road routes between Bridge of Dee and large employment zones at Westhill, Kingswells and Dyce. Minor roads to the west of Aberdeen provide an alternative option for north to south traffic, avoiding the A90(T) corridor which experiences heavy congestion at peak times. Such rat running traffic links between North Deeside Road and Inchgarth Road mainly using Pitfodels Station Road and Westerton Road.

3.5.6 These existing roads are narrow and characterised by tight geometry, residential frontage, restricted pedestrian / cycle infrastructure, traffic calming measures, on street parking in some locations and narrow bridges (some controlled by shuttle traffic signals). All of these roads have poor visibility at their junctions with North Deeside Road, which introduces road safety concerns. The roads are not suitable for large vehicles, and are appropriate for access to local residences only rather than for through traffic. Effort has been made to prevent rat running traffic between North Deeside Road and Inchgarth Road by making the routes unattractive. However despite those efforts rat running still occurs inducing a higher level of traffic flow than the roads should carry.

3.5.7 The Aberdeen Western Peripheral Route (AWPR) is due to open in 2018 and will become the primary route north to south past Aberdeen, linking residential zones to employment and education facilities. North Deeside Road is one of only two non-trunk primary distributor roads that will have a junction with the committed AWPR, which will follow an alignment approximately 7.5km to the west of the site. North Deeside Road will therefore remain a primary route carrying traffic between the AWPR and the City Centre

3.5.8 One of the key benefits of the AWPR is the expected reduction of demand on use of the various minor orbital routes around western Aberdeen. Reductions in flow along these routes will provide relief to the city-bound traffic along North Deeside Road past the development, improving traffic flow operation overall.

3.5.9 Traffic modelling undertaken by SYSTRA in connection with the Aberdeen Sub Area Model 4a (ASAM4a) reports that the AWPR will lead to a reduction in daily traffic flow on the A93 North Deeside Road and Garthdee / Inchgarth Road, with the reduction varying on differing sections of the road.

3.5.10 The traffic flow changes on the A93 East of Cults in 2018 due to the AWPR opening are reported to be -22% eastbound and -32% westbound in the AM Peak, and -36% eastbound and -28% westbound in the PM peak. These changes in flow are deemed to be representative of the weekday peak hour A93 traffic impact at the site access. The reduction in two way Annual Average Daily Traffic (AADT) is reported to be 28%, which would equate to approximately 4,750 vehicles.

3.5.11 The traffic flow changes on Garthdee / Inchgarth Road in 2018 due to the AWPR opening are reported to be -34% eastbound and -27% westbound in the AM Peak, and -34% eastbound and -29% westbound in the PM peak. These changes in flow are deemed to be representative of the weekday peak hour Inchgarth Road traffic impact at the site access The reduction in two way Annual Average Daily Traffic (AADT) is reported to be 24%, which would equate to approximately 2,750 vehicles.

3.5.12 The percentage reductions obtained from the ASAM4a model are included within Appendix D.

4 Development Proposals

4.1 Overview

4.1.1 The proposed development will consist of 95 retirement units made up of a mix of appartments & townhouses. The proposal also includes a 50 bed care home and 5 small scale retail units, each approximately 100m² GFA.

4.1.2 The proposed development is illustrated by the site Masterplan included within Appendix A and is split into 7 sites as follows:

- Site 1: 27 No. 2 bedroom Apartments (6 blocks containing 4 / 5 Apartments per block)
- Site 2: 16 No. 2 bedroom Townhouses
- Site 3: 26 No. 2 bedroom Apartments (6 blocks containing 4 / 5 Apartments per block)
- Site 4: 14 No. 1 bedroom Amenity Housing
- Site 7: 12 No. 2 bedroom Apartments
- TOTAL RETIREMENT UNITS = 95
- Site 5: 50 Bedroom Care Home
- Site 6: 5 No. Mixed Retail Units @ circa 100m² / unit. Total GFA = circa 500m²

4.1.3 Access to all development would be taken from a new link road proposed between A93 North Deeside Road and Inchgarth Road. The development site Masterplan, contained in Appendix A, illustrates the location of the proposed new link road between North Deeside Road and Inchgarth Road.

4.1.4 The commercial development will be targeted specifically to the needs of the people living within the retirement community to avoid the need for them to travel longer distances to small scale retail units in Cults and Garthdee. The type of commercial development could include a pharmacy, physiotherapist, hairdresser, newsagent, coffee shop etc.

4.2 New Link Road

4.2.1 Aberdeen City Council's Strategic Infrastructure Plan (SIP) 'focuses on the development of the enabling infrastructure needed to realise the city's aspirations by creating a unified and cohesive proposal that is needed to deliver growth'. One of the Key Goals of the SIP is to provide 'Better Local Transport' which is to be achieved through the delivery of a number of Transport Projects.

4.2.2 The Aberdeen Access from the South study was concluded in 2008 and identified suitable options to improve the flow of traffic and reduce delays in the Bridge of Dee area of Aberdeen. It identifies schemes to improve journey times for all traffic and any proposals are identified as deliverable in the short, medium or long term. Included in this project is *'exploring the merits of a link road between Inchgrath Road and North Deeside Road, as part of a wider solution combined with the proposals for the Bridge of Dee'*.

4.2.3 ACC has considered the concept of an Inchgarth Link Road between the A93 and Inchgarth Road and this has gone through the Scottish Transport Appraisal Guidance (STAG) Stage 1 and Stage 2 process. The scenario with the link road included is referred to as 'Concept 6B'.

4.2.4 The initial STAG Stage 1 assessment provided the following comments in regards to Concept 6B, the Inchgarth Link Road:

"During the review of Concept 6B it was identified that there were significant engineering difficulties with progressing the link from Garthdee Road / Inchgarth Road to the A93 North Deeside Road at the preferred location, due to the vertical alignment of the link road being considerably steeper than permitted by design standards. In addition, operational testing indicated that Concept 6 would operate effectively without the requirement for the additional link. While an alternative location for the link may be feasible in engineering terms, it is considered that the link has been demonstrated not to be necessary as part of a wider solution combined with the proposals for the Bridge of Dee.

The appraisal concluded that Concept 6B be rejected for further consideration on the basis that the link has been demonstrated not to be necessary as part of the wider solution combined with the proposals for the Bridge of Dee. However, the A93/Inchgarth Road link has not been considered to the same level of details as other concepts and therefore, to enable a consistent comparison between all concepts to be fully explored, it is considered appropriate to take this concept forward for further consideration to enable it to be progressed to a comparable level of detail."

4.2.5 Whilst Concept 6B had been recommended to be rejected at STAG Stage 1, it was agreed by Aberdeen City Councillors that this option merits further consideration.

4.2.6 The STAG Stage 1 assessment concluded that the link road is not considered necessary as part of a wider solution combined with the proposals for the Bridge of Dee. It is therefore considered that the proposed new link road would not attract strategic traffic and would essentially only attract local traffic.

4.2.7 The STAG Part 2 Appraisal has now been completed and the outcomes of the appraisal have been reported to the Communities, Housing and Infrastructure Committee on the 24th January 2017. The key findings in relation to the Inchgarth Link Road are stated below:

'The link road between the A93 North Deeside Road and Inchgarth Road does not make Concept 6B materially better than Concept 6, and results in additional cost and environmental impacts. Whilst the link road has merits in its own right, and appears to have some public support it is not an essential component of works required to address capacity issues in the Bridge of Dee area.'

4.2.8 It can therefore be concluded that there is no requirement for a link road between Inchgarth Road and North Deeside Road to support the Bridge of Dee proposals. The Inchgarth Link Road does have some merits in its own right which is that it can perform more of a local function rather than being considered as a strategic route. This is expressly made clear in the STAG Appraisal.

4.2.9 The existing roads between the A93 North Deeside Road and Inchgarth Road currently carry a high level of strategic traffic that is not just local to the immediate surrounding area. However the AWPR will result in significant reductions, as would be expected, and as discussed in Section 3 of this report. There will always be an element of 'strategic traffic' that would use either a new Link Road or the existing routes. This is no different to the majority of all non-strategic routes in and around Aberdeen, as to access the main strategic routes you have to first use the more local routes.

4.2.10 It is considered that the reductions in traffic associated with the AWPR are as a result of the Strategic Movement Traffic diverting to the AWPR to access areas such as Altens and to the South of Aberdeen without the need for having to route via the Bridge Of Dee. The existing routes between the A93 North Deeside Road and

Inchgarth Road would therefore revert to providing mainly local access and carry only Strategic Movement Traffic for the immediate local area.

4.2.11 The provision of the Inchgarth Link Road would have the effect of channelling local traffic on to an appropriately designed route, relieving routes that have sub-standard geometry and poor junction visibility.

4.2.12 A new link road is proposed as part of the development of the site and would incorporate appropriate geometry, providing benefits to the local road network. It would provide an alternative route between the A93 North Deeside Road and Inchgarth Road in preference to the use of Pitfodels Station Road and Westerton Road. The link road would have the effect of channelling some existing traffic on to an appropriately designed route, relieving routes that have sub-standard geometry and poor junction visibility. The route would not be intended to encourage rat running, but would be used by traffic that is already doing so via Pitfodels Station Road and Westerton Road.

4.2.13 The proposed link road would be constructed with suitable pedestrian / cyclist infrastructure, and would allow for a pedestrian / cycle connection to The Deeside Way.

4.2.14 The addition of a new link road would also provide potential for public transport links to form between Inchgarth Road and North Deeside Road, extending to the AWPR. At present buses cannot use the minor roads to pass from the North Deeside Road to Inchgarth Road, restricting the opportunity for public transport network improvements. A new link road would allow new bus route opportunities to be explored.

4.2.15 Existing bus stops on the A93 North Deeside Road are within the recommended 400 metres of the site and are regularly served throughout the day by both First and Stagecoach services. With the potential for the new link road to accommodate buses and provide a public transport link from the A93, further bus stops could not only be located on the new link road but also within 400 metres of the site on Inchgarth Road / Garthdee Road.

4.2.16 Pedestrian footways will be provided throughout the development with direct connections formed with the existing pedestrian facilities provided at Inchgarth Road, A93 North Deeside Road and the Deeside Way. A 3m wide cycle is proposed to the west of the new link road with a 2m footway provided to the east. The disabled access route between Inchgarth Road and the A93 North Deeside Road is illustrated on the site Masterplan included within Appendix A.

4.2.17 The new Link Road would lead to particular benefits for pedestrians and cyclists who currently use routes such as Pitfodels Station Road which is narrow, has poor visibility and has sections where no footways are provided, increasing safety concerns for vulnerable road users. Removing the majority of traffic from these routes as a consequence of providing the new Link Road would represent a safety benefit to pedestrians and cyclists, and also to motorists. It is considered that the reference within the STAG Part 2 Appraisal to the *'merits of the Inchgarth Link Road and the public support'* is also in this context.

4.2.18 The engineering issues have also been addressed through the proposed new alignment which also reduces the attractiveness of the route for strategic traffic. The design is considered appropriate, not only for site constraints, but also for all-round design purposes in an urban situation and achieving traffic speed control at 30 mph, which is entirely appropriate for the location and the nature of existing and proposed developments.

4.2.19 The provision of a roundabout at the Inchgarth Road / New Link Road junction will ensure that traffic speeds are reduced on all approaches, particular on Inchgarth Road where local residents have raised concerns during public consultation events in regards to speeding traffic. At the A93 North Deeside Road / New Link Road junction a ghost island junction is proposed ensuring that right turning traffic from the A93 West will not impact upon traffic continuing east towards the centre of Aberdeen.

4.2.20 Junction analysis, discussed in Section 5, confirms that both junctions will operate within capacity in the AM and PM peak hours with the proposed development included.

4.2.21 Fairhurst Drawing No 106859 / sk1010 Rev C, included within Appendix E provides the indicative layout of the new link road. Junction visibility splays of 4.5m x 120m are provided, confirming that the appropriate visibility can be achieved at the New Link Road / A93 North Deeside Road junction.

4.3 Parking

4.3.1 The ALDP 2017 Interim Planning Advice Topic Area 5 – **Transport and Accessibility** is emerging Supplementary Guidance (SG) and comments on car parking standards for all types of developments. Table 4-1 summarises the '*Outer City Parking Standards'* applicable for the proposed development with Table 4-2 summarising the proposed parking provision for the development.

ACC Parking Standards		
Land Use	Outer City	Per
1 Bedroom Flat	1.5	Unit
2 Bedroom Flat	1.5	Unit
Up to 3 Bedroom Dwelling	2	Dwelling
Affordable	0.8	Unit
Care Home	1	Resident Staff
	1	3 Residents
Non-food Retail < 1000 sqm	1	30 m²

Table 4-1: ACC Parking Standards

Inchgarth Development		*ACC Parking Requirement*	Operational Car Parking	Visitor Car Parking	TOTAL Car Parking
Site 1					
27	2 Bed Apartments	*41*	41	5	**46**
Site 2					
16	2 Bed Townhouses	*32*	32	4	**36**
Site 3					
26	2 Bed Apartments	*39*	39	5	**44**
Site 4					
14	1 Bed Amenity	*11*	11		**14**
Site 5					
50	Bed Care home (Residents)	*17*	17	n/a	**17**
50	Bed Care home (9 Resident Staff)	*9*	9	n/a	**9**
Site 6					
500	Non-food Retail (combined m² GFA)	*17*	17		**22**
Site 7					
12	2 Bed Apartments	*18*	18	2	**20**
TOTAL PARKING		***184***	**184**	**16**	**208**

Table 4-2: Parking Provision

4.3.2 For the retirement units an element of visitor car parking is also included. The SG does not provide a parking standard for visitor parking but does state that '*visitor parking may also be required in new developments of more than 10 units'*. It is proposed to provide an additional 16 visitor car parking spaces within Sites 1, 2, 3 and 7 as indicated in Table 4-2.

4.3.3 Following additional scoping discussions with ACC Roads Development, they have confirmed that the provision of visitor parking does not usually pertain to apartments as parking for apartments is typically unallocated and therefore visitors can use any spaces that are available. ACC Roads Development have confirmed that their preference would be to keep all of the residential parking unallocated as it would permit shared use between residents and visitors, reducing the requirement for allocated parking.

4.3.4 The client would be agreeable to this or to a reduction in visitor parking if preferred by ACC. It is considered that this would be addressed by way of a planning condition, given that the current layout accommodates a level of parking that currently includes visitor spaces.

4.3.5 Parking for the retail units and the care home will include 2 disabled parking spaces at each location and be located within 45m of the main entrance.

4.3.6 Motorcycle and cycle parking will be provided in accordance with ACC guidelines, unless otherwise agreed. The exact form and location of any provision would be agreed through further detailed / MSC applications, if PPiP were to be granted.

4.4 Waste Collection Strategy

4.4.1 Within ACC's scoping response of 07/07/17, it was requested that a Waste Collection Strategy be included within the Transport Assessment. It is however considered that given that the application is for Planning Permission in Principle that the detailed Waste Collection Strategy could be a condition along with full details of the Internal Road Layout. This would also include the supporting Swept Path Analysis for a refuse vehicle and fire tender once the 'Principle' of the Link Road and Internal Road Layout has been agreed.

5 Trip Generation and Distribution

5.1 Vehicle Trip Generation

5.1.1 All trip rates and resulting trip generations for the AM and PM peak hours have been agreed with ACC through the formal scoping process.

5.1.2 The TRICS Online database has been used to derive comparable vehicle trip estimates for the proposed development. The following Multi-Modal TRICS reports are included within Appendix F and have been used to estimate the number of vehicle trips during the weekday AM and PM peak hours:

- RESIDENTIAL/N - RETIREMENT FLATS
- HEALTH/F - CARE HOME (ELDERLY RESIDENTIAL)
- RETAIL/I - SHOPPING CENTRE - LOCAL SHOPS

5.1.3 The TRICS assessment included sites in an 'EDGE OF TOWN' and 'SUB URBAN' location which are of similar size to what is proposed. Sites in the Greater London and South East regions have been excluded. Table 5-1 to Table 5-3 show the vehicle trip rates and subsequent trips associated with the proposed development.

95 Retirement Units				
Vehicles	AM Peak Hr		PM Peak Hr	
Per 1 Dwelling	08:00 - 09:00		17:00 - 18:00	
	In	Out	In	Out
Trip Rate	0.073	0.05	0.055	0.095
Trip Generation	8	5	6	10

Table 5-1: Retirement Units Vehicle Trip Generation

50 Bed Care Home				
Vehicles	AM Peak Hr		PM Peak Hr	
Per 1 Dwelling	08:00 - 09:00		17:00 - 18:00	
	In	Out	In	Out
Trip Rate	0.051	0.034	0.044	0.092
Trip Generation	3	2	2	5

Table 5-2: Care Home Vehicle Trip Generation

500 m² GFA Community Related Shops				
Vehicles	AM Peak Hr		PM Peak Hr	
Per 100 sqm GFA	08:00 - 09:00		17:00 - 18:00	
	In	Out	In	Out
Trip Rate	5.71	5.206	6.508	7.124
Trip Generation	29	26	33	36
20% Pass-by	*-6*	*-5*	*-7*	*-7*
50% Internal	*-14*	*-13*	*-16*	*-18*
New Trips	9	8	10	11

Table 5-3: Local Shops Vehicle Trip Generation

5.1.4 The community related shopping units would primarily be there to serve the development community to reduce the need to travel, particularly for those in the retirement units and care home. The types of commercial development will be targeted specifically for the needs of the people living within the retirement community and could include a pharmacy, physiotherapist, hairdresser, newsagent, coffee shop etc.

5.1.5 It is therefore considered that the majority of trips would either be generated from within the proposed development or from pass-by trips, i.e. trips already on the network. It is further considered that given the shopping opportunities provided along the A93 North Deeside Road within Cults and the larger retail parks at Garthdee, the number of new trips being generated would be minimal.

5.1.6 The total number of new trips has therefore been established assuming that 50% of trips will be generated from within the development and a further 20% will be generated from pass-by trips already on the network.

5.1.7 A 20% reduction for pass-by is considered to be robust and is consistent with specific research undertaken by experts in the Transportation Industry. MacIver (1999) identifies that a proportion of trip generation at retail sites can be classed as pass-by on less significant commuting routes, in out-of-town locations and in urban areas with smaller populations, the pass-by proportion can be assumed to be in the range of 15-25%.

5.1.8 Whilst the internal trips do not impact on the wider road network, it is considered that the majority of trips internally would be undertaken on foot and therefore the internal trips by car would in reality be less than those stated in Table 5-3.

5.1.9 Table 5-4 shows the combined vehicle trip generation for the proposed development and indicates that a total of 34 and 43 two-way vehicle trips will be generated during the weekday AM and PM peak hours respectively.

Combined Development				
Vehicles	AM Peak Hr		PM Peak Hr	
	08:00 - 09:00		17:00 - 18:00	
	In	Out	In	Out
New Trips	19	15	18	25
Two Way	34		43	

Table 5-4: Combined Development Vehicle Trip Generation

5.1.10 However in order to present a robust assessment, a sensitivity test has also been undertaken which does not include any reductions for pass-by or internal trips. Table 5-4S shows that under this scenario the combined development would result in a total of 72 and 91 two-way vehicle trips being generated during the weekday AM and PM peak hours respectively.

Combined Development				
Vehicles	AM Peak Hr		PM Peak Hr	
	08:00 - 09:00		17:00 - 18:00	
	In	Out	In	Out
New Trips	39	33	41	50
Two Way	72		91	

Table 5-4S: Combined Development Vehicle Trip Generation - Sensitivity

5.2 People Trip Assessment

5.2.1 Trip rates for all modes have also been established from the multi-modal TRICS outputs attached in Appendix F and are summarised in Table 5-5 to Table 5-7 overleaf. An assessment to determine the overall mode share based on the AM and PM Peak Hour trips has also been undertaken and is provided in Table 5-8. For the sensitivity test the overall mode share is shown in Table 5-8S.

95 Units	Residential - Retirement Units Trip Rates				Residential - Retirement Units Trip Generation			
	AM Peak Hour 08:00-09:00		PM Peak Hour 17:00-18:00		AM Peak Hour 08:00-09:00		PM Peak Hour 17:00-18:00	
	Arrival	Departure	Arrival	Departure	Arrival	Departure	Arrival	Departure
Total People	0.126	0.085	0.123	0.173	13	9	13	18
Vehicle Occupants	0.1	0.069	0.085	0.142	11	7	9	15
Car Driver	0.073	0.05	0.055	0.095	8	5	6	10
Car Passenger	0.027	0.019	0.03	0.047	3	2	3	5
Pedestrians	0.024	0.014	0.036	0.031	3	1	4	3
Cyclists	0	0	0	0	0	0	0	0
Public Transport	0.002	0.002	0.002	0	0	0	0	0

Table 5-5: Retirement Unit People Trip Assessment

50 Beds	Health - Care Home Trip Rates				Health - Care Home Trip Generation			
	AM Peak Hour 08:00-09:00		PM Peak Hour 17:00-18:00		AM Peak Hour 08:00-09:00		PM Peak Hour 17:00-18:00	
	Arrival	Departure	Arrival	Departure	Arrival	Departure	Arrival	Departure
Total People	0.092	0.078	0.071	0.176	5	4	4	9
Vehicle Occupants	0.064	0.041	0.047	0.119	3	2	2	6
Car Driver	0.051	0.034	0.044	0.092	3	2	2	5
Car Passenger	0.013	0.007	0.003	0.027	1	0	0	1
Pedestrians	0.017	0.02	0.003	0.017	1	1	0	1
Cyclists	0.003	0.003	0.014	0.01	0	0	1	1
Public Transport	0.007	0.014	0.007	0.031	0	1	0	2

Table 5-6: Care Home People Trip Assessment

500 m² GFA	Retail - Local Shops Trip Rates				Retail - Local Shops Trip Generation			
	AM Peak Hour 08:00-09:00		PM Peak Hour 17:00-18:00		AM Peak Hour 08:00-09:00		PM Peak Hour 17:00-18:00	
	Arrival	Departure	Arrival	Departure	Arrival	Departure	Arrival	Departure
Total People	15.927	15.619	13.31	15.227	**80**	**78**	**67**	**76**
Vehicle Occupants	7.222	6.41	8.705	9.783	**36**	**32**	**44**	**49**
Car Driver	5.71	5.206	6.508	7.124	**29**	**26**	**33**	**36**
	20% pass-by trips				*-6*	*-5*	*-7*	*-7*
	50% internal trips				*-14*	*-13*	*-16*	*-18*
	30% external trips				**9**	**8**	**10**	**11**
Car Passenger	1.512	1.204	2.197	2.659	**8**	**6**	**11**	**13**
Pedestrians	8.3	8.649	4.297	5.122	**42**	**43**	**21**	**26**
Cyclists	0.224	0.224	0.112	0.182	**1**	**1**	**1**	**1**
Public Transport	0.182	0.336	0.196	0.14	**1**	**2**	**1**	**1**

Table 5-7: Local Shops People Trip Assessment

Mode	AM & PM Peak Hour Mode Share					
	Arrivals		Departures		Total	
Total People	138	100%	151	100%	289	100%
Car Driver	37	27%	40	27%	77	27%
Car Passenger	25	18%	28	19%	53	18%
Pedestrians	70	51%	75	50%	146	50%
Cyclists	3	2%	3	2%	5	2%
Public Transport	3	2%	5	3%	8	3%

Table 5-8: Proposed Development Mode Share

Mode	AM & PM Peak Hour Mode Share					
	Arrivals		Departures		Total	
Total People	180	100%	194	100%	375	100%
Car Driver	79	44%	83	43%	162	43%
Car Passenger	25	14%	28	14%	53	14%
Pedestrians	70	39%	75	39%	146	39%
Cyclists	3	1%	3	1%	5	1%
Public Transport	3	2%	5	2%	8	2%

Table 5-8S: Proposed Development Mode Share - Sensitivity

5.3 Development Distribution

5.3.1 The proposed development trip distribution is shown on Network Diagram Figure A15 in Appendix G. Given that the development proposal is for a Retirement Community it is considered that the majority of any AM and PM peak hour traffic would be attracted to the east towards Aberdeen. For the purposes of the junction analysis the distribution split is 75% to the east and 25% to the west.

5.3.2 Traffic routing to the west (25%) has been assigned to the A93 North Deeside Road with traffic routing to the east (75%) split between the A93 North Deeside Road (50%) and Inchgarth Road (25%).

5.3.3 It is considered that this represents a robust distribution for the purposes of junction analysis with 75% of traffic being distributed via the A93 North Deeside Road / New Link Road junction.

5.3.4 The resulting network diagrams for the proposed development vehicle trips are included as Figures A16 and A17 in Appendix G.

6 Traffic Impact Analysis

6.1 Introduction

6.1.1 Table 5-4 confirms that the combined vehicle trip generation for the proposed development will result in a total of 34 and 43 two-way vehicle trips being generated during the weekday AM and PM peak hours respectively.

6.1.2 It is considered that this level of traffic would not have a significant impact on the local road network and traffic impact analysis would therefore not be required. Furthermore, the opening year would be post AWPR when traffic levels are predicted to reduce along the A93 North Deeside Road as discussed in Section 3 of this report.

6.1.3 However the impact of the proposed new link road does require to be assessed as it would be anticipated that the majority of existing traffic using Westerton Road and Pitfodels Station Road would divert on to the new link road.

6.2 Base Traffic Data

6.2.1 Detailed discussions were held with ACC to agree the collection of traffic survey data. However due to roadworks and road closures that have regularly been in place on and around the A93, and continue to be so mainly due to the AWPR, it was agreed with ACC that the use of historic traffic data would be more representative given that current traffic flows are likely to be skewed.

6.2.2 ACC therefore agreed to provide traffic survey data that they had previously obtained for Inchgarth Road, Westerton Road and Pitfodels Station Road between Tuesday 26th October 2010 and Wednesday 3rd November 2010. The data available was 12hr link count data and did not include any turning movements.

6.2.3 ACC also provided more up to date traffic data from 2015 from a permanent traffic counter located on the A93 North Deeside Road adjacent to the proposed development. The data provided by ACC was for September 2015 which was pre any AWPR works.

6.2.4 Fairhurst already had approved turning count data from 2011 and 2013 at the junctions of A93 North Deeside Road / Westerton Road and A93 North Deeside Road / Pitfodels Station Road respectively.

6.2.5 Network Diagram Figures A1 and A2 represent the various traffic counts during the AM and PM peak hours.

6.2.6 The 2011 and 2013 traffic turning movements compare well with the 2010 link counts obtained by ACC and have therefore been utilised for the purposes of the traffic impact assessment on the A93 North Deeside Road. The 2011 and 2013 traffic volumes on the A93 North Deeside Road are higher than the volume of traffic recorded by the permanent traffic counter in 2015. It is therefore considered that the use of the 2010, 2011 and 2013 traffic data will ensure a robust assessment is undertaken.

6.3 Committed Development

6.3.1 Although it is considered that the AM and PM peak hour traffic levels pre 2013 are higher than more recent traffic flows, committed development traffic on the A93 has still been included. The development traffic related to the committed development has previously been agreed with ACC on the A93 North Deeside Road Corridor and includes:

- Pinewood / Hazledene Development (350 Units)
- Countesswells Development (3000 Units)
- Pittengullies Brae Development (32 Units)
- Oldfold Farm Development (550 Units)

6.3.2 The component peak hour traffic flows for the committed developments have been extracted from their respective Transport Assessment reports

6.3.3 Network diagram Figures A3 to A6 included within Appendix G represents the committed development traffic flows with the 'Base + Committed' traffic network diagrams shown by Figure A7 and Figure A8.

6.4 AWPR Reductions

6.4.1 The opening year of the development will be post completion of the AWPR and therefore the AWPR percentage reductions discussed above have been applied.

6.4.2 Network diagram Figure A9 and Figure A10 included within Appendix G shows the percentage reductions established from the ASAM 4a Traffic Data. The percentage reductions have been applied to the Base plus Committed Development traffic flows to provide a post AWPR traffic network. This is shown on network diagrams Figure A11 and Figure A12 within Appendix G.

6.5 New Link Road

6.5.1 As discussed previously, with the new link road in place it is expected that traffic from Westerton Road and Pitfodels Station Road will re-distribute to the new link road. Network diagrams Figure A13 and Figure A14 included within Appendix G represents the re-distribution of vehicle movements.

6.5.2 Network diagram Figure A18 and Figure A19 included within Appendix G represents the Base plus development traffic with the link road in place. For the sensitivity analysis that considers no reductions for pass-by or linked trips associated with the retail trips, Network diagrams Figure A20 to Figure A23 are included.

6.6 Traffic Impact Analysis

6.6.1 As agreed through scoping with ACC, the new junctions proposed with the Link Road have been assessed which includes:

- A93 North Deeside Road / New Link Road Ghost Island Junction
- Inchgarth Road / New Link Road 3-arm Roundabout Junction

6.6.2 TRL's software package Junctions 8 has been used to assess the operation of the A93 / New Link Road junction using the PICADY module. To assess the operation of the Inchgarth Road / New Link Road 3-arm roundabout junction the ARCADY module has been used.

6.6.3 As discussed above, a sensitivity scenario has been included which does not consider any reductions of the retail trips as a result of internal / pass-by trips. The traffic impact has therefore been assessed under the following scenarios for the new junctions:

- Base plus Development
- Base plus Development (Sensitivity)

6.6.4 Table 6-1 to Table 6-4 overleaf summarise the results of the junction modelling for the AM and PM peak hours with junction modelling output reports included in Appendix H.

AM Peak Hour	Base + Development			Base + Development (Sensitivity)		
Arm	RFC (%)	Queue (PCU)	Delay (secs)	RFC (%)	Queue (PCU)	Delay (secs)
Inchgarth Rd East	16%	0	4	16%	0	4
Inchgarth Rd West	15%	0	5	15%	0	5
New Link Road	47%	1	6	47%	1	6

Table 6-1: Inchgarth Road / New Link Road 3-arm roundabout junction Analysis Weekday AM Peak Hour

PM Peak Hour	Base + Development			Base + Development (Sensitivity)		
Arm	RFC (%)	Queue (PCU)	Delay (secs)	RFC (%)	Queue (PCU)	Delay (secs)
Inchgarth Rd East	44%	1	7	45%	1	7
Inchgarth Rd West	8%	0	5	8%	0	5
New Link Road	28%	0	5	29%	0	5

Table 6-2: Inchgarth Road / New Link Road 3-arm roundabout junction Analysis Weekday PM Peak Hour

AM Peak Hour	Base + Development			Base + Development (Sensitivity)		
Arm	RFC (%)	Queue (PCU)	Delay (secs)	RFC (%)	Queue (PCU)	Delay (secs)
New Link Road (to A93 West)	26%	0	9	28%	0	9
New Link Road (to A93 East)	24%	0	25	30%	0	27
A93 West	77%	3	24	78%	3	25

Table 6-3: A93 / New Link Road Junction Analysis Weekday AM Peak Hour

PM Peak Hour	Base + Development			Base + Development (Sensitivity)		
Arm	RFC (%)	Queue (PCU)	Delay (secs)	RFC (%)	Queue (PCU)	Delay (secs)
New Link Road (to A93 West)	61%	2	17	64%	2	19
New Link Road (to A93 East)	23%	0	22	31%	0	27
A93 West	41%	1	11	42%	1	12

Table 6-4: A93 / New Link Road Junction Analysis Weekday PM Peak Hour

6.6.5 The ARCADY results in Table 6-1 and Table 6-2 show that with the development included the proposed Inchgarth Road / New Link Road 3-arm roundabout junction operates within capacity under all scenarios in the AM and PM peak hours and will therefore operate with minimal levels of queuing and delay with the proposed development included.

6.6.6 The PICADY results in Table 6-3 and Table 6-4 show that the proposed A93 / New Link Road Ghost Island Junction operates within capacity under all scenarios in the AM and PM peak hours and will therefore operate with minimal delay and queuing under all scenarios in the AM and PM peak hours.

6.6.7 The analysis confirms that with the new link road and re-distributed vehicle trips from Westerton Road and Pitfodels Station Road included, the proposed development can be accommodated on the road network with both proposed new link road junctions operating within capacity.

7 Residential Travel Plan Framework

7.1 Introduction

7.1.1 Paragraph 279 of SPP comments that *'Development plans should indicate when a travel plan will be required to accompany a proposal for a development which will generate significant travel'*. The Aberdeen LDP Supplementary Guidance 'Transport and Accessibility' confirms that a Travel Plan is required for residential development proposals in excess of 100 units.

7.1.2 Travel Plans for Residential Developments require to be tailored to the needs, location and scale of the development. In line with best practice, it is envisaged that the practical implementation of the Travel Plan would require the preparation of a Residential Travel Pack.

7.2 Residential Travel Pack Aims and Objectives

7.2.1 The site is suitably located to take advantage of the existing sustainable transport infrastructure on the adjacent road network. The aim of the emerging Residential Travel Pack would be to promote and encourage use of more sustainable travel options rather than single occupier car journeys.

7.2.2 The Residential Travel Pack would need to be reviewed, monitored and updated regularly. Objectives of the emerging Residential Travel Pack would be to address the following;

- *Increase awareness among residents of travel choices and implications*
- *Facilitate and promote more active forms of travel*
- *Increase the share of residents travelling by walking, cycling or public transport*
- *Promote the personal health benefits of active travel*
- *Reduce single car occupancy trips by promoting car sharing and use of the Car Club.*

7.3 Framework for the preparation of the Residential Travel Pack

7.3.1 The Residential Travel Pack would be completed and presented to ACC for approval prior to occupation of the first unit. It is the intention of the developer to liaise with the Council during the development of the Residential Travel Pack. The undernoted general headings would form the framework for developing the Residential Travel Pack.

- *Walking and cycling maps*
- *Introduction*
- *Walking*
- *Cycling*

- *Public Transport (bus, taxi and trains)*
- *Car sharing / Car Club scheme information including details of Aberdeen City Car Club Scheme 'Co-wheels' and Getabout – free online car sharing scheme.*
- *General travel information and carbon calculator*

7.3.2 All sections would include details such as:

- *Short introduction to the mode describing links to the surrounding network*
- *Benefits of sustainable travel by each mode relevant to the individual (such as health and saving money / time) rather than improvements for society / environment as a whole*
- *For walking, cycling and bus a table of distances and time taken to reach local facilities. Reference would also be made to any costs / change required for bus travel*
- *Relevant website / contacts including local groups such as – www.walkit.com/aberdeen, www.cycle-streets.net, www.aberdeencycleforum.org.uk (free adult cycle training), www.firstgroup.com/ukbus/aberdeen, www.stagecoachbus.com/aberdeen, www.aberdeentaxinumbers.co.uk, www.getbout.liftshare.com, www.co-wheels.org.uk and www.travelinescotland.com*

7.3.3 The Travel Pack will contain information on the health benefits of active travel, directing residents to websites such as www.sustrans.org.uk and www.healthyliving.gov.uk. Tips for active travel include:

- *Think "healthy living" before you travel – every time you use your legs it does you good*
- *If your trip is less than a mile or so, try walking – or walk some of the way if it is too far*
- *Start your active lifestyle gently, by walking part of the way, or taking a bus home*
- *If you are thinking about cycling, try out your route at the weekend first*
- *Try walking or cycling to work every day and see how much fitter you feel*

7.3.4 The Travel Pack should also contain information on the environmental damage of CO_2 emissions resulting from car use. Hints for reducing environmental damage created by car use could include:

- *Try to avoid using a car for short journeys – use public transport, cycle or walk*
- *Plan ahead – choose uncongested routes, combine trips or car share*
- *Cold starts – drive away as soon as possible after starting*
- *Drive smoothly and efficiently – harsh acceleration and heavy braking have a very significant effect on fuel consumption, driving more smoothly saves fuel*
- *Slow down – driving at high speeds significantly increases fuel consumption*
- *Use higher gears as soon as traffic conditions allow*

- *Switch off – sitting stationary is zero miles per gallon, switch off the engine whenever it is safe to do so*
- *Lose weight – don't carry unnecessary weight, remove roof racks when not in use.*

8 Employer Travel Plan Framework

8.1 Policy Context

8.1.1 Transport and Planning policy at national and local level aims to encourage development in a sustainable fashion in order to minimise potential transport impacts. Travel Plans may be used as a mechanism to help to secure the objective to maximise alternative travel choices.

8.1.2 PAN 75 indicates that *'Travel Plans are documents that set out a package of positive and complementary measures, for the overall delivery of more sustainable travel patterns for a specific development.'* It further states that *'their ability and success in influencing travel patterns is dependent upon the commitment of the developer and occupier of a development.'*

8.1.3 PAN 75 further indicates that for detailed applications '*the travel plan should incorporate a variety of measures and targets to encourage sustainable travel, such as mode share targets (MSTs), an implementation time scale and agreed monitoring and review process*'

8.1.4 With regard to speculative developments, PAN 75 advises that *'Where the occupier is speculative or unknown the planning conditions which would be associated with the travel plan should include physical/infrastructure facilities to encourage walking and cycling, for example adequate storage provision, showering facilities, links to wider walking and cycling networks and possible provision of additional public transport facilities. The plan at this stage should concentrate on output measures e.g. the number of trips by different modes that can be accommodated on the network. Any outline permission given should pass on the commitment to develop a full travel plan to the end user and enable future development and modification of the travel plan*'.

8.1.5 The LDP Supplementary Guidance 'Transport and Accessibility' advocates that '*a Travel Plan is a general term for a package of measures aimed at promoting more sustainable travel choices to and from a site, with an emphasis on reducing reliance on the private car, thereby lessening the impact of that site on the surrounding road network.'*

8.1.6 The Supplementary Guidance refers to the Council's Technical Advice Note *Travel Plans: A Guide for Developers* and that this will contain detailed guidance on preparing a Travel Plan and associated documentation. This is however currently not available but would be referred to if it is available during the development of any final Travel Plan

8.1.7 The 'Travel Plan Resources Pack for Employers' describes a Travel Plan as a *'package of measures aimed at promoting sustainable travel within an organisation'.* This package of measures is not considered as a "one-off" provision by a developer or organisation but a process of delivery from the setting of policy, the creation of the supporting networks through to application on the ground and monitoring. All of these elements require to be linked through the partnership working of the various stakeholders within the travel plan process.

8.2 Travel Plan Aims

8.2.1 The proposed retail development has no specific end user identified. Therefore it would not be possible to fully develop any Travel Plan around the particular travel demands and needs of a specified occupier. The Travel Plan Framework will act as a guide and provide the basis for the preparation of a full Travel Plan which meets the operational needs of the prospective end user.

8.2.2 This TP Framework sets out the measures to be carried out by the developer to make the development accessible by sustainable travel modes and minimise car usage to the development. It also identifies potential measures that could be implemented by the prospective end user in order to develop a full Travel Plan which aims to promote and encourage travel by sustainable and environmentally friendly modes to their hotel.

8.2.3 A Travel Plan would primarily be aimed at encouraging a change in the way that employees travel to work, as Travel Planning measures can have greatest effect on those who make regular trips to a building, and employers can impart greatest influence on employees. Nonetheless, Travel Planning measures can also be aimed at influencing the way that infrequent building users travel to the site, such as visitors and customers.

8.3 Objectives

8.3.1 It is envisaged that the aspirations of the emerging Travel Plan will be specific to the business needs of the end user. This could include the following objectives:

- To minimise the proportion of trips made to the development by car, particularly single occupancy car trips
- To promote the health and environmental benefits associated with travel by sustainable transport modes
- To facilitate and promote more active forms of travel
- Increase the share of staff travelling to work by walking, cycling or public transport
- Reduce single occupant car journeys to work
- To ensure the Travel Plan is reviewed, monitored and updated regularly

8.4 Action Plan

8.4.1 A successful delivery and implementation of a Travel Plan can improve; accessibility by sustainable modes, positively affect modal choice for journeys to work and reduce congestion on the transport network. The most important measure of a Travel Plan's success is its effect on employee travel behaviour to, at and from work through car use reduction while also supporting more sustainable forms of travel and where possible reducing the overall need to travel.

8.4.2 The following sets out the Travel Plan Framework implementation strategy:

- The Travel Plan Framework agreed with Aberdeen City Council at the planning stage

- Implementation of any site specific measures to promote sustainable travel to the development. Specific measures to be implemented at the outset are detailed in Section 3 and 4.
- The identified end user of the development will be required to appoint a Travel Plan Coordinator and prepare a full Travel Plan specific to their business aimed at reducing car trips by employees and guests
- Implementation of further measures to promote sustainable travel post occupation and development of the initial Travel Plan.
- Establish a base line travel pattern to the development through a programme of Staff Travel Surveys to be undertaken annually. In addition, a Staff Travel Survey will also be undertaken within 3 months post occupation.
- Set clear modal shift targets with specific dates for their achievement
- Monitor the progress of the Travel Plan at regular intervals.

8.5 Potential End User Travel Plan Measures

8.5.1 The key to successful implementation of a Travel Plan is the involvement of senior management and staff at all stages of the implementation process. There is a need for communication in order to maximise the potential benefits of implementing Travel Plan measures.

8.5.2 As intimated previously, the identified end-user will be responsible for appointing a Travel Plan Coordinator (TPC). The TPC could be a staff member who will be the main point of contact for all Travel Plan related issues. The TPC will be required to be a competent person who would be provided with sufficient resources to fully implement agreed Travel Plan measures. Once appointed, the name and contact details of the Travel Plan Coordinator will be provided to the Council.

8.6 Appointment of a Travel Plan Co-ordinator

8.6.1 The Travel Plan Coordinator will be responsible for:

- Implementation of the Travel Plan, including preparation of initial travel surveys and agreement of travel mode share targets.
- Being the point of contact for travel information, including preparation and distribution of up to date travel information packs for staff and customers on a regular basis.
- Liaising with public transport operators, planning / highway authorities and other stakeholders to explore the potential for sustainable travel improvements.
- Potential liaison with other local employers to explore opportunities for co-operation in achieving the aims of the Travel Plan.
- Promoting and marketing the Travel Plan, including provision of up to date information on regional and national initiatives / promotional events, e.g. National Bike Week.
- Monitoring progress of the Travel Plan through coordinating repeat surveys and using the findings to develop new measures as necessary to encourage sustainable travel.

- Regularly reviewing the aims / objectives of the Travel Plan along with implementing any new Travel Plan measures and setting revised travel targets.
- Facilitating and arranging cycle user groups forums / meetings.
- Promoting car sharing.
- Monitoring use of the development car park.
- Annual review of the progress of the Travel Plan with the Council.

8.7 Measures to Encourage Walking and Cycling

8.7.1 Pedestrian and cycle accessibility throughout the development and connections to the wider network will be enhanced with the provision of the new link road and direct connection to/from The Deeside Way. .

8.7.2 A plan of safe pedestrian and cycle routes would be made available to all staff. The plan would highlight established routes between the development and other local facilities and varies nearby destinations, and provide an indication of distances and travel times to each facility.

8.7.3 The retail element of the development proposal will be catered towards the needs of those living in the retirement community. Walking and cycling between the two development elements is expected to be high given the proximity

8.7.4 Secure cycle parking would be provided for staff and customers. The provision of shower and locker facilities on site could be promoted as a trip end facility for staff choosing to commute by active travel modes.

8.8 Measures to Encourage Use of Public Transport

8.8.1 Being located adjacent to the high quality public transport route on the A93 will provide the very best opportunity to encourage the use of public transport for staff, visitors and customers. Plans of public transport routes and timetables would be made available to all future staff and displayed for customers and visitors who may require it. This would provide information on services suitable for specific trip making and provide details on the location of relevant bus stops, as well as providing an indication of travel time and distance to their nearest stop.

8.9 Measures to Raise Awareness

8.9.1 The following measures could be adopted to raise the travel awareness of all existing and future staff at the development:

- All future staff would be provided with travel information packs, containing information on walking, cycling and public transport services and a copy of the site specific Travel Plan where appropriate.
- The designated Travel Plan Coordinator would undertake an induction process with all future staff to promote sustainable travel to work.

8.10 Monitoring and Review

Monitoring

8.10.1 The TPC will review the effects of the various initiatives with Aberdeen City Council on an annual basis. The purpose of this review is to:

- Provide a running assessment of how staff travel to the site
- Develop revised targets for staff travel
- Review and alteration of initiatives if necessary
- Develop new initiatives to encourage reduced use of the private car

8.10.2 Annual surveys would be used for monitoring purposes. This will identify changes in modal split over a defined period. If the surveys reveal that the targeted changes have not been met, areas where improvements are required would be identified and measures implemented in an attempt to reverse the trend. This process would be undertaken in full consultation with Aberdeen City Council.

Targets

8.10.3 Mode share targets should be set following the completion of the initial staff travel surveys. It is anticipated that these surveys would be undertaken within 3 months post occupation of the development. However, it is also anticipated that some of the travel planning measures and initiatives would be in place prior to the surveys being undertaken in order to promote sustainable travel to employees within the development.

Review

8.10.4 The first review should take place one year after the implementation of the Travel Plan and annually for the following three years. The review should be undertaken in consultation with Aberdeen City Council.

9 Summary and Conclusion

9.1 Introduction

9.1.1 This Transport Assessment (TA) has been prepared on behalf of Cults Property Development Company Ltd. to support a planning application in principle for the development of a retirement community.

9.1.2 The proposed development site is located in the Pitfodels area to the west of Aberdeen City Road just to the east of the residential area of Cults. The site is bound to the north by North Deeside Road (A93) and to the south by Inchgarth Road.

9.1.3 National Cycle Network Route 195 'The Deeside Way', dissects the site and allows segregated bicycle travel, not only in to the city centre, but to the west to Peterculter.

9.1.4 In advance of this report being prepared a scoping note has been submitted to and agreed with Aberdeen City Council's Road Development Service (ACC).

9.1.5 Relevant Transport Planning Policy has been reviewed and discussed within the TA confirming that the development proposal accords with policy and guidance at a Local, Regional and National level.

9.2 Accessibility

9.2.1 The site is located approximately 2.5 miles from the west end of Union Street, approximately 3 miles from Aberdeen Rail / Bus Stations and 8 miles to Aberdeen Dyce International Airport. The existing site is un-used farmland and access can be gained via North Deeside Road and Inchgarth Road.

9.2.2 North Deeside Road facilitates both commuter and leisure trips by multiple modes of travel, particularly cyclists and public transport. Users benefit from on / off road cycle facilities and public transport services as it is a principal bus corridor.

9.2.3 Inchgarth Road links Garthdee and Westerton Road. To the east it provides access to Robert Gordon University (RGU), David Lloyd, the Garthdee Retail Parks and Bridge of Dee.

9.2.4 Residential neighbourhoods such as Cults, Seafield, Mannofield and Garthdee are within the 2400 metre walking catchment area of the site. Direct access will be provided from the development site onto the Deeside Way facilitating walking and cycling trips. Further pedestrian and cycle access to the site can be gained from North Deeside Road and Inchgarth Road.

9.2.5 A number of local facilities are included within a 2400m walking distance from the site including the Cults retail area, Tesco, Asda, Garthdee retail park, RGU and David Lloyd. Although not entirely relevant to a retirement community, the site is within acceptable walking distances to Primary and Secondary Schools. However, the schools do often host community meetings and events which would be of relevance.

9.2.6 North Deeside Road is a route that is popular with cyclists. The route benefits from the provision of on road advisory cycle lanes along much of its length. The Deeside Way offers a further off-road route between the site and the city centre and runs parallel to North Deeside Road, connecting to Duthie Park. The Deeside Way is accessible directly via the site and routes from Aberdeen City through to Ballater via Cults, Bieldside, Milltimber, Peterculter and Banchory.

9.2.7 The closest bus stops, served by frequent local bus routes, are located on North Deeside Road within a 400m walking distance of the existing site. First Service 19 and Stagecoach Services 201, 202 and 203 operate a combined frequency of about 7 services per hour or one service every 8 – 9 minutes. Additional services can be accessed at further stops situated on Garthdee Road and Auchinyell Road, within an 800m walking distance.

9.2.8 All bus services identified within the vicinity of the site route to, or through, the City Centre and so offer interchange opportunities with other bus services. In addition, Union Square acts as an interchange point with bus and train services routing to local, regional and nationwide destinations.

9.2.9 Pitfodels Station Road and Westerton Road provide the main links between North Deeside Road and Inchgarth Road and as such currently accommodate both local and rat-running strategic traffic. These existing roads are narrow and characterised by tight geometry, residential frontage, restricted pedestrian / cycle infrastructure, traffic calming measures, on street parking in some locations and narrow bridges. Existing visibility is poor at their junctions with North Deeside Road.

9.2.10 Whilst the AWPR will assist in removing many of these strategic movement vehicle trips, Pitfodels Station Road and Westerton Road are generally not suitable for large vehicles, and are more appropriate for access to local residences rather than for through traffic.

9.2.11 As part of the development proposals, a proposed new link road between Inchgarth Road and North Deeside Road would accommodate re-distributed vehicle movements from Pitfodels Station Road and Westerton Road allowing them to provide local access only. This would create a much safer environment for all road users and the local residents.

9.3 Development Proposals

9.3.1 The proposed development will consist of 95 retirement units made up of a mix of apartments & townhouses. The proposal also includes a 50 bed care home and 5 small scale retail units, each approximately 100m² GFA. Access to all development would be taken from the new link road proposed between North Deeside Road and Inchgarth Road.

9.3.2 The commercial development will be targeted specifically to the needs of the people living within the retirement community to avoid the need for them to travel longer distances to small scale retail units in Cults and Garthdee.

9.4 New Link Road

9.4.1 A new link road is proposed as part of the development of the site which would incorporate appropriate geometry and offer benefits to the local road network. It would provide an alternative route between North Deeside Road and Inchgarth Road in preference to the use of Pitfodels Station Road and Westerton Road.

9.4.2 The new link road would have the effect of channelling existing traffic on to an appropriately designed route, relieving routes that have sub-standard geometry and poor junction visibility. The route would not be intended to encourage rat running, but would be used by traffic that is already doing so via Pitfodels Station Road and Westerton Road.

9.4.3 The new link road would lead to particular benefits for pedestrians and cyclists who currently use routes such as Pitfodels Station Road which is narrow, has poor visibility and has sections where no footways are provided, increasing safety concerns for vulnerable road users. Removing traffic from these routes as a consequence of providing the new Link Road would represent a safety benefit to pedestrians and cyclists, and also to motorists.

9.4.4 The new link road would provide potential for public transport links to form between Inchgarth Road and North Deeside Road, extending to the AWPR and also allow new bus route opportunities to be explored.

9.5 Traffic Impact

9.5.1 All trip rates and resulting trip generations for the AM and PM peak hours have been agreed with ACC through the formal scoping process. This includes an assessment of People Trips in accordance with Transport Assessment guidance.

9.5.2 Vehicle trip generation for the small commercial development with and without the allowance of pass-by and internal trips has been considered so that a robust assessment could be considered. Whilst this will produce a robust assessment it is considered to be unrealistic as the commercial development is likely to be centred on the needs of the residents of the proposed retirement development and therefore most of the trips would be expected to come from within the overall development with many being on-foot.

9.5.3 The overall combined vehicle trip generation for the proposed development will result in a total of only 34 and 43 two-way vehicle trips being generated during the weekday AM and PM peak hours respectively. This increases to 72 and 91 two-way vehicle trips when considering no reductions in the number of commercial trips as a result of pass-by and internal trips.

9.5.4 It is considered that this level of traffic would not have a significant impact on the local road network and traffic impact analysis would normally not be required, however the impact of the proposed new link road does require to be assessed as it would be anticipated that the majority of existing traffic using Westerton Road and Pitfodels Station Road would divert on to the proposed new link road.

9.5.5 The traffic impact analysis confirms that with the new link road and re-distributed vehicle trips from Westerton Road and Pitfodels Station Road included, the proposed development (with and without commercial pass-by and linked trip reductions) can be accommodated on the road network with both proposed new link road junctions operating within capacity in the AM and PM peak hours.

9.6 Conclusion

9.6.1 The site is highly accessible by walking, cycling and public transport, as well as for vehicles to/from the adjacent local road network. Measures within the proposed development would effectively promote sustainable travel by residents, staff, customers and visitors.

9.6.2 The proposed new link road will provide relieve to existing routes that have sub-standard geometry and poor junction visibility whilst improving safety for pedestrians, cyclists and motorists.

9.6.3 Residential and Employer Travel Plan Frameworks have been included as part of this report which outlines the key objectives, monitoring and implementation methods that can be utilised to develop a Residential Travel Pack which will provide targeted information for new residents and a full Travel Plan which meets the operational needs of the prospective retailer.

9.6.4 It is concluded that the site's location and characteristics meet with both local, regional and national policies on sustainable development, and no specific traffic or transport impacts will arise from the development.

Appendix A

Site Masterplan

Rev :	Date :	Comments :

2

COMMUNITY RETIREMENT VILLAGE - NORTH DEESIDE ROAD / INCHGARTH ROAD, ABERDEEN

1	6 NO. HOUSES - CONTAINING 4 / 5 APARTMENTS PER HOUSE [27 NO.]	[46 Spaces - 23 Surface + 23 Undercroft]
2	16 NO. 2 BEDROOM SEMI-DETACHED APARTMENTS	[36 Spaces - All Surface]
3	6 NO. HOUSES - CONTAINING 4 / 5 APARTMENTS PER HOUSE [26 NO.]	[44 Spaces - All Surface]
4	50 BEDROOM CARE HOME	[26 Spaces - All Surface]
5	5 NO. RETAIL UNITS [MIXED]	[22 Spaces - All Surface]
6	14 NO. AMENITY HOUSING	[14 Spaces - All Surface]
7	12 NO. 2 BEDROOM APARTMENTS	[20 Spaces - All Surface]
8	ARCHITECTURAL FEATURE INCLUDING SUDS POND	

- INDICATIVE SUDS LOCATION
- EXISTING SURVEYED TREES TO BE RETAINED
- INDICATIVE NEW TREE PLANTING
- DISABLED ACCESS FROM INCHGARTH ROAD TO NORTH DEESIDE ROAD
- 3.0M WIDE CYCLE PATH

INDICATIVE OVERALL MASTERPLAN

FITZGERALD ASSOCIATES

ARCHITECTURAL + INTERIOR DESIGNERS
53 ALBERT STREET ABERDEEN AB25 1XT
+44 (0)1224 633375
info@fitzgeraldassociates.co.uk

CIAT Registered Practice

Client :	Cults Development Co. Ltd	
Project :	New Development North Deeside Road / Inchgarth Road	
Description :	Planning Details Overall Masterplan	
Drawn By : Ewan Campbell	Scale : A1=1-1000	Date : June 2017
Project No : 3847	Drawing No : 102	Rev : C

Appendix B

Scoping Correspondence

Mark Peters

From:	Scott Lynch <SLynch@aberdeencity.gov.uk>
Sent:	07 July 2017 14:41
To:	Mark Peters
Cc:	Lucy Greene
Subject:	RE: 106859: The Inchgarth Retirement Community, Site at North Deeside Road/Inchgarth Road, Aberdeen - Transportation Scoping

Mark,

Thanks for the response!

See my comments below, in orange.

If you have any further comments, let me know.

Have a nice weekend,

Scott

From: Mark Peters [mailto:mark.peters@fairhurst.co.uk]
Sent: 05 July 2017 15:51
To: Scott Lynch
Subject: RE: 106859: The Inchgarth Retirement Community, Site at North Deeside Road/Inchgarth Road, Aberdeen - Transportation Scoping

Scott

My response to your bullet points:

- I had assumed that as you had not rebutted my explanation in relation to internal trips that this had essentially been agreed – particularly given that it is based on Industry research and standard practice. Not all trips are always new trips on the network and given the development proposal clearly there will be internal trips, which in reality will mainly be undertaken by foot. However as I mentioned previously we will look at the impact of all trips being new to the network if it provides a level of comfort that you require in this instance. I would note however that this will provide a very worst case (and unlikely) scenario.

  As the TRICS used are for multi modal vehicle trips, it still seems high to me that, at peak times, 50% of the people going to the shops would be residents *driving* there. If this is the busiest time period and the residents are retired I imagine they'd either go earlier/later to avoid the rush, or just walk to the shops if they're capable of doing so. As you've said, you're still carrying out the sensitivity of all trips being new to the network, so this is a moot point at this stage.

- There have been discussions with Colin Burnett previously in regards to the re-alignment of the road. The roundabout is proposed and the traffic impact analysis will further support the proposal. The requirements for the junction type with the A93 has been informed by those earlier discussions with comments in respect of road alignment and gradients taken into consideration as part of the current proposals.

  Noted that you've discussed the link road realignment with Colin. I'm working from home today, but I'll check with Jane when I'm next in as she will most probably be privy to Colin's thoughts. I also note that you are proposing to provide a roundabout to calm the traffic on Inchgarth Road / the surrounding area. If the proposed roundabout is in accordance with the masterplan we will agree the principle, however detailed design checks will still be carried out. If the roundabout is outwith what is proposed in the master plan we would like justification about the provision of the roundabout before checking the detailed design / modelling.

- I would think it likely that parking would be a mix of allocated and unallocated. The flats would result in the need for 1.5 spaces each so obviously only 1 space could officially be allocated to each flat. There is still surely a requirement to consider visitor parking for flats in the same way there is a requirement for houses as both will generate visitors and the parking needs should be considered. Can you therefore confirm the following:

  - If the parking spaces are unallocated then there is no need to provide visitor car parking spaces for any of the residential development proposed.
  - If parking is to be allocated then the proposed visitor parking is acceptable.

  Our preference would be to keep all of the residential parking unallocated as it would permit shared use between residents and visitors, reducing the requirement for allocated parking. I've spoken with Lucy Greene and she has confirmed that this would also be planning's preference – for shared use parking and not to provide specific visitor parking.

My very first email within the chain below includes the following:

In accordance with the Scottish Government document 'Transport Assessment Guidance', it is considered that the proposal does not exceed the threshold whereby a full Transport Assessment would be required. Trip Generation of the proposed development, particularly during the AM and PM peak hours would be low and we therefore we propose to undertake a Transport Statement that will consider the following matters;

- *Site access requirements*
- *Transport planning policy*
- *Local development context*
- *Surrounding transport infrastructure*
- *Sustainable transport opportunities*
- *Trip generation by all modes of transport*
- *Parking requirements*
- *Swept Path Analysis for service vehicles*
- *Travel Plan Framework*

This is essentially a Transport Assessment without any traffic impact analysis as a result of the low development trips.

On the basis that we are now including Traffic Impact Analysis and your email of 28th November (also included below) confirms that you were previously happy with the proposed approach, I trust that this is still acceptable. The TA will therefore comment on the following:

- *Site access requirements*
- *Transport planning policy*
- *Local development context*
- *Surrounding transport infrastructure*
- *Sustainable transport opportunities*
- *Trip generation by all modes of transport – Trip distribution and assignment also required*
- *Traffic Impact Analysis*
- *Parking requirements*
- *Swept Path Analysis for service vehicles*
- *Travel Plan Framework*
- *Network diagram showing traffic flows on the network*
- *Waste collection strategy also required*

If you could confirm the visitor parking requirements that would be appreciated and we will amend accordingly, if required. However perhaps worth discussing with Planning as previous applications for flats have resulted in the need to provide visitor parking!

I am sure you can appreciate the importance of reaching agreement on the visitor parking requirement as there are potential changes required to the Masterplan which may result in changes to the overall layout. I would not want to be suggesting removing car parking and having the Masterplan re-done for us then to be told at a later date that we need to provide visitor parking. Just to clarify, the applicant is content with either allocated or unallocated parking.

Thanks and best regards

Mark Peters, IEng BSc (Hons) MCIHT
Principal Engineer - Transportation

Fairhurst
engineering solutions, delivering results

Britannia House,
Endeavour Drive,
Arnhall Business Park,
Westhill,
AB32 6UF

Tel No (Direct Dial): 01224 047356
Email: mark.peters@fairhurst.co.uk
Website: http://www.fairhurst.co.uk

From: Scott Lynch [mailto:SLynch@aberdeencity.gov.uk]
Sent: 05 July 2017 12:53
To: Mark Peters
Subject: RE: 106859: The Inchgarth Retirement Community, Site at North Deeside Road/Inchgarth Road, Aberdeen - Transportation Scoping

Hi Mark,

Thanks for the email.

I just had a couple of questions/comments:

- We previously did not agree on the internal trip rate, but I note that you say as a sensitivity you will consider a no-reduction case, which is agreeable;
- You mention that the new link road has been discussed with roads – who, specifically, did you discuss this with, and what was agreed? For example, was the principle of the roundabout agreed?
- Regarding the provision of visitor parking, the quote you provide from the SG refers specifically to residential dwellings, it does not pertain to flats. The reason it doesn't apply to flats is that their parking is typically unallocated, so visitors can use any spaces that are available. Can you confirm that it is your intention for the spaces to be un-allocated?
  Following the same train of thought, the townhouses you are proposing don't have individual driveways, but instead have shared parking areas - like the flats. I would therefore argue that visitor parking would also be unnecessary here.

Aside from the above, I'm happy with the previously agreed approach of the TA (using existing traffic data as opposed to doing counts, for the reasons you've stated below). However, regarding the exact content of the TA, I'm scrolling through the email history and I can't find specifically what was to be contained – could you please remind me? Apologies, I'm not sure where that email would have gone!

Thanks very much!

Scott

From: Mark Peters [mailto:mark.peters@fairhurst.co.uk]
Sent: 28 June 2017 17:00
To: Scott Lynch
Subject: RE: 106859: The Inchgarth Retirement Community, Site at North Deeside Road/Inchgarth Road, Aberdeen - Transportation Scoping

Hi Scott

I hope you are well. I am sure you will recall the above development proposal that was scoped with yourself at the end of 2016 – email history included below.

The proposals have changed slightly and a new masterplan (attached) has been prepared. This has been discussed with Planners and the new link road discussed with Roads. There aren't any significant changes to the proposals and the overall combined traffic generation is less than what we had agreed previously. The main changes are that there is now no sports pitch, the retail element is reduced and there are more retirement units. The care home has also increased slightly from 40 bed to 50 bed.

A summary of the development is:

- Site 1: 27 No. 2 bedroom Flats (6 blocks containing 4 / 5 flats per block)
- Site 2: 16 No. 2 bedroom Townhouses
- Site 3: 26 No. 2 bedroom Flats (6 blocks containing 4 / 5 flats per block)
- Site 4: 24 No. 1 bedroom Affordable Units
- Site 7: 12 No. 2 bedroom Units
- TOTAL RETIREMENT UNITS = 105
- Site 5: 50 Bedroom Care Home
- Site 6: 5 No. Mixed Retail Units @ circa 100m² / unit. Total GFA = circa 500m²

Access to all development will still be from the new link road proposed between A93 North Deeside Road and Inchgarth Road. The new link road is proposed as part of the development of the site and would incorporate appropriate geometry and would offer benefits to the local road network. It would provide an alternative route between the A93 North Deeside Road and Inchgarth Road in preference to the use of Pitfodels Station Road and Westerton Road. The link road would have the effect of channelling some existing traffic on to an appropriately designed route, relieving routes that have sub-standard geometry and poor junction visibility. The route would not be intended to encourage rat running, but would be used by traffic that is already doing so via Pitfodels Station Road and Westerton Road.

The proposed link road would be constructed with suitable pedestrian / cyclist infrastructure, and would allow for a pedestrian / cycle connection to The Deeside Way.

The provision of a roundabout at the Inchgarth Road / New Link Road junction will ensure that traffic speeds are reduced on all approaches, particular on Inchgarth Road where local residents have raised concerns during public consultation events in regards to speeding traffic. At the A93 North Deeside Road / New Link Road junction a ghost island junction is proposed ensuring that right turning traffic from the A93 West will not impact upon traffic continuing east towards the centre of Aberdeen.

Parking is to be provided in accordance with ACC standards. Tables 4-1 and 4-2 detail the proposed parking provision:

ACC Parking Standards		
Land Use	Outer City	Per

1 Bedroom Flat	1.5	Unit
2 Bedroom Flat	1.5	Unit
Up to 3 Bedroom Dwelling	2	Dwelling
Affordable	0.8	Unit
Care Home	1	Resident Staff
	1	3 Residents
Non-food Retail < 1000 sqm	1	30 m²

Table 4-1: ACC Parking Standards

Inchgarth Development		*ACC Parking Requirement*	Operational Car Parking	Visitor Car Parking	TOTAL Car Parking
		Site 1			
27	2 Bed Flats	*41*	41	5	**46**
		Site 2			
16	2 Bed Townhouses	*32*	32	4	**36**
		Site 3			
26	2 Bed Flats	*39*	39	5	**44**
		Site 4			
24	1 Bed Affordable	*19*	19		**19**
		Site 5			
50	Bed Care home (Residents)	*17*	17	n/a	**17**
50	Bed Care home (9 Resident Staff)	*9*	9	n/a	**9**
		Site 6			
500	Non-food Retail (combined m² GFA)	*17*	17		**17**
		Site 7			
12	2 Bed Flats	*18*	18	2	**20**
TOTAL PARKING		***192***	**192**	**16**	**208**

Table 4-2: Parking Provision

For the retirement units an element of visitor car parking is also included. The SG does not provide a parking standard for visitor parking but does state that 'visitor parking may also be required in new developments of more than 10 units'. It is proposed to provide an additional 16 visitor car parking spaces within Sites 1, 2, 3 and 7 as indicated in Table 4-2

The updated Traffic Generation is provided in Tables 5-1 to Table 5-4 below:

105 Retirement Units				
Vehicles	AM Peak Hr		PM Peak Hr	
Per 1 Dwelling	08:00 - 09:00		17:00 - 18:00	
	In	Out	In	Out
Trip Rate	0.073	0.05	0.055	0.095
Trip Generation	8	5	6	10

Table 5-1: Retirement Units Vehicle Trip Generation

50 Bed Care Home				
Vehicles	AM Peak Hr		PM Peak Hr	
Per 1 Dwelling	08:00 - 09:00		17:00 - 18:00	
	In	Out	In	Out
Trip Rate	0.051	0.034	0.044	0.092
Trip Generation	3	2	2	5

Table 5-2: Care Home Vehicle Trip Generation

500 m² GFA Community Related Shops				
Vehicles	AM Peak Hr		PM Peak Hr	
Per 100 sqm GFA	08:00 - 09:00		17:00 - 18:00	
	In	Out	In	Out
Trip Rate	5.71	5.206	6.508	7.124
Trip Generation	29	26	33	36
20% Pass-by	*-6*	*-5*	*-7*	*-7*
50% Internal	*-14*	*-13*	*-16*	*-18*
New Trips	9	8	10	11

Table 5-3: Local Shops Vehicle Trip Generation

Combined Development				
Vehicles	AM Peak Hr		PM Peak Hr	
	08:00 - 09:00		17:00 - 18:00	
	In	Out	In	Out
New Trips	19	15	18	25
Two Way	34		43	

Table 5-4: Combined Development Vehicle Trip Generation

The previously agreed combined development vehicle trip generation is included within the email history below but replicated again for convenience:

Combined Development (Previous Proposal)				
Vehicles	AM Peak Hr		PM Peak Hr	
	08:00 - 09:00		17:00 - 18:00	
	In	Out	In	Out
Trip Generation	26	22	27	34
Two Way	48		61	

Table 4: Combined Development Vehicle Trip Generation (Previous)

As can be seen from comparing Table 5-4 with Table 4, the current proposals will result in there being a reduced traffic impact in both the AM and PM peak hours. This is due to the reduced retail element which is now only 500sqm GFA where as previously it was 1095sqm.

You will also recall that we previously discussed the pass-by and internal reductions applied for the retail element (see history below). Whilst I stand by these reductions based on the reasoning previously provided, we will also include a sensitivity test without any retail reductions in order to provide a robust assessment when carrying out analysis of the new Link Road junctions.

The TA will include further details on People Trips for the proposed development.

I assume that you are still content with the previously agreed approach and content of the TA? This is essentially utilising previously agreed traffic data and additional data provided by ACC (again you will recall previous discussions on this). Given the continued roadworks and delays on the A93 associated with the AWPR works, we would still consider that any traffic surveys carried out at this time would not be representative of 'normal' traffic conditions. Furthermore I am aware of people using the A93 / B979 Netherley Road as an alternative route to the A90 at Stonehaven due to the lengthy delays associated with the on-going AWPR works on the A90 between Charleston and Stonehaven.

As agreed previously, we will assess the impact of re-distributing traffic from Westerton Road and Pitfodels Station Road onto the new link road and assess its proposed junctions with Inchgarth Road and North Deeside Road. Development traffic, based on the Tables above, will be included. I trust this remains acceptable.

The TA will also provide comments in respect of the impacts of the AWPR and also the outcomes of the relevant STAG assessments associated with the Access from the South Bridge of Dee study.

I trust you are in agreement to the above, but I just wanted to keep you updated on how the development has progressed and altered. If you could confirm at your earliest convenience that would be appreciated.

Thanks and best regards

Mark Peters, IEng BSc (Hons) MCIHT
Principal Engineer - Transportation

Fairhurst
engineering solutions, delivering results

Britannia House,
Endeavour Drive,
Arnhall Business Park,
Westhill,
AB32 6UF

Tel No (Direct Dial): 01224 047356
Email: mark.peters@fairhurst.co.uk
Website: http://www.fairhurst.co.uk

From: Scott Lynch [mailto:SLynch@aberdeencity.gov.uk]
Sent: 28 November 2016 16:35
To: Mark Peters
Subject: RE: 106859: The Inchgarth Retirement Community, Site at North Deeside Road/Inchgarth Road, Aberdeen - Transportation Scoping

Mark,

Thanks for the email.

That sounds good.

Scott

From: Mark Peters [mailto:mark.peters@fairhurst.co.uk]
Sent: 28 November 2016 15:14
To: Scott Lynch

Cc: Hugh Murdoch
Subject: RE: 106859: The Inchgarth Retirement Community, Site at North Deeside Road/Inchgarth Road, Aberdeen - Transportation Scoping

Scott

Thanks for your email below and our follow up conversation earlier.

I'm looking to arrange traffic surveys this week, before we get into the Christmas period and propose to undertake the traffic surveys covering the following study area over a 1 day period.

1. A93 / Westerton Road Priority Junction

2. Westerton Road / Inchgarth Road Priority Junction

3. A93 / Pitfodels Station Road Priority Junction

4. Pitfodels Station Road / Inchgarth Road Priority Junction

Survey Period: AM: 07:00 - 10:00
PM: 16:00 - 19:00

The attached plan illustrates the junction locations.

For the Traffic Impact Analysis we will assess the impact of the existing traffic that currently uses Westerton Road and Pitfodels Station Road diverting to the proposed new link road. As assessment of the new link road / A93 junction will be undertaken which includes the diverted and new development trips.

As the development will be post AWPR, we will apply the predicted percentage reductions on the A93 corridor in this location as determined from ASAM4. This is consistent with other Traffic Impact Assessments that we have carried out on this corridor in recent years. We will include full details of the ASAM 4 data.

I would be grateful if you could confirm at your earliest opportunity that the above survey scope and TIA proposal is acceptable.

Thanks and best regards

Mark Peters, IEng BSc (Hons) MCIHT
Principal Transportation Engineer

Fairhurst
engineering solutions, delivering results

88 Queens Road,
Aberdeen,
AB15 4YQ
Tel: 01224 321222
DD: 01224 327655
Fax: 01224 323201
Email: mark.peters@fairhurst.co.uk
Website: http://www.fairhurst.co.uk

From: Scott Lynch [mailto:SLynch@aberdeencity.gov.uk]
Sent: 28 November 2016 13:39
To: Mark Peters
Cc: Hugh Murdoch
Subject: RE: 106859: The Inchgarth Retirement Community, Site at North Deeside Road/Inchgarth Road, Aberdeen - Transportation Scoping

Hi Mark,

I've read your two emails that came in on Friday.

As it stands, the development planned contains the following (note, the corresponding TA requirements for each development type are shown in red);

- 46 retirement dwellings (TA required for >100 dwellings, therefore 46% of capacity)
- 540m2 commercial (TA required for >1000m2, therefore 54% of capacity)
- 40 bedroom care home (with 9 resident staff) (No specific category in guidance)
- All weather sports pitch + pavilion (TA required for >1000m2 for leisure facilities, no specific dimensions given for this, but as football/rugby pitches are in excess of 8000m2 it will exceed this)

I know that developments that are multi-faceted are considered cumulatively, and the process isn't as straight forward as 46% of the residential capacity + 54% of commercial capacity = 100% of total capacity. However, the retirement dwellings + the commercial aspect are near this 100% threshold before even considering the care home and sports facilities. This alone is perhaps reason to consider this development for a TA.

I spoke to Hugh to gather his thoughts and his primary concern is that if you're saying you acknowledge that the link road will alleviate Westerton Road and Pitfodels Station Road, we need to clearly understand what this new distribution of traffic will look like analytically. This is especially true at the junction on the A93 where a cross-roads is created. The aforementioned adjacent roads also have traffic calming measures (speed bumps, traffic lights, etc) however it is unclear what is planned for the link road in this development. If suitable speed calming measures are not introduced it will further increase the attractiveness of this route as a rat-run.

So, whilst the content of the development itself is perhaps a grey area and it could be argued that a TA is not required for a retirement village, the combination of that *and* location of the development and the surrounding/proposed roads are sufficient to warrant one.

Thanks,

Scott

From: Mark Peters [mailto:mark.peters@fairhurst.co.uk]
Sent: 25 November 2016 16:51
To: Scott Lynch
Cc: Gregor Whyte
Subject: RE: 106859: The Inchgarth Retirement Community, Site at North Deeside Road/Inchgarth Road, Aberdeen - Transportation Scoping

Scott

Further to my email below, I can confirm that the proposals will only include the ground floor retail units which is a combined GFA of 540sqm made up of 6 x 90sqm. As you are aware the size criteria for a full Transport Assessment for retail is > 1000sqm GFA. The total number of retirement units is 46. For housing the criteria for a full Transport Assessment is > 100 units. I would suggest that as retirement units the criteria would be greater given the reduced trip generation (when compared with standard housing trip generation), particularly during the peak hours.

It is therefore considered that the combination of the 46 retirement units and 560sqm GFA retail falls under the threshold that requires a full Transport Assessment.

I will give you a call on Monday to discuss.

Thanks and best regards

Mark Peters, IEng BSc (Hons) MCIHT

Principal Transportation Engineer

Fairhurst
engineering solutions, delivering results

88 Queens Road,
Aberdeen,
AB15 4YQ
Tel: 01224 321222
DD: 01224 327655
Fax: 01224 323201
Email: mark.peters@fairhurst.co.uk
Website: http://www.fairhurst.co.uk

From: Mark Peters
Sent: 25 November 2016 10:42
To: 'Scott Lynch'
Cc: Gregor Whyte
Subject: RE: 106859: The Inchgarth Retirement Community, Site at North Deeside Road/Inchgarth Road, Aberdeen - Transportation Scoping

Scott

Thanks for the email below. I have provided a response to your two bullet points (included below) which I would appreciate if you could review and get back to me on Monday on your return from leave.

Thanks and best regards

Mark Peters, IEng BSc (Hons) MCIHT
Principal Transportation Engineer

Fairhurst
engineering solutions, delivering results

88 Queens Road,
Aberdeen,
AB15 4YQ
Tel: 01224 321222
DD: 01224 327655
Fax: 01224 323201
Email: mark.peters@fairhurst.co.uk
Website: http://www.fairhurst.co.uk

From: Scott Lynch [mailto:SLynch@aberdeencity.gov.uk]
Sent: 24 November 2016 16:51
To: Mark Peters
Cc: Gregor Whyte
Subject: RE: 106859: The Inchgarth Retirement Community, Site at North Deeside Road/Inchgarth Road, Aberdeen - Transportation Scoping

Mark,

Having looked at the information you've provided I was initially minded to agree with you about not requiring any traffic impact analysis, however looking into it in more detail I actually think it will be required. I note that this is retirement accommodation, but my main concerns are the commercial aspect of the development and the location of the site/internal roads. Specifically;

- The winding road shown in red on the master plan drawing from inchgarth road to the A93 may encourage traffic to rat-run through the development;
  Traffic is already using Westerton Road and Pitfodels Station Road – both are sub-standard. I wouldn't consider this traffic as rat-running as the traffic is already making the movement between the A93 North Deeside Road and Inchgarth Road. The new link road essentially replaces these roads and will enable them to return to their intended purpose of providing local access only, There is opportunity for both sub-

standard roads to have restrictions such as access only, one way or no vehicles over the Deeside Way bridge. The link road has been identified by ACC in a number of studies recognising its needs.

- The size of the commercial aspect of the develop is likely to generate significant peak trips. Additionally, 50% internal trips seems high, it means half of all residents of the retirement units (not the care home) would be driving on a daily basis to the shops in the same hour window? A 20% pass-by rate seems high, what is this based on?

  The commercial development is proposed for use by those living in the retirement community to avoid the need for them to travel longer distances to Cults and Garthdee. The type of commercial development will be targeted specifically with the needs of the people living within the retirement community. The number of vehicle trips by those living within the retirement community would be low, given the proximity and any vehicle trips would be internal to the development so not on the wider road network. It is accepted that this will not restrict others from using it. However there are more opportunities and greater variety of retailing opportunities within Cults and at Garthdee so I disagree that the proposals will generate significant peak trips.

  A pass-by rate of 20% is not high, it is more often included as 30% for retail. This is based on industry research.

  If the commercial element were to be only have half the retail GFA and just ground floor retail space (6 x 90sqm = 540sqm), would you be more content with our proposed Transport Statement?

Based on the above factors, I think that a traffic impact analysis is required.

Sorry again for taking so long to respond on this – I'll look at the scoping in more detail next week. If you need a response on the above tomorrow you'll need to contact Gregor Whyte as I'm on annual leave.

Thanks,

Scott

From: Mark Peters [mailto:mark.peters@fairhurst.co.uk]
Sent: 24 November 2016 11:15
To: Scott Lynch
Subject: Re: 106859: The Inchgarth Retirement Community, Site at North Deeside Road/Inchgarth Road, Aberdeen - Transportation Scoping

Scott

My main concern is if we need to do any traffic surveys as the closer we get to Christmas the more likely any surveys become skewed due to Christmas shopping etc. However we are not proposing any traffic impact analysis as we don't feel that the development will generate many AM and PM peak hour trips as it is essentially a retirement development.

If you were able to confirm whether you agree that no traffic impact analysis is required then that would provide some comfort as we have a tight timescale to complete our report as the planning application is to be submitted early December.

Thanks and best regards

Mark Peters
Principal Transportation Engineer

Fairhurst
engineering solutions, delivering results

88 Queens Road,

Aberdeen,
AB15 4YQ
Tel: 01224 321222 Fax: 01224 323201
Email: mark.peters@fairhurst.co.uk Website: http://www.fairhurst.co.uk

On 24 Nov 2016, at 11:07, Scott Lynch <SLynch@aberdeencity.gov.uk> wrote:

Mark,

I apologise for the delay in getting back to you on this – with Kamran away for a month we're under a bit more pressure than usual!

I'll get back to you on this next week. I hope that's alright with you?

Regards,

Scott

From: Mark Peters [mailto:mark.peters@fairhurst.co.uk]
Sent: 24 November 2016 10:44
To: Scott Lynch
Subject: Fwd: 106859: The Inchgarth Retirement Community, Site at North Deeside Road/Inchgarth Road, Aberdeen - Transportation Scoping

Scott

Further to the email below and our recent discussions, have you had a change to review the proposed scope?

I can also clarify that the applicant has decided to proceed with Option 3a which is the sports pitch option so a reduction of 28 retirement units. Overall retirement units will be 46. This will make a small reduction in peak hour trip generation but given that it is low in any case for retirement units it doesn't make much difference.

Thanks and best regards

Mark Peters
Principal Transportation Engineer

Fairhurst
engineering solutions, delivering results

88 Queens Road,
Aberdeen,
AB15 4YQ
Tel: 01224 321222 Fax: 01224 323201
Email: mark.peters@fairhurst.co.uk Website: http://www.fairhurst.co.uk

Begin forwarded message:

From: "Mark Peters" <mark.peters@fairhurst.co.uk>
To: "Scott Lynch" <SLynch@aberdeencity.gov.uk>
Subject: 106859: The Inchgarth Retirement Community, Site at North Deeside Road/Inchgarth Road, Aberdeen - Transportation Scoping

Scott,

We have been appointed by Cults Property Development Company Limited to prepare a Transport Statement to support a planning application for a mixed use Retirement / Care Home development in Cults on land between Inchgarth Road and the A93 North Deeside Road. The overall site is split into 3 site areas as indicated below and as shown on the attached Masterplan Layouts.

Site 1

- 28 No. 2 bedroom Retirement Flats and 2 No. 3 bedroom Retirement Flats. Total of 62 parking spaces in accordance with ACC Parking Standards and includes 2 allocated visitor spaces.

Site 2

- 16 No. 2 bedroom Retirement Townhouses. Total of 36 parking spaces in accordance with ACC Parking Standards and includes 4 allocated visitor spaces.
- 40 bedroom Care Home. Total of 22 car parking spaces made up of 13 resident spaces and 9 staff spaces in accordance with ACC Parking Standards.
- Community Related Shopping: 6 x Ground Floor Units @ 90m2 / unit and 3 x First Floor Units @ 185m2 / unit. Total of 38 car parking spaces, including 2 disabled spaces, in accordance with ACC Parking Standards for food/non-food retail units.

Site 3

There are currently two options being considered for Site 3.

- Option A: All Weather Pitch + Pavilion (changing / storage facilities only). Total of 41 parking spaces, including 2 disabled spaces. 4 coach parking spaces are also allowed for. There are no car parking standards for sports pitches or changing pavilions within the ACC Parking Standards. It is considered that the provision of 41 parking spaces would be appropriate.
- Option B: 28 No. 2 bedroom Retirement Units. Total of 56 parking spaces in accordance with ACC Parking Standards for 2 bedroom flats.

There is not currently an end user identified for the all-weather pitch, however there have been discussions with Robert Gordons University who are located less than 1km to the east on Garthdee Road. Vehicle generation as a result of the sports pitch would be very low during the AM and PM Peak Periods. The peak operation of the sports pitch would be during the day (possible RGU use) and at weekends when traffic levels on the wider network are lower than during the AM and PM peak hours.

Associated with the development proposals is the provision of a new link road between Inchgarth Road and the A93 North Deeside Road. This would essentially replace 2 sub-standard routes that connect between Inchgarth Road and the A93 North Deeside Road: Pitfodels Station Road and Westerton Road. Both Roads carry traffic routing between the Garthdee Road and North Deeside Road areas. These roads are constrained in width and visibility with limited pedestrian footway provision. Where the existing roads cross over the Deeside Way, road width is further reduced with the need for traffic signal controls on Pitfodels Station Road and Deeview Road / St Devenicks Place. Advanced discussions regarding the link road have been held with Colin Burnett in the ACC Roads team and would continue whilst working up the detailed design of the road and the bridge over the Deeside Way.

The new link road would be built in accordance with current standards and would be of sufficient width and design to accommodate buses. The route over the Deeside Way would be 2-way with no need for traffic signals. Pedestrian foot / cycleways would be provided along its entire length with connections to / from the Deeside Way.

The new link road will allow the adjacent sub-standard roads to return to their intended purpose of providing access to and from the properties they serve.

In accordance with the Scottish Government document 'Transport Assessment Guidance', it is considered that the proposal does not exceed the threshold whereby a full Transport Assessment would be required. Trip Generation of the proposed development, particularly during the AM and PM peak hours would be low and we therefore we propose to undertake a Transport Statement that will consider the following matters;

- Site access requirements
- Transport planning policy
- Local development context
- Surrounding transport infrastructure
- Sustainable transport opportunities
- Trip generation by all modes of transport
- Parking requirements
- Swept Path Analysis for service vehicles
- Travel Plan Framework

This is essentially a Transport Assessment without any traffic impact analysis as a result of the low development trips.

Trip Generation- Proposed site.

The TRICS Online database has been used to derive comparable vehicle trip estimates for the proposed development. TRICS reports for the following are attached and have been used to estimate the number of vehicle trips during the weekday AM and PM peak hours:

- RESIDENTIAL/N - RETIREMENT FLATS
- HEALTH/F - CARE HOME (ELDERLY RESIDENTIAL)
- RETAIL/I - SHOPPING CENTRE - LOCAL SHOPS

The TRICS report includes sites in an 'EDGE OF TOWN' and 'SUB URBAN' location which are of similar size to what is proposed. Sites in the Greater London and South East regions have been excluded. The Tables below show the vehicle trip rates and subsequent trips associated with the proposed development which we propose to use.

74 Retirement Units				
Vehicles	AM Peak Hr		PM Peak Hr	
Per 1 Dwelling	08:00 - 09:00		17:00 - 18:00	
	In	Out	In	Out
Trip Rate	0.073	0.05	0.055	0.095
Trip Generation	5	4	4	7

Table 1 – Retirement Flats Vehicle Trip Rates and Trips

40 Resident Care Home				
Vehicles	AM Peak Hr		PM Peak Hr	
Per 1 Resident	08:00 - 09:00		17:00 - 18:00	
	In	Out	In	Out
Trip Rate	0.051	0.034	0.044	0.092
Trip Generation	2	1	2	4

Table 2 – Care Home Vehicle Trip Rates and Trips

1095 sqm GFA Community Related Shops				
Vehicles	AM Peak Hr		PM Peak Hr	
Per 100 sqm GFA	08:00 - 09:00		17:00 - 18:00	
	In	Out	In	Out
Trip Rate	5.71	5.206	6.508	7.124
Trip Generation	63	57	71	78
20% Pass-by	*-13*	*-11*	*-14*	*-16*
50% Internal	*-31*	*-29*	*-36*	*-39*
New Trips	19	17	21	23

Table 3 – Community Related Shops Vehicle Trip Rates and Trips

The community related shopping units would primarily be there to serve the development community to reduce the need to travel, particularly for those in the retirement units and care home. The services anticipated to be provided could be a pharmacy, physiotherapist, hairdresser, newsagent, coffee shop etc. It is therefore considered that the majority of trips would either be generated from within the proposed development or from pass-by trips, i.e. trips already on the network. It is further considered that given the shopping opportunities provided along the A93 North Deeside Road within Cults and the larger retail parks at Garthdee, the number of new trips being generated would be minimal. The total number of new trips has therefore been established assuming that 50% of trips will be generated from within the development and a further 20% will be generated from pass-by trips already on the network.

The TRICS assessment indicates that the proposed development at Inchgarth will generate 48 and 61 two-way vehicle trips during the weekday AM and PM peak hours respectively.

Combined Development				
Vehicles	AM Peak Hr		PM Peak Hr	
	08:00 - 09:00		17:00 - 18:00	
	In	Out	In	Out
Trip Generation	26	22	27	34
Two Way	48		61	

Table 4 – Combined Development Two-Way Vehicle Trips

The Transport Statement would comment on trips by other modes using the multi-modal TRICS outputs attached. The full People Trip Assessment will be included within the Transport Statement

The site is currently vacant land. Access would be gained from the new link road providing access to both Inchgarth Road and North Deeside Road. As the generated traffic is likely to have a minimal impact on the wider network we do not propose to carry out any traffic impact analysis. Furthermore, the opening year would be post AWPR when traffic levels are predicted to reduce along the A93 North Deeside Road.

I would appreciate if you could confirm acceptance of this proposed methodology and trip rates to be included in the Transport Statement in support of the Retirement Development Proposal at Inchgarth, Cults. If there are any other matters that you feel should be included within the Transport Statement then please let me know.

Thanks and best regards

Mark Peters, IEng BSc (Hons) MCIHT
Principal Transportation Engineer

Fairhurst
engineering solutions, delivering results

88 Queens Road,
Aberdeen,
AB15 4YQ
Tel: 01224 321222
DD: 01224 327655
Fax: 01224 323201
Email: mark.peters@fairhurst.co.uk
Website: http://www.fairhurst.co.uk

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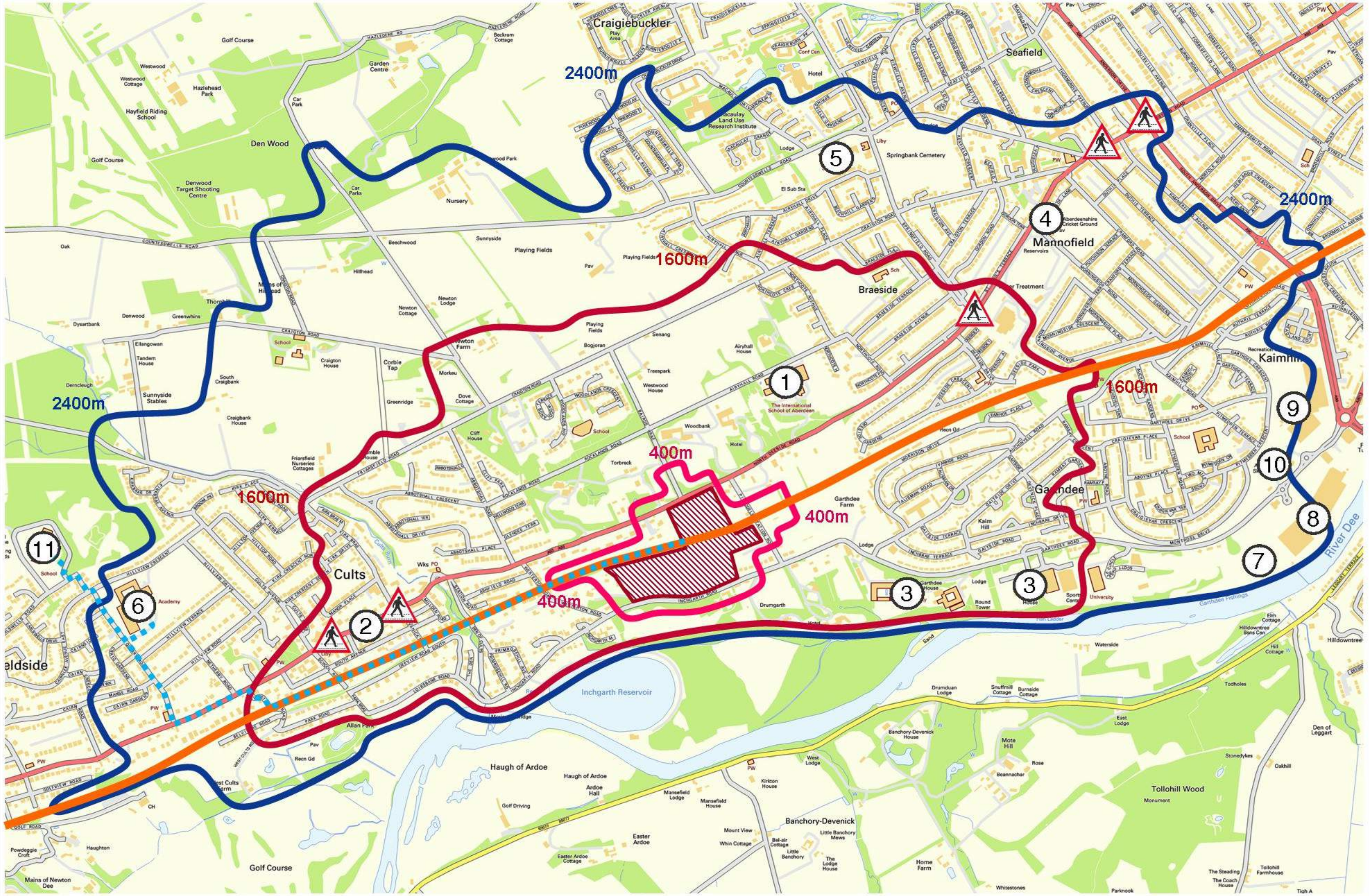
Appendix C
Accessibility Maps

FAIRHURST

N

Project Title:
106859 Inchgarth Retirement Community

Drawing Title:
Walking Accessibility
Figure 3-1: *Walking Isochrones & Local Facilities*



KEY:

- Development Site Boundary
- Walking Route to Schools
- Traffic Free Route The Deeside Way

Walking Isochrones:

- 400 metres
- 1600 metres
- 2400 metres

Formal Crossing Points:

- Signalised Pedestrian Crossing

Local Amenities:

1. International School of Aberdeen
2. Cults Retail Area
3. Robert Gordon University (RGU)
4. Tesco Food Store
5. Airyhall Primary School
6. Cults Academy
7. David Lloyd
8. Garthdee Retail Park
9. Asda Superstore
10. Aberdeen Snowsports and Garthdee Football Centre
11. Cults Primary School

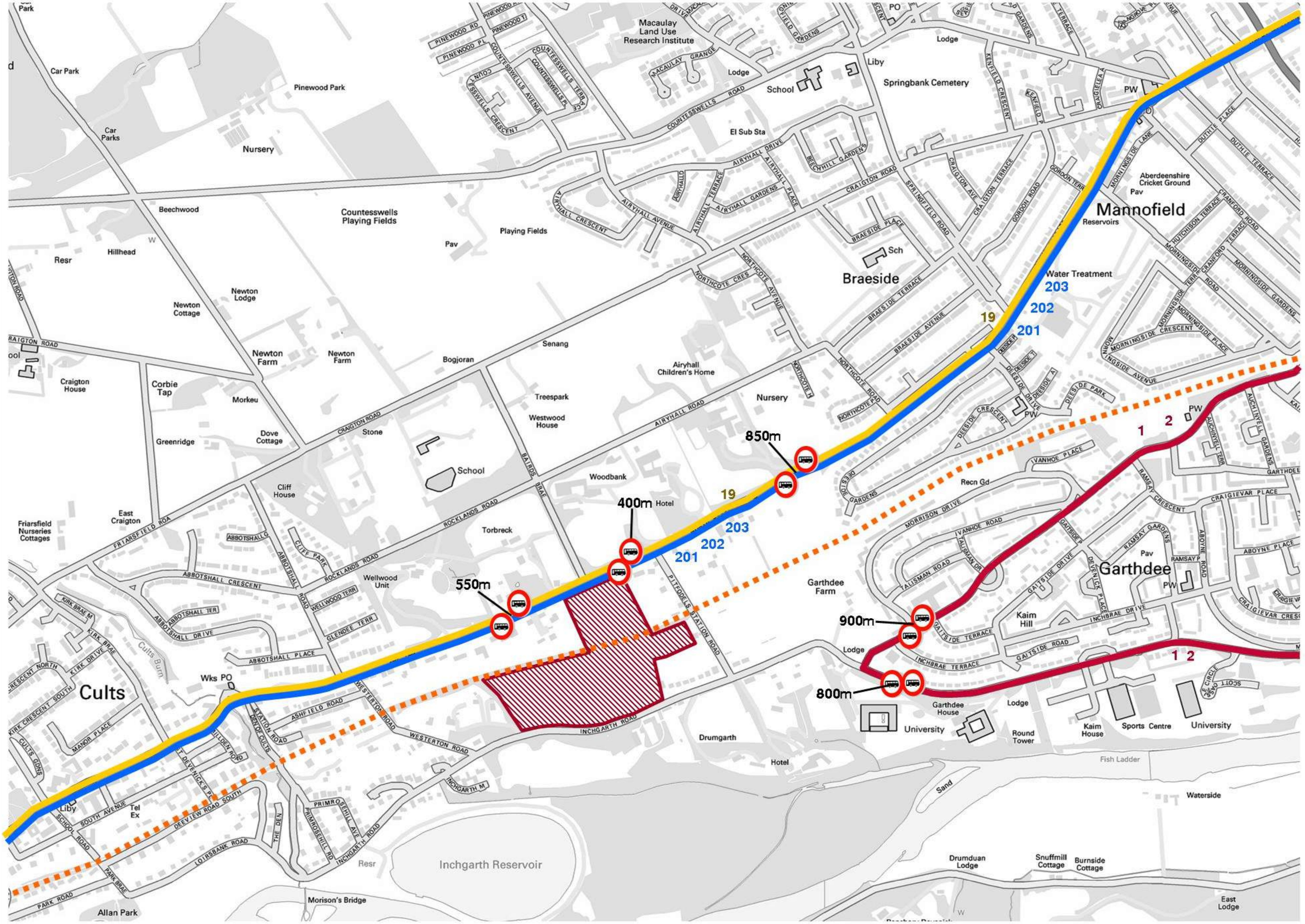
Client:

Drawn by: MP

Date: 01/06/17

88 Queens Road
Aberdeen
AB15 4YQ

T: 01224 321222
F: 01224 323201



FAIRHURST

N

Project Title:
106859 Inchgarth Retirement Community

Drawing Title:
Bus Accessibility
Figure 3-2: *Local Bus Routes & Stops*

KEY:

Development Site Boundary

Traffic Free Route
The Deeside Way

Bus Services:

Service 1 & 2
First Group

Service 201, 202 & 203
Stagecoach

Service 19
First Group

Closest Bus Stops:

Closest Bus Stops
(Maximum Walking Distance)

Client:

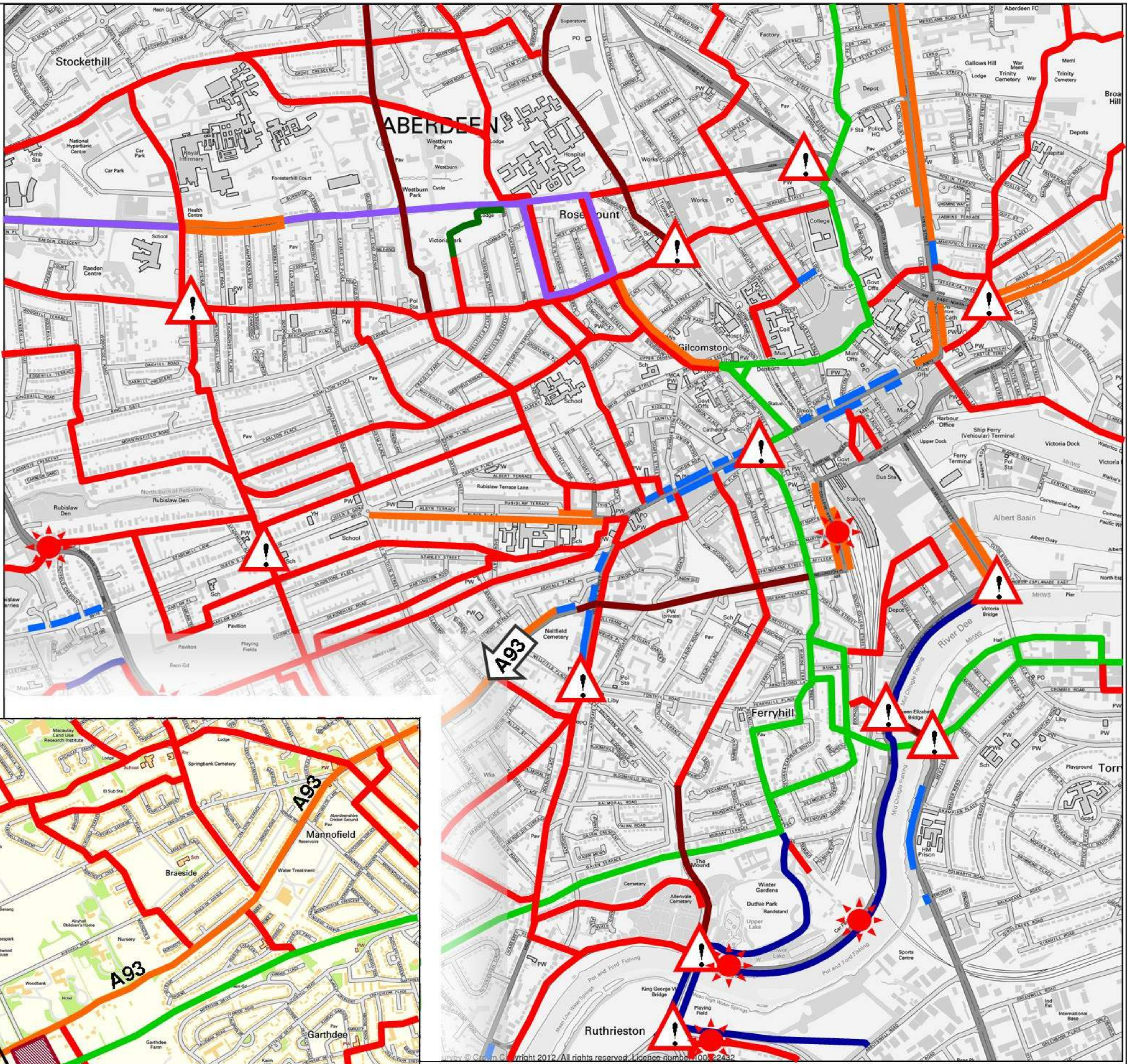
Drawn by: MP

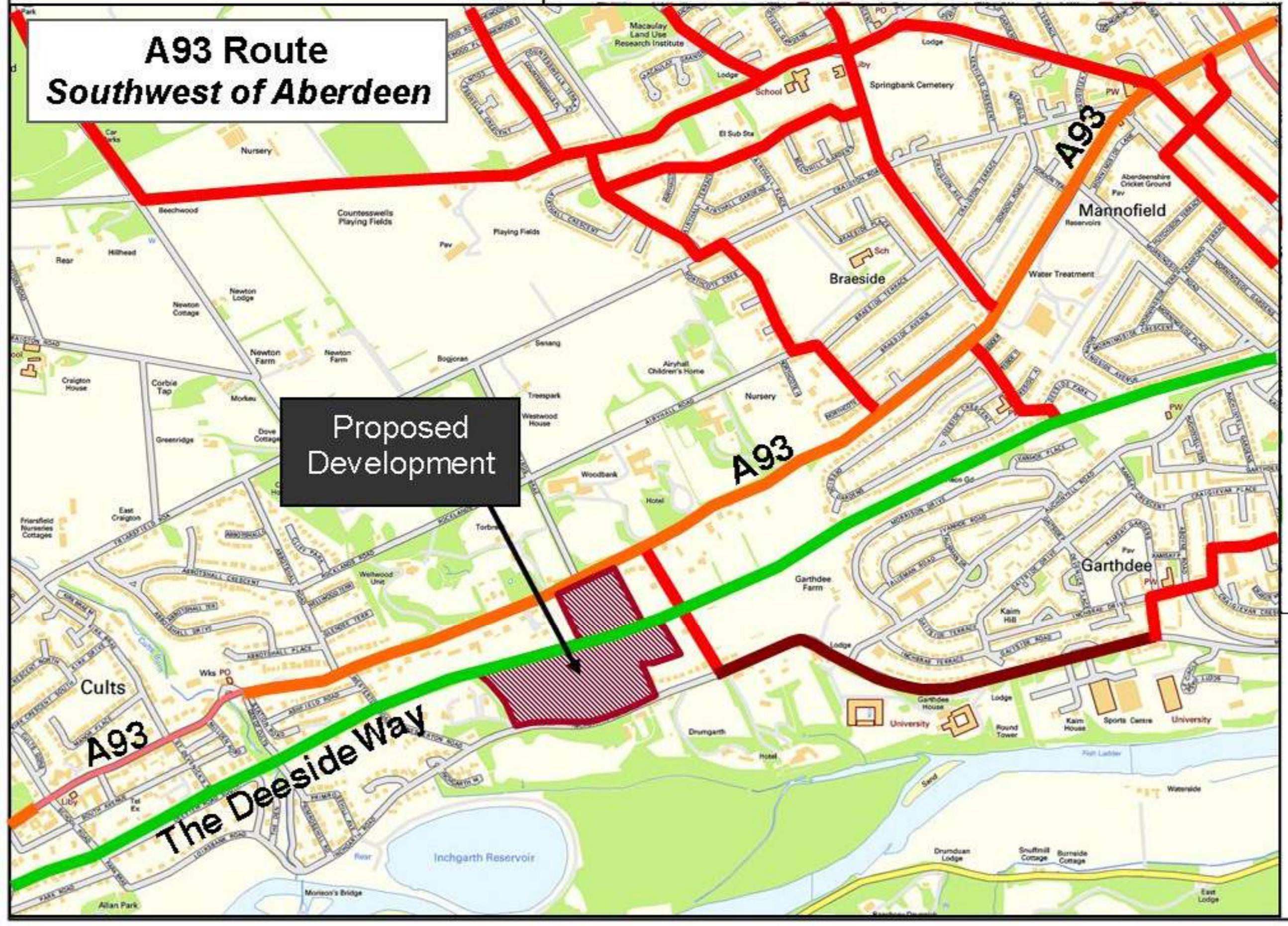
Date: 01/06/17

88 Queens Road
Aberdeen
AB15 4YQ

T: 01224 321222
F: 01224 323201

A93 North Deeside Road





FAIRHURST

N

Project Title:
106859 Inchgarth Retirement Community

Drawing Title:
Cycling Accessibility
Figure 3-3: *Local Cycle Routes and Facilities*

KEY:

- Development Site Boundary

Local Cycle Routes and Crossings:

- Recommended Route
- On Road Cycle Route
- Bus, Cycle and Taxi Lane
- Dual Use Path
- Signed Route
- Busy but Useful Road
- Path Where Cyclist May Need to Dismount
- National Cycle Network, Route 1 (Under Review) and Route 195
- Toucan Crossing or Useful Pedestrian Crossing
- Approach with Care

The map above highlights the cycle facilities and routes within Aberdeen City. It reflects the maps produced by Aberdeen Cycle Forum.

The map to the left identies the cycling facilities and routes within the vicinity of the site. Note that the site is directly served by the on-road cycle lanes found on North Deeside Road and National Cycle Network Route 195 ' The Deeside Way'.

Client:

Drawn by: MP

Date: 01/06/17

88 Queens Road
Aberdeen
AB15 4YQ

T: 01224 321222
F: 01224 323201

Appendix D

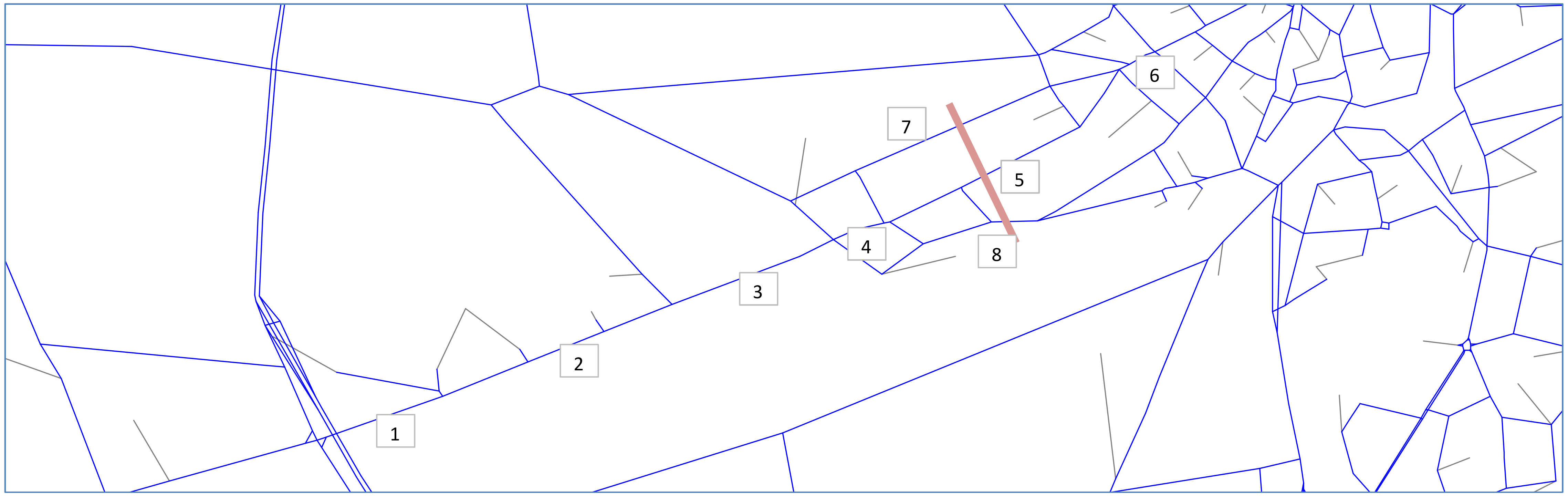
ASAM4a Traffic Data

ASAM4A Traffic Data - A93 Corridor Traffic Data

Year	Network ID	Demand
2018	W27	C417
2018	W30	C417

All flows are described in vehicles - Total Traffic Volumes per hour or at AADT level

Traffic Flow Locations

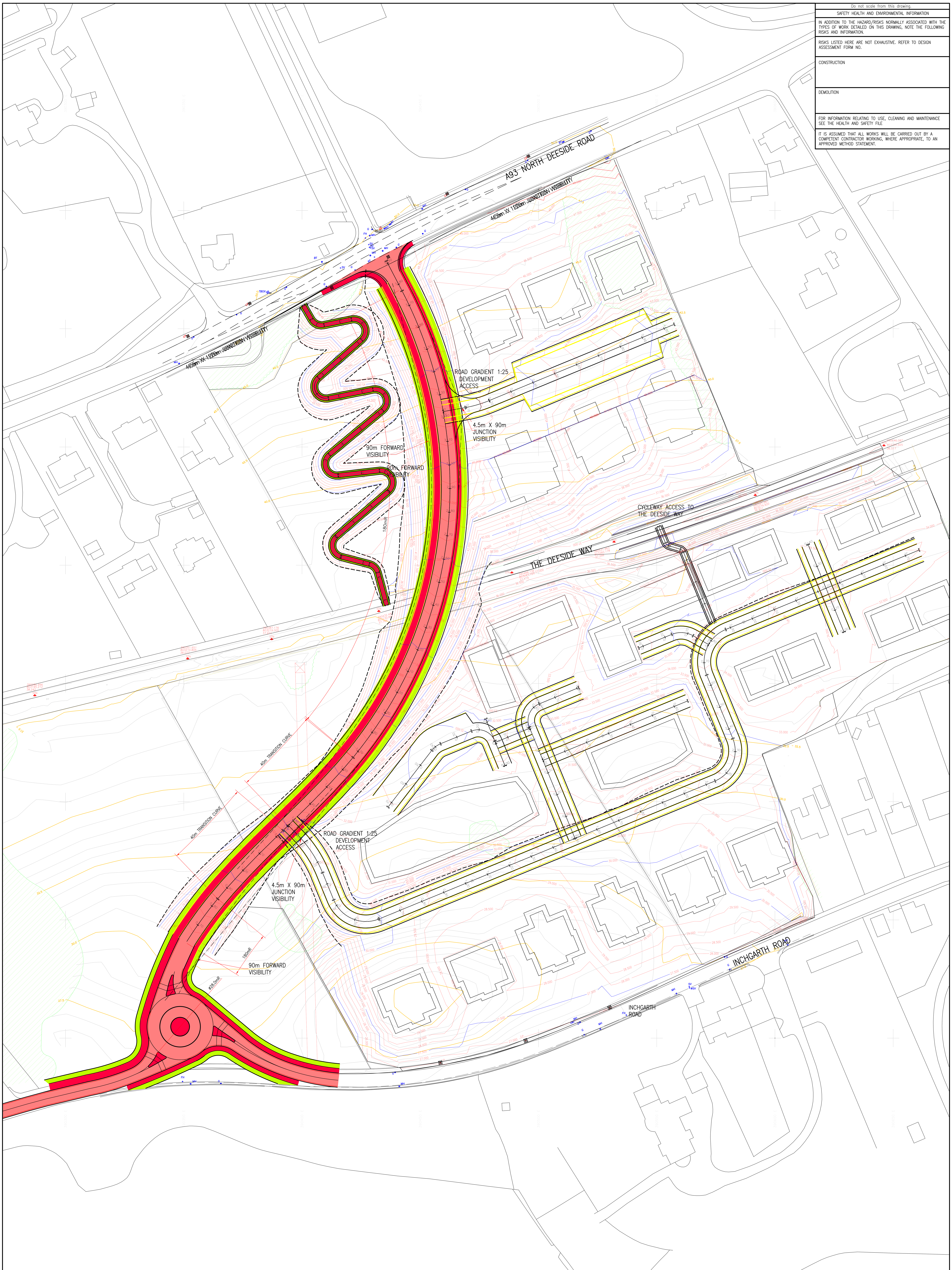


ASAM4A Traffic Data: A93 Corridor

Map Location	Location	Direction	2018 No AWPR (W27 C417)			2018 With AWPR (W30 C417)			2018 Ref Case - AWPR			% 2018 Ref Case - AWPR		
			AM	PM	AADT	AM	PM	AADT	AM	PM	AADT	AM	PM	AADT
1	A93 East of B979 Maryculter Bridge	EB	711	332	4,309	490	313	3,592	-221	-19	-717	-31%	-6%	-17%
		WB	372	652	5,005	345	395	3,893	-28	-258	-1,112	-7%	-40%	-22%
	Total two-way		**1,083**	**984**	**9,314**	**834**	**707**	**7,485**	**-249**	**-277**	**-1,829**	**-23%**	**-28%**	**-20%**
2	A93 East of Milltimber	EB	874	369	5,094	500	206	3,131	-374	-164	-1,963	-43%	-44%	-39%
		WB	426	832	5,859	239	436	3,503	-188	-396	-2,356	-44%	-48%	-40%
	Total two-way		**1,301**	**1,202**	**10,953**	**739**	**642**	**6,634**	**-562**	**-560**	**-4,319**	**-43%**	**-47%**	**-39%**
3	A93 East of Bieldside	EB	745	361	4,694	569	227	3,586	-176	-134	-1,108	-24%	-37%	-24%
		WB	434	828	5,928	274	570	4,402	-161	-258	-1,526	-37%	-31%	-26%
	Total two-way		**1,179**	**1,189**	**10,622**	**843**	**797**	**7,988**	**-337**	**-392**	**-2,634**	**-29%**	**-33%**	**-25%**
4	A93 East of Kirk Brae	EB	743	366	4,644	536	229	3,188	-207	-136	-1,456	-28%	-37%	-31%
		WB	379	684	6,260	305	591	4,724	-74	-94	-1,536	-19%	-14%	-25%
	Total two-way		**1,122**	**1,050**	**10,904**	**841**	**820**	**7,912**	**-281**	**-230**	**-2,992**	**-25%**	**-22%**	**-27%**
5	A93 East of Cults	EB	426	301	3,368	331	192	2,306	-96	-109	-1,062	-22%	-36%	-32%
		WB	296	448	3,345	202	324	2,525	-94	-124	-820	-32%	-28%	-25%
	Total two-way		**722**	**749**	**6,713**	**533**	**516**	**4,831**	**-189**	**-233**	**-1,882**	**-26%**	**-31%**	**-28%**
6	A93 West of Anderson Drive	EB	424	351	4,655	368	270	3,330	-56	-80	-1,325	-13%	-23%	-28%
		WB	175	319	2,853	131	328	3,258	-44	8	405	-25%	3%	14%
	Total two-way		**599**	**670**	**7,508**	**499**	**598**	**6,588**	**-100**	**-72**	**-920**	**-17%**	**-11%**	**-12%**
7	Craigton Road	EB	225	220	2,365	258	196	2,057	33	-24	-308	15%	-11%	-13%
		WB	353	347	3,019	246	262	2,218	-108	-85	-801	-31%	-24%	-27%
	Total two-way		**578**	**567**	**5,384**	**504**	**459**	**4,275**	**-75**	**-108**	**-1,109**	**-13%**	**-19%**	**-21%**
8	Garthdee Road	EB	583	217	2,986	384	143	2,277	-198	-74	-709	-34%	-34%	-24%
		WB	316	531	4,772	230	377	3,718	-87	-154	-1,054	-27%	-29%	-22%
	Total two-way		**899**	**748**	**7,758**	**614**	**520**	**5,995**	**-285**	**-228**	**-1,763**	**-32%**	**-30%**	**-23%**
9	Total A93 Eastern Screenline	EB	1,234	738	8,719	973	531	6,640	-260	-207	-2,079	-21%	-28%	-24%
	(Locations 5, 7 & 8)	WB	965	1,326	11,136	677	964	8,461	-288	-362	-2,675	-30%	-27%	-24%
	Total two-way		**2,199**	**2,064**	**19,855**	**1,650**	**1,495**	**15,101**	**-549**	**-569**	**-4,754**	**-25%**	**-28%**	**-24%**

Appendix E

Proposed New Link Road: Fairhurst Drawing No. 106859/sk1010 Rev C



Do not scale from this drawing.

SAFETY HEALTH AND ENVIRONMENTAL INFORMATION

IN ADDITION TO THE HAZARD/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING RISKS AND INFORMATION.

RISKS LISTED HERE ARE NOT EXHAUSTIVE. REFER TO DESIGN ASSESSMENT FORM NO.

CONSTRUCTION

DEMOLITION

FOR INFORMATION RELATING TO USE, CLEANING AND MAINTENANCE SEE THE HEALTH AND SAFETY FILE

IT IS ASSUMED THAT ALL WORKS WILL BE CARRIED OUT BY A COMPETENT CONTRACTOR WORKING, WHERE APPROPRIATE, TO AN APPROVED METHOD STATEMENT.

Rev.	Date	Description	Drawn	Checked	Approved
C	07/07/17	INTERNAL SITE REMODELLED	RALW	RW	RW
B	20/06/17	REMOTE NORTHERN FOOTPATH RELOCATED. BASEMENT STOREY MODELLED ON FLATS ADJACENT TO DESIDE WAY	RALW	RW	RW
A	27/01/17	DRAWING GENERALLY ENHANCED	RALW	RW	RW

Notes:

Client:

Project Title:
NORTH DEESIDE ROAD/INCHGARTH ROAD PROPOSED RELIEF ROAD AND ASSOCIATED DEVELOPMENT

Drawing Title:
ROAD LAYOUT – INDICATIVE ALTERNATIVE ALIGNMENT 2

FAIRHURST
88 Queens Road,
ABERDEEN, AB15 4YQ
Tel: 01224 321 222 Fax: 01224 323 201

Scale at A0: 1:500
Status: For Information
Drawn: RW
Checked:
Approved:
Date: 20/01/17
Date:
Date:
Drawing No.: 106859/sk1010
Revision: C

Appendix F

TRICS Output Reports

Calculation Reference: AUDIT-109305-161104-1115

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 03 - RESIDENTIAL
Category : N - RETIREMENT FLATS
MULTI-MODAL VEHICLES

Selected regions and areas:

03	SOUTH WEST		
	BR	BRISTOL CITY	2 days
	DV	DEVON	1 days
	NS	NORTH SOMERSET	1 days
04	EAST ANGLIA		
	CA	CAMBRIDGESHIRE	1 days
09	NORTH		
	TW	TYNE & WEAR	1 days
11	SCOTLAND		
	GC	GLASGOW CITY	1 days

This section displays the number of survey days per TRICS® sub-region in the selected set

Filtering Stage 2 selection:

This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation.

Parameter: Number of dwellings
Actual Range: 36 to 137 (units:)
Range Selected by User: 33 to 137 (units:)

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/08 to 29/09/15

This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.

Selected survey days:

Tuesday	3 days
Wednesday	1 days
Thursday	2 days
Friday	1 days

This data displays the number of selected surveys by day of the week.

Selected survey types:

Manual count	7 days
Directional ATC Count	0 days

This data displays the number of manual classified surveys and the number of unclassified ATC surveys, the total adding up to the overall number of surveys in the selected set. Manual surveys are undertaken using staff, whilst ATC surveys are undertaking using machines.

Selected Locations:

Suburban Area (PPS6 Out of Centre)	3
Edge of Town	2
Neighbourhood Centre (PPS6 Local Centre)	2

This data displays the number of surveys per main location category within the selected set. The main location categories consist of Free Standing, Edge of Town, Suburban Area, Neighbourhood Centre, Edge of Town Centre, Town Centre and Not Known.

Selected Location Sub Categories:

Residential Zone	6
No Sub Category	1

This data displays the number of surveys per location sub-category within the selected set. The location sub-categories consist of Commercial Zone, Industrial Zone, Development Zone, Residential Zone, Retail Zone, Built-Up Zone, Village, Out of Town, High Street and No Sub Category.

Filtering Stage 3 selection:

Use Class:

C3	3 days

This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order 2005 has been used for this purpose, which can be found within the Library module of TRICS®.

Population within 1 mile:

5,001 to 10,000	1 days
15,001 to 20,000	2 days
25,001 to 50,000	4 days

This data displays the number of selected surveys within stated 1-mile radii of population.

Population within 5 miles:

100,001 to 125,000	1 days
125,001 to 250,000	2 days
250,001 to 500,000	2 days
500,001 or More	2 days

This data displays the number of selected surveys within stated 5-mile radii of population.

Car ownership within 5 miles:

0.6 to 1.0	1 days
1.1 to 1.5	6 days

This data displays the number of selected surveys within stated ranges of average cars owned per residential dwelling, within a radius of 5-miles of selected survey sites.

Travel Plan:

No	7 days

This data displays the number of surveys within the selected set that were undertaken at sites with Travel Plans in place, and the number of surveys that were undertaken at sites without Travel Plans.

LIST OF SITES relevant to selection parameters

1 BR-03-N-01 RETIREMENT VILLAGE BRISTOL CITY
HOLLWAY ROAD
STOCKWOOD
BRISTOL
Neighbourhood Centre (PPS6 Local Centre)
Residential Zone
Total Number of dwellings: 58
Survey date: TUESDAY 22/09/15 Survey Type: MANUAL

2 BR-03-N-02 RETIREMENT VILLAGE BRISTOL CITY
MEG THATCHERS GARDENS

BRISTOL
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 49
Survey date: FRIDAY 18/09/15 Survey Type: MANUAL

3 CA-03-N-01 RETIREMENT FLATS CAMBRIDGESHIRE
HEDDA DRIVE
HAMPTON HARGATE
PETERBOROUGH
Neighbourhood Centre (PPS6 Local Centre)
Residential Zone
Total Number of dwellings: 50
Survey date: WEDNESDAY 14/05/08 Survey Type: MANUAL

4 DV-03-N-01 RETIREMENT VILLAGE DEVON
ST MARYCHURCH ROAD
ST MARYCHURCH
TORQUAY
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 45
Survey date: TUESDAY 29/09/15 Survey Type: MANUAL

5 GC-03-N-01 RETIREMENT FLATS GLASGOW CITY
RIVERFORD ROAD
NEWLANDS
GLASGOW
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 47
Survey date: TUESDAY 10/06/08 Survey Type: MANUAL

6 NS-03-N-01 RETIREMENT VILLAGE NORTH SOMERSET
DIAMOND BATCH
WORLE
WESTON SUPER MARE
Edge of Town
Residential Zone
Total Number of dwellings: 137
Survey date: THURSDAY 24/09/15 Survey Type: MANUAL

7 TW-03-N-02 RETIREMENT FLATS TYNE & WEAR
BRABOURNE GARDENS

NORTH SHIELDS
Edge of Town
No Sub Category
Total Number of dwellings: 36
Survey date: THURSDAY 17/12/09 Survey Type: MANUAL

This section provides a list of all survey sites and days in the selected set. For each individual survey site, it displays a unique site reference code and site address, the selected trip rate calculation parameter and its value, the day of the week and date of each survey, and whether the survey was a manual classified count or an ATC count.

TRIP RATE for Land Use 03 - RESIDENTIAL/N - RETIREMENT FLATS

MULTI-MODAL VEHICLES

Calculation factor: 1 DWELLS

BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	7	60	0.026	7	60	0.017	7	60	0.043
08:00 - 09:00	7	60	0.073	7	60	0.050	7	60	0.123
09:00 - 10:00	7	60	0.145	7	60	0.085	7	60	0.230
10:00 - 11:00	7	60	0.085	7	60	0.083	7	60	0.168
11:00 - 12:00	7	60	0.107	7	60	0.109	7	60	0.216
12:00 - 13:00	7	60	0.090	7	60	0.114	7	60	0.204
13:00 - 14:00	7	60	0.152	7	60	0.152	7	60	0.304
14:00 - 15:00	7	60	0.102	7	60	0.126	7	60	0.228
15:00 - 16:00	7	60	0.088	7	60	0.111	7	60	0.199
16:00 - 17:00	7	60	0.135	7	60	0.095	7	60	0.230
17:00 - 18:00	7	60	0.055	7	60	0.095	7	60	0.150
18:00 - 19:00	7	60	0.069	7	60	0.073	7	60	0.142
19:00 - 20:00	4	72	0.038	4	72	0.055	4	72	0.093
20:00 - 21:00	4	72	0.035	4	72	0.048	4	72	0.083
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			1.200			1.213			2.413

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.

Parameter summary

Trip rate parameter range selected:	36 - 137 (units:)
Survey date date range:	01/01/08 - 29/09/15
Number of weekdays (Monday-Friday):	7
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	0
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 03 - RESIDENTIAL/N - RETIREMENT FLATS

MULTI-MODAL CYCLISTS

Calculation factor: 1 DWELLS

BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	7	60	0.000	7	60	0.000	7	60	0.000
08:00 - 09:00	7	60	0.000	7	60	0.000	7	60	0.000
09:00 - 10:00	7	60	0.000	7	60	0.000	7	60	0.000
10:00 - 11:00	7	60	0.000	7	60	0.000	7	60	0.000
11:00 - 12:00	7	60	0.000	7	60	0.000	7	60	0.000
12:00 - 13:00	7	60	0.000	7	60	0.000	7	60	0.000
13:00 - 14:00	7	60	0.000	7	60	0.000	7	60	0.000
14:00 - 15:00	7	60	0.000	7	60	0.000	7	60	0.000
15:00 - 16:00	7	60	0.000	7	60	0.000	7	60	0.000
16:00 - 17:00	7	60	0.000	7	60	0.000	7	60	0.000
17:00 - 18:00	7	60	0.000	7	60	0.000	7	60	0.000
18:00 - 19:00	7	**60**	**0.002**	7	60	0.000	7	**60**	**0.002**
19:00 - 20:00	4	72	0.000	4	72	0.000	4	72	0.000
20:00 - 21:00	4	72	0.000	4	72	0.000	4	72	0.000
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.002			0.000			0.002

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.

Parameter summary

Trip rate parameter range selected:	36 - 137 (units:)
Survey date date range:	01/01/08 - 29/09/15
Number of weekdays (Monday-Friday):	7
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	0
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 03 - RESIDENTIAL/N - RETIREMENT FLATS

MULTI-MODAL VEHICLE OCCUPANTS

Calculation factor: 1 DWELLS

BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	7	60	0.028	7	60	0.017	7	60	0.045
08:00 - 09:00	7	60	0.100	7	60	0.069	7	60	0.169
09:00 - 10:00	7	60	0.180	7	60	0.111	7	60	0.291
10:00 - 11:00	7	60	0.104	7	60	0.109	7	60	0.213
11:00 - 12:00	7	60	0.137	7	60	0.149	7	60	0.286
12:00 - 13:00	7	60	0.118	7	60	0.161	7	60	0.279
13:00 - 14:00	7	60	0.209	7	60	0.197	7	60	0.406
14:00 - 15:00	7	60	0.137	7	60	0.154	7	60	0.291
15:00 - 16:00	7	60	0.114	7	60	0.137	7	60	0.251
16:00 - 17:00	7	60	0.173	7	60	0.102	7	60	0.275
17:00 - 18:00	7	60	0.085	7	60	0.142	7	60	0.227
18:00 - 19:00	7	60	0.092	7	60	0.085	7	60	0.177
19:00 - 20:00	4	72	0.045	4	72	0.083	4	72	0.128
20:00 - 21:00	4	72	0.052	4	72	0.059	4	72	0.111
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			1.574			1.575			3.149

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.

Parameter summary

Trip rate parameter range selected:	36 - 137 (units:)
Survey date date range:	01/01/08 - 29/09/15
Number of weekdays (Monday-Friday):	7
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	0
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 03 - RESIDENTIAL/N - RETIREMENT FLATS
MULTI-MODAL PEDESTRIANS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	7	60	0.019	7	60	0.017	7	60	0.036
08:00 - 09:00	7	60	0.024	7	60	0.014	7	60	0.038
09:00 - 10:00	7	60	0.066	7	60	0.062	7	60	0.128
10:00 - 11:00	7	60	0.033	7	60	0.071	7	60	0.104
11:00 - 12:00	7	**60**	**0.081**	7	60	0.050	7	60	0.131
12:00 - 13:00	7	60	0.059	7	**60**	**0.073**	7	60	0.132
13:00 - 14:00	7	60	0.081	7	60	0.066	7	**60**	**0.147**
14:00 - 15:00	7	60	0.045	7	60	0.057	7	60	0.102
15:00 - 16:00	7	60	0.045	7	60	0.052	7	60	0.097
16:00 - 17:00	7	60	0.043	7	60	0.026	7	60	0.069
17:00 - 18:00	7	60	0.036	7	60	0.031	7	60	0.067
18:00 - 19:00	7	60	0.009	7	60	0.017	7	60	0.026
19:00 - 20:00	4	72	0.003	4	72	0.028	4	72	0.031
20:00 - 21:00	4	72	0.007	4	72	0.003	4	72	0.010
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.551			0.567			1.118

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.

Parameter summary

Trip rate parameter range selected:	36 - 137 (units:)
Survey date date range:	01/01/08 - 29/09/15
Number of weekdays (Monday-Friday):	7
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	0
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 03 - RESIDENTIAL/N - RETIREMENT FLATS
MULTI-MODAL PUBLIC TRANSPORT USERS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	7	60	0.000	7	60	0.000	7	60	0.000
08:00 - 09:00	7	60	0.002	7	60	0.002	7	60	0.004
09:00 - 10:00	7	60	0.007	7	60	0.019	7	60	0.026
10:00 - 11:00	7	60	0.031	7	60	0.009	7	60	0.040
11:00 - 12:00	7	60	0.005	7	60	0.026	7	60	0.031
12:00 - 13:00	7	60	0.017	7	60	0.017	7	60	0.034
13:00 - 14:00	7	60	0.007	7	60	0.019	7	60	0.026
14:00 - 15:00	7	60	0.009	7	**60**	**0.033**	7	60	0.042
15:00 - 16:00	7	60	0.026	7	60	0.005	7	60	0.031
16:00 - 17:00	7	**60**	**0.038**	7	60	0.031	7	**60**	**0.069**
17:00 - 18:00	7	60	0.002	7	60	0.000	7	60	0.002
18:00 - 19:00	7	60	0.002	7	60	0.019	7	60	0.021
19:00 - 20:00	4	72	0.007	4	72	0.003	4	72	0.010
20:00 - 21:00	4	72	0.000	4	72	0.000	4	72	0.000
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.153			0.183			0.336

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.

Parameter summary

Trip rate parameter range selected: 36 - 137 (units:)
Survey date date range: 01/01/08 - 29/09/15
Number of weekdays (Monday-Friday): 7
Number of Saturdays: 0
Number of Sundays: 0
Surveys automatically removed from selection: 0
Surveys manually removed from selection: 0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 03 - RESIDENTIAL/N - RETIREMENT FLATS

MULTI-MODAL TOTAL PEOPLE

Calculation factor: 1 DWELLS

BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	7	60	0.047	7	60	0.033	7	60	0.080
08:00 - 09:00	7	60	0.126	7	60	0.085	7	60	0.211
09:00 - 10:00	7	60	0.254	7	60	0.192	7	60	0.446
10:00 - 11:00	7	60	0.168	7	60	0.190	7	60	0.358
11:00 - 12:00	7	60	0.223	7	60	0.225	7	60	0.448
12:00 - 13:00	7	60	0.194	7	60	0.251	7	60	0.445
13:00 - 14:00	7	60	0.296	7	60	0.282	7	60	0.578
14:00 - 15:00	7	60	0.192	7	60	0.244	7	60	0.436
15:00 - 16:00	7	60	0.185	7	60	0.194	7	60	0.379
16:00 - 17:00	7	60	0.254	7	60	0.159	7	60	0.413
17:00 - 18:00	7	60	0.123	7	60	0.173	7	60	0.296
18:00 - 19:00	7	60	0.107	7	60	0.121	7	60	0.228
19:00 - 20:00	4	72	0.055	4	72	0.114	4	72	0.169
20:00 - 21:00	4	72	0.059	4	72	0.062	4	72	0.121
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			2.283			2.325			4.608

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.

Parameter summary

Trip rate parameter range selected: 36 - 137 (units:)
Survey date date range: 01/01/08 - 29/09/15
Number of weekdays (Monday-Friday): 7
Number of Saturdays: 0
Number of Sundays: 0
Surveys automatically removed from selection: 0
Surveys manually removed from selection: 0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

Calculation Reference: AUDIT-109305-161104-1121

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 05 - HEALTH
Category : F - CARE HOME (ELDERLY RESIDENTIAL)
MULTI-MODAL VEHICLES

Selected regions and areas:

03	SOUTH WEST		
	DC	DORSET	1 days
05	EAST MIDLANDS		
	LN	LINCOLNSHIRE	1 days
06	WEST MIDLANDS		
	WK	WARWICKSHIRE	1 days
07	YORKSHIRE & NORTH LINCOLNSHIRE		
	NY	NORTH YORKSHIRE	1 days
	WY	WEST YORKSHIRE	1 days
11	SCOTLAND		
	AG	ANGUS	1 days

This section displays the number of survey days per TRICS® sub-region in the selected set

Filtering Stage 2 selection:

This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation.

Parameter: Number of residents
Actual Range: 32 to 76 (units:)
Range Selected by User: 32 to 180 (units:)

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/08 to 11/12/13

This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.

Selected survey days:

Tuesday	1 days
Wednesday	1 days
Thursday	1 days
Sunday	3 days

This data displays the number of selected surveys by day of the week.

Selected survey types:

Manual count	6 days
Directional ATC Count	0 days

This data displays the number of manual classified surveys and the number of unclassified ATC surveys, the total adding up to the overall number of surveys in the selected set. Manual surveys are undertaken using staff, whilst ATC surveys are undertaking using machines.

Selected Locations:

Suburban Area (PPS6 Out of Centre)	5
Edge of Town	1

This data displays the number of surveys per main location category within the selected set. The main location categories consist of Free Standing, Edge of Town, Suburban Area, Neighbourhood Centre, Edge of Town Centre, Town Centre and Not Known.

Selected Location Sub Categories:

Residential Zone	6

This data displays the number of surveys per location sub-category within the selected set. The location sub-categories consist of Commercial Zone, Industrial Zone, Development Zone, Residential Zone, Retail Zone, Built-Up Zone, Village, Out of Town, High Street and No Sub Category.

Filtering Stage 3 selection:

Use Class:

C2	5 days
C3	1 days

This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order 2005 has been used for this purpose, which can be found within the Library module of TRICS®.

Population within 1 mile:

1,001 to 5,000	1 days
5,001 to 10,000	1 days
10,001 to 15,000	1 days
20,001 to 25,000	1 days
25,001 to 50,000	2 days

This data displays the number of selected surveys within stated 1-mile radii of population.

Population within 5 miles:

5,001 to 25,000	1 days
25,001 to 50,000	1 days
75,001 to 100,000	1 days
125,001 to 250,000	1 days
250,001 to 500,000	1 days
500,001 or More	1 days

This data displays the number of selected surveys within stated 5-mile radii of population.

Car ownership within 5 miles:

0.6 to 1.0	3 days
1.1 to 1.5	3 days

This data displays the number of selected surveys within stated ranges of average cars owned per residential dwelling, within a radius of 5-miles of selected survey sites.

Travel Plan:

No	6 days

This data displays the number of surveys within the selected set that were undertaken at sites with Travel Plans in place, and the number of surveys that were undertaken at sites without Travel Plans.

LIST OF SITES relevant to selection parameters

1 AG-05-F-01 NURSING HOME ANGUS
SEATON GROVE
SEATON ROAD
ARBROATH
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of residents: 48
Survey date: SUNDAY 20/05/12 Survey Type: MANUAL

2 DC-05-F-02 NURSING HOME DORSET
WHARNCLIFFE ROAD
BOSCOMBE
BOURNEMOUTH
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of residents: 43
Survey date: WEDNESDAY 16/07/08 Survey Type: MANUAL

3 LN-05-F-01 NURSING HOME LINCOLNSHIRE
23 NETTLEHAM ROAD

LINCOLN
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of residents: 38
Survey date: SUNDAY 30/06/13 Survey Type: MANUAL

4 NY-05-F-04 NURSING HOME NORTH YORKSHIRE
ROECLIFFE LANE

BOROUGHBRIDGE
Edge of Town
Residential Zone
Total Number of residents: 76
Survey date: SUNDAY 16/10/11 Survey Type: MANUAL

5 WK-05-F-01 NURSING HOME WARWICKSHIRE
CLARENDON SQUARE

LEAMINGTON SPA
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of residents: 32
Survey date: THURSDAY 25/10/12 Survey Type: MANUAL

6 WY-05-F-01 NURSING HOME WEST YORKSHIRE
CLIFF ROAD
HYDE PARK
LEEDS
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of residents: 58
Survey date: TUESDAY 15/06/10 Survey Type: MANUAL

This section provides a list of all survey sites and days in the selected set. For each individual survey site, it displays a unique site reference code and site address, the selected trip rate calculation parameter and its value, the day of the week and date of each survey, and whether the survey was a manual classified count or an ATC count.

TRIP RATE for Land Use 05 - HEALTH/F - CARE HOME (ELDERLY RESIDENTIAL)
MULTI-MODAL VEHICLES
Calculation factor: 1 RESIDE
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. RESIDE	Trip Rate	No. Days	Ave. RESIDE	Trip Rate	No. Days	Ave. RESIDE	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	6	49	0.081	6	49	0.058	6	49	0.139
08:00 - 09:00	6	49	0.051	6	49	0.034	6	49	0.085
09:00 - 10:00	6	49	0.047	6	49	0.024	6	49	0.071
10:00 - 11:00	6	49	0.071	6	49	0.058	6	49	0.129
11:00 - 12:00	6	**49**	**0.088**	6	49	0.068	6	**49**	**0.156**
12:00 - 13:00	6	49	0.044	6	49	0.078	6	49	0.122
13:00 - 14:00	6	49	0.071	6	49	0.044	6	49	0.115
14:00 - 15:00	6	49	0.088	6	49	0.064	6	49	0.152
15:00 - 16:00	6	49	0.051	6	49	0.068	6	49	0.119
16:00 - 17:00	6	49	0.054	6	49	0.081	6	49	0.135
17:00 - 18:00	6	49	0.044	6	**49**	**0.092**	6	49	0.136
18:00 - 19:00	6	49	0.058	6	49	0.071	6	49	0.129
19:00 - 20:00	6	49	0.047	6	49	0.047	6	49	0.094
20:00 - 21:00	5	50	0.008	5	50	0.040	5	50	0.048
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.803			0.827			1.630

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.

Parameter summary

Trip rate parameter range selected:	32 - 76 (units:)
Survey date date range:	01/01/08 - 11/12/13
Number of weekdays (Monday-Friday):	3
Number of Saturdays:	0
Number of Sundays:	3
Surveys automatically removed from selection:	0
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 05 - HEALTH/F - CARE HOME (ELDERLY RESIDENTIAL)

MULTI-MODAL CYCLISTS

Calculation factor: 1 RESIDE

BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. RESIDE	Trip Rate	No. Days	Ave. RESIDE	Trip Rate	No. Days	Ave. RESIDE	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	6	49	0.000	6	49	0.000	6	49	0.000
08:00 - 09:00	6	49	0.003	6	49	0.003	6	49	0.006
09:00 - 10:00	6	49	0.003	6	49	0.003	6	49	0.006
10:00 - 11:00	6	49	0.000	6	49	0.000	6	49	0.000
11:00 - 12:00	6	49	0.000	6	49	0.000	6	49	0.000
12:00 - 13:00	6	49	0.000	6	49	0.000	6	49	0.000
13:00 - 14:00	6	49	0.003	6	49	0.000	6	49	0.003
14:00 - 15:00	6	49	0.000	6	49	0.000	6	49	0.000
15:00 - 16:00	6	49	0.010	6	**49**	**0.014**	6	**49**	**0.024**
16:00 - 17:00	6	49	0.000	6	49	0.000	6	49	0.000
17:00 - 18:00	6	**49**	**0.014**	6	49	0.010	6	49	0.024
18:00 - 19:00	6	49	0.000	6	49	0.000	6	49	0.000
19:00 - 20:00	6	49	0.000	6	49	0.000	6	49	0.000
20:00 - 21:00	5	50	0.000	5	50	0.000	5	50	0.000
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.033			0.030			0.063

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.

Parameter summary

Trip rate parameter range selected:	32 - 76 (units:)
Survey date date range:	01/01/08 - 11/12/13
Number of weekdays (Monday-Friday):	3
Number of Saturdays:	0
Number of Sundays:	3
Surveys automatically removed from selection:	0
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 05 - HEALTH/F - CARE HOME (ELDERLY RESIDENTIAL)
MULTI-MODAL VEHICLE OCCUPANTS
Calculation factor: 1 RESIDE
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. RESIDE	Trip Rate	No. Days	Ave. RESIDE	Trip Rate	No. Days	Ave. RESIDE	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	6	49	0.095	6	49	0.058	6	49	0.153
08:00 - 09:00	6	49	0.064	6	49	0.041	6	49	0.105
09:00 - 10:00	6	49	0.047	6	49	0.027	6	49	0.074
10:00 - 11:00	6	49	0.085	6	49	0.078	6	49	0.163
11:00 - 12:00	6	49	0.122	6	49	0.085	6	**49**	**0.207**
12:00 - 13:00	6	49	0.047	6	49	0.095	6	49	0.142
13:00 - 14:00	6	49	0.102	6	49	0.061	6	49	0.163
14:00 - 15:00	6	**49**	**0.125**	6	49	0.075	6	49	0.200
15:00 - 16:00	6	49	0.075	6	49	0.081	6	49	0.156
16:00 - 17:00	6	49	0.061	6	**49**	**0.132**	6	49	0.193
17:00 - 18:00	6	49	0.047	6	49	0.119	6	49	0.166
18:00 - 19:00	6	49	0.081	6	49	0.092	6	49	0.173
19:00 - 20:00	6	49	0.061	6	49	0.061	6	49	0.122
20:00 - 21:00	5	50	0.012	5	50	0.056	5	50	0.068
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			1.024			1.061			2.085

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.

Parameter summary

Trip rate parameter range selected:	32 - 76 (units:)
Survey date date range:	01/01/08 - 11/12/13
Number of weekdays (Monday-Friday):	3
Number of Saturdays:	0
Number of Sundays:	3
Surveys automatically removed from selection:	0
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 05 - HEALTH/F - CARE HOME (ELDERLY RESIDENTIAL)
MULTI-MODAL PEDESTRIANS
Calculation factor: 1 RESIDE
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. RESIDE	Trip Rate	No. Days	Ave. RESIDE	Trip Rate	No. Days	Ave. RESIDE	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	6	49	**0.041**	6	49	0.017	6	49	0.058
08:00 - 09:00	6	49	0.017	6	49	0.020	6	49	0.037
09:00 - 10:00	6	49	0.017	6	49	0.007	6	49	0.024
10:00 - 11:00	6	49	0.037	6	49	0.014	6	49	0.051
11:00 - 12:00	6	49	0.017	6	49	0.034	6	49	0.051
12:00 - 13:00	6	49	0.024	6	49	0.037	6	49	0.061
13:00 - 14:00	6	49	0.024	6	49	0.017	6	49	0.041
14:00 - 15:00	6	49	0.024	6	49	0.031	6	49	0.055
15:00 - 16:00	6	49	0.037	6	49	**0.047**	6	49	**0.084**
16:00 - 17:00	6	49	0.007	6	49	0.020	6	49	0.027
17:00 - 18:00	6	49	0.003	6	49	0.017	6	49	0.020
18:00 - 19:00	6	49	0.017	6	49	0.003	6	49	0.020
19:00 - 20:00	6	49	0.017	6	49	0.024	6	49	0.041
20:00 - 21:00	5	50	0.000	5	50	0.012	5	50	0.012
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.282			0.300			0.582

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.

Parameter summary

Trip rate parameter range selected: 32 - 76 (units:)
Survey date date range: 01/01/08 - 11/12/13
Number of weekdays (Monday-Friday): 3
Number of Saturdays: 0
Number of Sundays: 3
Surveys automatically removed from selection: 0
Surveys manually removed from selection: 0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 05 - HEALTH/F - CARE HOME (ELDERLY RESIDENTIAL)

MULTI-MODAL PUBLIC TRANSPORT USERS

Calculation factor: 1 RESIDE

BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. RESIDE	Trip Rate	No. Days	Ave. RESIDE	Trip Rate	No. Days	Ave. RESIDE	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	6	49	0.017	6	49	0.000	6	49	0.017
08:00 - 09:00	6	49	0.007	6	49	0.014	6	49	0.021
09:00 - 10:00	6	49	0.000	6	49	0.003	6	49	0.003
10:00 - 11:00	6	**49**	**0.051**	6	49	0.007	6	**49**	**0.058**
11:00 - 12:00	6	49	0.020	6	49	0.000	6	49	0.020
12:00 - 13:00	6	49	0.000	6	49	0.003	6	49	0.003
13:00 - 14:00	6	49	0.003	6	49	0.000	6	49	0.003
14:00 - 15:00	6	49	0.007	6	49	0.014	6	49	0.021
15:00 - 16:00	6	49	0.000	6	49	0.003	6	49	0.003
16:00 - 17:00	6	49	0.000	6	49	0.024	6	49	0.024
17:00 - 18:00	6	49	0.007	6	**49**	**0.031**	6	49	0.038
18:00 - 19:00	6	49	0.007	6	49	0.000	6	49	0.007
19:00 - 20:00	6	49	0.014	6	49	0.000	6	49	0.014
20:00 - 21:00	5	50	0.004	5	50	0.008	5	50	0.012
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.137			0.107			0.244

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.

Parameter summary

Trip rate parameter range selected:	32 - 76 (units:)
Survey date date range:	01/01/08 - 11/12/13
Number of weekdays (Monday-Friday):	3
Number of Saturdays:	0
Number of Sundays:	3
Surveys automatically removed from selection:	0
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 05 - HEALTH/F - CARE HOME (ELDERLY RESIDENTIAL)
MULTI-MODAL TOTAL PEOPLE
Calculation factor: 1 RESIDE
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. RESIDE	Trip Rate	No. Days	Ave. RESIDE	Trip Rate	No. Days	Ave. RESIDE	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	6	49	0.153	6	49	0.075	6	49	0.228
08:00 - 09:00	6	49	0.092	6	49	0.078	6	49	0.170
09:00 - 10:00	6	49	0.068	6	49	0.041	6	49	0.109
10:00 - 11:00	6	**49**	**0.173**	6	49	0.098	6	49	0.271
11:00 - 12:00	6	49	0.159	6	49	0.119	6	**49**	**0.278**
12:00 - 13:00	6	49	0.071	6	49	0.136	6	49	0.207
13:00 - 14:00	6	49	0.132	6	49	0.078	6	49	0.210
14:00 - 15:00	6	49	0.156	6	49	0.119	6	49	0.275
15:00 - 16:00	6	49	0.122	6	49	0.146	6	49	0.268
16:00 - 17:00	6	49	0.068	6	**49**	**0.176**	6	49	0.244
17:00 - 18:00	6	49	0.071	6	49	0.176	6	49	0.247
18:00 - 19:00	6	49	0.105	6	49	0.095	6	49	0.200
19:00 - 20:00	6	49	0.092	6	49	0.085	6	49	0.177
20:00 - 21:00	5	50	0.016	5	50	0.075	5	50	0.091
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			1.478			1.497			2.975

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.

Parameter summary

Trip rate parameter range selected:	32 - 76 (units:)
Survey date date range:	01/01/08 - 11/12/13
Number of weekdays (Monday-Friday):	3
Number of Saturdays:	0
Number of Sundays:	3
Surveys automatically removed from selection:	0
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

Calculation Reference: AUDIT-109305-161104-1107

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 01 - RETAIL
Category : I - SHOPPING CENTRE - LOCAL SHOPS
MULTI-MODAL VEHICLES

Selected regions and areas:

03	SOUTH WEST		
	GS	GLOUCESTERSHIRE	1 days
05	EAST MIDLANDS		
	LE	LEICESTERSHIRE	1 days
	NR	NORTHAMPTONSHIRE	1 days
06	WEST MIDLANDS		
	SH	SHROPSHIRE	1 days
08	NORTH WEST		
	CH	CHESHIRE	2 days
09	NORTH		
	TV	TEES VALLEY	2 days
	TW	TYNE & WEAR	1 days
11	SCOTLAND		
	EB	CITY OF EDINBURGH	1 days

This section displays the number of survey days per TRICS® sub-region in the selected set

Filtering Stage 2 selection:

This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation.

Parameter: Gross floor area
Actual Range: 260 to 1840 (units: sqm)
Range Selected by User: 240 to 2500 (units: sqm)

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/08 to 28/10/14

This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.

Selected survey days:

Monday	2 days
Tuesday	2 days
Wednesday	2 days
Thursday	3 days
Friday	1 days

This data displays the number of selected surveys by day of the week.

Selected survey types:

Manual count	10 days
Directional ATC Count	0 days

This data displays the number of manual classified surveys and the number of unclassified ATC surveys, the total adding up to the overall number of surveys in the selected set. Manual surveys are undertaken using staff, whilst ATC surveys are undertaking using machines.

Selected Locations:

Suburban Area (PPS6 Out of Centre)	2
Edge of Town	2
Neighbourhood Centre (PPS6 Local Centre)	6

This data displays the number of surveys per main location category within the selected set. The main location categories consist of Free Standing, Edge of Town, Suburban Area, Neighbourhood Centre, Edge of Town Centre, Town Centre and Not Known.

Selected Location Sub Categories:

Residential Zone	10

This data displays the number of surveys per location sub-category within the selected set. The location sub-categories consist of Commercial Zone, Industrial Zone, Development Zone, Residential Zone, Retail Zone, Built-Up Zone, Village, Out of Town, High Street and No Sub Category.

Filtering Stage 3 selection:

Use Class:

A1	8 days

This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order 2005 has been used for this purpose, which can be found within the Library module of TRICS®.

Population within 1 mile:

5,001 to 10,000	1 days
10,001 to 15,000	1 days
15,001 to 20,000	2 days
20,001 to 25,000	2 days
25,001 to 50,000	3 days
50,001 to 100,000	1 days

This data displays the number of selected surveys within stated 1-mile radii of population.

Population within 5 miles:

25,001 to 50,000	1 days
100,001 to 125,000	3 days
125,001 to 250,000	2 days
250,001 to 500,000	4 days

This data displays the number of selected surveys within stated 5-mile radii of population.

Car ownership within 5 miles:

0.6 to 1.0	3 days
1.1 to 1.5	7 days

This data displays the number of selected surveys within stated ranges of average cars owned per residential dwelling, within a radius of 5-miles of selected survey sites.

Petrol filling station:

Included in the survey count	0 days
Excluded from count or no filling station	10 days

This data displays the number of surveys within the selected set that include petrol filling station activity, and the number of surveys that do not.

Travel Plan:

No	10 days

This data displays the number of surveys within the selected set that were undertaken at sites with Travel Plans in place, and the number of surveys that were undertaken at sites without Travel Plans.

LIST OF SITES relevant to selection parameters

1 CH-01-I-02 LOCAL SHOPS CHESHIRE
CHRISTLETON ROAD
BOUGHTON HEATH
CHESTER
Neighbourhood Centre (PPS6 Local Centre)
Residential Zone
Total Gross floor area: 260 sqm
Survey date: TUESDAY 15/05/12 Survey Type: MANUAL

2 CH-01-I-03 LOCAL SHOPS CHESHIRE
MILL LANE
BACHE
CHESTER
Neighbourhood Centre (PPS6 Local Centre)
Residential Zone
Total Gross floor area: 365 sqm
Survey date: THURSDAY 17/05/12 Survey Type: MANUAL

3 EB-01-I-01 LOCAL SHOPS CITY OF EDINBURGH
COLINTON ROAD
CRAIGLOCKHART
EDINBURGH
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Gross floor area: 825 sqm
Survey date: THURSDAY 28/10/10 Survey Type: MANUAL

4 GS-01-I-01 LOCAL SHOPS GLOUCESTERSHIRE
SALISBURY AVENUE
WARDEN HILL
CHELTENHAM
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Gross floor area: 525 sqm
Survey date: MONDAY 26/04/10 Survey Type: MANUAL

5 LE-01-I-02 LOCAL SHOPS LEICESTERSHIRE
RYDER ROAD

LEICESTER
Edge of Town
Residential Zone
Total Gross floor area: 550 sqm
Survey date: TUESDAY 28/10/14 Survey Type: MANUAL

6 NR-01-I-01 LOCAL SHOPS NORTHAMPTONSHIRE
OCCUPATION ROAD

CORBY
Neighbourhood Centre (PPS6 Local Centre)
Residential Zone
Total Gross floor area: 755 sqm
Survey date: WEDNESDAY 19/11/08 Survey Type: MANUAL

7 SH-01-I-02 LOCAL SHOPS SHROPSHIRE
WREKIN DRIVE
DONNINGTON
TELFORD
Edge of Town
Residential Zone
Total Gross floor area: 900 sqm
Survey date: THURSDAY 24/10/13 Survey Type: MANUAL

LIST OF SITES relevant to selection parameters (Cont.)

8	TV-01-I-03	LOCAL SHOPS		TEES VALLEY
	ACKLAM ROAD			
	ACKLAM			
	MIDDLESBROUGH			
	Neighbourhood Centre (PPS6 Local Centre)			
	Residential Zone			
	Total Gross floor area:		1840 sqm	
	Survey date: FRIDAY		04/10/13	Survey Type: MANUAL
9	TV-01-I-04	LOCAL SHOPS		TEES VALLEY
	CARGO FLEET LANE			
	ORMESBY			
	MIDDLESBROUGH			
	Neighbourhood Centre (PPS6 Local Centre)			
	Residential Zone			
	Total Gross floor area:		585 sqm	
	Survey date: MONDAY		07/10/13	Survey Type: MANUAL
10	TW-01-I-02	LOCAL SHOPS		TYNE & WEAR
	DURHAM ROAD			
	BARNES PARK			
	SUNDERLAND			
	Neighbourhood Centre (PPS6 Local Centre)			
	Residential Zone			
	Total Gross floor area:		540 sqm	
	Survey date: WEDNESDAY		21/11/12	Survey Type: MANUAL

This section provides a list of all survey sites and days in the selected set. For each individual survey site, it displays a unique site reference code and site address, the selected trip rate calculation parameter and its value, the day of the week and date of each survey, and whether the survey was a manual classified count or an ATC count.

TRIP RATE for Land Use 01 - RETAIL/I - SHOPPING CENTRE - LOCAL SHOPS
MULTI-MODAL VEHICLES
Calculation factor: 100 sqm
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00	1	540	1.296	1	540	1.296	1	540	2.592
07:00 - 08:00	10	715	5.416	10	715	4.829	10	715	10.245
08:00 - 09:00	10	715	5.710	10	715	5.206	10	715	10.916
09:00 - 10:00	10	715	6.466	10	715	5.962	10	715	12.428
10:00 - 11:00	10	715	5.878	10	715	5.500	10	715	11.378
11:00 - 12:00	10	715	6.704	10	715	6.746	10	715	13.450
12:00 - 13:00	10	715	8.523	10	715	8.006	10	715	16.529
13:00 - 14:00	10	715	7.418	10	715	7.362	10	715	14.780
14:00 - 15:00	10	715	6.032	10	715	6.326	10	715	12.358
15:00 - 16:00	10	715	5.724	10	715	6.046	10	715	11.770
16:00 - 17:00	10	715	6.144	10	715	5.892	10	715	12.036
17:00 - 18:00	10	715	6.508	10	715	7.124	10	715	13.632
18:00 - 19:00	10	715	6.746	10	715	7.292	10	715	14.038
19:00 - 20:00	8	815	6.457	8	815	6.304	8	815	12.761
20:00 - 21:00	8	815	4.463	8	815	4.969	8	815	9.432
21:00 - 22:00	6	823	3.846	6	823	4.433	6	823	8.279
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			93.331			93.293			186.624

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.

Parameter summary

Trip rate parameter range selected:	260 - 1840 (units: sqm)
Survey date date range:	01/01/08 - 28/10/14
Number of weekdays (Monday-Friday):	10
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	4
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 01 - RETAIL/I - SHOPPING CENTRE - LOCAL SHOPS
MULTI-MODAL CYCLISTS
Calculation factor: 100 sqm
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00	1	540	0.185	1	540	0.000	1	540	0.185
07:00 - 08:00	10	715	0.294	10	715	0.224	10	715	0.518
08:00 - 09:00	10	715	0.224	10	715	0.224	10	715	0.448
09:00 - 10:00	10	715	0.210	10	715	0.210	10	715	0.420
10:00 - 11:00	10	715	0.154	10	715	0.126	10	715	0.280
11:00 - 12:00	10	715	0.182	10	715	0.182	10	715	0.364
12:00 - 13:00	10	715	0.126	10	715	0.168	10	715	0.294
13:00 - 14:00	10	715	0.168	10	715	0.168	10	715	0.336
14:00 - 15:00	10	715	0.182	10	715	0.224	10	715	0.406
15:00 - 16:00	**10**	**715**	**0.392**	**10**	**715**	**0.336**	**10**	**715**	**0.728**
16:00 - 17:00	10	715	0.364	10	715	0.322	10	715	0.686
17:00 - 18:00	10	715	0.112	10	715	0.182	10	715	0.294
18:00 - 19:00	10	715	0.308	10	715	0.266	10	715	0.574
19:00 - 20:00	8	815	0.169	8	815	0.184	8	815	0.353
20:00 - 21:00	8	815	0.015	8	815	0.061	8	815	0.076
21:00 - 22:00	6	823	0.202	6	823	0.162	6	823	0.364
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			3.287			3.039			6.326

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.

Parameter summary

Trip rate parameter range selected:	260 - 1840 (units: sqm)
Survey date date range:	01/01/08 - 28/10/14
Number of weekdays (Monday-Friday):	10
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	4
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 01 - RETAIL/I - SHOPPING CENTRE - LOCAL SHOPS
MULTI-MODAL VEHICLE OCCUPANTS
Calculation factor: 100 sqm
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00	1	540	1.481	1	540	1.481	1	540	2.962
07:00 - 08:00	10	715	6.312	10	715	5.542	10	715	11.854
08:00 - 09:00	10	715	7.222	10	715	6.410	10	715	13.632
09:00 - 10:00	10	715	7.824	10	715	7.152	10	715	14.976
10:00 - 11:00	10	715	7.446	10	715	6.928	10	715	14.374
11:00 - 12:00	10	715	8.425	10	715	8.537	10	715	16.962
12:00 - 13:00	**10**	**715**	**10.623**	**10**	**715**	**10.217**	**10**	**715**	**20.840**
13:00 - 14:00	10	715	9.125	10	715	9.321	10	715	18.446
14:00 - 15:00	10	715	7.768	10	715	8.244	10	715	16.012
15:00 - 16:00	10	715	7.572	10	715	8.104	10	715	15.676
16:00 - 17:00	10	715	8.062	10	715	7.810	10	715	15.872
17:00 - 18:00	10	715	8.705	10	715	9.783	10	715	18.488
18:00 - 19:00	10	715	9.531	10	715	10.175	10	715	19.706
19:00 - 20:00	8	815	9.080	8	815	8.911	8	815	17.991
20:00 - 21:00	8	815	6.043	8	815	6.488	8	815	12.531
21:00 - 22:00	6	823	5.040	6	823	5.304	6	823	10.344
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			120.259			120.407			240.666

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.

Parameter summary

Trip rate parameter range selected:	260 - 1840 (units: sqm)
Survey date date range:	01/01/08 - 28/10/14
Number of weekdays (Monday-Friday):	10
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	4
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 01 - RETAIL/I - SHOPPING CENTRE - LOCAL SHOPS
MULTI-MODAL PEDESTRIANS
Calculation factor: 100 sqm
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00	1	540	4.259	1	540	3.333	1	540	7.592
07:00 - 08:00	10	715	3.835	10	715	3.065	10	715	6.900
08:00 - 09:00	10	715	8.300	10	715	8.649	10	715	16.949
09:00 - 10:00	10	715	6.858	10	715	5.962	10	715	12.820
10:00 - 11:00	10	715	6.452	10	715	6.144	10	715	12.596
11:00 - 12:00	10	715	6.312	10	715	6.312	10	715	12.624
12:00 - 13:00	10	715	8.160	10	715	7.460	10	715	15.620
13:00 - 14:00	10	715	6.914	10	715	6.774	10	715	13.688
14:00 - 15:00	10	715	6.060	10	715	6.354	10	715	12.414
15:00 - 16:00	**10**	**715**	**10.077**	**10**	**715**	**10.021**	**10**	**715**	**20.098**
16:00 - 17:00	10	715	5.472	10	715	5.654	10	715	11.126
17:00 - 18:00	10	715	4.297	10	715	5.122	10	715	9.419
18:00 - 19:00	10	715	3.765	10	715	4.297	10	715	8.062
19:00 - 20:00	8	815	3.589	8	815	3.911	8	815	7.500
20:00 - 21:00	8	815	2.776	8	815	3.113	8	815	5.889
21:00 - 22:00	6	823	2.611	6	823	2.996	6	823	5.607
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			89.737			89.167			178.904

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.

Parameter summary

Trip rate parameter range selected:	260 - 1840 (units: sqm)
Survey date date range:	01/01/08 - 28/10/14
Number of weekdays (Monday-Friday):	10
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	4
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 01 - RETAIL/I - SHOPPING CENTRE - LOCAL SHOPS
MULTI-MODAL PUBLIC TRANSPORT USERS
Calculation factor: 100 sqm
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00	1	540	0.741	1	540	1.111	1	540	1.852
07:00 - 08:00	10	715	0.252	10	715	0.224	10	715	0.476
08:00 - 09:00	10	715	0.182	10	715	0.336	10	715	0.518
09:00 - 10:00	10	715	0.140	10	715	0.126	10	715	0.266
10:00 - 11:00	10	715	0.210	10	715	0.182	10	715	0.392
11:00 - 12:00	10	715	0.350	10	715	0.462	10	715	0.812
12:00 - 13:00	10	715	0.378	10	715	0.294	10	715	0.672
13:00 - 14:00	10	715	0.476	10	715	0.224	10	715	0.700
14:00 - 15:00	10	715	0.238	10	715	0.252	10	715	0.490
15:00 - 16:00	10	715	0.420	10	715	0.182	10	715	0.602
16:00 - 17:00	10	715	0.252	10	715	0.196	10	715	0.448
17:00 - 18:00	10	715	0.196	10	715	0.140	10	715	0.336
18:00 - 19:00	10	715	0.140	10	715	0.168	10	715	0.308
19:00 - 20:00	8	815	0.215	8	815	0.138	8	815	0.353
20:00 - 21:00	8	815	0.092	8	815	0.107	8	815	0.199
21:00 - 22:00	6	823	0.263	6	823	0.283	6	823	0.546
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			4.545			4.425			8.970

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.

Parameter summary

Trip rate parameter range selected:	260 - 1840 (units: sqm)
Survey date date range:	01/01/08 - 28/10/14
Number of weekdays (Monday-Friday):	10
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	4
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 01 - RETAIL/I - SHOPPING CENTRE - LOCAL SHOPS
MULTI-MODAL TOTAL PEOPLE
Calculation factor: 100 sqm
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00	1	540	6.667	1	540	5.926	1	540	12.593
07:00 - 08:00	10	715	10.693	10	715	9.055	10	715	19.748
08:00 - 09:00	10	715	15.927	10	715	15.619	10	715	31.546
09:00 - 10:00	10	715	15.031	10	715	13.450	10	715	28.481
10:00 - 11:00	10	715	14.262	10	715	13.380	10	715	27.642
11:00 - 12:00	10	715	15.269	10	715	15.493	10	715	30.762
12:00 - 13:00	**10**	**715**	**19.286**	10	715	18.139	**10**	**715**	**37.425**
13:00 - 14:00	10	715	16.683	10	715	16.487	10	715	33.170
14:00 - 15:00	10	715	14.248	10	715	15.073	10	715	29.321
15:00 - 16:00	10	715	18.460	**10**	**715**	**18.642**	10	715	37.102
16:00 - 17:00	10	715	14.150	10	715	13.982	10	715	28.132
17:00 - 18:00	10	715	13.310	10	715	15.227	10	715	28.537
18:00 - 19:00	10	715	13.744	10	715	14.906	10	715	28.650
19:00 - 20:00	8	815	13.052	8	815	13.144	8	815	26.196
20:00 - 21:00	8	815	8.926	8	815	9.770	8	815	18.696
21:00 - 22:00	6	823	8.117	6	823	8.745	6	823	16.862
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			217.825			217.038			434.863

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.

Parameter summary

Trip rate parameter range selected:	260 - 1840 (units: sqm)
Survey date date range:	01/01/08 - 28/10/14
Number of weekdays (Monday-Friday):	10
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	4
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

Appendix G

Network Diagrams

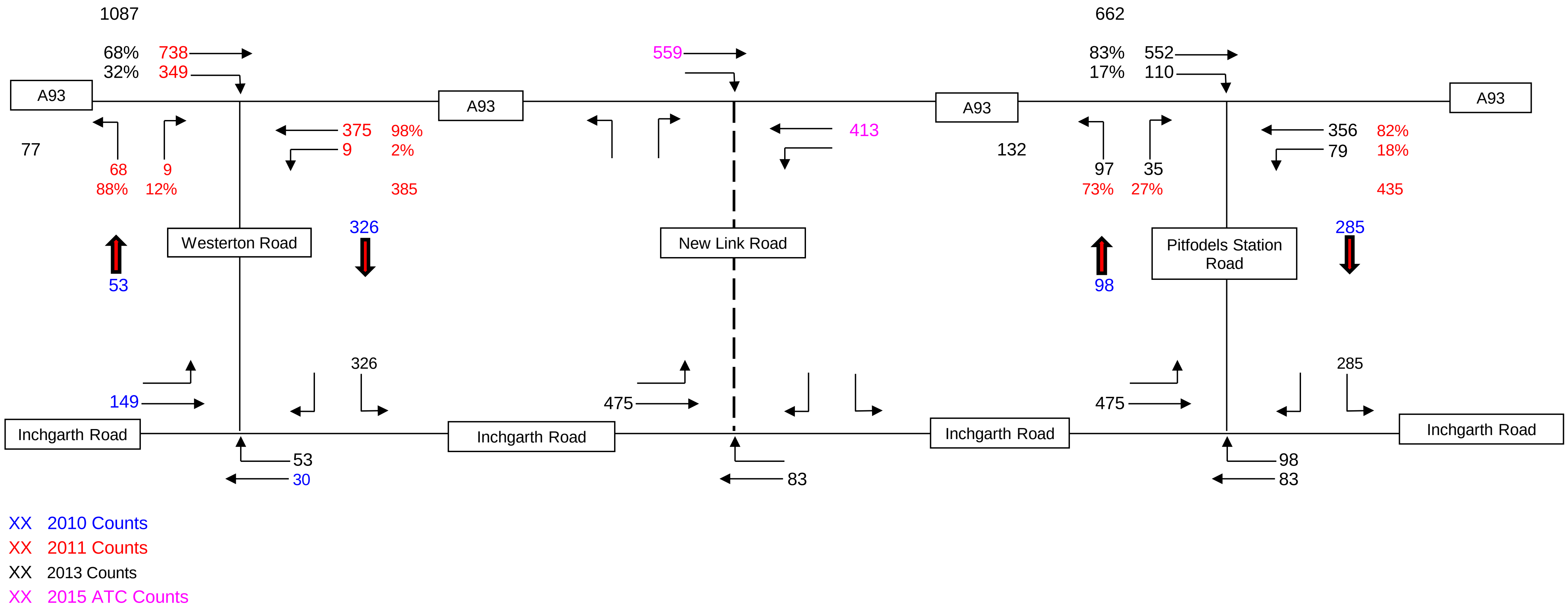


Figure A1: Base AM Peak Hour

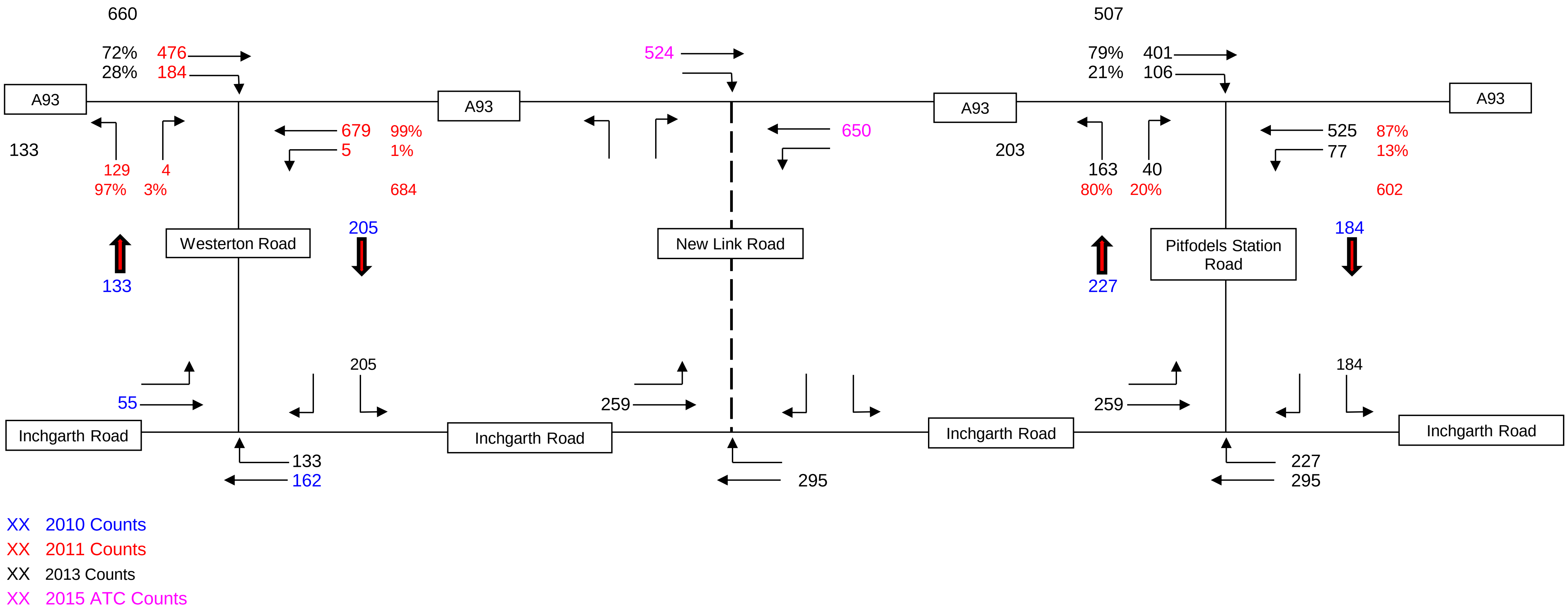


Figure A2: Base PM Peak Hour

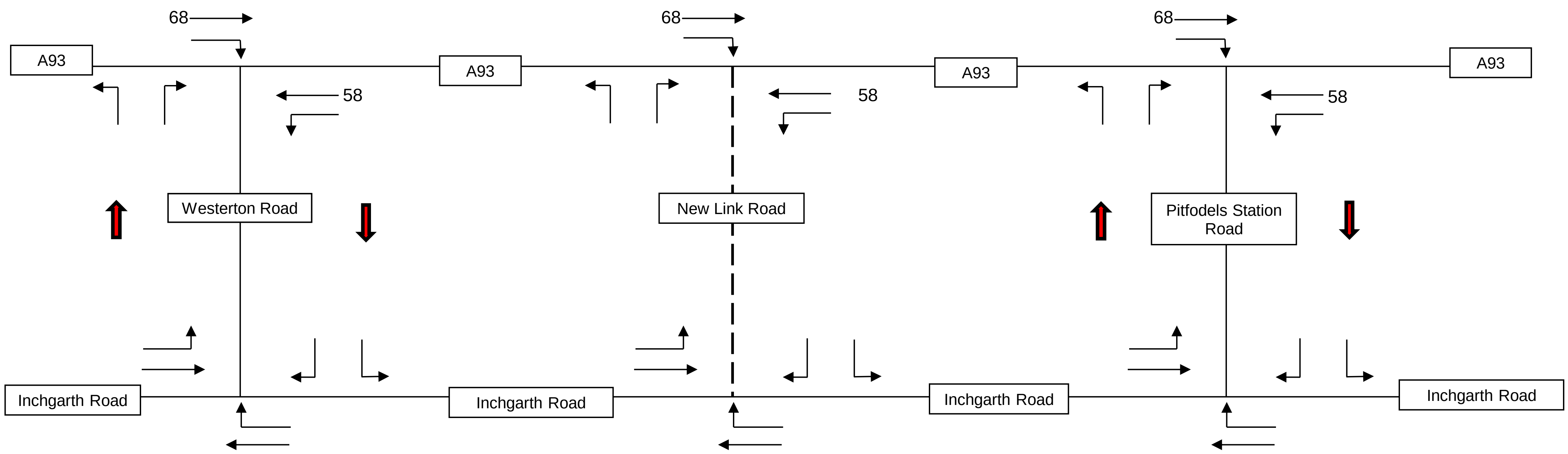


Figure A3: Committed Development (excluding Oldfold) - AM Peak Hour

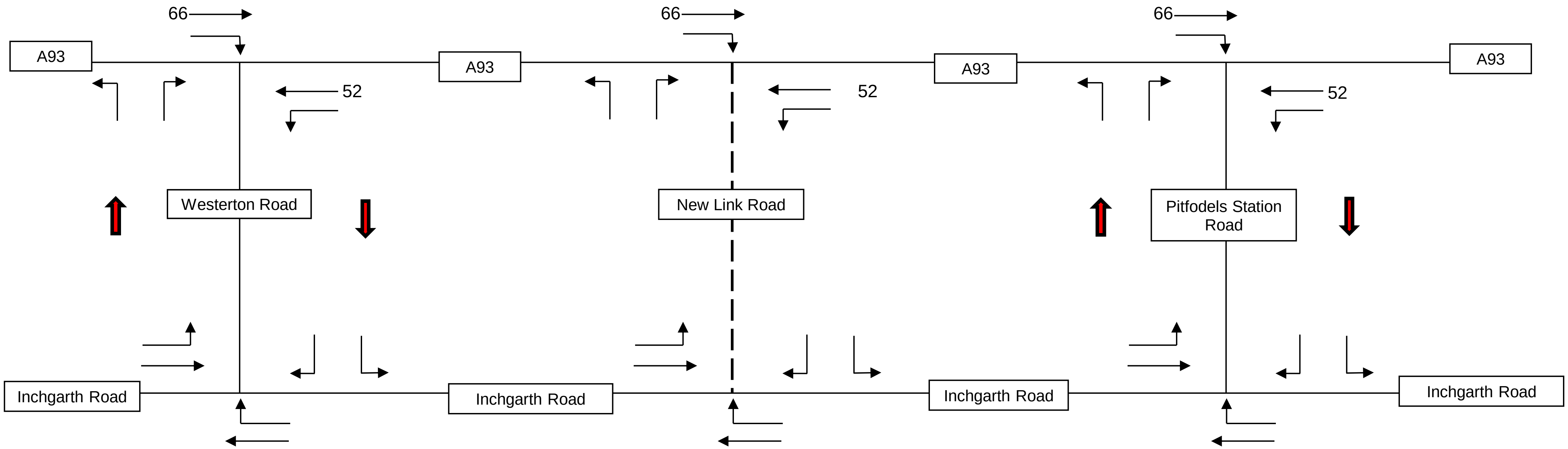


Figure A4: Committed Development (excluding Oldfold) - PM Peak Hour

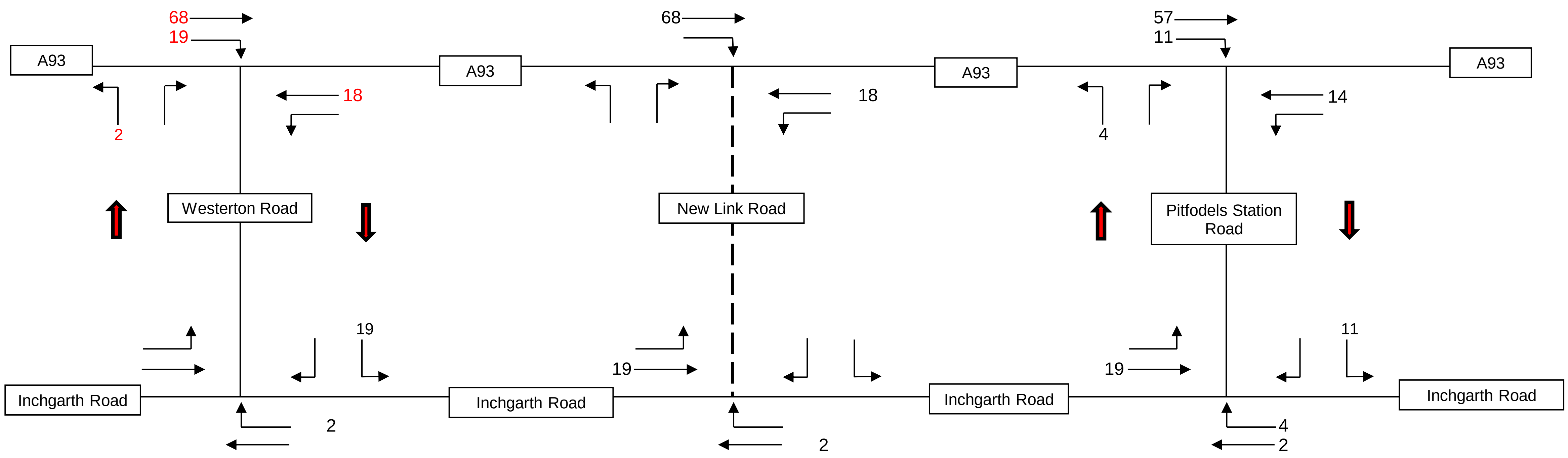


Figure A5: Oldfold Development - AM Peak Hour

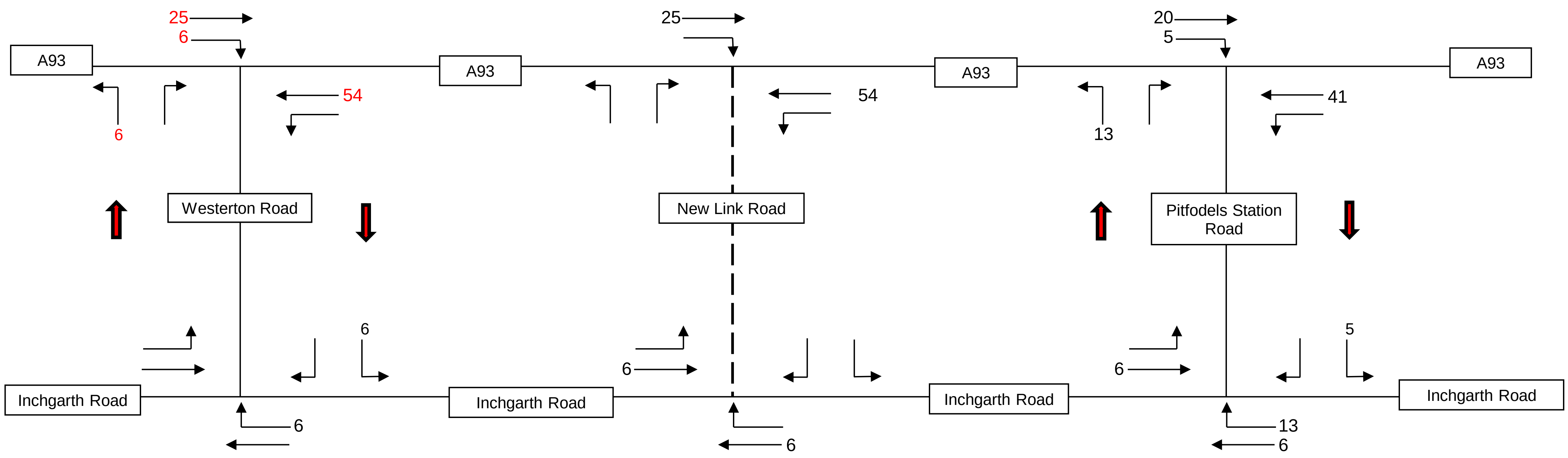


Figure A6: Oldfold Development - PM Peak Hour

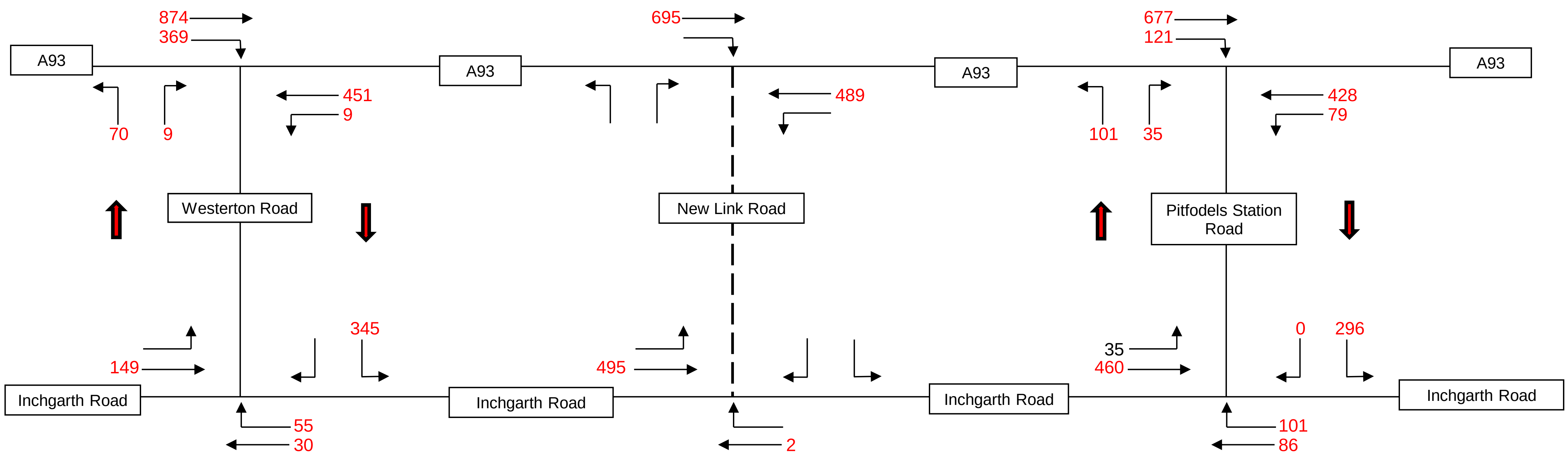


Figure A7: Base plus Comm Development - AM Peak Hour (Pre WPR)

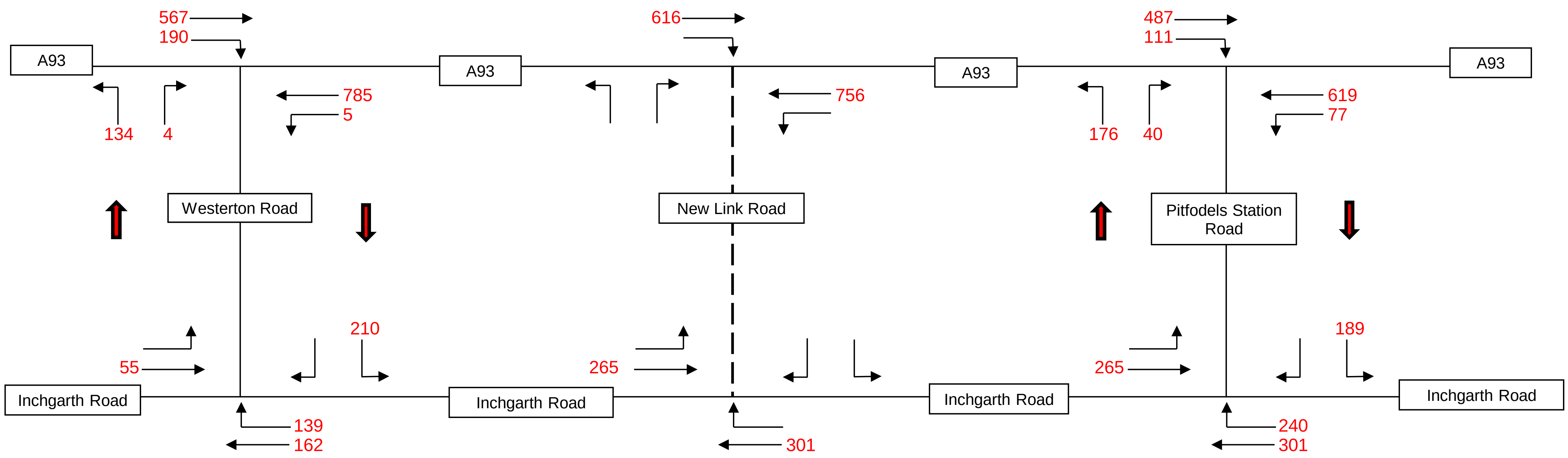


Figure A8: Base plus Comm Development - PM Peak Hour (Pre WPR)

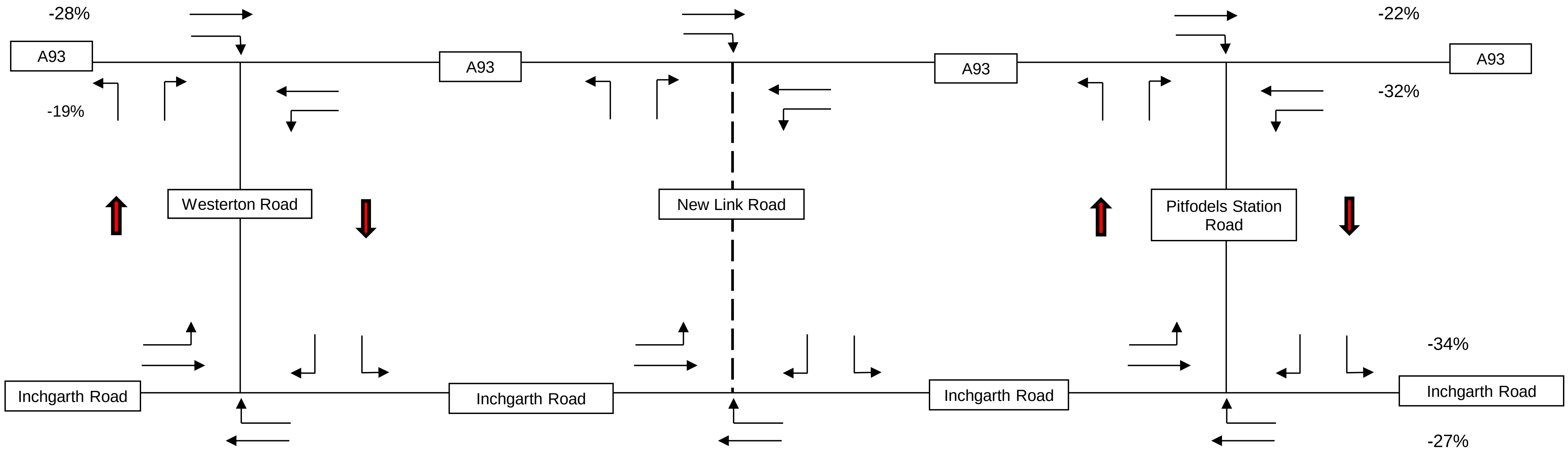


Figure A9: A93 Corridor Post-WPR Reductions - AM Peak Hour

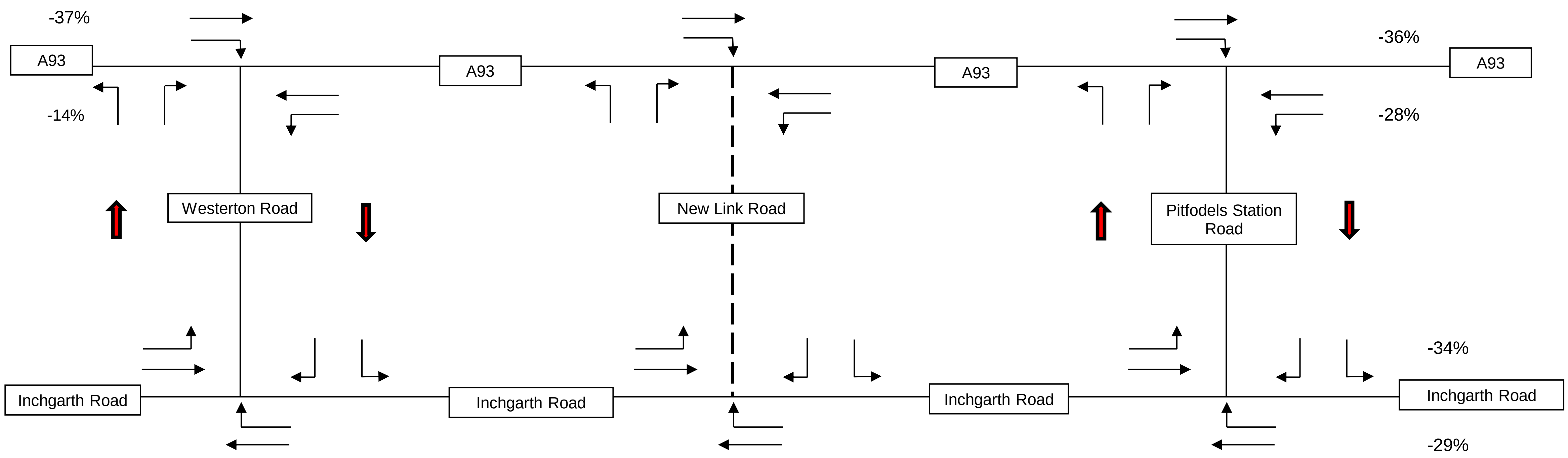


Figure A10: A93 Corridor Post-WPR Reductions - AM Peak Hour

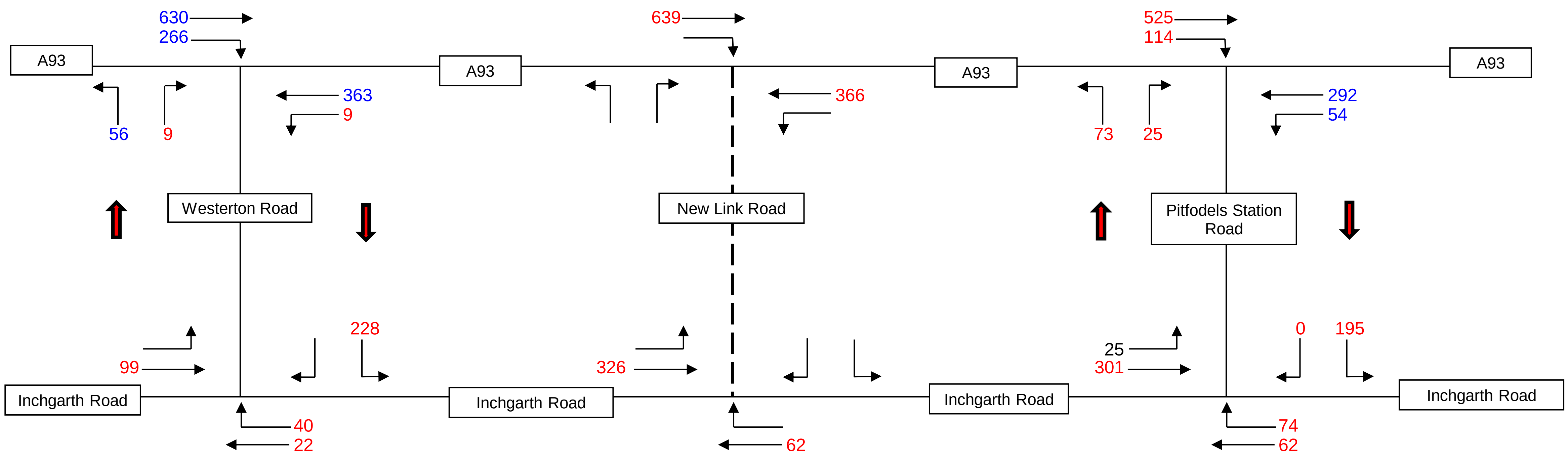


Figure A11: Base plus Comm Development - AM Peak Hour (Post WPR)

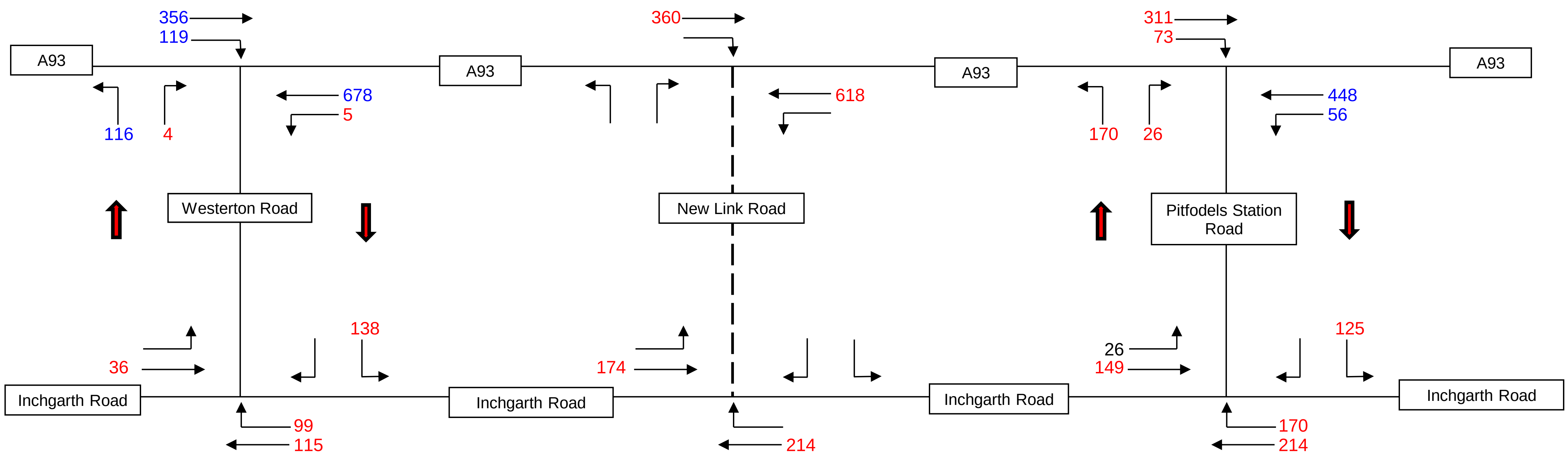


Figure A12: Base plus Comm Development - PM Peak Hour (Post WPR)

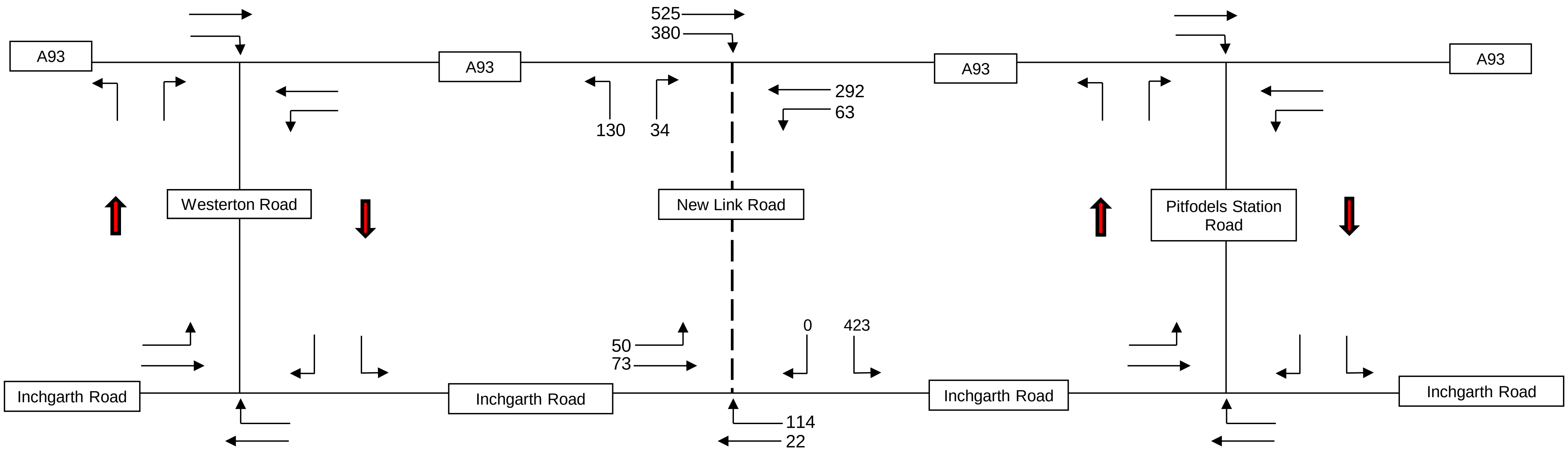


Figure A13: Inchgarth Link Road - Base AM Peak Hour (Post WPR)

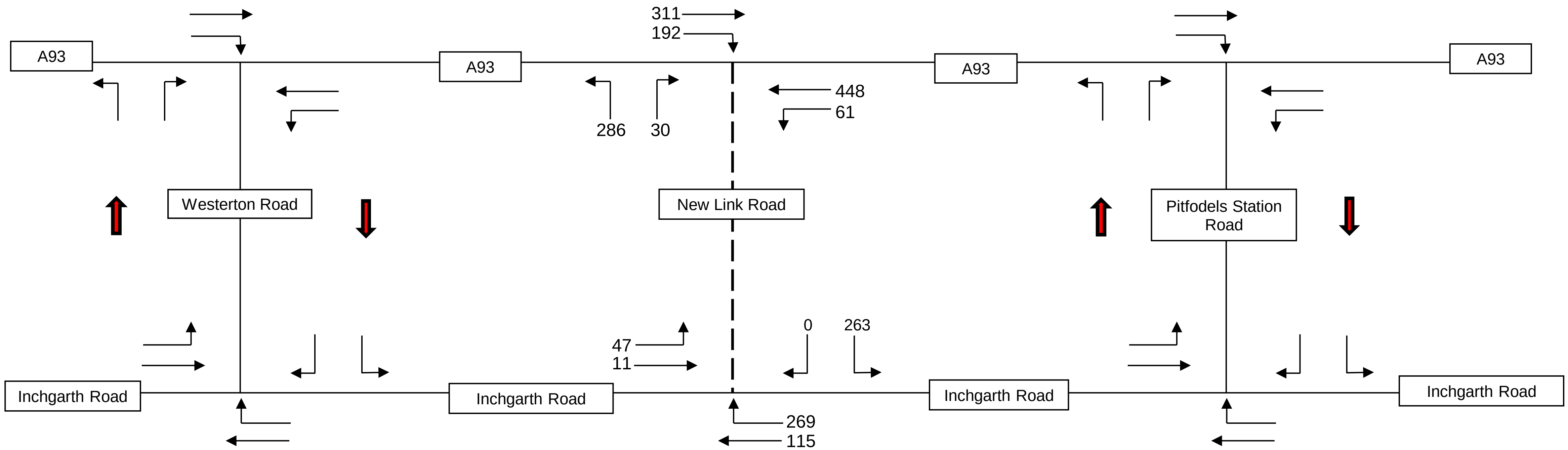


Figure A14: Inchgarth Link Road - Base PM Peak Hour (Post WPR)

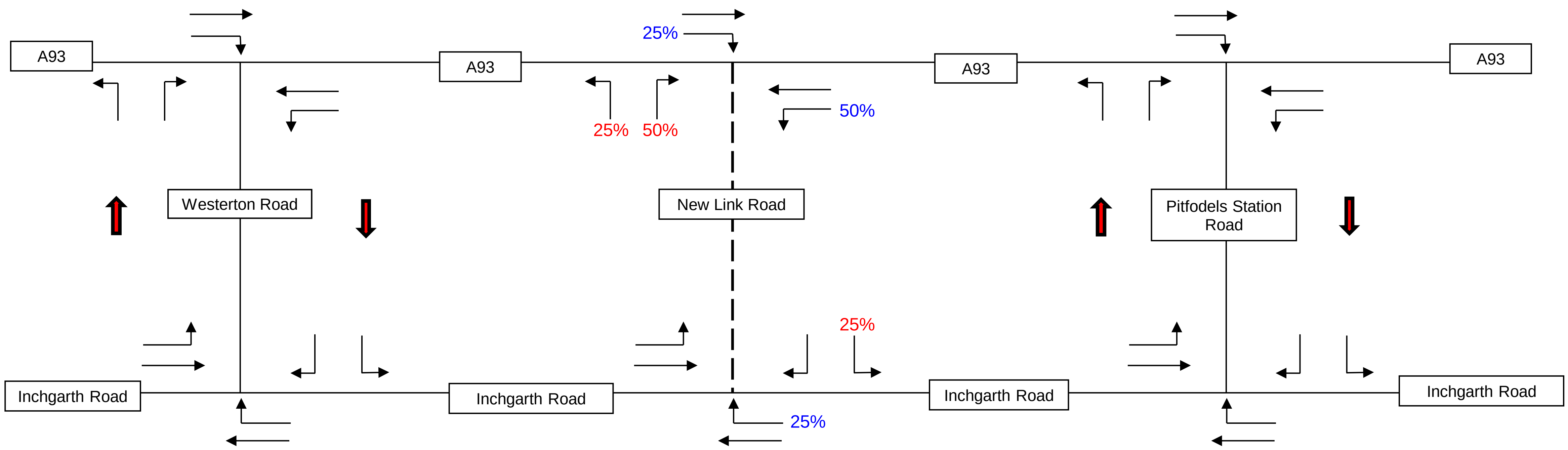


Figure A15: Proposed Development Trip Distribution

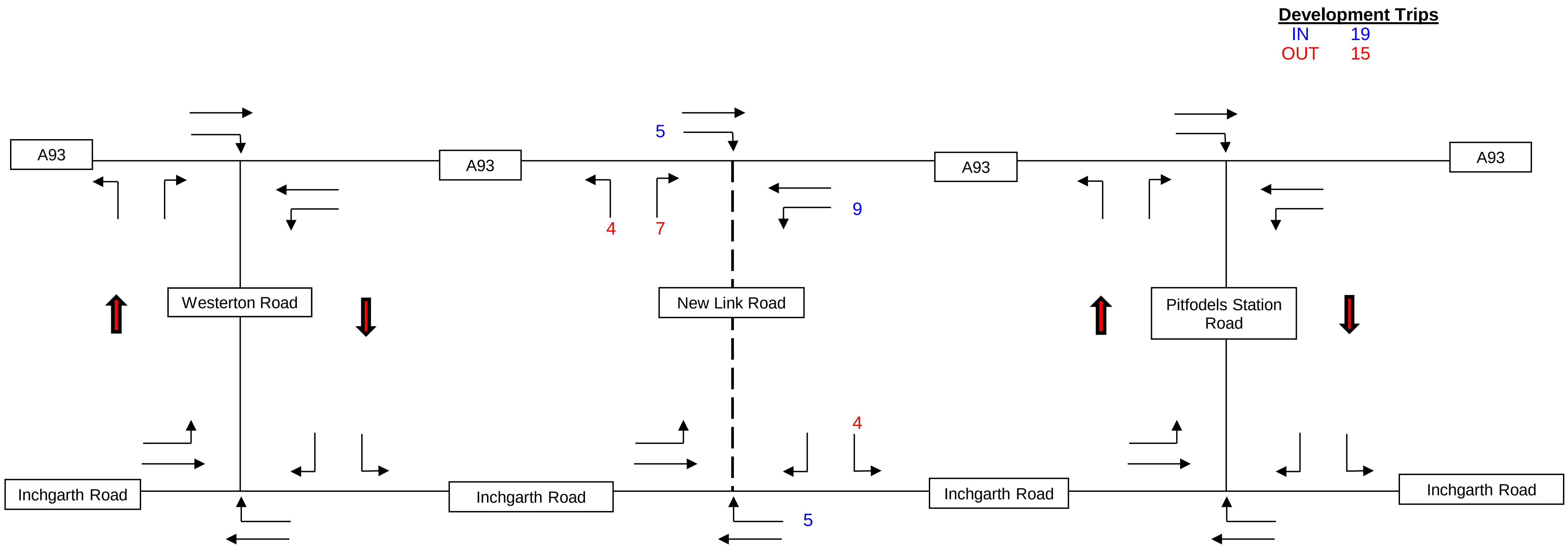


Figure A16: Proposed Development Traffic - AM Peak

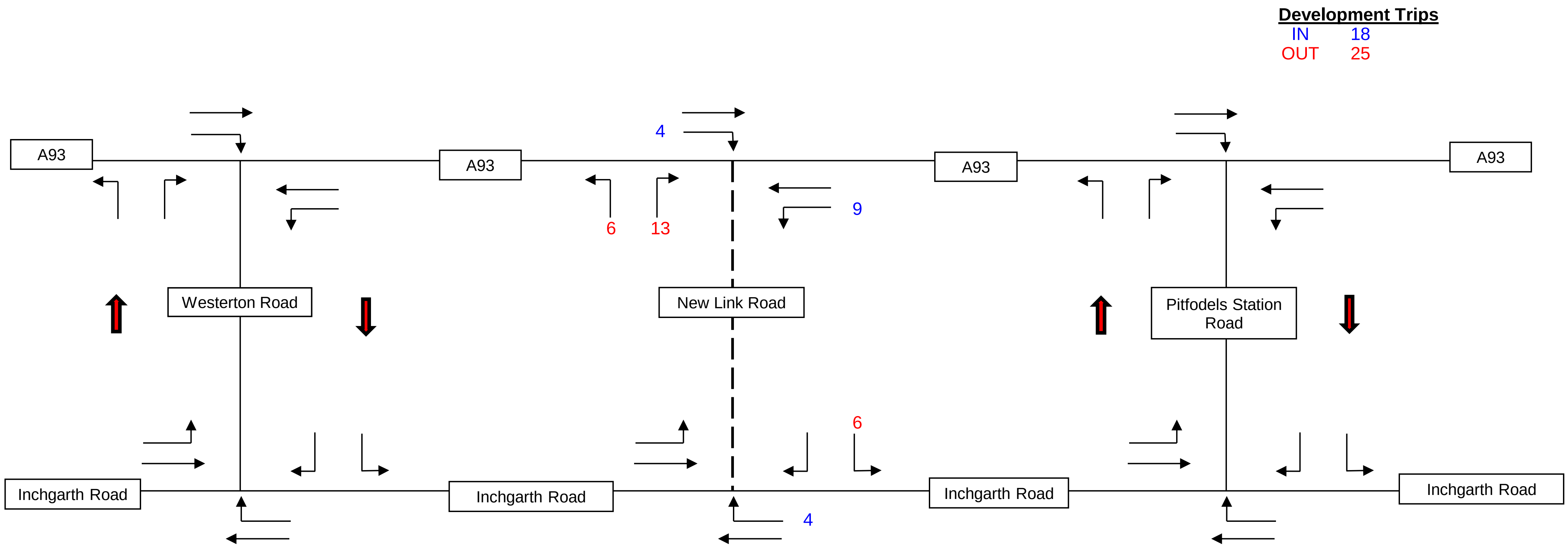


Figure A17: Proposed Development Traffic - PM Peak

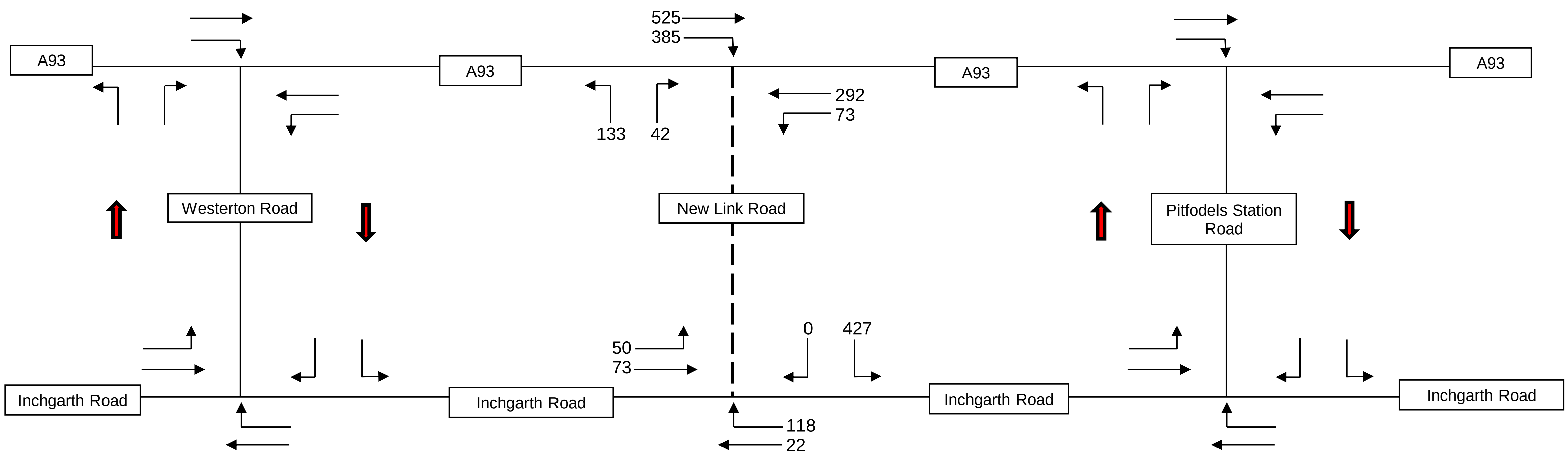


Figure A18: Inchgarth Link Road - Base AM plus Development Traffic (Post WPR)

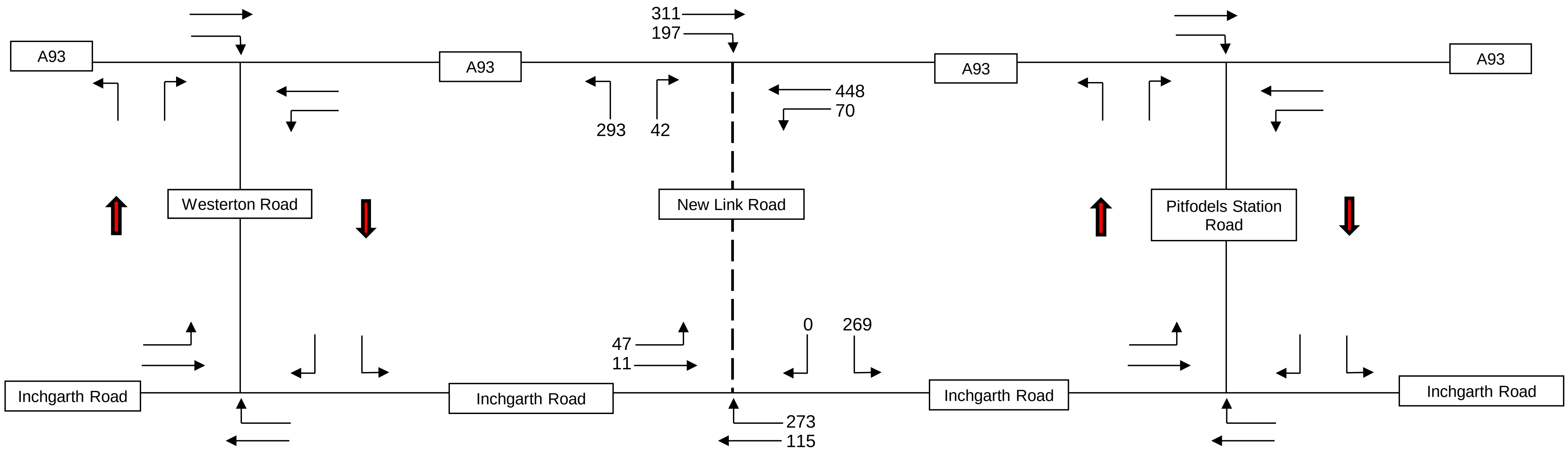


Figure A19: Inchgarth Link Road - Base PM plus Development Traffic (Post WPR)

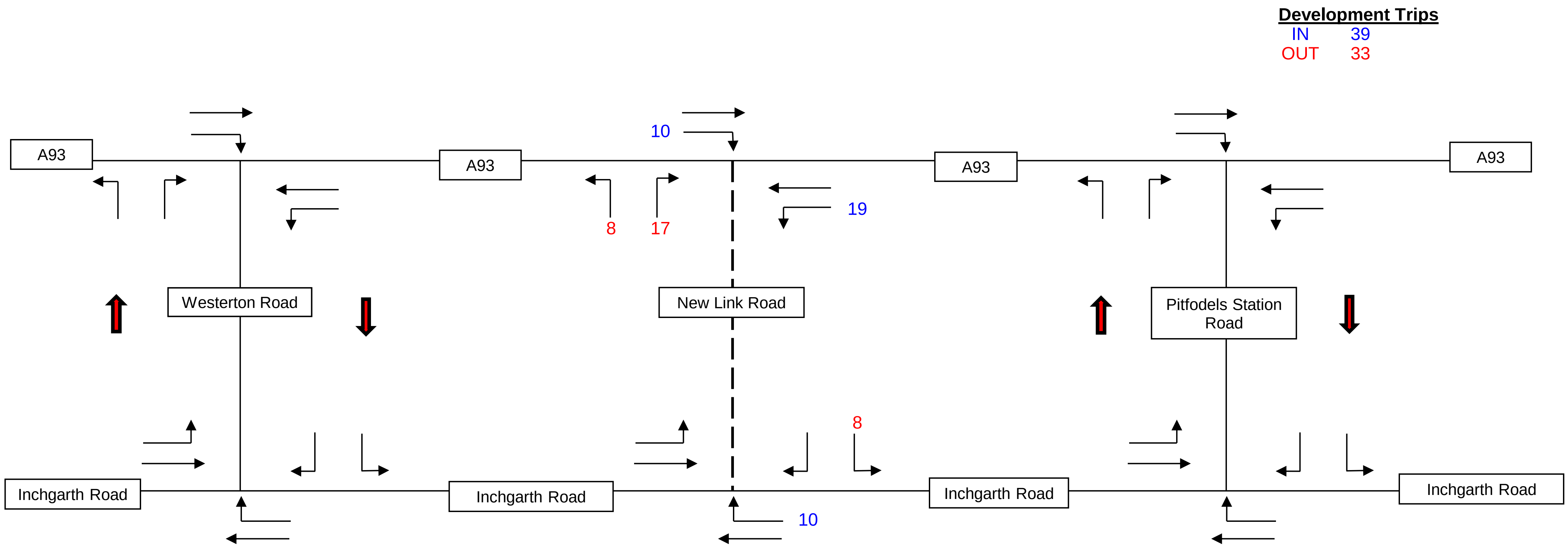


Figure A20: Proposed Development Traffic - AM Peak 'Sensitivity' Analysis

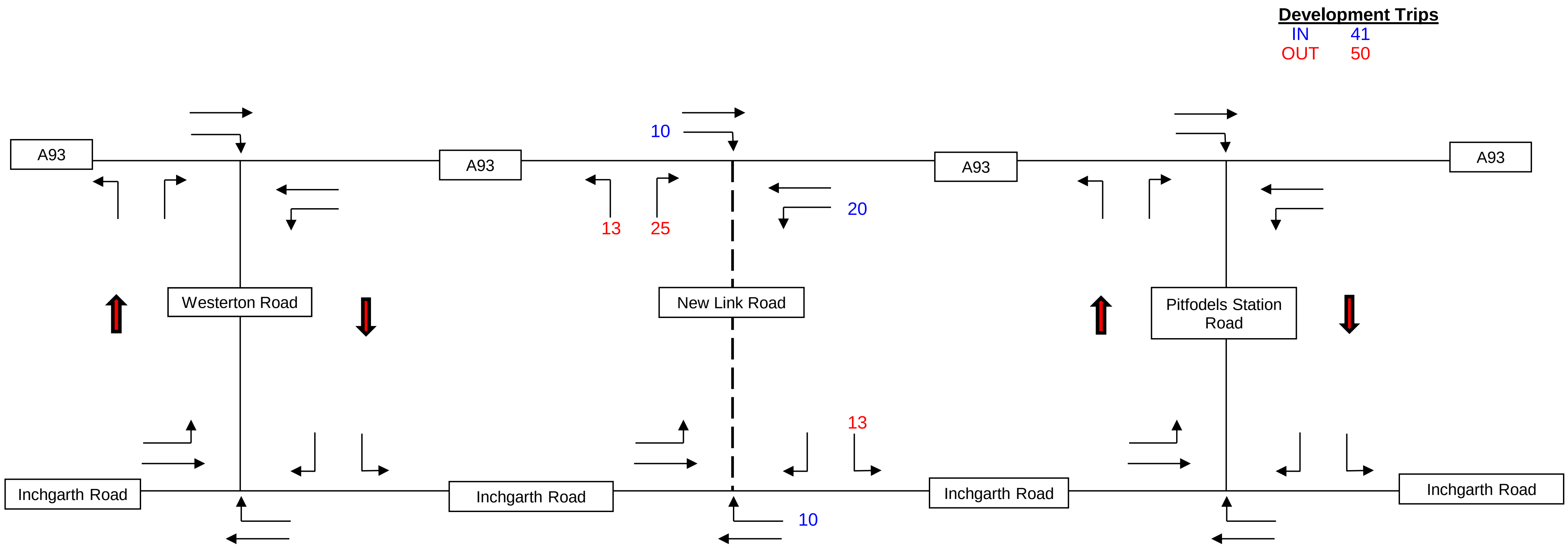


Figure A21: Proposed Development Traffic - PM Peak 'Sensitivity' Analysis

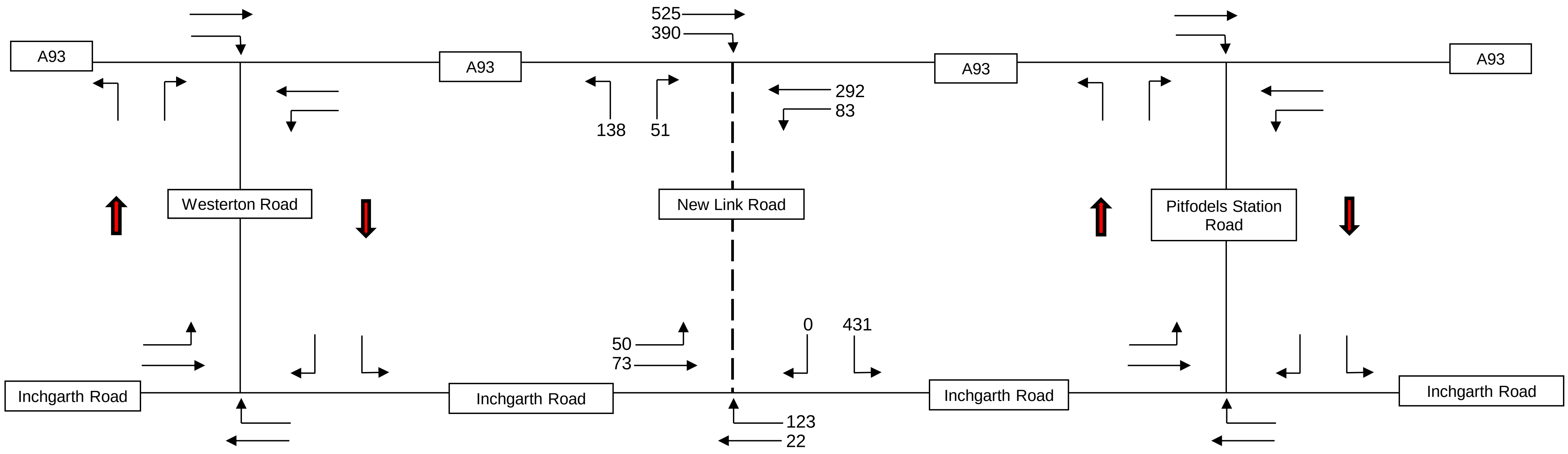


Figure A22: Inchgarth Link Road - Base AM plus Development Traffic (Post WPR) 'Sensitivity' Analysis

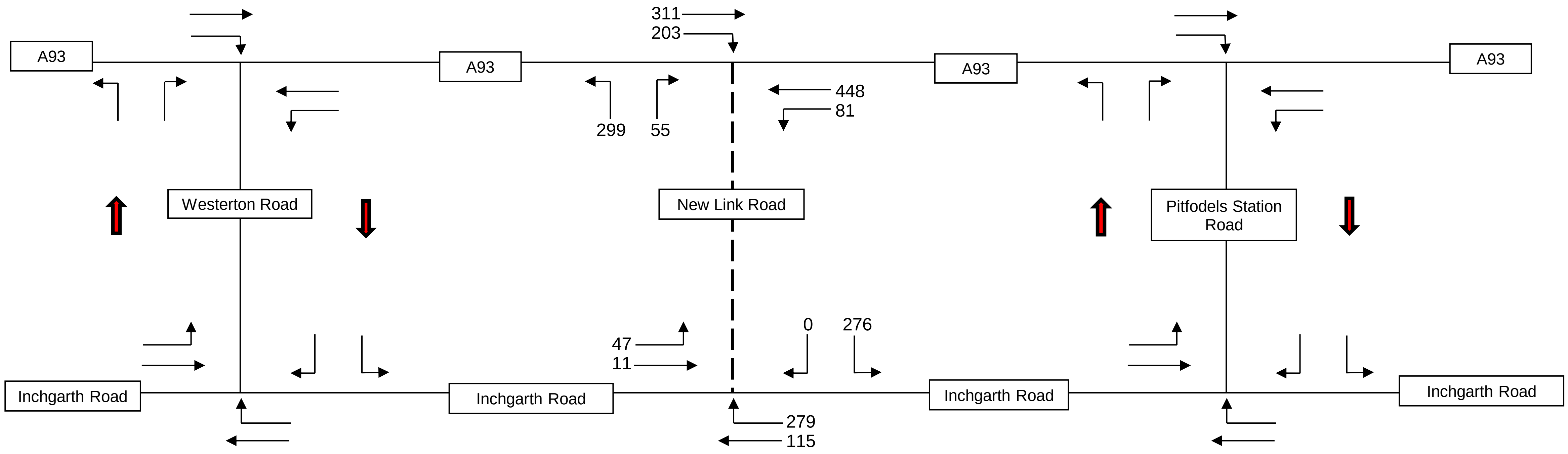


Figure A23: Inchgarth Link Road - Base PM plus Development Traffic (Post WPR) 'Sensitivity' Analysis

Appendix H

Junction Modelling Output Reports

Junctions 8

ARCADY 8 - Roundabout Module

Version: 8.0.4.487 [15039,24/03/2014]

For sales and distribution information, program advice and maintenance, contact TRL:
Tel: +44 (0)1344 770758 email: software@trl.co.uk Web: http://www.trlsoftware.co.uk

Filename: 106859 Inchgarth Mixed-use Development - Proposed Inchgarth Road Roundabout.arc8
Path: X:\105000-109999\106000-106999\a106859\Transportation\Modelling
Report generation date: 06/06/2017 15:46:32

Summary of junction performance

	AM			AM Sensitivity			PM			PM Sensitivity		
	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC
	Proposed Inchgarth Road Roundabout - Base plus Development											
Inchgarth Road east	0.19	4.40	0.16	0.20	4.43	0.16	0.78	6.60	0.44	0.80	6.68	0.45
Inchgarth Road west	0.17	4.54	0.15	0.17	4.55	0.15	0.08	4.59	0.08	0.08	4.61	0.08
Inchgarth Link Road	0.87	6.67	0.47	0.88	6.72	0.47	0.40	4.82	0.28	0.41	4.87	0.29

Values shown are the maximum values over all time segments. Delay is the maximum value of average delay per arriving vehicle.

"D1 - Base plus Development, AM " model duration: 07:45 - 09:15
"D2 - Base plus Development, PM" model duration: 16:45 - 18:15
"D3 - Base plus Development, AM Sensitivity" model duration: 07:45 - 09:15
"D4 - Base plus Development, PM Sensitivity" model duration: 16:45 - 18:15

Run using Junctions 8.0.4.487 at 06/06/2017 15:46:31

File summary

Title	(untitled)
Location	
Site Number	
Date	06/06/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	michaela
Description	

Analysis Options

Vehicle Length (m)	Do Queue Variations	Calculate Residual Capacity	Residual Capacity Criteria Type	RFC Threshold	Average Delay Threshold (s)	Queue Threshold (PCU)
5.75			N/A	0.85	36.00	20.00

Units

Distance Units	Speed Units	Traffic Units Input	Traffic Units Results	Flow Units	Average Delay Units	Total Delay Units	Rate Of Delay Units
m	kph	PCU	PCU	perHour	s	-Min	perMin

Proposed Inchgarth Road Roundabout - Base plus Development, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Proposed Inchgarth Road Roundabout	ARCADY			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
Base plus Development, AM	Base plus Development	AM		ONE HOUR	07:45	09:15	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Arm Order	Grade Separated	Large Roundabout	Junction Delay (s)	Junction LOS
1	(untitled)	Roundabout	1,2,3			5.83	A

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Name	Arm	Name	Description
Inchgarth Road east	1	Inchgarth Road east	
Inchgarth Road west	2	Inchgarth Road west	
Inchgarth Link Road	3	Inchgarth Link Road	

Capacity Options

Name	Minimum Capacity (PCU/hr)	Maximum Capacity (PCU/hr)
Inchgarth Road east	0.00	99999.00
Inchgarth Road west	0.00	99999.00
Inchgarth Link Road	0.00	99999.00

Roundabout Geometry

Name	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
Inchgarth Road east	3.00	4.40	3.70	11.00	28.00	52.00	
Inchgarth Road west	3.00	4.40	5.00	12.70	28.00	58.00	
Inchgarth Link Road	3.65	4.40	2.00	9.00	28.00	51.00	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Name	Enter slope and intercept directly	Entered slope	Entered intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
Inchgarth Road east		(calculated)	(calculated)	0.474	972.789
Inchgarth Road west		(calculated)	(calculated)	0.475	990.839
Inchgarth Link Road		(calculated)	(calculated)	0.485	1048.855

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Name	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
Inchgarth Road east	ONE HOUR	✓	140.00	100.000
Inchgarth Road west	ONE HOUR	✓	123.00	100.000
Inchgarth Link Road	ONE HOUR	✓	427.00	100.000

Direct/Resultant Flows

Direct Flows Data

Time Segment	Name	Direct Demand Entry Flow (PCU/hr)	DirectDemandEntryFlowInPCU (PCU/hr)	Direct Demand Exit Flow (PCU/hr)	Direct Demand Pedestrian Flow (Ped/hr)
07:45-08:00	Inchgarth Road east	105.40	105.40		
08:00-08:15	Inchgarth Road east	125.86	125.86		
08:15-08:30	Inchgarth Road east	154.14	154.14		
08:30-08:45	Inchgarth Road east	154.14	154.14		
08:45-09:00	Inchgarth Road east	125.86	125.86		
09:00-09:15	Inchgarth Road east	105.40	105.40		
07:45-08:00	Inchgarth Road west	92.60	92.60		
08:00-08:15	Inchgarth Road west	110.57	110.57		
08:15-08:30	Inchgarth Road west	135.43	135.43		
08:30-08:45	Inchgarth Road west	135.43	135.43		
08:45-09:00	Inchgarth Road west	110.57	110.57		
09:00-09:15	Inchgarth Road west	92.60	92.60		
07:45-08:00	Inchgarth Link Road	321.47	321.47		
08:00-08:15	Inchgarth Link Road	383.86	383.86		
08:15-08:30	Inchgarth Link Road	470.14	470.14		
08:30-08:45	Inchgarth Link Road	470.14	470.14		
08:45-09:00	Inchgarth Link Road	383.86	383.86		
09:00-09:15	Inchgarth Link Road	321.47	321.47		

Turning Proportions

Turning Counts / Proportions (PCU/hr) - (untitled) (for whole period)

		To		
		Inchgarth Road east	Inchgarth Road west	Inchgarth Link Road
From	Inchgarth Road east	0.000	22.000	118.000
	Inchgarth Road west	73.000	0.000	50.000
	Inchgarth Link Road	427.000	0.000	0.000

Turning Proportions (PCU) - (untitled) (for whole period)

		To		
		Inchgarth Road east	Inchgarth Road west	Inchgarth Link Road
From	Inchgarth Road east	0.00	0.16	0.84
	Inchgarth Road west	0.59	0.00	0.41
	Inchgarth Link Road	1.00	0.00	0.00

Vehicle Mix

Average PCU Per Vehicle - (untitled) (for whole period)

		To		
		Inchgarth Road east	Inchgarth Road west	Inchgarth Link Road
From	Inchgarth Road east	1.000	1.000	1.000
	Inchgarth Road west	1.000	1.000	1.000
	Inchgarth Link Road	1.000	1.000	1.000

Heavy Vehicle Percentages - (untitled) (for whole period)

		To		
		Inchgarth Road east	Inchgarth Road west	Inchgarth Link Road
From	Inchgarth Road east	0.0	0.0	0.0
	Inchgarth Road west	0.0	0.0	0.0
	Inchgarth Link Road	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Name	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
Inchgarth Road east	0.16	4.40	0.19	A
Inchgarth Road west	0.15	4.54	0.17	A
Inchgarth Link Road	0.47	6.67	0.87	A

Proposed Inchgarth Road Roundabout - Base plus Development, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Proposed Inchgarth Road Roundabout	ARCADY			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
Base plus Development, PM	Base plus Development	PM		ONE HOUR	16:45	18:15	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Arm Order	Grade Separated	Large Roundabout	Junction Delay (s)	Junction LOS
1	(untitled)	Roundabout	1,2,3			5.77	A

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Name	Arm	Name	Description
Inchgarth Road east	1	Inchgarth Road east	
Inchgarth Road west	2	Inchgarth Road west	
Inchgarth Link Road	3	Inchgarth Link Road	

Capacity Options

Name	Minimum Capacity (PCU/hr)	Maximum Capacity (PCU/hr)
Inchgarth Road east	0.00	99999.00
Inchgarth Road west	0.00	99999.00
Inchgarth Link Road	0.00	99999.00

Roundabout Geometry

Name	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
Inchgarth Road east	3.00	4.40	3.70	11.00	28.00	52.00	
Inchgarth Road west	3.00	4.40	5.00	12.70	28.00	58.00	
Inchgarth Link Road	3.65	4.40	2.00	9.00	28.00	51.00	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Name	Enter slope and intercept directly	Entered slope	Entered intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
Inchgarth Road east		(calculated)	(calculated)	0.474	972.789
Inchgarth Road west		(calculated)	(calculated)	0.475	990.839
Inchgarth Link Road		(calculated)	(calculated)	0.485	1048.855

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Name	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
Inchgarth Road east	ONE HOUR	✓	388.00	100.000
Inchgarth Road west	ONE HOUR	✓	58.00	100.000
Inchgarth Link Road	ONE HOUR	✓	269.00	100.000

Direct/Resultant Flows

Direct Flows Data

Time Segment	Name	Direct Demand Entry Flow (PCU/hr)	DirectDemandEntryFlowInPCU (PCU/hr)	Direct Demand Exit Flow (PCU/hr)	Direct Demand Pedestrian Flow (Ped/hr)
16:45-17:00	Inchgarth Road east	292.11	292.11		
17:00-17:15	Inchgarth Road east	348.80	348.80		
17:15-17:30	Inchgarth Road east	427.20	427.20		
17:30-17:45	Inchgarth Road east	427.20	427.20		
17:45-18:00	Inchgarth Road east	348.80	348.80		
18:00-18:15	Inchgarth Road east	292.11	292.11		
16:45-17:00	Inchgarth Road west	43.67	43.67		
17:00-17:15	Inchgarth Road west	52.14	52.14		
17:15-17:30	Inchgarth Road west	63.86	63.86		
17:30-17:45	Inchgarth Road west	63.86	63.86		
17:45-18:00	Inchgarth Road west	52.14	52.14		
18:00-18:15	Inchgarth Road west	43.67	43.67		
16:45-17:00	Inchgarth Link Road	202.52	202.52		
17:00-17:15	Inchgarth Link Road	241.83	241.83		
17:15-17:30	Inchgarth Link Road	296.17	296.17		
17:30-17:45	Inchgarth Link Road	296.17	296.17		
17:45-18:00	Inchgarth Link Road	241.83	241.83		
18:00-18:15	Inchgarth Link Road	202.52	202.52		

Turning Proportions

Turning Counts / Proportions (PCU/hr) - (untitled) (for whole period)

		To		
From		Inchgarth Road east	Inchgarth Road west	Inchgarth Link Road
	Inchgarth Road east	0.000	115.000	273.000
	Inchgarth Road west	11.000	0.000	47.000
	Inchgarth Link Road	269.000	0.000	0.000

Turning Proportions (PCU) - (untitled) (for whole period)

		To		
		Inchgarth Road east	Inchgarth Road west	Inchgarth Link Road
From	Inchgarth Road east	0.00	0.30	0.70
	Inchgarth Road west	0.19	0.00	0.81
	Inchgarth Link Road	1.00	0.00	0.00

Vehicle Mix

Average PCU Per Vehicle - (untitled) (for whole period)

		To		
		Inchgarth Road east	Inchgarth Road west	Inchgarth Link Road
From	Inchgarth Road east	1.000	1.000	1.000
	Inchgarth Road west	1.000	1.000	1.000
	Inchgarth Link Road	1.000	1.000	1.000

Heavy Vehicle Percentages - (untitled) (for whole period)

		To		
		Inchgarth Road east	Inchgarth Road west	Inchgarth Link Road
From	Inchgarth Road east	0.0	0.0	0.0
	Inchgarth Road west	0.0	0.0	0.0
	Inchgarth Link Road	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Name	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
Inchgarth Road east	0.44	6.60	0.78	A
Inchgarth Road west	0.08	4.59	0.08	A
Inchgarth Link Road	0.28	4.82	0.40	A

Proposed Inchgarth Road Roundabout - Base plus Development, AM Sensitivity

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Proposed Inchgarth Road Roundabout	ARCADY			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
Base plus Development, AM Sensitivity	Base plus Development	AM Sensitivity		ONE HOUR	07:45	09:15	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Arm Order	Grade Separated	Large Roundabout	Junction Delay (s)	Junction LOS
1	(untitled)	Roundabout	1,2,3			5.86	A

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Name	Arm	Name	Description
Inchgarth Road east	1	Inchgarth Road east	
Inchgarth Road west	2	Inchgarth Road west	
Inchgarth Link Road	3	Inchgarth Link Road	

Capacity Options

Name	Minimum Capacity (PCU/hr)	Maximum Capacity (PCU/hr)
Inchgarth Road east	0.00	99999.00
Inchgarth Road west	0.00	99999.00
Inchgarth Link Road	0.00	99999.00

Roundabout Geometry

Name	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
Inchgarth Road east	3.00	4.40	3.70	11.00	28.00	52.00	
Inchgarth Road west	3.00	4.40	5.00	12.70	28.00	58.00	
Inchgarth Link Road	3.65	4.40	2.00	9.00	28.00	51.00	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Name	Enter slope and intercept directly	Entered slope	Entered intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
Inchgarth Road east		(calculated)	(calculated)	0.474	972.789
Inchgarth Road west		(calculated)	(calculated)	0.475	990.839
Inchgarth Link Road		(calculated)	(calculated)	0.485	1048.855

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Name	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
Inchgarth Road east	ONE HOUR	✓	145.00	100.000
Inchgarth Road west	ONE HOUR	✓	123.00	100.000
Inchgarth Link Road	ONE HOUR	✓	431.00	100.000

Direct/Resultant Flows

Direct Flows Data

Time Segment	Name	Direct Demand Entry Flow (PCU/hr)	DirectDemandEntryFlowInPCU (PCU/hr)	Direct Demand Exit Flow (PCU/hr)	Direct Demand Pedestrian Flow (Ped/hr)
07:45-08:00	Inchgarth Road east	109.16	109.16		
08:00-08:15	Inchgarth Road east	130.35	130.35		
08:15-08:30	Inchgarth Road east	159.65	159.65		
08:30-08:45	Inchgarth Road east	159.65	159.65		
08:45-09:00	Inchgarth Road east	130.35	130.35		
09:00-09:15	Inchgarth Road east	109.16	109.16		
07:45-08:00	Inchgarth Road west	92.60	92.60		
08:00-08:15	Inchgarth Road west	110.57	110.57		
08:15-08:30	Inchgarth Road west	135.43	135.43		
08:30-08:45	Inchgarth Road west	135.43	135.43		
08:45-09:00	Inchgarth Road west	110.57	110.57		
09:00-09:15	Inchgarth Road west	92.60	92.60		
07:45-08:00	Inchgarth Link Road	324.48	324.48		
08:00-08:15	Inchgarth Link Road	387.46	387.46		
08:15-08:30	Inchgarth Link Road	474.54	474.54		
08:30-08:45	Inchgarth Link Road	474.54	474.54		
08:45-09:00	Inchgarth Link Road	387.46	387.46		
09:00-09:15	Inchgarth Link Road	324.48	324.48		

Turning Proportions

Turning Counts / Proportions (PCU/hr) - (untitled) (for whole period)

		To		
		Inchgarth Road east	Inchgarth Road west	Inchgarth Link Road
From	Inchgarth Road east	0.000	22.000	123.000
	Inchgarth Road west	73.000	0.000	50.000
	Inchgarth Link Road	431.000	0.000	0.000

Turning Proportions (PCU) - (untitled) (for whole period)

		To		
		Inchgarth Road east	Inchgarth Road west	Inchgarth Link Road
From	Inchgarth Road east	0.00	0.15	0.85
	Inchgarth Road west	0.59	0.00	0.41
	Inchgarth Link Road	1.00	0.00	0.00

Vehicle Mix

Average PCU Per Vehicle - (untitled) (for whole period)

		To		
		Inchgarth Road east	Inchgarth Road west	Inchgarth Link Road
From	Inchgarth Road east	1.000	1.000	1.000
	Inchgarth Road west	1.000	1.000	1.000
	Inchgarth Link Road	1.000	1.000	1.000

Heavy Vehicle Percentages - (untitled) (for whole period)

		To		
		Inchgarth Road east	Inchgarth Road west	Inchgarth Link Road
From	Inchgarth Road east	0.0	0.0	0.0
	Inchgarth Road west	0.0	0.0	0.0
	Inchgarth Link Road	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Name	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
Inchgarth Road east	0.16	4.43	0.20	A
Inchgarth Road west	0.15	4.55	0.17	A
Inchgarth Link Road	0.47	6.72	0.88	A

Proposed Inchgarth Road Roundabout - Base plus Development, PM Sensitivity

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Proposed Inchgarth Road Roundabout	ARCADY			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
Base plus Development, PM Sensitivity	Base plus Development	PM Sensitivity		ONE HOUR	16:45	18:15	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Arm Order	Grade Separated	Large Roundabout	Junction Delay (s)	Junction LOS
1	(untitled)	Roundabout	1,2,3			5.83	A

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Name	Arm	Name	Description
Inchgarth Road east	1	Inchgarth Road east	
Inchgarth Road west	2	Inchgarth Road west	
Inchgarth Link Road	3	Inchgarth Link Road	

Capacity Options

Name	Minimum Capacity (PCU/hr)	Maximum Capacity (PCU/hr)
Inchgarth Road east	0.00	99999.00
Inchgarth Road west	0.00	99999.00
Inchgarth Link Road	0.00	99999.00

Roundabout Geometry

Name	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
Inchgarth Road east	3.00	4.40	3.70	11.00	28.00	52.00	
Inchgarth Road west	3.00	4.40	5.00	12.70	28.00	58.00	
Inchgarth Link Road	3.65	4.40	2.00	9.00	28.00	51.00	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Name	Enter slope and intercept directly	Entered slope	Entered intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
Inchgarth Road east		(calculated)	(calculated)	0.474	972.789
Inchgarth Road west		(calculated)	(calculated)	0.475	990.839
Inchgarth Link Road		(calculated)	(calculated)	0.485	1048.855

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Name	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
Inchgarth Road east	ONE HOUR	✓	394.00	100.000
Inchgarth Road west	ONE HOUR	✓	58.00	100.000
Inchgarth Link Road	ONE HOUR	✓	276.00	100.000

Direct/Resultant Flows

Direct Flows Data

Time Segment	Name	Direct Demand Entry Flow (PCU/hr)	DirectDemandEntryFlowInPCU (PCU/hr)	Direct Demand Exit Flow (PCU/hr)	Direct Demand Pedestrian Flow (Ped/hr)
16:45-17:00	Inchgarth Road east	296.62	296.62		
17:00-17:15	Inchgarth Road east	354.20	354.20		
17:15-17:30	Inchgarth Road east	433.80	433.80		
17:30-17:45	Inchgarth Road east	433.80	433.80		
17:45-18:00	Inchgarth Road east	354.20	354.20		
18:00-18:15	Inchgarth Road east	296.62	296.62		
16:45-17:00	Inchgarth Road west	43.67	43.67		
17:00-17:15	Inchgarth Road west	52.14	52.14		
17:15-17:30	Inchgarth Road west	63.86	63.86		
17:30-17:45	Inchgarth Road west	63.86	63.86		
17:45-18:00	Inchgarth Road west	52.14	52.14		
18:00-18:15	Inchgarth Road west	43.67	43.67		
16:45-17:00	Inchgarth Link Road	207.79	207.79		
17:00-17:15	Inchgarth Link Road	248.12	248.12		
17:15-17:30	Inchgarth Link Road	303.88	303.88		
17:30-17:45	Inchgarth Link Road	303.88	303.88		
17:45-18:00	Inchgarth Link Road	248.12	248.12		
18:00-18:15	Inchgarth Link Road	207.79	207.79		

Turning Proportions

Turning Counts / Proportions (PCU/hr) - (untitled) (for whole period)

		To		
From		Inchgarth Road east	Inchgarth Road west	Inchgarth Link Road
	Inchgarth Road east	0.000	115.000	279.000
	Inchgarth Road west	11.000	0.000	47.000
	Inchgarth Link Road	276.000	0.000	0.000

Turning Proportions (PCU) - (untitled) (for whole period)

		To		
		Inchgarth Road east	Inchgarth Road west	Inchgarth Link Road
From	Inchgarth Road east	0.00	0.29	0.71
	Inchgarth Road west	0.19	0.00	0.81
	Inchgarth Link Road	1.00	0.00	0.00

Vehicle Mix

Average PCU Per Vehicle - (untitled) (for whole period)

		To		
		Inchgarth Road east	Inchgarth Road west	Inchgarth Link Road
From	Inchgarth Road east	1.000	1.000	1.000
	Inchgarth Road west	1.000	1.000	1.000
	Inchgarth Link Road	1.000	1.000	1.000

Heavy Vehicle Percentages - (untitled) (for whole period)

		To		
		Inchgarth Road east	Inchgarth Road west	Inchgarth Link Road
From	Inchgarth Road east	0.0	0.0	0.0
	Inchgarth Road west	0.0	0.0	0.0
	Inchgarth Link Road	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Name	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
Inchgarth Road east	0.45	6.68	0.80	A
Inchgarth Road west	0.08	4.61	0.08	A
Inchgarth Link Road	0.29	4.87	0.41	A

Junctions 8

PICADY 8 - Priority Intersection Module

Version: 8.0.4.487 [15039,24/03/2014]

Filename: 106859 Inchgarth Mixed-use Development - North Deeside Ghost Island Junction.arc8
Path: X:\105000-109999\106000-106999\a106859\Transportation\Modelling
Report generation date: 06/06/2017 16:07:21

Summary of junction performance

	AM			AM Sensitivity			PM			PM Sensitivity		
	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC
	Porposed Ghost Island Junction - Base plus Development											
Stream B-C	0.35	8.64	0.26	0.38	9.15	0.28	1.50	17.08	0.61	1.73	19.46	0.64
Stream B-A	0.31	24.71	0.24	0.41	27.00	0.30	0.29	22.77	0.23	0.44	26.53	0.31
Stream C-AB	2.94	23.72	0.77	3.18	25.37	0.78	0.68	11.29	0.41	0.72	11.65	0.42
Stream C-A	-	-	-	-	-	-	-	-	-	-	-	-
Stream A-B	-	-	-	-	-	-	-	-	-	-	-	-
Stream A-C	-	-	-	-	-	-	-	-	-	-	-	-

Values shown are the maximum values over all time segments. Delay is the maximum value of average delay per arriving vehicle.

"D1 - Base plus Development, AM " model duration: 07:45 - 09:15
"D2 - Base plus Development, PM" model duration: 16:45 - 18:15
"D3 - Base plus Development, AM Sensitivity" model duration: 07:45 - 09:15
"D4 - Base plus Development, PM Sensitivity" model duration: 16:45 - 18:15

Run using Junctions 8.0.4.487 at 06/06/2017 16:07:19

File summary

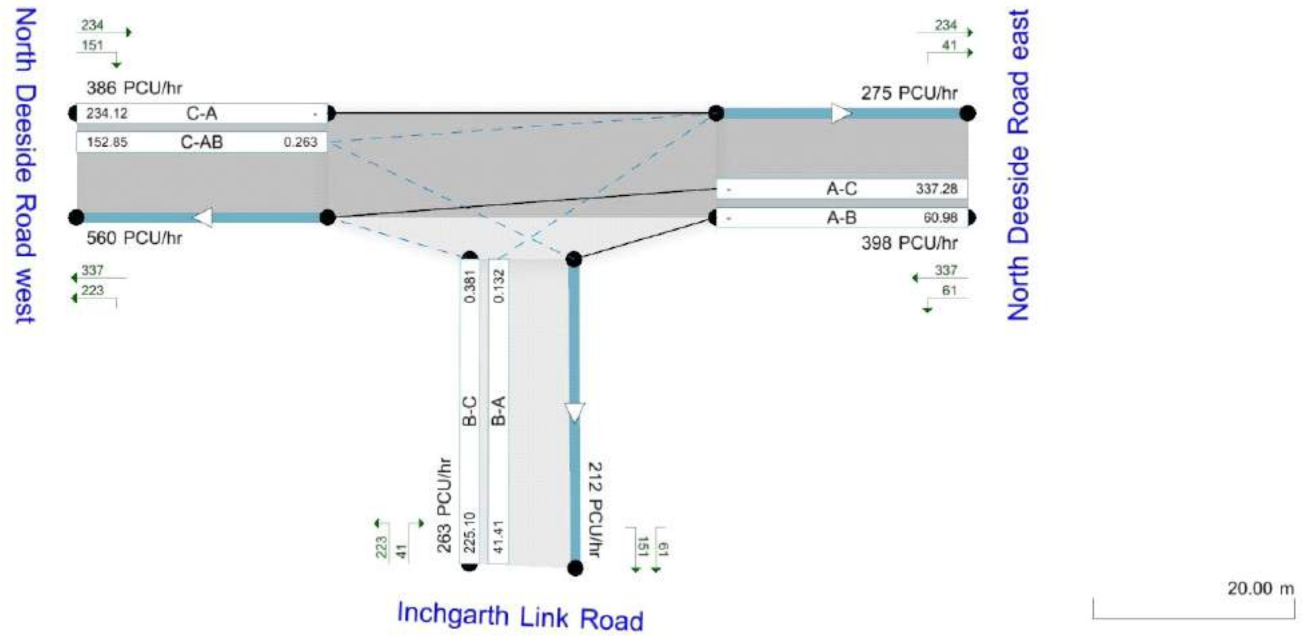
Title	(untitled)
Location	
Site Number	
Date	06/06/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	michaela
Description	

Analysis Options

Vehicle Length (m)	Do Queue Variations	Calculate Residual Capacity	Residual Capacity Criteria Type	RFC Threshold	Average Delay Threshold (s)	Queue Threshold (PCU)
5.75			N/A	0.85	36.00	20.00

Units

Distance Units	Speed Units	Traffic Units Input	Traffic Units Results	Flow Units	Average Delay Units	Total Delay Units	Rate Of Delay Units
m	kph	PCU	PCU	perHour	s	-Min	perMin



Showing modelled flow through junction (PCU/hr).
Streams (upstreams) show Total Demand (PCU/hr); Streams (downstreams) show RFC ()
Time Segment: (07:45-08:00)
Showing Analysis Set "A1 - Porposed Ghost Island Junction "; Demand Set "D1 - Base plus Development, AM "

The junction diagram reflects the last run of ARCADY.

Porposed Ghost Island Junction - Base plus Development, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Porposed Ghost Island Junction	N/A			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
Base plus Development, AM	Base plus Development	AM		ONE HOUR	07:45	09:15	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
1	(untitled)	T-Junction	Two-way	A,B,C	20.38	C

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Name	Arm	Name	Description	Arm Type
North Deeside Road east	A	North Deeside Road east		Major
Inchgarth Link Road	B	Inchgarth Link Road		Minor
North Deeside Road west	C	North Deeside Road west		Major

Major Arm Geometry

Name	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
North Deeside Road west	6.00		0.00	✓	3.00	100.00	✓	6.00

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Name	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
Inchgarth Link Road	One lane plus flare				10.00	5.60	3.65	3.65	3.65	✓	1.00	30	25

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	508.199	0.093	0.234	0.147	0.334
1	B-C	706.356	0.108	0.274	-	-
1	C-B	686.890	0.266	0.266	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Name	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
North Deeside Road east	ONE HOUR	✓	365.00	100.000
Inchgarth Link Road	ONE HOUR	✓	175.00	100.000
North Deeside Road west	ONE HOUR	✓	910.00	100.000

Turning Proportions

Turning Counts / Proportions (PCU/hr) - (untitled) (for whole period)

		To		
		North Deeside Road east	**Inchgarth Link Road**	**North Deeside Road west**
From	**North Deeside Road east**	0.000	73.000	292.000
	Inchgarth Link Road	42.000	0.000	133.000
	North Deeside Road west	525.000	385.000	0.000

Turning Proportions (PCU) - (untitled) (for whole period)

		To		
		North Deeside Road east	Inchgarth Link Road	North Deeside Road west
From	North Deeside Road east	0.00	0.20	0.80
	Inchgarth Link Road	0.24	0.00	0.76
	North Deeside Road west	0.58	0.42	0.00

Vehicle Mix

Average PCU Per Vehicle - (untitled) (for whole period)

		To		
		North Deeside Road east	Inchgarth Link Road	North Deeside Road west
From	North Deeside Road east	1.000	1.000	1.000
	Inchgarth Link Road	1.000	1.000	1.000
	North Deeside Road west	1.000	1.000	1.000

Heavy Vehicle Percentages - (untitled) (for whole period)

		To		
		North Deeside Road east	Inchgarth Link Road	North Deeside Road west
From	North Deeside Road east	0.0	0.0	0.0
	Inchgarth Link Road	0.0	0.0	0.0
	North Deeside Road west	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.26	8.64	0.35	A
B-A	0.24	24.71	0.31	C
C-AB	0.77	23.72	2.94	C
C-A	-	-	-	-
A-B	-	-	-	-
A-C	-	-	-	-

Porposed Ghost Island Junction - Base plus Development, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Porposed Ghost Island Junction	N/A			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
Base plus Development, PM	Base plus Development	PM		ONE HOUR	16:45	18:15	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
1	(untitled)	T-Junction	Two-way	A,B,C	15.38	C

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Name	Arm	Name	Description	Arm Type
North Deeside Road east	A	North Deeside Road east		Major
Inchgarth Link Road	B	Inchgarth Link Road		Minor
North Deeside Road west	C	North Deeside Road west		Major

Major Arm Geometry

Name	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
North Deeside Road west	6.00		0.00	✓	3.00	100.00	✓	6.00

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Name	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
Inchgarth Link Road	One lane plus flare				10.00	5.60	3.65	3.65	3.65	✓	1.00	30	25

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	492.145	0.090	0.227	0.143	0.324
1	B-C	714.578	0.110	0.277	-	-
1	C-B	686.890	0.266	0.266	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Name	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
North Deeside Road east	ONE HOUR	✓	518.00	100.000
Inchgarth Link Road	ONE HOUR	✓	335.00	100.000
North Deeside Road west	ONE HOUR	✓	508.00	100.000

Turning Proportions

Turning Counts / Proportions (PCU/hr) - (untitled) (for whole period)

		To		
		North Deeside Road east	**Inchgarth Link Road**	**North Deeside Road west**
From	**North Deeside Road east**	0.000	70.000	448.000
	Inchgarth Link Road	42.000	0.000	293.000
	North Deeside Road west	311.000	197.000	0.000

Turning Proportions (PCU) - (untitled) (for whole period)

		To		
		North Deeside Road east	Inchgarth Link Road	North Deeside Road west
From	North Deeside Road east	0.00	0.14	0.86
	Inchgarth Link Road	0.13	0.00	0.87
	North Deeside Road west	0.61	0.39	0.00

Vehicle Mix

Average PCU Per Vehicle - (untitled) (for whole period)

		To		
		North Deeside Road east	Inchgarth Link Road	North Deeside Road west
From	North Deeside Road east	1.000	1.000	1.000
	Inchgarth Link Road	1.000	1.000	1.000
	North Deeside Road west	1.000	1.000	1.000

Heavy Vehicle Percentages - (untitled) (for whole period)

		To		
		North Deeside Road east	Inchgarth Link Road	North Deeside Road west
From	North Deeside Road east	0.0	0.0	0.0
	Inchgarth Link Road	0.0	0.0	0.0
	North Deeside Road west	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.61	17.08	1.50	C
B-A	0.23	22.77	0.29	C
C-AB	0.41	11.29	0.68	B
C-A	-	-	-	-
A-B	-	-	-	-
A-C	-	-	-	-

Porposed Ghost Island Junction - Base plus Development, AM Sensitivity

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Porposed Ghost Island Junction	N/A			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
Base plus Development, AM Sensitivity	Base plus Development	AM Sensitivity		ONE HOUR	07:45	09:15	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
1	(untitled)	T-Junction	Two-way	A,B,C	21.84	C

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Name	Arm	Name	Description	Arm Type
North Deeside Road east	A	North Deeside Road east		Major
Inchgarth Link Road	B	Inchgarth Link Road		Minor
North Deeside Road west	C	North Deeside Road west		Major

Major Arm Geometry

Name	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
North Deeside Road west	6.00		0.00	✓	3.00	100.00	✓	6.00

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Name	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
Inchgarth Link Road	One lane plus flare				10.00	5.60	3.65	3.65	3.65	✓	1.00	30	25

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	512.378	0.093	0.236	0.148	0.337
1	B-C	704.215	0.108	0.273	-	-
1	C-B	686.890	0.266	0.266	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Name	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
North Deeside Road east	ONE HOUR	✓	375.00	100.000
Inchgarth Link Road	ONE HOUR	✓	189.00	100.000
North Deeside Road west	ONE HOUR	✓	915.00	100.000

Turning Proportions

Turning Counts / Proportions (PCU/hr) - (untitled) (for whole period)

		To		
		North Deeside Road east	**Inchgarth Link Road**	**North Deeside Road west**
From	**North Deeside Road east**	0.000	83.000	292.000
	Inchgarth Link Road	51.000	0.000	138.000
	North Deeside Road west	525.000	390.000	0.000

Turning Proportions (PCU) - (untitled) (for whole period)

	To			
From		North Deeside Road east	Inchgarth Link Road	North Deeside Road west
	North Deeside Road east	0.00	0.22	0.78
	Inchgarth Link Road	0.27	0.00	0.73
	North Deeside Road west	0.57	0.43	0.00

Vehicle Mix

Average PCU Per Vehicle - (untitled) (for whole period)

	To			
From		North Deeside Road east	Inchgarth Link Road	North Deeside Road west
	North Deeside Road east	1.000	1.000	1.000
	Inchgarth Link Road	1.000	1.000	1.000
	North Deeside Road west	1.000	1.000	1.000

Heavy Vehicle Percentages - (untitled) (for whole period)

	To			
From		North Deeside Road east	Inchgarth Link Road	North Deeside Road west
	North Deeside Road east	0.0	0.0	0.0
	Inchgarth Link Road	0.0	0.0	0.0
	North Deeside Road west	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.28	9.15	0.38	A
B-A	0.30	27.00	0.41	D
C-AB	0.78	25.37	3.18	D
C-A	-	-	-	-
A-B	-	-	-	-
A-C	-	-	-	-

Porposed Ghost Island Junction - Base plus Development, PM Sensitivity

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Porposed Ghost Island Junction	N/A			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
Base plus Development, PM Sensitivity	Base plus Development	PM Sensitivity		ONE HOUR	16:45	18:15	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
1	(untitled)	T-Junction	Two-way	A,B,C	17.31	C

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Name	Arm	Name	Description	Arm Type
North Deeside Road east	A	North Deeside Road east		Major
Inchgarth Link Road	B	Inchgarth Link Road		Minor
North Deeside Road west	C	North Deeside Road west		Major

Major Arm Geometry

Name	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
North Deeside Road west	6.00		0.00	✓	3.00	100.00	✓	6.00

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Name	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
Inchgarth Link Road	One lane plus flare				10.00	5.60	3.65	3.65	3.65	✓	1.00	30	25

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	496.346	0.090	0.229	0.144	0.326
1	B-C	712.426	0.109	0.276	-	-
1	C-B	686.890	0.266	0.266	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Name	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
North Deeside Road east	ONE HOUR	✓	529.00	100.000
Inchgarth Link Road	ONE HOUR	✓	354.00	100.000
North Deeside Road west	ONE HOUR	✓	514.00	100.000

Turning Proportions

Turning Counts / Proportions (PCU/hr) - (untitled) (for whole period)

		To		
		North Deeside Road east	**Inchgarth Link Road**	**North Deeside Road west**
From	**North Deeside Road east**	0.000	81.000	448.000
	Inchgarth Link Road	55.000	0.000	299.000
	North Deeside Road west	311.000	203.000	0.000

Turning Proportions (PCU) - (untitled) (for whole period)

		To		
From		North Deeside Road east	Inchgarth Link Road	North Deeside Road west
	North Deeside Road east	0.00	0.15	0.85
	Inchgarth Link Road	0.16	0.00	0.84
	North Deeside Road west	0.61	0.39	0.00

Vehicle Mix

Average PCU Per Vehicle - (untitled) (for whole period)

		To		
From		North Deeside Road east	Inchgarth Link Road	North Deeside Road west
	North Deeside Road east	1.000	1.000	1.000
	Inchgarth Link Road	1.000	1.000	1.000
	North Deeside Road west	1.000	1.000	1.000

Heavy Vehicle Percentages - (untitled) (for whole period)

		To		
From		North Deeside Road east	Inchgarth Link Road	North Deeside Road west
	North Deeside Road east	0.0	0.0	0.0
	Inchgarth Link Road	0.0	0.0	0.0
	North Deeside Road west	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.64	19.46	1.73	C
B-A	0.31	26.53	0.44	D
C-AB	0.42	11.65	0.72	B
C-A	-	-	-	-
A-B	-	-	-	-
A-C	-	-	-	-

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FAIRHURST

Drainage Assessment

Inchgarth Road, Cults

May 2018

Issue 04

FAIRHURST

FAIRHURST

CONTROL SHEET

CLIENT: Cults Property Development Company Ltd.

PROJECT TITLE: Inchgarth Road, Cults

REPORT TITLE: Drainage Assessment

PROJECT REFERENCE: 106859

DOCUMENT NUMBER: 4

STATUS: Final

Issue & Approval Schedule		Name	Signature	Date
	Prepared by	M Campbell	[redacted]	06/06/17
	Checked by	D Aitken	[redacted]	06/06/17
	Approved by	L Morrison	[redacted]	06/06/17

Revision Record	Rev.	Date	Status	Description	Signature	
	1	06/07/17	Final	Appendix A updated	By	[redacted]
					Check	[redacted]
					Approve	[redacted]
	2	16/05/18	Final	Minor changes made to text	By	[redacted]
					Check	[redacted]
					Approve	[redacted]

	3	25/05/18	Final	Development area amended.	By	[redacted]
					Check	[redacted]
					Approve	[redacted]

This document has been prepared in accordance with procedure OP/P02 of the *Fairhurst Quality and Environmental Management System*

This document has been prepared in accordance with the instructions of the client, Cults Property Development Ltd, for the client's sole and specific use. Any other persons who use any information contained herein do so at their own risk.

Contents

Drainage Assessment

This drainage assessment is prepared in accordance with the guidance given in the following documents:-

- Water Assessment & Drainage Assessment Guide – A guide for Scotland, produced by SEPA on behalf of the Sustainable Urban Drainage Scottish Working Party (SUDSWP)
- Planning Advice Note (PAN) 61: Planning and Sustainable Urban Drainage Systems, issued by the Scottish Executive Development Department, July 2001.
- The CIRIA SUDS Manual – C753.
- Sewers for Scotland, Third Edition, April 2015, published by Scottish Water & WRc plc.
- SUDS for Roads.

The Development Proposal

Cults Development Company Ltd. propose to develop an area of greenfield land within Cults, Aberdeen. The proposed development will consist of a mixed use community comprising residential, retail and care home facilities.

The total development area is 6.8ha and is bound to the north by the North Deeside Road, Inchgarth Road to the south and existing residential houses to the east and west. The development is located at OS Grid Reference NJ90 49803 275.

Refer to Conceptual Drainage Layout – drawing No. 106859/2200, and 2201 for details of the site layout and drainage proposals.

Existing Drainage

There is an existing surface water sewer running north-east to south-west through the full length of the site. There is also a combined sewer running along the southern boundary of the site along Inchgarth Road. It is likely the existing surface water sewer will need to be diverted to accommodate the development proposals. This will be progressed and discussed with Scottish Water Asset Impact Team.

Any existing drainage encountered during the development will be reinstated or re-routed as necessary. See Appendix D for Scottish Water GIS records.

Site Conditions

A site investigation was carried out by Grampian Geotechnical (Scotland) Ltd in November 2016. The investigation results revealed that beneath a topsoil layer which is up to 0.7m thick, the subsoils are generally medium dense sand with varying proportions of silt and gravel, and the occasional cobbles and boulders. Groundwater was only encountered within 1 of the 8 trial pits.

Foul Drainage

New foul gravity sewers will be provided to serve the development and will be located within the new roads and areas of open ground where necessary. Sewers will be designed and installed in accordance with 'Sewers for Scotland, Third Edition, April 2015', published by Scottish Water & WRc plc.

Each plot will discharge to the new sewer via a single disconnecting chamber located within its own curtilage.

Capacity at the Nigg waste water treatment plant has been confirmed by Scottish Water.

Surface Water Drainage

Using the simple index approach referred to in the SUDS manual (CIRIA Report C753), developments of this nature show a medium level of pollution hazard. Therefore the surface water run-off has to be dealt with accordingly.

The simple index approach states that SUDS should be provided to ensure that a total pollution mitigation index equals or exceeds the pollution hazard index.

Residential Roads/Car Parking/Roofs

Referring to Table 1 (Appendix B), the residential roads, car parking and roofs are shown to have pollution hazard indices (worst case scenario) of**:**

- TSS: 0.5
- Metals: 0.4
- Hydrocarbons: 0.4

In order to provide the necessary mitigation, Table 2 (Appendix B) should be referred to. Based on the land use and by looking at the mitigation indices it is proposed that treatment should be provided in the form of an extended detention basin. This gives overall mitigation indices of:

- TSS: 0.5
- Metals: 0.5
- Hydrocarbons: 0.6

Overall, it can be seen that the mitigation indices provided by the detention basin outweigh the pollution hazard indices of the land use type. Therefore, the proposed SUDS measures are deemed adequate.

Non-Domestic Roads/Car Parking

Referring to Table 1 (Appendix B), the roads and car parking serving the retail units and care home are shown to have pollution hazard indices (worst case scenario) of**:**

- TSS: 0.7
- Metals: 0.6
- Hydrocarbons: 0.7

In order to provide the necessary mitigation, Table 2 (Appendix B) should be referred to. Based on the land use and by looking at the mitigation indices it is proposed that treatment should be provided in the form of 'at source' permeable paving with below ground filter trenches along with the extended detention basin. This gives overall mitigation indices of:

- TSS: 0.7 + (0.5 x 0.4) + (0.5 x 0.5) = >0.95

- Metals: 0.6 + (0.5 x 0.4) + (0.5 x 0.5) = >0.95
- Hydrocarbons: 0.7 + (0.5 x 0.4) + (0.5 x 0.6) = >0.95

Overall, it can be seen that the mitigation indices provided by the paving, filter trenches and the detention basin outweigh the pollution hazard indices of the land use type. Therefore, the proposed SUDS measures are deemed adequate.

Spine Road

Referring to Table 1 (Appendix B), the main spine road is shown to have pollution hazard indices (worst case scenario) of**:**

- TSS: 0.7
- Metals: 0.6
- Hydrocarbons: 0.7

In order to provide the necessary mitigation, Table 2 (Appendix B) should be referred to. Based on the land use and by looking at the mitigation indices it is proposed that treatment should be provided in the form of 'at source' road side filter trenches with an end-of-line extended detention basin. This gives overall mitigation indices of:

- TSS: 0.4 + (0.5 x 0.4) + (0.5 x 0.5) = 0.85
- Metals: 0.4 + (0.5 x 0.4) + (0.5 x 0.5) = 0.85
- Hydrocarbons: 0.4 + (0.5 x 0.4) + (0.5 x 0.6) = 0.9

Overall, it can be seen that the mitigation indices provided by the filter trenches and the detention basin outweigh the pollution hazard indices of the land use type. Therefore, the proposed SUDS measures are deemed adequate.

See Appendix B for summary of Simple Index Approach results from the HR Wallingford SIA Tool.

Conveyance

New surface water sewers will be provided to service the development and will be located within the new roads and areas of open ground where necessary. Sewers will be designed and installed in accordance with 'Sewers for Scotland, Third Edition, April 2015', published by Scottish Water & WRc plc.

Run-off from the internal proposed roads will be drained direct to the new sewers via a number of methods. Trapped gullies will drain the majority of the residential roads, whilst permeable paving with below ground filter trenches will drain the main internal road and car parking areas that serve the retail and care home facilities.

Run-off from the spine road will be drained to road side filter trenches via traditional trapped gullies.

Run-off from plots roofs will also drain direct to the new sewers. Each plot will discharge to the new surface water sewer system via a single disconnecting chamber located within its own curtilage.

Hydraulic Control

In accordance with the Drainage Assessment guide, the rate and volume of surface water run-off from the post development situation should not exceed the surface water run-off from the existing Greenfield site. This equates to a total surface water discharge of 22.34l/s for the proposed 6.8ha development site, during a critical 10 year plus climate change rainfall event.

Attenuation volumes will be provided within the extended detention basin as well as the cellular storage units in order to contain the run-off volumes generated by the critical 10 year, plus climate change, rainfall return event. The extended detention basin and cellular storage unit will also contain the run-off volumes generated by critical rainfall events up to and including the 200 year plus climate change rainfall return event. The attenuated discharge from these SUDS measures will not exceed the agreed Greenfield rate to the existing surface water sewers. Refer to Appendix C for details of calculations.

Site levels will be set in order to prevent water entering buildings or restricting access for emergency vehicles.

Maintenance

- Scottish Water will adopt and maintain the new foul and surface water sewers. The developer will own the drainage system until it is adopted. The developer will also remain responsible for maintenance of the drainage system until Scottish Water issue a Completion Certificate for the drainage system, at which time they will assume responsibility for maintenance of the elements they are to adopt.
- Scottish Water will also adopt and maintain the extended detention basin constructed to serve this development.
- Road gullies and road side filter trenches will be adopted and maintained by Aberdeen City Council as part of the roads adoption.
- The cellular storage crates will remain private and be the responsibility of the developer to maintain.
- Areas of porous paving with filter trenches located below will also remain private, and will be maintained by either the individual house owners/occupiers or form part of a factoring agreement for areas of open space within the development.

Construction Phase SUDS

A method statement, detailing how surface water arising during construction will be dealt with, will be prepared by the contractor for approval prior to commencement of works on site.

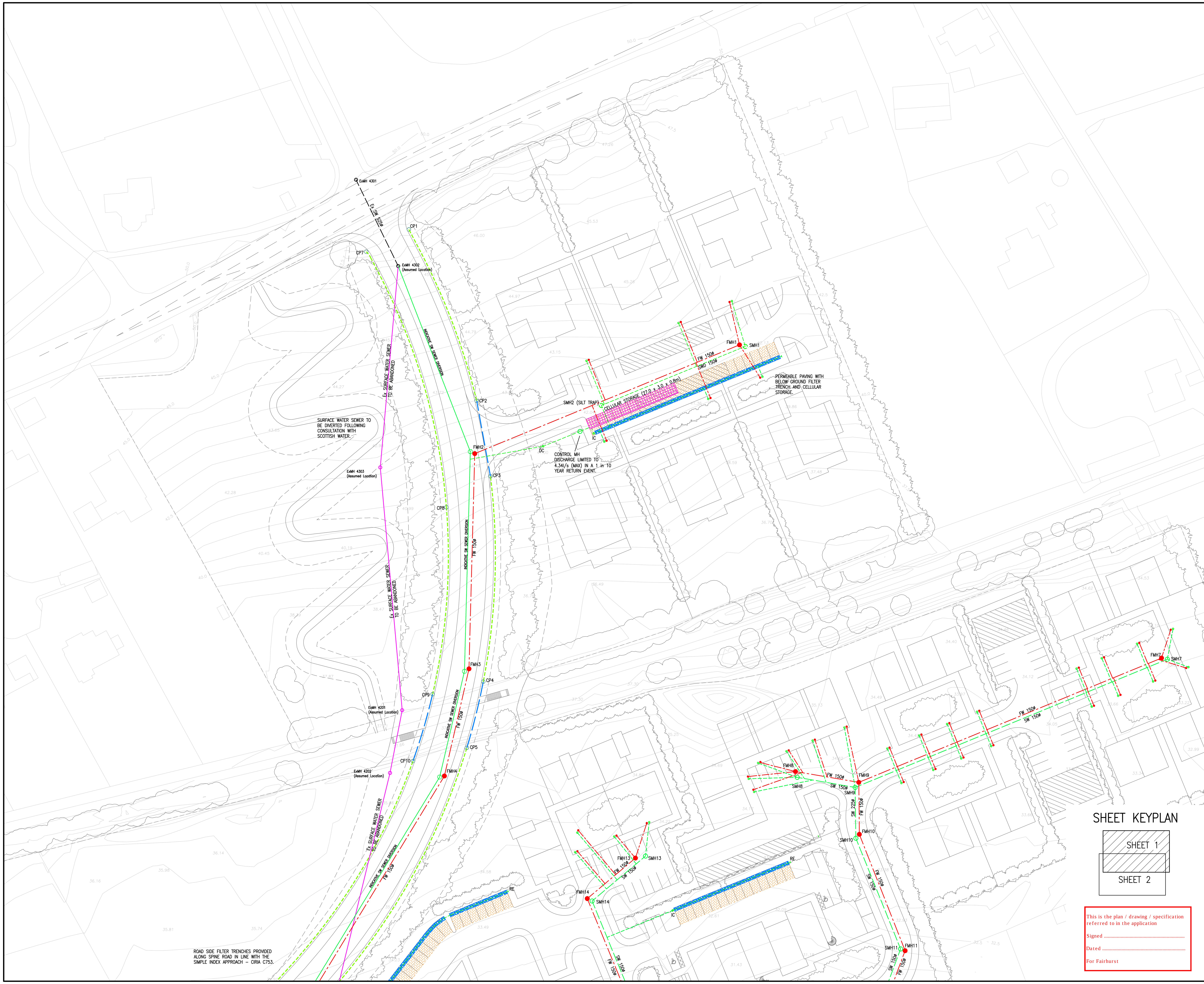
During the development of the site a surface water management strategy will be prepared. This strategy will be submitted to the Planning Authority for their approval prior to the commencement of works.

The surface water management strategy will be based on the contractors' method statement and will incorporate the following measures to prevent the surface water run-off from the construction works discharging to the watercourse.

- Localised interception of surface water run-off. Temporary ditches or channels around the area of works would provide this. Check dams or silt traps can be provided to encourage the settlement of silt.
- Protection of permanent drainage system. Surface water run-off from construction areas will, where practicable, not be drained to the permanent drainage system. This will prevent silt and other construction debris from building up in the system. Where the use of the permanent system cannot be avoided then the system will need to be thoroughly cleaned on the completion of the construction phase.

Appendix A - Drawings

- 106859/2200 - Conceptual Drainage Layout Sheet 1 of 2.
- 106859/2201 – Conceptual Drainage Layout Sheet 2 of 2.



Do not scale from this drawing.

SAFETY HEALTH AND ENVIRONMENTAL INFORMATION

IN ADDITION TO THE HAZARD/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING RISKS AND INFORMATION.

RISKS LISTED HERE ARE NOT EXHAUSTIVE. REFER TO DESIGN ASSESSMENT FORM NO.

CONSTRUCTION

DEMOLITION

FOR INFORMATION RELATING TO USE, CLEANING AND MAINTENANCE SEE THE HEALTH AND SAFETY FILE

IT IS ASSUMED THAT ALL WORKS WILL BE CARRIED OUT BY A COMPETENT CONTRACTOR WORKING, WHERE APPROPRIATE, TO AN APPROVED METHOD STATEMENT.

LEGEND

- EXISTING COMBINED SEWER
- EXISTING SURFACE WATER SEWER
- INDICATIVE SW SEWER DIVERSION
- FOUL SEWER
- SURFACE WATER SEWER
- DISCONNECTION CHAMBERS
- 150mm DIA. TYPE H FILTER DRAIN, WRAPPED IN IMPERMEABLE GEOTEXTILE MEMBRANE
- 225mm DIA. TYPE H FILTER DRAIN, WRAPPED IN IMPERMEABLE GEOTEXTILE MEMBRANE
- 150mm DIA. TYPE Z CARRIER DRAIN
- 225mm DIA. TYPE Z CARRIER DRAIN
- CATCHPIT – TYPE 7
- CHANNEL DRAIN
- POROUS PAVING
- FILTER TRENCH (1.0m WIDE)
- CELLULAR STORAGE CRATES

Rev.	Date	Description	Drwn.	Chkd.	Appd.
C	16/05/18	SITE LAYOUT UPDATED.	MC	DA	LAM
B	06/07/17	DRAINAGE UPDATED IN–LINE WITH NEW SITE LAYOUT.	MC	DA	LAM
A	06/06/17	UPDATED TO INCLUDE NEW SITE LAYOUT.	MC	DA	LAM

FAIRHURST
88 Queens Road
ABERDEEN
AB15 4YQ

Tel: 01224 321222
Fax: 01224 323201

Client:
CULTS PROPERTY DEVELOPMENT COMPANY LTD.

Project Title:
NORTH DEESIDE ROAD/INCHGARTH ROAD PROPOSED RELIEF ROAD AND ASSOCIATED DEVELOPMENT

Drawing Title:
CONCEPTUAL DRAINAGE LAYOUT SHEET 1 OF 2

Scale at A1:	Status:	
1:500	For Information	
Drawn: MC	Checked: DA	Approved: LAM
Date: 20/12/16	Date: 20/12/16	Date: 20/12/16

Drawing No.: 106859/2200
Revision: C

SAFETY HEALTH AND ENVIRONMENTAL INFORMATION

IN ADDITION TO THE HAZARD/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING RISKS AND INFORMATION.

RISKS LISTED HERE ARE NOT EXHAUSTIVE. REFER TO DESIGN ASSESSMENT FORM NO.

CONSTRUCTION

DEMOLITION

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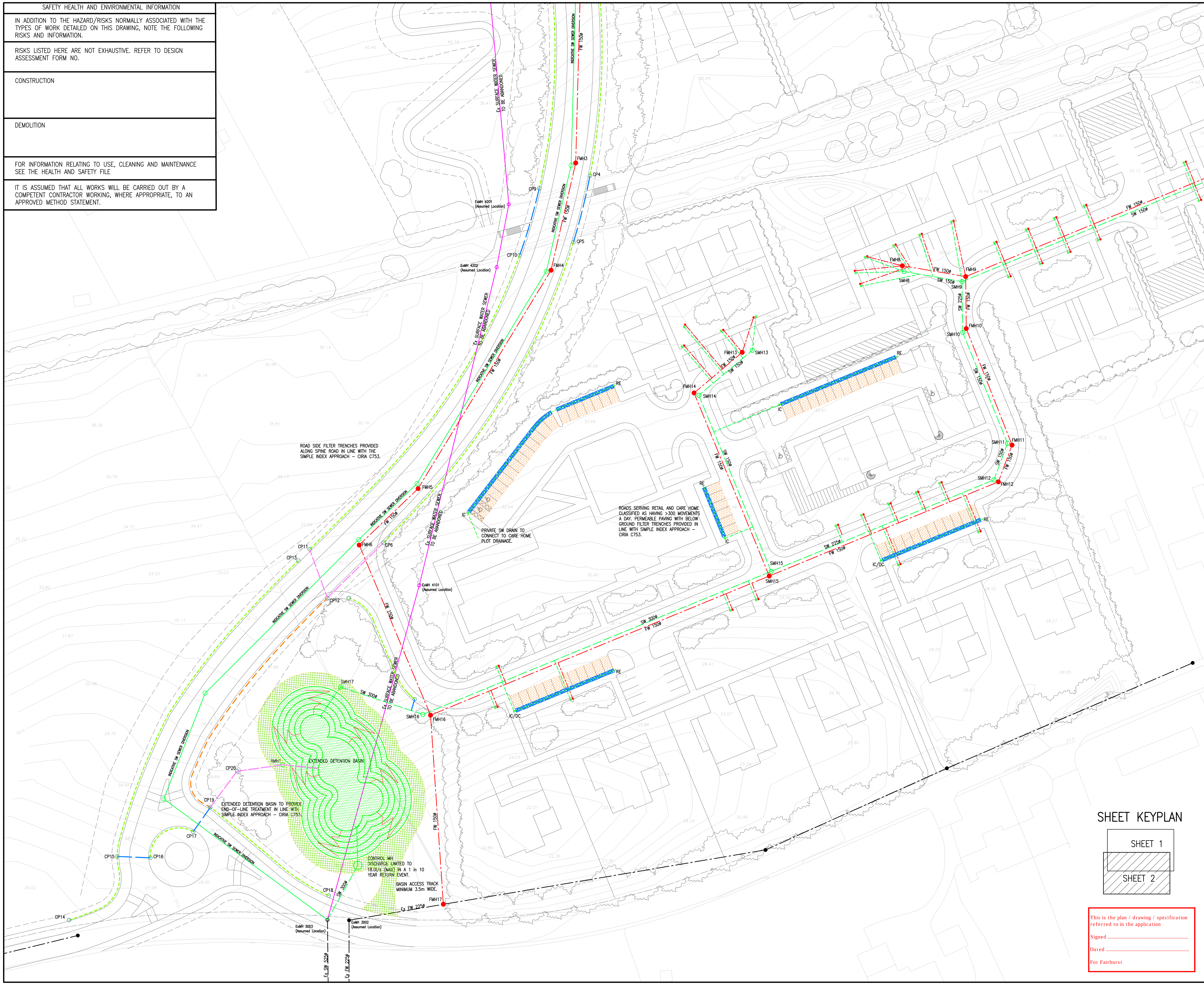
IT IS ASSUMED THAT ALL WORKS WILL BE CARRIED OUT BY A COMPETENT CONTRACTOR WORKING, WHERE APPROPRIATE, TO AN APPROVED METHOD STATEMENT.

Do not scale from this drawing.



LEGEND

- EXISTING COMBINED SEWER
- EXISTING SURFACE WATER SEWER
- INDICATIVE SW SEWER DIVERSION
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- CHANNEL DRAIN
- POROUS PAVING
- FILTER TRENCH (1.0m WIDE)
- CELLULAR STORAGE CRATES

This is the plan / drawing / specification referred to in the application

Signed ....

Dated ....

For Fairhurst

Rev.	Date	Description	Drwn.	Chkd.	Appd.
C	16/05/18	SITE LAYOUT UPDATED.	MC	DA	LAM
B	06/07/17	DRAINAGE UPDATED IN-LINE WITH NEW SITE LAYOUT.	MC	DA	LAM
A	06/06/17	UPDATED TO INCLUDE NEW SITE LAYOUT.	MC	DA	LAM

FAIRHURST
88 Queens Road
ABERDEEN
AB15 4YQ

Tel: 01224 321222
Fax: 01224 323201

Client:
CULTS PROPERTY DEVELOPMENT COMPANY LTD.

Project Title:
NORTH DEESIDE ROAD/INCHGARTH ROAD PROPOSED RELIEF ROAD AND ASSOCIATED DEVELOPMENT

Drawing Title:
CONCEPTUAL DRAINAGE LAYOUT SHEET 2 OF 2

Scale at A1: 1:500	Status: For Information	
Drawn: MC	Checked: DA	Approved: LAM
Date: 20/12/16	Date: 20/12/16	Date: 20/12/16

Drawing No.: 106859/2201 Revision: C

Appendix B – Simple Index Approach

- Table 1 Pollution Hazard Indices (CIRIA: The SUDS Manual).
- Table 2 Mitigation Indices for Discharges to Surface Water (CIRIA: The SUDS Manual).
- Summary of Simple Index Approach Results (HR Wallingford SIA: Tool)

Pollution hazard indices for different land use classifications				
Land use	**Pollution hazard level**	**Total suspended solids (TSS)**	**Metals**	**Hydrocarbons**
Residential roofs	Very low	0.2	0.2	0.05
Other roofs (typically commercial/industrial roofs)	Low	0.3	0.2 (up to 0.8 where there is potential for metals to leach from the roof)	0.05
Individual property driveways, residential car parks, low traffic roads (e.g. cul de sacs, homezones and general access roads) and non-residential car parking with infrequent change (e.g. schools, offices) i.e. < 300 traffic movements/day	Low	0.5	0.4	0.4
Commercial yard and delivery areas, non-residential car parking with frequent change (e.g. hospitals, retail), all roads except low traffic roads and trunk roads/motorways	Medium	0.7	0.6	0.7
Sites with heavy pollution (e.g. haulage yards, lorry parks, highly frequented lorry approaches to industrial estates, waste sites), sites where chemicals and fuels (other than domestic fuel oil) are to be delivered, handled, stored, used or manufactured; industrial sites; trunk roads and motorways	High	0.8	0.8	0.9

Table 1 - Pollution Hazard Indices (CIRIA: The SUDS Manual)

NB. All applicable land uses relevant to this application are highlighted in yellow, but only the worst case one to be used to progress SUDS selection.

Indicative SuDS mitigation indices for discharges to surface waters			
	Mitigation indices		
Type of SuDS component	**TSS**	**Metals**	**Hydrocarbons**
Filter strip	0.4	0.4	0.5
Filter drain	0.4	0.4	0.4
Swale	0.5	0.6	0.6
Bioretention system	0.8	0.8	0.8
Permeable pavement	0.7	0.6	0.7
Detention basin	0.5	0.5	0.6
Pond	0.7	0.7	0.5
Wetland	0.8	0.8	0.8
Proprietary treatment systems	These must demonstrate that they can address each of the contaminant types to acceptable levels for frequent events up to approximately the 1 in 1 year return period event, for inflow concentrations relevant to the contributing drainage area.		

Table 2 - Mitigation Indices for Discharges to Surface Water (CIRIA: The SUDS Manual)

NB. Proposed SUDS measures to be used in Simple Index Approach are highlighted in yellow.

SUMMARY TABLE		DESIGN CONDITIONS			
		1	2	3	4
Land Use Type	Roads (excluding low traffic roads, highly frequented lorry approaches to industrial estates, trunk roads/motorways)				
Pollution Hazard Level	Medium				
Pollution Hazard Indices					
TSS	0.7				
Metals	0.6				
Hydrocarbons	0.7				
SuDS components proposed					
Component 1	Pervious pavement (where the pavement is not designed as an infiltration component)	SuDS components can only be assumed to deliver these indices if they follow design guidance with respect to hydraulics and treatment set out in the relevant technical component chapters of the SuDS Manual. See also checklists in Appendix B			
Component 2	Filter drain (where the trench is not designed as an infiltration component)	SuDS components can only be assumed to deliver these indices if they follow design guidance with respect to hydraulics and treatment set out in the relevant technical component chapters of the SuDS Manual. See also checklists in Appendix B	Filter drains should be preceded by upstream component(s) that trap(s) silt, or designed specifically to retain sediment in a separate zone, easily accessible for maintenance, such that the sediment will not be re-suspended in subsequent events		
Component 3	Detention basin	SuDS components can only be assumed to deliver these indices if they follow design guidance with respect to hydraulics and treatment set out in the relevant technical component chapters of the SuDS Manual. See also checklists in Appendix B			
SuDS Pollution Mitigation Indices					
TSS	>0.95				
Metals	>0.95				
Hydrocarbons	>0.95				
Groundwater protection type	None				
Groundwater protection Pollution Mitigation Indices					
TSS	0				
Metals	0				
Hydrocarbons	0				
Combined Pollution Mitigation Indices		Reference to local planning documents should also be made to identify any additional protection required for sites due to habitat conservation (see Chapter 7 The SuDS design process). The implications of developments on or within close proximity to an area with an environmental designation, such as a Site of Special Scientific Interest (SSSI), should be considered via consultation with relevant conservation bodies such as Natural England			
TSS	>0.95				
Metals	>0.95				
Hydrocarbons	>0.95				
Acceptability of Pollution Mitigation					
TSS	Sufficient				
Metals	Sufficient				
Hydrocarbons	Sufficient				

SUMMARY TABLE		DESIGN CONDITIONS			
		1	2	3	4
Land Use Type	Low traffic roads (e.g. residential roads and general access roads, < 300 traffic movements/day)				
Pollution Hazard Level	Low				
Pollution Hazard Indices					
TSS	0.5				
Metals	0.4				
Hydrocarbons	0.4				
SuDS components proposed					
Component 1	Detention basin	SuDS components can only be assumed to deliver these indices if they follow design guidance with respect to hydraulics and treatment set out in the relevant technical component chapters of the SuDS Manual. See also checklists in Appendix B			
Component 2	None				
Component 3	None				
SuDS Pollution Mitigation Indices					
TSS	0.5				
Metals	0.5				
Hydrocarbons	0.6				
Groundwater protection type	None				
Groundwater protection Pollution Mitigation Indices					
TSS	0				
Metals	0				
Hydrocarbons	0				
Combined Pollution Mitigation Indices					
TSS	0.5	Reference to local planning documents should also be made to identify any additional protection required for sites due to habitat conservation (see Chapter 7 The SuDS design process). The implications of developments on or within close proximity to an area with an environmental designation, such as a Site of Special Scientific Interest (SSSI), should be considered via consultation with relevant conservation bodies such as Natural England			
Metals	0.5				
Hydrocarbons	0.6				
Acceptability of Pollution Mitigation					
TSS	Sufficient				
Metals	Sufficient				
Hydrocarbons	Sufficient				

SUMMARY TABLE		DESIGN CONDITIONS			
		1	2	3	4
Land Use Type	Roads (excluding low traffic roads, highly frequented lorry approaches to industrial estates, trunk roads/motorways)				
Pollution Hazard Level	Medium				
Pollution Hazard Indices					
TSS	0.7				
Metals	0.6				
Hydrocarbons	0.7				
SuDS components proposed					
Component 1	Filter drain (where the trench is not designed as an infiltration component)	SuDS components can only be assumed to deliver these indices if they follow design guidance with respect to hydraulics and treatment set out in the relevant technical component chapters of the SuDS Manual. See also checklists in Appendix B	Filter drains should be preceded by upstream component(s) that trap(s) silt, or designed specifically to retain sediment in a separate zone, easily accessible for maintenance, such that the sediment will not be re-suspended in subsequent events		
Component 2	Filter drain (where the trench is not designed as an infiltration component)	SuDS components can only be assumed to deliver these indices if they follow design guidance with respect to hydraulics and treatment set out in the relevant technical component chapters of the SuDS Manual. See also checklists in Appendix B	Filter drains should be preceded by upstream component(s) that trap(s) silt, or designed specifically to retain sediment in a separate zone, easily accessible for maintenance, such that the sediment will not be re-suspended in subsequent events		
Component 3	Detention basin	SuDS components can only be assumed to deliver these indices if they follow design guidance with respect to hydraulics and treatment set out in the relevant technical component chapters of the SuDS Manual. See also checklists in Appendix B			
SuDS Pollution Mitigation Indices					
TSS	0.85				
Metals	0.85				
Hydrocarbons	0.9				
Groundwater protection type	None				
Groundwater protection Pollution Mitigation Indices					
TSS	0				
Metals	0				
Hydrocarbons	0				
Combined Pollution Mitigation Indices		Reference to local planning documents should also be made to identify any additional protection required for sites due to habitat conservation (see Chapter 7 The SuDS design process). The implications of developments on or within close proximity to an area with an environmental designation, such as a Site of Special Scientific Interest (SSSI), should be considered via consultation with relevant conservation bodies such as Natural England			
TSS	0.85				
Metals	0.85				
Hydrocarbons	0.9				
Acceptability of Pollution Mitigation					
TSS	Sufficient				
Metals	Sufficient				
Hydrocarbons	Sufficient				

Appendix C – Calculations

- Pre-Development Calculations - 10, 50 100 and 200 year rainfall return event.
- Extended Detention Basin Calculations - 10, 50, 100 and 200 year rainfall return event.
- Cellular Storage Calculations – 10, 50, 100 and 200 year rainfall return event.

FAIRHURST					**CALCULATION SHEET**
CONSULTING STRUCTURAL AND CIVIL ENGINEERS **Cults Property Development Company Ltd** **Inchgarth Road** **Cults** **Pre-development Run-off Calculation**	**PROJECT**	**JOB No.**	106859	**Calculated by**	MC
		SHEET No.	1		
		DATE	18/05/17	**Checked by**	DA

To establish Winter Rain Acceptance Potential (WRAP) for site from site investigation results

From FSR Clause 4

A Drainage group:

B Depth to impermeable layers:

C Permeability group:

D Slope:

From Table 4.5 of FSR a WRAP of 2 is obtained.

Establish Pre-development Peak Surface Water Run-off

The following formula is used to calculate the peak flow in m^3/s ;-

$$Q_{BARrural} = 0.00108 \times Area^{0.89} \times SAAR^{1.17} \times SOIL^{2.17}$$

where, AREA is the Gross Area in km^2 = 5.800 ha / 100 = 0.05800 km^2
SAAR for Cults = 789
SOIL is factor for WRAP value. For WRAP of 2 , SOIL is 0.30

$$Q_{BARrural} = 0.00108 \times 0.05800^{0.89} \times 789^{1.17} \times 0.30^{2.17}$$

$$= 0.00108 \times 0.07933 \times 2452.34 \times 0.07334$$

$$= 0.01541 \ m^3/s$$

$$= 15.41 \ l/s$$

Apply Regional Growth Factors from Table 1(2.39) of FSSR 14

Site is in Region 1 (Fig. 2.4), therefore Factors are:

10 year event is 1.45, therefore 10 year pre-development Run-off = 15.41 x 1.45 = 22.34 l/s

50 year event is 2.12, therefore 50 year pre-development Run-off = 15.41 x 2.12 = 32.67 l/s

100 year event is 2.48, therefore 100 year pre-development Run-off = 15.41 x 2.48 = 38.22 l/s

200 year event is 2.81, therefore 200 year pre-development Run-off = 15.41 x 2.81 = 43.30 l/s

Summary of Results for 10 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Winter	24.119	0.419	17.6	0.0	17.6	172.1	O K
30 min Winter	24.229	0.529	17.6	0.0	17.6	229.3	O K
60 min Winter	24.351	0.651	17.6	0.0	17.6	298.8	O K
120 min Winter	24.470	0.770	17.6	0.0	17.6	373.2	O K
180 min Winter	24.531	0.831	17.6	0.0	17.6	413.7	O K
240 min Winter	24.567	0.867	17.6	0.0	17.6	438.1	O K
360 min Winter	24.607	0.907	17.6	0.0	17.6	466.1	O K
480 min Winter	24.631	0.931	17.8	0.0	17.8	483.5	O K
600 min Winter	24.644	0.944	17.9	0.0	17.9	493.0	O K
720 min Winter	24.650	0.950	18.0	0.0	18.0	497.2	O K
960 min Winter	24.639	0.939	17.9	0.0	17.9	489.5	O K
1440 min Winter	24.593	0.893	17.6	0.0	17.6	456.1	O K
2160 min Winter	24.494	0.794	17.6	0.0	17.6	388.9	O K
2880 min Winter	24.374	0.674	17.6	0.0	17.6	312.5	O K
4320 min Winter	23.922	0.222	17.6	0.0	17.6	82.1	O K
5760 min Winter	23.785	0.085	15.9	0.0	15.9	29.1	O K
7200 min Winter	23.759	0.059	13.4	0.0	13.4	19.9	O K
8640 min Winter	23.743	0.043	11.6	0.0	11.6	14.5	O K
10080 min Winter	23.732	0.032	10.3	0.0	10.3	10.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
15 min Winter	42.568	0.0	193.4	0.0	28
30 min Winter	28.844	0.0	262.2	0.0	42
60 min Winter	19.545	0.0	355.1	0.0	70
120 min Winter	13.243	0.0	481.8	0.0	126
180 min Winter	10.547	0.0	575.6	0.0	182
240 min Winter	8.974	0.0	652.7	0.0	234
360 min Winter	7.146	0.0	779.7	0.0	296
480 min Winter	6.080	0.0	884.7	0.0	376
600 min Winter	5.364	0.0	975.9	0.0	456
720 min Winter	4.842	0.0	1057.5	0.0	534
960 min Winter	4.087	0.0	1189.5	0.0	688
1440 min Winter	3.218	0.0	1404.9	0.0	988
2160 min Winter	2.534	0.0	1659.5	0.0	1420
2880 min Winter	2.139	0.0	1867.8	0.0	1852
4320 min Winter	1.559	0.0	2042.4	0.0	2424
5760 min Winter	1.246	0.0	2176.2	0.0	2944
7200 min Winter	1.047	0.0	2285.8	0.0	3672
8640 min Winter	0.908	0.0	2379.6	0.0	4408
10080 min Winter	0.805	0.0	2461.8	0.0	5144

Model Details

Storage is Online Cover Level (m) 25.700

Tank or Pond Structure

Invert Level (m) 23.700

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	329.0	0.800	664.0	1.600	1050.0
0.400	490.0	1.200	850.0	2.000	1260.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0188-1760-1000-1760
Design Head (m)	1.000
Design Flow (l/s)	17.6
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	188
Invert Level (m)	23.600
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1500

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	17.6	Kick-Flo®	0.715	15.0
Flush-Flo™	0.334	17.6	Mean Flow over Head Range	-	14.9

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	6.6	1.200	19.2	3.000	29.7	7.000	44.7
0.200	16.8	1.400	20.6	3.500	32.0	7.500	46.2
0.300	17.5	1.600	22.0	4.000	34.1	8.000	47.7
0.400	17.5	1.800	23.3	4.500	36.1	8.500	49.1
0.500	17.2	2.000	24.5	5.000	38.0	9.000	50.5
0.600	16.6	2.200	25.6	5.500	39.8	9.500	51.9
0.800	15.8	2.400	26.7	6.000	41.5		
1.000	17.6	2.600	27.7	6.500	43.1		

Orifice Overflow Control

Diameter (m) 0.080 Discharge Coefficient 0.600 Invert Level (m) 25.000

Summary of Results for 50 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Winter	24.297	0.597	17.6	0.0	17.6	267.3	O K
30 min Winter	24.440	0.740	17.6	0.0	17.6	353.5	O K
60 min Winter	24.595	0.895	17.6	0.0	17.6	457.6	O K
120 min Winter	24.754	1.054	18.8	0.0	18.8	575.8	O K
180 min Winter	24.841	1.141	19.5	0.0	19.5	645.8	O K
240 min Winter	24.896	1.196	19.9	0.0	19.9	691.7	O K
360 min Winter	24.959	1.259	20.3	0.0	20.3	745.5	O K
480 min Winter	24.993	1.293	20.6	0.0	20.6	775.8	O K
600 min Winter	25.018	1.318	20.7	0.1	20.9	798.2	O K
720 min Winter	25.033	1.333	20.9	0.5	21.3	812.2	O K
960 min Winter	25.038	1.338	20.9	0.6	21.5	816.7	O K
1440 min Winter	25.019	1.319	20.8	0.2	20.9	798.8	O K
2160 min Winter	24.952	1.252	20.3	0.0	20.3	739.7	O K
2880 min Winter	24.869	1.169	19.7	0.0	19.7	668.5	O K
4320 min Winter	24.552	0.852	17.6	0.0	17.6	427.9	O K
5760 min Winter	24.126	0.426	17.6	0.0	17.6	175.6	O K
7200 min Winter	23.843	0.143	17.3	0.0	17.3	50.9	O K
8640 min Winter	23.782	0.082	15.6	0.0	15.6	28.1	O K
10080 min Winter	23.763	0.063	13.8	0.0	13.8	21.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
15 min Winter	63.575	0.0	288.9	0.0	29
30 min Winter	42.587	0.0	387.2	0.0	43
60 min Winter	28.529	0.0	518.9	0.0	70
120 min Winter	19.111	0.0	695.3	0.0	126
180 min Winter	15.118	0.0	824.9	0.0	184
240 min Winter	12.802	0.0	931.9	0.0	240
360 min Winter	10.127	0.0	1105.2	0.0	346
480 min Winter	8.576	0.0	1247.9	0.0	396
600 min Winter	7.538	0.0	1371.2	0.5	472
720 min Winter	6.784	0.0	1480.8	2.3	552
960 min Winter	5.699	0.0	1658.8	3.3	706
1440 min Winter	4.457	0.0	1946.7	0.7	1016
2160 min Winter	3.486	0.0	2283.8	0.0	1460
2880 min Winter	2.928	0.0	2557.8	0.0	1884
4320 min Winter	2.121	0.0	2778.0	0.0	2692
5760 min Winter	1.687	0.0	2945.8	0.0	3352
7200 min Winter	1.412	0.0	3082.9	0.0	3824
8640 min Winter	1.221	0.0	3199.7	0.0	4408
10080 min Winter	1.080	0.0	3302.0	0.0	5136

Model Details

Storage is Online Cover Level (m) 25.700

Tank or Pond Structure

Invert Level (m) 23.700

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	329.0	0.800	664.0	1.600	1050.0
0.400	490.0	1.200	850.0	2.000	1260.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0188-1760-1000-1760
Design Head (m)	1.000
Design Flow (l/s)	17.6
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	188
Invert Level (m)	23.600
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1500

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	17.6
Flush-Flo™	0.334	17.6
Kick-Flo®	0.715	15.0
Mean Flow over Head Range	-	14.9

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	6.6	1.200	19.2	3.000	29.7	7.000	44.7
0.200	16.8	1.400	20.6	3.500	32.0	7.500	46.2
0.300	17.5	1.600	22.0	4.000	34.1	8.000	47.7
0.400	17.5	1.800	23.3	4.500	36.1	8.500	49.1
0.500	17.2	2.000	24.5	5.000	38.0	9.000	50.5
0.600	16.6	2.200	25.6	5.500	39.8	9.500	51.9
0.800	15.8	2.400	26.7	6.000	41.5		
1.000	17.6	2.600	27.7	6.500	43.1		

Orifice Overflow Control

Diameter (m) 0.080 Discharge Coefficient 0.600 Invert Level (m) 25.000

Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Winter	24.387	0.687	17.6	0.0	17.6	320.5	O K
30 min Winter	24.543	0.843	17.6	0.0	17.6	421.7	O K
60 min Winter	24.714	1.014	18.5	0.0	18.5	545.2	O K
120 min Winter	24.892	1.192	19.8	0.0	19.8	687.6	O K
180 min Winter	24.991	1.291	20.6	0.0	20.6	773.9	O K
240 min Winter	25.053	1.353	21.0	1.1	22.1	830.3	O K
360 min Winter	25.113	1.413	21.4	3.6	25.0	886.4	O K
480 min Winter	25.149	1.449	21.6	4.4	26.1	921.8	O K
600 min Winter	25.175	1.475	21.8	4.9	26.7	946.5	O K
720 min Winter	25.190	1.490	21.9	5.2	27.1	961.9	O K
960 min Winter	25.196	1.496	22.0	5.3	27.2	967.1	O K
1440 min Winter	25.179	1.479	21.8	5.0	26.8	950.3	O K
2160 min Winter	25.128	1.428	21.5	4.0	25.5	901.4	O K
2880 min Winter	25.074	1.374	21.1	1.9	23.0	849.6	O K
4320 min Winter	24.782	1.082	19.0	0.0	19.0	597.7	O K
5760 min Winter	24.492	0.792	17.6	0.0	17.6	387.4	O K
7200 min Winter	24.061	0.361	17.6	0.0	17.6	143.9	O K
8640 min Winter	23.829	0.129	17.2	0.0	17.2	45.6	O K
10080 min Winter	23.782	0.082	15.6	0.0	15.6	28.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
15 min Winter	75.323	0.0	342.3	0.0	29
30 min Winter	50.214	0.0	456.4	0.0	43
60 min Winter	33.475	0.0	609.2	0.0	72
120 min Winter	22.316	0.0	811.7	0.0	128
180 min Winter	17.604	0.0	960.9	0.0	184
240 min Winter	14.877	0.0	1082.6	3.2	240
360 min Winter	11.735	0.0	1281.4	26.6	340
480 min Winter	9.918	0.0	1443.4	47.9	386
600 min Winter	8.704	0.0	1583.9	64.4	462
720 min Winter	7.823	0.0	1707.8	77.4	540
960 min Winter	6.559	0.0	1909.0	89.0	696
1440 min Winter	5.115	0.0	2233.6	88.3	994
2160 min Winter	3.990	0.0	2613.6	67.0	1432
2880 min Winter	3.345	0.0	2920.2	26.3	1880
4320 min Winter	2.415	0.0	3163.7	0.0	2728
5760 min Winter	1.917	0.0	3348.1	0.0	3528
7200 min Winter	1.602	0.0	3498.7	0.0	4112
8640 min Winter	1.384	0.0	3626.5	0.0	4512
10080 min Winter	1.223	0.0	3738.3	0.0	5136

Model Details

Storage is Online Cover Level (m) 25.700

Tank or Pond Structure

Invert Level (m) 23.700

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	329.0	0.800	664.0	1.600	1050.0
0.400	490.0	1.200	850.0	2.000	1260.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0188-1760-1000-1760
Design Head (m)	1.000
Design Flow (l/s)	17.6
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	188
Invert Level (m)	23.600
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1500

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	17.6	Kick-Flo®	0.715	15.0
Flush-Flo™	0.334	17.6	Mean Flow over Head Range	-	14.9

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	6.6	1.200	19.2	3.000	29.7	7.000	44.7
0.200	16.8	1.400	20.6	3.500	32.0	7.500	46.2
0.300	17.5	1.600	22.0	4.000	34.1	8.000	47.7
0.400	17.5	1.800	23.3	4.500	36.1	8.500	49.1
0.500	17.2	2.000	24.5	5.000	38.0	9.000	50.5
0.600	16.6	2.200	25.6	5.500	39.8	9.500	51.9
0.800	15.8	2.400	26.7	6.000	41.5		
1.000	17.6	2.600	27.7	6.500	43.1		

Orifice Overflow Control

Diameter (m) 0.080 Discharge Coefficient 0.600 Invert Level (m) 25.000

Summary of Results for 200 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Winter	24.485	0.785	17.6	0.0	17.6	383.0	O K
30 min Winter	24.656	0.956	18.0	0.0	18.0	502.0	O K
60 min Winter	24.844	1.144	19.5	0.0	19.5	647.9	O K
120 min Winter	25.039	1.339	20.9	0.6	21.5	817.9	O K
180 min Winter	25.141	1.441	21.6	4.2	25.8	913.6	O K
240 min Winter	25.203	1.503	22.0	5.4	27.4	975.0	O K
360 min Winter	25.274	1.574	22.5	6.5	28.9	1046.4	O K
480 min Winter	25.317	1.617	22.7	7.0	29.8	1092.3	O K
600 min Winter	25.347	1.647	22.9	7.4	30.3	1123.7	O K
720 min Winter	25.365	1.665	23.0	7.6	30.6	1143.2	O K
960 min Winter	25.371	1.671	23.1	7.7	30.8	1149.5	O K
1440 min Winter	25.353	1.653	23.0	7.5	30.4	1130.1	O K
2160 min Winter	25.297	1.597	22.6	6.8	29.4	1071.2	O K
2880 min Winter	25.233	1.533	22.2	5.9	28.1	1004.9	O K
4320 min Winter	25.016	1.316	20.7	0.1	20.9	796.7	O K
5760 min Winter	24.742	1.042	18.7	0.0	18.7	566.7	O K
7200 min Winter	24.475	0.775	17.6	0.0	17.6	376.1	O K
8640 min Winter	24.049	0.349	17.6	0.0	17.6	138.1	O K
10080 min Winter	23.833	0.133	17.2	0.0	17.2	47.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
15 min Winter	89.187	0.0	405.5	0.0	30
30 min Winter	59.170	0.0	538.3	0.0	43
60 min Winter	39.256	0.0	714.3	0.0	72
120 min Winter	26.044	0.0	948.0	0.8	128
180 min Winter	20.487	0.0	1118.3	21.5	184
240 min Winter	17.279	0.0	1257.5	45.1	238
360 min Winter	13.592	0.0	1483.8	85.0	340
480 min Winter	11.463	0.0	1668.3	116.8	386
600 min Winter	10.045	0.0	1827.8	142.5	464
720 min Winter	9.017	0.0	1968.8	163.7	542
960 min Winter	7.544	0.0	2196.5	190.2	698
1440 min Winter	5.867	0.0	2561.9	216.0	998
2160 min Winter	4.563	0.0	2989.4	205.4	1432
2880 min Winter	3.818	0.0	3334.0	179.3	1852
4320 min Winter	2.749	0.0	3601.4	0.9	2736
5760 min Winter	2.178	0.0	3803.8	0.0	3528
7200 min Winter	1.818	0.0	3968.4	0.0	4336
8640 min Winter	1.568	0.0	4108.5	0.0	4848
10080 min Winter	1.384	0.0	4230.3	0.0	5256

Model Details

Storage is Online Cover Level (m) 25.700

Tank or Pond Structure

Invert Level (m) 23.700

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	329.0	0.800	664.0	1.600	1050.0
0.400	490.0	1.200	850.0	2.000	1260.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0188-1760-1000-1760
Design Head (m)	1.000
Design Flow (l/s)	17.6
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	188
Invert Level (m)	23.600
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1500

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	17.6	Kick-Flo®	0.715	15.0
Flush-Flo™	0.334	17.6	Mean Flow over Head Range	-	14.9

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	6.6	1.200	19.2	3.000	29.7	7.000	44.7
0.200	16.8	1.400	20.6	3.500	32.0	7.500	46.2
0.300	17.5	1.600	22.0	4.000	34.1	8.000	47.7
0.400	17.5	1.800	23.3	4.500	36.1	8.500	49.1
0.500	17.2	2.000	24.5	5.000	38.0	9.000	50.5
0.600	16.6	2.200	25.6	5.500	39.8	9.500	51.9
0.800	15.8	2.400	26.7	6.000	41.5		
1.000	17.6	2.600	27.7	6.500	43.1		

Orifice Overflow Control

Diameter (m) 0.080 Discharge Coefficient 0.600 Invert Level (m) 25.000

Summary of Results for 10 year Return Period (+30%)

Half Drain Time : 53 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Winter	40.400	0.200	0.0	4.4	4.4	15.4	O K
30 min Winter	40.452	0.252	0.0	4.4	4.4	19.4	O K
60 min Winter	40.501	0.301	0.0	4.4	4.4	23.2	O K
120 min Winter	40.539	0.339	0.0	4.4	4.4	26.1	O K
180 min Winter	40.546	0.346	0.0	4.4	4.4	26.7	O K
240 min Winter	40.541	0.341	0.0	4.4	4.4	26.2	O K
360 min Winter	40.512	0.312	0.0	4.4	4.4	24.0	O K
480 min Winter	40.469	0.269	0.0	4.4	4.4	20.7	O K
600 min Winter	40.428	0.228	0.0	4.4	4.4	17.5	O K
720 min Winter	40.391	0.191	0.0	4.4	4.4	14.7	O K
960 min Winter	40.335	0.135	0.0	4.4	4.4	10.4	O K
1440 min Winter	40.302	0.102	0.0	3.8	3.8	7.8	O K
2160 min Winter	40.285	0.085	0.0	3.0	3.0	6.5	O K
2880 min Winter	40.276	0.076	0.0	2.5	2.5	5.8	O K
4320 min Winter	40.262	0.062	0.0	1.9	1.9	4.8	O K
5760 min Winter	40.255	0.055	0.0	1.5	1.5	4.2	O K
7200 min Winter	40.249	0.049	0.0	1.2	1.2	3.8	O K
8640 min Winter	40.246	0.046	0.0	1.1	1.1	3.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Winter	42.568	0.0	17.9	21
30 min Winter	28.844	0.0	24.2	34
60 min Winter	19.545	0.0	32.9	60
120 min Winter	13.243	0.0	44.7	96
180 min Winter	10.547	0.0	53.4	134
240 min Winter	8.974	0.0	60.5	172
360 min Winter	7.146	0.0	72.3	246
480 min Winter	6.080	0.0	82.1	312
600 min Winter	5.364	0.0	90.5	372
720 min Winter	4.842	0.0	98.0	430
960 min Winter	4.087	0.0	110.3	534
1440 min Winter	3.218	0.0	130.3	752
2160 min Winter	2.534	0.0	154.0	1104
2880 min Winter	2.139	0.0	173.3	1464
4320 min Winter	1.559	0.0	189.4	2164
5760 min Winter	1.246	0.0	201.9	2928
7200 min Winter	1.047	0.0	212.1	3672
8640 min Winter	0.908	0.0	220.8	4376

Summary of Results for 10 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m^3)	Status
10080 min Winter	40.243	0.043	0.0	1.0	1.0	3.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m^3)	Discharge Volume (m^3)	Time-Peak (mins)
10080 min Winter	0.805	0.0	228.4	5112

Model Details

Storage is Online Cover Level (m) 41.500

Cellular Storage Structure

Invert Level (m) 40.200 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	81.0	81.0	0.900	0.0	129.0
0.800	81.0	129.0			

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0107-4400-0400-4400
Design Head (m)	0.400
Design Flow (l/s)	4.4
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	107
Invert Level (m)	40.200
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.400	4.4	Kick-Flo®	0.309	3.9
Flush-Flo™	0.163	4.4	Mean Flow over Head Range	-	3.5

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.7	1.200	7.3	3.000	11.3	7.000	17.1
0.200	4.4	1.400	7.9	3.500	12.2	7.500	17.7
0.300	4.0	1.600	8.4	4.000	13.0	8.000	18.3
0.400	4.4	1.800	8.9	4.500	13.7	8.500	18.9
0.500	4.9	2.000	9.3	5.000	14.4	9.000	19.4
0.600	5.3	2.200	9.8	5.500	15.2	9.500	20.0
0.800	6.1	2.400	10.2	6.000	15.8		
1.000	6.7	2.600	10.6	6.500	16.5		

Summary of Results for 50 year Return Period (+30%)

Half Drain Time : 80 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Σ Max Outflow (l/s)	Max Volume (m³)	Status
15 min Winter	40.512	0.312	0.0	4.4	4.4	24.0	O K
30 min Winter	40.596	0.396	0.0	4.4	4.4	30.4	O K
60 min Winter	40.675	0.475	0.0	4.8	4.8	36.5	O K
120 min Winter	40.736	0.536	0.0	5.0	5.0	41.3	O K
180 min Winter	40.759	0.559	0.0	5.1	5.1	43.0	O K
240 min Winter	40.763	0.563	0.0	5.2	5.2	43.3	O K
360 min Winter	40.748	0.548	0.0	5.1	5.1	42.2	O K
480 min Winter	40.720	0.520	0.0	5.0	5.0	40.0	O K
600 min Winter	40.689	0.489	0.0	4.8	4.8	37.6	O K
720 min Winter	40.655	0.455	0.0	4.7	4.7	35.0	O K
960 min Winter	40.581	0.381	0.0	4.4	4.4	29.3	O K
1440 min Winter	40.404	0.204	0.0	4.4	4.4	15.7	O K
2160 min Winter	40.311	0.111	0.0	4.1	4.1	8.6	O K
2880 min Winter	40.295	0.095	0.0	3.5	3.5	7.3	O K
4320 min Winter	40.275	0.075	0.0	2.5	2.5	5.8	O K
5760 min Winter	40.265	0.065	0.0	2.0	2.0	5.0	O K
7200 min Winter	40.259	0.059	0.0	1.7	1.7	4.5	O K
8640 min Winter	40.254	0.054	0.0	1.5	1.5	4.2	O K
10080 min Winter	40.250	0.050	0.0	1.3	1.3	3.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Winter	63.575	0.0	26.7	21
30 min Winter	42.587	0.0	35.8	35
60 min Winter	28.529	0.0	48.1	62
120 min Winter	19.111	0.0	64.5	98
180 min Winter	15.118	0.0	76.5	138
240 min Winter	12.802	0.0	86.4	176
360 min Winter	10.127	0.0	102.5	250
480 min Winter	8.576	0.0	115.8	324
600 min Winter	7.538	0.0	127.2	394
720 min Winter	6.784	0.0	137.4	464
960 min Winter	5.699	0.0	153.9	602
1440 min Winter	4.457	0.0	180.5	828
2160 min Winter	3.486	0.0	211.9	1108
2880 min Winter	2.928	0.0	237.3	1472
4320 min Winter	2.121	0.0	257.7	2204
5760 min Winter	1.687	0.0	273.3	2872
7200 min Winter	1.412	0.0	286.1	3584
8640 min Winter	1.221	0.0	296.9	4384
10080 min Winter	1.080	0.0	306.3	5032

Model Details

Storage is Online Cover Level (m) 41.500

Cellular Storage Structure

Invert Level (m) 40.200 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	**Area (m²)**	**Inf. Area (m²)**	**Depth (m)**	**Area (m²)**	**Inf. Area (m²)**
0.000	81.0	81.0	0.900	0.0	129.0
0.800	81.0	129.0			

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0107-4400-0400-4400
Design Head (m)	0.400
Design Flow (l/s)	4.4
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	107
Invert Level (m)	40.200
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	**Head (m)**	**Flow (l/s)**
Design Point (Calculated)	0.400	4.4
Flush-Flo™	0.163	4.4
Kick-Flo®	0.309	3.9
Mean Flow over Head Range	-	3.5

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	**Flow (l/s)**	**Depth (m)**	**Flow (l/s)**	**Depth (m)**	**Flow (l/s)**	**Depth (m)**	**Flow (l/s)**
0.100	3.7	1.200	7.3	3.000	11.3	7.000	17.1
0.200	4.4	1.400	7.9	3.500	12.2	7.500	17.7
0.300	4.0	1.600	8.4	4.000	13.0	8.000	18.3
0.400	4.4	1.800	8.9	4.500	13.7	8.500	18.9
0.500	4.9	2.000	9.3	5.000	14.4	9.000	19.4
0.600	5.3	2.200	9.8	5.500	15.2	9.500	20.0
0.800	6.1	2.400	10.2	6.000	15.8		
1.000	6.7	2.600	10.6	6.500	16.5		

Summary of Results for 100 year Return Period (+30%)

Half Drain Time : 94 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Winter	40.574	0.374	0.0	4.4	4.4	28.8	O K
30 min Winter	40.673	0.473	0.0	4.8	4.8	36.4	O K
60 min Winter	40.770	0.570	0.0	5.2	5.2	43.9	O K
120 min Winter	40.845	0.645	0.0	5.5	5.5	49.7	O K
180 min Winter	40.876	0.676	0.0	5.6	5.6	52.0	O K
240 min Winter	40.886	0.686	0.0	5.6	5.6	52.8	O K
360 min Winter	40.875	0.675	0.0	5.6	5.6	52.0	O K
480 min Winter	40.849	0.649	0.0	5.5	5.5	50.0	O K
600 min Winter	40.817	0.617	0.0	5.4	5.4	47.5	O K
720 min Winter	40.784	0.584	0.0	5.2	5.2	44.9	O K
960 min Winter	40.708	0.508	0.0	4.9	4.9	39.1	O K
1440 min Winter	40.570	0.370	0.0	4.4	4.4	28.5	O K
2160 min Winter	40.349	0.149	0.0	4.4	4.4	11.5	O K
2880 min Winter	40.307	0.107	0.0	3.9	3.9	8.2	O K
4320 min Winter	40.282	0.082	0.0	2.9	2.9	6.3	O K
5760 min Winter	40.271	0.071	0.0	2.3	2.3	5.4	O K
7200 min Winter	40.263	0.063	0.0	1.9	1.9	4.9	O K
8640 min Winter	40.258	0.058	0.0	1.7	1.7	4.5	O K
10080 min Winter	40.254	0.054	0.0	1.5	1.5	4.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Winter	75.323	0.0	31.7	21
30 min Winter	50.214	0.0	42.3	35
60 min Winter	33.475	0.0	56.5	62
120 min Winter	22.316	0.0	75.3	100
180 min Winter	17.604	0.0	89.1	140
240 min Winter	14.877	0.0	100.4	178
360 min Winter	11.735	0.0	118.8	254
480 min Winter	9.918	0.0	133.9	326
600 min Winter	8.704	0.0	146.9	396
720 min Winter	7.823	0.0	158.4	468
960 min Winter	6.559	0.0	177.1	602
1440 min Winter	5.115	0.0	207.2	882
2160 min Winter	3.990	0.0	242.5	1172
2880 min Winter	3.345	0.0	271.0	1476
4320 min Winter	2.415	0.0	293.5	2188
5760 min Winter	1.917	0.0	310.7	2936
7200 min Winter	1.602	0.0	324.6	3592
8640 min Winter	1.384	0.0	336.5	4392
10080 min Winter	1.223	0.0	346.8	5104

Model Details

Storage is Online Cover Level (m) 41.500

Cellular Storage Structure

Invert Level (m) 40.200 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	81.0	81.0	0.900	0.0	129.0
0.800	81.0	129.0			

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0107-4400-0400-4400
Design Head (m)	0.400
Design Flow (l/s)	4.4
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	107
Invert Level (m)	40.200
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.400	4.4
Flush-Flo™	0.163	4.4
Kick-Flo®	0.309	3.9
Mean Flow over Head Range	-	3.5

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.7	1.200	7.3	3.000	11.3	7.000	17.1
0.200	4.4	1.400	7.9	3.500	12.2	7.500	17.7
0.300	4.0	1.600	8.4	4.000	13.0	8.000	18.3
0.400	4.4	1.800	8.9	4.500	13.7	8.500	18.9
0.500	4.9	2.000	9.3	5.000	14.4	9.000	19.4
0.600	5.3	2.200	9.8	5.500	15.2	9.500	20.0
0.800	6.1	2.400	10.2	6.000	15.8		
1.000	6.7	2.600	10.6	6.500	16.5		

Summary of Results for 200 year Return Period (+30%)

Half Drain Time : 103 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Winter	40.647	0.447	0.0	4.6	4.6	34.4	O K
30 min Winter	40.765	0.565	0.0	5.2	5.2	43.5	O K
60 min Winter	40.882	0.682	0.0	5.6	5.6	52.5	O K
120 min Winter	40.974	0.774	0.0	6.0	6.0	59.6	O K
180 min Winter	41.019	0.819	0.0	6.1	6.1	62.7	O K
240 min Winter	41.055	0.855	0.0	6.3	6.3	63.9	O K
360 min Winter	41.039	0.839	0.0	6.2	6.2	63.5	O K
480 min Winter	41.002	0.802	0.0	6.1	6.1	61.7	O K
600 min Winter	40.969	0.769	0.0	6.0	6.0	59.2	O K
720 min Winter	40.934	0.734	0.0	5.8	5.8	56.5	O K
960 min Winter	40.853	0.653	0.0	5.5	5.5	50.3	O K
1440 min Winter	40.710	0.510	0.0	4.9	4.9	39.2	O K
2160 min Winter	40.514	0.314	0.0	4.4	4.4	24.2	O K
2880 min Winter	40.332	0.132	0.0	4.4	4.4	10.2	O K
4320 min Winter	40.290	0.090	0.0	3.3	3.3	7.0	O K
5760 min Winter	40.277	0.077	0.0	2.6	2.6	5.9	O K
7200 min Winter	40.268	0.068	0.0	2.2	2.2	5.2	O K
8640 min Winter	40.262	0.062	0.0	1.9	1.9	4.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Winter	89.187	0.0	37.5	22
30 min Winter	59.170	0.0	49.8	35
60 min Winter	39.256	0.0	66.2	64
120 min Winter	26.044	0.0	87.9	102
180 min Winter	20.487	0.0	103.7	140
240 min Winter	17.279	0.0	116.6	180
360 min Winter	13.592	0.0	137.6	256
480 min Winter	11.463	0.0	154.8	330
600 min Winter	10.045	0.0	169.5	402
720 min Winter	9.017	0.0	182.6	472
960 min Winter	7.544	0.0	203.7	610
1440 min Winter	5.867	0.0	237.6	872
2160 min Winter	4.563	0.0	277.3	1300
2880 min Winter	3.818	0.0	309.4	1532
4320 min Winter	2.749	0.0	334.1	2208
5760 min Winter	2.178	0.0	352.9	2928
7200 min Winter	1.818	0.0	368.2	3632
8640 min Winter	1.568	0.0	381.2	4408

Summary of Results for 200 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
10080 min Winter	40.258	0.058	0.0	1.7	1.7	4.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
10080 min Winter	1.384	0.0	392.5	5048

Model Details

Storage is Online Cover Level (m) 41.500

Cellular Storage Structure

Invert Level (m) 40.200 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	81.0	81.0	0.900	0.0	129.0
0.800	81.0	129.0			

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0107-4400-0400-4400
Design Head (m)	0.400
Design Flow (l/s)	4.4
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	107
Invert Level (m)	40.200
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

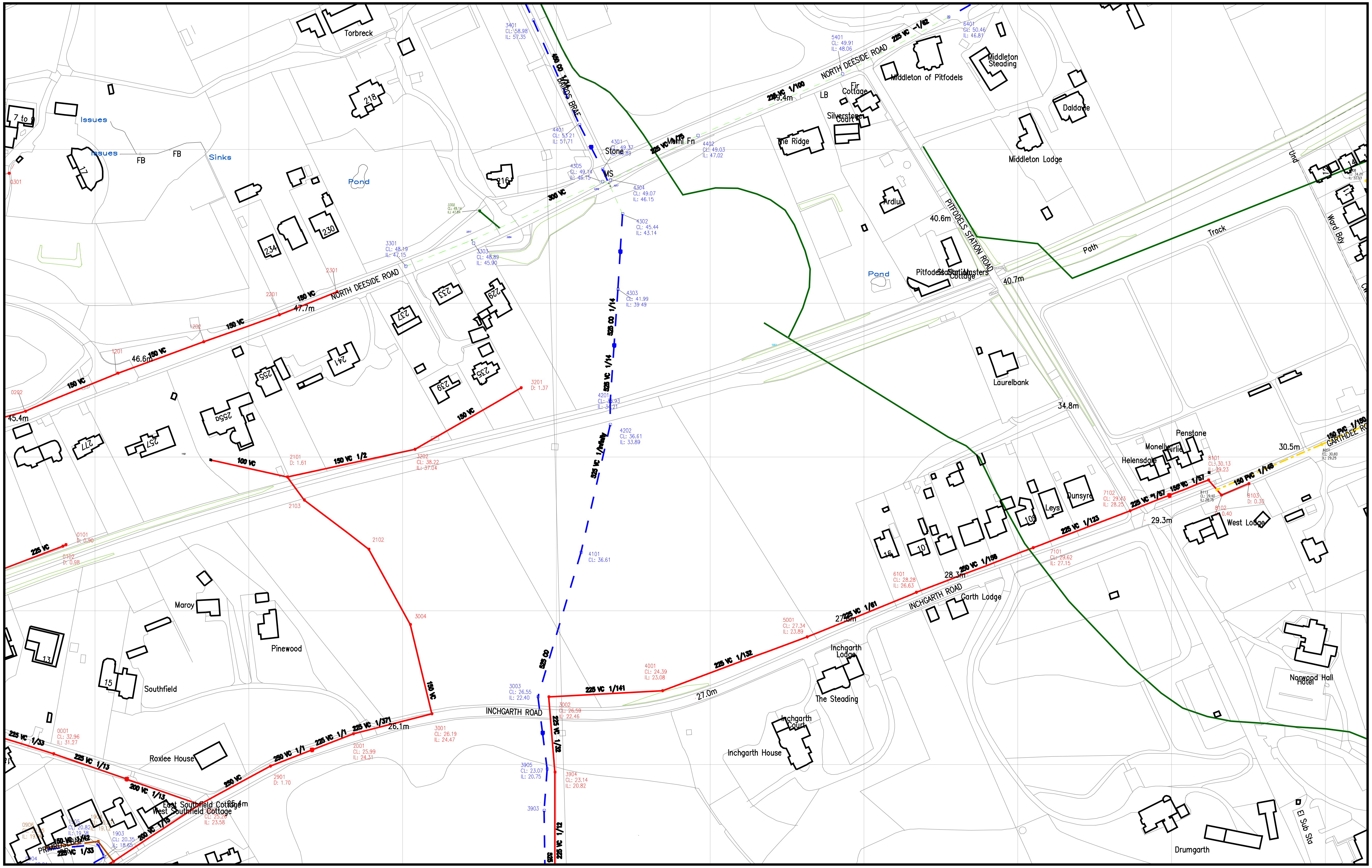
Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.400	4.4	Kick-Flo®	0.309	3.9
Flush-Flo™	0.163	4.4	Mean Flow over Head Range	-	3.5

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.7	1.200	7.3	3.000	11.3	7.000	17.1
0.200	4.4	1.400	7.9	3.500	12.2	7.500	17.7
0.300	4.0	1.600	8.4	4.000	13.0	8.000	18.3
0.400	4.4	1.800	8.9	4.500	13.7	8.500	18.9
0.500	4.9	2.000	9.3	5.000	14.4	9.000	19.4
0.600	5.3	2.200	9.8	5.500	15.2	9.500	20.0
0.800	6.1	2.400	10.2	6.000	15.8		
1.000	6.7	2.600	10.6	6.500	16.5		

Appendix D – Scottish Water

- GIS Records - Sewers



N

The representation of physical assets and the boundaries of areas in which Scottish Water and others have an interest does not necessarily imply their true positions. For further details contact the appropriate District Office.

Date Plotted: 19/10/2016

OP/JQVNF065

Wastewater Plan

0 236 metres

Scale: 1:2500

Plotted By: intocli01

Scottish Water
Always serving Scotland
Castle House,
6 Castle Drive,
Dunfermline,
KY11 8GG
Tel No: 0845 601 8855

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FAIRHURST

Inchgarth Road, Aberdeen

Environmental Desk Study

May 2018

FAIRHURST

CONTROL SHEET

CLIENT: **Cults Property Development Co. Ltd**

PROJECT TITLE: **Inchgarth Road, Aberdeen**

REPORT TITLE: **Environmental Desk Study**

PROJECT REFERENCE: **106859**

Issue and Approval Schedule:

ISSUE 1	Name	Signature	Date
Prepared by	Jennifer Bohill	[redacted]	07/11/2016
Reviewed by	Nigel Turner	[redacted]	07/11/2016
Approved by	Lyndsay Yuille	[redacted]	07/11/2016
Issue Details	FINAL		

Revision Record:

Issue	Date	Status	Description	By	Chk	App
2	01/06/17	FINAL	Report updated following update to development proposals	JB	LY	LY
3	27/06/17	FINAL	Report updated following further minor revisions to development proposals	NT	LY	LY
4	25/05/18	FINAL	Report updated following client comments	JB	CS	CS
5						
6						
7						
8						

This report has been prepared in accordance with procedure OP/P02 of Fairhurst's integrated Quality and Environmental Management System (QEMS)

This document has been prepared in accordance with the instructions of the client, Cults Property Development Co. Ltd, for the client's sole and specific use. Any other persons who use any information contained herein do so at their own risk.

Executive Summary

Fairhurst were commissioned by Cults Property Development Co. Ltd (CPD) (the Client) to carry out an environmental desk study report in order to establish potential environmental constraints associated with the proposed redevelopment of the site located on North Deeside Road in Aberdeen. It is understood the site is to be developed for a mixed residential and commercial end-use.

The desk study identified no previous development on site, and concludes that the site is Greenfield. The only potential (albeit minor) source of contamination identified was the former railway (and station) that bisects the site. Any contamination from this source (if present) is likely to be highly localised. However, it is considered possible that significant contamination *could* be locally present and, therefore, it is recommended that a basic ground investigation is carried out. A simple trial pitting exercise would be appropriate close to the railway line, with environmental testing only considered necessary if evidence of made ground or potentially contaminated material is discovered.

The desk study also identified other potential development constraints on site that may be pertinent to its future development - the main ones are as follows:

- Locally variable ground conditions should be anticipated, plus the presence of cobbles and boulders in places. Rockhead may be relatively shallow to the north.
- Earthworks are anticipated to be required in order to create level development platforms due to the site topography and generally undulating nature of the ground.
- There are a number of services indicated to be crossing the site, including overhead powerlines and underground water services. An unidentified 'water course' is shown crossing the site, the providence of which is not known. No evidence of this feature was identified on site. Note although the presence of an aqueduct on the southern site boundary.
- Mature trees present across site: orders may be placed for preservation of some trees.
- A small bank of soil, probably a site scrape from adjacent development, was noted at the south-west corner of the south-west field. Japanese knotweed was recorded growing in this bund. Specialist advice should be sought on removal of Japanese knotweed.
- The site is located at the margins of an area identified at being at risk from radon gas. ACC suggest that radon protection should be considered in new buildings along the boundaries to the south and east of the site, as radon mapping will have inherent error. Requirements should be confirmed with Building Control. Should basic radon protection be required, Fairhurst recommend a 50m buffer area along the boundary, and any developments within this area are constructed with basic radon protection measures.
- Although identified as Greenfield, disturbed ground *may* be encountered (possibly relating to past agricultural activities), as potentially evidenced by deep (1.5 m) topsoil recorded in BGS logs, and the presence of nettles.

In addition to the targeted investigation recommended to determine risk to future site users, it is recommended that an intrusive geotechnical ground investigation is undertaken. It would be cost effective to include the environmental investigation in the main ground investigation.

As the site is considered Greenfield, no chemical testing is considered necessary to inform water pipe specification for Scottish Water, unless water pipes will be placed in direct proximity to the dismantled railway.

Contents

Drawings

Appendices

1.0 Introduction

Fairhurst were commissioned by Cults Property Development Co. Ltd (the Client), to carry out an environmental desk study for a proposed development site located to the south of North Deeside Road and north of Inchgarth Road, Aberdeen. It is understood that the site is to be developed for a mixed use community comprising residential, retail and care home facilities. The site location is show on Drawing 106859/9100.

1.1 Aims

The aims of the desk study were to undertake a Phase 1 investigation in accordance with British Standard 10175:2011 "Investigation of Potentially Contaminated Sites" (BSI, 2011). The following information is included:

- To carry out a desk based study by way of a site walkover and review of pertinent published information including historical maps, geological and hydrogeological maps, in addition to relevant online and consultation resources (e.g. SEPA, RCAHMS, and Aberdeen City Council etc.).
- To identify, assess and evaluate potentially contaminants including any sources, pathways and receptors as well as any other environmental factors applicable to the site.
- To assess and evaluate the risk of significant harm occurring to one or more site receptors.
- To recommend further site investigation, where applicable, in order to facilitate and support the development of the site.

In addition, outline comments regarding certain other potential development constraints, including geotechnical, are included where applicable.

2.0 Sources of Information

2.1 Envirocheck

A range of available historical Ordnance Survey maps were obtained from Envirocheck. An Envirocheck report was obtained 12th October 2016 and reviewed in the production of the desk study. These maps are included as Appendix 1 and are referenced in Table 1 below.

Table 1: List of Historical Maps consulted as part of this desk study.

Sheet	Scale	Date
Aberdeenshire	1:2500	1864 – 1892, 1901, 1925
	1:10560	1869, 1902 – 1904, 1928, 1938
Kincardineshire	1:2500	1895
Ordnance Survey Plan	1:2500	1963 – 1967, 1980
	1:10000	1959, 1967 – 1968, 1974, 1984 - 1988
Large- Scale National Grid Data	1:2500	1993
Aerial Photography	1:2500	2001
	1:10560	1944
Aberdeen	1:10000	1981
10k Raster Mapping	1:10000	2000, 2006
VectorMap Local	1:10000	2016

2.2 Internet Sources

The following internet sources were consulted for further information concerning the site:

- Aberdeen City planning website
- British Geological Survey (BGS) online resources: www.bgs.ac.uk
- National Library of Scotland (NLS) Historical Maps: http://maps.nls.uk
- Scottish Environmental Protection Agency (SEPA): www.sepa.org.uk
- Historic Environment Scotland https://canmore.org.uk
- UK Radon Map http://www.ukradon.org/information/ukmaps

Information from these websites is incorporated into this desk study where relevant.

2.3 Previous Reports

One previous report, for an adjacent site, has been consulted in the preparation of this desk study.

Table 2: **List of Previous Reports consulted in preparation of the desk study**

Site	GI Contractor	Date	Report Ref.
Marcliffe Hotel, Aberdeen	Fairhurst	2014	105300

2.4 British Geological Survey

Details of the British Geological Survey (BGS) maps referenced for the desk study are listed in Table 3.

Table 3: List of BGS Maps Consulted.

Sheet	Scale	Date
Scotland Sheet 77 (Superficial Deposits) Aberdeen	1:50 000	2004
Scotland Sheet 77 (Solid) Aberdeen	1:50 000	1982

2.5 Consultations

Table 4: List of Consultations undertaken with date of enquiry and response.

Organisation	Date Of Enquiry	Date Of Reply
Contaminated Land Unit	13/10/2016	18/10/2016
Petroleum Officer	13/10/2016	17/10/2016

Consultation responses are included as Appendix 2.

2.6 Site Walkover

A site walkover was conducted on the 13th October 2016 by a Fairhurst Engineer and is detailed further in the following sections of this report. The full site walkover report along with photographs taken during the survey can be found in Appendix 3.

3.0 Site Description

3.1 Location

The site is located to the south of North Deeside Road (A93) at approximate grid reference NJ90514 03257 in Cults, which is approximately 4.5 km to the south west of Aberdeen City Centre.

A dismantled railway line splits the site into two, running from north east to south west. To the north of the dismantled railway, the site comprises of one field; south of the railway the site comprises 3 fields as detailed in Drawing 106859/9101. The overall site area is approximately 9.9Ha.

3.2 Topography

In general, the site slopes down towards the south, but is fairly undulating overall. The three fields in the southern part of the site have a step in level, down to the west. A hollow was noted to the south of the site within the centre field with Inchgarth Road located at a higher elevation than the site. The gradient of the slope in the centre field therefore was greater than that of the surrounding fields. A second dip was recorded in the south western corner of the western field. This was much shallower in nature with mature trees growing in the area.

3.3 Site Walkover Summary

A site walkover was undertaken on the 13th October 2016 by a Fairhurst Environmental Engineer. The site visit was conducted in dry, overcast weather preceded by heavy rain.

3.3.1 Access

The northern site was accessed by a track located to the north east of the site, from North Deeside Road. The track was overgrown and moderately steep.

The southern site was accessed by two separate gates located on Inchgarth Road.

Access across the site may be inhibited to some extent by dense vegetation and the presence of plough troughs. In addition steps in the southern field levels and the presence of a dip to the south of the centre field and western corner of the western field may further affect access.

3.3.2 Boundaries & Surrounding Land Uses

The site is surrounded by residential properties, with private residential land directly to the east and west. Two roads bound the site to the north and south, North Deeside Road and Inchgarth Road.

To the north of the site a retaining wall was noted separating North Deeside Road from the site. The northern site was also bound to the south and west by walls, with a fence noted to the east. The south of the site was bound by a fence to the north and south, which was recorded as damaged. A second retaining wall was noted on the southern site boundary, where Inchgarth Road passed a dip in the site. A wall bound the site to the east and hedges/grass bund bound the site to the west. The southern site was divided into three fields, separated by walls.

3.3.3 Site Surface & Vegetation

The site was heavily vegetated with areas of dense trees, scrub and tall grass. Mature trees were noted to surround the site. Rosebay willowherb was dominant across much of the southern fields, with localised areas of nettles.

No invasive weeds were recorded (such as Japanese knotweed) except for a localised outcrop at the south-east end of site; however, a full invasive weed survey was outwith the scope of this report. It is anticipated an ecological survey will be required for the site prior to development of the site.

3.3.4 Surface Water

No surface water features were recorded onsite. Heavy vegetation masked any potential drainage ditches and a low recorded in the centre field has the potential to become boggy.

4.0 Historical Development of the Site

The historical development of the site and its immediate surrounding area was established from the examination of existing historical Ordnance Survey maps. The findings are summarised in Table 5 and extracts from the historic maps are reproduced in Appendix 1.

Table 5: Historical Map Review

Date	Notable Features	Potential Sources of Contamination
1864 – 1892, 1895	On site The site was noted as agricultural land, bound to the north and south by roads. A railway line crossed the site from east to west, splitting the site in two.	Railway
	Off site An old quarry was recorded approximately 100m to the north of the site. Residential properties were noted to surround the site and a water body was recorded to the south west of the site, outwith the site boundary. A water works/reservoir was recorded approximately 900m to the north of the site.	
1901, 1902 - 1904, 1925, 1928, 1938, 1944	On site Pitfodels Station was developed immediately to the east of the site, with a new platform located extended west along the railway line.	Station
	Off site Further development of residential buildings in surrounding area. A gravel pit was recorded approximately 300m west of the site. The village of Cults was located approximately 500m to the west.	
1959 ,1963 – 1967, 1967-1968	On site A drainage ditch was recorded flowing from north to south across the southern section of the site. An electrical transmission line crossed the site from south to north with a mast noted in the centre of the site.	
	Off site Residential buildings were developed to the south east of the site, outwith the site boundary. Gravel pit now no longer shown (potentially infilled)	Infilled Gravel Pit
1974, 1980, 1981, 1984 – 1988, 1993, 2000, 2006, 2016	On site Railway recorded as dismantled. Land within site boundary remained undeveloped.	Dismantled Railway
	Offsite No change recorded.	

4.1 Aerial Photographs

Aerial photographs (Google Earth) illustrate the southern fields were ploughed in 2001. Subsequent aerial photographs, 2003, 2007, 2008, 2012 and 2015, indicated the site was left uncultivated, with the spread of small trees and dense vegetation apparent.

4.2 Summary of Potential Sources of Contamination from map review

Based on the historical map review, there are two potentially significant sources of contamination, i.e. an infilled gravel pit and dismantled railway / railway station. However, based on the distance from site, the infilled gravel pit is not anticipated to represent a significant risk to the site.

The remaining potential significant source present on site is the dismantled railway / railway station.

5.0 Consultation Response

5.1 Contaminated Land Unit

A response was received on 18th October 2016 stating that there are no known sources of potential contamination at the subject site or within the surrounding area. There are also no known former landfill sites or animal burial grounds at the subject site or in close proximity to the site. Aberdeen City Council is not aware of any records of complaints, notices etc. about nuisance relating to the current or previous site uses. Aberdeen City Council confirms that there are no private potable water sources within 2 km of the subject area. The response is included as Appendix 2.

5.2 Petroleum Officer

A response was received on 17th October 2016 stating the historic petroleum records had no records of any underground tanks at the premises previously used for the storage of petroleum spirit. The response is included as Appendix 2.

5.3 Local Authority Archaeology Service and Canmore

Information on scheduled historic monuments was obtained online on the 13th October 2016 from Canmore the online catalogue to Scotland's archaeology, buildings, industrial and maritime heritage and is presented in Table 6. No sites or monuments were recorded on site; however, several are located close to the site. No scheduled monuments were noted within 250 m of the site. The nearest is Pitfodels Castle, 600 m to the southwest, where probable remains of a 15th century motte exists.

Table 6: Summary of historical / archaeological sites on or close to the site

Location	Site Reference Number	Description	Distance from site
Woodbank	236840	Listed building and walled garden, built in 1848.	30 m north
Woodbank	339870	War memorial	30 m north
Pitfodels	241206	Pitfodels Station	50 m east
Inchgarth	173884, 173885, 316654	Inchgarth House (19th Century), Cottage and Victorian Greenhouse	30 m south

5.4 Services Information

Service information was obtained as part of this desk study and is contained within Appendix 4.

5.4.1 Electricity

Scottish and Southern Energy (SSE) map indicates a double circuit overhead line crosses the site from the north western corner of the northern field, through the north western corner of the central field, to south eastern corner of the western field.

Along the northern boundary of the site, low voltage cables are recorded along North Deeside Road, these include service, main, D.C. and street lighting cables. A piolet cable is also located to the north of the site. These are indicated as being offsite.

A service cable runs down the western boundary to a residential building located to the west of the norther field.

Along the southern boundary of the site, fibre optic, low voltage cables and high voltage cables run along the north of Inchgarth Road. These are indicated as being located offsite.

5.4.2 Gas

The Scotia Gas Network plan indicates that there are no gas mains located onsite. A low pressure main is recorded to run along the northern edge of Inchgarth Road, to the south of the site.

5.4.3 Water

There are a number of water pipes indicated in Scottish Water plans running along or across the site, detailed as follows:

- An 8 inch PVC distribution mains pipe follows the railway track, across the centre of the site (in an east to west direction), with further 4 inch and 6 inch mains running along the North Deeside Road (to the north) and Inchgarth Road (to the south).

- Two (parallel) 600 mm raw water mains are noted to follow the railway track along the southern boundary of the northern field. The raw water mains then run in a southwestern direction crossing the central and western fields in the south of the site.

- A 40 inch aqueduct is recorded running along Inchgarth Road, at the southern edge of site spans the southern boundary of the site. This extends northwards along Pitfodels Station Road – this is shown on the plan as being off-site, although slightly to the west of the road itself.

- The Scottish Water wastewater plan indicates a surface water pipe crossing the site, from north east to south west, through the northern, central and western fields.

- A combined sewer line crosses the centre of the western field, running approximately north to south. A second combined water line runs along the southern boundary of the site, along Inchgarth Road.

- A water course is shown crossing the northern field and the eastern field to the south. The provenance of this feature is not known, and it was not recorded from the site walkover, but may be a drainage feature. Across the northern field, this watercourse follows a semi-circular route – the reason for this is unknown.

5.4.4 BT

The BT map indicates that there are no cables onsite. A cable runs along the northern boundary of the northern field and a second cable is noted to run along the southern boundary of the south eastern field.

6.0 Geology & Hydrogeology

6.1 Geology

6.1.1 Superficial Geology

The BGS superficial deposit map (BGS, 2004) indicates the site to be underlain by glaciofluvial ice contact deposits of the Lochton Sand and Gravel formation. These deposits comprise gravel and sand which form mounds and ridges, are generally poorly sorted, with clasts of Dalradian metamorphic and Caledonian igneous rocks. This reflects generally undulating topography of the site.

Along the northern site boundary, superficial deposits are recoded as diamicton. The recorded change in geology reflects the fact that the site is on the northern edge of a major glacial channel, now occupied by the River Dee.

Three historical boreholes are located on site; two of which are located in the southern section of site, one on the railway line. A fourth borehole is located to the east of the site.

The two boreholes (NJ90SW7111/15 and NJ90SW7111/16) within the southern area of site comprise 0.3 m – 1.5 m gravelly topsoil overlying medium dense brown medium-coarse sand and gravel and few cobbles. Between a depth of 0.3m and 1.0m bgl, in the borehole located in the centre of the site, very dense cobbles and boulder gravel was recorded. Boreholes were terminated at 5m bgl (BGS, Geoindex Onshore, 2016).

The two boreholes (NJ90SW7111/14 and NJ90SW7111/38) located near the railway line indicate that 0.3 – 0.5m of fill overlies stiff to firm brown very sandy gravelly boulder clay. Superficial deposits were recorded to depth of 5.6m and 4.3m bgl (BGS, Geoindex Onshore, 2016).

6.1.2 Solid Geology

The BGS solid geology map (BGS, Scotland Sheet 77 Solid Edition, 1982) illustrates a fault extending across the northern edge of site from the north east to the south west. The area to the north of the fault comprises foliated muscovite-biotite-granite. The majority of site, to the south of the fault comprises psammite, semipelite and subsidiary pelite with vary sparse calc-silicate ribs.

Two boreholes located on the dismantled railway encountered rock at 5.6m bgl and 4.3m bgl. Weathered rock was described as pink/grey coarse grained granite/gneiss (BGS, Geoindex Onshore, 2016).

6.2 Hydrogeology

6.2.1 Superficial Aquifer

The superficial deposits are recorded as highly productive, dominated by intergranular flow (MacDonald, 2004). SEPA record groundwater body as the Lower Dee Valley Sand and Gravel, which is classified as having good quality and quantity of groundwater with high confidence (SEPA, 2011). These deposits are classified as a drinking water protection zone (SEPA, 2011).

6.2.2 Bedrock Aquifer

The BGS Hydrogeological Map of Scotland indicates that bedrock aquifer is classified as a low productivity which produces small amounts of water in near surface weathered zone and fractures (BGS, Hydrogeological Map of Scotland, 1988).

6.2.3 Groundwater Vulnerability

The Vulnerability of Groundwater in the Uppermost Aquifer Map (SNIFFER, 2004) records the site as being Class 4b, which is considered to be vulnerable to those pollutants not readily adsorbed or transformed.

6.3 Hydrology

The closest surface water receptor is an unnamed stream located 150 m south of the site. The River Dee is situated approximately 500 m to the south of the site. The River Dee is classified as having an overall status of poor with medium confidence, with ecological status of poor and chemical status pass. The River Dee is classified as a drinking water protections zone (SEPA, 2011).

A well is located 100m north of the site; this is anticipated to be upgradient of the site based on the topography of the area. Aberdeen City Council state that there are no private potable water sources within 2 km of the subject area.

6.4 Flooding

The site is located within a potentially vulnerable area to flooding. Along the northern edge of the dismantled railway line and in the south western corner of the site there is a medium to high likelihood of flooding from surface water (SEPA, Flood Maps, 2015).

6.5 Mineral Extraction

6.5.1 Mine workings
A review of the BGS data indicates that no mine workings are present on site (BGS, Non-Coal Mining Plans, 2016).

6.5.2 Quarrying
Historical maps indicate an old quarry and gravel pit to the north of the site, which are approximately 500m and 300m away respectively.

6.6 Radon

A high resolution radon map was retrieved for the site, and can be referenced in Appendix 5. This shows the site to be unaffected by radon, although immediately to the south and east the area falls into an area where 1 – 3% of buildings are above the Action Level.

6.7 Invasive Weeds

No invasive species (including Giant Hogweed or Japanese Knotweed) were noted during the walkover, *except* for a localised growth of Japanese knotweed at the south-west site boundary. It should be noted that the walkover was not carried out by a trained botanist, and a full botanical survey is beyond the scope of this report.

6.8 Protected Areas

The River Dee, located 500 m of the site is classified as a Special Area of Conservation (SAC).

7.0 Previous Reports

The site is not known to have been the subject of any previous ground investigations. However, a ground investigation was carried out by Fairhurst in 2007 on a site located approximately 150 m to the north east. The presence of a fault spanning the northern boundary of the site, and the difference in anticipated superficial deposits between the two sites (coupled with the availability of more relevant site-specific data from BGS boreholes) means that ground conditions encountered during the 2007 investigation are unlikely to closely reflect those on site; therefore, further information has not been included.

8.0 Development Proposals

It is understood that the site is to be developed for a mixed use community comprising residential, retail and care home facilities, as shown in Drawing 3847/102-C (Fitzgerald Associates). It is understood that this is to include a number of flatted houses, townhouses and affordable units as well as a care home.

A link road is proposed to run between the A93 (north) and Garthdee Road (south) – the land to the west of this (approximately 1/3 of site) will be retained as green space / a wildlife corridor.

SUDS, roadways and cycle paths are also included within the design.

9.0 Preliminary Conceptual Model & Qualitative Risk Assessment

A preliminary site conceptual model is formed by presenting all identified and suspected sources, pathways, and receptors from the desk study. These are presented in the following sections. The principles of environmental risk assessment are presented in Appendix 6. The significance of the presence of these elements is considered by carrying out a risk assessment of all potential pollutant linkages.

9.1 Source Characterisation

The following potential sources of contamination have been identified.

Table 7: Identified Potential Sources of Contamination

Source	Distance (m)	Compass Direction	Identified by:
Dismantled Railway Line / Railway Station	0	E-W	Historical Maps, site walkover

Those sources that cannot be discounted are carried forward to the Qualitative Risk Assessment, and are detailed in Table 8 below.

Table 8: Sources carried forward to Qualitative Risk Assessment

Source	Observations
Dismantled Railway Line / Railway Station	A dismantled railway line is noted to cross the site, dividing the site into two, with a former station adjacent to the north-east corner of site. The railway was active until approximately 1974. Made Ground is likely in the immediate vicinity of the track.

Contaminants of concern associated with these sources are listed in Table 9. Primary sources of contamination include track ballast, wood treatment and fuel and oil spills. Although herbicides and de-icers may have been used, the age of the railway means such contaminants are likely to have degraded (or would be detected in a standard PAH and metals suite) so are not considered separately applicable. PCBs may be associated with transformers, although would be highly localised. Asbestos may be locally present from demolished structures.

Table 9: Contaminants of Concern (CoC)

CONTAMINANTS OF CONCERN											
SOURCE	**Metals**	**TPH**	**PAH**	**Ammonia**	**Sulphate**	**pH**	**Ground Gas**	**SVOCs / VOCs**	**PCBs**	**Asbestos**	**Cyanide**
Dismantled Railway Line and Made Ground associated with historic railway	X	X	X		X				X	X	

9.2 Pathway Characterisation

The potential pathways by which receptors might be exposed to contaminants (sources) at the site can vary depending on the proposed or current land use (e.g. residential properties, public open space, retail). The key pathways are identified below.

9.2.1 Human Health

For humans, the three possible significant routes of exposure to contaminants in Scotland are considered to be:

- inhalation of volatile chemicals;
- ingestion of dusts or soil either by hand-to-mouth activity or by eating plants grown in contaminated soils; and
- dermal (skin) contact with contaminated soils and waters and transfer of contaminants through the skin into the body.

9.2.2 Buildings, Properties & Services

Buildings and services can also be affected by contaminants in the following ways:

- by direct contact of building fabric with contaminated soils / aggressive soils;
- permeation of water supply pipes.

9.2.3 The Local Water Environment

For the Water Environment the following pathways may be present:

- leaching of contaminants from the soil into groundwater under the site; and
- migration of contaminated groundwater into surface water bodies

9.3 Receptor Characterisation

The receptors are the elements in the pollutant linkage that can potentially be harmed by the contaminants. These are as follows:

- Humans: site workers and end users (future residents);
- Buildings: building fabric and services; and
- The local water environment (groundwater and surface water).

9.4 Pollutant Linkages

The significance of potential pollutant linkages at the site is now qualitatively assessed by considering the magnitude of the hazard and the possibility of the linkages occurring based on the observations made, as shown in Table 12.

Table 12: Preliminary Qualitative Risk Assessment for Identified Sources of Contamination

Source	Potential contaminants	Potential Pathways	Potential Receptors	Assessment	Potential Severity	Potential Probability	Risk Class	Investigation required?
Dismantled Railway line and Made Ground associated with historic railway	Metals PAHs TPH Sulphate PCBs Asbestos	Ingestion, inhalation, dermal contact	Human health	The presence of the old railway line indicated the potential for localised Made Ground on site. In addition, there is potential for historic spills associated with the railway line and the station. Contaminants within the ground have the potential to cause significant harm to human health via ingestion, inhalation and dermal contact. However, any such contamination is likely to be highly localised to the railway.	High	Low	Moderate	Yes
		Direct contact with foundations and services	Building fabric and services	The presence of the old railway line indicated the potential for localised Made Ground onsite. In addition, there is potential for historic spills associated with the railway line and its removal.	Moderate	Low	Moderate / Low	Yes
		Leaching, migration	Groundwater + Surface Water	The presence of the old railway line indicated the potential for localised Made Ground and contamination on site. Contaminants within the ground could have the potential to leach into underlying groundwater and migrate to offsite surface water receptors (The River Dee) or groundwater receptors. However, the potential for a quantity of mobile contamination sufficient to impact significantly on the Water Environment is considered extremely small. There are no potable water wells within 2km of the site.	Moderate	Very Low	Low / Very Low	No

10.0 Conclusions

An environmental desk study report has been prepared for the proposed redevelopment of the site located to the south of North Deeside Road in Cults, Aberdeen, on behalf of Cults Property Development Co. Ltd (the Client). The desk study has been prepared in order to assess the historical development of the site, likely ground conditions and to identify the presence of any potential sources of contamination in relation to the proposed residential development and associated landscaping and infrastructure. In addition, this desk study also briefly comments on other potential development constraints, such as geotechnical issues. It is understood the site is to be developed for a mixed use community comprising residential, retail and care home facilities.

The desk study identified one potentially significant source of contamination on site, i.e. the presence of the dismantled railway (and railway station), which bisects site. A potential pollutant linkage exists and therefore further targeted investigation is recommended. However, this is considered to be a relatively low-risk source of contamination, and any contamination or made ground present is likely to be highly localised. No other sources of potential contamination have been identified.

Note that this report considers the site to be Greenfield; however, it is noted that the presence of nettles in places, and the relatively deep topsoil recorded in the BGS logs, does suggest that some disturbed ground, potentially relating to agricultural practices, is a *possibility*.

There are, however, other potential development constraints that are detailed below:

- The site is located at the margins of an area identified at being at risk from radon gas. ACC suggest that radon protection should be considered in new buildings along the boundary; to the south and east of the site, as radon mapping will have inherent error. Requirements should be confirmed with Building Control.

- The undulating topography of the site, and general fall in levels to the south, will likely necessitate a significant degree of earthworks in order to produce development platforms. Further, the drop in site levels from the North Deeside Road (note the presence of retaining walls) will require careful consideration if access to site is to be from this direction.

- Natural ground conditions may well be variable across site as the site is located on the margins of a glacial valley. Significant quantities of cobbles and boulders may be encountered, and rockhead depth could also vary across site (potentially being shallower towards the north), although shallow bedrock is considered unlikely to be a significant development constraint.

- BGS boreholes recorded ‘gravelly topsoil’ to a depth of 1.5 m at the south west end of site. This may be due to natural processes or to past agricultural activities, or to other anthropogenic activities. Note that the accuracy of this description cannot be confirmed.

- Excess topsoil is likely to be generated by development. Note that BGS boreholes suggest that this could be locally relatively deep. Note also that the widespread presence of rosebay willowherb roots may be a constraint to direct re-use of topsoil in garden areas as this is a fairly invasive plant.

- A small bank of soil, probably a site scrape from adjacent development, was noted at the south-west corner of the south-west field. Japanese knotweed was recorded growing in this bund.

- There are several major services running across or adjacent to site, including overhead powerlines, an aqueduct along the southern edge of site, and surface and foul water pipes. There is also a ‘water-course’ indicated running across site, although exactly what this is not clear; it could not be located on site from the walkover.

- Mature trees are present across site and orders may be in place for the preservation of some trees. In addition, there are a lot of saplings in places that will need to be cleared.

- As the site is Greenfield, some degree of archaeological involvement through planning is likely, although the site is not identified as being of special archaeological significance.

11.0 Recommendations

It is recommended that targeted ground investigation is carried out along the margins of the railway and railway station to determine if there is any evidence of made ground or contamination. Trial pitting will be suitable for this purpose. It is anticipated that such an investigation would best be incorporated into a wider site investigation to inform ground conditions. Environmental testing should be carried out on any material that is identified as made ground or potentially contaminated in this area. Potentially contaminated material is not anticipated elsewhere on site.

Wider site investigation will be required to inform ground conditions and potential earthworks, which should include trial pitting and boreholes. Geotechnical testing should be carried out to assess the presence of superficial deposits and general soil properties. This should include earthwork properties in possible areas of cut, and may also include assessment of slope stability. Note that investigation should also specifically include investigation of the extent of deep 'topsoil' recorded in the BGS borehole logs as this could be a potential development constraint.

As the site is considered Greenfield, no chemical testing is considered necessary to inform water pipe specification for Scottish Water, unless water pipes will be placed in direct proximity to the dismantled railway. Since this part of site is classed as Brownfield due to the presence of the dismantled railway line, chemical testing of soils in accordance with UKWIR guidelines would be required by Scottish Water.

The site is on the margin of an area indicated to be affected by radon; therefore, basic radon protection measures *may* be required, at least across parts of site. Any requirements for radon protection should be agreed with Aberdeen City Building Control.

If any material is to be removed from site, it is important that waste management regulations and best practice are followed. This will potentially include ensuring suitability of any material for re-use off-site as well as ensuring that any applicable waste exemptions are held.

It is recommended that water services crossing site are located. The location and depth of the aqueduct at the southern edge of site should also be determined, principally with regards to the proposed road junction.

Specialist advice should be sought on removal of Japanese knotweed.

12.0 References

BGS. (1982). Scotland Sheet 77 Solid Edition.

BGS. (1988). Hydrogeological Map of Scotland.

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Fairhurst. (2014). Redevelopment of Marcliffe Hotel Desk Study Report.

MacDonald, B. a. (2004). A GIS of aquifer productivity in Scotland: explanatory notes. British Geologiacl Survey Commissioned Report.

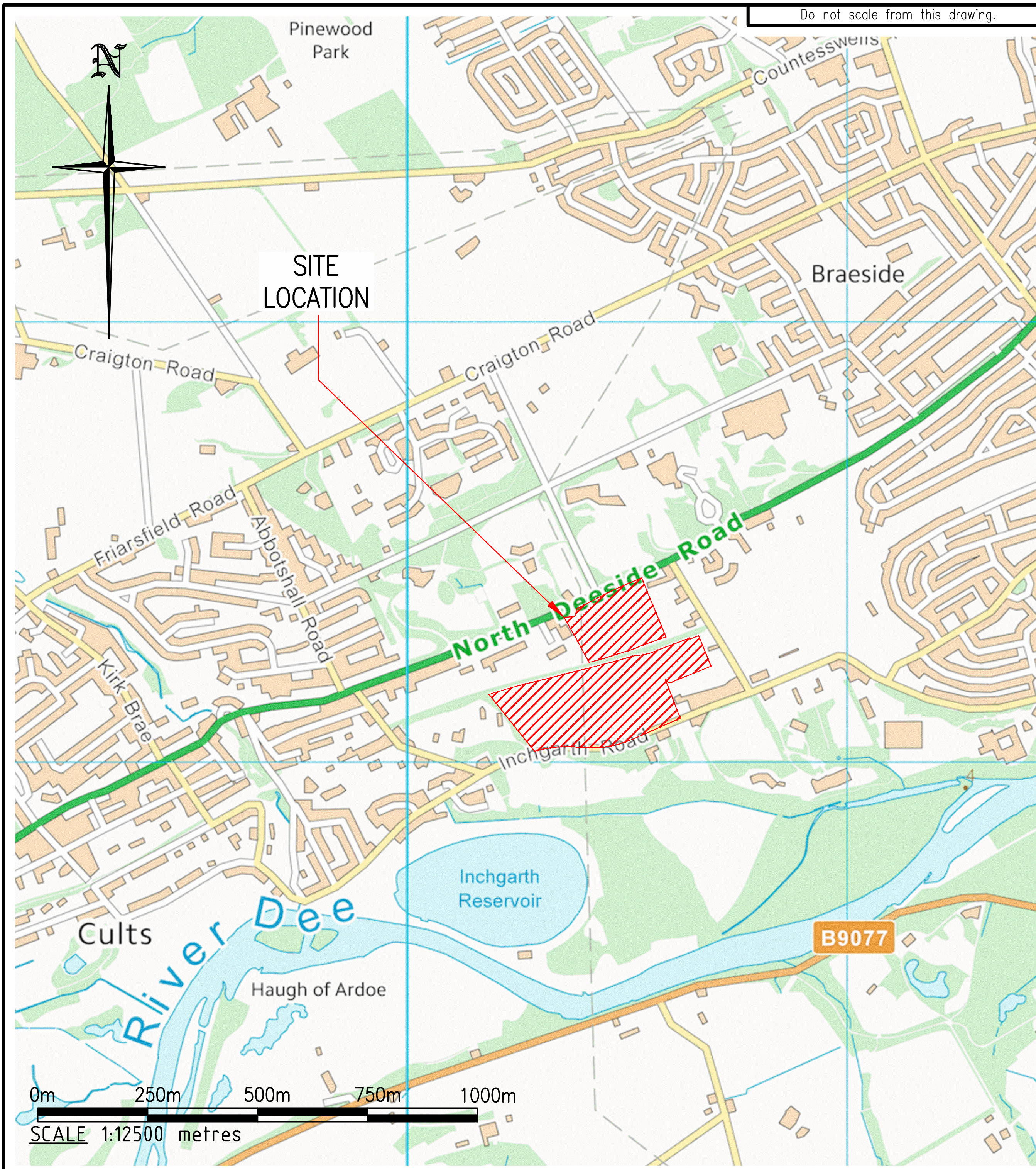
SEPA. (2011). River Basin Management Plan (RBMP) Interactive Map. Retrieved October 13, 2016, from http://gis.sepa.org.uk/rbmp/

SEPA. (2015). Flood Maps. Retrieved October 13, 2016, from http://map.sepa.org.uk/floodmap/map.htm

SNIFFER. (2004). Vulnerability of Groundwater in the Uppermost Aquifer.

Drawings

106859/9100	Site Location Plan
106859/9101	Site Walkover Survey Plan
3847/102-C	Overall Masterplan (Fitzgerald Associates)



SITE CENTRED AT OS GRID REF: NJ 905 032

Rev.	Date	Description	Drawn	Checked	Approved

Project Title:

NORTH DEESIDE ROAD/INCHGARTH ROAD PROPOSED RELIEF ROAD AND ASSOCIATED DEVELOPMENT

Drawing Title:

SITE LOCATION PLAN

FAIRHURST

88 Queens Road,
ABERDEEN, AB15 4YQ
Tel: 01224 321 222 Fax: 01224 323 201

Scale at A4:	Status:	
AS SHOWN	**For Information**	
Drawn: **RD**	Checked: **JB**	Approved: **CS**
Date: **13/10/16**	Date: **13/10/16**	Date: **01/06/17**

Drawing No.:	Revision:
106859/9100	–

Do not scale from this drawing.

SAFETY HEALTH AND ENVIRONMENTAL INFORMATION

IN ADDITION TO THE HAZARD/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING RISKS AND INFORMATION.

RISKS LISTED HERE ARE NOT EXHAUSTIVE. REFER TO DESIGN ASSESSMENT FORM NO.

CONSTRUCTION

DEMOLITION

FOR INFORMATION RELATING TO USE, CLEANING AND MAINTENANCE SEE THE HEALTH AND SAFETY FILE

IT IS ASSUMED THAT ALL WORKS WILL BE CARRIED OUT BY A COMPETENT CONTRACTOR WORKING, WHERE APPROPRIATE, TO AN APPROVED METHOD STATEMENT.

LEGEND:

- WALL
- FENCE
- GRASS AREA
- GENTLE SLOPE
- STEEP SLOPE
- TREES
- PHOTO REFERENCE

Rev.	Date	Description	Drwn.	Chkd.	Appd.

FAIRHURST
88 Queens Road
ABERDEEN
AB15 4YQ
Tel: 01224 321222
Fax: 01224 323201

Client:

Project Title:
NORTH DEESIDE ROAD/INCHGARTH ROAD PROPOSED RELIEF ROAD AND ASSOCIATED DEVELOPMENT

Drawing Title:
SITE WALKOVER PLAN

Scale at A3: 1:1000	Status: For Information	
Drawn: MD	Checked: JB	Approved: CS
Date: 17/10/16	Date: 17/10/16	Date: 01/06/17
Drawing No.: 106859/9101		Revision:

Rev :	Date :	Comments :

2

COMMUNITY RETIREMENT VILLAGE - NORTH DEESIDE ROAD / INCHGARTH ROAD, ABERDEEN

1	6 NO. HOUSES - CONTAINING 4 / 5 APARTMENTS PER HOUSE [27 NO.]	[46 Spaces - 23 Surface + 23 Undercroft]
2	16 NO. 2 BEDROOM SEMI-DETACHED APARTMENTS	[36 Spaces - All Surface]
3	6 NO. HOUSES - CONTAINING 4 / 5 APARTMENTS PER HOUSE [26 NO.]	[44 Spaces - All Surface]
4	50 BEDROOM CARE HOME	[26 Spaces - All Surface]
5	5 NO. RETAIL UNITS [MIXED]	[22 Spaces - All Surface]
6	14 NO. AMENITY HOUSING	[14 Spaces - All Surface]
7	12 NO. 2 BEDROOM APARTMENTS	[20 Spaces - All Surface]
8	ARCHITECTURAL FEATURE INCLUDING SUDS POND	

- INDICATIVE SUDS LOCATION
- EXISTING SURVEYED TREES TO BE RETAINED
- INDICATIVE NEW TREE PLANTING
- DISABLED ACCESS FROM INCHGARTH ROAD TO NORTH DEESIDE ROAD
- 3.0M WIDE CYCLE PATH

INDICATIVE OVERALL MASTERPLAN

FITZGERALD ⊕ ASSOCIATES

ARCHITECTURAL + INTERIOR DESIGNERS
53 ALBERT STREET ABERDEEN AB25 1XT
+44 (0)1224 633375
info@fitzgeraldassociates.co.uk

CIAT
Registered Practice

Client :	Cults Development Co. Ltd	
Project :	New Development North Deeside Road / Inchgarth Road	
Description :	Planning Details Overall Masterplan	
Drawn By : Ewan Campbell	Scale : A1=1-1000	Date : June 2017
Project No : 3847	Drawing No : 102	Rev : C

Appendix 1

Historical Mapping Legends

Ordnance Survey County Series 1:10,560

Gravel Pit
Sand Pit
Other Pits
Quarry
Shingle
Orchard
Osiers
Reeds
Marsh
Mixed Wood
Deciduous
Brushwood
Fir
Furze
Rough Pasture
Arrow denotes flow of water
Trigonometrical Station
Site of Antiquities
Bench Mark
Pump, Guide Post, Signal Post
Well, Spring, Boundary Post
·285 Surface Level
Sketched Contour
Instrumental Contour
Main Roads (Fenced / Un-Fenced)
Minor Roads (Fenced / Un-Fenced)
Sunken Road
Raised Road
Road over Railway
Railway over River
Railway over Road
Level Crossing
Road over River or Canal
Road over Stream
Road over Stream
County Boundary (Geographical)
County & Civil Parish Boundary
Administrative County & Civil Parish Boundary
Co. Boro. Bdy. — County Borough Boundary (England)
Co. Burgh Bdy. — County Burgh Boundary (Scotland)
RD. Bdy. — Rural District Boundary
Civil Parish Boundary

Ordnance Survey Plan 1:10,000

Chalk Pit, Clay Pit or Quarry
Gravel Pit
Sand Pit
Disused Pit or Quarry
Refuse or Slag Heap
Lake, Loch or Pond
Dunes
Boulders
Coniferous Trees
Non-Coniferous Trees
Orchard
Scrub
Coppice
Bracken
Heath
Rough Grassland
Marsh
Reeds
Saltings
Building
Direction of Flow of Water
Shingle
Sand
Glasshouse
Sloping Masonry
Pylon
Pole
Electricity Transmission Line
Cutting
Embankment
Standard Gauge Multiple Track
Road Under
Road Over
Level Crossing
Foot Bridge
Standard Gauge Single Track
Siding, Tramway or Mineral Line
Narrow Gauge

Geographical County
Administrative County, County Borough or County of City
Municipal Borough, Urban or Rural District, Burgh or District Council
Borough, Burgh or County Constituency
Shown only when not coincident with other boundaries
Civil Parish
Shown alternately when coincidence of boundaries occurs

BP, BS	Boundary Post or Stone	Pol Sta	Police Station
Ch	Church	PO	Post Office
CH	Club House	PC	Public Convenience
F E Sta	Fire Engine Station	PH	Public House
FB	Foot Bridge	SB	Signal Box
Fn	Fountain	Spr	Spring
GP	Guide Post	TCB	Telephone Call Box
MP	Mile Post	TCP	Telephone Call Post
MS	Mile Stone	W	Well

1:10,000 Raster Mapping

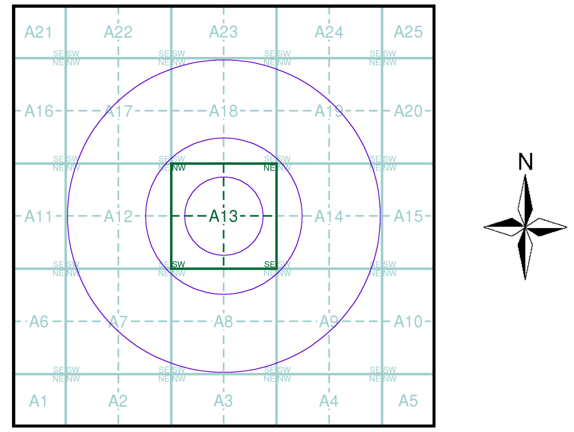
Gravel Pit
Refuse tip or slag heap
Rock
Rock (scattered)
Boulders
Boulders (scattered)
Shingle
Mud
Sand
Sand Pit
Slopes
Top of cliff
General detail
Underground detail
Overhead detail
Narrow gauge railway
Multi-track railway
Single track railway
County boundary (England only)
Civil, parish or community boundary
District, Unitary, Metropolitan, London Borough boundary
Constituency boundary
Area of wooded vegetation
Non-coniferous trees
Non-coniferous trees (scattered)
Coniferous trees
Coniferous trees (scattered)
Positioned tree
Orchard
Coppice or Osiers
Rough Grassland
Heath
Scrub
Marsh, Salt Marsh or Reeds
Water feature
Flow arrows
MHW(S) Mean high water (springs)
MLW(S) Mean low water (springs)
Telephone line (where shown)
Electricity transmission line (with poles)
BM 123.45 m Bench mark (where shown)
Triangulation station
Point feature (e.g. Guide Post or Mile Stone)
Pylon, flare stack or lighting tower
Site of (antiquity)
Glasshouse
General Building
Important Building

FAIRHURST

Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Kincardineshire	1:10,560	1868	3
Aberdeenshire	1:10,560	1869	4
Aberdeenshire	1:10,560	1902 - 1904	5
Aberdeenshire	1:10,560	1928	6
Aberdeenshire	1:10,560	1938	7
Historical Aerial Photography	1:10,560	1944	8
Ordnance Survey Plan	1:10,000	1959	9
Ordnance Survey Plan	1:10,000	1967 - 1968	10
Ordnance Survey Plan	1:10,000	1974	11
Aberdeen	1:10,000	1981	12
Ordnance Survey Plan	1:10,000	1984 - 1988	13
10K Raster Mapping	1:10,000	2000	14
10K Raster Mapping	1:10,000	2006	15
VectorMap Local	1:10,000	2016	16

Historical Map - Slice A



Order Details

Order Number: 100675691_1_1
Customer Ref: 106859
National Grid Reference: 390450, 803220
Slice: A
Site Area (Ha): 0.01
Search Buffer (m): 1000

Site Details

9 North Deeside Road, Bieldside, ABERDEEN, AB15 9AD

Landmark INFORMATION GROUP
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk

Russian Military Mapping Legends

1:5,000 and 1:10,000 mapping

a. Not drawn to scale b. Drawn to scale

Government and Administrative Buildings
Military and Industrial Buildings
Military and Communication Areas
Subway Entrance
Fireproof Building
Prominent Fireproof Building
Non-fireproof Building
Non-fireproof Building (non-dwelling)
Factory, mill, and flour mill, with chimneys
Factory, mill, and flour mill, without chimneys
Power Station, drawn to scale
ГЭС Hydroelectric Power Station
Radio Station, drawn to scale
Telephone Station, drawn to scale
Abandoned Open-pit Mine or Quarry
сол. Open-pit Salt Mine
−1,5 Pit
нефть Oil Deposit or Well
нефть Oil Seepage
+7,0 отвал Tailings Pile
скл. гор. Fuel Storage Tanks
газг. Natural Gas Tank
125,4 / 125,1 Bench Mark
бур. Drill Hole
+2,0 Burial Mound
+1,2 67,8 Triangulation Point on Burial Mound
Fill раз. Cut платф. Single-track Railroad
ст. Tunnel тун. Small Bridge Pipe (Culvert) Double-track Railroad and Station Building
сосна 24/0,30 Coniferous Forest
клен 12/0,20 Deciduous Forest
ель береза 20/0,25 Mixed Forest
Lawns
Citrus Orchard
Wet Ground
Scattered Vegetation

243,8 Values for prominent elevations
186,0 Numbers for spot elevations, depth soundings, contour lines, etc.
0,2 Velocity of the current, width of river bed, depth of river
180/12 180/12 Fractional terms: length and capacity of bridges; depth of fords and condition of the river bottom; height of forest and the diameter of trees

Russian Alphabet (For reference and phonetic interpretation of map text)

А а (A)	З з (Z)	П п (P)	Ч ч (CH)
Б б (B)	И и (I)	Р р (R)	Ш ш (SH)
В в (V)	Й й (Y)	С с (S)	Щ щ (SHCH)
Г г (G)	К к (K)	Т т (T)	ъ (-)
Д д (D)	Л л (L)	У у (U)	ы (Y)
Е е (E)	М м (M)	Ф ф (F)	ь (')
Ё ё (YO)	Н н (N)	Х х (KH)	Э э (E)
Ж ж (ZH)	О о (O)	Ц ц (TS)	Ю ю (YU or IU)
			Я я (YA or IA)

1:25,000 mapping

a. Not drawn to scale b. Drawn to scale

Government and Administrative Buildings
Military and Industrial Buildings
Military and Communication Areas
Subway Entrance
Partly Demolished Buildings
Demolished Buildings
Built-Up Area with Fireproof Buildings Predominant
Built-Up Area with Non-Fireproof Buildings Predominant
Individual Fireproof Building
Prominent Industrial Building
Individual Dwelling, Fireproof
Ruins of an Individual Dwelling
Factory or Mill Chimney
бум. Factory or Mill with Chimney
скип. Factory or Mill without Chimney
медн. Mine or Open Pit Mine
кам. уг. Operating Shaft or Mine
Non-Operating Shaft or Mine
сол. Salt Mine
Tailings Pile
−1.7 Pit
гл. пес. кам. Stone Quarry
Gas Pump or Service Station
Fuel Storage or Natural Gas Tank
Oil or Natural Gas Derrick
Small Hydroelectric Power Station
Power Station
б.тр. Transformer Station
Cemetery
+8.1 Burial Mound (height in metres)
95.7 Triangulation Point on Burial Mound
92.6 Triangulation Point
52.1 Bench Mark
71.1 Bench Mark (monumented)
Telegraph Office
Telephone Station
Radio Station
Radio Tower
Airfield or Seaplane Base
Landing Strip
Cut Fill Km Post Plantings Telegraph/Telephone Lines Main Highway
Highway under Construction
Width of Road Steep Grade Improved Dirt Road (former truck road)
Small Bridge ст. Pipe (Culvert) Tunnel Double-track Railroad with First Class Station
Dismantled Railroad
Railroad Under Construction
Shore Embankment
+2.4 River or Ditch with Embankment
Water Gauge Direction and velocity of current 0.2 135.1 Water Level Mark
К. 125.0/ 4.4 8м (г.-сол.) Well
вдхр. Water Reservoir or Rain Water Pit
156.2 кл. Spring
20 Isobath with value
Heavy (Index) Contour Line
20 Contour Line and Value
Half Contour Line
347.1 Spot Elevation Value
Coniferous
Deciduous
Mixed
Scrub

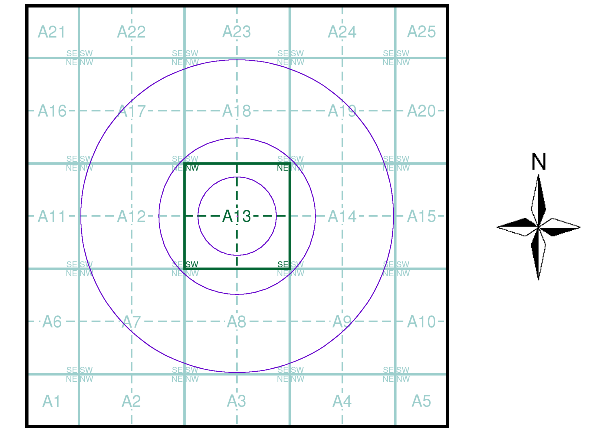
Key to Numbers on Mapping

FAIRHURST

Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Kincardineshire	1:10,560	1868	3
Aberdeenshire	1:10,560	1869	4
Aberdeenshire	1:10,560	1902 - 1904	5
Aberdeenshire	1:10,560	1928	6
Aberdeenshire	1:10,560	1938	7
Historical Aerial Photography	1:10,560	1944	8
Ordnance Survey Plan	1:10,000	1959	9
Ordnance Survey Plan	1:10,000	1967 - 1968	10
Ordnance Survey Plan	1:10,000	1974	11
Aberdeen	1:10,000	1981	12
Ordnance Survey Plan	1:10,000	1984 - 1988	13
10K Raster Mapping	1:10,000	2000	14
10K Raster Mapping	1:10,000	2006	15
VectorMap Local	1:10,000	2016	16

Russian Map - Slice A



Order Details

Order Number: 100675691_1_1
Customer Ref: 106859
National Grid Reference: 390450, 803220
Slice: A
Site Area (Ha): 0.01
Search Buffer (m): 1000

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FAIRHURST

Kincardineshire

Published 1868

Source map scale - 1:10,560

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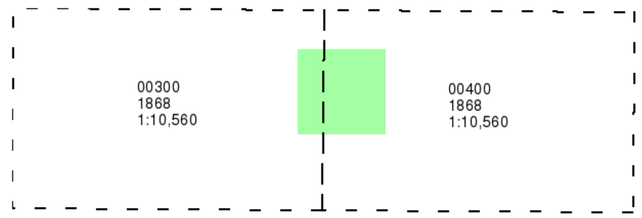
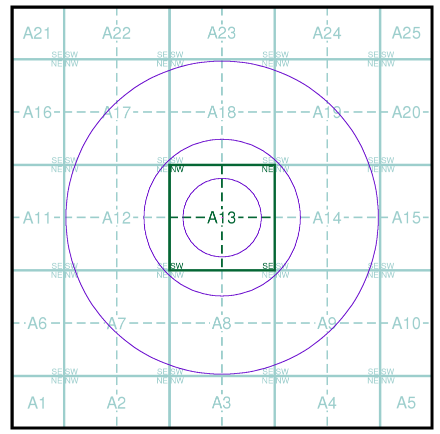
Map Name(s) and Date(s)



Historical Map - Slice A



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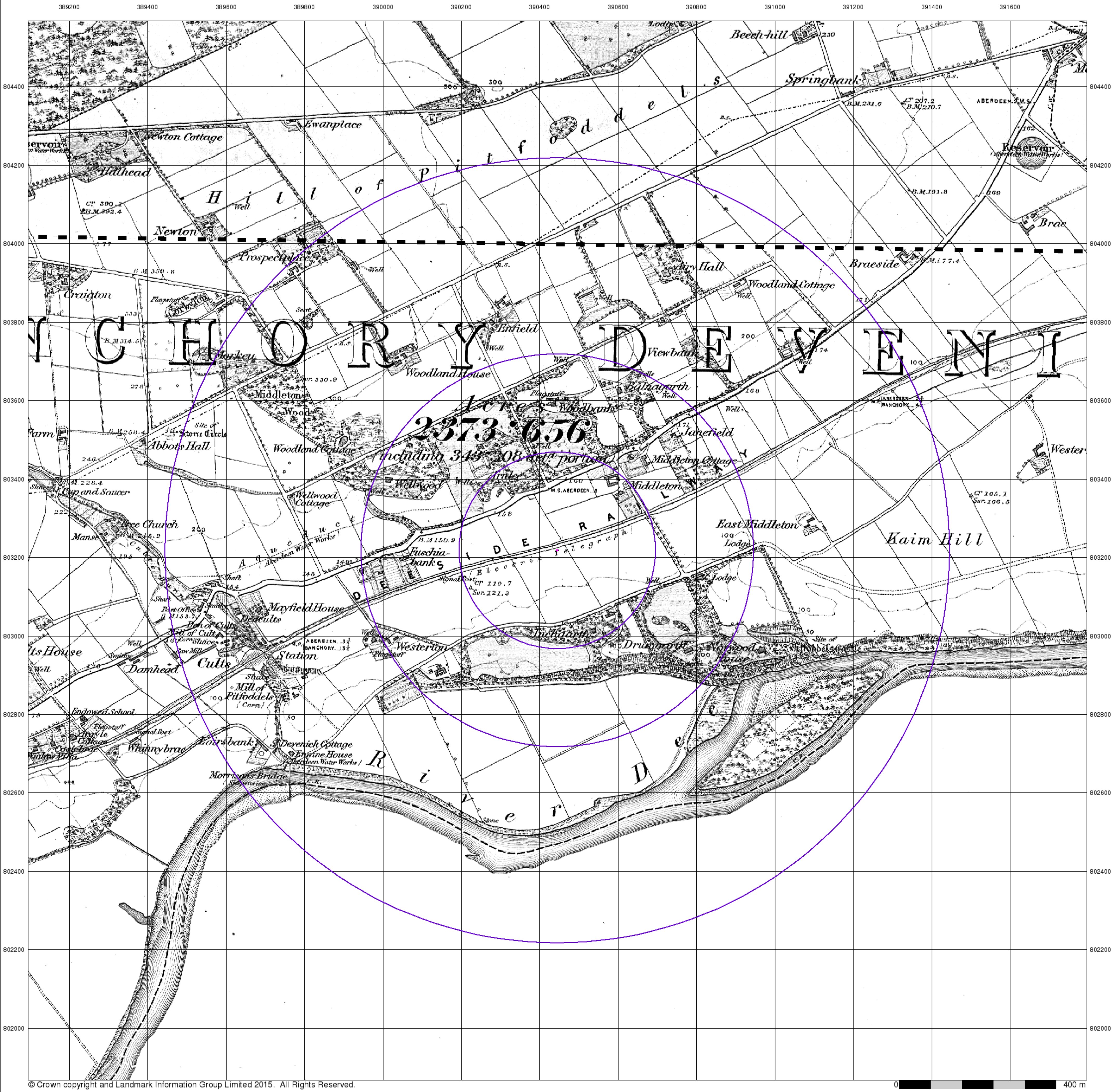

FAIRHURST

Aberdeenshire

Published 1869

Source map scale - 1:10,560

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940`s, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

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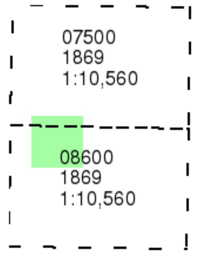
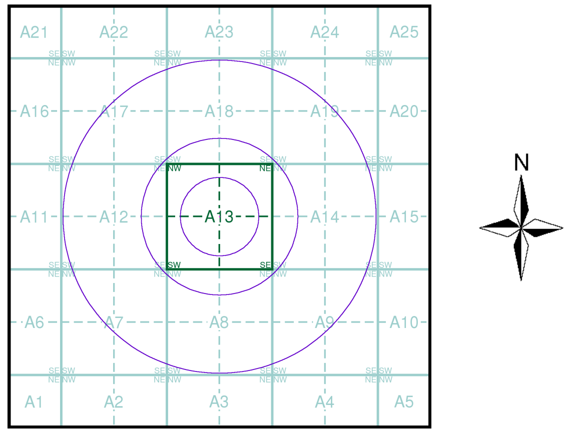


Historical Map - Slice A



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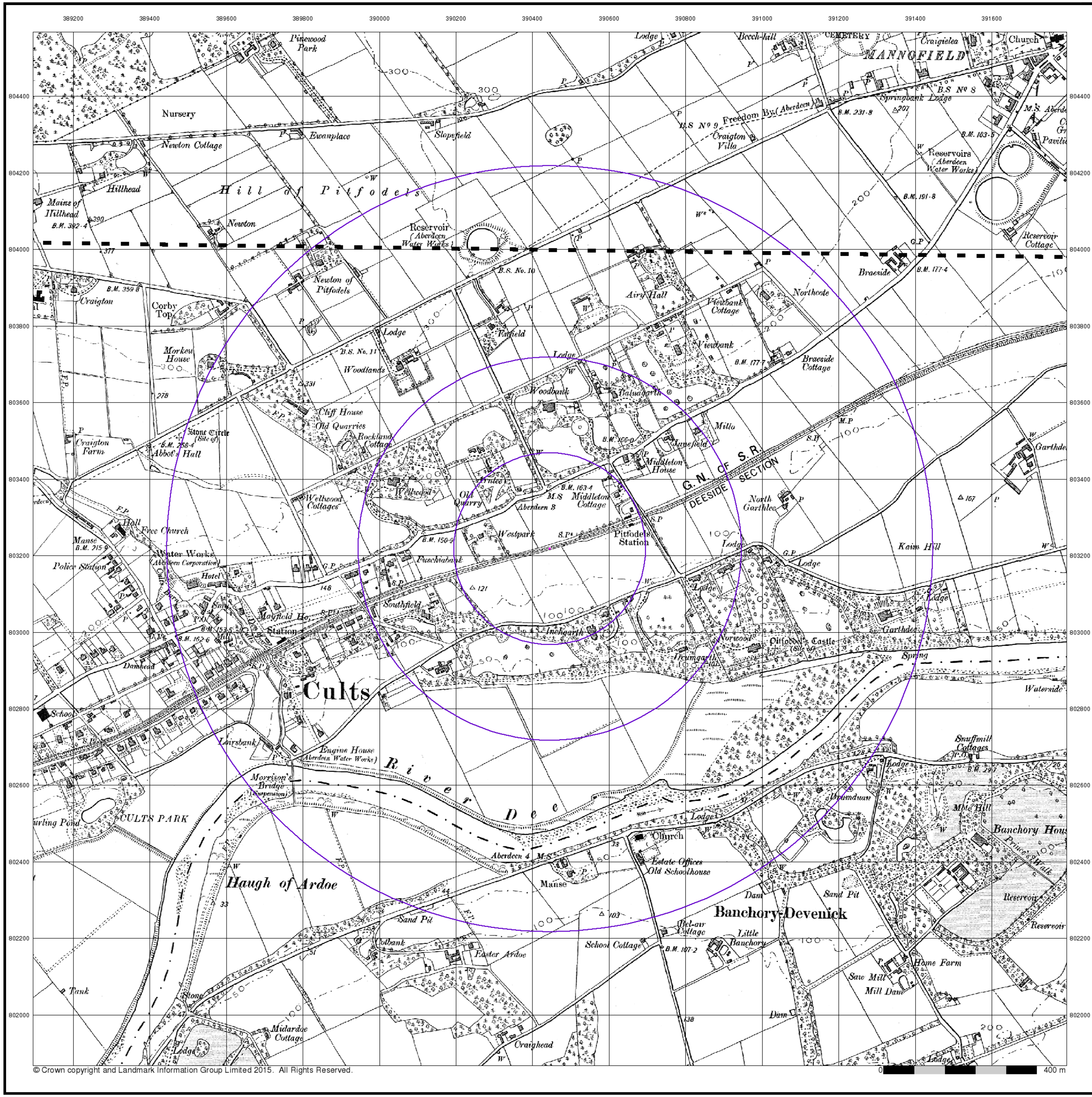

FAIRHURST

Aberdeenshire

Published 1902 - 1904

Source map scale - 1:10,560

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940`s, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

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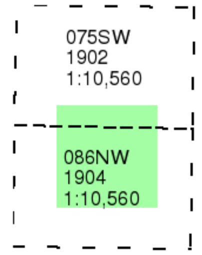
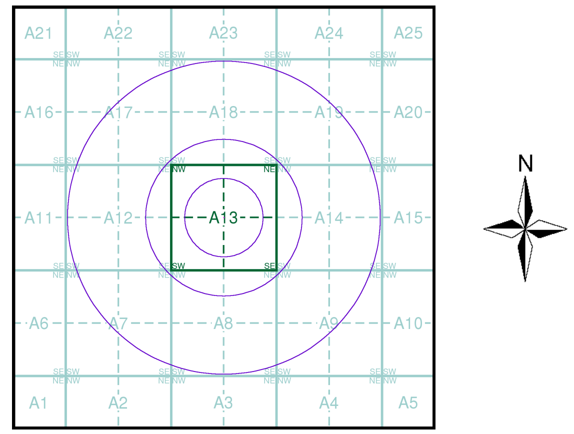


Historical Map - Slice A



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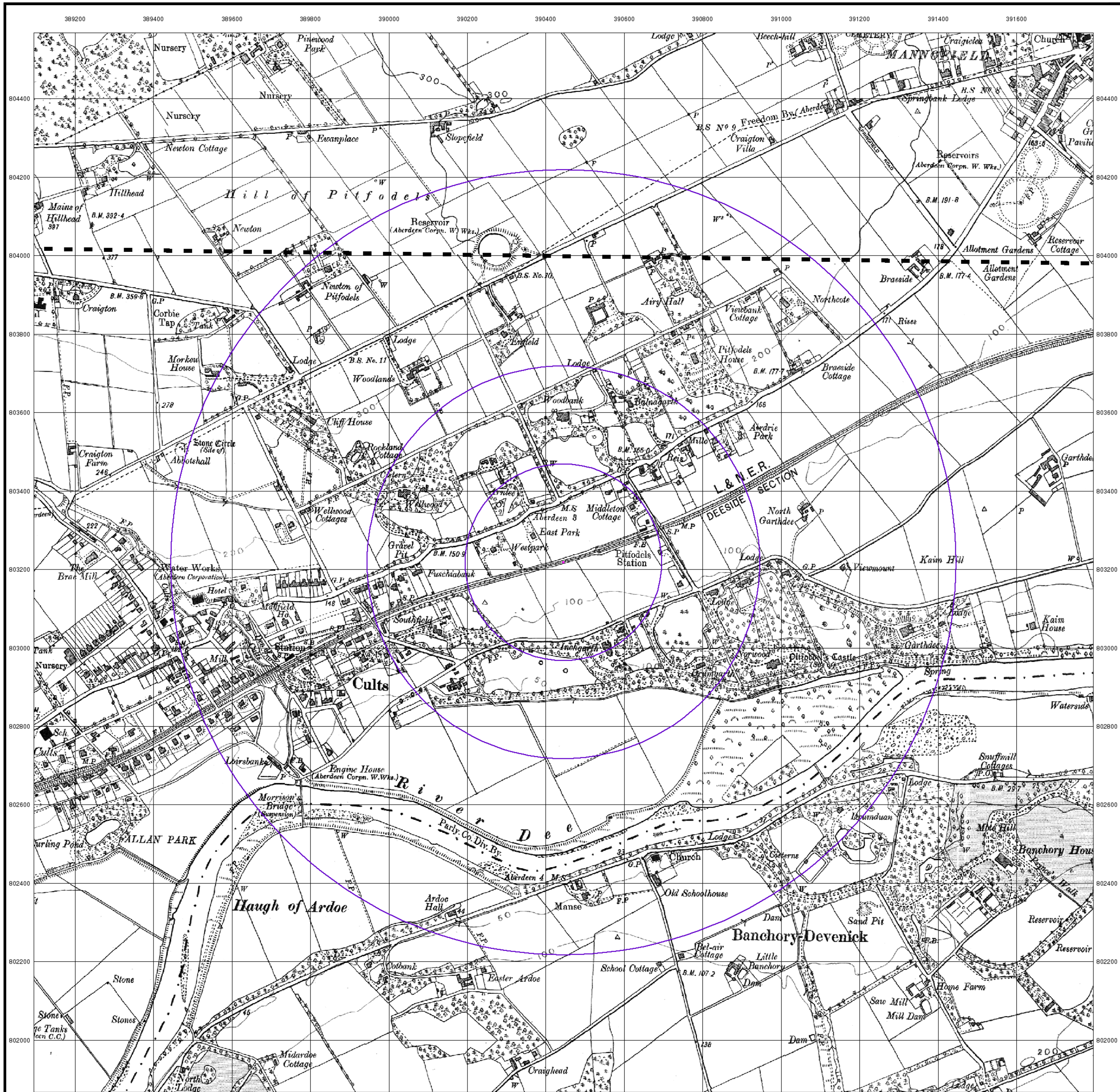

FAIRHURST

Aberdeenshire

Published 1928

Source map scale - 1:10,560

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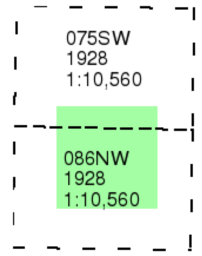
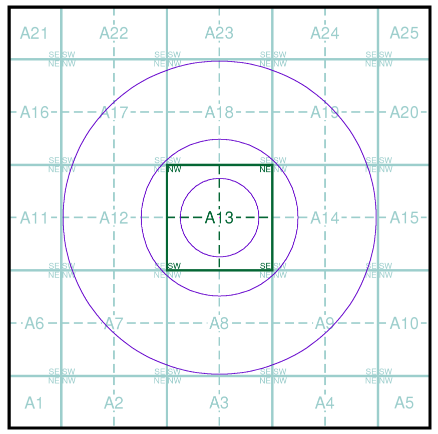
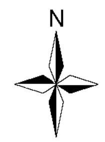


Historical Map - Slice A





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0 400 m

FAIRHURST

Aberdeenshire

Published 1938

Source map scale - 1:10,560

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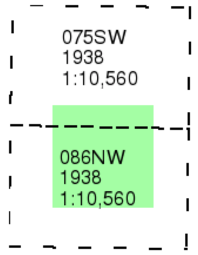
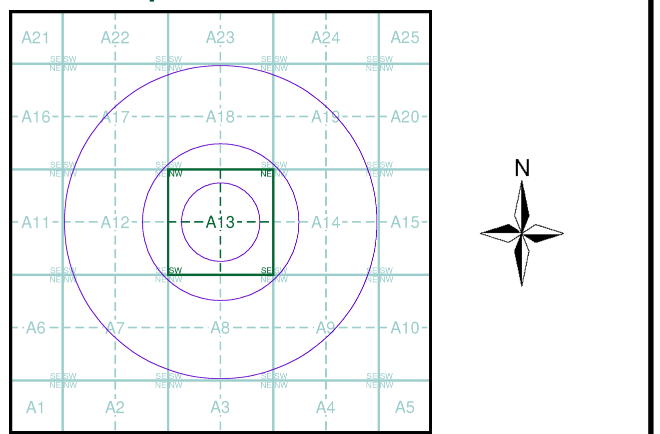


Historical Map - Slice A



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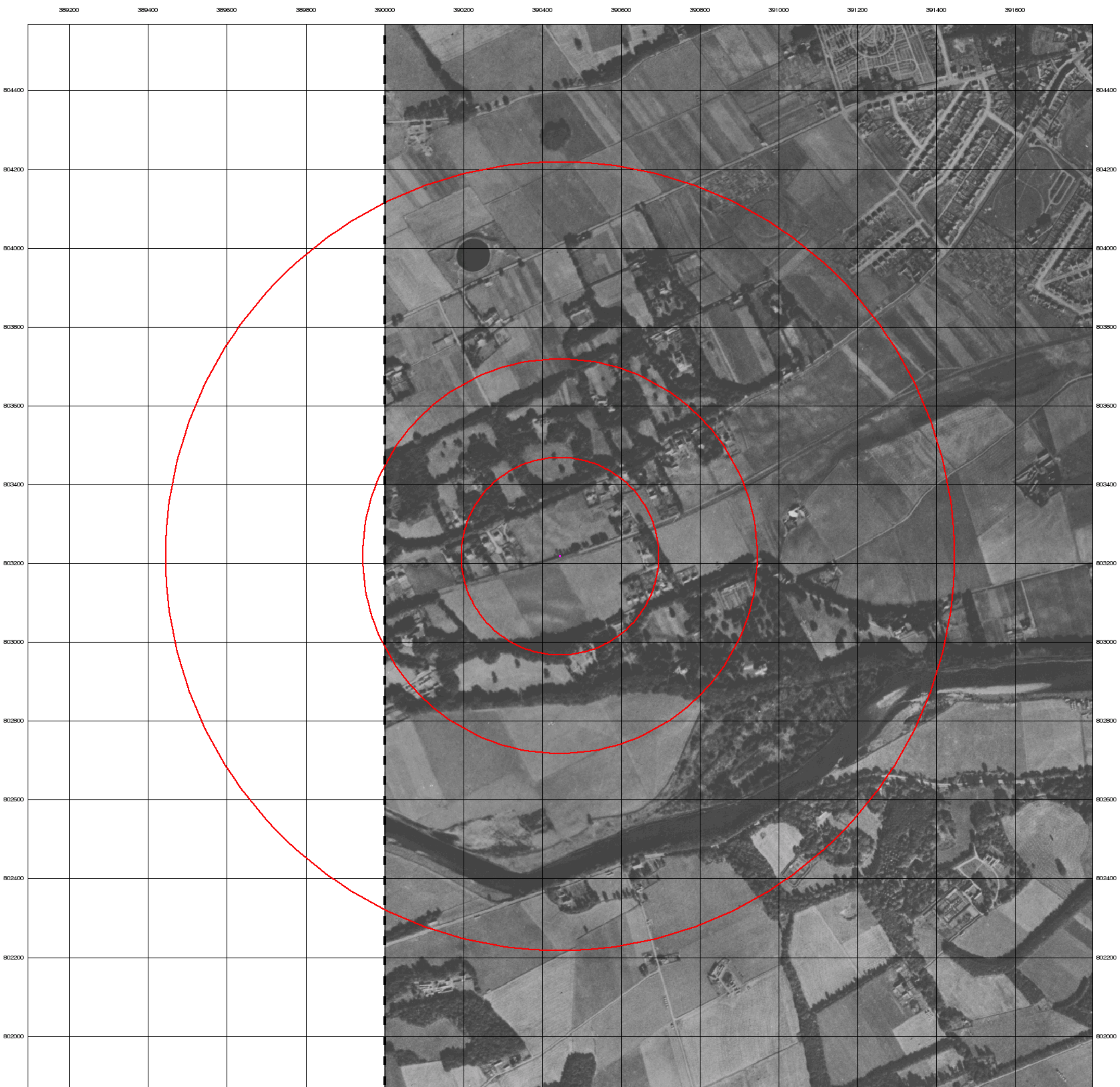


FAIRHURST

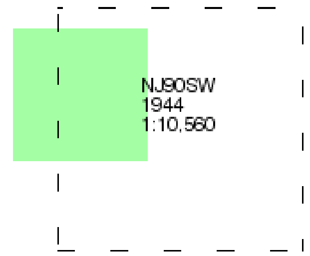
Historical Aerial Photography

Published 1944

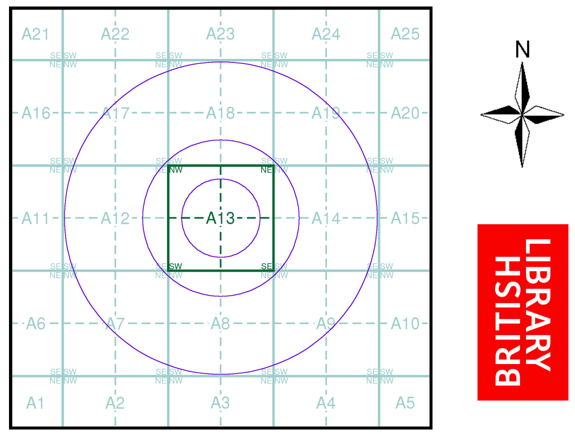
Source map scale - 1:10,560

The Historical Aerial Photos were produced by the Ordnance Survey at a scale of 1:1,250 and 1:10,560 from Air Force photography. They were produced between 1944 and 1951 as an interim measure, pending preparation of conventional mapping, due to post war resource shortages. New security measures in the 1950's meant that every photograph was re-checked for potentially unsafe information with security sites replaced by fake fields or clouds. The original editions were withdrawn and only later made available after a period of fifty years although due to the accuracy of the editing, without viewing both revisions it is not easy to spot the edits. Where available Landmark have included both revisions.

Map Name(s) and Date(s)



Historical Aerial Photography - Slice A



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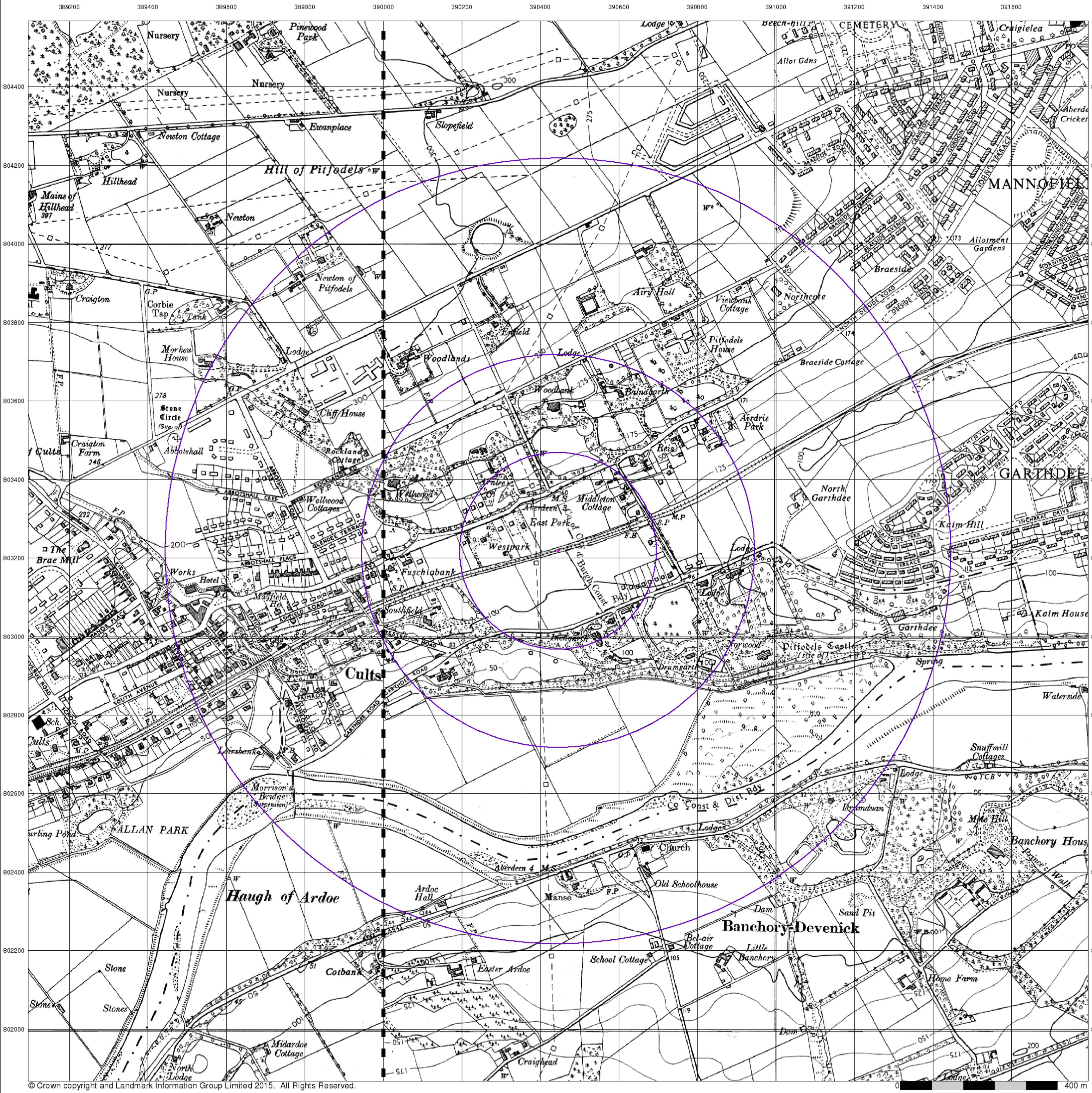

FAIRHURST

Ordnance Survey Plan

Published 1959

Source map scale - 1:10,000

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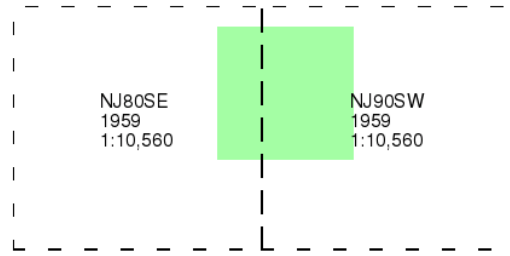
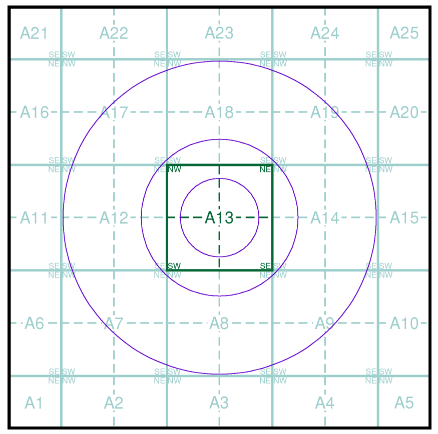
Map Name(s) and Date(s)



Historical Map - Slice A



N

Order Details

Order Number:	100675691_1_1
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Slice:	A
Site Area (Ha):	0.01
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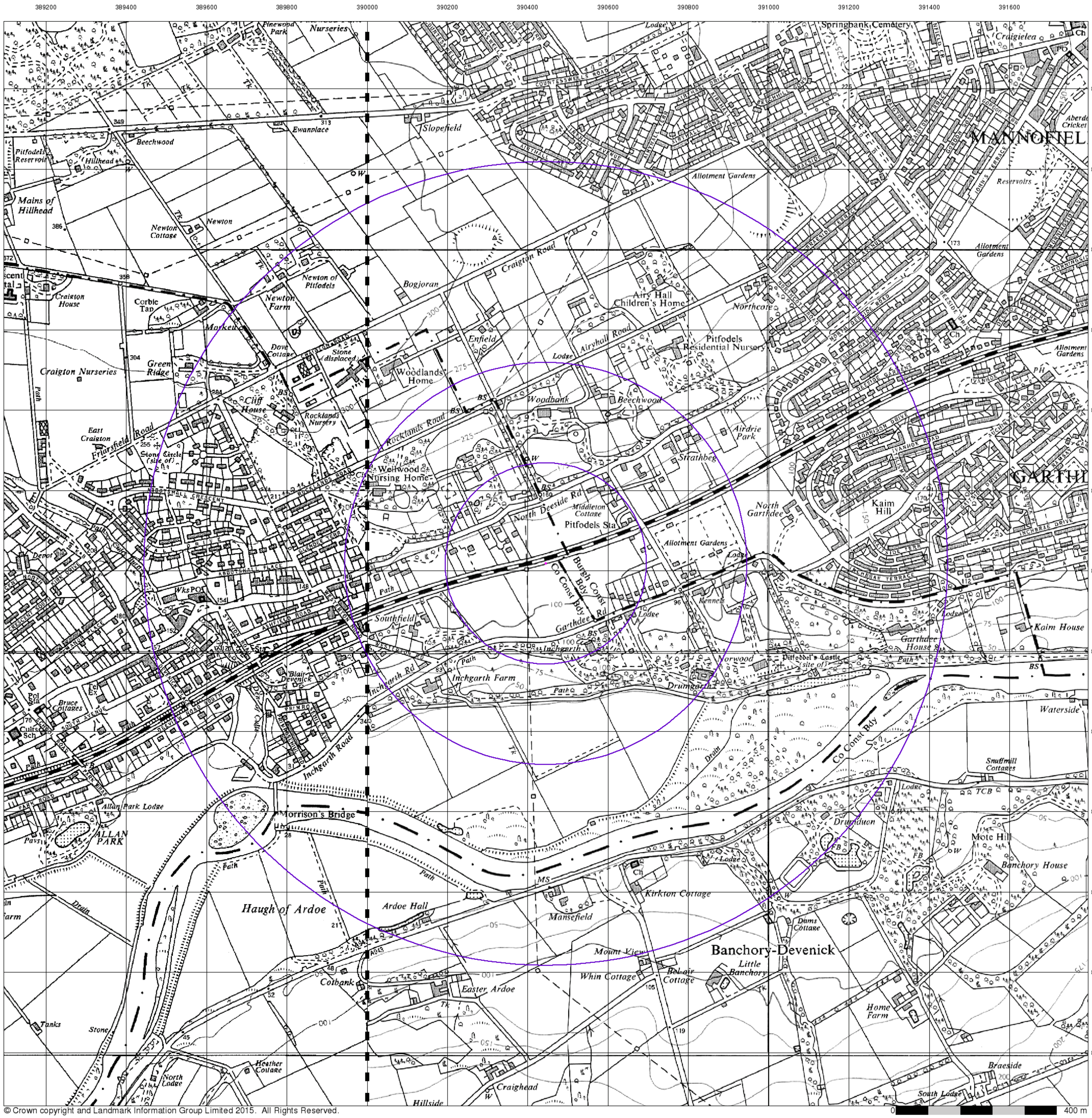

FAIRHURST

Ordnance Survey Plan

Published 1967 - 1968

Source map scale - 1:10,000

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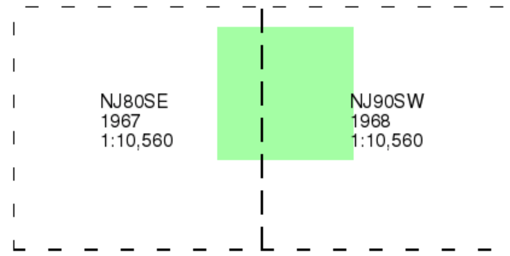
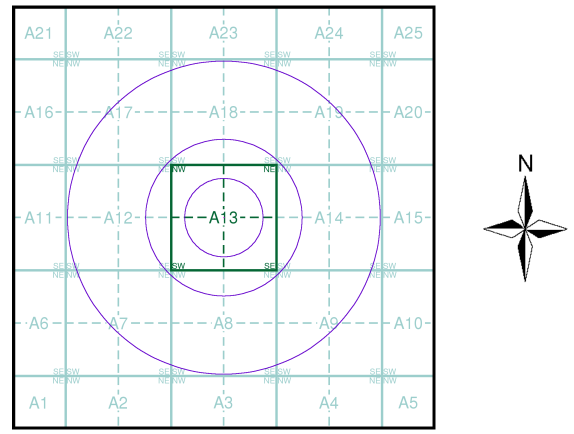


Historical Map - Slice A



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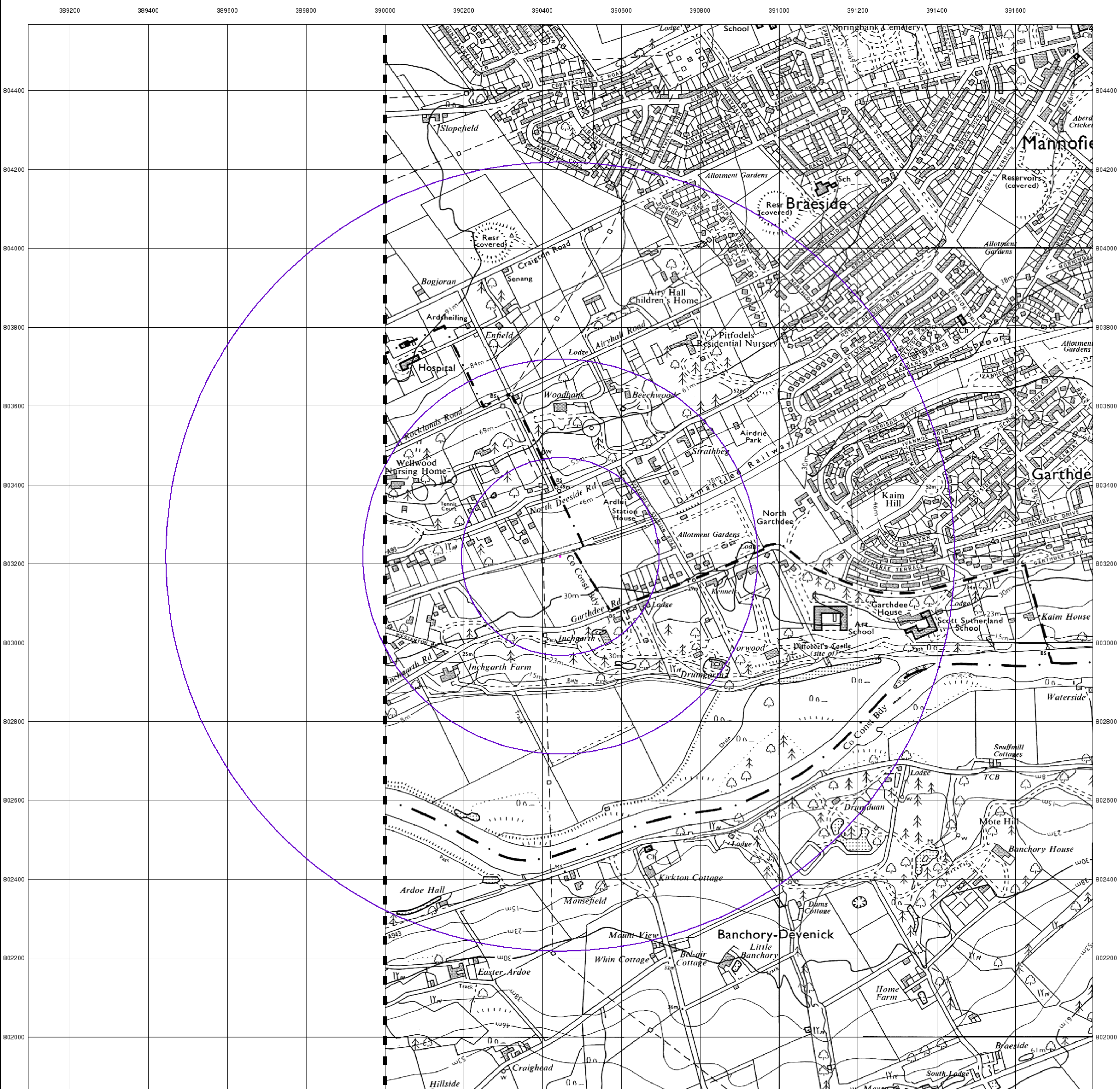

FAIRHURST

Ordnance Survey Plan

Published 1974

Source map scale - 1:10,000

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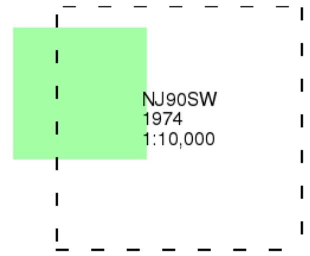
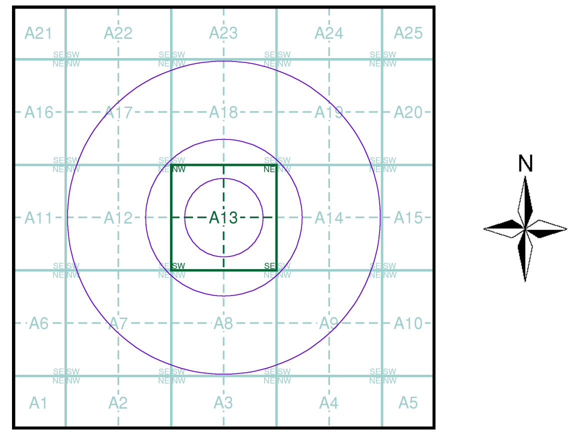


Historical Map - Slice A



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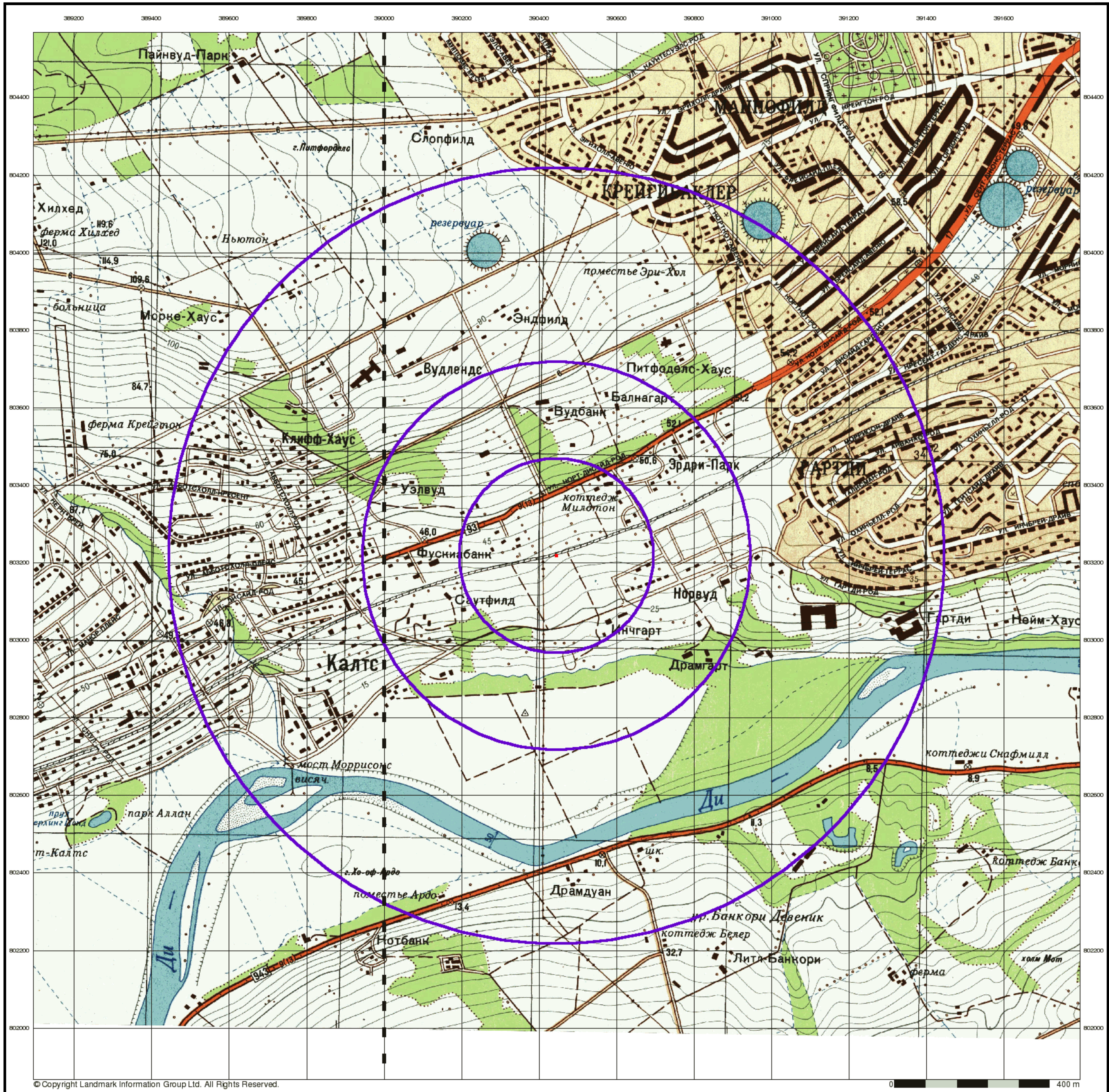


FAIRHURST

Aberdeen

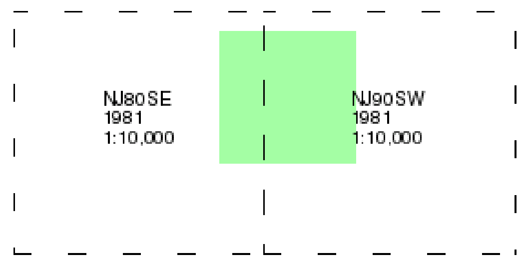
Published 1981

Source map scale - 1:10,000

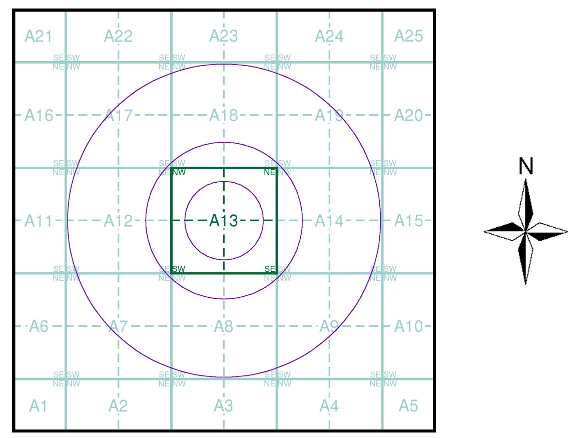
These maps were produced by the Russian military during the Cold War between 1950 and 1997, and cover 103 towns and cities throughout the U.K. The maps are produced at 1:25,000, 1:10,000 and 1:5,000 scale, and show detailed land use, with colour-coded areas for development, green areas, and non-developed areas. Buildings are coloured black and important building uses (such as hospitals, post offices, factories etc.) are numbered, with a numbered key describing their use.

They were produced by the Russians for the benefit of navigation, as well as strategic military sites and transport hubs, for use if they were to have invaded the U.K. The detailed information provided indicates that the areas were surveyed using land-based personnel, on the ground, in the cities that are mapped.

Map Name(s) and Date(s)



Russian Map - Slice A



Order Details

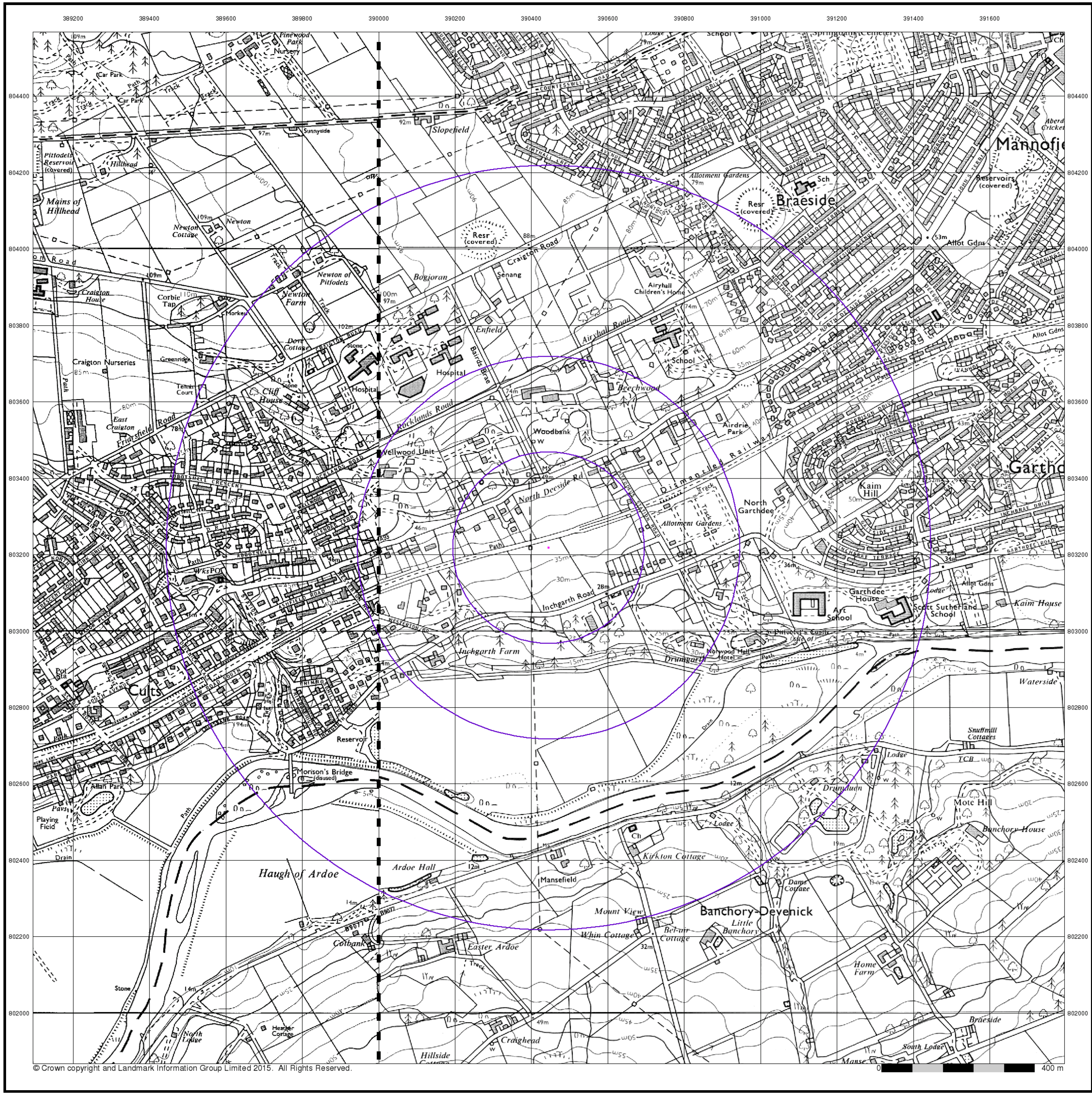
Order Number:	100675691_1_1
Customer Ref:	106859
National Grid Reference:	390450, 803220
Slice:	A
Site Area (Ha):	0.01
Search Buffer (m):	1000

Site Details

9 North Deeside Road, Bieldside, ABERDEEN, AB15 9AD

Landmark INFORMATION GROUP

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



FAIRHURST

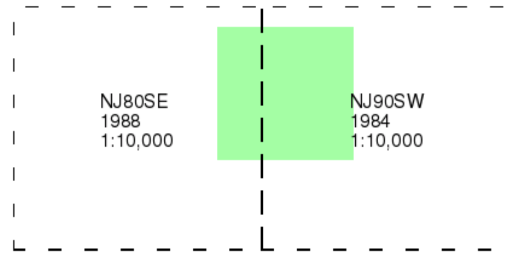
Ordnance Survey Plan

Published 1984 - 1988

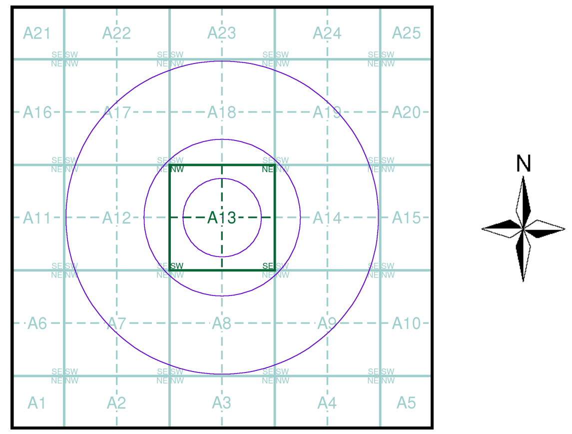
Source map scale - 1:10,000

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940`s, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)



Historical Map - Slice A



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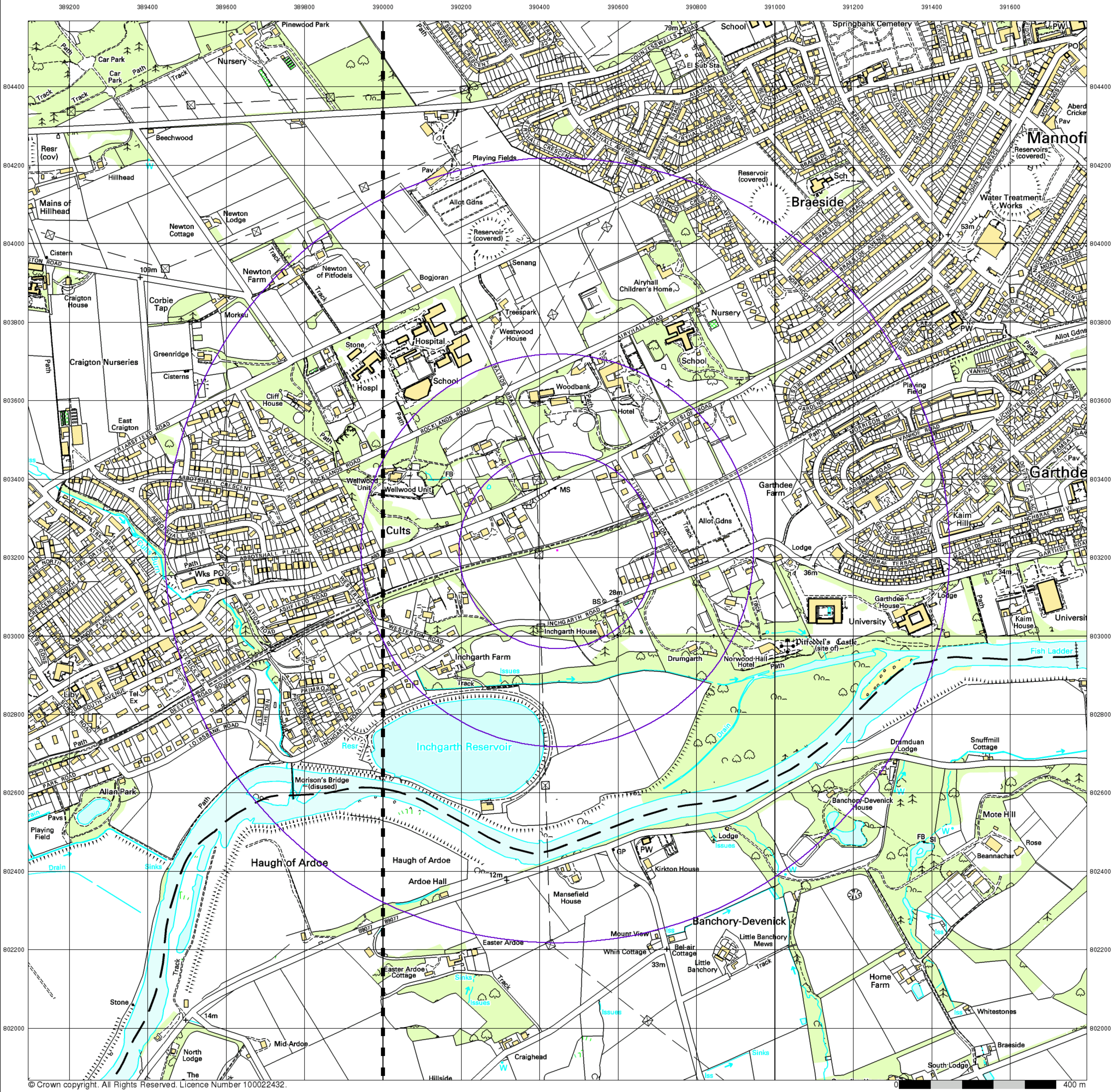


FAIRHURST

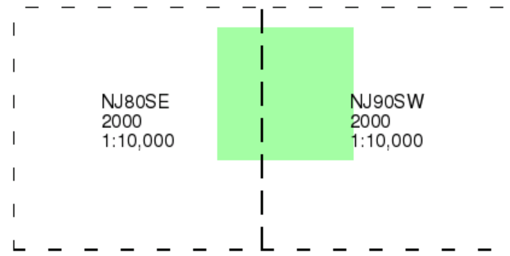
10k Raster Mapping

Published 2000

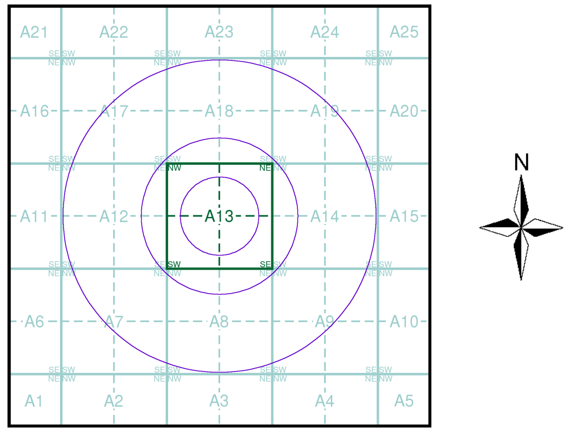
Source map scale - 1:10,000

The historical maps shown were produced from the Ordnance Survey`s 1:10,000 colour raster mapping. These maps are derived from Landplan which replaced the old 1:10,000 maps originally published in 1970. The data is highly detailed showing buildings, fences and field boundaries as well as all roads, tracks and paths. Road names are also included together with the relevant road number and classification. Boundary information depiction includes county, unitary authority, district, civil parish and constituency.

Map Name(s) and Date(s)



Historical Map - Slice A



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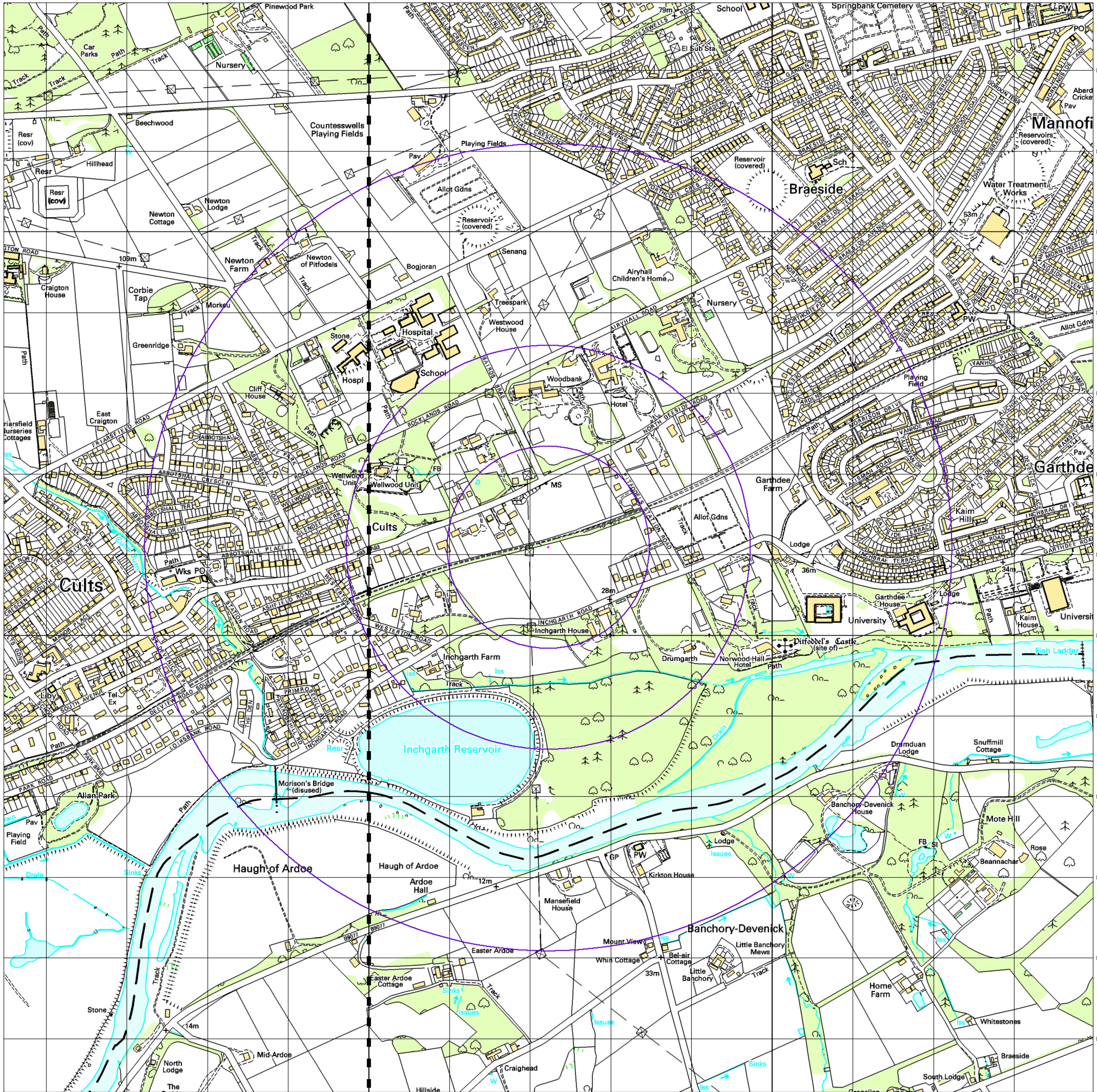


FAIRHURST

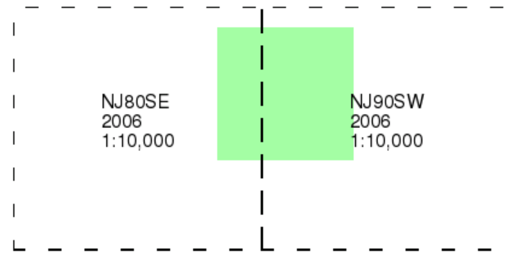
10k Raster Mapping

Published 2006

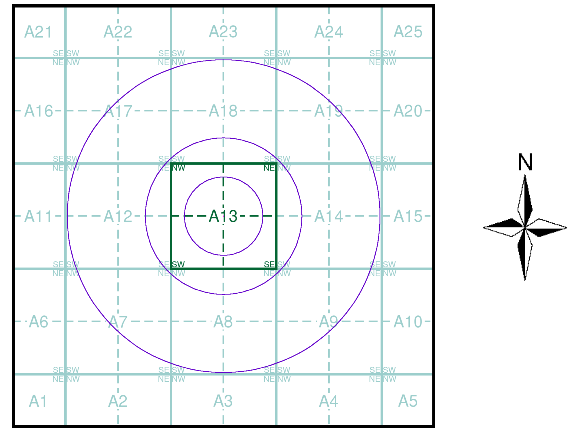
Source map scale - 1:10,000

The historical maps shown were produced from the Ordnance Survey`s 1:10,000 colour raster mapping. The maps are derived from Landplan which replaced the old 1:10,000 maps originally published in 1970. The data is highly detailed showing buildings, fences and field boundaries as well as all roads, tracks and paths. Road names are also included together with the relevant road number and classification. Boundary information depiction includes county, unitary authority, district, civil parish and constituency.

Map Name(s) and Date(s)



Historical Map - Slice A



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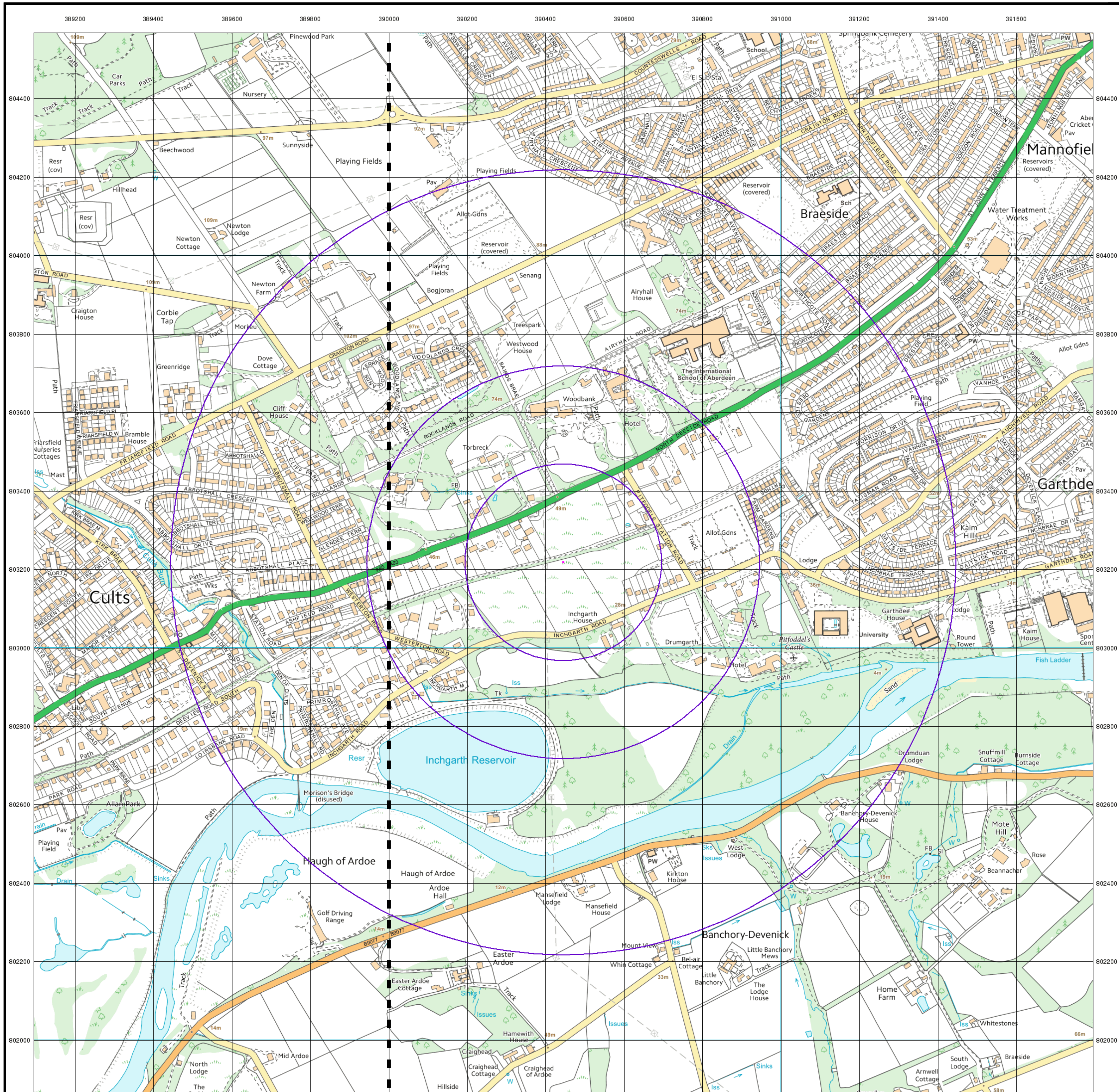


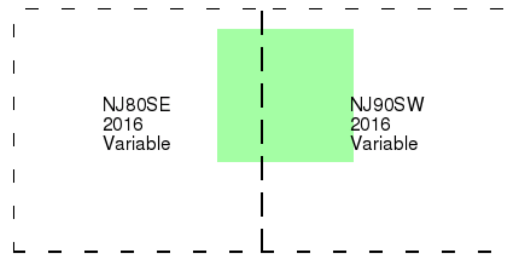
0 400 m

FAIRHURST

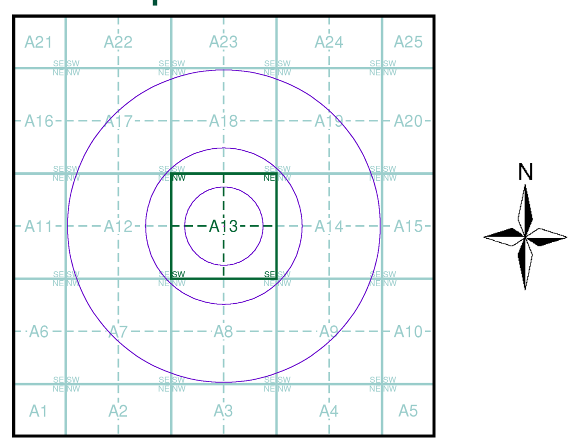
VectorMap Local
Published 2016
Source map scale - 1:10,000

VectorMap Local (Raster) is Ordnance Survey's highest detailed 'backdrop' mapping product. These maps are produced from OS's VectorMap Local, a simple vector dataset at a nominal scale of 1:10,000, covering the whole of Great Britain, that has been designed for creating graphical mapping. OS VectorMap Local is derived from large-scale information surveyed at 1:1250 scale (covering major towns and cities),1:2500 scale (smaller towns, villages and developed rural areas), and 1:10 000 scale (mountain, moorland and river estuary areas).

Map Name(s) and Date(s)



Historical Map - Slice A



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Historical Mapping Legends

Ordnance Survey County Series and Ordnance Survey Plan 1:2,500

Quarry
Gravel Pit
Sand Pit
Clay Pit
Shingle
Refuse Heap
Sloping Masonry
Flat Rock
Marsh
Reeds
Osiers
Rough Pasture
Furze
Wood
Mixed Wood
Brushwood
Orchard
Fir
Ford
Stepping Stones
Ferry
Waterfall
Lock
Trig. Station
507 Altitude at Trig. Station
B.M.325·9 Bench Mark
342 + Surface Level
Arrow denotes flow of water
Antiquities (site of)
Cutting
Embankment
Railway crossing Road
Level Crossing
Road crossing Railway
Railway crossing River or Canal
Road over single stream
Road over River or Canal

County Boundary (Geographical)
County & Civil Parish Boundary
Administrative County & Civil Parish Boundary
Co. Boro. Bdy. County Borough Boundary (England)
Co. Burgh Bdy. County Burgh Boundary (Scotland)

B.P. B.S.	Boundary Post or Stone	P.C.B	Police Call Box
B.R.	Bridle Road	P	Pump
E.P	Electricity Pylon	S.P	Signal Post
F.B.	Foot Bridge	Sl.	Sluice
F.P.	Foot Path	Sp.	Spring
G.P	Guide Post or Board	T.C.B	Telephone Call Box
M.S	Mile Stone	Tr.	Trough
M.P. M.R.	Mooring Post or Ring	W	Well

Ordnance Survey Plan, Additional SIMs and Supply of Unpublished Survey Information 1:2,500 and 1:1,250

Inactive Quarry, Chalk Pit or Clay Pit
Active Quarry, Chalk Pit or Clay Pit
Rock
Boulders
Slopes
Cliff
Top
Roofed Building
Glazed Roof Building
Sloping Masonry
Archway
Non-Coniferous Tree (surveyed)
Coniferous Tree (surveyed)
Non-Coniferous Trees (not surveyed)
Coniferous Trees (not surveyed)
Orchard Tree
Scrub
Bracken
Coppice, Osier
Reeds
Marsh, Saltings
Rough Grassland
Heath
Culvert
Direction of water flow
B M Bench Mark
Antiquity (site of)
Cave Entrance
Triangulation Station
Electricity Pylon
E T L Electricity Transmission Line

County Boundary (Geographical)
County & Civil Parish Boundary
Civil Parish Boundary
Admin. County or County Bor. Boundary
L B Bdy London Borough Boundary
Symbol marking point where boundary mereing changes

BH	Beer House	P	Pillar, Pole or Post
BP, BS	Boundary Post or Stone	PO	Post Office
Cn, C	Capstan, Crane	PC	Public Convenience
Chy	Chimney	PH	Public House
D Fn	Drinking Fountain	Pp	Pump
El P	Electricity Pillar or Post	SB, S Br	Signal Box or Bridge
FAP	Fire Alarm Pillar	SP, SL	Signal Post or Light
FB	Foot Bridge	Spr	Spring
GP	Guide Post	Tk	Tank or Track
H	Hydrant or Hydraulic	TCB	Telephone Call Box
LC	Level Crossing	TCP	Telephone Call Post
MH	Manhole	Tr	Trough
MP	Mile Post or Mooring Post	Wr Pt, Wr T	Water Point, Water Tap
MS	Mile Stone	W	Well
NTL	Normal Tidal Limit	Wd Pp	Wind Pump

Large-Scale National Grid Data 1:2,500 and 1:1,250

Slopes
Cliff
Top
Rock
Rock (scattered)
Boulders
Boulders (scattered)
Positioned Boulder
Scree
Non-Coniferous Tree (surveyed)
Coniferous Tree (surveyed)
Non-Coniferous Trees (not surveyed)
Coniferous Trees (not surveyed)
Orchard Tree
Scrub
Bracken
Coppice, Osier
Reeds
Marsh, Saltings
Rough Grassland
Heath
Culvert
Direction of water flow
Triangulation Station
Antiquity (site of)
E T L Electricity Transmission Line
Electricity Pylon
BM 231.60m Bench Mark
Buildings with Building Seed
Roofed Building
Glazed Roof Building
Civil parish/community boundary
District boundary
County boundary
Boundary post/stone
Boundary mereing symbol (note: these always appear in opposed pairs or groups of three)

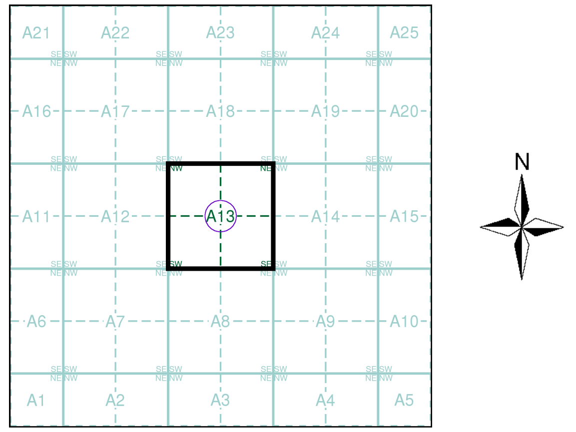
Bks	Barracks	P	Pillar, Pole or Post
Bty	Battery	PO	Post Office
Cemy	Cemetery	PC	Public Convenience
Chy	Chimney	Pp	Pump
Cis	Cistern	Ppg Sta	Pumping Station
Dismtd Rly	Dismantled Railway	PW	Place of Worship
El Gen Sta	Electricity Generating Station	Sewage Ppg Sta	Sewage Pumping Station
El P	Electricity Pole, Pillar	SB, S Br	Signal Box or Bridge
El Sub Sta	Electricity Sub Station	SP, SL	Signal Post or Light
FB	Filter Bed	Spr	Spring
Fn / D Fn	Fountain / Drinking Ftn.	Tk	Tank or Track
Gas Gov	Gas Valve Compound	Tr	Trough
GVC	Gas Governer	Wd Pp	Wind Pump
GP	Guide Post	Wr Pt, WrT	Water Point, Water Tap
MH	Manhole	Wks	Works (building or area)
MP, MS	Mile Post or Mile Stone	W	Well

FAIRHURST

Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Aberdeenshire	1:2,500	1864 - 1892	2
Kincardineshire	1:2,500	1895	3
Aberdeenshire	1:2,500	1901	4
Aberdeenshire	1:2,500	1925	5
Ordnance Survey Plan	1:2,500	1963 - 1967	6
Ordnance Survey Plan	1:1,250	1980	7
Additional SIMs	1:2,500	1987	8
Additional SIMs	1:1,250	1987	9
Large-Scale National Grid Data	1:1,250	1993	10
Large-Scale National Grid Data	1:2,500	1993	11
Large-Scale National Grid Data	1:1,250	1994	12
Historical Aerial Photography	1:2,500	2001	13

Historical Map - Segment A13



Order Details

Order Number: 100675691_1_1
Customer Ref: 106859
National Grid Reference: 390450, 803220
Slice: A
Site Area (Ha): 0.01
Search Buffer (m): 100

Site Details

9 North Deeside Road, Bieldside, ABERDEEN, AB15 9AD

Landmark INFORMATION GROUP
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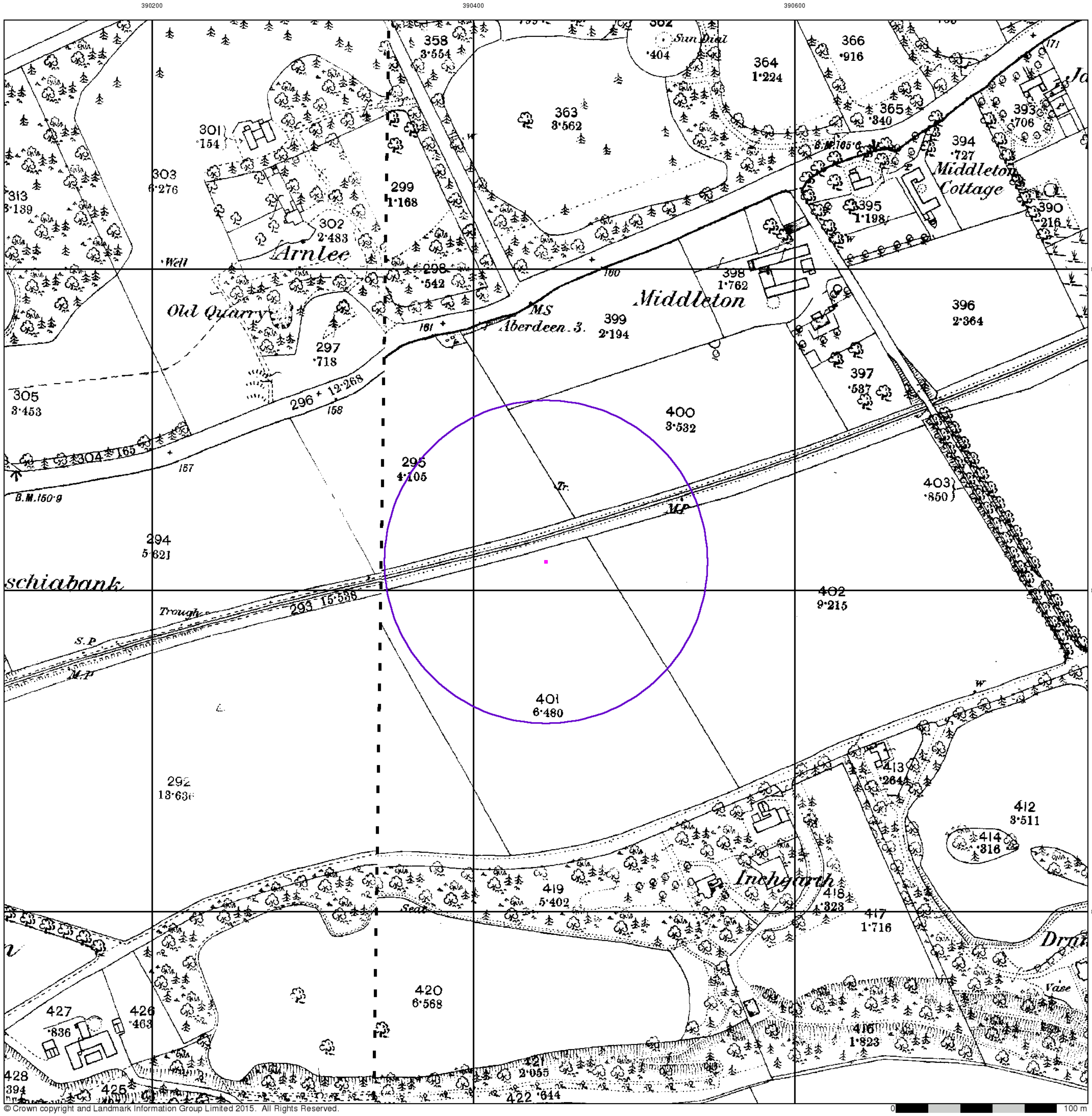


0 100 m

FAIRHURST

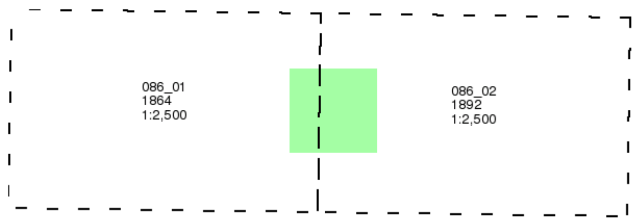
Aberdeenshire

Published 1864 - 1892

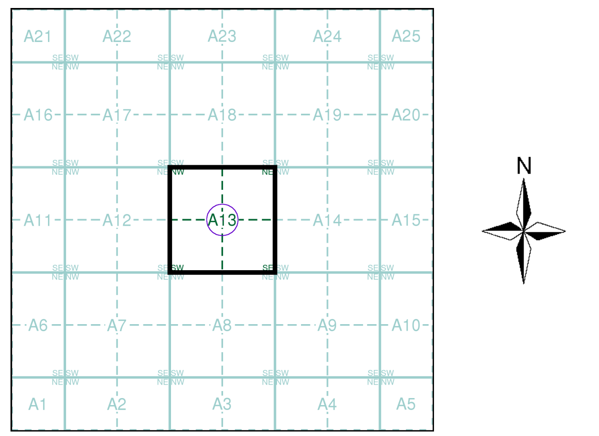
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



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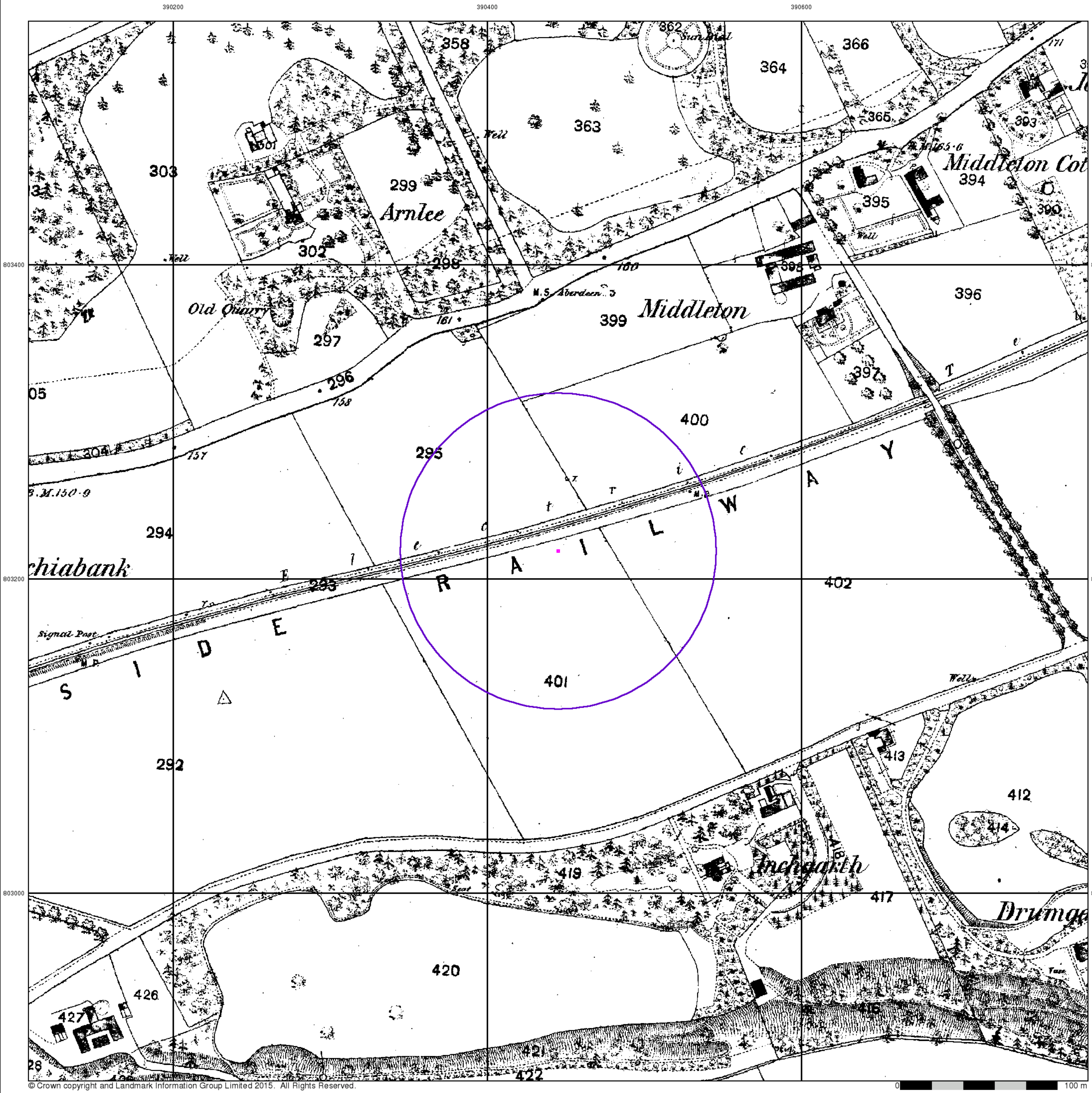

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0 100 m

FAIRHURST

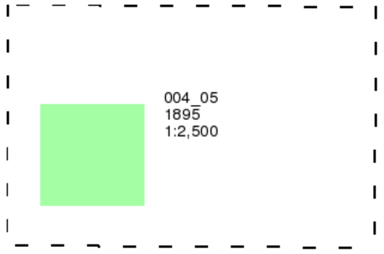
Kincardineshire

Published 1895

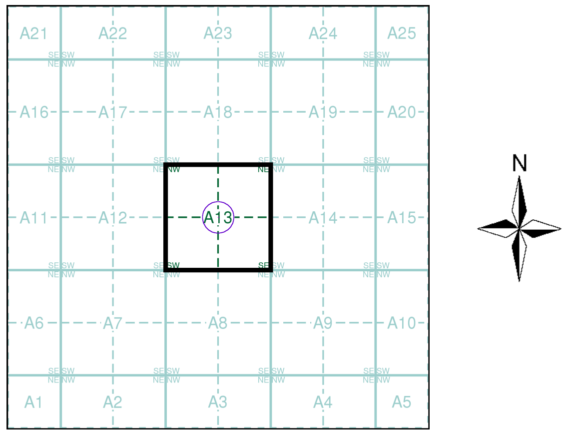
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



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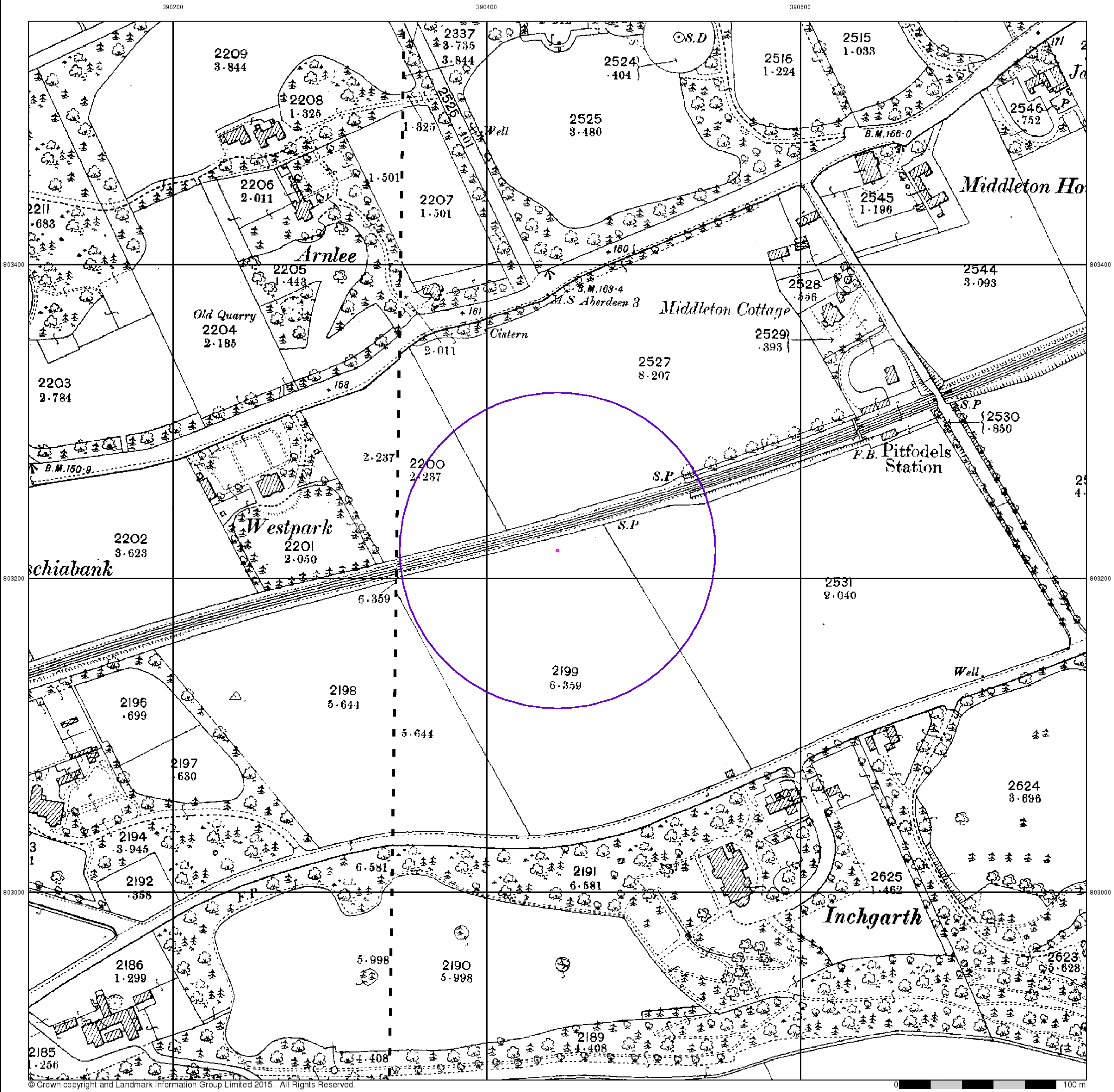


FAIRHURST

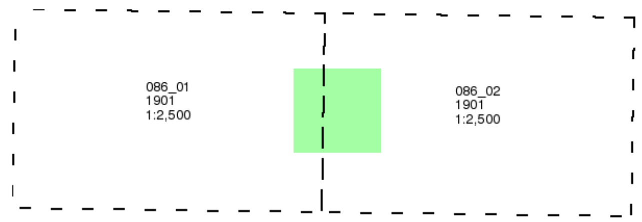
Aberdeenshire

Published 1901

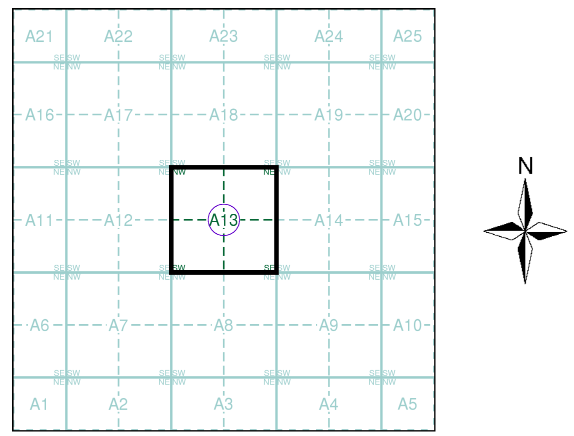
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



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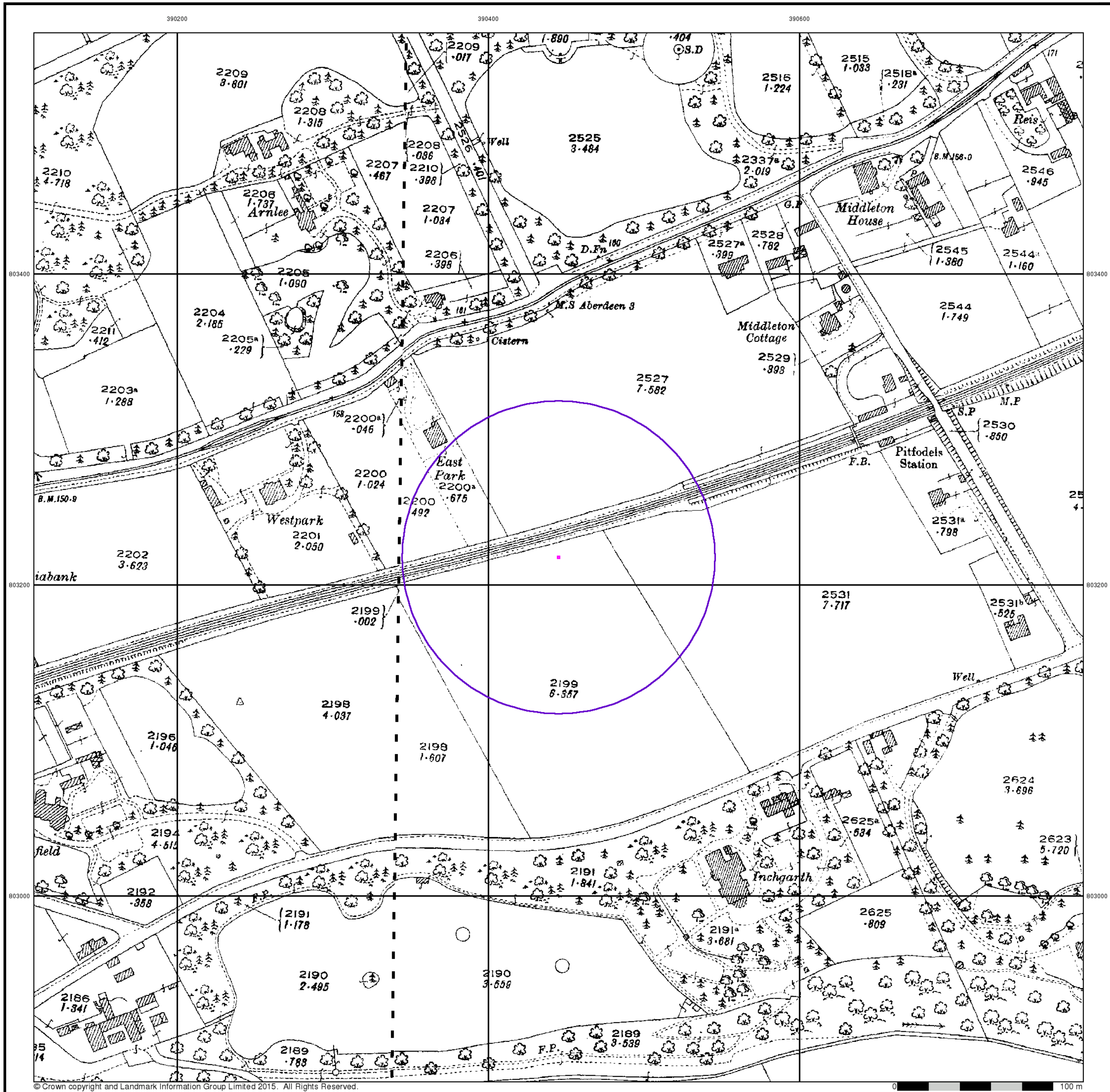

0 100 m

FAIRHURST

Aberdeenshire

Published 1925

Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

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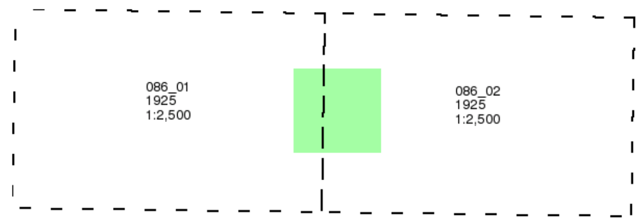
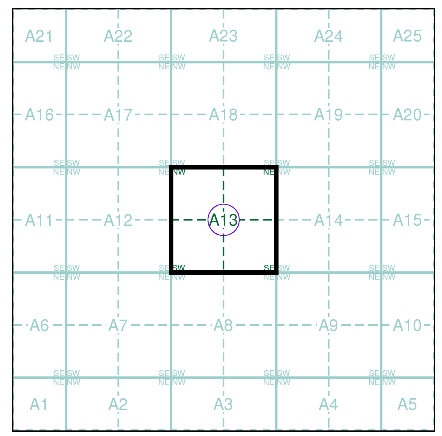
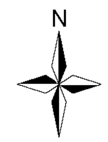


Historical Map - Segment A13





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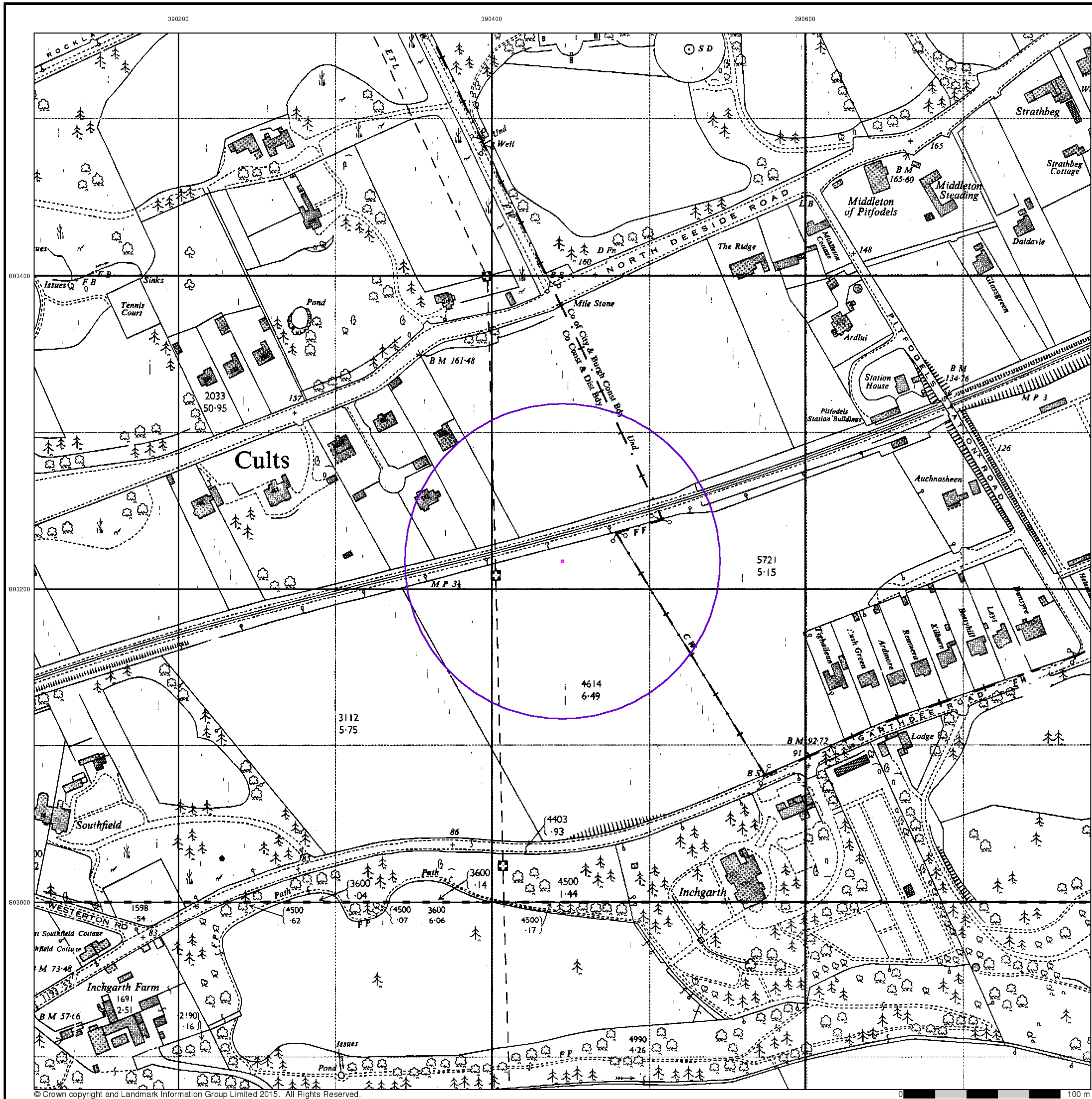

FAIRHURST

Ordnance Survey Plan

Published 1963 - 1967

Source map scale - 1:2,500

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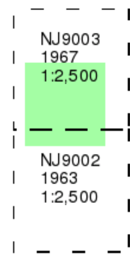
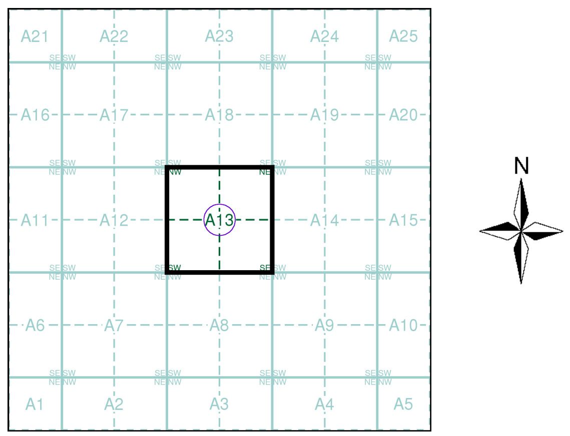


Historical Map - Segment A13



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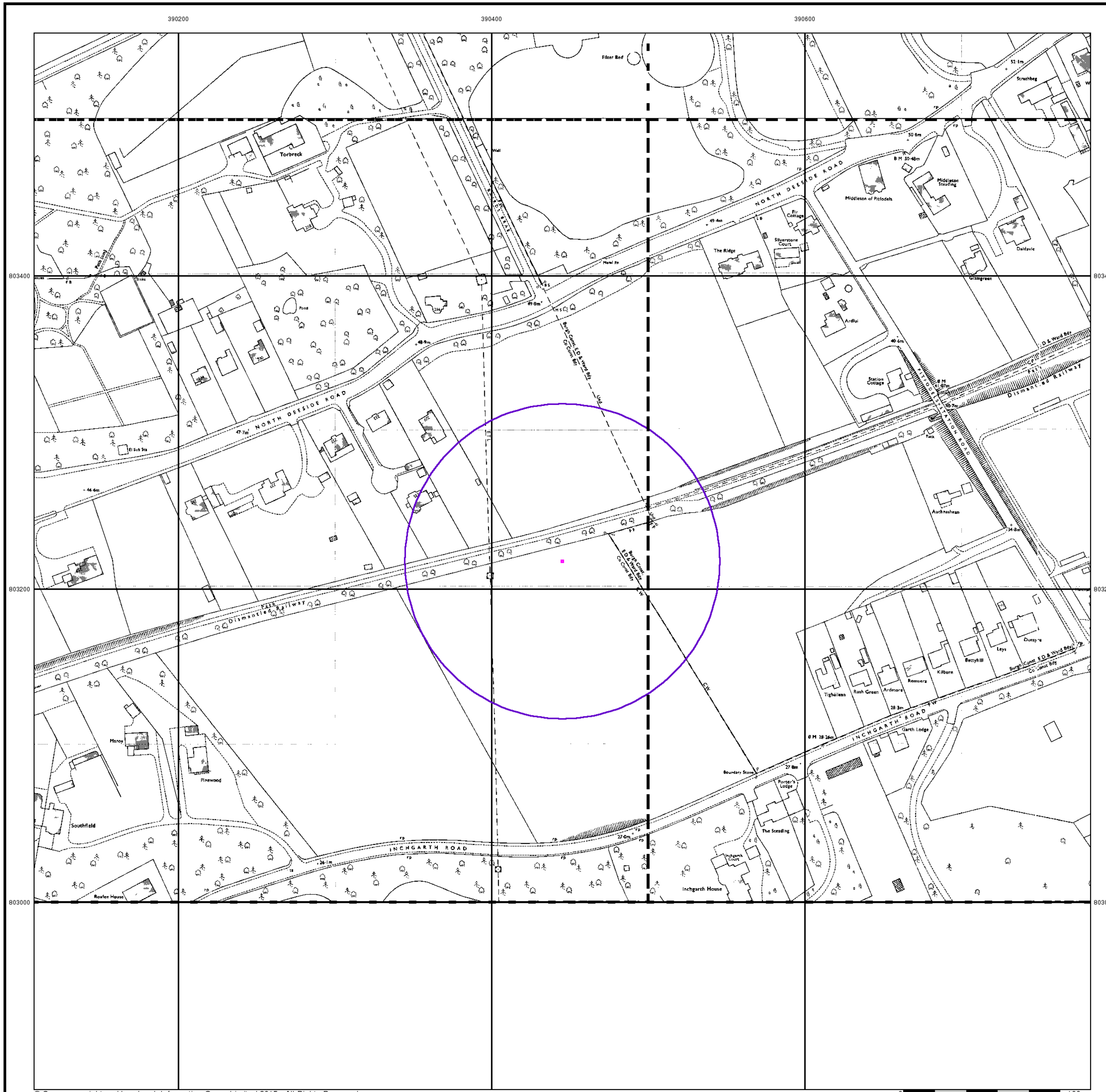
National Grid Reference:	390450, 803220
Slice:	A
Site Area (Ha):	0.01
Search Buffer (m):	100

Site Details

9 North Deeside Road, Bieldside, ABERDEEN, AB15 9AD

Landmark INFORMATION GROUP

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



0 100 m

FAIRHURST

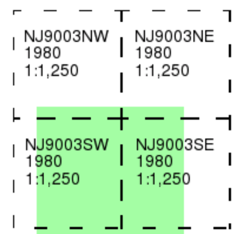
Ordnance Survey Plan

Published 1980

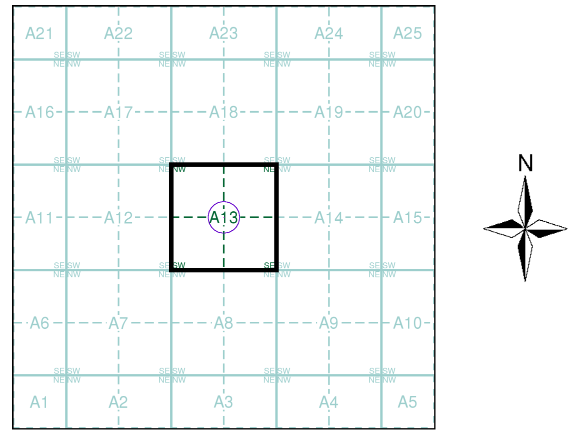
Source map scale - 1:1,250

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

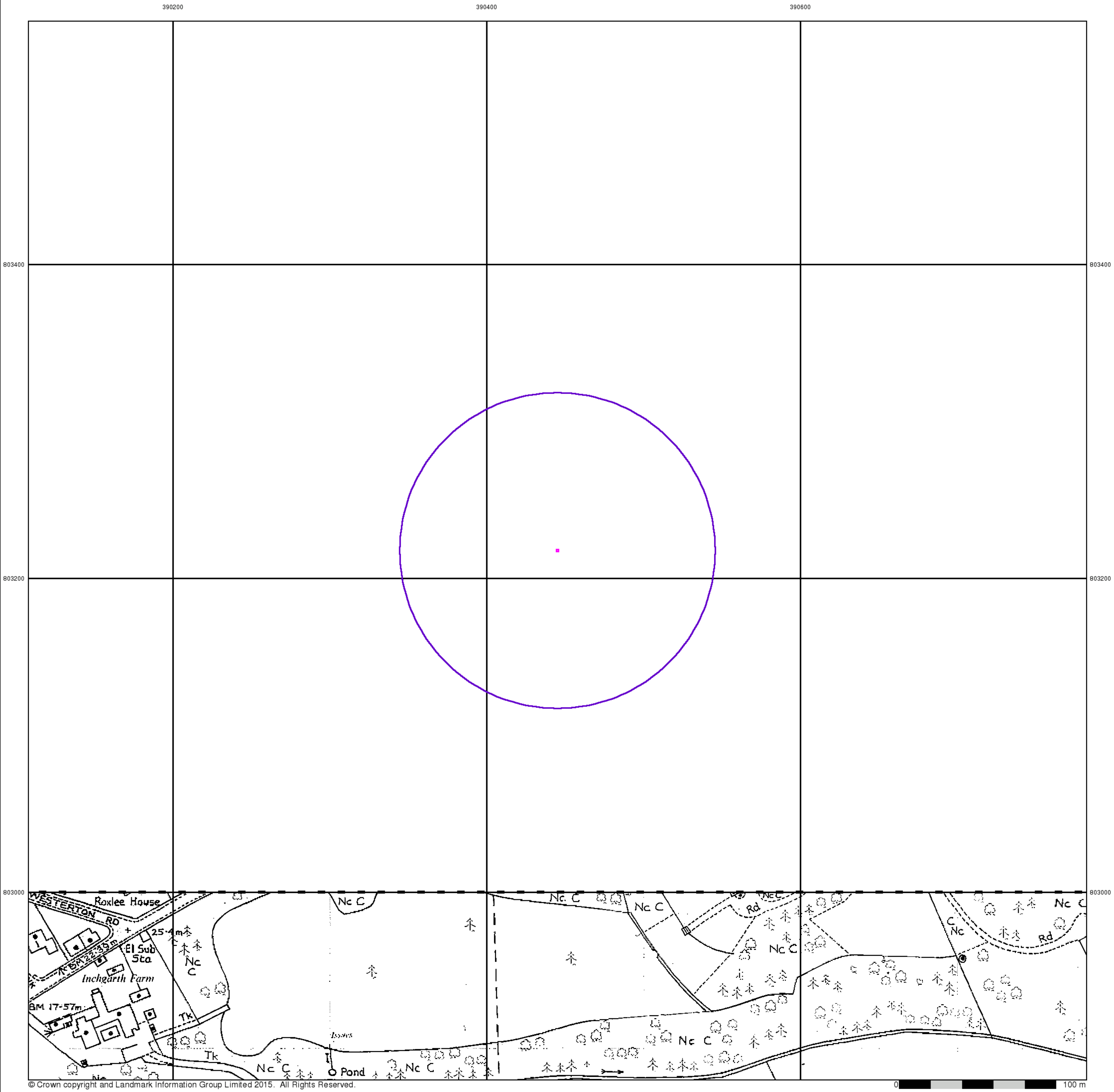
Order Number:	100675691_1_1
Customer Ref:	106859
National Grid Reference:	390450, 803220
Slice:	A
Site Area (Ha):	0.01
Search Buffer (m):	100

Site Details

9 North Deeside Road, Bieldside, ABERDEEN, AB15 9AD

Landmark INFORMATION GROUP

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



FAIRHURST

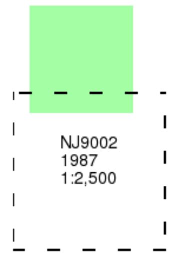
Additional SIMs

Published 1987

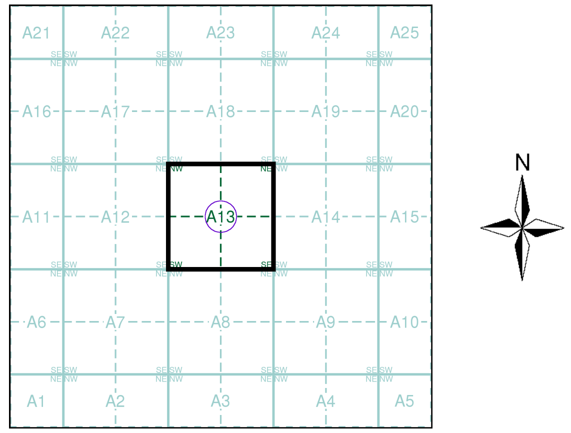
Source map scale - 1:2,500

The SIM cards (Ordnance Survey's `Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1994, and contain detailed information on buildings, roads and land-use. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

Order Number: 100675691_1_1
Customer Ref: 106859
National Grid Reference: 390450, 803220
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Site Area (Ha): 0.01
Search Buffer (m): 100

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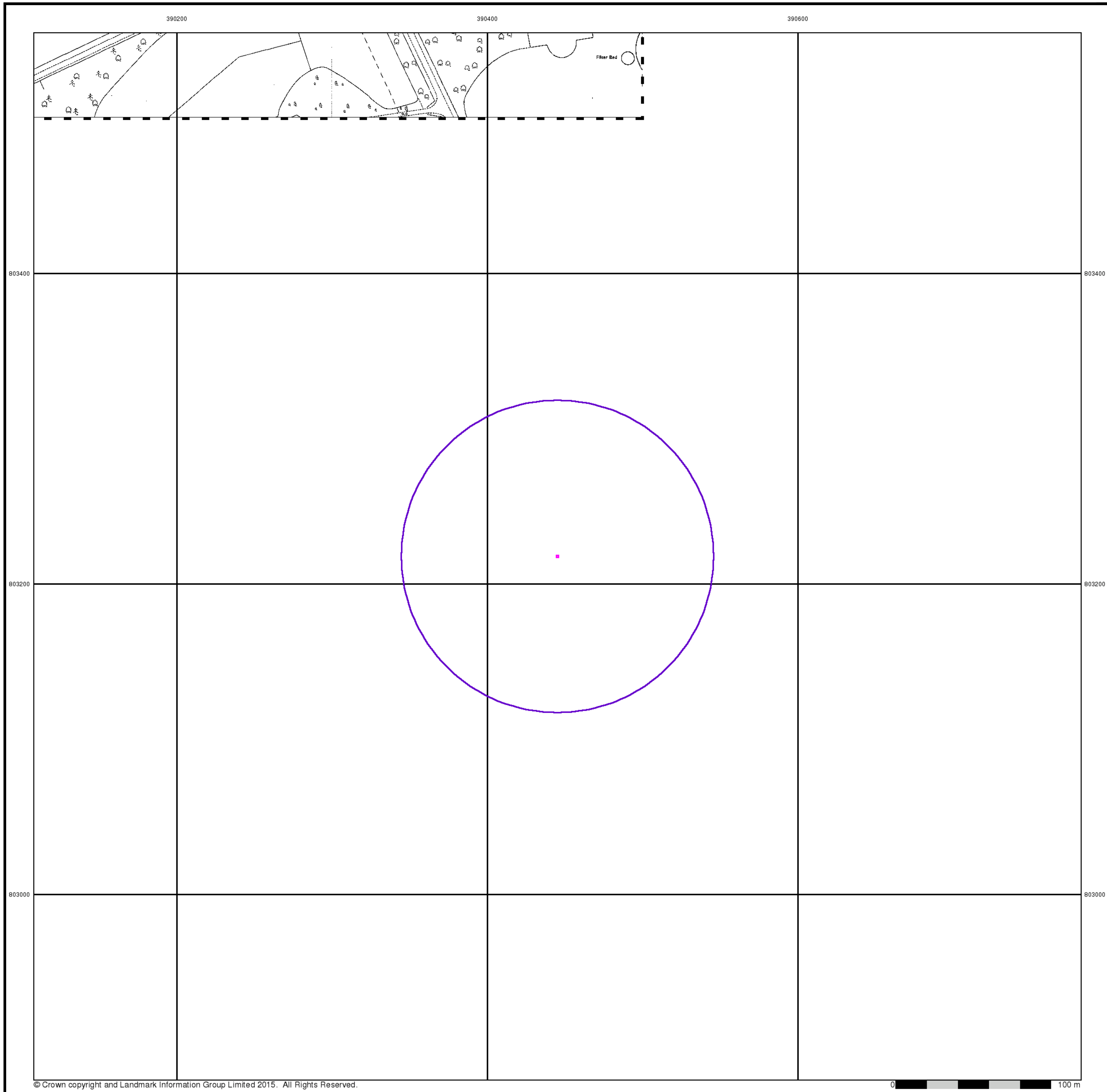


FAIRHURST

Additional SIMs

Published 1987

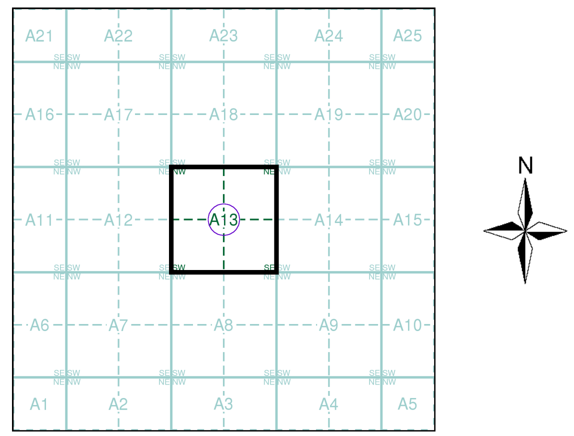
Source map scale - 1:1,250

The SIM cards (Ordnance Survey's `Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1994, and contain detailed information on buildings, roads and land-use. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)

NJ9003NW
1987
1:1,250

Historical Map - Segment A13



Order Details

Order Number:	100675691_1_1
Customer Ref:	106859
National Grid Reference:	390450, 803220
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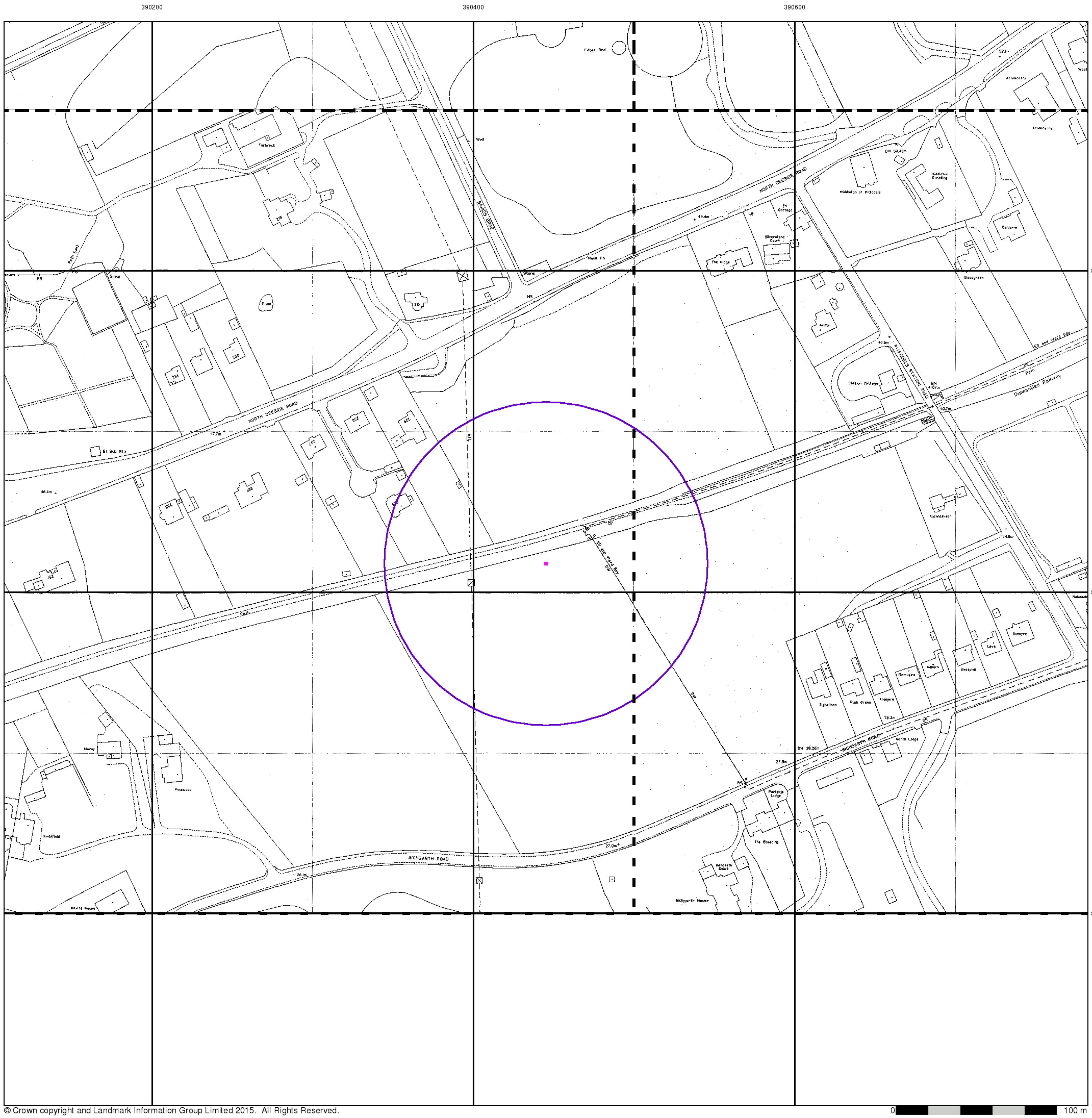
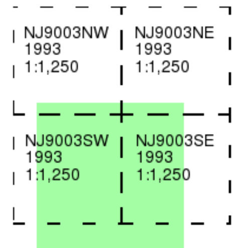


FAIRHURST

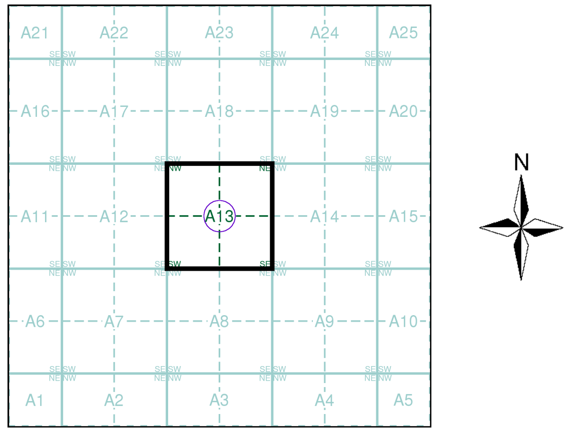
Large-Scale National Grid Data
Published 1993
Source map scale - 1:1,250

'Large Scale National Grid Data' superseded SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') in 1992, and continued to be produced until 1999. These maps were the fore-runners of digital mapping and so provide detailed information on houses and roads, but tend to show less topographic features such as vegetation. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

Order Number:	100675691_1_1
Customer Ref:	106859
National Grid Reference:	390450, 803220
Slice:	A
Site Area (Ha):	0.01
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Site Details

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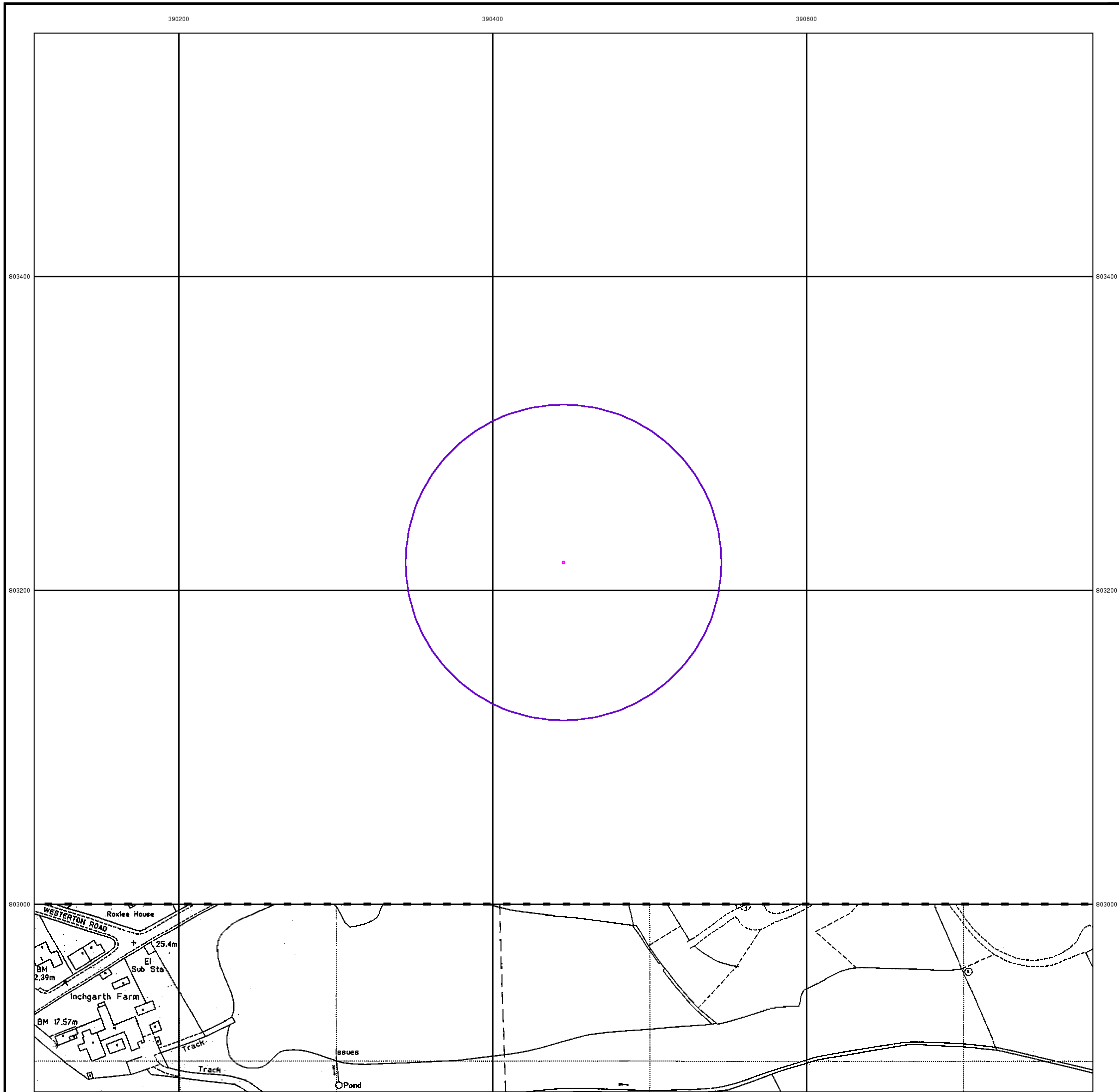
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



FAIRHURST

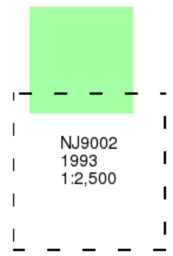
Large-Scale National Grid Data

Published 1993

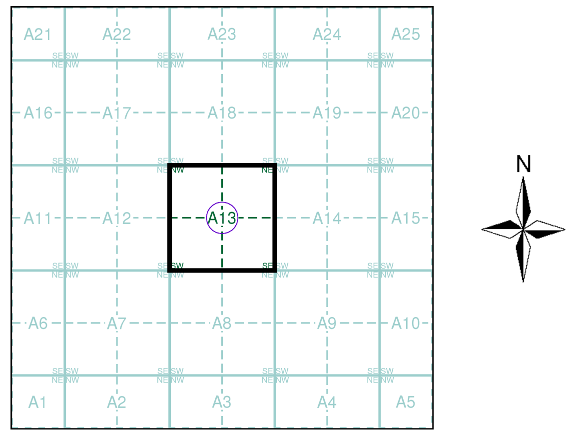
Source map scale - 1:2,500

'Large Scale National Grid Data' superseded SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') in 1992, and continued to be produced until 1999. These maps were the fore-runners of digital mapping and so provide detailed information on houses and roads, but tend to show less topographic features such as vegetation. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A13



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Customer Ref: 106859
National Grid Reference: 390450, 803220
Slice: A
Site Area (Ha): 0.01
Search Buffer (m): 100

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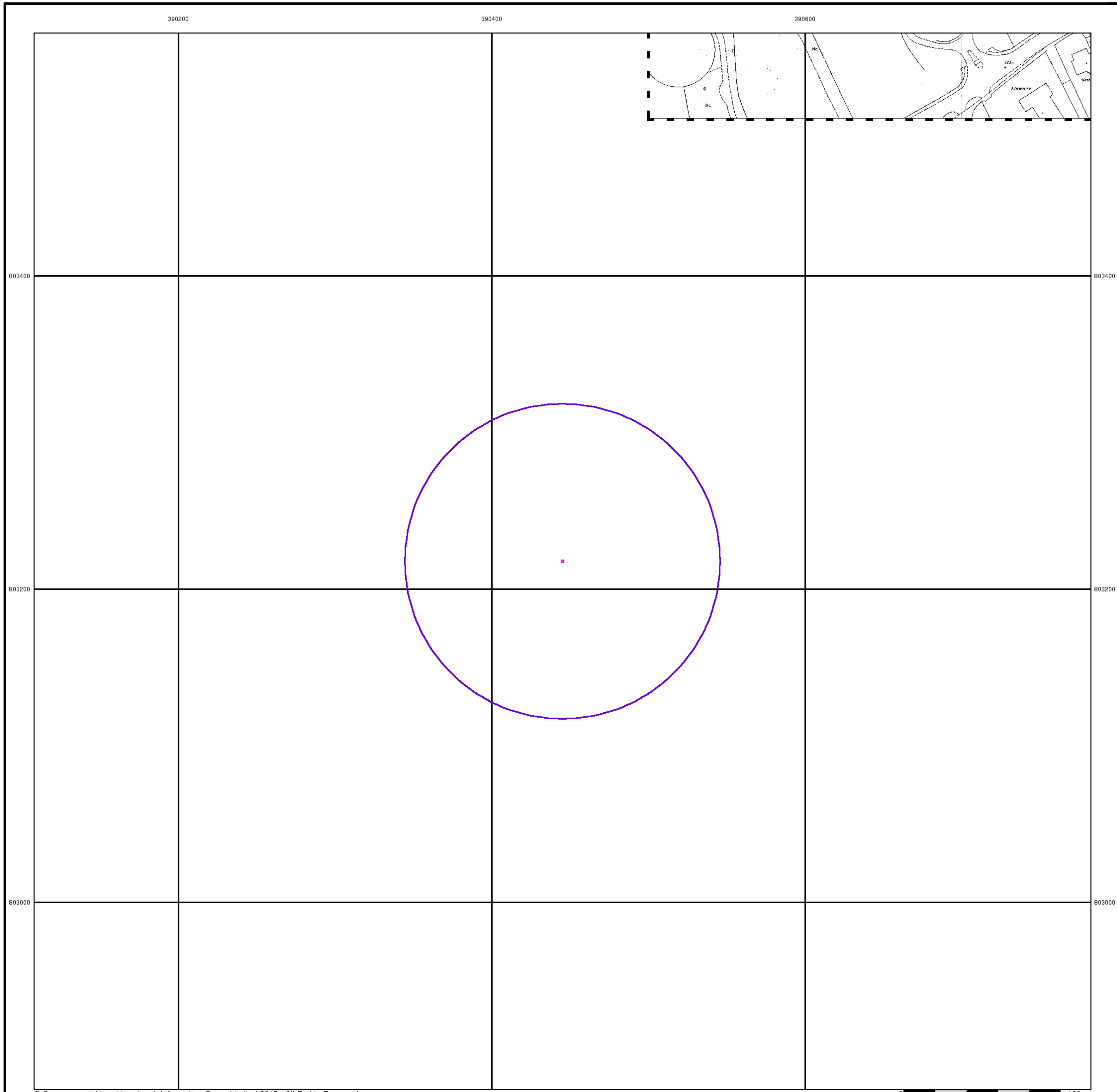


FAIRHURST

Large-Scale National Grid Data

Published 1994

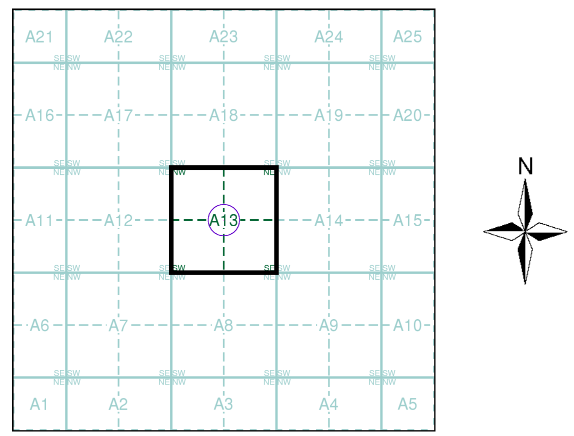
Source map scale - 1:1,250

'Large Scale National Grid Data' superseded SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') in 1992, and continued to be produced until 1999. These maps were the fore-runners of digital mapping and so provide detailed information on houses and roads, but tend to show less topographic features such as vegetation. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)

NJ9003NE
1994
1:1,250

Historical Map - Segment A13



Order Details

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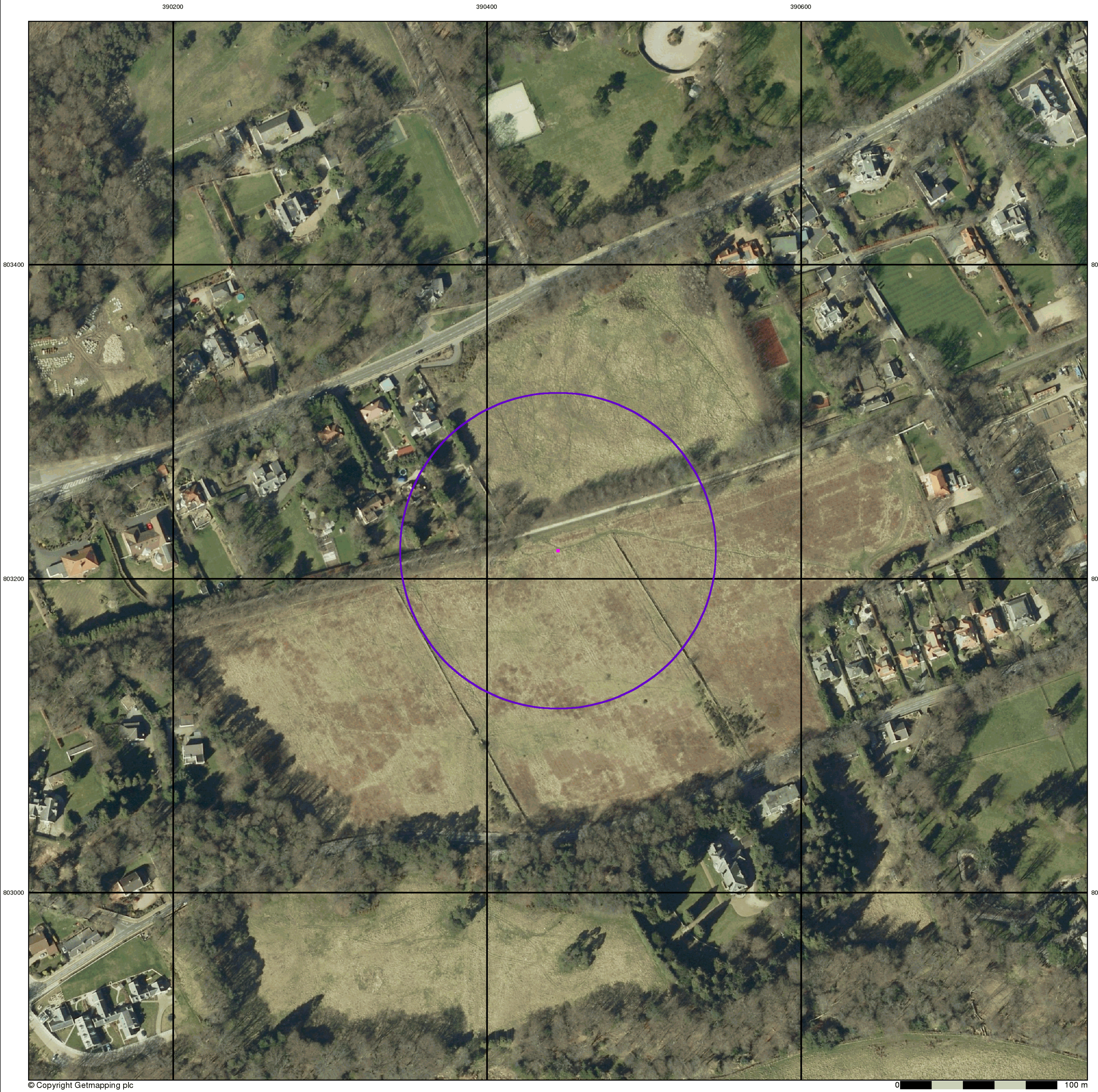


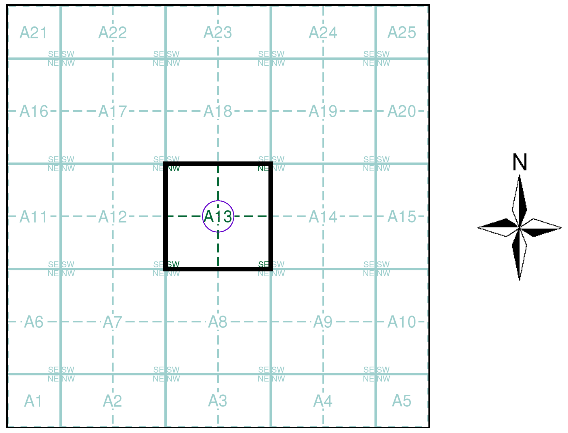
FAIRHURST

Historical Aerial Photography

Published 2001

This aerial photography was produced by Getmapping, these vertical aerial photographs provide a seamless, full colour survey of the whole of Great Britain

Historical Aerial Photography - Segment A13



Order Details

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Customer Ref: 106859
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Site Area (Ha): 0.01
Search Buffer (m): 100

Site Details

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Landmark INFORMATION GROUP

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk

Appendix 2

Our Ref.
Your Ref. JB/106859
Contact Clare Horton
Email chorton@aberdeencity.gov.uk
Direct Dial 01224 523822
Direct Fax 01224 523887

18.10.16

Jennifer Bohill

Fairhurst
Britannia House Ground Floor
Endeavour Drive
Arnhall Business Park
Westhill
Aberdeenshire
AB32 6UF

Environmental Health and Trading Standards
Communities, Housing and Infrastructure
Aberdeen City Council
Business Hub 15
Third Floor South
Marischal College
Broad Street
Aberdeen AB10 1AB

Tel 03000 200 292
Minicom 01224 522381
DX 529451, Aberdeen 9
www.aberdeencity.gov.uk

Dear Jennifer,

106859: Redevelopment of Site on North Deeside Road (off Inchgarth Road), Aberdeen

I refer to your request for environmental information for the above site. I can inform you of the following:

There are no known sources of potential contamination at the subject site or within the close environs. There are also no known former landfill sites or animal burial grounds at the subject site or in close proximity to the site.

This Service is not aware of any records of complaints, notices etc. about nuisance relating to the current or previous site uses and it's environs.

There are no private potable water sources within 2km of the subject area.

According to the Indicative Atlas of Scotland (HPA/BGS 2011), the site is in an area with a less than 1% probability of having an indoor radon concentration above the Radon Action Level (200Bq/m3). According to the Indicative Atlas, areas immediately adjacent to the south of the subject site (across Inchgarth Road) have a 3-5% probability of having indoor radon concentrations above the Radon Action Level. Accordingly, this would place areas to the immediate south in an Intermediate Probability Area and radon protection measures for new buildings would be advised. The Indicative Atlas is only an estimate of the radon potential. Actual radon levels could only be determined by carrying out measurements.

I trust this information is of use. An invoice for £50 plus VAT will follow in due course.

PETE LEONARD
DIRECTOR

Yours Sincerely,

Clare Horton
Authorised Officer (Contaminated Land)

Sandie Pirie

From: Graham Shand <GShand@aberdeencity.gov.uk>
Sent: 17 October 2016 15:54
To: Jennifer Bohill
Subject: RE: 106859 North Deeside Road Development

Dear Jennifer

Petroleum Regulation Acts 1928 & 36

I refer to your email and attached location plan regarding the above premises and advise as follows.

This Service's historic petroleum records have no records of any underground tanks at the premises.

As a general matter, it should be noted that the records we hold relate to tanks which have previously been used for the storage of petroleum spirit and methods taken to prevent the danger of fire and explosion from said tanks.

An invoice will follow for the provision of this information.

If you require any further information, please do not hesitate to contact me.

Regards
Graham
Graham Shand
Senior Enforcement Officer

Aberdeen City Council
Environmental Health & Trading Standards
Communities, Housing and Infrastructure
Business Hub 15
Third Floor South
Marischal College
Broad Street
Aberdeen
AB10 1AB

Email gshand@aberdeencity.gov.uk
Direct Dial 01224 523732
Fax 01224 523887

Reception tel 03000 200 292
www.aberdeencity.gov.uk

From: Jennifer Bohill [mailto:jennifer.bohill@fairhurst.co.uk]
Sent: 13 October 2016 17:27
To: Graham Shand
Subject: 106859 North Deeside Road Development

Job No.: 106859

Graham,

Please find attached a request for information with regards to the development of a site located on North Deeside Road.

Kind regards,

Jenny

Jennifer Bohill
Environmental Engineer
Geotechnical & Environmental Services

Fairhurst
Britannia House Ground Floor
Endeavour Drive
Arnhall Business Park,
Westhill, Aberdeenshire
AB32 6UF

Tel No (Direct Dial) 01224 047 336
Email jennifer.bohill@fairhurst.co.uk

Appendix 3

WALKOVER SURVEY RECORD SHEET

Project: Development of North Deeside Road			Job No: 106859
Engineer: Jennifer Bohill	Date: 13/10/2016	Weather: Dry and overcast	
Contact:			
Photographs taken? Yes	Plan attached? Yes		

Observations	Constructive comments must be made against each prompt	Further action required?

1. Site Details

Access	e.g. Roads/paths/Restricted access for plant?/unauthorised The site is divided into two, split by the old railway track which is now utilised as a public footpath. The Northern site can be accessed from North Deeside Road where a track enters the site down a slope in the north east corner (Photo 13). The southern site is divided into three fields with stone walls as divides (Photo 2 and Photo 24). Access to the fields is through gates located on Inchgarth Road (Photo 23). These are situated in close proximity to the dividing walls. The fence surrounding the site is damaged and therefore pedestrians can access the site from the north and south of each plot.	
Boundaries and adjacent land uses	e.g. Fences/hedges/walls? Residential/industrial/undeveloped? The surrounding area is dominated by residential developments. The site is bound to the south by the Inchgarth Road and to the north by North Deeside Road.	
Surface condition and safe walking	e.g. Tarmac/concrete/grass etc; broken/smooth? In general the site is covered with grass and herbage (rosebay willowherb dominant). Areas of shrubs and tree are located across the site (Photo 1, Photo 5, Photo 14, Photo 19 and Photo 27).	

2. Topography

Surface topography	e.g. Elevation/slopes/mounds on site & adjacent? The topography of the site is undulating, however in general the site slopes to the south (Photo 1, Photo 10, Photo 26 and Photo 27). The centre southern field has a dip/bowl in the south western corner of the site (Photo 26 and Photo 28). A smaller dip is located in the south western corner of the western field (Photo 3 and Photo 4).	
Surface slopes and steep faces, details of land reshaping	e.g. Man-made/natural/height/angle? A step in ground level is noted between the centre and western field in the south section of the site (Photo 24). The railway track to the east is noted to be on a bank	

	(above GL) (Photo 6 and Photo 16) and where is enters the old platform to the east is in a cut (Photo 29). The road in the north of the site is above the sites GL with a possible retaining wall (Photo 12).	
Evidence of subsidence	e.g damage to buildings/surface depressions None	
Evidence of landslip, slides or failures.	e.g Abrupt changes in slope profile/tilting trees, posts or walls None	
Evidence of cuttings or toe slope excavations	e.g Locations/gradient None.	
Evidence of imported soil, tipped material or rubbish	e.g Does it have an odour?/is it hot? Few areas of garden debris across the site where this has been dumped from surrounding properties. Few areas of rubbish left across site including beehives in the south east corner, and BBQ waste near Pitfodels Station Road. (Photo 4, Photo 7 and Photo 11).	
Retaining walls	e.g. Height/construction/condition? A potential retaining wall was noted to the north of the site (Photo 12).	

3. Geology

Surface Soils	e.g. Compressible ground/made ground/desiccated clays/pits Made Ground was noted on the bank of the railway track. No other soil exposed (Photo 16).	
Rock Outcrops	e.g. Stream beds/service excavations/cuttings/surface exposures/cliff or slope faces/quarries/pits No rock outcrops.	

4. Surface Water

Surface water features present	e.g Culverts/streams/ponds/springs/issues/drainage ditches/marshes None recorded. Paths located where historical drainage ditches marked.	
Water logged ground	e.g Extent/reason for water logging None. Low in centre field on south potentially waterlogged however thick vegetation restricted access (Photo 28).	
Signs of flooding	e.g River gauges/flood debris/flood protection? None	
Are there any water loving plants?	e.g Reeds/marsh grasses None recorded.	
Signs of contamination	e.g discoloration of water. None evident.	

5. Groundwater

Groundwater conditions	e.g. Any springs/sinks/issues None noted.	
Evidence of shallow water table	e.g. Marshy/boggy ground None - thick vegetation masking majority of site.	

6. Vegetation

Areas and type of vegetation	Thicket of birch noted in north east corner of northern site (Photo 14). Site boundaries surrounded by mature trees (Photo 2, Photo 5, Photo 6, Photo 9 and Photo 20. Area of thick young trees recorded in south eastern field (Photo 19). Grass and rosebay willowherb dominant.	
Evidence of distress	e.g Dead/dying No	
Tree / Hedgerow species and height	Birch, sycamore, pine, etc.	
Evidence of former trees	e.g Tree stumps Trees across the site.	

7. Historic & Current Development

Known history of site	e.g. from historic plans/desk study information/anecdotal evidence? Agricultural, dips in ground still noted in southern site from unknown activity.	
Previous structures	e.g. Size/construction/brick/timber/asbestos/use? None – Railway line crossed the site dividing the site in the north and south.	
Existing buildings/ structures	e.g. Size/construction/brick/timber/asbestos/use? None- railway track dismantled, now a footpath.	
Old foundations	e.g. Size/construction? None	
Building dilapidation and distress	e.g. General condition/cracking? No	
Neighbouring structures under distress	e.g. General condition/cracking? No	
Underground services, manholes, drains, tanks or pits	e.g. Type/size/depth? On railway path cable head stones and cover noted (Photo17)	

8. Additional Information

Visible surface Contamination	e.g. Fly tipping/oil etc Areas of rubbish noted across the site and included garden waste, beehives etc. (Photo 4, Photo 7 and Photo 11).	
Unusual odours, fumes or dust	e.g. Type/source? None noted.	
Spillages/ Accidents	e.g. Type/source? None noted.	
Waste Products	e.g. Type/processes? None.	
Delivery and Storage	e.g. Materials/uses/storage? None.	
Materials and processes currently carried out on site	e.g. Raw materials/products? None.	
Plant or machinery on site	e.g. Type/size/use? None.	
Water supply	e.g. Location? None.	
Confined space or restricted working area	e.g. Height/width? None.	
Overhead cables	e.g. Telephone/electricity-33KV/275KV/height? Overhead cable noted crossing the site from the north west of the northern field to the south east corner of the western field.	

Photo 1: Looking north across

Photo 2: Stone wall dividing western and central fields.

Photo 3: South western corner of site.

Photo 4: South western corner of site.

Photo 5: Dense vegetation in south western field

Photo 6: West along dismantled railway line

Photo 7: Compost pile

Photo 8: Electricity Pilon within central field

Photo 9: Southern section of northern field

Photo 10: north western section of northern field

Photo 11: Plant debris and north western corner of northern field

Photo 12: Potential retaining wall in north west of northern field

Photo 13: Access to northern field

Photo 14: Trees in north east corner of northern field.

Photo 15: Looking south east across northern field

Photo 16: Bank up to railway track

Photo: 17: Electricity cable headstone and cover on railway track

Photo 18: Divide between eastern and central fields, southward.

Photo 19: North eastern corner of eastern field

Photo 20: View across western extent of southern fields

Photo 21: View looking north west across southern fields

Photo 22: View across southern boundary of site

Photo 23: Access to south eastern and central fields.

Photo 24: Step between central and eastern field

Photo 25: Looking north across the central field

Photo 26: Looking north west across slope in central field

Photo 27: View to north in centre of central field

Photo 28: Looking south from top of hill in central field.

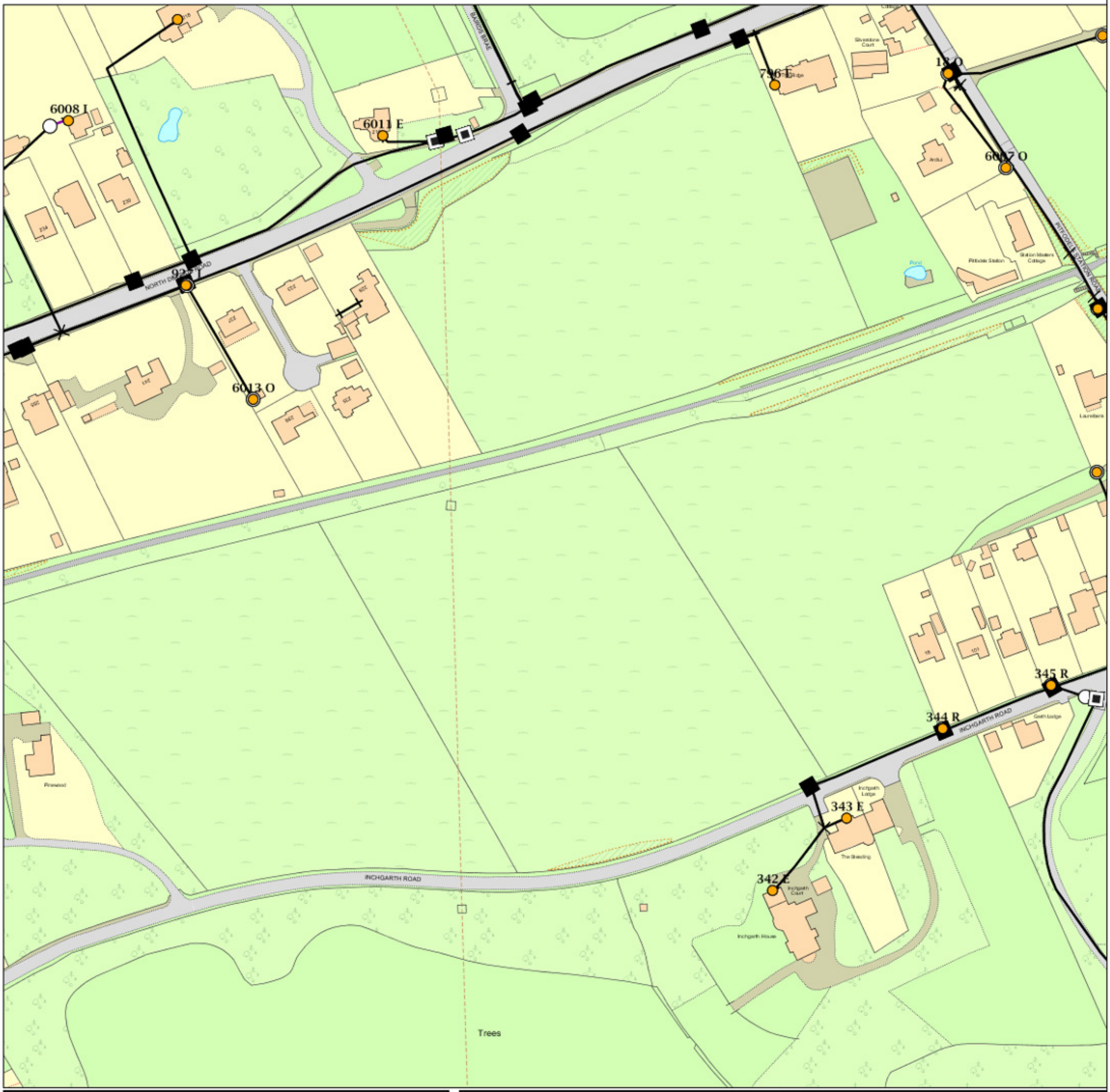
Photo 29: Old Station

Originator: **Jennifer Bohill** **Date:** **21/10/2016**

Checked & Approved: **Date:**

Appendix 4

Maps by email Plant Information Reply



IMPORTANT WARNING

Information regarding the location of BT apparatus is given for your assistance and is intended for general guidance only. No guarantee is given of its accuracy.
It should not be relied upon in the event of excavations or other works being made near to BT apparatus which may exist at various depths and may deviate from the marked route.

openreach

CLICK BEFORE YOU DIG

FOR PROFESSIONAL FREE ON SITE ASSISTANCE PRIOR TO COMMENCEMENT OF EXCAVATION WORKS INCLUDING LOCATE AND MARKING SERVICE

email cbyd@openreach.co.uk

ADVANCE NOTICE REQUIRED
(Office hours: Monday - Friday 08.00 to 17.00)
www.openreach.co.uk/cbyd

KEY TO BT SYMBOLS

DP	Pole
Planned DP	Planned Pole
PCP	Joint Box
Planned PCP	Change Of State
Built	Split Coupling
Planned	Duct Tee
Inferred	Planned Box
Building	Manhole
Kiosk	Planned Manhole
Hatchings	Cabinet
	Planned Cabinet

Other proposed plant is shown using dashed lines.
BT Symbols not listed above maybe disregarded.
Existing BT Plant may not be recorded.
Information valid at time of preparation

openreach
a BT Group business

BT Ref : SXZ03055F
Map Reference : (centre) NJ9044603188
Easting/Northing : (centre) 390446,803
Issued : 13/10/2016 15:05:17

WARNING: IF PLANNED WORKS FALL INSIDE HATCHED AREA IT IS ESSENTIAL BEFORE PROCEEDING THAT YOU CONTACT THE NATIONAL NOTICE HANDLING CENTRE. PLEASE SEND E-MAIL TO: nnhc@openreach.co.uk

Linesearch before U dig

Enquiry Confirmation

LSBUD Ref: 9250310

Date of enquiry: 13/10/2016
Time of enquiry: 14:35

Enquirer

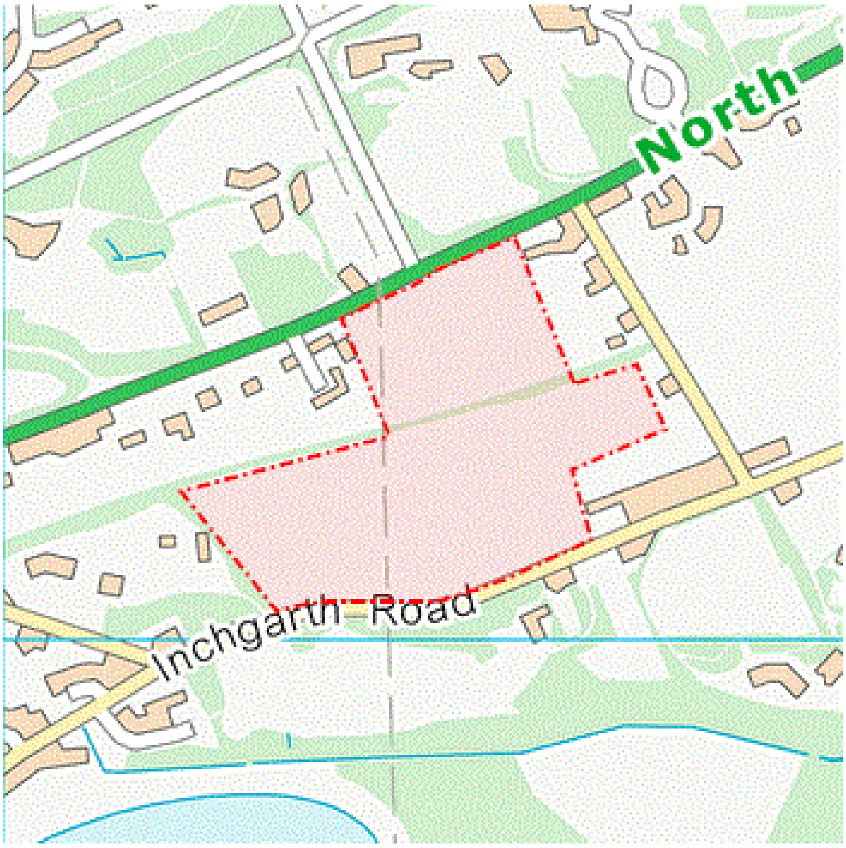
Name	Mr Ross Donaldson	Phone	01224 047338
Company	Fairhurst	Mobile	Not Supplied
		Fax	Not Supplied
Address	Britannia House Ground Floor Arnhall Business Park, Endeavour Drive Westhill Aberdeenshire AB32 6UF		
Email	ross.donaldson@fairhurst.co.uk		
Notes	Please ensure your contact details are correct and up to date on the system in case the LSBUD Members need to contact you.		

Enquiry Details

Scheme/Reference	106859		
Enquiry type	Initial Enquiry	Work category	Excavations Non Utility
Start date	16/10/2016	Work type	Multiple excavations site
End date	31/01/2017	Site size	98208 metres square
Searched location	XY= 390446, 803188 Easting/Northing	Work type buffer*	25 metres
Confirmed location	390537 803245		

* The WORK TYPE BUFFER is a distance added to your search area based on the Work type you have chosen.

Site Map



V3.3.2

Asset Owners

Terms and Conditions. Please note that this enquiry is subject always to our standard terms and conditions available at www.linesearchbeforeudig.co.uk ("Terms of Use") and the disclaimer at the end of this document. Please note that in the event of any conflict or ambiguity between the terms of this Enquiry Confirmation and the Terms of Use, the Terms of Use shall take precedence.

Validity and search criteria. The results of this enquiry are based on the confirmed information you entered and are valid only as at the date of the enquiry. It is your responsibility to ensure that the Enquiry Details are correct, and LinesearchbeforeUdig accepts no responsibility for any errors or omissions in the Enquiry Details or any consequences thereof. LSBUD Members update their asset information on a regular basis so you are advised to consider this when undertaking any works. It is your responsibility to choose the period of time after which you need to resubmit any enquiry but the maximum time (after which your enquiry will no longer be dealt with by the LSBUD Helpdesk and LSBUD Members) is 28 days. If any details of the enquiry change, particularly including, but not limited to, the location of the work, then a further enquiry must be made.

Asset Owners & Responses. Please note the enquiry results include the following:

1. "LSBUD Members" who are asset owners who have registered their assets on the LSBUD service.
2. "Non LSBUD Members" are asset owners who have not registered their assets on the LSBUD service but LSBUD is aware of their existence. Please note that there could be other asset owners within your search area.

Below are three lists of asset owners:

1. LSBUD Members who have assets registered within your search area. (“Affected”)
   a. These LSBUD Members will either:
      i. Ask for further information (“Email Additional Info” noted in status). The additional information includes: Site contact name and number, Location plan, Detailed plan (minimum scale 1:2500), Cross sectional drawings (if available), Work Specification.

      ii. Respond directly to you (“Await Response”). In this response they may either send plans directly to you or ask for further information before being able to do so, particularly if any payments or authorisations are required.

2. LSBUD Members who do not have assets registered within your search area. (“Not Affected”)

3. Non LSBUD Members who may have assets within your search area. Please note that this list is not exhaustive and all details are provided as a guide only. It is your responsibility to identify and consult with all asset owners before proceeding.

National Grid. Please note that the LSBUD service only contains information on National Grid's Gas above 7 bar asset, all National Grid Electricity Transmission assets and National Grid's Gas Distribution Limited above 2 bar asset.

For National Grid Gas Distribution Ltd below 2 bar asset information please go to www.beforeyoudig.nationalgrid.com

LSBUD Members who have assets registered on the LSBUD service within the vicinity of your search area.

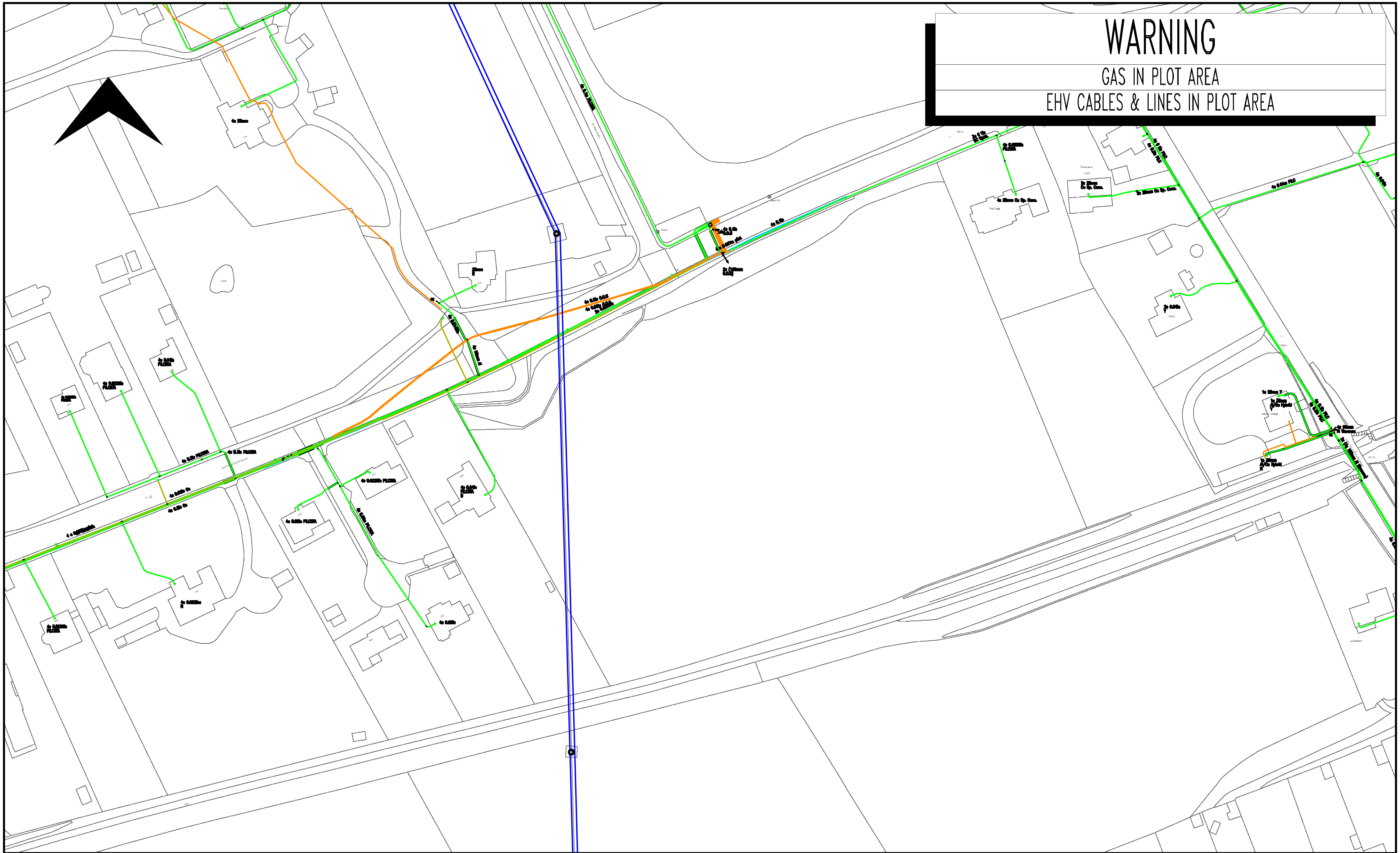
List of affected LSBUD members
No LinesearchbeforeUdig Asset Owners within the Zone of Interest

LSBUD members who do not have assets registered on the LSBUD service within the vicinity of your search area. Please be aware that LSBUD members make regular changes to their assets.

List of not affected LSBUD members		
AWE Pipeline	ESSAR	Perenco UK Limited (Purbeck Southampton Pipeline)
BOC Limited (A Member of the Linde Group)	Esso Petroleum Company Limited	Petroineos
BP Midstream Pipelines	FibreSpeed Limited	Phillips 66
BPA	Fulcrum Pipelines Limited	Premier Transmission Ltd (SNIP)
Carrington Gas Pipeline	Gamma	Redundant Pipelines - LPDA
CATS Pipeline c/o Wood Group PSN	Humbly Grove Energy	RWEnpower (Little Barford and South Haven)
Cemex	IGas Energy	SABIC UK Petrochemicals
Centrica Energy	Ineos Enterprises Limited	Scottish Power Generation
Centrica Storage Ltd	INEOS Manufacturing (Scotland and TSEP)	Seabank Power Ltd
CLH Pipeline System Ltd	Lark Energy	Shell (St Fergus to Mossmorran)
Concept Solutions People Ltd	Lightsource SPV Limited	Shell Pipelines
ConocoPhillips (UK) Ltd	Mainline Pipelines Limited	Total (Finaline, Colnbrook & Colwick Pipelines)
Coryton Energy Co Ltd (Gas Pipeline)	Manchester Jetline Limited	Transmission Capital
Dong Energy (UK) Ltd	Manx Cable Company	Uniper UK Ltd
E.ON UK CHP Limited	Marchwood Power Ltd (Gas Pipeline)	Vattenfall
EirGrid	National Grid Gas (Above 7 bar), National Grid Gas Distribution Limited (Above 2 bar) and National Grid Electricity Transmission	Western Power Distribution
Electricity North West Limited	Northumbrian Water Group	Wingas Storage UK Ltd
ENI & Himor c/o Penspen Ltd	NPower CHP Pipelines	Zayo Group UK Ltd c/o JSM Group Ltd
ESP Utilities Group	Oikos Storage Limited	

The following non-LSBUD members may have assets in your search area. It is YOUR RESPONSIBILITY to contact them before proceeding. Please be aware this list is not exhaustive and it is your responsibility to identify and contact all asset owners within your search area.

Non-LSBUD members (Asset owners not registered on LSBUD)			
Asset Owner	**Preferred contact method**	**Phone**	**Status**
BT	https://www.swns.bt.com/pls/mbe/welcome.home	08009173993	Not Notified
CityFibre	asset.team@cityfibre.com	033 3150 7282	Not Notified
Colt	plantenquiries@catelecomuk.com	01227768427	Not Notified
Energetics Electricity	plantenquiries@energetics-uk.com	01698404646	Not Notified
ENGIE	nrswa@cofely-gdfsuez.com	01293 549944	Not Notified
GTC	https://pe.gtc-uk.co.uk/PlantEnqMembership	01359240363	Not Notified
Hibernia Networks	info@hibernianetworks.com	01704 322 300	Not Notified
Instalcom	plantenquiries@instalcom.co.uk	02087314613	Not Notified
Interoute	interoute.enquiries@plancast.co.uk	02070259000	Not Notified
Mobile Broadband Network Limited	mbnl.plant.enquires@turntown.com	01212 621 100	Not Notified
Redcentric plc	plant-enquiries@redcentricplc.com	0845 200 2200	Not Notified
Scotia Gas Networks	plantlocation@scotiagasnetworks.co.uk	01414184093	Not Notified
Scottish and Southern Energy	mapping.services@sse.com	01256337294	Not Notified
Scottish Water	searches@scottishwater.co.uk	01382563666	Not Notified
Sky UK Limited	nrswa@sky.uk	02070323234	Not Notified
Utility assets Ltd	assetrecords@utilityassets.co.uk		Not Notified
Verizon Business	osp-team@uk.verizonbusiness.com	01293611736	Not Notified
Virgin Media	http://www.digdat.co.uk	08708883116	Not Notified
Vodafone	osm.enquiries@atkinsglobal.com	01454662881	Not Notified
Vtesse Networks	https://vtplant.vtesse.com	01992532100	Not Notified



NORMAL DEPTH TO THE TOP OF THE CABLE WHEN LAID.

	services	l.v.	h.v.	e.h.v.
FOOTPATH	0.40m	0.45m	0.60m	0.75m
ROAD CROSSING	0.60m	0.60m	0.75m	0.90m

l.v./services – up to 1000V.
h.v. – over 1000V to 11,000V.
e.h.v. – 22,000V to 132,000V,

WARNING

There may have been subsequent alterations to the surface levels. Trial holes must be taken to determine positions and depth of cables. HS (G) 47 Booklet from the Health and Safety Executive – Avoiding Danger from Buried Cables – should be consulted before commencing excavation work. (available from HMSO)

WHEN WORKING IN THE VICINITY OF OVERHEAD LINES THE HEALTH AND SAFETY GUIDANCE NOTE GS6 SHOULD BE CONSULTED. (AVAILABLE FROM HMSO)

Scottish and Southern Energy plc.
Registered in Scotland No. 117119.
Registered Office: Inveralmond House
200 Dunkeld Road,
Perth, PH1 3AQ.

North Deeside and Inchgarth Road

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Subject to revision without notice.

Scottish and Southern Energy

NORTH EAST DISTRICT
Tel: 01224 667200

Grid Ref: NJ90440332
Scale: 1:1250
Date: 13/10/2016
All Voltages

WARNING

GAS IN PLOT AREA

EHV CABLES & LINES IN PLOT AREA

NORMAL DEPTH TO THE TOP OF THE PIPE WHEN LAID.

MAINS		SERVICES	
FOOTPATH	0.60m	PRIVATE	0.375m
VERGE	0.75m	PUBLIC	0.45m
ROAD CROSSING	0.75m		

WARNING

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Scottish and Southern Energy

NORTH EAST DISTRICT
Tel: 01224 667200

Grid Ref: NJ90440332
Scale: 1:1250
Date: 13/10/2016
GAS

Watch it!

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Scottish Hydro Electric Power Distribution Ltd

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The Electricity at Work Regulations 1989 impose health and safety requirements upon employers, employees and self-employed persons with respect to electricity at work. The regulations impose restrictions on persons being engaged in work activities on or near live conductors.

Regulation 14 requires that: "No person shall be engaged in any work activity on or near any live conductor (other than one suitably covered with insulating material so as to prevent danger) that danger may arise unless:

- it is **unreasonable** in all circumstances for it to be dead; and
- it is **reasonable** in all circumstances for him to be at work on or near it while it is live; and
- suitable precautions (including where necessary the provision of suitable protective equipment) are taken to prevent injury."

The purpose of the regulations is to require precautions to be taken against the risk of death or personal injury from electricity in work activities.

Publications

The Health and Safety Executive have produced a document entitled 'Avoiding Danger from Underground Services', and the Appendix 1 deals specifically with electric cables. Copies are available from HMSO's Accredited Agents and good booksellers, Ref. HS (G) 47.

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Note

In situations of emergency or danger, or where the advice contained in these notes cannot be followed, you must consult Scottish and Southern Energy plc immediately. Tel. 08457 708090 for southern England or 0800 300999 for Scotland.

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It is not intended that the issue of these plans will absolve either party from their obligation under any of the acts that control digging in the public highways.

Supplies To Properties, etc.

The location of cables supplying individual properties, street lighting, traffic signs, telephone kiosks etc. are not always shown on the plans. You should assume that each property, streetlight etc. will have its own supply cable.

Major Circuits

Where our plans indicate the presence of cables with a voltage exceeding 11,000 volts, you are advised to contact our local depot (telephone number is on the plans), before commencing any excavations within the vicinity of these cables. These major transmission circuits form an extremely important link in Scottish and Southern Energy's network, and damaging or modifying these circuits is a major and costly undertaking. Any development should therefore be designed to allow these circuits to remain undisturbed and accessible in their present location.

For your own and your workmates' safety, please follow the **do's** and **don'ts** listed below:

- ✓ **do** make sure you have plans of the underground cables in the area **before** any excavation work starts. Remember that some cables may not be shown on plans. If carrying out emergency work, excavate as though there are buried live cables in the vicinity.
- ✓ **do** use a cable locator to determine the position of existing cables in the work area. The positions should be marked and tests made as work proceeds. **If in doubt, get advice from your supervisor.**
- ✓ **do** ask for a cable to be made dead if it is buried in concrete.
- ✓ **do** watch for signs of cables as work progresses. Note any marker-tape or cable-cover, which may be exposed.

- ✓ **do** backfill carefully, using stone-free soil around the cables, replacing marker-tapes and / or covers.
- ✓ **do** notify us immediately if you accidentally damage our cables. Arrange to keep people well clear of a cable that has been damaged until we have confirmed it has been made safe.
- ✓ **do** make sure before starting to demolish a building that all cables have been disconnected. We welcome prior notice of the intention to demolish buildings. This enables us to ensure that the site has been made safe electrically.
- ✓ **don't** operate a bulldozer, scraper, dragline or excavator; unless you are satisfied that there are no buried cables in the working area.
- ✓ **don't** use picks, pins, forks or pointed instruments in soft clay or soil when cables are present. Exercise extreme caution where such instruments are used to free lumps of stone, or break up firmly compacted ground. **Never** throw a fork or sharp instrument into the ground.
- ✓ **don't** dig trial holes over the indicated route of the cable. Excavate alongside instead.
- ✓ **don't** use exposed cables as a convenient step or handhold.
- ✓ **don't** handle or attempt to alter the position of any cable.

Remember that a damaged cable may cause extensive loss of supplies, make expensive repairs necessary and cause serious or even fatal injury.

If effective measures are not adopted to protect our equipment, we will take steps to recover the cost of any damage caused. Persons causing damage resulting in loss of supply to customers can be held legally responsible for any claims made by those customers. Promptness in reporting an incident will minimise costs.

In most cases it is not practicable to make cables dead without interrupting supplies to our customers. But given adequate notice, we will wherever possible, give advice regarding special precautions which may be necessary on any site where particular problems are likely to be encountered. The right is reserved to make a charge for this service.

Electricity cables can exist anywhere - under paths or roads, in gardens or driveways, on new housing or industrial development sites or even farmland.

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- ✓ **do** co-operate with us during planning and sitework stages.
- ✓ **do** follow the advice given in HSE Guidance Note GS 6 when siting barriers, goal posts, bunting etc.
- ✓ **do** keep overhead lines in view when moving scaffolding or machinery and take special care when felling or lopping trees.
- ✓ **do** remember that the raising or slewing of a crane or excavator jib may cause danger when operating near an overhead line.
- ✓ **do** avoid any machinery that is in contact with an overhead line until we confirm that conditions are safe.
- ✓ **do** warn others to keep well clear.
- ✓ **don't** drive a high vehicle below an overhead line when an alternative route is available.
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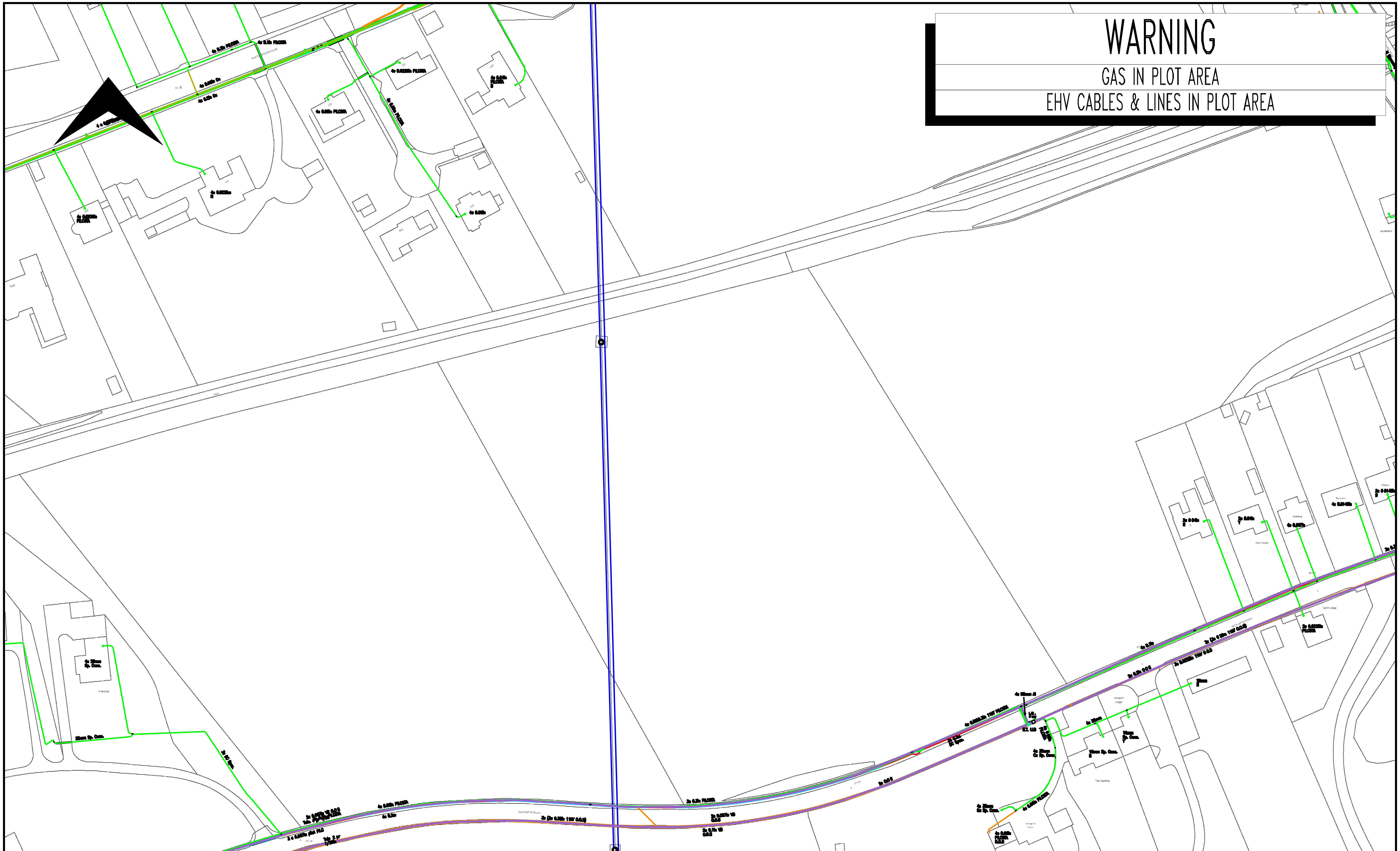

WARNING

GAS IN PLOT AREA

EHV CABLES & LINES IN PLOT AREA

NORMAL DEPTH TO THE TOP OF THE CABLE WHEN LAID.				
	services	l.v.	h.v.	e.h.v.
FOOTPATH	0.40m	0.45m	0.60m	0.75m
ROAD CROSSING	0.60m	0.60m	0.75m	0.90m

l.v./services – up to 1000V.
h.v. – over 1000V to 11,000V.
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Tel: 01224 667200

Grid Ref: NJ90430317
Scale: 1:1250
Date: 13/10/2016
All Voltages

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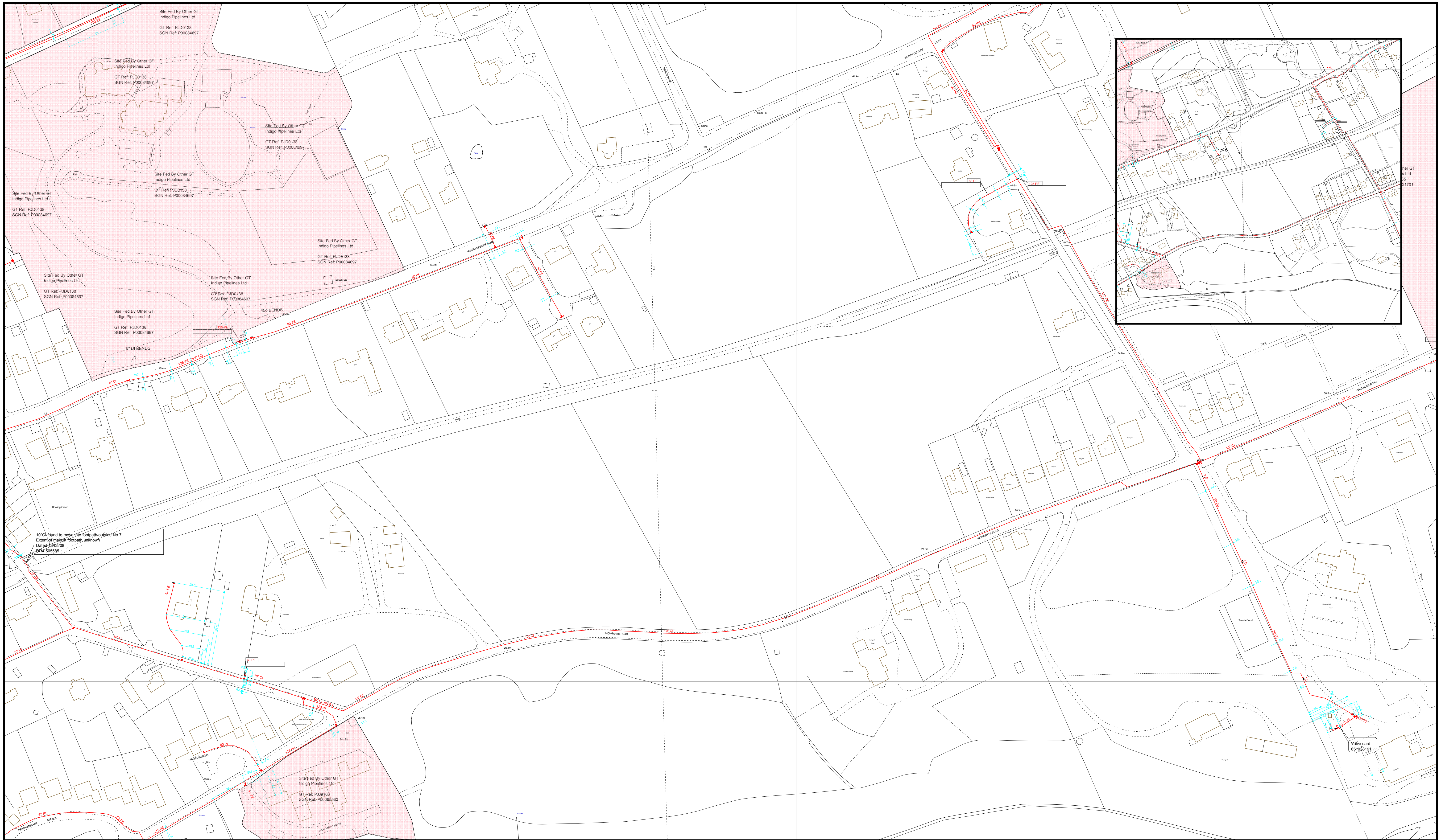


USER ID: rdonaldson
DATE: 13 Oct 2016
EXTRACT DATE: 07 Jul 2016
MAP REF: NJ9003SW
CENTRE: 390446, 803188
SCALE: 1:2,553

LP Mains
MP Mains
IP Mains
LHP Mains
NHP Mains

Valve | Depth of Cover | Syphon | Diameter Change | Material Change

This plan shows those pipes owned by Scotia Gas Networks plc in their role as a Licensed Gas Transporter (GT). Gas pipes owned by other GTs, or otherwise privately owned, may be present in this area. Information with regard to such pipes should be obtained from the relevant owners. The information shown on this plan is given without warranty, the accuracy thereof cannot be guaranteed. Service pipes, valves, syphons, stub connections, etc. are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Scotia Gas Networks plc or their agents, servants or contractors for any error or omission. Safe digging practices, in accordance with HS(G)47, must be used to verify and establish the actual position of mains, pipes, services and other apparatus on site before any mechanical plant is used. It is your responsibility to ensure that this information is provided to all persons (either direct labour or contractors) working for you on or near gas apparatus. The information included on this plan should not be referred to beyond a period of 28 days from the date of issue.

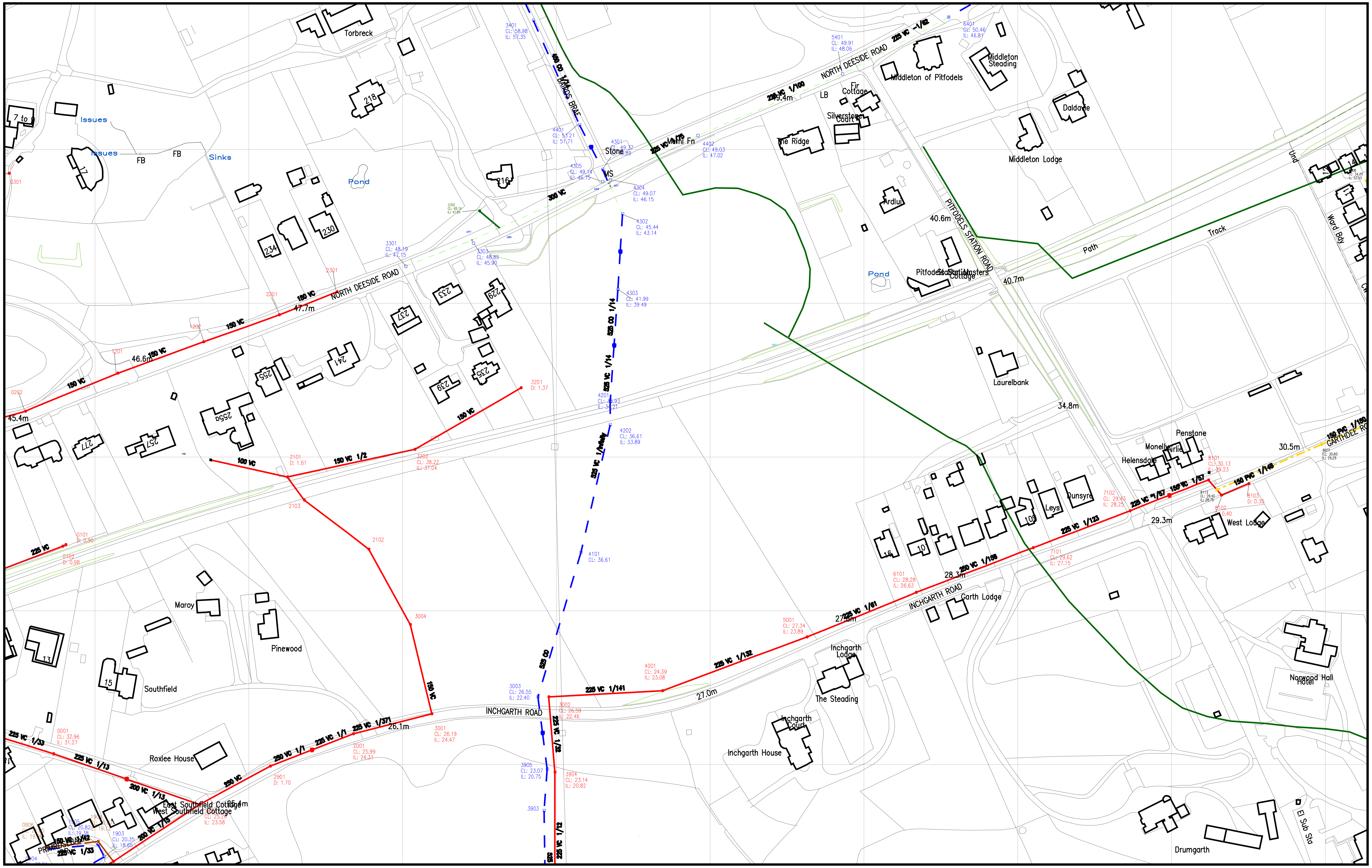
Product: UtilityMaps
Version: 1.6.8.1
Template: 'Scotia Gas Networks (A3 Landscape)'

N

Scotia Gas Networks
Delivering gas safely, reliably and efficiently

Scottish and Southern Energy plc
Key

	UNDERGROUND	OVERHEAD	
LOW VOLTAGE	Street Lighting Cable	LV Line	Feeder Pillar
	Service Cable		Supply Point
	Main Cable		Link Box
	D.C. Cable		Duct
	Out of Service Cable		
	Joint Position		
HIGH VOLTAGE	6.6kV Cable	11kV Line	
	11kV Cable	22 kV Line	
	22kV Cable	33kV Line	
	33kV Cable	132kV Line	
	132kV Cable	275kV Line	
	275kV Cable	Double Circuit	
	Joint Position	Pole Mounted Transformer	
		Air Break	
		Sectionaliser	
		Pole Box	
	Pilot Cable		
	Fibre Optic Cable		



N	The representation of physical assets and the boundaries of areas in which Scottish Water and others have an interest does not necessarily imply their true positions. For further details contact the appropriate District Office.	OP/JQVNF065 Wastewater Plan 0 — 236 metres	(c) Crown copyright and database rights 2016 Ordnance Survey 100023460. You are permitted to use this data solely to enable you to respond to, or interact with, the organisation that provided you with the data. You are not permitted to copy, sub-licence, distribute or sell any of this data to third parties in any form	Scottish Water Always serving Scotland Castle House, 6 Castle Drive, Dunfermline, KY11 8GG Tel No: 0845 601 8855
	Date Plotted: 19/10/2016	Scale: 1:2500	Plotted By: intocli01	

SMALLWORLD GIS – WASTEWATER LEGEND

Pipework

- Combined (red)
- Foul (brown)
- Surface Water (blue)
- Natural Water (light blue)
- CSO (dark blue)
- Trade Effluent (brown)
- Treated Effluent (black)
- Abandoned (grey)
- Water Course (dark green)
- PFI sewer (bright green)
- Rising Main (red)
- Proposed sewers (foul, combined and surface water)

Syphon

Chamber (same colour as pipework)

Dual Chamber (same colour as pipework)

Surface Water Chamber

Collapse/Choke (not visible by default)

Combined Storm Overflow

Connection (not visible)

Duct

Ghost Node (not visible by default)

HB Hatchbox

H Hydraulic Control Chamber

Lamphole

Change of Attributes

Outfall

Inlet

Pumping Station

Wash Out

BI Bifurcation Chamber

Balancing Pond

Rodding Eye

Septic Tank

Sewer Junction

Sewer Structure

Sewerage Air Valve

Sewerage Pipe Bridge

Sluice Valve

Storm Tank

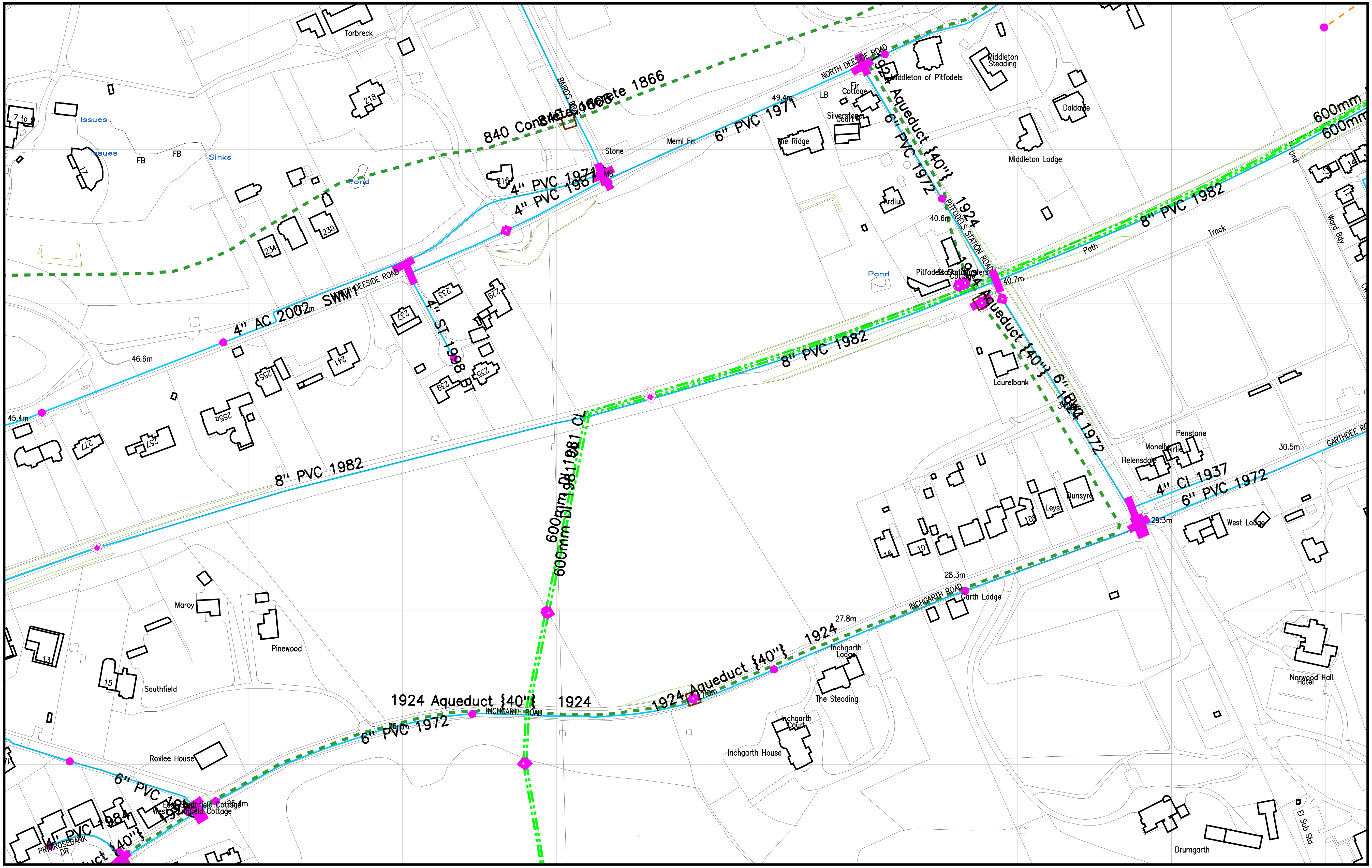
? Unknown End

WWTW Treatment Plant

Vent Column

Buchan Trap

Capped End (same colour as pipework)



The representation of physical assets and the boundaries of areas in which Scottish Water and others have an interest does not necessarily imply their true positions. For further details contact the appropriate District Office.

Date Plotted: 19/10/2016

OP/JQVNF065

Water Plan

0 236 metres

Scale: 1:2500

Plotted By: intocli01

Scottish Water
Always serving Scotland

Castle House, 6 Castle Drive, Dunfermline, KY11 8GG
Tel No: 0845 601 8855

SMALL WORLD GIS WATER LEGEND

Trunk Main (in use)
Distribution Main
Raw Water Main
Mains (abandoned)
Mains (proposed)
Mains (isolated)
Communication Pipe
Supply Pipe
Tunnel
Open Course
Aqueduct
Logical Service Link
Duct
Air Valve Double
Air Valve Single
Anode
Hydrant : Terminal
Hydrant : Fire
Dialysis Patient

Tapping
Field trough
Other fitting
Orifice Plate
Meter Point
Cleansing Cock
Coupling
Flow Restrictor
Taper
Change Collar
End Cap
Stopcock
Sample Point
Service Point
Hatchbox
Chemical Dosing Point
Break Pressure Tank

Bulk Meter
Revenue Meter
Meter Cable
Meter Display Unit
Pumping Station
Booster Station
Pump Symbol
River Intake
Spring Intake
Borehole Intake
Other Company Intake
Clear Water Tank
Service Reservoir
Impounding Reservoir
Pumped Storage Reservoir
Storage Tank
Storage - Other
Balancing Tank - Current

Water Treatment Works
Pressure Reducing Valve
Pressure Sustaining Valve
Reflux (Non-Return) Valve
Washout (Scour) Valve
Control Valve
Pressure Relief Valve
Altitude Valve
Level Control Valve
Valve - Other
BC WSZ Valve
BC DMA Valve
BC WOA Valve
BC PRA Valve
BC PCC Valve
BC PSA Valve
Pipebridge

Appendix 5

FIND
PROFESSIONAL MAPPING INTELLIGENCE

Scale	1:5,000
Date	04/03/13

Ordnance Survey

Appendix 6

Principles of Environmental Risk Assessment

The Environmental Protection Act (1990), Part II A Contaminated Land (Section 57 of the Environment Act 1995), revised by Scottish Statutory Instrument No.658 (2005), and the Contaminated Land Regulations (1999) provide a basis on which to determine the risks and liabilities presented by a contaminated site. Contaminated Land is defined within Annex 3, Chapter A Part 1- Scope of Chapter and in all those Sections mentioned as:

"Any land which appears to the local authority in whose area it is situated to be in such a condition, by reason of substances in, on or under the land that:

(a) Significant harm is being caused or there is significant possibility of such harm being caused; or

(b) Significant pollution of the water environment is being caused or there is a significant possibility of such pollution being caused."

Section 57 of the Environment Act 1995 requires that any site identified as being "contaminated" by the Local Authority will be registered by them and remediation will be required to render the site fit for use.

The presence of contamination is not the sole factor for deciding whether a site is contaminated. Relevant parties should identify site-specific risks and provide objective, cost-effective methods to manage the contamination in a manner that satisfies the proposed end-use.

A risk-based approach, which takes both technical and non-technical aspects into consideration when making decisions on contamination resulting from past, present or future human activities, is advocated. The assessment of environmental risks generally relies on the identification of three principal elements forming a 'pollutant linkage':

SOURCE: the contaminant

PATHWAY: the route through which the contaminant can migrate, and

RECEPTOR: any human, animal, plant, water environment or property that may be adversely affected (harmed) by the contaminant

In the absence of any one of these elements, on any given site, there is no risk. Where all three elements are present, risk assessment is required to determine the significance of the harm that is being or may be caused. As outlined above, the terms of the Contaminated Land regime specify that remediation need only be implemented where a site is causing, or there is a significant possibility that it will cause, significant harm, or significant pollution to the water environment.

Development of contaminated land is usually addressed through the application of planning and development legislation and guidance (i.e. Planning Advice Note 33). The suitable for use approach is seen as the most appropriate to deal with contaminated land, taking account of environmental, social and economic objectives. The assessment is made in the context of the proposed land use (i.e. residential, retail, open-space and tourist developments).

Street Engineering Review and Quality Audit

The Inchgarth Retirement Community – Aberdeen

May 2018

Issue 2

FAIRHURST

FAIRHURST

CONTROL SHEET

CLIENT: Cults Property Development Company Ltd.

PROJECT TITLE: The Inchgarth Retirement Community – Aberdeen.

REPORT TITLE: Street Engineering Review and Quality Audit

PROJECT REFERENCE: 106859

Issue and Approval Schedule:

ISSUE 1 **Final**	Name	Signature	Date
Prepared by	R Wildi	[redacted]	11/17
Reviewed by	M Peters		11/17
Approved by	I Ross		11/17
Issue details	Final		

Revision Record:

Issue	Date	Status	Description	By	Chk	App
2	7/05/18	FINAL	Minor changes	RALW	MP	IR
3						
4						
5						
6						
7						
8						

This report has been prepared in accordance with procedure OP/P03 of Fairhurst's Quality Assurance System.

Contents

Street Engineering Review

Summary of Proposed Development

This document has been compiled in support of the planning submission by Cults Development Company Ltd. for the development of a greenfield site within Cults, Aberdeen. The development is to consist of a mix of semi-detached houses, apartment houses, semi-detached/terraced apartments, amenity housing, care home and retail units.

The internal roads design adopts the principles of the Scottish Government's policy document "Designing Streets" but in a more conventional type layout with the majority of the roads having footways on both sides of the road. Soft landscaping is used to visually soften the development and encourage bio-diversity.

Access to the development is provided via a new road link from Inchgarth Road to the south to the North Deeside Road to the north. This road has been incorporated into the design to provide a more suitable route for the Inchgarth Road/North Deeside Road crossover than the existing routes to the west and the east.

This document sets out the design considerations given with regards to the vehicular access to and from the site, including pedestrian accessibility, street design, parking provision, surface materials and buried services.

Street Design & Considerations

The site is located on agricultural/undeveloped land to the east of the existing settlement of Cults to the north of the Inchgarth Reservoir.

Access to this development will be from two locations, one, to the north, directly off the A93 North Deeside Road opposite Bairds Brae, and the second, to the south, will be from a new roundabout constructed on Inchgarth Road.

The link road will have a speed limit of 30mph. The introduction of the roundabout on Inchgarth Road would also facilitate to the reduction in speed limit from 40mph to 30mph along this portion of the road.

Due to its major function of providing a link between the North Deeside Road and Inchgarth Road, it is necessary for the access link road to retain a formal traffic movement dominant configuration. This requires the road to be designed to Design Manual for Roads and Bridges (DMRB). The road width will be a minimum of 7.3m wide (widened locally at bends as necessary). It is not possible to reduce speeds to 20mph as the DMRB precludes the use of incorporating tight bends as speed reducing features.

The north junction for the link access road will be via a new ghost island junction. The link road then proceeds downhill in two sweeping bends down to Inchgarth road where it connects with a new roundabout.

The site topography and the presence of the Deeside Way significantly affect the way the site can be developed. The Deeside Way splits the site into two, and its height, whilst maintaining the route, along with the associated relative levels of the North Deeside Road and Inchgarth Road controls the gradient of the link road to its north and south.

The housing development areas to the east of the link road are then served by two housing roads constructed to the Designing Streets philosophy, one to the north of the Deeside Way and one to the south.

To reduce speed to the 12 – 15 mph required, it would be normal to use curves within the horizontal alignment and limit lengths of any straight sections of carriageway and thereby reduce forward visibility. However, due to the size and shape of the developable areas this does not allow for straight lengths of alignment to be limited to the preferred 60-80m. To mitigate this parking and junctions have been used to demonstrate to the driver that this is very much a residential area.

Due to the configuration of the internal roads and the natural traffic calming effect, forward visibility requirements are reduced such that they are mainly incorporated within the proposed carriageway extents, with some crossing open space areas. Where visibility splays are out with the carriageway they will be formed in either a soft or hard landscaping or low maintenance treatment, to be agreed with Aberdeen City Roads.

In considering the safety aspects of the scheme, and how this would impact on our design, the features within the design (as noted above) have resulted in a configuration that provides both a very satisfactory layout in traffic management terms, but also provides a very safe environment for pedestrians. In support of the roads design and to confirm the safety aspects of our design, a Stage 1 & 2 Road Safety Audit will be undertaken by an independent Traffic Consultant.

Parking Provision

The development comprises of a mix of 95 semi-detached, terraced and apartment block house types which are designed to incorporate the numbers of parking spaces appropriate for each house size, this being;

- 1 or 2 bed apartments 1.5no. spaces.
- 1 bed semi-detached/terraced 1.5no. spaces.
- 2 or 3 bed semi-detached/terraced 2no. spaces.

Due to the status of the link road being a through route, being more traffic movement dominated, on-road parking will be prevented by the provision of parking restrictions. This will allow a free flow of traffic between the North Deeside Road and Inchgarth Road.

The layout is of a more conventional type and as such with regards to accessibility and manoeuverability of vehicles within the development, we do not anticipate any issues with the vehicles likely to enter/egress this development.

Material Specification

As part of the approach to the “Designing Streets” requirements, it is proposed to use a variety of road finishes and colours. Any Asphalt surfacing will be dark grey/black in accordance with the Council’s standard requirements with the block paving similarly restricted to the limited colours preferred by the Council. This will avoid any issues relating to the future maintenance of these areas once they are adopted by the Council.

The table below sets out the hierarchy of the roads proposed and highlights the specification, function and maintenance issues associated with each of these:

Road Type	Specification	Materials	Speed
Main Link Road	Significant road forming the main access to and from the development. No house frontage access. 7.3m minimum wide road with a 3.0m wide cycleway on one side and also a 2.0m wide footway on the other.	Asphalt road and Dense Macadam footways and cycleways. Landscape treatment to embankments to create enclosed, route clearly separate from the residential areas.	30MPH
Residential Streets	Housing roads intended purely for access to residential and retail properties. Parking along frontage and accesses to internal parking areas. 5.5m wide roads and 2.0m wide footways on both sides of the road.	Asphalt road with Dense Macadam footway. Landscape treatment to garden boundaries to create enclosures, amenity and improve safety.	12–15 MPH

Services & Street Lighting

Services

All mains services will be accommodated below the footways and service strips. This includes the street lighting cabling, with the street lighting units themselves being located either within the adjacent footways and/or in recessed rectangular hard surfaced areas within public open space areas and/or plot curtilages adjacent to the carriageway. These areas will be adopted and not conveyed to properties. Services will be installed in accordance with current standards and individual service provider requirements with regards to depth of cover and access chambers when located in either footways or service strips.

Street Lighting

The types of street lighting units are in accordance with the Council's standards for their future ease of maintenance.

Preliminary Selection of Lighting Classes

Distributor Road

From Table A.5: Lighting classes for subsidiary roads with a typical speed of main user v <= 30mph, with an environmental zone E3 and a traffic flow of normal gives us a lighting class P3.

Development Roads

From Table A.6: Lighting classes for subsidiary roads with mainly slow-moving vehicles, cyclists and pedestrians, with an environmental zone E3 and a traffic flow of normal gives us lighting class P5. However, Aberdeen City Council does not accept P5 therefore P4 will be used.

Risk Assessment

The risk assessment deals with potential hazards to the general public. Particular attention will be given to hazards affecting younger children. It also considers special hazards which may arise during construction or subsequent maintenance of facilities under Construction (Design and Management) Regulations 2015. In general, other than the items identified below, the road layout presents no unusual hazards under the CDM regulations that a competent designer could not reasonably foresee with a development of this type.

Roads Risk Assessment

Parameter	Hazard	Likelihood	Severity
Traffic composition	Localised mixed use housing road with cars, pedestrians, and cyclists.	Low	Medium
Complexity of task	There may be some parked vehicles and there are short sections of traffic calming features. These are on tight bends and traffic will be moving very slowly.	Low	Medium
Risk of crime	Theft from properties and vehicles.	Low	Medium

*No high severity therefore no amendment to the lighting class will be required.

General

During the design of the street lighting, to allow for such items as CDM, risk assessments, light pollution/nuisance etc., we have so far as is practically reasonable taken account and catered for the following:

- Overhead power lines and other obstructions.
- Trees and potential growth and accounting for summer foliage.
- Minimise obtrusive light.
- Locating street lighting on property boundaries and away from windows.
- Avoiding locations where lighting columns could be struck by vehicles.

In accordance with the Council's current requirements, design & electrical calculations will be included as part of the overall street lighting design.

Site Levels & Accessibility

The site is divided into two parts by the new link road, west and east. The west side is left predominately unchanged as a corridor for wildlife. Because of the existing gradient of the northern part of the site at approx. 1 in 11.2, for accessibility, a meandering path with an average gradient of 1 in 20 will be constructed between the North Deeside Road and the Deeside Way. The southern portion of the west side, having an approx. gradient of 1 in 11.6 will have more natural informal paths meandering through it, at the existing grade.

The east side of the development, where the housing and retail elements are to be constructed again have existing gradients of approx. 1 in 11.5. These areas will generally have roads and footpaths with gradients of approx. 1 in 20 and provide a route from the Deeside Way to Inchgarth Road. As such, a route of average gradient, 1 in 20, will be provided from the North Deeside Road to Inchgarth Road.

As such significant earthworks will be carried out to provide accessible gradients for roads, footways and driveways. All entrances to the houses will be barrier free level access from the street and parking areas. Thresholds and paving junctions are detailed to meet the Building Standards and Roads Construction Consent requirements.

Public Open Space & Density

A detailed landscape design has been prepared for the site which sets out treatment of open space, garden frontages, street planting and structure planting areas. The landscape design has been prepared in conjunction with development of the housing and roads layouts to ensure proper integration of the design.

Drainage & SUDS

Foul Water Drainage

All houses will be connected to the mains foul sewer network that will subsequently be maintained by Scottish Water.

Surface Water Drainage

In carrying out the detailed design for the surface water sewers, overland flow paths will need to be identified via modelling to ensure that accesses in particular, do not provide a path for storm surface water to properties. Capacity of road gullies are a limiting factor for drainage design that makes clear overland flow planning essential.

Using the simple index approach referred to in the SUDS manual (CIRIA Report C753), mixed use developments show a medium level of pollution hazard. Therefore the surface water run-off has to be dealt with accordingly.

The simple index approach states that SUDS should be provided to ensure that a total pollution mitigation index equals or exceeds the pollution hazard index.

Referring to Table 1 (Appendix A), this development is shown to have pollution hazard indices (worst case scenario) of**:**

- TSS: 0.7
- Metals: 0.6
- Hydrocarbons: 0.7

In order to provide the necessary mitigation, Table 2 (Appendix A) should be referred to. Based on the land use and by looking at the mitigation indices it is proposed that 2 levels of treatment should be provided in the form of ‘at source’ road side filter trenches with an end-of-line extended detention basin. This gives overall mitigation indices of:

- TSS: 0.5 + (0.5 x 0.5) = 0.75
- Metals: 0.6 + (0.5 x 0.5) = 0.85
- Hydrocarbons: 0.6 + (0.5 x 0.6) = 0.9

Overall, it can be seen that the mitigation indices provided by the combination of an 'at source' road side filter trenches with an end-of-line extended detention basin outweigh the pollution hazard indices of the development site. Therefore, the SUDS measures are deemed adequate provision for each catchment area of the development.

Conveyance - New surface water sewers will be provided to service the development and will be located within the new roads and areas of open ground where necessary. Sewers will be designed and installed in accordance with "Sewers for Scotland, Third Edition, April 2015", published by Scottish Water & WRc plc.

Run-off from the internal proposed roads will be drained direct to the new surface water sewers via traditional trapped gullies. Car parking areas will drain to porous paving within the parking bays then through a filter trench located below before discharging into the new surface water sewers via a single disconnecting chamber.

The link road will be drained to roadside filter trenches via traditional trapped gullies.

Run-off from individual plots will also drain direct to the new surface water sewer system. Each plot will discharge to the new surface water sewer system via a single disconnecting chamber located within its own curtilage.

Site control - The new surface water sewers will discharge to one of the grass conveyance swale/ and extended detention basin, located within an area of open ground within the development site. The roadside filter trenches will also discharge to either a standalone extended detention basin, or a combination of grass conveyance swale and extended detention basin, located within an area of open ground within the development site.

Hydraulic Control

In accordance with the Drainage Assessment guide, the rate and volume of surface water run-off from the post development situation should not exceed the surface water run-off from the existing Greenfield site. This equates to a total surface water discharge of 22.34l/s for the proposed 6.8ha development site, during a critical 10 year plus climate change rainfall return event (excluding wildlife corridor open space) .

Attenuation volumes will be provided within the extended detention basins in order to contain the run-off volumes generated by the critical 10 year, plus climate change, rainfall return event. The basins will also contain the run-off volumes generated by critical rainfall events up to and including the 200 years, plus climate change, rainfall return event. The attenuated discharge from the basins will not exceed the agreed Greenfield rate to the existing watercourse. Refer to Appendix C for details of calculations.

Site levels will be set in order to prevent water entering buildings or restricting access for emergency vehicles.

As part of the design approvals and subsequent adoptions in due course, Scottish Water will take on responsibility for the foul and surface water sewers, together with the maintenance of the extended detention basins. Aberdeen City Council will take on responsibility for the maintenance of the grass conveyance swales.

Quality Audit

Purpose

The purpose of the Quality Audit is to ensure that the design creates an environment where users can have realistic travel choices, feel safe to walk and cycle and have an environment where their mode choice is maximised through provision of non-intimidating environment. The Quality Audit reviews the plans from the different user perspectives to ensure that their needs are considered within the design. The Quality Audit provides the local authority, clients and designers with a balanced overview of the scheme and ensures that the place function is not overwhelmed by the movement function within the design, and helps to ensure that both functional and aesthetic considerations complement each other. It also helps to ensure that the plan being delivered provides a balance in access demands and the design encourages users to travel in more sustainable ways i.e. the layout and design encourages walking and cycling as a first choice in preference to using the car for non-essential car journeys. The Quality Audit is an important aspect of street design as it considers how different users will receive and make use of the space. Thus, the design has a huge impact on future use by residents and visitors and impacts on the development of a sense of community.

The emphasis of the Designing Streets policies is to ensure that design encourages development of communities and provides an environment conducive to encouraging people to move around in more sustainable ways (walking and cycling) and to value their surroundings through having an increased sense of community. Designing Streets promotes a hierarchy for street users where pedestrians are placed at the top. The Quality Audit thus reviews the plans and can influence the final detailed design to ensure that the policy is carried through design to implementation.

Aberdeen City Council's strategy is to promote walking and cycling in order to improve health and wellbeing, promote integrated communities, reduce congestion and reduce carbon impacts from single occupancy vehicles. The Quality Audit reviews the plans on the basis of the principles of this strategy and advises on any areas where the plan can be improved in order to assist in delivering better community environments that have a high sense of place, provide alternative choices for movement (walking and cycling) where people will want to live and where communities can grow.

Accessibility Audit

The plans for the site have been assessed in terms of the level of accessibility to key facilities around the site by walking and cycling. This included a review of the connectivity of the network internally and externally with the surrounding network and key facilities.

The Accessibility Audit looked at the walking and cycling journeys between the site and key facilities that are likely to be destinations for future residents of the area. Footways will be a minimum of 2.0m wide, alongside vehicular routes, whilst shared use footways/cycleways will have a minimum width of 3.0m.

Access to the site:

Access to this development is via the link road, from Inchgarth Road to the south to the North Deeside Road to the north.

The link road will have a speed limit of 30mph along its length with a reduction to 20mph when entering the junctions to the residential streets. Each junction will be provided with visibility envelopes appropriate to this speed.

The link road, having the additional connectivity function between Inchgarth Road and the North Deeside Road to the north will be a minimum of 7.3m wide (widened locally at bends as necessary).

Street Hierarchy:

As noted above, the main accesses to and from this site will be 7.3m wide with a footway/cycleway along one side and with a 2.0m footway on the opposite side to the footway/cycleway. These will lead to the residential streets off the east side of the development.

Junctions off the link road will be formed by 2no. residential streets of 5.5m wide widths with a more conventional configuration. These will lead to less significant streets/accesses and parking bays along the side of the roads.

Walking:

On average people walk around 400 metres in a 5 minute period, and as such walking within this scheme would take approx. 5 minutes, with walks to the public open space/play areas generally taking 2 to 4 minutes. Facilities are located within the site, again being accessible in 2 to 4 minutes.

From the North Deeside Road, a remote footway has been provided through the open space to the northwest of the site and leads onto the Deeside Way. Progressing eastwards, the route then utilises the Deeside Way to access the footway within the south eastern portion of the development. Working westerly back through the development, the footway connects back onto the link road to continue in a south westerly direction onto Inchgarth Road. The requirement for this route is to provide DDA compliant pedestrian route. It has been agreed with Aberdeen City Council that a 1 in 16 gradient with associated platforms is acceptable for this purpose.

Analysis:

The analysis of the site and connections to the surrounding area considers the location and suitability of crossing points to allow movement from footway to footway crossing carriageways. Suitable at-level crossing points with tactile paving are important features in any design particularly for mobility and visually impaired pedestrians, those in wheelchairs and parents with push chairs. This has been addressed at all locations across the site.

Footway widths are a key consideration in terms of access. These vary across this site from 3.0m cycleways to 2.0m footways.

Site footways were examined for any areas of inadequate width and any location where proposed street furniture or planting could introduce obstacles to pedestrian flows, reduce footway width and cause difficulties for visually impaired.

Findings:

1) The audit considered the criteria above and found that the layout and design of the site accommodates the needs of the pedestrians well.
2) The design encompasses the principles of Designing Streets and minimal street furniture and signing is proposed. What street furniture is proposed is located to provide maximum footway widths.
3) All the junctions and crossing points provide level crossing facilities with appropriate tactile paving.

Conclusion:

The proposed design caters well for pedestrians with suitable links throughout the site. External links to the existing Cults settlement have also been provided and will encourage walking to local facilities.

Cycling:

The purpose of the cycling audit is to assess the routes and highlight those areas that would be most suitable for use by cyclists.

The audit included a review of road widths and considered provision of any additional facilities for cyclists in the area. The audit reviewed the links between the development and the existing surrounding network.

The cycle audit seeks to identify whether the overall street design is cycle friendly and that facilities provided specifically for cyclists, are designed in accordance with best practice.

The cycle audit is a systematic process designed to ensure that the design actually encourages cycling. It is likely that experienced cyclists will still use the roadway to progress through the site. Cyclists of varying abilities use the route that they see as being the safest. Children and non-confident cyclists would tend to use the shared use cycleway/footway route where they are less likely to come into conflict with moving vehicles.

In order for cycling routes to be safe, convenient and attractive the following five criteria have been considered and met:

Coherence: The cycling infrastructure should form a coherent entity, linking all significant trip origins and destinations, routes should be continuous and consistent in standard.

Directness: Routes should be as direct as possible, based on desire lines - detours and delays will deter use.

Attractiveness: Routes must be attractive to cyclists on subjective as well as objective criteria: lighting, personal safety, aesthetics, noise and integration with the surroundings are important.

Safety: Designs should minimise casualties and perceived danger for cyclists and other road users.

Comfort: Cyclists need routes that are smooth, with well-maintained surfaces, flush kerbs, regularly swept, and with gentle gradients; routes must be convenient to use and avoid complicated manoeuvres and interruptions.

Analysis:

The cycle audit examined the main routes through the development site and how they will link to the existing network.

There is provision for cyclists through the creation of a 3m wide footway/cycleway alongside the main link road and continuing into the development on the residential roads. Also, via the link road there is connection to the wider existing cycle network.

Through the design of the streets the priority and safety of cyclists has been considered to ensure that cycling is a viable and attractive option from and within this development.

Non-Motorised Users:

Introduction:

Non-motorised users can comprise a wide group of users of different ages, levels of mobility and needs. This group typically comprises of those in a wheel chair, those with walking/mobility difficulties, people with push chairs/young children, those with mobility scooters and those with visual impairment.

Mobility impairment includes people who walk with some form of aid such as a walking stick or frame and those who use wheelchairs. Around 70% of disabled people have mobility issues and wheelchair users comprise approximately 10% of this group. In order to cater for those with mobility impairment and increase comfort levels, the design should provide even surfaces, free from clutter. Visual impairment affects around 2 million people in the UK however 95% have a degree of residual vision. This highlights the importance of ensuring tonal contrast in design in aiding navigation.

Hearing impairment and those who are profoundly deaf are affected by design where a pronounced crossfall is in place. The deaf often have balance problems and therefore the street design should where possible consider the degree of crossfall (between 1% and 2.5% desired) in order to assist those with hearing impairment and deafness.

The main principles that typically should be present in any design to provide a degree of equality and address the needs of non-motorised users include:

- Not giving rise to road safety or personal safety concerns
- Directly facilitate the desired journey without undue deviation or difficulty
- Link origins with destinations as directly as possible
- Be attractive and comfortable to use
- Be accessible to disabled users and people with children and pushchairs
- Be continuous and not subject to severance or fragmentation

The principles adopted in the development of this scheme have resulted in a layout that has considered the above aspects and incorporated the findings into the layout and street design.

A review of the layout plans was undertaken in order to assess the layout provided from a non-motorised user's point of view.

Findings:

- The design of the streets includes provision of traditional streets and shared.

- The traditional streets provide carriageways and footway/cycleways separated by a 100mm kerb. Where pedestrian crossing areas are created, dropped kerb and tactile paving blocks are included, to assist those with mobility and visual impairments, and those using wheelchairs and pushchairs.

- This scheme has provides 2m footways and good access to green spaces.

- The pedestrian desire lines in general are good for all users.

- The table on page 7 details the hierarchy of the roads and the associated footways and demonstrates how they link together through the development.

Conclusion:

The conclusions that can be drawn from the non-motorised user audit is that the layout provides well in terms of dropped kerbs and adequate footway widths for this user group.

Non-motorised users should have no significant access issues throughout this development site.

The new development should potentially be an interesting scheme with a high sense of place and build within the context of the existing local topography and should accommodate people with a wide range of mobility levels.

Public Transport Links:

In support of the planning application a Transport Assessment was compiled which considered the Public Transport accessibility to/from the development site.

As part of the purchase of the units, the developer will be providing a Travel Pack which gives information on the options available for travelling in and around the scheme to encourage the house owners to break the habit of simply getting into a car for every journey.

Place Check Audit

The layout proposed has been examined against the six qualities of successful places set out in Designing Streets.

Distinctive:

A range of size and mix of house types, utilising a range of traditional materials set within a high quality landscaped street layout, respecting the topography and allowing for future linking to adjacent development proposals, ensures that the proposed development contributes positively to the surrounding area.

Safe and Pleasant:

The proposed layout respects the Designing Streets principle of respecting pedestrians first.

The hierarchy of streets proposed and set out in the table on page 7 will be effective in reducing vehicle speeds and improving safety to reduce speeds, and to enhance the cycling and pedestrian environment.

The proposed layout embodies the features of street design being advocated in "Designing Streets" by incorporating sections of block paving and introducing tight bends all to achieve the desired effect of naturally reducing traffic speeds. NB. These speed reducing features should reduce speeds below the usual 20mph.

The layout provides a well-connected network of streets and paths for use by pedestrians and cyclists. Links tend to be short thus providing adequate opportunity for direct walking routes.

Easy to move around:

The development is provided with footways of sufficient width and drop kerbs to accommodate those in wheelchairs, mobility scooters and pushchairs etc.

The gradients of the new access roads and footways will make it relatively easy for mobility impaired users to move around the development.

The hierarchy of the streets is important and relates to level of legibility of the network.

In general, the junctions will be effective in reducing vehicle speeds through their spacing, geometry and widths.

Junctions have been designed with tight corner radii. This provides a dual effect of reducing vehicle speeds turning into the street thus improving cyclist safety and creating more direct pedestrian crossing facilities without deviating from the pedestrian desire line.

Welcoming:

The overall scheme has been developed within the context of the Masterplan.

On average people walk around 400 metres in a 5 minute period, and as such walking within this scheme would take 5 minutes, with walks to the public open space/play areas generally taking 2 to 4 minutes.

The site has been designed to provide considerable soft landscaping to boundaries and frontages as well as high quality areas of open and useable space carried on from the design principles set out in the Masterplan adopted for this site.

Adaptable:

Parking is generally provided within car parking court areas or road side end on car parking bays which also provide parking for visitors. However, there are also areas available on the streets for visitor parking if required.

It is noted that a degree of informal on-street parking can be accommodated on most streets without adversely compromising safety of operation.

The design ensures that parking areas are overlooked, close to destinations and easy to find and identify.

Tracking has been undertaken to demonstrate that larger vehicles can access all areas of the site. Tracking of large refuse vehicles and large cars has been undertaken for the site and will be subject to detailed discussions with Aberdeen City Council.

Resource Efficient:

The approach to the design provides a development which embodies the principles of resource efficiency throughout. This is demonstrated by:

- Having properties generally fronting onto streets and not providing lengths of street that are only routes to properties located further away.

- Orientation of streets and buildings to maximise sunlight benefits.
- Utilities strips in the street to manage future maintenance works.
- Landscape strategy emphasising the use of green space and planting to enhance the layout and reduce vehicle speeds throughout.

The use of Sustainable Urban Drainage Systems (SUDS) has been discussed in detail in the Street Engineering Review.

<u>Visual Quality Audit:</u>

A landscape layout has been prepared for the site which integrates the road and housing layout to provide interest, enclosure of frontages, open space and structured planting. Use of planting and trees along the edge of the road provides visual interest, reduces the impact of buildings on the environment and provides enclosure of open spaces.

A range of house types are proposed within the layout with high quality materials being proposed, including dry dash render, upvc windows and facings, timber fencing and block/drydash boundary walls and makes provision for a range of users, and creates a high quality environment, provides buildings which are distinctive and attractive and creates a settlement that can become a community in which people would want to live. The variety of building sizes, including height and massing, is likely to create an interesting and attractive community, combined with a street layout which works with the existing topography as much as possible and creates a high visual amenity and quality perspective.

Following completion all landscape areas will be the subject of a factoring arrangement which will ensure that the site is fully maintained to a high standard in the future.

The design of this scheme will provide an attractive and welcoming environment for residents and visitors.

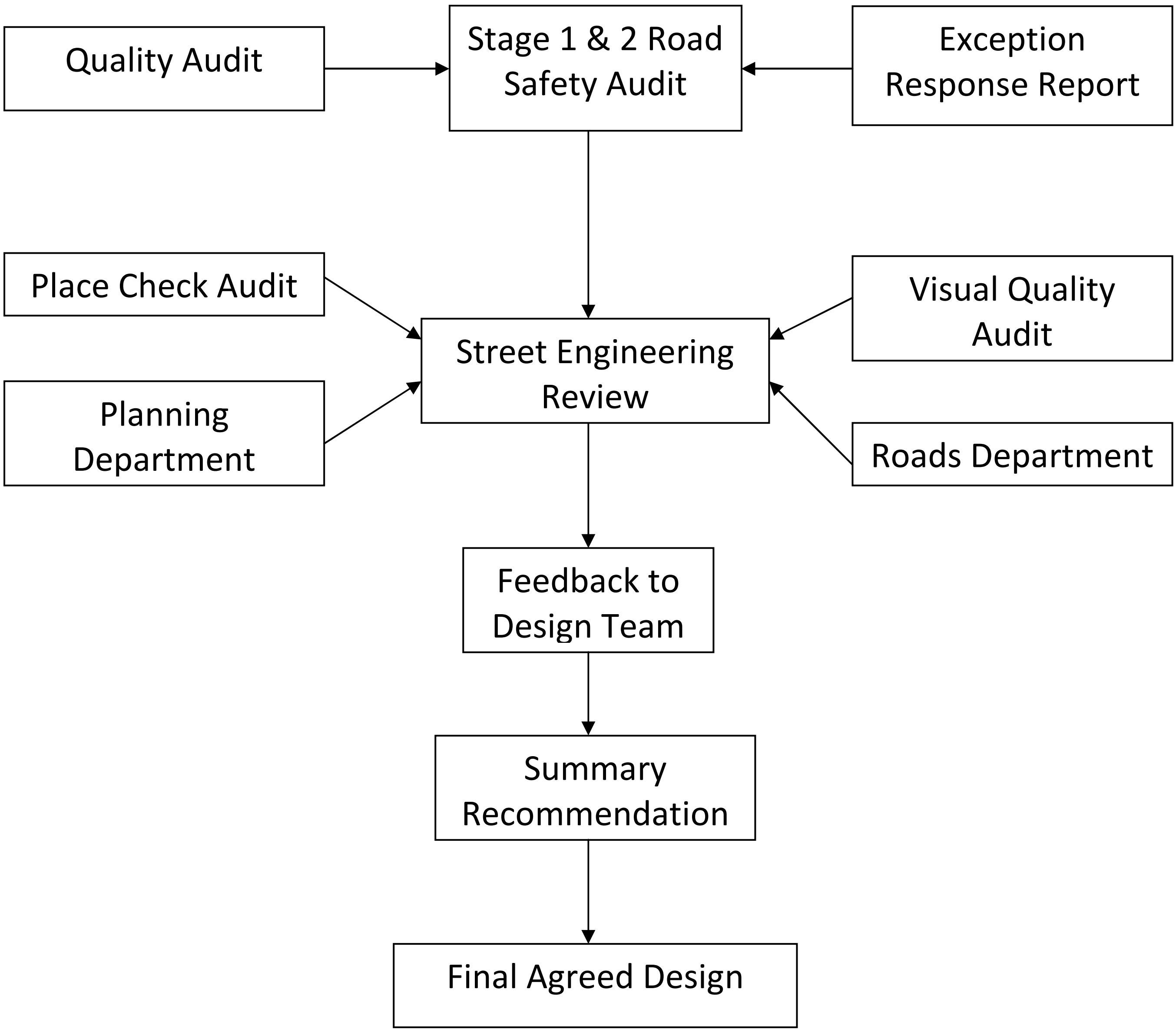
<u>Conclusions:</u>

The outcome of the Quality Audit has identified that the Masterplan layout overall provides:

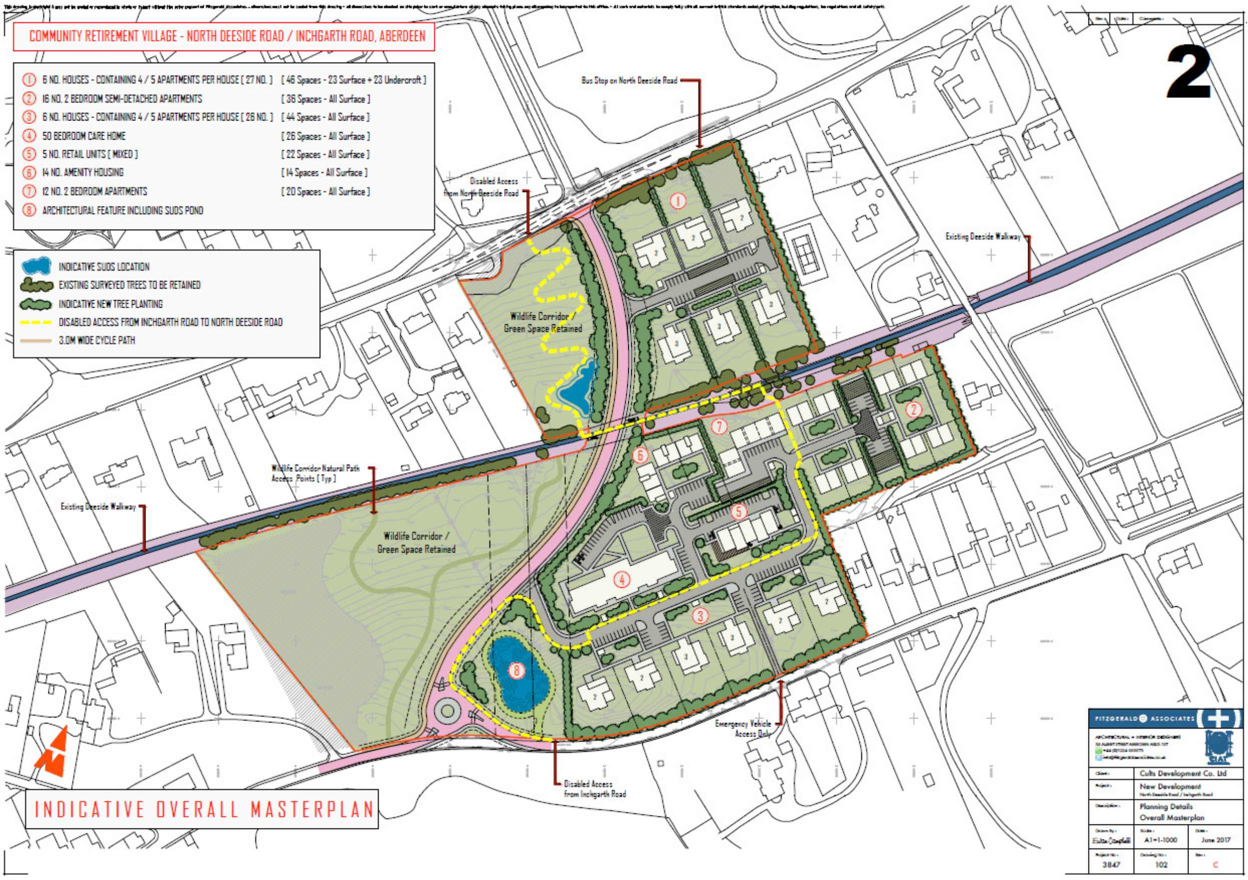
- A high level of connectivity within the site;

- Accessible networks and routes to facilities;
- A mix of property sizes and layouts to provide for an encouraged mix of different types of residents;
- Street forms which are distinctive;
- A greater sense of community through easy access to local neighbourhood facilities and an attractive and high quality environment in which all users will have opportunity and be encouraged to walk and be less car dependent.

Appendix A - Street Engineering Review Diagram



Appendix B – Site Layout Drawing



Drawing Number 3847/102C

Land at North Deeside Road/Inchgarth Road, Aberdeen

Desk-based assessment (DBA)

National Grid Reference: NJ 90405 03201 (centred)

Parish: Aberdeen and Peterculter

Height OD: 25-40m OD

Written and researched by:

Cameron Archaeology

Commissioning client:

Cults Property Development Company Limited

Contractor:

Cameron Archaeology
45 View Terrace
Aberdeen
AB25 2RS
01224 643020
[redacted]
cameronarch@btinternet.com
www.cameronarchaeology.com
Company registration no 372223 (Scotland)
VAT registration no 990 4373 00

Date: 16 October 2016
Updated: 1 August 2017

CONTENTS

ILLUSTRATIONS

SUMMARY

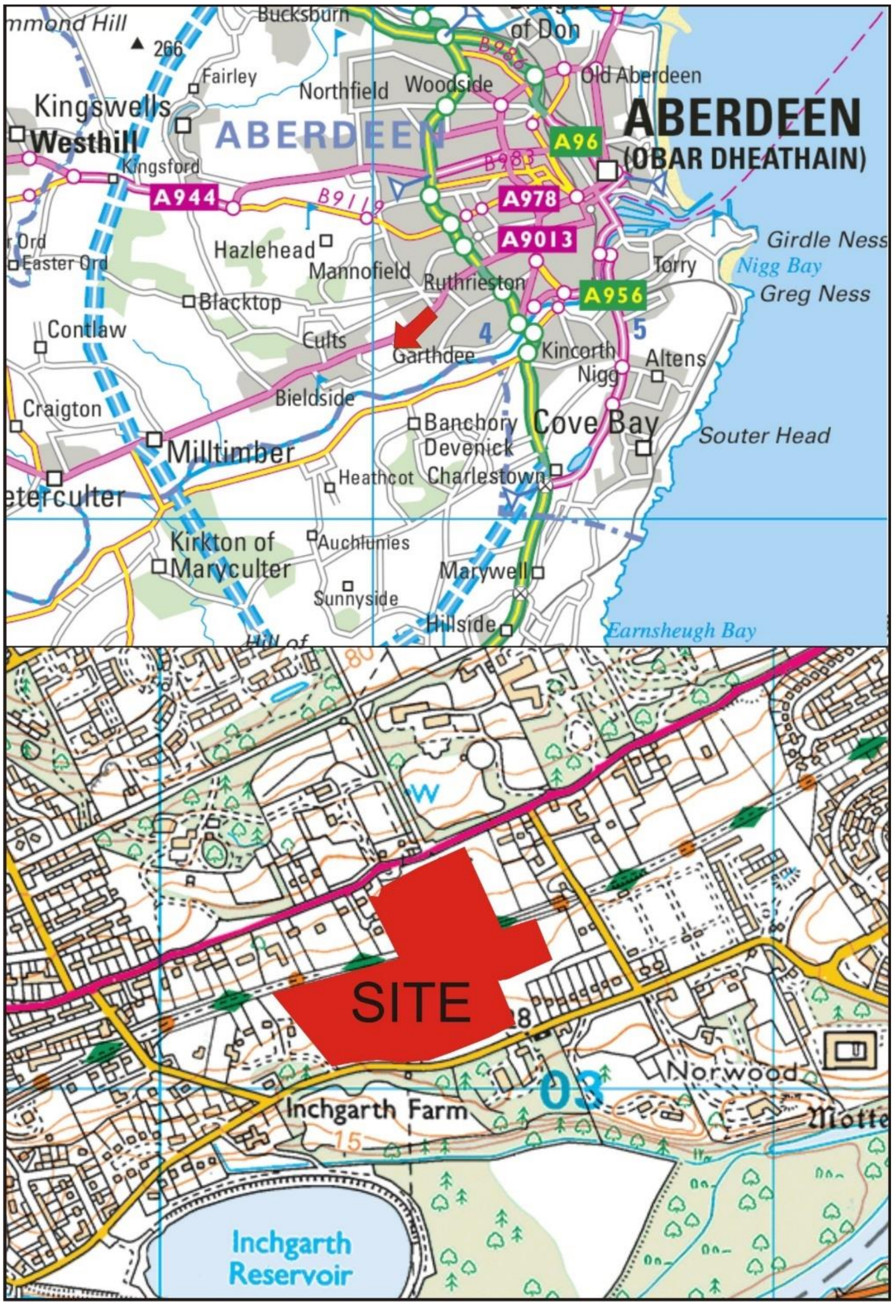
This Desk-Based Assessment was commissioned by Fitzgerald Associates for Cults Property Development Company Limited. A Proposal of Application Notice (PAN) to Aberdeen City Council (161227/PAN) for a retirement community comprising apartments, townhouses, a care home and some small retail units. Aberdeenshire Council Archaeology Service (who cover Aberdeen City) requires a 7-10% archaeological field evaluation in the first instance.

1 BACKGROUND

1.1 The site (Illus 1) is located between Garthdee and Cults on the N side of Inchgarth Road and the S of the A93 North Deeside Road. It is centred on NGR NJ 90405 03201, at 25-40m OD in the parish of Aberdeen and Peterculter.

1.2 The work was commissioned by Fitzgerald Associates for Cults Property Development Company Limited. A Proposal of Application Notice (PAN) to Aberdeen City Council (161227/PAN) for a retirement community comprising apartments, townhouses, a care home and some small retail units. Aberdeenshire Council Archaeology Service (who cover Aberdeen City) requires a 7-10% archaeological field evaluation (Illus 2) in the first instance.

1.3 All the archaeological work will be carried out in the context of Scottish Planning Policy (SPP) Planning Advice Note (PAN 2/2011) and Historic Environment Scotland's Policy Statement (HESPS) which state that archaeological remains should be regarded as part of the environment to be protected and managed.



Illus 1 Location plan (*Contains Ordnance Survey data © Crown copyright and database right 2016*)

Illus 2 Site plan showing proposed development (*copyright* Fitzgerald Associates)

2 ARCHAEOLOGICAL BACKGROUND

2.1 There is one Scheduled Ancient Monument within 1km of the proposed development. The so-called motte of Pitfoddel's Castle (NJ90SW 1) is a natural mound that occupies a wooded promontory on the steep edge of a river terrace cut by the Dee. The mound measures about 40m from NW to SE by 25m transversely and rises to about 5m in height. However, the mound was once larger, and is shown almost twice as extensive as it is today on the first edition of the OS 25-inch map (Aberdeenshire, 1870). The tradition of its use as the site of a castle was first recorded at that time. The mound has been landscaped on several occasions since: a broad terrace has been levelled into it on the E; a track cuts into its sides on the N and S; and an excavation has been made in the SW for a new wing of the Norwood House Hotel (NJ90SW 43.00) in 1976. The mound may have been used as the site of an earthwork castle, but no trace of any defences is visible today. A small rectangular platform with a sharp profile is visible on the W of the mound, but this may be a garden feature of the country house. If a castle stood here, it was probably built by the Murrays of Colbyn, who obtained the barony of Pitfoddel de novo between 1389 and 1397. The barony passed to the Rede family in the 15th century and thence to the Menzies in the 16th century. In view of the date of the erection of the barony, the possibility of an earthwork castle is less likely than a stone-built tower-house (Yeoman 1988, 130; Bogdan and Bryce 1991, 23; CFA 1992, 34-5).

2.2 There are 24 Listed Buildings (Appendix 2) within 1 km of the proposed development. These are mainly 19th-century houses and associated buildings, including Inchgarth, Fairview, Norwood, Garthdee House. There is a stone windmill in the gardens of Drumgarth which was built in 1859 for George Jamieson, a jeweller, and is designed by the Inverness architects Alexander & William Reid and Mackenzie. Drumgarth and its windmill is situated in the Pitfodels area of Aberdeen, which was purchased and feued by the Pitfodels Land Company (established 1854). Jamieson was a partner in the company and Drumgarth was one of the first houses to be built on the former Pitfodels estate. Fiddes in his article Pitfodels and Early History of Garthdee (2005, 25-33) states that Jamieson had the windmill resited in 1859 from his feu near Windmill Brae in Aberdeen city centre to Drumgarth, possibly for use as a summerhouse. However, map evidence suggests that the windmill was moved from its original site around 1870-80. The Large Scale Town Ordnance Survey Map of Aberdeen, published in 1867 depicts a windmill at the south entrance to Windmill Lane, close to Windmill Brae and the 1st Edition Ordnance Survey Map, published in 1869 shows the house at Drumgarth, but does not show the windmill. By the 1899, 2nd Edition Ordnance Survey Map, the windmill is shown in its present position to the west of Drumgarth. It is likely therefore that the windmill was moved to Drumgarth around 1870-80. The windmill is likely to date from the mid-17th century and a windmill is shown at the Windmill Lane site on the 1661 map of Aberdeen by James Gordon (Donnachie and Stewart 1964-6, 276-97).

2.3 The Deeside Line runs through the proposed development. The Royal Deeside Railway was formed in 1996 with the intention of reclaiming part of the former branch line from Aberdeen to Ballater, constructed between 1853 and 1856 by the Deeside Railway company and closed by British Railways in 1966 and is now at walk and cycle route. Pitfodels Station to the E of the proposed development was converted to holiday let accommodation in 2011 (Cameron 2011, 10).

2.4 There are fifty-eight sites of archaeological and historic interest within 1km of the proposed development (Appendix 1). The area has sparse prehistoric activity recorded, primarily as discrete finds. One is the find spot of a barbed and tanged arrowhead (NJ90SW 19) of Buchan flint which was found by Mr I M McDonald in his garden at 4 Gaitside Terrace, Aberdeen, in 1949; the current location of the flint is unknown. Mr Henderson of 154 Deeside Gardens recovered a flint end-scraper, barbed and tanged arrowhead and knife/scraper (NJ90SW 51) while gardening between 1965-1979, and noted (but did not recover) other flakes; objects with finder (NMRS 1992, 35).

2.5 On Craigton Road there are a series of Freedom Land boundary markers (Stones 8, 9, 10, 11, 12; NJ90SW 17, 34, 35, 46, 132) (Cruickshank and Gunn 1929, 36). In 1313, Robert the Bruce granted Aberdeen custodianship over his Royal Forest of the Stocket. The term Royal Forest is slightly misleading as it really meant a hunting ground, which may have included a wooded area. In 1319 Robert issued a second charter. This granted Aberdeen fuller rights over the Stocket, in return for an annual payment, or feu, of £213 6s 8d Sterling – the modern day equivalent of approximately £91,000. The earliest boundary markers were probably natural features such as burns and stones (described as 'earthfast' stones), with the addition of small purpose-built cairns. The first description of the marches dates back to a 'riding of the marches' in 1525. The practice of riding the boundary lines was intended to ensure they were being observed and respected, and that no adjacent landowners had encroached onto the town's lands. These rides were accompanied by a great deal of ceremony and feasting (Aberdeen City Council).

2.6 Archaeological interventions have taken place at Viewfield (international School) on the N side of North Deeside Road where a remnant of the 17th-century Viewfield House and a 20th-century bunker were recorded (Cameron 2008, 13). On Airyhall Road an archaeological evaluation recorded quarry pits of probably 19th-century date (Cameron 2013, 10) and prior to the construction of Nazareth care Home on Airyhall Road an evaluation revealed no archaeological finds or features (Cameron 2010, 11). A Level 2 standing building survey was carried out of Garthdee Farm

(NJ90SW 184) and a 10% evaluation of the neighbouring fields prior to a residential development. No archaeological finds or features were recorded during the evaluation (Cameron 2014, 10).

2.7 There are no known archaeological or historic sites within the boundary of the proposed development. The area has been farmland since the earliest maps (Illus 3-8). The 1st, 2nd and 3rd edition OS maps show the area as part of at least seven agricultural fields (Illus 9-11). On the 1st edition (Illus 9) there is a small area of water, a possible well marked within the site on the SW side of Middleton. The Deeside Railway Line runs through the site. By the 2nd Edition map the fields have been consolidated and the site consists of three fields. No other features are recorded on these OS maps. The 1946 aerial photograph (Illus 12) shows no additional features.

3 ARCHAEOLOGICAL REQUIREMENTS

Due to the relatively undisturbed nature of this site Aberdeenshire Council Archaeology Service (who cover Aberdeen City) requires a 7-10% archaeological field evaluation in the first instance.

4 REFERENCES

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5 ACKNOWLEDGEMENTS

Thanks to Alison Wright and Kevin Fitzgerald, Fitzgerald Associates for initiating this project and to Bruce Mann, Aberdeenshire Council Archaeology Service for Aberdeenshire, Moray, Angus and Aberdeen for his advice during this work.

APPENDIX 1 Archaeological and historical sites within 1km of the proposed site (RCAHMS)

Dataset UID	Name	OS NGR	Classification
112884	CULTS STATION	NJ 89740 02990	RAILWAY STATION. ALTNAME = STATION ROAD
134436	ABERDEEN, CULTS, INCHGARTH ROAD, FAIRVIEW	NJ 89769 02714	ENGINE HOUSE (19TH CENTURY), WATERWORKS (19TH CENTURY). ALTNAME = CULTS WATERWORKS
134437	CULTS, 268 NORTH DEESIDE ROAD	NJ 89970 03200	STONE
134469	ABERDEEN, GARTHDEE ROAD, DRUMGARTH, WINDMILL	NJ 90702 02957	WINDMILL. ALTNAME = INCHGARTH ROAD
141171	ABERDEEN, RIVER DEE	NJ 91080 02710	BRIDGE
143636	DRUMDUAN	NJ 91140 02600	COUNTRY HOUSE. ALTNAME = BANCHORY HOUSE, DRUMDUAN HOUSE
149554	ABERDEEN, GARTHDEE ROAD, GARTHDEE HOUSE	NJ 91376 03057	VILLA (19TH CENTURY). ALTNAME = SCOTT SUTHERLAND SCHOOL OF ARCHITECTURE, GARTHDEE HOUSE POLICIES
149555	ABERDEEN, GARTHDEE ROAD, GARTDEE HOUSE, WEST LODGE	NJ 91038 03186	GATE LODGE. ALTNAME = SCOTT SUTHERLAND SCHOOL OF ARCHITECTURE, GARTHDEE HOUSE POLICIES
149557	ABERDEEN, GARTHDEE ROAD, GRAY'S SCHOOL OF ART	NJ 91130 03060	COLLEGE. ALTNAME = GARTHDEE HOUSE POLICIES
150018	ABERDEEN, GATHDEE ROAD, INCHGARTH	NJ 90150 02910	FARMHOUSE, FARMSTEAD. ALTNAME = INCHGARTH FARM
150031	ABERDEEN, GARTHDEE ROAD, NORWOOD, WEST LODGE	NJ 90819 03156	GATE LODGE. ALTNAME = PITFODELS, NORWOOD HALL HOTEL
155158	CULTS	NJ 89790 02860	FARMSTEAD, MILL
173427	ABERDEEN, LOIRSBANK ROAD, GENERAL	NJ 89580 02760	GENERAL VIEW
173882	ABERDEEN, DEN OF CULTS, GENERAL	NJ 89740 02820	GENERAL VIEW
173884	ABERDEEN, GARTHDEE ROAD, INCHGARTH HOUSE	NJ 90556 03016	HOUSE (19TH CENTURY)
173885	ABERDEEN, GARTHDEE ROAD, INCHGARTH COTTAGE	NJ 90640 03090	COTTAGE
174532	ABERDEEN, CULTS, CULTS HOTEL	NJ 89570 03140	HOTEL
174881	ABERDEEN, NORTH DEESIDE ROAD, WELLWOOD UNIT (WOODLANDS HOSPITAL)	NJ 90030 03403	HOSPITAL. ALTNAME = CULTS, WELLWOOD HOUSE, WELLWOOD HOSPITAL
19407	ABERDEEN, CULTS, ST DEVENICK SUSPENSION BRIDGE	NJ 89770 02609	SUSPENSION BRIDGE (19TH CENTURY). ALTNAME = ST DEVENICKS BRIDGE ,

			MORRISON'S BRIDGE, MORISON'S BRIDGE, RIVER DEE, THE SHAKKIN' BRIGGIE
19409	CULTS MILL	NJ 89611 02993	WATERMILL (19TH CENTURY). ALTNAME = MILLDEN ROAD, MILL OF CULTS
19410	ABERDEEN, CRAIGTON ROAD, BOUNDARY MARKER 11	NJ 89910 03764	BOUNDARY STONE. ALTNAME = ABERDEEN, MARCH STONE 11, EAST ROCKLANDS
20247	PITFODDEL'S CASTLE	NJ 91030 02960	CASTLE. ALTNAME = PITFODELS, PITFODDELS CASTLE, NORWOOD HOUSE HOTEL
20257	ABERDEEN, 4 GAITSIDE TERRACE	NJ 91380 03260	BARBED AND TANGED ARROWHEAD (FLINT)
20265	BANCHORY HOUSE, WEST LODGE	NJ 90870 02500	LODGE
20275	ABERDEEN, CRAIGTON ROAD, BOUNDARY MARKER 10	NJ 90293 03947	BOUNDARY MARKER. ALTNAME = ABERDEEN, MARCH STONE 10, SLOPEFIELD RESERVOIR
20284	BANCHORY-DEVENICK, ST DEVENICK'S CHURCH	NJ 90670 02476	BURIAL GROUND, CHURCH, WAR MEMORIAL (20TH CENTURY). ALTNAME = BANCHORY-DEVENICK PARISH KIRK, BANCHORY-DEVENICK OLD PARISH CHURCH, WAR MEMORIAL ROLL OF HONOUR
207661	EAST MIDDLETON	NJ 91100 03290	COTTAGE, CROFT. ALTNAME = ABERDEEN, AUCHINYELL ROAD, NORTH GARTHDEE
207662	NORTH GARTHDEE	NJ 91060 03360	COTTAGE, CROFT. ALTNAME = NORTH GARTHLEE
207664	BRAESIDE COTTAGE	NJ 91050 03730	COTTAGE, CROFT. ALTNAME = ABERDEEN, NORTH DEESIDE ROAD
207665	WOODLAND COTTAGE	NJ 90920 03900	COTTAGE, CROFT. ALTNAME = ABERDEEN, AIRYHALL ROAD, BRAEHALL, VIEWBANK COTTAGE
207666	AIRYHALL ROAD	NJ 90530 03880	WALLED GARDEN. ALTNAME = ABERDEEN, AIRYHALL ROAD, AIRY HALL
209835	CLIFF HOUSE, BOUNDARY STONE	NJ 89750 03640	BOUNDARY STONE
209836	CLIFF HOUSE	NJ 89797 03590	HOUSE
210199	CLIFF HOUSE, QUARRY	NJ 89780 03550	QUARRY
219531	BANCHORY-DEVENICK, OLD MANSE	NJ 90489 02382	MANSE. ALTNAME = MANSEFIELD HOUSE
219532	BANCHORY-DEVENICK, OLD SCHOOLHOUSE	NJ 90676 02412	SCHOOLHOUSE. ALTNAME = KIRKTON COTTAGE
236840	ABERDEEN, NORTH DEESIDE ROAD, WOODBANK, WALLED GARDEN AND GATEPIERS	NJ 90447 03596	GATE PIER(S), VILLA (19TH CENTURY), WALLED GARDEN. ALTNAME = WOODBANK SPORTS CENTRE, AIRYHALL ROAD, BAIRDS BRAE
236989	ABERDEEN, PITFODELS, NORTH DEESIDE ROAD, VIEWBANK	NJ 90775 03749	AIR RAID SHELTER (20TH CENTURY), HOSTEL, SCHOOL, TOWER. ALTNAME = PITFODELS HOUSE, PITFODELS HOSTEL, PITFODELS SCHOOL
241206	PITFODELS STATION	NJ 90650 03310	RAILWAY STATION. ALTNAME = PITFODELS STATION ROAD

241257	BANCHORY-DEVENICK, ST DEVENICK'S CHURCH, WATCH HOUSE	NJ 90672 02438	WATCH HOUSE
287754	ABERDEEN, COUNTESSWELLS ROAD, CRAIGIEBUCKLER HOUSE, DOOCOT	NJ 90000 04000	DOVECOT
293847	ABERDEEN, PITFODELS, NORTH DEESIDE ROAD, VIEWBANK, BUNKER	NJ 90808 03720	BUNKER (20TH CENTURY)(POSSIBLE)
293975	CULTS, WOODLANDS	NJ 90100 03740	NO CLASS (EVENT)
294229	ABERDEEN, PITFODELS, NORTH DEESIDE ROAD, VIEWBANK TOWER	NJ 90809 03752	FOLLY, HOUSE (POST MEDIEVAL), TOWER
311832	CRAIGTON ROAD	NJ 90670 04110	NO CLASS (EVENT)
311835	ABERDEEN, GARTHDEE CAMPUS	NJ 91060 03130	BUILDING, BLADE (FLINT)(NEOLITHIC)
316654	PITFODELS, INCHGARTH ROAD, INCHGARTH HOUSE, VICTORIAN GREENHOUSE	NJ 90587 03057	GLASSHOUSE
320303	GARTHDEE ROAD, ROBERT GORDON'S INSTITUTE OF TECHNOLOGY	NJ 91060 03130	NO CLASS (EVENT)
320405	AIRYHALL ROAD, BRAESIDE	NJ 90818 03948	FIELD DRAIN(S), QUARRY PIT(S) (19TH CENTURY)
331372	ABERDEEN, LOIRSBANK ROAD, GENERAL	NJ 89580 02760	NO CLASS (EVENT)
332222	INCHGARTH RESERVOIR	NJ 90209 02714	RESERVOIR
339870	ABERDEEN, CULTS, NORTH DEESIDE ROAD, WAR MEMORIAL	NJ 90471 03410	WAR MEMORIAL (20TH CENTURY). ALTNAME = MAJ REID WW1 WAR MEMORIAL FOUNTAIN
351915	ABERDEEN, NORTH DEESIDE ROAD, THE MARCLIFFE AT PITFODELS	NJ 90610 03632	HOTEL. ALTNAME = BALNAGARTH HOUSE
70528	ABERDEEN, GARTHDEE ESTATE	NJ 91000 03000	GENERAL VIEW. ALTNAME = PITMEDDEN ROAD
77013	ABERDEEN, GARTHDEE ROAD, NORWOOD	NJ 90983 02973	HOTEL, HOUSE. ALTNAME = PITFODELS, NORWOOD HALL HOTEL, NORWOOD HOUSE HOTEL
80077	TOLLOHILL WOOD, PARKNOOK	NJ 90200 02340	OBELISK
81288	CULTS, NORTH DEESIDE ROAD	NJ 90410 03390	PILLBOX (20TH CENTURY). ALTNAME = CULTS, 216 ARNLEE LODGE, NORTH DEESIDE ROAD, BAIRNS RD
85148	ABERDEEN, 154 DEESIDE GARDENS	NJ 91000 03500	BARBED AND TANGED ARROWHEAD (FLINT), FLAKE(S) (FLINT), SCRAPER (TOOL)(S) (FLINT)

APPENDIX 2 LISTED BUILDINGS WITHIN 1KM (RCAHMS CANMORE Online)

Dataset UID	Name	OS NGR
333839	MORISON'S BRIDGE OVER RIVER DEE	NJ 89770 02609
349396	INCHGARTH, GARTHDEE ROAD	NJ 90556 03016
349417	FAIRVIEW, INCHAGARTH ROAD	NJ 89769 02714
349418	MORRISON'S BRIDGE (THE SHAKKIN' BRIGGIE) OVER RIVER DEE.	NJ 89770 02609
349459	MILL OF CULTS, MILLDEN ROAD,	NJ 89611 02993
349466	WINDMILL, DRUMGARTH, GARTHDEE ROAD	NJ 90702 02957
349467	NORWOOD, GARTHDEE ROAD	NJ 90983 02973
349468	NORWOOD LODGE, GARTHDEE ROAD	NJ 90819 03156
349471	PITFODELS NORTH DEESIDE ROAD PITFODELS HOUSE	NJ 90642 03464
349473	CULTS, NORTH DEESIDE ROAD WELLWOOD	NJ 90030 03403
395300	GARTHDEE ROAD, GARTHDEE HOUSE (SCOTT SUTHERLAND SCHOOL OF ARCHITECTURE), INCLUDING TERRACE WALLS AND STEPS, EAST AND WEST LODGES	NJ 91376 03057
395301	GARTHDEE ROAD, GARTHDEE HOUSE (SCOTT SUTHERLAND SCHOOL OF ARCHITECTURE), INCLUDING TERRACE WALLS AND STEPS, EAST AND WEST LODGES	NJ 91038 03186
395302	GARTHDEE ROAD, GARTHDEE HOUSE (SCOTT SUTHERLAND SCHOOL OF ARCHITECTURE), INCLUDING TERRACE WALLS AND STEPS, EAST AND WEST LODGES	NJ 91430 03120
400043	CULTS, PITFODELS STATION ROAD, FORMER STATION BUILDING	NJ 90650 03311
405743	Garthdee House (Scott Sutherland School of Architecture), including Terrace Walls and Steps and excluding 1956 and later additions to south and east, Robert Gordon University, Garthdee Road, Aberdeen	NJ 91316 03058
405744	West Lodge including gatepiers and rear outbuilding and excluding former ancillary building to west, Robert Gordon University, Garthdee Road, Aberdeen	NJ 91038 03186
405745	West Lodge including gatepiers and rear outbuilding and excluding former ancillary building to west, Robert Gordon University, Garthdee Road, Aberdeen	NJ 91065 03186
405746	East Lodge including gatepiers, Robert Gordon University, Garthdee Road, Aberdeen	NJ 91430 03120
405747	East Lodge including gatepiers, Robert Gordon University, Garthdee Road, Aberdeen	NJ 91425 03134
406119	Garthdee House (Scott Sutherland School of Architecture), including Terrace Walls and Steps and excluding 1956 and later additions to south and east, Robert Gordon University, Garthdee Road, Aberdeen	NJ 91292 03044
406248	Inchgarth House including garden terrace, Inchgarth Road, Aberdeen	NJ 90556 03015
406249	Inchgarth House including garden terrace, Inchgarth Road, Aberdeen	NJ 90523 02979
406329	Windmill, Drumgarth, Inchgarth Road, Aberdeen	NJ 90702 02957
406334	Norwood Hall Hotel, excluding 2-storey extension to west and south, and 2-storey extension to east, Garthdee Road, Aberdeen	NJ 90983 02973

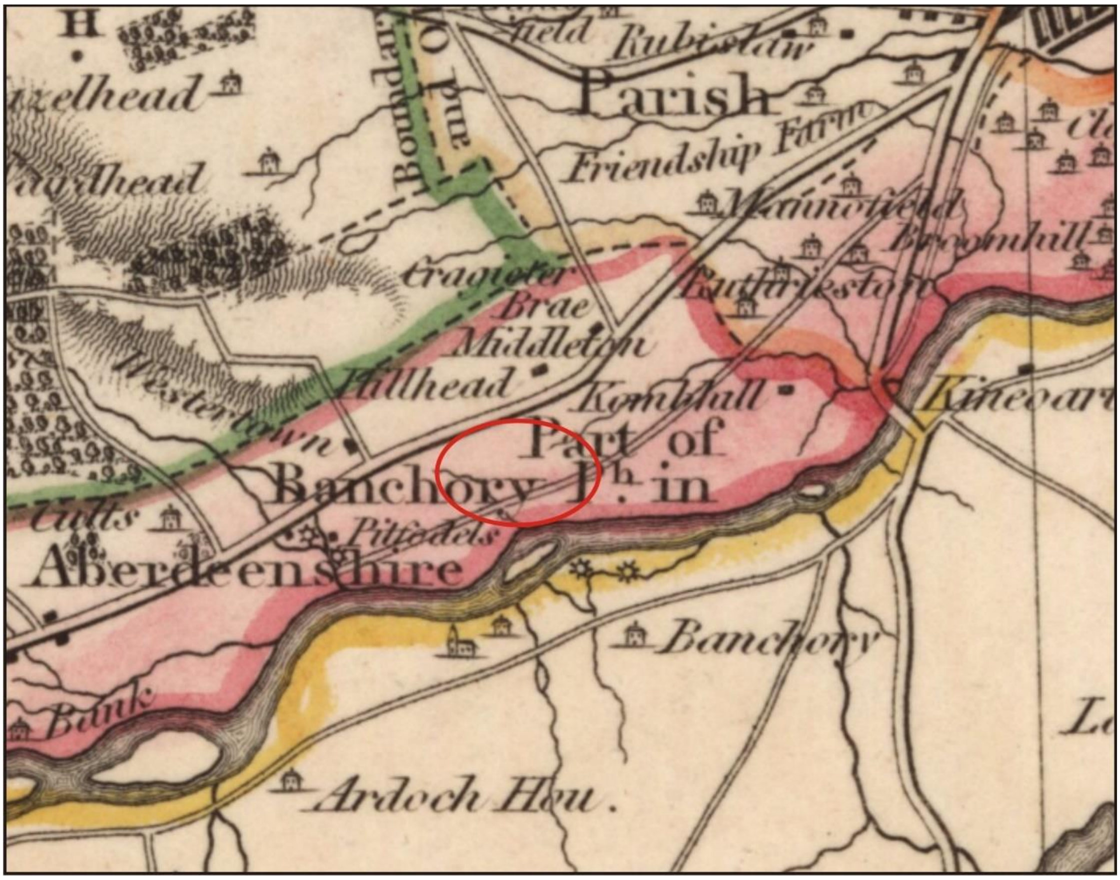
APPENDIX 3 MAPS

Illus 3 Pont map of 1583-96 showing approximate area of proposed development circled in red (*copyright National Library of Scotland)*

Illus 4 Gordon map of 1636-52 showing approximate area of proposed development circled in red (*copyright National Library of Scotland)*

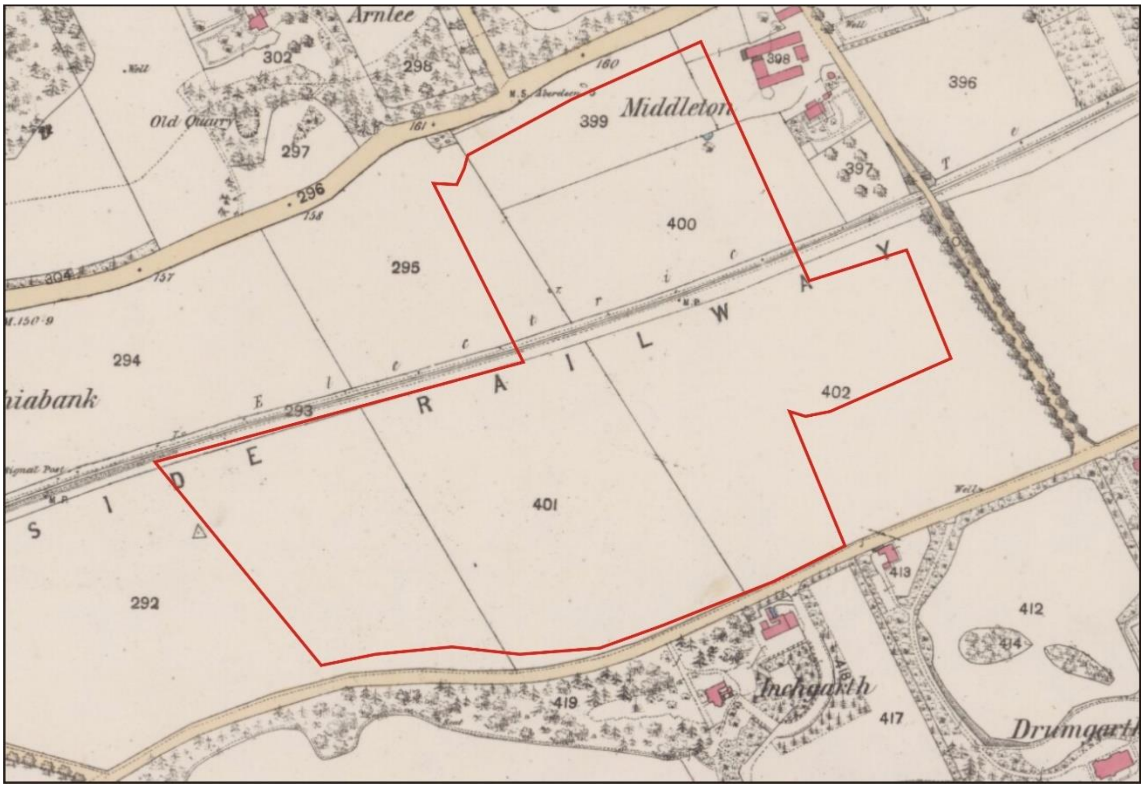
Illus 5 Blaeu map of 1654 showing approximate area of proposed development circled in red (*copyright National Library of Scotland)*

Illus 6 Moll map of 1745 showing approximate area of proposed development circled in red (*copyright National Library of Scotland)*

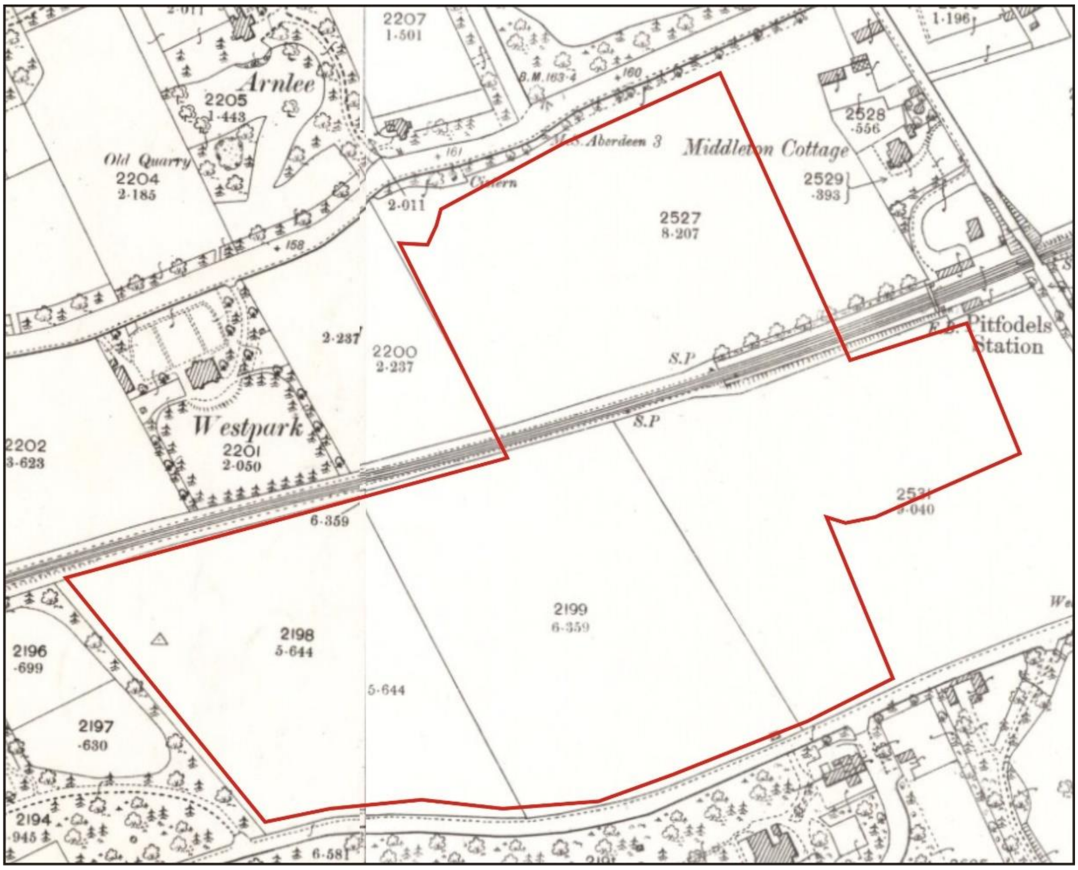


Illus 7 Thomson map of 1826 showing approximate area of proposed development circled in red (*copyright National Library of Scotland)*

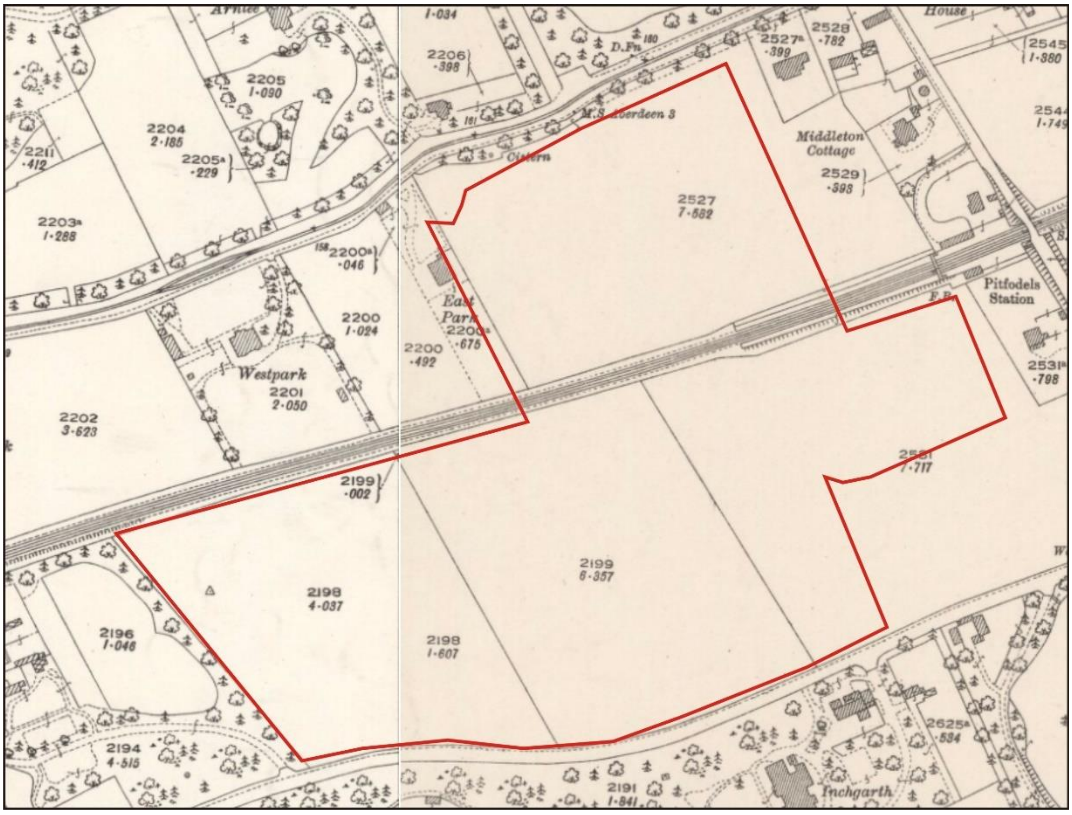
Illus 8 Robertson map of 1822 showing approximate area of proposed development circled in red (*copyright National Library of Scotland)*



Illus 9 First Edition OS map showing site outline in red (*copyright National Library of Scotland)*
Kincardine Sheet IV.5 (Combined) Survey date: 1865 Publication date: 1868



Illus 10 Second Edition OS map showing site outline in red (*copyright National Library of Scotland)* Aberdeenshire 086.02 (includes: Aberdeen; Banchory-Devenick; Nigg; Peterculter) Publication date: 1901 Revised: 1899**/** Aberdeenshire 086.01 (includes: Aberdeen; Peterculter)



Illus 11 Third Edition OS map showing site outline in red (*copyright National Library of Scotland)* Aberdeenshire 086.01 (includes: Aberdeen; Peterculter) Publication date: 1925 Revised: 1923 Levelled: 1899**/** Aberdeenshire 086.02 (Banchory-Devenick; Nigg; Peterculter)

Illus 12 1946 aerial photograph with site outline in red; (copyright NCAP) Date: 16 April 1946 Date known. Location: Easter Ardoe; Peterculter; ABERDEENSHIRE; SCOTLAND. Coordinates (lat, lon): 57.117538, -2.163619. UNI: NCAP-000-000-091-805

SANDY BROWN

Consultants in Acoustics, Noise & Vibration

16523-R01-C

25 May 2018

Land at North Deeside Road / Inchgarth Road, Aberdeen

Noise assessment report

55 Charterhouse Street, London EC1M 6HA
68 Sackville Street, Manchester M1 3NJ
2 Walker Street, Edinburgh EH3 7LA
87 Caroline Street, Birmingham B3 1UP

T: +44 (0)20 7549 3500
T: +44 (0)161 771 2020
T: +44 (0)131 235 2020
T: +44 (0)121 227 5020

post@sandybrown.com
www.sandybrown.com

Sandy Brown Associates LLP
Registered in England & Wales No. OC 307504
Registered Office: 55 Charterhouse Street, London EC1M 6HA

Version	Date	Comments	Author	Reviewer
A	20 Jun 17	Initial issue	Gordon Dolbear	Craig Simpson
B	21 May 18	Revised issue	Gordon Dolbear	Craig Simpson
C	25 May 18	Minor update to masterplan	Gordon Dolbear	Craig Simpson

Summary

Sandy Brown has been commissioned by Cults Property Development Company Ltd to carry out a noise assessment for the proposed masterplan development on land adjacent to North Deeside Road / Inchgarth Road, Aberdeen.

An application for planning permission in principle is to be made.

The proposed development is to include a new relief road, residential accommodation, retail units and car parking.

An environmental noise survey has been carried out and predictions of noise levels on the proposed site have been made using road traffic flow data.

To provide suitable conditions for the proposed residential developments on areas 1, 3, 4 and 6, it is recommended that noise mitigation measures should be provided. Outline recommendations for suitable noise mitigation measures are given.

To protect the amenity of the existing dwellings located to the west of the proposed relief road, it is recommended that a noise barrier be constructed to screen the road from these properties. Outline recommendations for the construction of the barrier are given.

Noise limits for proposed building services plant associated with the development are given and the design of these will need to ensure the limits are met.

It is recommended that deliveries and service collections to and from the retail units should where feasible be limited to daytime hours i.e. between 7am and 9pm.

Contents

1 Introduction

Sandy Brown has been commissioned by Cults Property Development Company Ltd to carry out a noise assessment for the proposed masterplan development on land adjacent to North Deeside Road / Inchgarth Road, Aberdeen.

This report presents the methodology and results of the noise survey undertaken, assesses the development proposals, and provides recommendations for noise mitigation measures.

The purpose of this report is to support the planning permission in principle application.

2 Site and development description

2.1 The site and its surroundings

An aerial view of the site and the approximate site boundary is shown in Figure 1.

Figure 1 Aerial view of site (courtesy of Google Earth Pro)

The existing site comprises areas of grassland and is located to the south of North Deeside Road (the A93), to the west of Pitfodels Station Road and to the north of Inchgarth Road. The

Deeside Walkway footpath runs in an approximate east to west direction across the middle of the site.

Existing noise-sensitive dwellings are located adjacent to the site on all of its boundaries.

The Aberdeen Western Peripheral Route (AWPR) will be opened prior to the development being complete. The opening of the AWPR is anticipated to reduce road traffic in the area.

2.2 Proposed development

The proposed site plan is given in Figure 2.

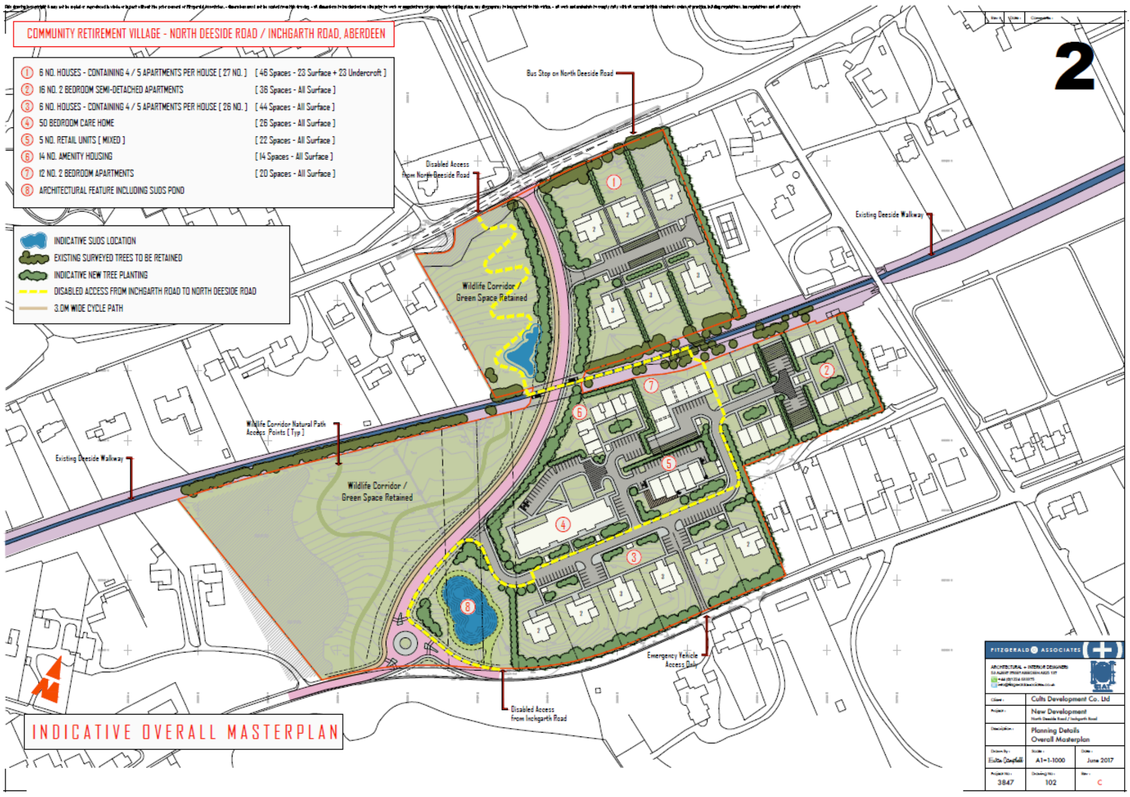


Figure 2 Proposed site plan

The proposed development comprises the following:

- A new relief road to connect North Deeside Road and Inchgarth Road
- A community retirement village with residential accommodation provided over a range of dwelling types
- 50 bedroom care home
- 5 retail units
- External and undercroft car parking

The retail units are likely to include a doctor and dental surgery, a pharmacy, a newsagent and a hairdresser.

The proposed development in each of the eight areas of the site is described in Table 1.

Table 1 Proposed development

Area	Development description
1	6 no. houses, each containing 4 or 5 apartments
2	16 no. two bedroom semi-detached apartments
3	6 no. houses, each containing 4 or 5 apartments
4	50 bedroom carehome
5	5 no. retail units
6	14 no. amenity housing
7	12 no. two bedroom apartments
8	Architectural feature

3 Noise survey methodology

A noise survey was carried out on the site from Monday 12 December 2016 until Tuesday 13 December 2016.

The survey was conducted by Gordon Dolbear and Scott Boughton of Sandy Brown.

A combination of unattended and attended noise measurements were taken.

The measurement positions are shown in Figure 1 and are described Table 2.

Table 2 Noise measurement positions

Position	Description
L	Approximately 10 m to the south of the stone wall on the north site boundary to the A93 to the east of the site. Free-field measurements
1	Approximately 3 m to the south of the A93 near-side edge to the east of the site. Free-field measurements
2	Approximately 1 m to the nearside edge of Pitfodels Station Road. Free-field measurements
3	Approximately 6 m to the nearside edge of Inchgarth Road on the south site boundary. Free-field measurements
4	To the rear of dwellings located off Pitfodels Station Road. Free-field measurements
5	To the east of dwellings located off Inchgarth Road to the west of the site. Free-field measurements
6	To the rear of dwellings located off North Deeside Road. Free-field measurements
7	To the west of dwellings located off North Deeside Road to the east of the site. Free-field measurements

Details of the equipment used, the key noise indices measured, and the weather conditions during the survey are provided in Appendix A. Further information of the survey methodology is provided below.

3.1 Unattended noise measurements

Unattended noise measurements were taken at Position L using a Larson Davis 820 sound level meter. The measurements were conducted over 5 minute periods between approximately 13:00 on Monday 12 and 10:00 on Tuesday 13 December 2016.

The microphone was attached to a pole which was elevated approximately 4 m above the local ground level. Although elevated, the microphone was still partially screened from North Deeside Road by the existing stone wall on the north boundary.

A photograph of the unattended noise monitoring equipment is shown in Figure 3.

Figure 3 Unattended noise monitoring equipment

3.2 Attended noise measurements

Attended sample noise measurements were taken at Positions 1 – 7 using a Bruel and Kjaer 2250 sound level meter. Measurements were taken during the daytime and evening on Monday 12 and during the early hours of Tuesday 13 December 2016.

At each position the microphone was mounted on a tripod approximately 1.2 m above local ground level.

4 Noise survey results

4.1 Observations

The dominant sources of noise on the site were road traffic from North Deeside Road and Inchgarth Road.

Less significant noise sources included road traffic on other roads, occasional aircraft activities and birdsong.

4.2 Unattended noise measurement results

A graph showing the results of the unattended noise measurements is provided in Appendix B.

The average daytime and night-time noise levels were measured to be:

- Daytime (07:00 – 23:00) $L_{Aeq,16h}$ 62 dB
- Night-time (23:00 – 07:00) $L_{Aeq,8h}$ 55 dB

4.3 Attended noise measurement results

The results of the attended noise measurements are summarised in Table 3. The attended measurements were carried out over 10 minute periods during the daytime and evening, and 5 minutes during the night-time.

Table 3 Attended noise measurement results

Position	Start time	Sound pressure levels (dB)				Noise sources
		$L_{Aeq,T}$	$L_{AFmax,T}$	$L_{A10,T}$	$L_{A90,T}$	
Monday 12 December 2016						
1	13:15	76	86	79	65	Road traffic on the A93
2	13:33	62	79	65	53	Road traffic on Pitfodels Station Road, distant traffic on the A93
3	13:59	63	75	68	46	Road traffic on Inchgarth Road, distant road traffic
4	14:14	53	60	56	49	Road traffic on Inchgarth Road, hedge trimming in garden
5	14:33	52	66	55	47	Road traffic on the A93, distant road traffic, birdsong, aircraft
6	14:47	51	62	52	48	Road traffic on the A93, distant road traffic, birdsong
2	15:03	62	74	66	53	Road traffic on Pitfodels Station Road, distant traffic on the A93
3	15:21	64	81	69	48	Road traffic on Inchgarth Road, occasional construction noise, birdsong
7	15:41	54	63	56	50	Road traffic on the A93, distant traffic, birdsong
1	15:55	75	90	79	64	Road traffic on the A93, bus stopping at bus stop
2	16:08	62	75	67	52	Road traffic on Pitfodels Station Road, distant traffic on the A93, overhead aircraft
3	16:25	64	80	69	46	Road traffic on Inchgarth Road
3	17:00	65	76	70	47	Road traffic on Inchgarth Road
2	17:18	62	76	66	52	Road traffic on Pitfodels Station Road, distant traffic on the A93

Table 3 Cont.

Position	Start time	Sound pressure levels (dB)				Noise sources
		$L_{Aeq,T}$	$L_{AFmax,T}$	$L_{A10,T}$	$L_{A90,T}$	
4	20:25	56	74	55	41	Road traffic on the A93, occasional traffic on Inchgarth Road, overhead aircraft
5	20:47	48	59	51	43	Road traffic on the A93, occasional traffic on Inchgarth Road, overhead aircraft
6	21:01	50	70	52	45	Road traffic on the A93, occasional traffic on Inchgarth Road, overhead aircraft
7	21:16	52	62	56	46	Road traffic on the A93, overhead aircraft
Tuesday 13 December 2016						
4	00:22	39	51	42	34	Distant road traffic, occasional traffic on the A93
5	00:34	38	47	41	33	Distant road traffic, occasional traffic on the A93
6	00:43	37	47	41	33	Distant road traffic, occasional traffic on the A93, electricity pylon
7	00:53	39	53	43	31	Distant road traffic, occasional traffic on the A93

5 Assessment criteria

5.1 Local authority consultation

Sandy Brown has discussed the proposed development and the assessment methodology with Nick Glover at Aberdeen City Council Environmental Health department and the following criteria reflect the discussions.

5.2 Criteria – noise-sensitive development

Planning Advice Note 1/2011 *Planning and Noise* provides general advice on the role of the planning system in helping to prevent and limit the adverse effects of noise. The associated companion document, *Technical Advice Note - Assessment of Noise* (TAN) gives more detailed technical advice and worked examples.

In the case of new noise-sensitive development, example 1 of the TAN document can be applied. In this example, the World Health Organisation (WHO) guideline external noise levels of $L_{Aeq,16h}$ 55 dB during the day, and $L_{Aeq,8h}$ 45 dB during the night are used. The amount by which these noise levels are exceeded determines the impact. The quantitative assessment from example 1 of the TAN is reproduced in Table 4.

Table 4 Assessment of magnitude of impacts criteria

External free field night-time noise level x = (Existing – 45*) $L_{Aeq,8h}$ (dB)	External free field daytime noise level x = (Existing – 55) $L_{Aeq,16h}$ (dB)	Magnitude of impact
> 15	>10	Major adverse
10 ≤ x ≤ 15	5 ≤ x ≤ 10	Moderate adverse
5 ≤ x < 10	3 ≤ x < 5	Minor adverse
0 ≤ x < 5	0 ≤ x < 3	Negligible
x < 0	x < 0	No adverse impact

* The $L_{Aeq,8h}$ 45 dB external noise level is based on an internal noise level of $L_{Aeq,8h}$ 30 dB and a partially open window providing a 15 dB attenuation, both as prescribed in the WHO guidelines. It is denoted in this way for convenience in this example. It should be borne in mind that people will normally be inside at night.

5.3 Criteria – noise generating development

5.3.1 General principles

Table 5 identifies the magnitudes of impact associated with an increase (or decrease) in noise level due to the introduction of a new noise generating source based on the guidance of the TAN.

Table 5 Magnitude of impact with change in noise level

Change in noise level, x (dB)	Magnitude of impact
$x \geq 5$	Major adverse
$3 \leq x < 5$	Moderate adverse
$1 \leq x < 3$	Minor adverse
$0 < x < 1$	Negligible adverse
$x = 0$	No change
$-1 < x < 0$	Negligible beneficial
$-3 < x \leq -1$	Minor beneficial
$-5 < x \leq -3$	Moderate beneficial
$x \leq -5$	Major beneficial

The level of significance is determined based on the above quantitative assessment, any additional qualitative assessments, and taking into consideration the sensitivity of the noise-sensitive receptors. In this case, all of the noise-sensitive receptors (dwellings) have a high sensitivity.

The levels of significance associated with the magnitudes of impact are shown in Table 6.

Table 6 Assessment of the level of significance

Magnitude of impact	Level of significance
Major	Large / very large
Moderate	Moderate / large
Minor	Slight / moderate
Negligible	Slight
No change	Neutral

5.3.2 External building services noise

BS 4142:2014 *Method for rating and assessing industrial and commercial sound* provides a framework for assessing the likelihood of complaints from noise sources such as building services plant. The method compares the noise level due to the source against the background sound level.

BS 4142 suggests that if the noise level is 10 dB or more above the existing background sound level, it is likely to be an indication of a significant adverse impact. If the level is 5 dB above the existing background sound level, it is likely to be an indication of an adverse impact. If the level does not exceed the background level, it is an indication of having a low impact.

If the noise contains 'attention catching features' such as tones, bangs etc, a penalty, based on the type and impact of those features, is applied.

Following the guidance of BS 4142, it is recommended that the rating noise level from all proposed new building services plant associated with the development should be no greater than the existing background sound levels.

5.4 Standard guidance for suitable internal noise levels

Guidance on acceptable internal noise levels in residential dwellings is given in BS 8233:2014 *Sound insulation and noise reduction for buildings*, and is also provided by the World Health Organisation. The guidance given by BS 8233 and WHO is shown in Table 7.

Table 7 Internal noise criteria for sleeping/resting

Internal space	Indoor ambient noise level L_{Aeq} (dB)		
	BS 8233 (07:00 to 23:00)	BS 8233 (23:00 to 07:00)	WHO
Living rooms	35	-	30/35[1]
Dining room	40	-	-
Bedrooms	35	30[2]	30[2]

[1] WHO does not differentiate between different types of living spaces, but recommends L_{Aeq} 30 dB in relation to sleep disturbance and L_{Aeq} 35 dB in relation to speech intelligibility. WHO provides a 16 hour time base when referring to speech intelligibility and an 8 hour time base when referring to sleep disturbance.

[2] BS 8233 notes that individual noise events can cause sleep disturbance, and that a guideline value may be set depending on the character and number of events per night, although no specific limit is provided. Section 3.4 of the WHO guidelines for community noise suggests that good sleep will not generally be affected if internal levels of L_{Amax} 45 dB are not exceeded more than 10-15 times per night.

6 Assessment of new dwellings

To assess the suitability of the proposed development, external noise levels across the site have been predicted using the environmental noise modelling software, CadnaA, which has been used to create a noise map of the site.

The noise predictions are based on the predicted 18 hour road traffic flows on the surrounding roads with the development, including the new relief road, and the proposed development plans present. The traffic flow data has been provided by the transportation engineer. The relevant network diagrams are provided in Appendix C.

It is important to note that small changes in traffic flows have negligible effects on noise levels. As an illustration of this, for noise levels to increase or decrease by 3 dB, traffic would have to double or half respectively.

The predicted external noise levels are shown in the form of a noise map in Figure 4. The results are presented in terms of the average daytime ($L_{Aeq,16h}$) noise levels. The night-time noise levels are expected to be around 7 – 8 dB lower than the predicted daytime levels. This is based on the results of the noise survey, and guidance given in the DEFRA publication, *Method for converting the UK road traffic noise index $L_{A10,18h}$ to the EU noise indices for road noise mapping*.

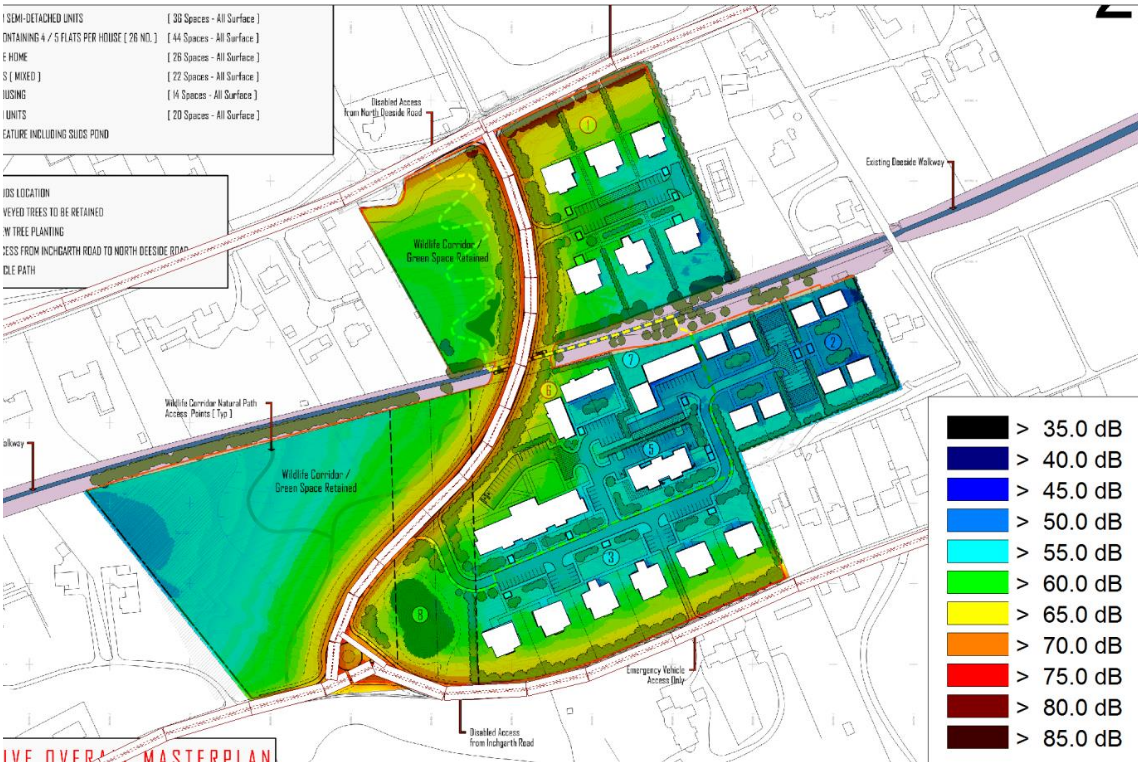


Figure 4 Noise map of the proposed site

It is important to note that the noise map does not show the screening effects that are likely to be provided by the site topography and the existing stone wall on the site boundary to North Deeside Road. The attenuation provided by these features will be dependent on the degree to which line of sight of the road is blocked from the receiver position, but typically a reduction of around 5 – 10 dB would be expected where line of sight is clearly broken.

The noise map shows that higher noise levels will be experienced at receiver points closer to the roads. Conversely, lower noise levels will be experienced further from the roads and where other buildings provide screening.

A summary of the external noise levels predicted outside the facades of the proposed buildings and the magnitude of impacts (following Table 4) are presented in Table 8.

Table 8 Assessment of noise levels on the proposed development

Area	Predicted external noise levels	Magnitude of impact
1	$L_{Aeq,16h}$ 54 – 65 dB $L_{Aeq,8h}$ 46 – 57 dB	Negligible adverse impact – moderate adverse impact
2	$L_{Aeq,16h}$ 51 – 55 dB $L_{Aeq,8h}$ 43 – 47 dB	No adverse impact – negligible adverse impact
3	$L_{Aeq,16h}$ 53 – 65 dB $L_{Aeq,8h}$ 45 – 57 dB	No adverse impact – moderate adverse impact
4	$L_{Aeq,16h}$ 56 – 61 dB $L_{Aeq,8h}$ 48 – 53 dB	Negligible adverse impact – moderate adverse impact
6	$L_{Aeq,16h}$ 56 – 63 dB $L_{Aeq,8h}$ 48 – 55 dB	Negligible adverse impact – moderate adverse impact
7	$L_{Aeq,16h}$ 53 – 58 dB $L_{Aeq,8h}$ 45 – 50 dB	No adverse impact – negligible adverse impact

The assessment indicates that areas 2 and 7 will unlikely require any form of noise mitigation.

It is recommended that noise mitigation measures for areas 1, 3, 4 and 6 be provided. Outline recommendations are given in section 8.1.

7 Assessment of existing dwellings

7.1 Road traffic noise

7.1.1 Existing roads

Table 9 summarises the 18 hour predicted road traffic flows on North Deeside Road and Inchgarth Road, and the predicted change in noise level with the introduction of the proposed development.

The base traffic flows include contributions from currently committed developments and the opening of the AWPR. The traffic flows are taken from network diagrams provided by the transportation engineer and the relevant network diagrams are given in Appendix C.

Table 9 Traffic flows on North Deeside Road and Inchgarth Road

Road	18 hour traffic flow		Predicted change in noise level (dB)
	Base (including committed development and opening of the AWPR)	With development	
North Deeside Road (to the east of the new relief road)	11995	11087	-0.3
North Deeside Road (to the west of the new relief road)	11995	12975	+0.3
Inchgarth Road (to the east of the new relief road)	4439	8848	+3.0
Inchgarth Road (to the west of the new relief road)	4439	1593	-4.5

The data provided suggests significant reductions in road traffic on Pitfodels Station Road and Westerton Road. The road traffic flow modelling assumes 100% of the traffic on these roads will be redistributed to the new relief road.

Table 9 shows that, with the exception of the section of Inchgarth Road to the east of the new relief road, the change in noise level will either be beneficial (i.e. is reduced), or of negligible adverse impact.

The change in road traffic on the section of Inchgarth Road to the east of the new relief road is predicted to increase noise levels in this area by 3 dB. With reference to Table 5, this increase is at the border of minor and moderate adverse impact. In a qualitative sense, the impact is considered to be minor due to it being a change to an existing noise source. The overall level of significance is considered to be slight/moderate.

Given the predicted levels of significance, it is considered that noise mitigation in relation to changes to the existing roads is not required.

7.1.2 New relief road

The proposed location of the new relief road brings it to within approximately 85 m of the nearest existing dwelling to the west, and approximately 35 m to the nearest residential garden.

The distances to other existing dwellings are greater, and the proposed development itself will provide screening to the receptors to the east.

The predicted traffic flows on the relief road indicate that noise levels due to this road outside the nearest existing dwelling are likely to be approximately $L_{\text{Aeq,16h}}$ 57 dB and $L_{\text{Aeq,8h}}$ 49 dB.

The existing noise climate in the vicinity of the dwelling, as measured a similar distance from North Deeside Road (at position 7), is around $L_{\text{Aeq},T}$ 54 dB during daytime hours. The baseline average daytime and night-time noise levels at this location are envisaged to be around $L_{\text{Aeq,16h}}$ 54 dB and $L_{\text{Aeq,8h}}$ 46 dB.

With the introduction of the new road, the total noise level outside the nearest dwelling is expected to increase by 4.7 dB. With reference to Table 5, this change in noise level is of moderate adverse impact. Given the introduction of the new road, the qualitative assessment is considered to be of moderate impact. The overall level of significance is considered to be moderate/large.

In the garden areas, the noise level from the new road will be greater, and the change in noise level greater still.

It is recommended that noise mitigation measures should therefore be provided to protect the amenity of the nearby existing dwellings located to the west of the proposed relief road and to the south of North Deeside Road.

Outline recommendations are given in section 8.2.1.

7.2 External building services noise

7.2.1 Basic limits

Based on the criteria presented in section 5.3.2 and the noise survey results, the cumulative noise level resulting from the operation of all new building services plant 1 m from the worst affected windows of the nearest noise-sensitive premises should not exceed the limits set out in Table 10.

Table 10 Plant noise limits at 1 m from the nearest noise sensitive premises

Location	Daytime (07:00 – 23:00) (dB $L_{Aeq,1h}$)	Night-time (23:00 – 07:00) (dB $L_{Aeq,15min}$)
Dwellings on Inchgarth Road to the south of area 2 (measurement pos. 4)	41	34
Dwellings on North Deeside Road to the west of the proposed plat park (measurement pos.6)	45	33
Dwellings on North Deeside Road and Pitfodels Station Road to the east of area 1 (measurement pos.7)	46	31

The limits set out in Table 10 do not include any attention catching features. The penalties for attention catching features may be significant, and will need to be considered as the building services design progresses. Further information is provided in Appendix D.

7.2.2 Assessment

All building services plant associated with the development will need to be designed to meet the noise limits set out above, including any corrections for attention catching features.

7.3 Car parking and deliveries

7.3.1 Car parking

Car parking is proposed to be provided for the residential and retail units.

Vehicle trip data provided by the transportation engineer indicates that around 310 vehicles are predicted to enter and exit the development site over the course of a day.

The residential parking is proposed to be distributed across the development site and noise levels from parking associated with this is not expected to be significant.

At the closest point, the external car parking associated with the retail units is approximately 55 m to the nearest existing dwelling to the southeast. The masterplan indicates the retail units will have around 22 car parking spaces.

Noise levels from busy external car parks are typically in the region of $L_{Aeq,T}$ 58 dB at 5 m distance from the parking zone. This is based on measurements taken of around 40 car movements over a 15 minute period. The proposed retail units' car park is unlikely to be as busy and therefore noise levels will be lower. Distance losses and screening from the proposed retail units themselves will also reduce the noise levels experienced outside the nearest dwellings. It is considered unlikely that the noise level due to the introduction of the retail unit car parking will significantly change the noise climate outside the nearest dwellings.

Noise mitigation measures in relation to car parking is therefore not considered necessary.

7.3.2 Deliveries

Deliveries to the retail units are anticipated to be via small trucks and vans rather than articulated vehicles.

Sandy Brown has previously measured noise from a range of delivery vehicles. Smaller vehicles such as vans typically measure around $L_{Aeq,T}$ 50 dB at a distance of 10 m.

To the closest dwellings, noise levels from such deliveries would be expected to be reduced to around L_{Aeq} 40 dB although maximum noise from impacts such as doors closing, goods being moved etc would be expected to be higher. The existing daytime ambient noise in the area is around $L_{Aeq,T}$ 53 dB.

To minimise the risk of disturbance due to deliveries, it is recommended that the delivery times should be managed. Recommendations are given in Section 8.2.3.

8 Recommendations

8.1 New dwellings

Outline recommendations for noise mitigation measures for the new dwellings are given in the following sections.

8.1.1 Area 1

- The existing stone wall to the north boundary should be retained (or a new wall constructed) to act as a barrier to reduce noise from North Deeside Road
- The location and height of the north group of houses should be such that line of sight to North Deeside Road is broken to the upper floor windows on the north facing facades by the wall / noise barrier described above
- Windows to noise-sensitive living accommodation should be avoided on the facades directly facing the new relief road
- Windows to the facades highlighted in Figure 5 should have a minimum sound insulation performance of R_w+C_{tr} 27 dB. This performance will be capable of being achieved with double-glazed windows comprising 6 mm glass, 16 mm cavity and 6 mm glass. Trickle ventilators to the same facades should have a minimum sound insulation performance of $D_{n,e,w}$ 31 dB when in the open position
- If a suitable noise barrier cannot be provided on the north boundary, the trickle vents on the north facing facades of the north group of houses should be enhanced and should have a minimum sound insulation performance of $D_{n,e,w}$ 38 dB when in the open position.

8.1.2 Area 3, 4 and 6

- Windows to the facades highlighted in Figure 5 should have a minimum sound insulation performance of R_w+C_{tr} 27 dB. Trickle ventilators to the same facades should have a minimum sound insulation performance as shown in Figure 5 when in the open position.

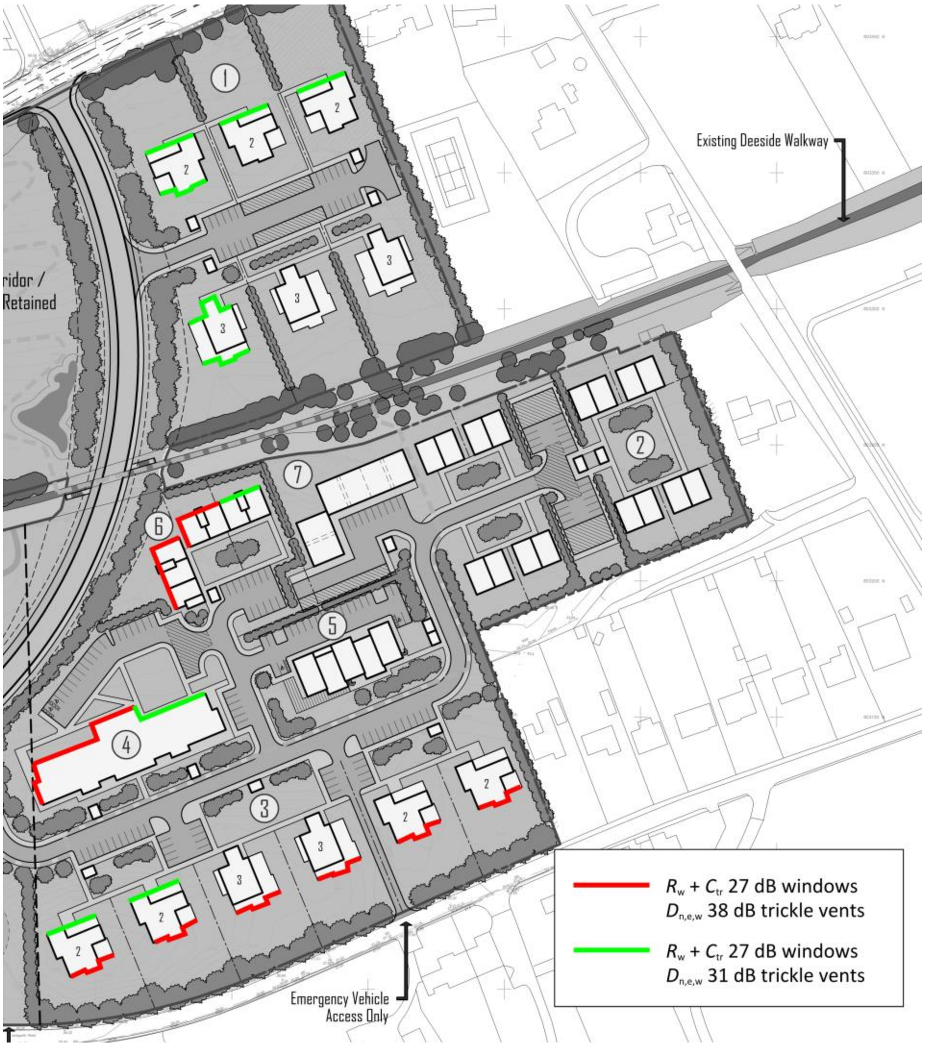


Figure 5 Facade sound insulation mark-up

For all other facades, standard double glazed windows and standard trickle ventilators will be acceptable.

8.2 Existing dwellings

8.2.1 Road traffic

To protect the amenity of the existing dwellings located to the west of the new relief road, it is recommended that a noise barrier should be constructed to screen the road from these properties.

The approximate extent of the noise barrier is shown in Figure 6.

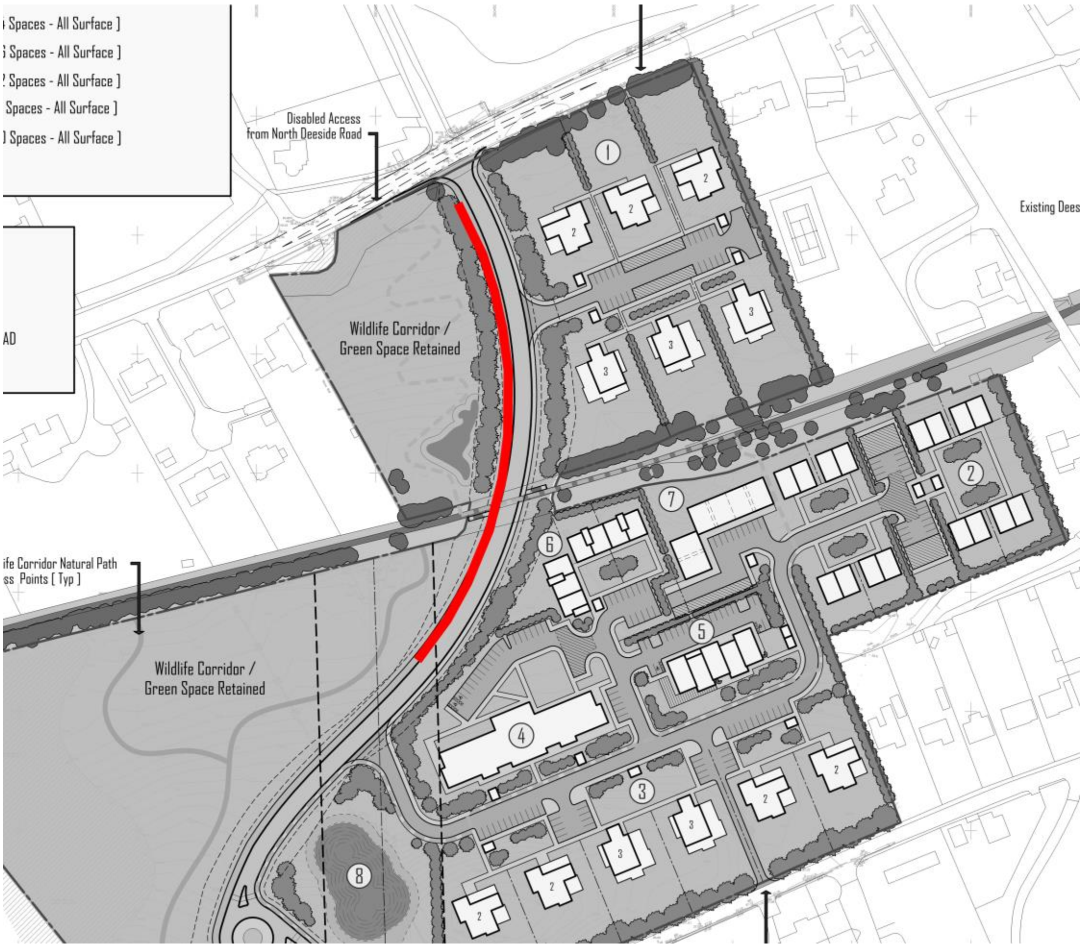


Figure 6 Indicative location of noise barrier to the new relief road

The barrier would need to be continuous along the indicated length and sufficient in height to break line of sight from the road to the upper floor windows of the existing dwellings. A bund and barrier combination may be suitable.

The barrier should be constructed from an imperforate material with a minimum mass of 8 kg/m^2. To prevent increasing noise levels to the development to the east, the inner face of the barrier (facing into the road) should be lined with a sound absorbing finish. Proprietary sound absorbing noise barrier systems are available.

Provided line of sight is sufficiently broken, the barrier would be expected to reduce noise generated by the new road to the existing dwellings by around 5 – 10 dB which would be expected to reduce the level of significance to slight/moderate.

8.2.2 External building services noise

External noise limits for building services plant associated with the proposed development are given in Section 7.2.1.

Building services plant should be designed to ensure the noise limits are met, including any corrections for attention catching features.

At this stage, no information is available in relation to the proposed installation of building services plant, and this will need to be assessed as the design progresses. Achieving the noise limits is however unlikely to be onerous given the anticipated scale of building services plant and with standard noise attenuation measures.

8.2.3 Retail unit deliveries

It is recommended that deliveries and service collections to and from the retail units should where feasible be limited to daytime hours i.e. between 7am and 9pm.

Appendix A

Survey details

Equipment

The calibration details for the equipment used during the survey are provided in Table A1.

Table A1 Equipment calibration data

Equipment description	Type/serial number	Manufacturer	Calibration expiry	Calibration certification number
Larson Davis 820				
Sound level meter	820 /A1140	Larson Davis	17 Sep 2017	1509515
Microphone	4189/1869412	B&K	17 Sep 2017	1509515
Pre-amp	PRM828/1585	Larson Davis	17 Sep 2017	1509515
Calibrator	CAL200/8583	Larson Davis	10 Sep 2017	1509501
2250				
Sound level meter	2250/3010038	B&K	9 Jun 2018	09298/CDK1603788
Microphone	4189/3036540	B&K	9 Jun 2018	09298/CDK1603788
Pre-amp	ZC-0032/24531	B&K	9 Jun 2018	09298/CDK1603788
Calibrator	4231/3016410	B&K	9 Jun 2018	09298/CDK1603776

Calibration of the sound level meters used for the measurements is traceable to national standards. The calibration certificates for the sound level meters used in this survey are available upon request.

The sound level meters and microphones were calibrated at the beginning and end of the measurements using their respective sound level calibrators. No significant deviation in calibration occurred.

Noise indices

The equipment was set to record a continuous series of broadband sound pressure levels. Noise indices recorded included the following:

- $L_{\mathrm{Aeq},T}$ The A-weighted equivalent continuous sound pressure level over a period of time, T.
- $L_{\mathrm{AFmax},T}$ The A-weighted maximum sound pressure level that occurred during a given period with a fast time weighting.
- $L_{\mathrm{A90},T}$ The A-weighted sound pressure level exceeded for 90% of the measurement period. Indicative of the background sound level.

Sound pressure level measurements are normally taken with an A-weighting (denoted by a subscript 'A', eg L_{A90}) to approximate the frequency response of the human ear.

A more detailed explanation of these quantities can be found in BS7445: Part 1: 2003 *Description and measurement of environmental noise, Part 1. Guide to quantities and procedures.*

Weather conditions

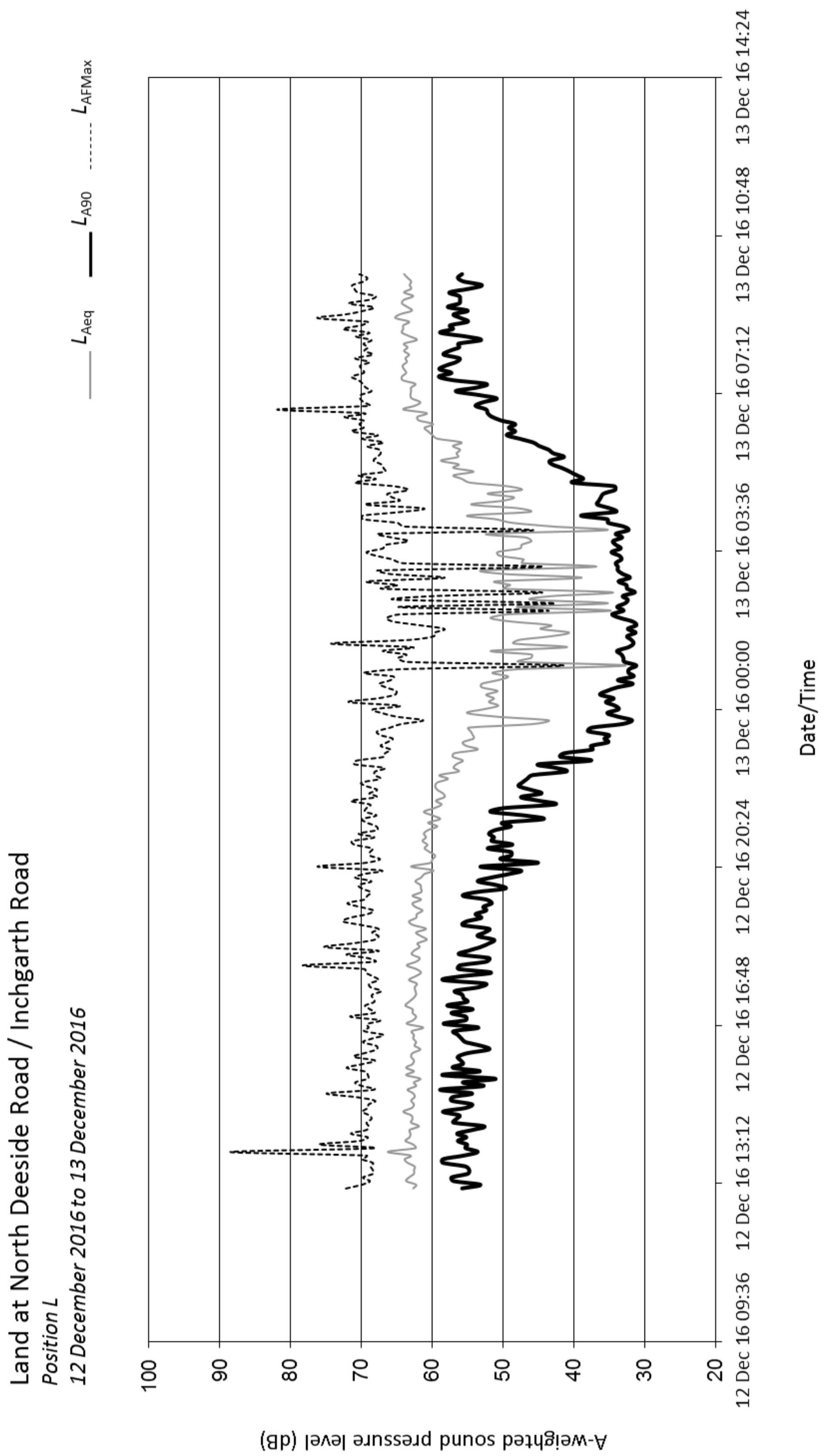
During the daytime, the weather was partially cloudy with dry surface conditions and no rain. Wind speeds were up to approximately 0.6 m/s from the southwest.

During the evening and night-time, the weather was partially cloudy with dry surface conditions and no rain. Wind speeds were less than 0.1 m/s.

The weather conditions are considered suitable for obtaining representative measurements.

Appendix B

Results of unattended measurements at Position L


Land at North Deeside Road / Inchgarth Road
Position L
12 December 2016 to 13 December 2016
L_{Aeq}
L_{A90}
L_{AFMax}
A-weighted sound pressure level (dB)
100
90
80
70
60
50
40
30
20
12 Dec 16 09:36
12 Dec 16 13:12
12 Dec 16 16:48
12 Dec 16 20:24
13 Dec 16 00:00
13 Dec 16 03:36
13 Dec 16 07:12
13 Dec 16 10:48
13 Dec 16 14:24
Date/Time

Appendix C

Road traffic network diagrams

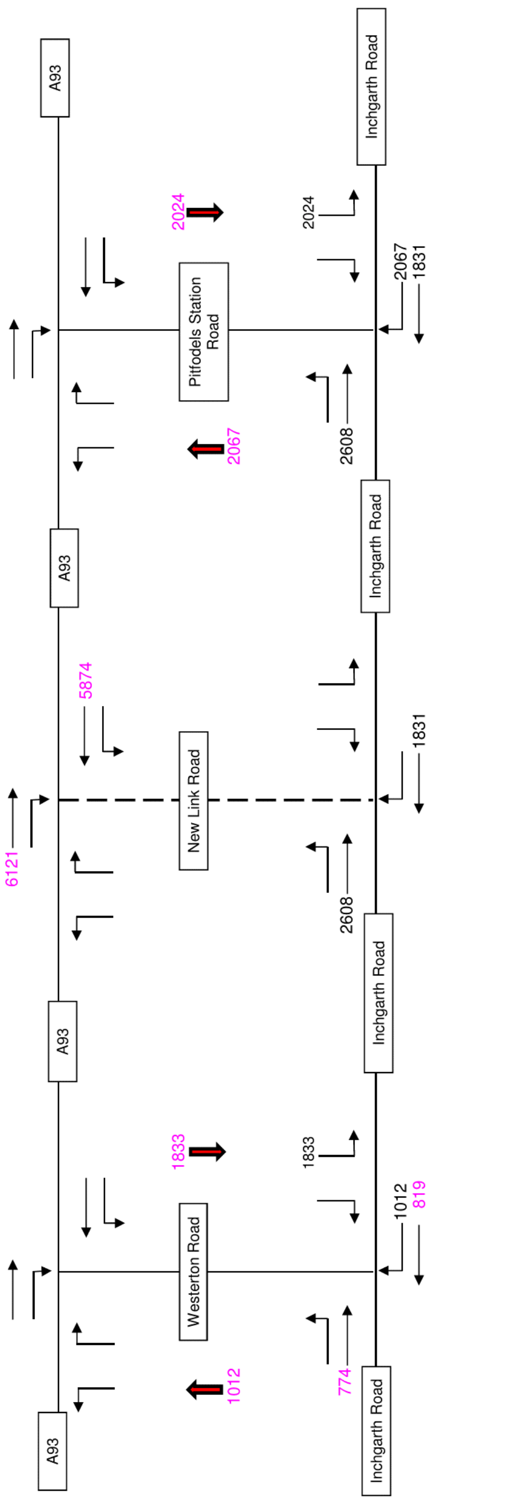


Figure E12: Base + Commited 18hr post AWPR

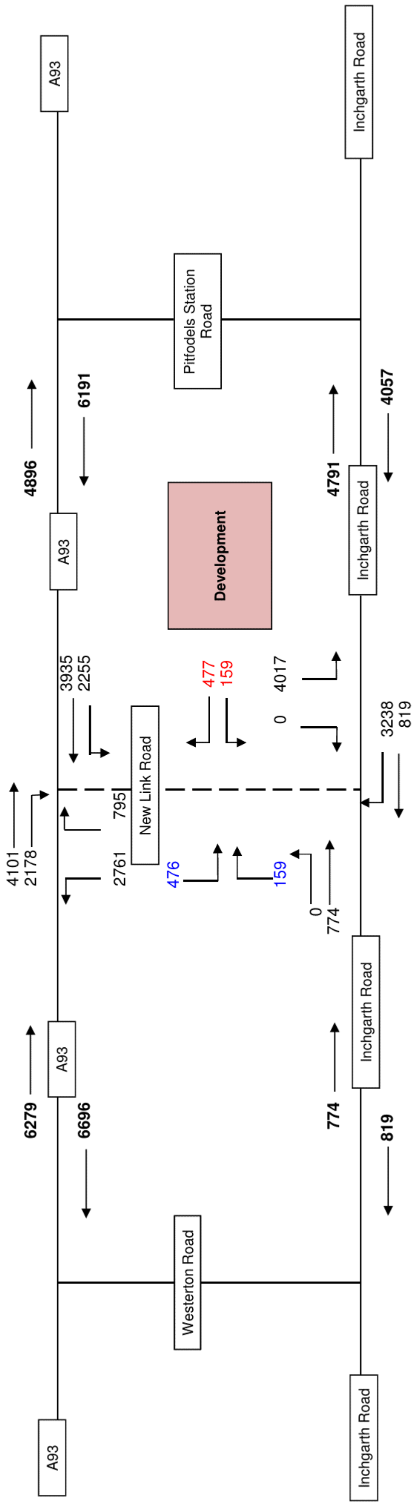


Figure E24: Inchgarth Link Road - 18 Hour (Post WPR) + Daily Development Trips Sensitivity

Appendix D

Attention catching features

If the proposed plant noise contains attention catching features (such as tonal elements, whines, whistles, bangs etc), the plant should be designed to achieve a limit below those set out above, based on the type and impact of the features.

If appropriate, a subjective assessment of the plant features can be adopted. Where the plant noise contains tonal elements, the following corrections can be made depending on how perceptible the tone is at the noise receptor:

- 0 dB where the tone is not perceptible
- 2 dB where the tone is just perceptible
- 4 dB where the tone is clearly perceptible
- 6 dB where the tone is highly perceptible

Where the plant noise is impulsive, the following corrections can be made depending on how perceptible the impulsivity is at the noise receptor:

- 0 dB where the impulse is not perceptible
- 3 dB where the impulse is just perceptible
- 6 dB where the impulse is clearly perceptible
- 9 dB where the impulse is highly perceptible

For noise which is equally both impulsive and tonal, then both features can be taken into account by linearly summing the corrections for both characteristics.

If the plant has other distinctive characteristics, such as intermittency, then a 3 dB correction can be made.

If a subjective assessment is not appropriate then an objective assessment can be made. A noise source is deemed to be tonal if the time averaged sound pressure level in a one-third octave band exceeds the level in adjacent one-third octave bands by the level differences given below:

- 15 dB in the low frequency one-third octave bands (25 Hz to 125 Hz)
- 8 dB in the mid frequency one-third octave bands (160 Hz to 400 Hz)
- 5 dB in the high frequency one-third octave bands (500 Hz to 10000 Hz)

If an objective assessment identifies the plant noise to be tonal then a 6 dB correction must be made.

astell associates
arboricultural, environmental and landscape consultants

Inchgarth Retirement Community

Landscape & Visual Assessment

23rd May 2018

Ref: IRC-1805-VIA

26 Binghill Crescent, Milltimber, Aberdeen, AB13 0HP;
Tel: (01224) 868458; email: info@astellassociates.co.uk
www.astellassociates.co.uk

23rd May 2018
IRC-1805-VIA

Landscape and Visual Assessment

Inchgarth Retirement Community

Contents

23rd May 2018
IRC-1805-VIA

Landscape and Visual Assessment

Inchgarth Retirement Community

1. Executive Summary

This report has been prepared to accompany the planning application for a retirement community in Pitfodels, on the south facing slope which runs from the North Deeside road down to Inchgarth road. The report sets out the findings of a Landscape and Visual Assessment carried out at the request of Cults Property Development Ltd.

An assessment of landscape character, designated sites and structures and local ecology was undertaken within the area. Detailed information is contained in this report with associated maps and illustrations. An assessment of the effects of this development was used to establish if there would be deterioration in the character of the local landscape.

Key visual receptor locations were chosen to maximize the representation of receptor types. Field assessments were then undertaken at a number of locations to ascertain potential or actual views in the area. The landscape and visual effects of each location are discussed in detail in the report and photos and site inspection notes were used to describe the effect that the development would have on the views from each location.

1.1.1. Conclusion

The above analysis of landscape and visual impacts do not indicate any significant effects and, having carefully assessed the potential landscape and visual effects throughout the study area, it is considered that the proposed retirement community in the land between the North Deeside road and Inchgarth road is visually acceptable and will not significantly alter the character of the landscape in this area.

There are large houses and large woodland gardens in the vicinity, and also smaller houses with gardens with mature trees immediately adjacent to the proposed development. This landscape character is extended into the proposed area of the development.

1.1.2. Mitigation

The majority of trees on the site will be retained, maintaining much of the natural screening and biodiversity of this area. The western third of the site will be retained as green space and wildlife corridors; this area will have tree and shrub planting throughout, increasing biodiversity and screening in this area. Landscaping and planting is proposed adjacent to the North Deeside road and a mound with further tree and shrub planting is proposed adjacent to Inchgarth road. Furthermore, along the edges of the proposed link road and throughout the rest of the site there is proposed extensive tree and shrub planting. This will further screen the development from view and to increase the current biodiversity and habitat connectivity of the site.

2. Introduction

Astell Associates is an ecological consultancy, based in Milltimber. The company was established in 1975 and has performed specialist surveys for small and large-scale development projects in different areas of Scotland and England.

Nigel Astell has performed landscape design and visual assessments for projects in the Cairngorms National Park and Loch Lomond World Invitational Golf Course, Cameron House, Loch Lomond. He has also carried out visual assessment and landscaping at Slaley Hall, Northumberland; and Belton Woods, Lincolnshire.

Astell Associates have been commissioned by Cults Property Development Ltd to carry out a Landscape and Visual Impact Assessment (LVIA) of land to the west of Pitfodels Station road, a site in which it is proposed to build 64 houses, 5 retail units, and a 50 bedroom care home. This Landscape and Visual Impact Assessment (LVIA) examines the existing landscape conditions in the setting of the proposed development and its context within the countryside. The landscape and visual characteristics have been investigated to establish quality, character, defining features, and any sensitivity to change.

The assessment of existing landscape and visual receptors, allows the assessment of the degree of change to the landscape, how the landscape will be affected and the potential impact of the development on the landscape.

2.1. Scope of the Assessment

This report covers:

- An assessment of the present landscape and landform.
- Analysis of impact of proposed development on the landscape.
- Photographs from within and out with the proposed development area.
- Analysis of the impact from or to these viewpoints.
- Mitigation measures.

2.2. Project Description.

It is proposed to have a mixed use development in this 9.9 ha site. This will be housing, commercial units, retirement homes, amenity and recreation space, footpaths, cycle ways and areas of natural wildlife corridors. Tree and shrub planting to maintain the woodland connectivity of the area and the formation of planted wildlife corridors will be carried out.

3. Assessment Methodology & Criteria

This report is based on 'Guidelines for Landscape and Visual Impact Assessments' 2002, Edition 2, produced by the landscape Institute and The Institute of Environmental Management And Assessment. It is also based on an analysis of information from site visits, design team meetings, photographs and reference documents.

Landscape and visual effects assessments are separate procedures, but linked in a number of ways. The landscape effects are derived from alterations to the physical landscape which may give rise to changes in the fabric or character of the landscape. Visual effects of those changes arise in the composition of use as a result of the landscape changes.

Following an initial desktop search, including relevant publications, ordnance survey data, and aerial mapping, the findings can be verified in the field. This forms the following:

- The existing situation, topography, built features and patterns of the study area.
- The existing landscape character which is assessed firstly within the desktop study, then verified by field studies.
- The venue and sensitivity of the existing landscape. This will include all relevant statutory and non-statutory designations and the sensitivity of the landscape to change.

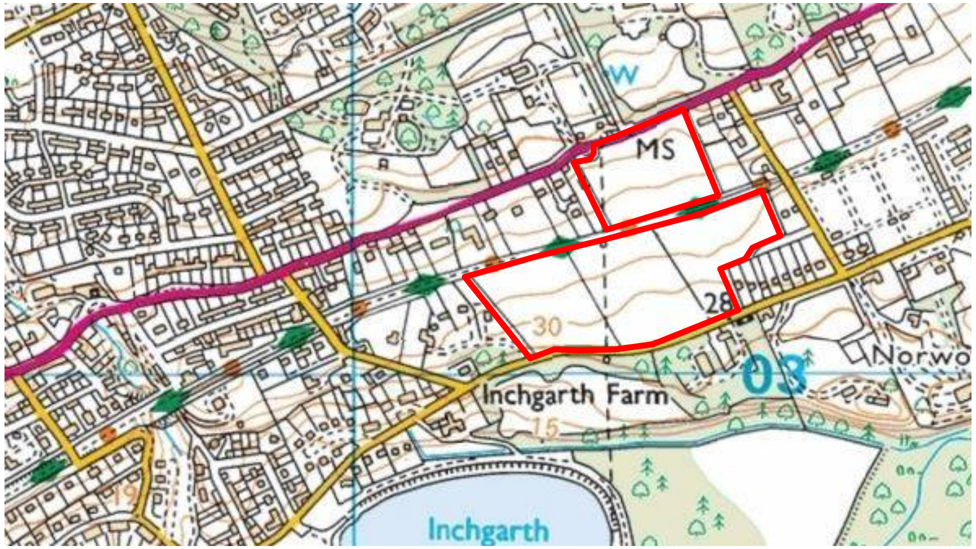
Field studies were carried out in October 2016 and August 2017 to assess the landscape, woodlands, and ecology, to photograph the site from many viewpoints, and to ascertain the impact of proposals at different times of the year.

3.1. Key Stages of the Assessment

This involves the following key stages.

- Establishing the baseline landscape character, quality and value.
- Site reconnaissance and defining the scope of the assessment.
- Assessing the sensitivity to change of the existing landscape.
- Evaluating the impact of the proposed development on the landscape character.
- Assessing these impacts based on magnitude and sensitivity to change.
- Describing the significance of these anticipated effects.

4. Site Location and Description.



The area is made up of two agricultural fields, divided by the Deeside Way / Old Deeside Railway line. The northern field is bordered on the south and east by old beech hedges which have grown to maturity. On the northern edge of this field there is a row of mature, mixed, deciduous trees, immediately adjacent to the North Deeside Road.

The southern field has scattered semi-mature and mature broadleaved trees immediately to the south of the Deeside Way. There are also dense areas of sycamore sapling regrowth and some pockets of scrub further down the slope. This field extends down to Inchgarth Road. There are two drystane dykes which run north to south, which originally divided this area into three fields. Sporadic mature sycamore trees grow adjacent to the dyke along Inchgarth Road.

The agricultural fields were originally used for grazing. However, they have lain unused for a number of years resulting in them being in an unkempt condition. The trees and scrub present on site have established during the period of disuse and are of low ecological value.

Both fields are bordered to the east and west by private, residential gardens.

4.1. Topography and Landuse

The entire site is on a south facing slope, with good drainage and lies between 25m and 50m above sea level. The site is a mixture of rough ruderal and open grass fields, scrubland, scattered trees, and woodland. The area has not been used for agriculture or grazing for a number of years.

4.2. Landscape Value/Designations.

The site is situated within the Pitfodels Conservation Area and many of the trees are protected by a tree preservation order.

The Deeside Way Local Nature Conservation Site runs through the centre of this area, and will be retained.

The site fields are designated as Green Space Network features, and much of these are retained, to the west of the access road.

The area to the south of Inchgarth road and the area to the north of the North Deeside road are classified as ancient woodland (Long Established of Plantation Origin). None of the areas of the site are classified as ancient woodland.

4.3. Archeological, Historic and Cultural Features

The site does not contain any designated cultural heritage assets.

4.4. Public Access

Currently, there is no way-marked walking or cycling route within the proposed site. There are informal desire line paths formed by dog walkers.

The Deeside Way, a long-distance walking and cycling route which links towns along the Dee valley, passes between the two fields of the site. This will provide an excellent means to link the proposed development with the existing community of Pitfodels and other areas along Deeside.

Walkways and cycle ways have been designed into the proposals to give access and connections from the North Deeside Road and Inchgarth Road to the Deeside Way, increasing connectivity in the area.

5. Assessment of Landscape Features, Woodlands, and Trees

Tree grouping is taken directly from the tree assessment (report IRC-1708-TR). The trees on the site have been grouped into eleven areas (labelled A – J) for ease of description. Group G has been separated into two halves to clarify the description of the management. The trees on the edge of the site have been grouped into eight groups (labelled S – Z). These tree groupings will be used to describe line-of-sight implications and alterations from the baseline.

5.1.1. Group A

An area of mature trees, a mixture of beech, sycamore, lime, and horse chestnut, with other species present as individuals. These trees are growing along the base of the retaining wall supporting the North Deeside Road. The development site is currently mainly screened from view by these trees. However, there are some areas, especially in winter, where the field can be glimpsed by pedestrians, but not by car users. The road is proposed to enter the site from the North Deeside road, opposite Baird's Brae. In this area five trees will be felled.

The majority of the trees in Group A will be retained. Immediately south of this area of trees a number of trees and shrubs will be planted. These retained and newly planted trees and shrubs will increase the screening and reduce views into the proposed development.

5.1.2. Group B

This is a dense stand of blackthorn bushes with little natural light penetrating the stand. These bushes will be removed. There will be no impact on the visual amenity.

5.1.3. Group C

Bordering the eastern edge of the north field, is a beech hedge which has been left to grow to maturity and now forms a close-grown line of trees.

The western branches of these trees will be cut back and the trees will be reduced in height. This will encourage adventitious growth, reducing any gaps currently between these trees, further obscuring the eastern edge of this site from view. Views into this part of the development site are only from private gardens, and the screening will be maintained.

5.1.4. Group D

In the southeast corner of the northern field this strip of mature broadleaved trees is mostly sycamore and lime. These trees are situated at the base of the old railway embankment of the Deeside Way. Currently there are gaps between these large mature trees allowing views north, from the Deeside Way, into the northern field of the site.

It is proposed to plant trees and shrubs in the gaps between these mature trees to further screen the proposed development from views.

5.1.5. Group E

This borders the southern edge of the north field and the Deeside Way. It was originally planted as a beech hedge but has been left to grow to maturity, and is now a line of close-grown trees.

The northern branches of these trees will be cut back and the trees will be reduced in height. This will encourage adventitious growth, therefore reducing any gaps currently between these trees further obscuring the development in the eastern part of this northern field from view.

The road through the site will cross the Deeside Way in this area. A section of the mature beech trees at the west end of this hedge will be felled for the road construction.

Following the construction stage of the development the gap created for the road will be reduced with the planting of replacement trees and shrubs.

5.1.6. Groups F, S, & T

Down the western boundary of the north field there are sparse mature trees (F) and a mature cypress hedge (S) partially obstructing this site from view from the west. In the northwest corner, bordering a driveway off the North Deeside Road is an area of scrub and small trees (T). The proposed road through the site will enter the site to the east of this area. Some of the scrub and small trees will be removed for the road construction. This area is to be reinforced with new tree and shrub planting.

It is proposed to retain this entire western area of the northern field as a green space, which will be planted as a wildlife corridor. The western edge of the proposed road will be planted with trees. The green space and line of trees will obscure the site from the west, and from the North Deeside Road.

5.1.7. Groups G1 & U

Along the southern edge of the Deeside Way there is a strip of mature trees. Immediately south of this is a strip of semi-mature woodland bordering the north of the southern field of the site.

This strip of woodland is to be retained as a wildlife corridor and the entire western area of the southern field is to be planted as green space to continue the habitat connectivity from the northern field. This green space will minimize the visual impact from the west and northwest of the site. It will also reduce views into the area from the southwest.

5.1.8. Groups G2 & V

This area of the field has more sparsely growing semi-mature trees. These trees will be felled for the proposals. On top of the railway embankment at the old Pitfodels Station platform there are mature sycamore and ash, which will be retained.

These trees, coupled with the elevation of the embankment screen the development from views from the Deeside Way. Where the embankment levels off to the west a mix of birch and cherry and shrubs will be planted to merge with the existing scattered semi-mature trees in this area, to further reduce views.

5.1.9. Groups H & Z

The properties on the western edge of the southern field of the site are lined with a strip of mature woodland (Z). Immediately to the east of this woodland is a dense stand of semi-mature sycamore (H).

The strip of woodland (Z) will not be affected by the proposals. Its retention will effectively screen the site from the west. The dense sycamore (H) will be felled and in its place a woodland corridor will be planted with indigenous trees and shrubs to increase biodiversity and to extend the woodland area. This green space will minimize the visual impact from the west, southwest and northwest of the site.

5.1.10. Groups I & Y

These are trees positioned sporadically along Inchgarth Road, on the southern edge of the site. They are mostly mature sycamore. Many of the trees are growing close to and damaging the pavement. They are also destroying the drystone dyke along the pavement. Many of these trees will be felled to protect further degradation of the dyke and pavement.

A strip of native woodland will be planted along this southern edge of the site. Inchgarth Road is the lowest point of this site therefore the proposed development will be visible for most of its length along this road. However, as the woodland strip matures and thickens, visibility will be reduced along much of its length. The road in this area will be 2 – 3m below the landscaping contour and this will further reduce views up the hill. Where the proposed road joins with Inchgarth Road, a roundabout is to be constructed and the southern tree line will be broken. To the west of this area is the tree and shrub planting of the open space/wildlife corridor. The new trees planted along this southern boundary and the roadside plantings within the proposed development will interrupt views of the houses and flats from Inchgarth Road.

On the south side of Inchgarth Road, mature tall deciduous and coniferous trees screen views down to and from the River Dee SAC. Between Inchgarth Road and the River Dee are tree fringed fields which screen views into the area from the River Dee walkways and from south of the river.

5.1.11. Group J

This group comprises all the trees growing on the former agricultural field. These young and semi-mature trees are dispersed widely throughout the area. The trees are predominantly sycamore, although there are several spruce in the southeast corner, and some willow.

All of the trees in this field area will be felled. In the eastern area will be the development and new landscape tree and shrub planting. West of the new road the felled trees will be replaced with indigenous species forming the wildlife corridor and public open space.

5.1.12. Group W

There are several large trees in the gardens bordering the eastern edge of the south field of the site.

These trees will be unaffected by the development and the planting of native trees and shrubs along this eastern boundary will enhance screening of the site from this perspective.

5.1.13. Group X

On the southern edge of the eastern end of the site there is a bund bordering a small residential cul-de-sac. There are several large, mature trees growing on this bund. There are also several large, mature trees growing at the northern edge of the gardens immediately to the west of this bund.

The trees on the bund and in the neighbouring gardens will be unaffected by the proposed development. Beyond the western end of the bund trees and shrubs will be planted. These trees will combine with the existing trees to increase screening in this area.

5.2. Site Landscape Features

This is a relatively low-lying site which has existed in its current form for many years and, as such, has few distinctive features, apart from the mature woodland and trees on the field edges.

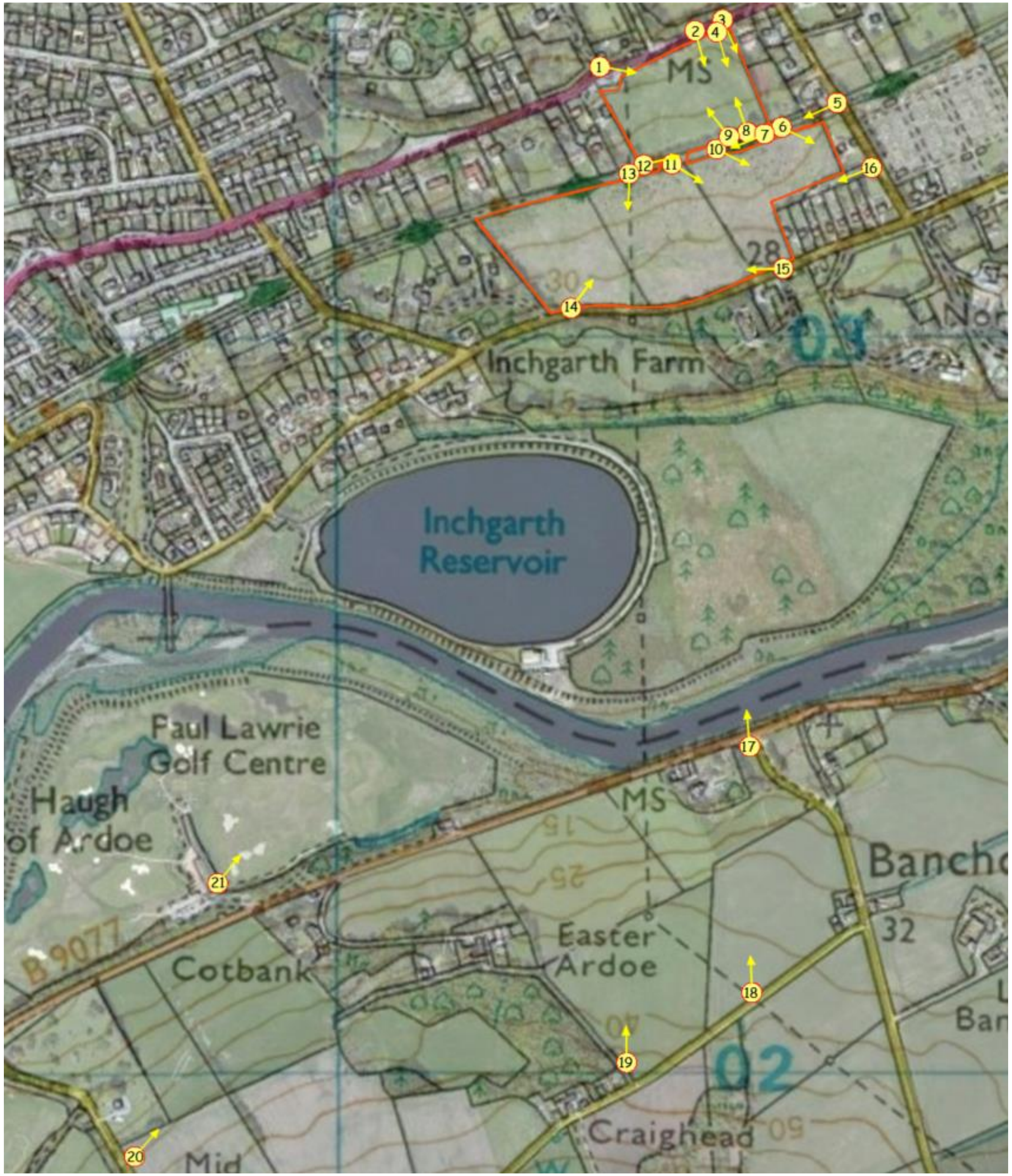
The southernmost boundary is bordered by Inchgarth Road, where there are large numbers of mature trees growing on different contours down to the river Dee. The canopies of these trees mesh together and visually join with the tree belts along the Deeside Way. This prevents views into the site from any areas on the south bank of the Dee Valley. The existing tree cover and proposed planting will mitigate the extent to which any changes to the landscape are visible.

New planting will improve the public open space and pathways through the tree and shrub areas will improve the woodland experience for pedestrians and dog walkers who use these areas at present.

5.3. Summary of Woodland and Landscpe Assessment

The mature trees and woodland areas throughout the site are to be retained. The western area of the proposed development is to be retained as open space and planted as a woodland wildlife corridor. This will increase the biodiversity of the area and maintain habitat connectivity from the North Deeside Road to the Deeside Way, and then south to Inchgarth Road and the River Dee SAC.

It is assessed that the main landscape features, the trees, will not be affected by the development. Limited views to the north from Inchgarth road and to the south from the North Deeside Road will be maintained. These views will be minimized by the maturing of the trees and shrubs planted within the development.



6. Photographic Assessment

Views from the south side of the River Dee, from Banchory-Devenick, Easter Ardoe, Craighead, and from the houses along the Craighead Road to Ardoe House and Mid Ardoe, are also screened by small copses of trees that are found on field edges and corners and associated with gardens in the area.

The visual assessment only found views into the application site along the electricity wayleave, under the pylons that run from north to south across the application site and cross the River Dee towards Easter Ardoe. The mature trees between the proposals and the River Dee will screen the two story houses at the top of the site and the two and three story houses adjacent to Inchgarth Road, on a lower contour. The various woodland and trees on the north facing bank up to Broadgreens, Lochend and around Ardoe House policies screen even distant views into the proposals from these areas.

Views from the golf driving range and 9-hole golf course in the River Dee SAC across Inchgarth Reservoir, only view a very small area of the agricultural fields to the west of Inchgarth House, with no views into the application site.

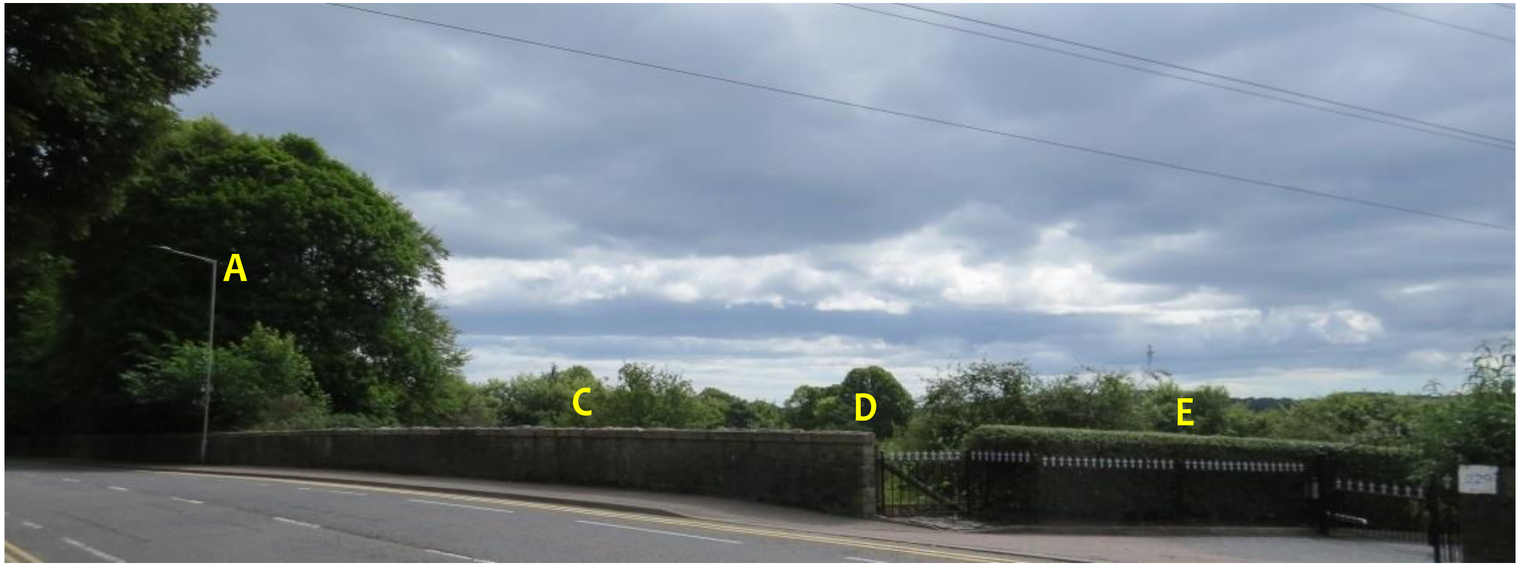


Photo 1:
North Deeside Road, view southeast, over area of public open space. The houses will be constructed on lower ground at the centre of photo. Roofs will be briefly visible as cars go to the east. This view will be screened by new tree and shrub planting.

Photo 1a:
Photo from position 1, adjacent to fence and wall on south side of North Deeside Road. The proposed footpath will enter the site from this position. The ground falls away toward the Deeside Way. View of proposed houses and noise barrier on the western side of the road will be limited and eventually obscured by new tree and shrub planting in the area. Tree belt A is on left of photo and beech hedge C can be seen at the centre of the photo.

Photo 1b:
View during November to show limited view into proposed development. In future the trees on the left of the photo will blend in with the wildlife corridor planting which will extend to the right, increasing the woodland in the area and will screen views towards the new access road.

Photo 2:
View south through tree belt A along North Deeside road. Views of proposed houses will be screened and limited. Further planting will reduce these views during the winter months.

Photo 3:
View towards proposed house positions through tree belt A. Ground contours are reduced as ground falls towards the Deeside Way. Houses are at a lower contour and views into the site are limited. The houses will not be on the skyline but at a lower level, seen against the backdrop of trees. This tree screen is to be thickened by new planting which will widen the tree belt and reduce views during the winter months.

Photo 4:
View from existing field entrance into north field. Beech hedge (trees) (area E) on the north side of Deeside Way are seen across the middle of the photo. Houses in this view will be 7m high and due to the cut and fill operation, will be on a lower contour and less visible against the backdrop of trees. Tree area D is seen on the centre left of this photo.

Photo 5:
View from bridge on Pitfodels Station Road. Deciduous sycamore trees screen views from the bridge and Station Road. One gap into the proposed development area is seen in the centre left of photograph.

Photo 6:
View east on Deeside Way. The old platform is seen in the foreground. Buildings will be visible in the short term in this area.

Photo 7:
View southwest along Deeside Way. Mature trees line the north side of the Deeside Way giving views into the proposed development area. These views are greatly reduced during the summer months. The new tree and shrub planting will increase the depth of the tree screen in this area. This will increase screening and reduce impacts.

Photo 8:
View northwest from Deeside Way. The open area visible is part of the house development area. The sycamore trees in the foreground and birch on the left are growing on the old platform area. The new trees and shrubs planted as part of the development proposals will reduce views into this area.

Photo 9:
View northwest from Deeside Way. A view from further southwest on the Deeside Way. Views of the proposed development will be seen in the winter, but are obscured in summer by trees. Proposed new planting will reduced visibility further.

Photo 10:
View south from Deeside Way. The new buildings will be seen from this area. New tree and shrub planting will reduce this view.

Photo 11:
View southeast from Deeside Way. This view is open at present. In the future the new relief road from north to southwest will remove all views as it crosses the Deeside Way at (4.7m) and effectively removes views of the proposals.

Photo 12:
View northeast along Deeside Way. The beech hedge (Area E), on the left, will be felled to allow the elevated relief road to cross the Deeside Way in this area.

Photo 13:
View south from Deeside Way into amenity area and wildlife corridor. The pylon wayleave is in the area that is to be amenity open space and will be retained as a wildlife corridor. New tree planting will connect the tree belts to the south (Inchgarth Road) with tree belts along the Deeside Way.

Photo 14:
View from Inchgarth Road into site across area of retained public open space. New road and houses will be constructed to the right. Public open space will be central and extending to the left. New tree planting in this public open space, and along Inchgarth Road, will further restrict and screen views into the area.

Photo 14a:
View east along Inchgarth Road from position 6. Mature deciduous and evergreen trees on south side of Inchgarth Road screen the proposed development from views from and to the River Dee SAC. Trees within the proposed development area, along Inchgarth Road, will be felled and replaced with screening trees and shrubs, on contoured mounds at a higher level.

Photo 15:
View west along Inchgarth Road. Mature trees to the south screen the proposals as in Photo 6a. Sycamore trees on north side of Inchgarth Road will be felled and new trees and shrubs planted to screen the proposed development. This photo shows the screening that will be achieved using tree and shrub planting.

Photo 16:
View west towards proposal along access track from Pitfodels Station Road. Views into proposed development screened by trees and large shrubs.

Photo 17:
View across South Deeside Road. Trees and hedging along the South Deeside Road, (B9077) prevent views across to the proposed development. Trees along the South Deeside Road screen the area. Further trees to the north (adjacent to Inchgarth reservoir) also screen the proposals.

Photo 18:
View from Craighead Road. The fields of the proposed development are distant and screened by mature trees.

Photo 18a:
Close up of Photo 9. Proposed development screened by mature trees of ancient woodland along Inchgarth Road and also the proposals are set against the backdrop of trees on the north side of the proposals, the woodland area of Cults and Pitfodels. Small areas of the development can be seen. These areas will be part of the open space/wildlife corridors designed into the west area of the site.

Photo 19:
View from across access road down to Easter Ardoe. View of site restricted to glimpses caused by pylon wayleave.

Photo 19a:
Close up of photo 10. View of application site. The only views are along the pylon wayleave. The views of the site are mainly prevented by the mature trees in the ancient woodland along Inchgarth Road. From these areas of Deeside, the application site is distant with many areas with limited views to the application site. The open areas of the site seen in this photograph are retained as open areas with new tree planting forming wildlife corridors.

Photo 20:
View northeast from above Mid Ardoe. There is no view of the application site from this area. It is screened by mature deciduous and coniferous trees on various levels of the north Deeside bank.

Photo 20a:
Close up of Photo 11 showing no views of the site. The site is screened by mature trees from all areas.

Photo 21:
View northeast from Aspire golf range. Application site is screened by woodlands and tall trees. There are no views of the application site from the golf driving range.

Photo 21a:
Close up of photo 12, mature trees and woodland showing no views into the application site area.

Photo 21b:
Further close up of Photo 12 showing mature trees along the north bank of the River Dee and other mature trees along Inchgarth Road. The field seen centre left (circled) to the west of Inchgarth House is a grass field to the south of Inchgarth Road, not the application site.

7. Viewpoint Analysis

Tables detailing the definitions of the terms used and their categorization are given in Appendices 10.1, 10.2 and 10.3, which should be referred to in association with the following tables.
All photos referred to in tables 7.1 and 7.2 are shown in Section 6.

7.1. Photographs taken close to the development site.

Photo no.	Location	Description	Sensitivity to Change	Magnitude of Change	Level of Impact
1.	Northern site boundary, west – view southeast	The North Deeside Road and the wall and railing at the southern edge of the pavement. Tall trees to the left of the photo and a tree line in the background can be seen over the wall.	Low	Medium	Minor Adverse
1a.	Northern site boundary, west – view southeast	The above wall and railing in the immediate foreground. High bushes to the right, tall trees to the left, between these a view down into a field with a mature tree line in the background.	Medium	Medium	Moderate/ Minor Adverse
2.	Northern site boundary, centre – view south	Mature trees and foliage, the top of a wall visible in the bottom of the photo.	High	Negligible	Negligible
3.	Northern site boundary, east – view south	A gap through thick vegetation, view of green field with mature trees in background.	High	Medium	Moderate Adverse
4.	Northeast corner of site – view south	A green field framed with tall trees and mature vegetation.	High	Medium	Moderate Adverse
5.	Vehicular bridge on Station Road, over Deeside Way.	Mature trees line both sides of the Deeside Way. One gap into the development site is seen.	Medium	Medium	Moderate/ Minor Adverse
6	Adjacent to south platform on old Pitfodels Station.	Mature trees will be retained, as will ruderal vegetation. New flats will be glimpsed through the trees.	Medium	Medium	Moderate/ Minor Adverse
7	Deeside Way, view west. Proposed development on left and right	Views through the trees are readily apparent in winter, but are canopy screening means that only glimpses are seen in summer.	Medium	Medium	Moderate Adverse
8	Deeside Way, looking north, during November.	View north over raised Northern Platform area of Deeside Way. This view is between mature trees to the tree belt along the North Deeside Road.	Medium	High	Moderate Adverse
9	Deeside Way, looking north, during November.	View north over raised Northern Platform area of Deeside Way. This view is between mature trees to the tree belt along the North Deeside Road.	Medium	High	Moderate Adverse

Photo no.	Location	Description	Sensitivity to Change	Magnitude of Change	Level of Impact
10	View south from the Deeside Way. New development to the southeast.	Field slopes from north to south with open views from the Deeside Way. The cut and fill, terraced levels will reduce the apparent height and views of the buildings.	Medium	High	Moderate Adverse
11	View southeast across east area by proposed development.	The development on the east will be seen at present, but in the future, views will be prevented by the elevated relief road crossing the Deeside Way.	Medium	High	Moderate Adverse
12	View east along Deeside Way.	The impact will be greater from east of the new relief road, and negligible from west of the road.	Medium	High	Moderate Adverse
13	View from Deeside Way along existing power line way leave.	Views are of open fields which will be a wildlife corridor and open space planted with many trees and shrubs.	Medium	Negligible	Negligible
14.	Southwest corner of site – view northeast	A sloping field with some scattered trees and a mature tree line at the top. Some tall ruderal vegetation in the foreground partially obscures this view. Area will be open space.	Medium	Negligible	Minor Adverse
14a.	Southern site boundary, west – view east	Inchgarth road and mature trees to the south on the right of the photo, tall ruderal vegetation and scattered trees on left. Field with mature trees in background can be viewed between this vegetation.	Medium	Medium	Moderate/ Minor Adverse
15.	Southern site boundary, east – view west	Inchgarth road and mature trees to the south on the left of the photo, tall ruderal vegetation and dense trees on right. No views into the site through this vegetation.	Medium	Medium	Moderate/ Minor Adverse
16	View west along unnamed access track from Pitfodels Station road.	An unpaved track with large shrubs on the right hand side foreground and mature trees on the left and right background. No views into the site through these trees and shrubs.	Low	Negligible	Negligible

7.2. Photographs taken from South of River Dee.

Photo no.	Location	Description	Receptor Sensitivity	Sensitivity to Change	Magnitude of Change	Level of Impact
17.	South Deeside Road (B9077), adjacent to Banchory Devenick turn off – view north	Dense, tall trees and shrubs bordering roadside. Taller, scattered mature trees are visible behind (above) this.	Low	High	Negligible	Negligible
18.	Craighead road above (south of) South Deeside Road – view north	Field with dense tree line in background, scattered houses and a pylon are visible in the distance.	Low	Low	Negligible	Negligible
18a.	Close up of previous photo	Mature trees up a slope. A line of pylons cuts through with one green field and two roofs visible.	Low	High	Negligible	Negligible
19.	Access road from Craighead road to Easter Ardoe – view north	Access track and fence line with wooden gate in foreground of photo, hedge to left of the photo. Beyond the fence a grass field, beyond this the River Dee surrounded by mature trees, especially on northern bank. Some scattered houses and a line of pylons are the only breaks in otherwise continuous canopy.	Low	High	Negligible	Negligible
19a.	Close up of previous photo.	Tree-covered slopes with pylon wayleave up centre of picture. There are some scattered roofs visible.	Low	High	Negligible	Negligible
20.	Mid Ardoe, south of South Deeside Road – view northeast	Field in foreground, house to left of photo. Beyond the house, a wooded slope with scattered houses.	Medium	Low	Negligible	Negligible
20a.	Close up of previous photo.	A slope entirely obscured by tree canopies, one pylon protrudes. A telegraph pole is in the foreground of the photo.	Medium	High	Negligible	Negligible
21.	Aspire golf range, southern end of driving range sheds – view northeast	Golf course with bunkers in foreground, tall trees to right of photo. Beyond golf course a wooded slope with scattered houses visible.	Medium	Medium	Negligible	Negligible
21a.	Close up of previous photo.	Golf course with bunkers in foreground, scattered scrub beyond with a large, white-roofed shed to the right. Beyond the scrub is a tree-covered slope.	Medium	High	Negligible	Negligible
21b.	Close up of previous photo.	Well-cut grass (golf course) in foreground, scrub beyond, and then wooded hillside. A gap in the trees to the left of the photo shows a green field.	Medium	High	Negligible	Negligible

7.3. Summary of Viewpoint Analysis

Many of the views taken from close to the development site (Nos 1 – 15) were classed as Moderate/Minor Adverse. This is commensurate with the change in use from fields to an urban environment. Views are readily seen into the area from the Deeside Way, both to the north and south. Mitigation measures will be in place to ensure that the existing environmental characteristics of the area are preserved using retained woodlands and tree belts, new tree and shrub plantings, wildlife corridors and pedestrian paths.

The views from the Deeside Way (photos 5 – 13) had a level of impact of Moderate Adverse. This is due to the fact that half of the field areas will be changed to buildings and glimpses of parts of this area will be seen from the Deeside Way. The many mature trees surrounding these areas will be retained, limiting views into the development, especially during summer. New tree and shrub planting will reduce this impact in the near future.

All the views taken from out with the development site (Nos 17 – 21) were classed as Negligible. This is because the site is surrounded by large trees and views of the site are restricted in all directions.

Positions north of the North Deeside Road, from the east at Pitfodels Station Road, and west of the proposed development have no view into the proposed development. Visibility is restricted by topography, buildings and trees. Views from the South Deeside Road are restricted by trees growing at field edges, along the River Dee, and by topography.

The construction phase will require the felling of a number of trees, especially for the link road. Views from the South Deeside Road will not be opened up by this tree felling as they will remain interrupted by trees on different contours in other areas. This can be seen in photos 18a and 19a. The roundabout which connects the link road with Inchgarth Road will not be visible from the south. South of Inchgarth Road and north of the River Dee there is an area of raised elevation woodland, this topography conceals views of the southwest of the site from the south.

The link road curves to the south and southwest and tree and shrub planting on both sides of the new link road will reduce views along the road from areas immediately adjacent to the site. The retained trees adjacent to the Deeside Way will also break up views along the road from different positions on the North Deeside road and Inchgarth road.

8. Conclusion

The assessment of the proposed retirement community at land to the west of Pitfodels Station Road has established that the development will change the landscape and visual amenity baseline conditions during the construction and operational phases.

The construction phases of the proposed development would be relatively short and are considered to have only temporary effects on the landscape and visual amenity of the area.

Once the retirement community is in place, the assessment has shown that there are not likely to be significant effects upon receptors in the study area. It is noted that the visual impacts are generally restricted due to the existing topography, trees, woodlands and existing man-made structures such as housing.

In conclusion, although there would be some localised effects for a small number of receptors located in close proximity to the site, there would be **no significant adverse effect** on the character of the landscape and **no significant adverse effect** on the wider visual amenity.

9. Mitigation

The main adverse effects will be seen from the North Deeside Road, Inchgarth Road, and the Deeside Way, which have close proximity to the proposals, these adverse effects will be short-lived. Along Inchgarth road there will be a raised mound of tree and shrub planting which will screen the proposals from view; the effectiveness of this screening will increase as the planting matures. The tree and shrub planting along the northern edge of the site will soften the proposals from the North Deeside road and eventually screen these proposals from this area. The western third of the site is allocated as green space and wildlife corridor, this, coupled with the tree and shrub planting to the north and south of the Deeside Way will screen these proposals from this area.

The extensive tree and shrub planting in the wildlife corridors, amenity areas, gardens, throughout the site, and adjacent to the new relief road will soften the proposals and eventually screen these proposals from outwith the site.

10. Appendices

10.1. Appendix A: Landscape Impact Assessment & Evaluation Criteria

The *sensitivity to change* of the designated site within the landscape character is arrived at by the review of landscape values and scenic quality.

The *magnitude of change* experienced by the landscape character from designated sites can be evaluated from the development proposal, usually by the description of the impact on specific landscape components in the area.

The *degree of significance of the impact* of the development on the landscape character can be assessed by relating the magnitude of the changes to the sensitivity of the change.

10.2. Landscape Character

The landscape character of an area can be divided into a number of parts, as detailed below:

1. Geological landscape: information on hydrology and human activity.
2. Landscape habitat: landscape features, the land characteristics and vegetation cover.
3. Landscape characteristics and qualities: Through the series, mainly visual - enclosure, diversity, colour, views, features to conserve / enhance.
4. Historic landscape: boundaries, building styles and features of archaeological interest.
5. Cultural landscape: this describes the human activity on the landscape and human cultural influences.

10.3. Landscape Impact

10.3.1. Sensitivity to Change

The sensitivity to change can be related to scenic quality and value, and will be rated as high, medium or low as shown in Table 1.

Table 1: Landscape Sensitivity

Sensitivity	Typical Descriptors
High	A highly valued landscape of high scenic quality, susceptible to change from any development, or small-scale complex landforms with distinctive landscape features.
Medium	A landscape of medium scenic quality which has occasional distinctive features. Settlements may be present in the vicinity.
Low	A landscape of large-scale simple landforms with no distinctive landscape features which will be tolerant of change arising from development. Contains few, if any valued features and existing settlements will be close by.

10.3.2. Landscape Impact – Magnitude of Change

Predicted impacts are reflected by the magnitude of change on the landscape character. This is assessed as shown in Table 2.

Table 2: Magnitude of change on landscape character

Magnitude of Change	Typical descriptors
High	Large scale change that would alter the overall perception and key characteristics of the view
Medium	Changes to a view that would be readily noticeable but not change the overall perception or key characteristics of the view
Low	Some measurable, small scale visual changes to the overall perception and key characteristics of the view.
Negligible	Very minor changes to the overall perception and key characteristics of the view that would barely noticeable with the naked eye

10.3.3. Landscape Impact - Sensitivity Criteria Matrix.

These criteria are a combination of receptor sensitivity and magnitude of change: See tables 1 and 2.

Table 3: Landscape Impact - Sensitivity Criteria Matrix

	Magnitude of Change			
Sensitivity of Landscape	**High**	**Medium**	**Low**	**Negligible**
High	Major	Moderate	Minor	Negligible
Medium	Moderate	Moderate / Minor	Minor	Negligible
Low	Moderate / Minor	Minor	Negligible	Negligible

10.3.4. Landscape Impact – Level of Impact Explained

The level of impact refers to the Sensitivity Criteria Matrix which associates the magnitude of change experienced by a designated site or landscape character area with its sensitivity to change from the development proposal. A direct impact on landscape elements, and whether features will have their relationships modified, are all taken into account when assessing direct impacts on landscape features and key characteristics.

These impacts are recorded in terms of a scale ranging from major – moderate – minor adverse through to negligible then on to minor– moderate – major beneficial. Explanations of the various impacts are given in Table 4 below.

Table 4: Levels of Impact Explained

	The proposed development would result in effects that potentially:
Major Adverse	Would be at considerable variance with the existing landscape character, degrading its integrity Would permanently degrade, diminish or destroy the integrity of valued characteristic features, elements and / or their setting; and/or Cannot be fully mitigated and may cumulatively amount to a major adverse effect.
Moderate Adverse	Would be at noticeable variance with the existing landscape character; and/or Cannot be fully mitigated and may cumulatively amount to a moderate adverse effect.
Minor Adverse	Would be at slight variance with the existing landscape character; and/or Can be largely mitigated with only slight residual adverse effect.
Negligible	Would be compatible with the existing landscape character.
Minor Beneficial	Would improve and enhance the existing landscape character; and/or Would restore valued characteristic features partially lost through other land uses.
Moderate Beneficial	Would markedly improve and enhance the existing landscape character; and/or Would restore valued characteristic features largely lost through other land uses.
Major Beneficial	Would substantially improve and enhance the existing landscape character; and/or Would restore or reinstate valued characteristic features of the area lost through other land uses

10.4. Appendix B: Contact details

Client: Cults Property Development Company Limited
11 Bon Accord Crescent,
Aberdeen.
AB11 6DE

Architect: Fitzgerald & Associates
53 Albert Street,
Aberdeen
AB25 1XT
01224 633 375

Environmental Consultant: Astell Associates
26 Binghill Crescent
Milltimber,
Aberdeen
AB13 0HP
Tel 01224 8686458
email: info@astellassociates.co.uk

10.5. Appendix C: Professional Qualifications

Nigel Astell has been involved in arboriculture for over 40 years. He holds degrees in Botany and Zoology and is a member of the Arboricultural Association and The Chartered Institute of Environmental and Ecological Management.

Tim Stephen has a BSc (hons) in Ecology from the University of Aberdeen. He has been involved in ecological surveying and monitoring work both in the UK and overseas for five years, and has taught on ecology courses for the University of Aberdeen for the past three years.

10.6. Appendix D: Bibliography

- The Landscape Institute with the Institute of Environmental Management and Assessment. *Guidelines for Landscape and Visual Impact Assessment*, 2nd Edition, 2010 Spon Press, Taylor and Francis Group, 270 Madison Ave. New York, NY 10016.
- Natural England and SNH, 2002: *Landscape character assessment: Guidance for England and Scotland. (April 2002)* [Accessed online at http://www.snh.org.uk/pdfs/publications/LCA/LCA.pdf]
- SNH1, 2002: Scottish Natural Heritage. Natural Heritage Zones: a National Assessment of Scotland's Landscapes. 2002. [Accessed online] http://www.snh.gov.uk/docs/B464892.pdf
- Aberdeenshire Local Development Plan 2012, p2 [Accessed online] http://www.aberdeenshire.gov.uk/planning/plans_policies/SGMARR.pdf

10.7. Appendix E: Legislation

Town & Country Planning (Scotland) Act 1997 (as amended)
Town & Country Planning (Trees) Regulations 1999
Health & Safety at Work Act 1974
Construction (Design & Management) Regulations 2015

Directive 92/43/EEC The Conservation of National Habitat & of Wild Flora & Fauna,
Directive 79/409/EEC, The Conservation of Wild Birds (The Birds Directive)
The Wildlife and Countryside Act 1981
Nature Conservation (Scotland) Act 2004
Badgers Act 1992
Natural Environment and Rural Communities Acts 2006
The Conservation (Habitats & c.) Regulations 1994
Annex IV of the EC Habitats Directive 1994

astell associates
arboricultural, environmental and landscape consultants

Inchgarth Retirement Community

Survey of Trees for Bats

23rd May 2018

Ref: IRC-1805-BS

26 Binghill Crescent, Milltimber, Aberdeen, AB13 0HP;
Tel: (01224) 868458; email: info@astellassociates.co.uk
www.astellassociates.co.uk

23rd May 2018
IRC-1805-BS

Survey of Trees for Bat Roost Potential

Inchgarth Retirement Community

Development Proposals

It is proposed to build a retirement community and playing fields in these former agricultural fields. A public road is proposed to connect the North Deeside road to the north of the site with Inchgarth road to the south. Footpaths and wildlife corridors are also proposed.

Purpose of Report

This report, and the accompanying information, is supplied in order to:

- Determine if there is any bat roost potential in the trees.
- Identify the presence or absence of bats roosts in the trees, which may have an impact on the development proposals.
- Recommend mitigation measures, if required, both prior to commencement of the project and after its completion.

Survey Summary

There are several trees in the northern field of the site with bat roost potential. None of the trees in the southern field have bat roost potential. Four trees with bat roost potential are to be felled for woodland management. Two trees with bat roost potential are to be felled for the proposed development. These six trees will be aerially inspected to identify any bat roosts present, before they are felled.

Data Collection & Survey Methodology

A daytime survey of the site was carried out by Nigel Astell and Tim Stephen on 28th November 2016. A follow-up survey was carried out in October 2017 to assess if there had been any changes to the bat roosting potential of the trees following the strong winds of 2017.

The trees in the development site of Inchgarth Retirement Community were surveyed, following the guidelines set out in the Bat Conservation Trust – Bat Surveyors Good Practice Guidelines, and English Nature, Bat Mitigation Guidelines.

The trees in the properties bordering the development site were not surveyed for bats unless they were to be felled for the development.

The following features of trees which can be used as a bat roost were looked for, as on page 64, box 8.1 of the BCT Bat Survey Guidelines:

- Natural holes
- Woodpecker holes
- Cracks / splits in major limbs
- Loose bark behind dense thick ivy
- Hollows and cavities
- Roosts within dense epicormic growth
- Bird and bat boxes

The survey looked for signs indicating possible use of a tree by bats:

- Scratches around entry points
- Staining around entry points
- Bat droppings in / around / below entrance exit points.
- Audible squeaking at dusk or in warm weather.
- Flies round holes / cavities.
- Smoothing of surfaces around cavity.
- Distinctive smell of bats.

Survey Constraints

The conclusions relate to conditions found at the time of inspection. The recommendations contained within this report are valid for a period of one year only.

Trees were inspected from ground level with binoculars. No aerial inspection has been carried out. Due to the time of year there were few leaves on the trees and trees could be assessed easily. Aerial inspection of trees to be felled, which are identified as having bat roost potential, will be required.

Assessment of Environment

This site is located between the North Deeside road and Inchgarth road, immediately to the east of Pitfodels Station road. It is two former agricultural fields, separated by the Old Deeside Way / Old Deeside Railway line and has mature deciduous trees in some areas.

The area is made up of two agricultural fields which have lain fallow for a number of years and are now in an unkempt condition. The Deeside Way / Old Deeside Railway line passes between these fields. The northern field is bordered on the south and east by old beech hedges which have grown to maturity. On the northern edge of this field there is a row of mature, mixed, deciduous trees, immediately adjacent to the North Deeside Road.

The southern field has scattered semi-mature broadleaved trees immediately to the south of the Deeside Way. There are some pockets of scrub further down the slope. This field extends down to Inchgarth Road. There are two drystane dykes which run north to south, equally dividing this field into three. The trees in the southern fields are mainly young / semi-mature trees which do not have features giving any bat roost potential

Both fields are bordered to the east and west by private, residential properties.

The main areas of trees with possibility of bat roost potential are adjacent to the North Deeside \Road and also on the north site of the Deeside Way.

Survey Results & Interpretation

The trees on the north, east and south borders of the northern field (trees 1 – 57 and tree 200), including the mature beech hedges, were surveyed. All the trees in the southern field (trees 58 – 153), and trees 229 – 231 (these lie outwith the development site but are to be felled) were also surveyed.

Each tree was surveyed following the Bat Conservation Trust guidelines. They were studied for cavities, holes, cracks, bark peeling or any other areas of bat roost potential. At this stage, the trees were not climbed. Only those trees with bat roost potential which are to be felled for health and safety or for the proposals will be climbed. The presence or absence of bat roosts in these trees will be established at that time.

No trees in the southern field were found to have bat roost potential. The following table highlights those trees in the northern field with bat roost potential which cannot be identified as bat roosts from the ground. The full survey of trees is detailed in Appendix A.

1	Beech	6	Sycamore	8	Elm	18	Sessile Oak
35	Sycamore	43	Sycamore	44	Ash	57	Birch
200	Norway Maple						

The follow-up survey in October 2017 found no changes to the trees with bat roosting potential since the previous inspections.

Further Inspection

Beech 1 and Norway maple 200 are the only trees with bat roost potential which are to be felled for the proposed development. Elm 8, sycamore 35, ash 44 and birch 57 are recommended to be felled for woodland management. These trees will be climbed to ascertain whether the bat roost potential is capable of supporting bat roosts. Any tree with evidence of bat roosts present will be climbed 24 hours before it is felled to ascertain if bats are occupying these structures.

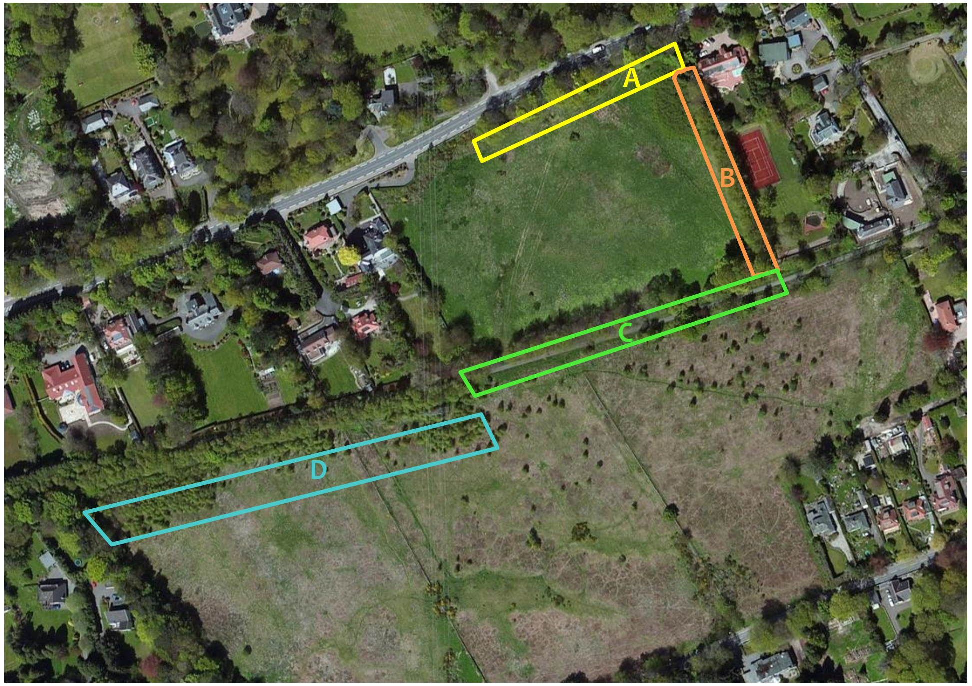
If trees with bat roost potential are not to be felled they will not be climbed.

Refer to Appendix B for table detailing tree categories for bat surveys, or refer to BCT bat survey guidelines, page 65, box 8.2 - Bat Survey Protocol for trees due to be affected by arboricultural works.

Mitigation

It is recommended that 6 Schwegler 2FN Bat Boxes are installed in the trees bordering the Deeside Way at the south of the northern field (area C). 6 Schwegler 2FN Bat Boxes will also be installed in the trees adjacent to the North Deeside road (area A). 4 Schwegler 2FN Bat Boxes will be installed in the beech trees on the east side of the northern field of the proposal (area B). 5 Schwegler 2FN Bat Boxes will be installed in the retained birch woodland to the southwest of the Deeside way (area D).

These bat boxes will provide additional roosting areas to compensate for any lost in the development.



Appendix A: Detail of Survey of Trees for Evidence of Bats

No.	Species	Age	Class	Bat Roost Potential
1	Beech	M	B	Where limb has come off in southeastern limb.
2	Lime	M	B	No bat roost potential.
3	Lime	M	B	No bat roost potential.
4	Norway Maple	M	C	No bat roost potential.
5	Beech	M	B	No bat roost potential.
6	Sycamore	M	C	Bat roost potential.
7	Sycamore	SM	C	No bat roost potential.
8	Elm	M	C	Bat roost potential in hollow at base, on north.
9	Sycamore	M	C	No bat roost potential.
10	Horse Chestnut	M	C	No bat roost potential.
11	Beech	M	B	No bat roost potential.
12	Beech	SM	B	No bat roost potential.
13	Lime	M	B	No bat roost potential.
14	Sycamore	M	B	No bat roost potential.
15	Horse Chestnut	M	C	No bat roost potential.
16	Lime	M	B	No bat roost potential.
17	Norway Maple	M	B	No bat roost potential.
18	Sessile Oak	M	B	Possibly, under ivy.
19	Lime	M	B	No bat roost potential.
20	Sycamore	M	B	No bat roost potential.
21	Lime	M	B	No bat roost potential.
22	Norway Maple	M	C	No bat roost potential.
23	Horse Chestnut	M	B	No bat roost potential.
24	Horse Chestnut	M	C	No bat roost potential.
25	Lime	M	B	No bat roost potential.
26	Lime	M	B	No bat roost potential.
27	Sycamore	M	C	No bat roost potential.

No.	Species	Age	Class	Bat Roost Potential
28	Cypress	M	U	No bat roost potential.
29	Beech	M	B	No bat roost potential.
30	Beech	M	B	No bat roost potential.
31	Beech	M	B	No bat roost potential.
32	Beech	M	B	No bat roost potential.
33	Sycamore	M	B	No bat roost potential.
34	Beech	M	B	No bat roost potential.
35	Sycamore	M	U	Large cavity in main stem.
36	Lime	M	B	No bat roost potential.
37	Sycamore	M	B	No bat roost potential.
38	Norway Maple	M	B	No bat roost potential.
39	Sycamore	M	B	No bat roost potential.
40	Lime	M	B	No bat roost potential.
41	Lime	M	C	No bat roost potential.
42	Lime	M	C	No bat roost potential.
43	Sycamore	M	B	Bat roost potential.
44	Ash	M	U	Bat roost potential.
45	Beech	M	B	No bat roost potential.
46	Beech	M	B	No bat roost potential.
47	Beech	M	B	No bat roost potential.
48	Beech	M	B	No bat roost potential.
49	Beech	M	B	No bat roost potential.
50	Beech	M	B	No bat roost potential.
51	Holly	M	B	No bat roost potential.
52	Beech	M	B	No bat roost potential.
53	Beech	M	B	No bat roost potential.
54	Cherry	M	C	No bat roost potential.
55	Cherry	M	C	No bat roost potential.
56	Cherry	M	C	No bat roost potential.
57	Birch	M	U	Woodpecker hole on north at 5.5m.

No.	Species	Age	Class	Bat Roost Potential
58	Birch	M	B	No bat roost potential.
59	Birch	M	B	No bat roost potential.
61	Willow	SM	C	No bat roost potential.
62	Birch	SM	B	No bat roost potential.
63	Birch	SM	B	No bat roost potential.
64	Willow	SM	B	No bat roost potential.
65	Willow	SM	B	No bat roost potential.
66	Birch	SM	C	No bat roost potential.
67	Birch	SM	B	No bat roost potential.
68	Birch	M	C	No bat roost potential.
69	Birch	SM	C	No bat roost potential.
70	Willow	SM	C	No bat roost potential.
71	Willow	M	C	No bat roost potential.
72	Willow	M	C	No bat roost potential.
73	Birch	M	C	No bat roost potential.
74	Birch	SM	B	No bat roost potential.
75	Willow	SM	B	No bat roost potential.
76	Willow	M	C	No bat roost potential.
77	Birch	SM	B	No bat roost potential.
78	Willow	M	B	No bat roost potential.
79	Willow	M	B	No bat roost potential.
80	Birch	M	B	No bat roost potential.
81	Willow	M	C	No bat roost potential.
82	Birch	SM	B	No bat roost potential.
83	Sycamore	SM	B	No bat roost potential.
84	Willow	SM	B	No bat roost potential.
85	Willow	SM	B	No bat roost potential.
86	Willow	M	U	No bat roost potential.
87	Willow	M	B	No bat roost potential.
88	Willow	M	B	No bat roost potential.

No.	Species	Age	Class	Bat Roost Potential
89	Willow	M	B	No bat roost potential.
90	Birch	SM	B	No bat roost potential.
91	Birch	SM	B	No bat roost potential.
92	Birch	SM	C	No bat roost potential.
93	Ash	M	C	No bat roost potential.
94	Birch	M	B	No bat roost potential.
95	Birch	M	A	No bat roost potential.
96	Willow	SM	B	No bat roost potential.
97	Birch	SM	C	No bat roost potential.
98	Birch	SM	B	No bat roost potential.
99	Birch	SM	B	No bat roost potential.
100	Birch	SM	B	No bat roost potential.
101	Birch	SM	B	No bat roost potential.
102	Birch	M	C	No bat roost potential.
103	Birch	M	B	No bat roost potential.
104	Birch	SM	B	No bat roost potential.
105	Birch	SM	B	No bat roost potential.
106	Birch	SM	B	No bat roost potential.
107	Willow	SM	B	No bat roost potential.
108	Birch	SM	B	No bat roost potential.
109	Birch	SM	B	No bat roost potential.
110	Birch	SM	B	No bat roost potential.
111	Birch	SM	C	No bat roost potential.
112	Birch	SM	B	No bat roost potential.
113	Birch	SM	B	No bat roost potential.
114	Birch	M	C	No bat roost potential.
115	Birch	SM	B	No bat roost potential.
116	Birch	SM	B	No bat roost potential.
117	Birch	SM	A	No bat roost potential.
118	Birch	SM	B	No bat roost potential.

No.	Species	Age	Class	Bat Roost Potential
119	Birch	SM	B	No bat roost potential.
120	Birch	SM	B	No bat roost potential.
121	Birch	M	B	No bat roost potential.
122	Birch	SM	B	No bat roost potential.
123	*Birch*	SM	B	*No bat roost potential.*
124	*Willow*	SM	B	*No bat roost potential.*
125	*Birch*	SM	B	*No bat roost potential.*
126	*Birch*	SM	B	*No bat roost potential.*
127	*Birch*	SM	B	*No bat roost potential.*
128	*Birch*	SM	B	*No bat roost potential.*
129	*Birch*	SM	B	*No bat roost potential.*
130	*Birch*	SM	B	*No bat roost potential.*
131	*Birch*	SM	B	*No bat roost potential.*
132	*Birch*	SM	B	*No bat roost potential.*
133	*Birch*	SM	B	*No bat roost potential.*
134	*Birch*	SM	B	*No bat roost potential.*
135	*Birch*	SM	B	*No bat roost potential.*
136	*Birch*	SM	B	*No bat roost potential.*
137	*Birch*	SM	B	*No bat roost potential.*
138	*Birch*	SM	A	*No bat roost potential.*
139	Beech	M	B	No bat roost potential.
139A	*Elm*	M	B	*No bat roost potential.*
140	Norway Maple	M	B	No bat roost potential.
141	Beech	M	C	No bat roost potential.
142	Sycamore	M	C	No bat roost potential.
143	Sycamore	M	C	No bat roost potential.
144	*Sycamore*	SM	B	*No bat roost potential.*
145	*Sycamore*	SM		*No bat roost potential.*
146	*Sycamore*	SM	B	*No bat roost potential.*
147	*Sycamore*	SM	C	*No bat roost potential.*

No.	Species	Age	Class	Bat Roost Potential
148	Sycamore	M	C	No bat roost potential.
149	Sycamore	SM	B	No bat roost potential.
150	Birch	SM	B	No bat roost potential.
151	Birch	SM	B	No bat roost potential.
152	Birch	SM	B	No bat roost potential.
153	Birch	SM	B	No bat roost potential.
200	*Norway Maple*	M	C	*Some cavities in crown.*
229	*Elm*	M	C	*No bat roost potential.*
230	*Elm*	M	C	*No bat roost potential.*
231	*Sycamore*	M	C	*No bat roost potential.*

Appendix B: Extract from 'Bat Surveys, Good Practice Guidelines'

Page 65, Box 8.2, Bat Survey Protocol for Trees due to be Affected by Arboricultural Work

Tree category and description	Stage 1 Survey requirements prior to determination	Stage 2 Further measures to inform mitigation	Stage 3 Likely mitigation
Category 1 Confirmed bat roost tree with field evidence of the presence of bats, e.g. droppings, scratch marks, grease marks or urine staining.	Tree identified on a map and on the ground. Further assessment to provide a best expert judgement on the likely use of the roost, numbers and species of bat, by analysis of droppings or other field evidence. **Ecologist involvement <u>will</u> be required.**	Avoid disturbance to trees where possible[1]. Further dusk and dawn surveys to establish more accurately the presence, species, numbers and type of roost present, and to inform the requirements for mitigation if felling is required.	Felled under Habitats Regulations licence[2] following the installation of equivalent habitats as a replacement. Felling would be undertaken taking reasonable avoidance measures[3] such as 'soft felling' to minimise the risk of harm to individual bats.
Category 2a Trees that have a high potential to support bat roosts	Tree identified on a map and on the ground. Further assessed to provide a best expert judgement on the potential use of suitable cavities, based on the habitat preferences of bats. **Ecologist involvement <u>may</u> be required.**	Avoid disturbance to trees where possible[1]. More detailed, off-the-ground visual assessment Further dusk and dawn surveys to establish the presence of bats and, if present, the species, numbers and type of roost to inform the requirements for mitigation if felling is required.	Trees with confirmed roosts following further survey would be upgraded to Category 1 and felled under licence as above. Trees with no confirmed roosts would be downgraded to Category 2b and felled taking reasonable avoidance measures[3].
Category 2b Trees with a moderate/low potential to support bat roosts	None. **Ecologist involvement is <u>unlikely</u> to be required.**	Avoid disturbance to trees where possible[1]. No further surveys.	Trees would be felled taking reasonable avoidance measures[3].
Category 3 Trees with negligible potential to support bat roosts	None. **Ecologist involvement will <u>not</u> be required unless new evidence is found.**	None.	No mitigation for bats required.

Appendix C: Bats in Scotland

Bats are nocturnal animals which roost all day, huddled together in dark sheltered places. At dusk they will leave their roosts and forage. All British bats primarily feed on invertebrates, with most of their diet consisting of flies, beetles and moths. Bats therefore prefer to forage in areas with a high insect population such as woodlands, scrub, wetlands, river corridors and flower rich grasslands.

Bat Habitat

Bats use different roosts during different times of year, and for different purposes. A bat colony will generally return to the same roosts year after year.

Bats hibernate over winter in a communal roost and generally remain inside from autumn to spring, although some can be drawn out of hibernation by a moderately high midday temperature or a mild night, when a temperature of 40°F (4.5°C) is sufficient to wake them and bring them out for an hour's hunt. Winter roosts are typically caves, mines, buildings and hollow trees which have constant low temperatures and high humidity.

In spring, the bats may use alternative roost sites which are used during the day.

By summer the female bats will be found at a maternity roost where they will give birth and suckle young. Preferred sites for a maternity roost are hollow trees, buildings and bridges.

Signs of Bat Habitation

In areas where bats are roosting dark pellet-like droppings will be found on walls and floors, as well as dark smudges and urine stains.

Due to the bats using roosting areas for many years, these droppings will accumulate and become an obvious sign of the presence or absence of bats.

On exiting the roost area bats normally void urine, which over time will leave characteristic marks at the entrance/exit to the roost.

Appendix D: Bat Licensing

Much bat work can be carried out without a license. Survey planning, bat detection and looking for signs of bat presence do not require a license. A license is only needed once it has been established that there are bats present.

A license is required by anyone needing to disturb, take, or possess bats for either scientific or survey purposes.

Further advice is available from the
Bat Conservation Trust, www.bats.org.uk and
Scottish Natural Heritage www.snh.gov.uk 01224 642863

Appendix E: Bats and the Law

Because populations of most species have declined in past decades, all British bats have been protected by law since 19821. The legal protection they receive has recently been strengthened by changes to the law arising from European Union obligations. All bat species found in Scotland are classed as European Protected Species.

All bat species are protected by the Wildlife and Countryside Act, 1981 (as amended), and the Conservation (Natural Habitats, etc.) Regulations, 1994. This legislation makes it illegal to intentionally or recklessly kill, injure or disturb bats, or destroy their roosts. It is therefore essential to establish whether the works being proposed will affect bats or their roosts.

Appendix F: Surveyor Qualifications

Nigel Astell has been involved in ecology and arboriculture for over 45 years. He holds degrees in Botany and Zoology and is a member of the Arboricultural Association and The Chartered Institute of Environmental and Ecological Management.

Nigel Astell is also a trained and experienced climber / arborist and has been climbing in the northeast for the last 40 years.

Tim Stephen has a BSc (Hons) Ecology from The University of Aberdeen, and has been involved in ecological surveying, research, species identification and teaching on ecology field courses in the UK and overseas for the past four years.

Appendix G: References

- www.nbn.org.uk - National Biodiversity Network web site.
- Bat Surveys - Good Practice Guidelines (3^{rd} Edition - 2016)
  Bat Conservation Trust, 250 Kennington Lane, London.
- Bat Workers Manual 3^{rd} Ed - Mitchell-Jones & Mc Leish (2012),
  Joint Nature Conservation Committee. Peterborough.

Appendix H: Contact Details

Client:
Cults Property Development Company Limited,
11 Bon Accord Crescent,
Aberdeen.
AB11 6DE
Tel: 01224 959826

Environmental Consultant:
Nigel Astell
Astell Associates
26 Binghill Crescent
Milltimber,
Aberdeen
AB13 0HP
Tel 01224 8686458
email: info@astellassociates.co.uk

[redacted]

Nigel Astell
Astell Associates

astell associates
arboricultural, environmental and landscape consultants

Inchgarth Retirement Community

Tree Survey

23rd May 2018
Ref: IRC-1805-TR

26 Binghill Crescent, Milltimber, Aberdeen, AB13 0HP;
Tel: (01224) 868458; email: info@astellassociates.co.uk
www.astellassociates.co.uk

23rd May 2018
IRC-1805-TR

Inchgarth Retirement Community

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Introduction

Astell Associates have been instructed by Cults Property Development Company Limited to advise on trees and the constraints on development at Inchgarth Retirement Community.

This report is intended to accompany the Planning Application as a document supporting the application and demonstrating that the implications of the proposed development on the arboricultural, landscape and cultural (conservation) value of the trees on the site have been fully considered.

Limitations

This is a preliminary assessment from ground level and observations have been made solely from visual inspection for the purposes of assessment for planning and the proposed development. No invasive or other detailed internal decay detection instruments have been used in assessing trunk condition.

The conclusions relate to conditions found at the time of inspection. The recommendations contained within this report (Tree Schedule) are valid for a period of one year only. Any significant alteration to the site that may affect the trees that are present or have a bearing on the planning implications (including level changes, hydrological changes, extreme climatic events or other site works) will necessitate a re-assessment of the trees and the site.

It should be noted that this survey is not a tree safety inspection. It is carried out in order to inform the planning process

Site Visit and Tree Assessment Methodology

Site visits were undertaken in October, November and December 2016 by Nigel Astell and Tim Stephen. A follow-up survey was carried out in October 2017 to ascertain if there had been any changes to the trees on the site after the high winds during 2017. This current survey updates the 2016 survey.

The inspection took place from ground level aided by the Visual Tree Assessment method (Mattheck and Breloer, 1994). A Laser Ace Hypsometer was used to establish tree heights and canopy distances.

The development design is guided by the tree constraints on site, and the locations of roads and buildings conform with BS: 5837 (2012) (Trees in Relation to Design, Demolition and Construction – Recommendations).

Survey Methodology

Many trees with a diameter of over 12cm have been numbered and surveyed for tree species, height, number of stems, stem diameter, branch spread (to N, S, E and W), condition, tree category and suitability for retention. See Appendix B for a plan showing location of each tree and its arboricultural tree category (Drawing IRC-1708-AA).

Data collected regarding individual trees and groups of trees is detailed in the Tree Schedule, Appendix A.

Development Proposals

It is proposed to build residential properties, retail units, and a care home in these former agricultural fields. A public road is proposed to connect the North Deeside road to the north of the site with Inchgarth road to the south. Footpaths and wildlife corridors are also proposed.

Tree Preservation Orders / Conservation Areas

The site is situated within a Conservation Area.

All of the trees at this site are protected by a Tree Preservation Order. However, the majority of the trees to be felled are semi-mature sycamore and willow which have self-established in the southern field since it has lain fallow. The mature trees around the fringes of the fields and along the Deeside Way will mostly be unaffected by the developments. Any trees which are to be felled will be replaced in the landscaping of the site following the construction phase.

The area to the south of Inchgarth road and the area to the north of the North Deeside road are classified as ancient woodland (Long Established of Plantation Origin). None of the areas of the site are classified as ancient woodland.

Site Description

The site is made up of two agricultural fields, divided by the Deeside Way/Old Deeside Railway line. The northern field is bordered on the south and east by old beech hedges which have been left to grow into mature trees. On the northern edge of this field, bordering the North Deeside Road, there is a row of mature, broadleaved trees, mainly sycamore, beech and lime.

The southern field has scattered, semi-mature, broadleaved trees (sycamore, willow, and birch) immediately to the south of the Deeside Way. This band of trees thickens to woodland to the west of the site. Down the western border of the south field there is a dense stand of semi-mature sycamore and dense sycamore saplings. Along Inchgarth road there are several mature, broadleaves (mainly beech and sycamore). Towards the southeastern corner of the site there is a stand of semi-mature sycamore and spruce. Many of the trees in this area are small diameter close-grown sycamore saplings with little ground flora below.

The agricultural fields were originally used for grazing. However, they have lain unused for a number of years resulting in them being in an unkempt condition. The trees and scrub present on site have established during the period of vacancy and in many cases are of low value.

The tree inspection of October 2017 found no significant differences had occurred since previous surveys in 2016.

Trees Within Site

The trees on the site have been grouped into ten areas (labelled A – J) for ease of description. Group G has been separated into two halves to clarify the description of the management. The trees on the edge of the site, which will have implications for the development, have been grouped into eight groups (labelled S – Z).

Group A (trees 1 – 28)

An area of mature trees, a mixture of beech, sycamore, lime, and horse chestnut, with a few other species present as individuals. These trees are growing along the base of the retaining wall of the North Deeside road.

The road enters the site from the North Deeside road, opposite Baird's Brae. In this area five trees (1 – 4 and 200) will be felled. An embankment is formed from the North Deeside road down to the development which involves a raise in height of the new road of around 1.5m

Group B

This is a dense stand of blackthorn bushes with little natural light penetrating the stand. These bushes will be felled.

Group C (trees 29 – 34)

Bordering the eastern edge of the north field, is a beech hedge which has been left to grow to maturity and now forms a close-grown line of trees. Five of the largest beeches within the hedge line were measured to give a root protection area of this tree belt. A large sycamore growing in the southern area of this hedge (tree 33) was also measured.

The western branches of these trees will be cut back and trees will be reduced in height by 5 – 7m. This will reduce the required root protection area of these trees, however the existing root protection area will be used to protect the trees.

Group D (trees 35 – 44)

In the southeast corner of the northern field this strip of mature broadleaved trees is mostly sycamore and lime. These trees are situated at the base of the old railway embankment of the Deeside Way.

These trees will be unaffected by the development as it is outwith the root protection area.

Group E (trees 45 – 53)

This borders the southern edge of the north field and the Deeside Way. It was originally planted as a beech hedge but has been left to grow to maturity, and is now a line of close-grown trees. There are some birch and holly growing amongst these beeches. Eight of the beeches were measured to give a root protection area for this overgrown hedge.

The northern branches of these trees will be cut back and the trees will be reduced in height by 5 – 7m. This will reduce the root protection area of these trees, however the existing root protection area will be used to protect the trees.

The new road will cross the Deeside way adjacent to an existing field entrance here. The line of close-grown beech hedge trees to the east and west of the new road will be felled back to a distance of 13m (including trees 46 – 49), as shown on plan IRC-1711-TP.

Group F (trees 54 – 56)

These are three mature cherry trees, which are situated in the southwest of the north field of the site.
These trees will be unaffected by the proposals.

Group G (trees 61 – 77, 86 – 88, 110 – 138, and 150 – 153)

This strip, along the northern edge of the southern field, is a stand of semi-mature trees. These are mostly sycamore with some birch and willow. Only those trees which have a DBH larger than 20cm have been measured and recorded. The remaining trees are often close-grown, self-seeded trees growing in this former agricultural field.

G1 This area will be retained as a 25m wide woodland wildlife corridor. The sycamore saplings in this area will be removed.

G2 This is the area of field with more sparsely growing semi-mature trees. These trees will be felled for the proposals.

Group H

This is a dense stand of semi-mature sycamore. They have been cut to the ground in the past and have grown back coppiced. The trees grow very closely together and do not allow penetration by natural light. These trees have not been individually labelled or measured.
This area will be clear-felled and mulched.

Group I (trees 93 and 139 – 149)

These trees are positioned sporadically along Inchgarth Road, on the southern edge of the site. They are mostly mature sycamore. Many of the trees are growing on, or from under, the dyke along the Inchgarth Road pavement.

The new road will form a roundabout with Inchgarth road here. Trees 93, 139, 139A, and 140 – 149 will be felled for this roundabout and also for the emergency vehicle access.

Group J (trees 78 – 82, 84 – 92, and 94 – 109)

This group comprises all the other trees growing on the former agricultural field. These young and semi-mature trees are dispersed widely throughout the area. Only willow and birch with a DBH larger than 20cm have been labelled and measured. Smaller trees within these agricultural fields have not been labelled. The trees are predominantly sycamore, although there are several spruce in the southeast corner.

All of the trees in this area will be felled for the development.

Trees Outwith Development Site

Group S

This is a mature cypress hedge adjacent to the boundary wall of the site. The largest cypress in the hedge was measured to offer a root protection area for the whole hedge. This hedge will be unaffected by the development.

Group T

This is an area of scrub and small trees bordering a driveway to the northwest of the site. Any small trees /scrub adjacent to the new access road will be felled. A footpath runs through the wildlife corridor and joins the North Deeside Road around 30m west of the access road, through group T .

Group U (trees 207 – 212)

This is a strip of trees along the southern edge of the Deeside Way. The majority of these trees are birch and sycamore although there are some pine present. Six of the trees in this strip were measured to give a root protection area for the largest trees present.

These trees will be unaffected by the development.

To the east of area U is an open area with no trees between area E and area G. In this position there are no trees bordering the Deeside Way.

Group V (trees 58, 59, and 213 – 218)

These trees are on top of the railway embankment at the old Pitfodels Station platform. These are mostly sycamore and birch. Not all of the trees in this area were labelled and measured, only the largest trees have been measured to give a root protection area for the trees in this area.

Group W (trees 219 and 220)

There are several large trees in this garden bordering the eastern edge of the south field of the site. Two of the larger trees, a birch and a beech, have been measured and labelled in order to provide a root protection distance for this edge of the site.

These trees will be unaffected by the development.

Group X (trees 221 – 228)

On the southern edge of the eastern end of the site there is a bund bordering a small residential cul-de-sac. There are several large, mature trees growing on this bund, including a particularly large sycamore. There are also several large, mature trees growing at the northern edge of the gardens immediately to the west of this bund. Eight of these trees have been measured to provide a root protection distance from this edge of the site.

These trees will be unaffected by the development.

Group Y (trees 93 and 229 – 231)

There are several trees growing on the edge of the pavement on Inchgarth road, They grow from the top of a ruinous wall. Three of the trees in this area have been measured.

Trees 93 and 229 – 231 will be felled for health and safety as they are further damaging the ruinous dyke.

Group Z (trees 201 – 206)

The properties on the western edge of the southern field of the site are lined with a strip of mature woodland. Six of the largest trees on the edge of these properties have been measured and described in order to provide a root protection distance for this edge of the site.

Tree 201 will be felled for the access road. The other trees will be unaffected by the development.

The cut and fill does not extend within 25m of the western boundary. A wildlife woodland corridor will be planted to extend the woodland area in this part of the development and give connectivity from the northwest to southwest of the site.

Tree Felling for Management

The following trees are recommended to be felled for woodland management or health and safety. No 202 onward are outwith the site boundary but are either dead or present a danger to public safety and should be felled.

7	Sycamore	8	Elm	9	Sycamore
24	Horse Chestnut	28	Cypress	44	Ash
93	Ash	202	Elm	203	Elm
229	Elm	230	Elm	231	Sycamore

Tree felling in relation to bats

The trees below have been identified as having bat roost potential from a ground level assessment. These trees are to be felled for the proposals or for woodland management. There are other trees with bat roost potential which are to be retained see report IRC-1801-BS for details of these trees. The trees below will be climbed to ascertain whether the bat roost potential is capable of supporting bat roosts. Any tree with evidence of bat roosts present will be climbed 24 hours before it is felled to ascertain if bats are occupying these structures. Refer to report IRC-1801-BS for details.

1	Beech	8	Elm	35	Sycamore	44	Ash
57	Birch	200	Norway Maple				

Tree Management in Relation to Development

The following trees will be felled for the proposed development:

1	Beech	2	Lime	3	Lime	4	Norway Maple
46	Beech	47	Beech	48	Beech	61	Willow
62	Birch	63	Birch	64	Willow	65	Willow
66	Birch	67	Birch	68	Birch	69	Birch
70	Willow	71	Willow	72	Willow	75	Willow
76	Willow	77	Birch	78	Willow	79	Willow
80	Birch	81	Willow	82	Birch	84	Willow
85	Willow	86	Willow	87	Willow	88	Willow
89	Willow	90	Birch	91	Birch	92	Birch
94	Birch	95	Birch	96	Willow	97	Birch
98	Birch	99	Birch	100	Birch	101	Birch
102	Birch	103	Birch	104	Birch	105	Birch
106	Birch	107	Willow	108	Birch	109	Birch
110	Birch	111	Birch	112	Birch	113	Birch
114	Birch	115	Birch	116	Birch	117	Birch
118	Birch	126	Birch	127	Birch	128	Birch
139	Beech	139A	Elm	144	Sycamore	145	Sycamore
146	Sycamore	147	Sycamore	200	Norway Maple		

The tree schedule with management recommendations for each tree is given in Appendix A

Tree Protection

All trees shown as retained within the tree table and site plans that accompany this report, should be protected in accordance with British Standard BS:5837 2012 - Trees in Relation to Design, Demolition and Construction, prior to the commencement of any development activity at the site.

The Tree Protection fencing will be erected in the locations shown in Drawing IRC-1711-TP (Appendix C). Details of fencing can be found in Appendix F.

Tree felling and remedial tree works will be undertaken before this fencing is erected.

After any tree felling and remedial tree works have been completed, the tree protection fencing must be erected before any demolition, site preparation or construction work commences, i.e. as the first operation on site following Planning Approval.

Paths

Footpaths have been designed to run from north to south, connecting the North Deeside Road with the Deeside Way (Old Railway Line) and also from the Deeside Way to Inchgarth Road.

One public footpath runs through the public open space on the west side of the access road. The second connects the Deeside Way with Inchgarth Road on the west side of the development proposals.

The paths are designed to go around the retained trees and where they pass over root plates of trees these areas will be constructed using the 'no-dig' construction method using a cellular confinement system, as detailed in Appendix H.

Underground Service Installation

Details of any proposed service runs associated with the proposed development have not been provided. However, any service runs in proximity to the retained trees will be excavated in accordance with National Joint Utilities Group (NJUG) Guidelines for installing and maintaining services close to trees (NJUG 10) or using thrust-bore technology.

Arboricultural Method Statement

1. All tree felling and tree surgery to overgrown beech hedges will be carried out. All works to BS3998: 2010 'Recommendations for Tree Works'.
2. Position of tree protection fencing will be marked out by the arboricultural consultant and site manager.
3. Tree protection fencing will then be erected as shown on plan IRC-1711-TP.
4. After erection the fencing will be inspected by the arboricultural consultant to confirm its correct positioning and construction.
5. The location and construction of the tree protection fence will then be confirmed in writing to the architect, the client and Aberdeen City Council Environmental Planners.
6. Tractor mounted mulchers will then remove the blackthorn scrub in the northern field and the sapling sycamore and semi-mature trees in the development area of the southern field.
7. Ground preparation to include topsoil stripping and benching of the site for roads and houses will then be carried out.

General Precautions

No materials that are likely to have an adverse effect on tree health will be stored or discharged within 10 metres of the trunk of a tree that is to be retained. Consideration will be given to the implications of storing materials upslope of retained trees to avoid the risk of potential spillages leaching down-slope and contaminating the Root Protection Area of a tree.

Such materials include:

- Oil
- Bitumen
- Cement

No fires will be lit within 20 metres of the trunk of any tree that is to be retained. Concrete mixing will not take place within 10 metres of the trunk of any tree.

Contingency Plans

In the event of unforeseen incidents occurring, that may adversely affect or threaten the welfare or security of the trees, the resident Site Agent/Manager shall inform the Arboricultural Consultant at the earliest opportunity and not more than one working day following the incident.

The Arboricultural Consultant will visit the site to inspect and assess the circumstances and make any appropriate recommendations. The Local Planning Authority Tree Officer will be informed by the Arboricultural Consultant of such incidents and recommendations will be submitted for approval to the Local Planning Authority, initially verbally, and subsequently in writing.

A record of any emergency incidents and works shall be maintained by the Arboricultural Consultant.

Incidents which may merit such contingency plans include:

- Accidental / unauthorised damage to the limbs, roots or trunk of trees
- The spillage of chemicals within or adjacent to a Root Protection Area
- The discharge of toxins / waste within or adjacent to a Root Protection Area
- The un-scheduled and / or un-supervised breaching of a tree protective barrier or Construction Exclusion Zone.

Supervision and Monitoring

An Arboricultural Consultant will be responsible for monitoring of all operations relating to arboricultural issues and will issue written confirmation of satisfactory completion of the following operations:

- Remedial tree works
- The erection of protective barriers around the retained trees in accordance with Drawing DCA-1711-TP
- The installation of all ground protection measures
- The excavation of trenches for any services if within the root protection area of trees.
- The excavation of any foundations within the identified Root Protection Areas
- The construction of all new hard surfaces within the Construction Exclusion Zones as marked on Drawing IRC-1711-TP.
- The construction of any new structures within the identified Root Protection Areas

Astell Associates will visit the site twice monthly and a record of site visits completed by the Arboricultural Consultant will be maintained for inspection.

The record of these site visits will be communicated in writing to the client, the architect, the contractor and Aberdeen City Council environmental planners.

On completion of the development the tree belts will be inspected for health and safety and reports written to inform future management of the woodlands and tree belts in the area.

The responsibility for these inspections will be passed on to the management company.

Replacement Planting

Following the tree felling for the proposals, woodland management and health and safety, replacement and landscape planting will be carried out, as detailed on plan IRC-1708-LS.

Appendix A Tree Schedule

No	Species	Dia at 1.5m (cm)	Canopy Radius (m)				Height (m)	RPA (m)	Age	Class	Description	Action
			N	S	E	W						
1	Beech	84	12	16	5	3	21	10.1	M	B	Twin-stemmed from 3m, tree has slight lean west, canopy suppressed to north and south but tree appears healthy.	Fell for development.
2	Lime	61	7	12	9	3	19	7.3	M	B	Canopy suppressed to south, adventitious stems at base, tree appears healthy.	Fell for development.
3	Lime	58	6	10	6	4	17	7.0	M	B	Tree has slight lean northwest, ivy becoming dominant in crown.	Fell for development.
4	Norway Maple	64	5	7	4	6	18	7.7	M	C	Twin-stemmed from 9m, tree leans southeast. Canopy one-sided to southeast, suppressed to north by beech, but tree appears healthy.	Fell for development.
5	Beech	76	8	12	12	5	18	9.1	M	B	Tree leans northwest, canopy mainly one-sided to northwest, some large canopy branches growing to southeast, tree appears healthy.	Retain
6	Sycamore	78	6	10	4	3	16	9.4	M	C	Tree has slight lean southwest, canopy suppressed by neighbouring, tree appears healthy	Retain at present.
7	Sycamore	30	5	6	2	1	9	3.6	SM	C	Tree suppressed by neighbouring trees.	Fell for management.
8	Elm	86	5	16	3	6	19	10.3	M	C	Three-stemmed from 4m, tree has substantial lean southeast. Canopy one-sided to southeast, dead wood, snags, and broken and hanging branches apparent in crown. There are some signs of Dutch elm disease and substantial rot at base to northwest.	Fell for safety.
9	Sycamore	49	6	9	2	5	17	5.9	M	C	Twin-stemmed from 2.75m, tree leans southeast, with a one-sided canopy to southeast. Tree suppressed by neighbouring trees.	Fell for woodland management.
10	Horse Chestnut	68	12	12	5	6	16	8.2	M	C	Tree leans northwest, canopy mainly one-sided to northwest, there is some rot at base, but not extensive.	Retain and inspect at regular intervals.
11	Beech	75	10	12	5	6	21	9.0	M	B	Tree leans southeast, canopy one-sided to southeast, tree appears healthy.	Retain
12	Beech	29	4	6	5	4	8	3.5	SM	B	Canopy one-sided to southeast, canopy to northwest suppressed by large branches from neighbouring beech and lime.	Retain
13	Lime	60	10	11	7	4	20	7.2	M	B	Canopy one-sided to east, canopy suppressed by neighbouring trees, but tree appears healthy.	Retain
14	Sycamore	48	8	9	5	2	17	5.8	M	B	Twin-stemmed from 6m, canopy suppressed to north and south by neighbouring trees, but tree appears healthy.	Retain
15	Horse Chestnut	70	7	11	9	5	16	8.4	M	C	Tree has slight lean southeast, canopy one-sided to southeast, with large branches stretching to southeast, dead wood and snags apparent in crown.	Retain at present.
16	Lime	53	7	7	5	4	19	6.4	M	B	Canopy suppressed to north by neighbouring trees, substantial adventitious growth at base, tree appears healthy.	Retain

No	Species	Dia at 1.5m (cm)	Canopy Radius (m)				Height (m)	RPA (m)	Age	Class	Description	Action
			N	S	E	W						
17	Norway Maple	46	4	5	5	3	15	5.5	M	B	Twin-stemmed from 5m, canopy suppressed to north and south by neighbouring trees, ivy becoming dominant in crown, bark damage at base but rot not evident.	Cut ivy, retain and inspect at regular intervals.
18	Sessile Oak	80	8	10	7	6	20	9.6	M	B	Canopy one-sided to east and southeast, ivy becoming dominant in crown, but tree appears healthy.	Cut ivy, retain and inspect at regular intervals.
19	Lime	68	7	6	6	8	16	8.2	M	B	Twin-stemmed from 8m, tree has slight lean north, appears healthy.	Retain.
20	Sycamore	103	8	14	3	8	17	12.4	M	B	Canopy suppressed to north, mainly one-sided to south and southeast, some dead wood and snags but tree appears healthy.	Retain.
21	Lime	66	14	8	6	4	19	7.9	M	B	Twin-stemmed from 12m, canopy suppressed to east, and one-sided to west, dead wood and snags apparent but tree appears healthy.	Retain
22	Norway Maple	52	12	12	4	4	16	6.2	M	C	Twin-stemmed from 5m, canopy suppressed to northwest, one-sided to southeast, dead wood, snags, and cavities apparent.	Retain and inspect at regular intervals.
23	Horse Chestnut	72	14	12	8	5	17	8.6	M	B	Canopy suppressed to northwest, one-sided to southeast, trunk damage at base, rot present but not extensive.	Retain and inspect at regular intervals.
24	Horse Chestnut	57	7	18	7	6	15	6.8	M	C	*Twin-stemmed from 3.5m, tree leans southeast with one-sided suppressed canopy mainly to southeast, tree suppressed by neighbouring trees.*	*Fell for woodland management.*
25	Lime	75	14	10	5	5	21	9.0	M	B	Canopy mainly one-sided to southeast, tree appears healthy.	Retain
26	Lime	67	9	12	8	3	21	8.0	M	B	Tree has slight lean north, canopy suppressed to south, tree appears healthy.	Retain
27	Sycamore	27, 16, 25	4	6	5	6	12	4.1	M	C	Three-stemmed from 0.1m, tree leans east, canopy mainly one-sided to south, tree appears healthy.	Retain at present.
28	Cypress	51	4	4	2	5	10	6.1	M	U	*Multi-stemmed from 6m where tree has been pollarded in past, tree has uprooted to southwest.*	*Fell*
29	Beech	19, 28, 27	3	1	2	11	17-23	4.8	M	B	Trees 29, 30, 31, 32 and 34 forma substantial beech hedge.	Cut back western branches and reduce height by 5-7m.
30	Beech	62, 33	2	2	4	12		8.4	M	B	Tree appears healthy.	Cut back western branches and reduce height by 5-7m.
31	Beech	30, 32, 17, 14	2	2	5	13		5.9	M	B	Tree appears healthy.	Cut back western branches and reduce height by 5-7m.
32	Beech	18, 17, 25, 18, 24, 22, 24	2	2	8	10		6.8	M	B	Tree appears healthy.	Cut back western branches and reduce height by 5-7m.
33	Sycamore	59	4	4	5	8	14	7.1	M	B	Tree has slight lean to southwest, canopy mainly one-sided to southwest, tree appears healthy.	Retain

No	Species	Dia at 1.5m (cm)	Canopy Radius (m)				Height (m)	RPA (m)	Age	Class	Description	Action
			N	S	E	W						
34	Beech	25, 19	2	2	8	6		3.8	M	B	Tree appears healthy.	Cut back western branches and reduce height by 5-7m.
35	Sycamore	113	9	0	2	2	6	13.6	M	U	Top has broken off at 6m in the past, substantial rot in main stem where limb has broken off in past, rot extended to base.	Remove large limb to northwest, retain as wildlife monolith.
36	Lime	76	8	8	4	5	21	9.1	M	B	Twin-stemmed from 3m, tree leans south, canopy suppressed to north, tree appears healthy.	Retain
37	Sycamore	97	10	10	7	8	21	11.6	M	B	Twin-stemmed from 4.5m, canopy suppressed to north and south by neighbouring trees, dead wood and snags apparent, but tree appears healthy.	Retain
38	Norway Maple	68	12	13	3	5	21	8.2	M	B	Twin-stemmed from 6m, canopy suppressed to north and south by neighbouring trees, appears healthy.	Remove lower large limb growing to northwest.
39	Sycamore	74	16	16	4	8	19	8.9	M	B	Three-stemmed from 4m, tree leans southwest, canopy suppressed to north and south, tree appears healthy.	Retain
40	Lime	100	12	10	8	12	25	12.0	M	B	Three main stems from 7m, tree appears healthy.	Retain
41	Lime	22	6	3	4	6	14	2.6	M	C	Tree has fallen in the past and is growing at the base of old railway line embankment.	Retain at present.
42	Lime	84	7	7	8	9	18	10.1	M	C	Tree has substantial lean north with many adventitious stems at base, tree appears healthy.	Retain at present.
43	Sycamore	116	12	12	7	7	18	13.9	M	B	Twin-stemmed from 4.5m, large limb growing to northeast at 2m, dead wood and snags apparent in crown.	Retain and inspect at regular intervals.
44	*Ash*	68	8	4	5	5	19	8.2	M	U	*Four main stems from 8m, north limb has broken and fallen into sycamore 43. Dead wood snags and rot apparent in crown, tree is in poor condition.*	*Fell*
45	Beech	104	10	11	5	2	18	12.5	M	B	Twin-stemmed from 1.5 and 3.5m, tree has substantial lean east, canopy mainly one-sided to east.	Retain at present.
46	*Beech*	82	12	7	4	3	16-21	9.8	M	B		*Fell for development.*
47	*Beech*	62	6	9	3	1		7.4	M	B		*Fell for development.*
48	*Beech*	67	6	9	3	1		8.0	M	B		*Fell for development.*
49	Beech	32, 36, 62, 20	8	9	3	7		9.7	M	B		Retain
50	Beech	33	6	7	6	1		4.0	M	B		Retain
51	Holly	52	4	5	5	5	9	6.2	M	B	Four main stems from 0.3 and 0.6m forming a multi-branched canopy, tree growing between beech hedge stems, appears healthy.	Retain

No	Species	Dia at 1.5m (cm)	Canopy Radius (m)				Height (m)	RPA (m)	Age	Class	Description	Action
			N	S	E	W						
52	Beech	50, 50, 36	20	12	8	2		9.5	M	B		Retain
53	Beech	89	5	10	2	7		10.7	M	B		Retain
54	Cherry	21	3	3	5	2	14	2.5	M	C	Tree leans north, canopy one-sided to north, appears healthy.	Retain at present.
55	Cherry	25, 28	4	5	7	0	18	4.5	M	C	Twin-stemmed from 0.4m, tree leans north, canopy one-sided to north, appears healthy.	Retain at present.
56	Cherry	41	6	8	8	4	19	4.9	M	C	Twin-stemmed from 1.8m, tree leans northwest, canopy one-sided to northwest, appears healthy.	Retain at present.
57	Birch	82	5	5	1	1	8	9.8	M	U	Twin-stemmed from 5m, the top of one of the main limbs has broken off, birch polypore fructifications are evident in crown.	Pollard 1m above divergent angle, retain for wildlife.
58	Birch	59	5	6	7	3	10	7.1	M	B	Tree appears healthy.	Retain
59	Birch	48	5	6	3	6	10	5.8	M	B	Tree appears healthy.	Retain
61	*Willow*	17, 19, 15	5	5	5	5	8	3.5	SM	C	*Tree appears healthy.*	*Fell for development.*
62	*Birch*	15	4	1	5	4	8	1.8	SM	B	*Tree appears healthy.*	*Fell for development.*
63	*Birch*	18, 16, 12	4	4	5	5	7	3.2	SM	B	*Tree appears healthy.*	*Fell for development.*
64	*Willow*	19, 26	5	4	5	3	7	3.9	SM	B	*Tree appears healthy.*	*Fell for development.*
65	*Willow*	27, 13, 12	5	5	6	6	7	3.9	SM	B	*Tree appears healthy.*	*Fell for development.*
66	*Birch*	17, 13, 8, 10	5	3	4	3	6	3.0	SM	C	*Tree appears healthy.*	*Fell for development.*
67	*Birch*	22	4	3	3	3	9	2.6	SM	B	*Tree appears healthy.*	*Fell for development.*
68	*Birch*	29	3	6	4	4	9	3.5	M	C	*Tree appears healthy.*	*Fell for development.*
69	*Birch*	18, 18	2	3	2	2	8	3.1	SM	C	*Tree appears healthy.*	*Fell for development.*
70	*Willow*	16, 22	5	3	4	3	6	3.3	SM	C	*Tree appears healthy.*	*Fell for development.*
71	*Willow*	18, 12, 14	8	6	7	6	9	3.1	M	C	*Tree appears healthy.*	*Fell for development.*
72	*Willow*	14, 17, 16	6	5	5	6	10	3.3	M	C	*Tree appears healthy.*	*Fell for development.*
73	Birch	20, 13	2	3	3	3	8	2.9	M	C	Tree appears healthy.	Retain at present.
74	Birch	19	3	3	3	2	10	2.3	SM	B	Tree appears healthy.	Retain
75	*Willow*	21, 14, 8	4	5	4	5	7	3.2	SM	B	*Tree appears healthy.*	*Fell for development.*
76	*Willow*	23, 14, 12, 12, 15, 21, 18	8	8	8	6	7	5.4	M	C	*Tree appears healthy.*	*Fell for development.*

No	Species	Dia at 1.5m (cm)	Canopy Radius (m)				Height (m)	RPA (m)	Age	Class	Description	Action
			N	S	E	W						
77	Birch	20	3	2	4	4	7	2.4	SM	B	Tree appears healthy.	Fell for development.
78	Willow	9, 8, 22, 8, 10, 10, 9, 12, 9, 10, 9	7	5	6	5	6	4.5	M	B	Tree appears healthy.	Fell for development.
79	Willow	54	5	5	5	4	9	6.5	M	B	Tree appears healthy.	Fell for development.
80	Birch	25	4	3	4	3	10	3.0	M	B	Tree appears healthy.	Fell for development.
81	Willow	22, 17, 14, 10	5	7	6	5	9	3.9	M	C	Tree appears healthy.	Fell for development.
82	Birch	17, 14	4	5	5	3	8	2.6	SM	B	Tree appears healthy.	Fell for development.
83	Sycamore	28	7	4	4	8	10	3.4	SM	B	Tree appears healthy.	Fell for development.
84	Willow	20, 11, 15	5	7	6	4	8	3.3	SM	B	Tree appears healthy.	Fell for development.
85	Willow	14, 11, 14, 13, 12, 10, 18	5	5	6	5	8	4.2	SM	B	Tree appears healthy.	Fell for development.
86	Willow	18, 17, 14, 13	7	2	7	2	8	3.8	M	U	Tree has fallen to southeast in the past, main stem lies on ground, height comes from branch growth.	Fell for development.
87	Willow	15, 16, 17, 19, 16, 27	8	5	7	8	11	5.5	M	B	Tree appears healthy.	Fell for development.
88	Willow	12, 17, 16, 10, 10, 12, 11, 14, 12	5	6	7	4	11	4.6	M	B	Tree appears healthy.	Fell for development.
89	Willow	12, 20, 20, 16	4	5	6	5	9	4.2	M	B	Tree appears healthy.	Fell for development.
90	Birch	20, 8, 12	4	5	2	5	9	3.0	SM	B	Tree appears healthy.	Fell for development.
91	Birch	17	2	4	4	4	8	2.0	SM	B	Tree appears healthy.	Fell for development.
92	Birch	18	5	2	6	6	8	2.2	SM	C	Tree appears healthy.	Fell for development.
93	Ash	18, 12	5	1	6	2	9	2.6	M	C	Tree appears healthy.	Fell for development.
94	Birch	24, 18, 18	2	5	4	4	10	4.2	M	B	Tree appears healthy.	Fell for development.
95	Birch	24	3	4	5	6	10	2.9	M	A	Tree appears healthy.	Fell for development.
96	Willow	27, 11	5	2	3	6	8	3.5	SM	B	Tree appears healthy.	Fell for development.
97	Birch	22, 15	5	4	5	5	10	3.2	SM	C	Tree appears healthy.	Fell for development.
98	Birch	13, 12, 11	3	4	3	5	7	2.5	SM	B	Tree appears healthy.	Fell for development.

No	Species	Dia at 1.5m (cm)	Canopy Radius (m)				Height (m)	RPA (m)	Age	Class	Description	Action
			N	S	E	W						
99	Birch	11, 11	2	3	3	2	7	1.9	SM	B	*Tree appears healthy.*	*Fell for health and safety due to position on dyke.*
100	Birch	14, 11, 13	3	2	2	2	8	2.6	SM	B	*Tree appears healthy.*	*Fell for development.*
101	Birch	16	4	3	4	4	8	1.9	SM	B	*Tree appears healthy.*	*Fell for development.*
102	Birch	22, 12, 14	4	6	5	6	9	3.4	M	C	*Tree appears healthy.*	*Fell for development.*
103	Birch	20	6	7	6	6	10	2.4	M	B	*Tree appears healthy.*	*Fell for development.*
104	Birch	22, 12	5	5	5	6	9	3.0	SM	B	*Tree appears healthy.*	*Fell for development.*
105	Birch	15, 16	5	4	5	5	7	2.6	SM	B	*Tree appears healthy.*	*Fell for development.*
106	Birch	20	5	5	4	5	7	2.4	SM	B	*Tree appears healthy.*	*Fell for development.*
107	Willow	15, 10, 25	5	6	4	5	9	3.7	SM	B	*Tree appears healthy.*	*Fell for development.*
108	Birch	21	6	5	7	5	8	2.5	SM	B	*Tree appears healthy.*	*Fell for development.*
109	Birch	19, 12	8	2	5	4	8	2.7	SM	B	*Tree appears healthy.*	*Fell for development.*
110	Birch	16, 18, 13	4	4	5	4	10	3.3	SM	B	*Tree appears healthy.*	*Fell for development.*
111	Birch	14, 11, 14	3	4	2	3	8	2.7	SM	C	*Tree appears healthy.*	*Fell for development.*
112	Birch	14, 16	3	3	3	3	9	2.6	SM	B	*Tree appears healthy.*	*Fell for development.*
113	Birch	19	2	5	4	2	9	2.3	SM	B	*Tree appears healthy.*	*Fell for development.*
114	Birch	24, 19	4	6	4	6	10	3.7	M	C	*Twin-stemmed from 0.5m, western stem broken off at 4.5m, eastern stem broken off at 6m.*	*Fell for development.*
115	Birch	12, 16, 14	4	5	5	5	10	2.9	SM	B	*Tree appears healthy.*	*Fell for development.*
116	Birch	17	3	3	2	3	9	2.0	SM	B	*Tree appears healthy.*	*Fell for development.*
117	Birch	19	3	3	4	3	11	2.3	SM	A	*Tree appears healthy.*	*Fell for development.*
118	Birch	14, 18	3	3	5	4	10	2.7	SM	B	*Tree appears healthy.*	*Fell for development.*
119	Birch	22	2	3	3	2	10	2.6	SM	B	Tree appears healthy.	Retain
120	Birch	21	5	6	5	6	10	2.5	SM	B	Tree appears healthy.	Retain
121	Birch	28	3	4	2	3	11	3.4	M	B	Tree appears healthy.	Retain
122	Birch	18	3	3	2	3	9	2.2	SM	B	Tree appears healthy.	Retain

No	Species	Dia at 1.5m (cm)	Canopy Radius (m)				Height (m)	RPA (m)	Age	Class	Description	Action
			N	S	E	W						
123	Birch	17	1	4	2	1	10	2.0	SM	B	Tree appears healthy.	Retain
124	Willow	13, 18	4	5	2	2	10	2.7	SM	B	Tree appears healthy.	Retain
125	Birch	12, 15	2	3	1	4	10	2.3	SM	B	Tree appears healthy.	Retain
126	*Birch*	15, 11, 14	5	4	5	1	8	2.8	SM	B	*Tree appears healthy.*	*Fell for development.*
127	*Birch*	29	3	5	5	3	10	3.5	SM	B	*Tree appears healthy.*	*Fell for development.*
128	*Birch*	12, 26	3	5	5	4	11	3.4	SM	B	*Tree appears healthy.*	*Fell for development.*
129	Birch	29	5	6	5	5	10	3.5	SM	B	Tree appears healthy.	Retain
130	Birch	23	4	4	3	3	9	2.8	SM	B	Tree appears healthy.	Retain
131	Birch	20	3	4	4	5	10	2.4	SM	B	Tree appears healthy.	Retain
132	Birch	23	2	4	5	1	10	2.8	SM	B	Tree appears healthy.	Retain
133	Birch	19	2	3	3	3	10	2.3	SM	B	Tree appears healthy.	Retain
134	Birch	18, 16	3	3	4	1	11	2.9	SM	B	Tree appears healthy.	Retain
135	Birch	14, 18	5	4	4	5	11	2.7	SM	B	Twin-stemmed from 1m, further divides at 2m, southeastern limb broken off. Tree appears healthy.	Retain
136	Birch	20	4	3	5	2	11	2.4	SM	B	Tree appears healthy.	Retain
137	Birch	23	4	4	4	5	9	2.8	SM	B	Tree appears healthy.	Retain
138	Birch	23	5	7	6	6	10	2.8	SM	A	Tree appears healthy.	Retain
139	*Beech*	39	9	7	7	7	10	4.7	M	B	*Three-stemmed from 1.,75 and 2m, tree appears healthy.*	*Fell for development.*
139A	*Elm*	20, 23	8	6	6	8	14	3.7	M	B	*Twin-stemmed from base, tree leans north, growing from base of drystane dyke, appears healthy.*	*Fell for development.*
140	Norway Maple	42, 32, 22, 36	10	10	10	8	10	8.1	M	B	Twin-stemmed from base, multi-stemmed from 1 and 1.2m to form spreading canopy, tree appears healthy.	Retain
141	Beech	36, 22, 11, 14, 54	8	9	8	9	11	8.5	M	C	Original tree uprooted and felled in past, now growing from base of old stump. Multi-stemmed from 0.75m, tree appears healthy.	Retain at present.
142	Sycamore	50	12	12	11	4	12	6.0	M	C	Tree leans northeast with one-sided canopy to northeast due to overshading by neighbouring lime and dead elms. Some dead wood and snags in canopy but tree appears healthy.	Retain at present.
143	Sycamore	39	10	10	12	6	11	4.7	M	C	Tree leans northeast with one-sided canopy to north and east due to overshading neighbouring dead elms. Tree appears healthy.	Retain at present.

No	Species	Dia at 1.5m (cm)	Canopy Radius (m)				Height (m)	RPA (m)	Age	Class	Description	Action
			N	S	E	W						
144	*Sycamore*	*18*	*4*	*2*	*3*	*4*	*7*	*2.2*	*SM*	**B**	*Tree leans north, appears healthy. (This is one of a group of sycamore of similar dimensions in this area.)*	*Fell for development.*
145	*Sycamore*								*SM*		*Line of sycamore growing from base of drystane dyke.*	*Fell for development.*
146	*Sycamore*	*13 stems*	*5*	*5*	*6*	*5*	*10*	*5.1*	*SM*	**B**	*Multi-stemmed (avg 12cm dia) from base to form spreading canopy, tree appears healthy.*	*Fell for development.*
147	*Sycamore*	*27 stems*	*6*	*6*	*5*	*6*	*10*	*7.8*	*SM*	C	*Multi-stemmed (avg 13cm dia) from base to form spreading canopy, some dead wood in centre of clump but tree appears healthy.*	*Fell for development.*
148	*Sycamore*	*11 stems*	*5*	*5*	*7*	*6*	*15*	*5.9*	*M*	C	*Originally single-stemmed but fell over to southeast in past, now multi-stemmed from base (avg 13cm dia). Fallen stem has taken root and now multi-stemmed in its own right. Growing on embankment of Inchgarth road, original clump leans north. Some dead wood at base but tree appears healthy.*	*Fell for development.*
149	Sycamore	22	6	5	5	4	8	2.6	SM	**B**	Tree leans north, grows from base of wall at pavement of Inchgarth road, appears healthy.	Retain
150	Birch	17	1	3	3	2	9	2.0	SM	**B**	Tree leans south with one-sided canopy to south, appears healthy.	Retain
151	Birch	22	2	4	4	3	10	2.6	SM	**B**	Tree leans south, appears healthy.	Retain
152	Birch	17	1	3	2	2	10	2.0	SM	**B**	Tree appears healthy.	Retain
153	Birch	13, 9, 16	2	6	2	2	9	2.7	SM	**B**	Three-stemmed from 0.75m, southern stem splits to two at 1.75m. Canopy mainly one-sided to south but tree appears healthy.	Retain
200	*Norway Maple*	*73*	*0*	*6*	*5*	*8*	*21*	*8.8*	*M*	C	*Twin-stemmed from 3m, tree leans southwest. Canopy suppressed to north, some dead wood, snags, and cavities present, but tree appears healthy.*	*Fell for development.*

The following trees lie outwith the development site -

No	Species	Dia at 1.5m (cm)	Canopy Radius (m)				Height (m)	RPA (m)	Age	Class	Description	Action
			N	S	E	W						
199	Cypress	50					8	6.0		C		
201	Lime	70					23	8.4			Twin-stemmed from 11m, some dead wood and snags in crown but tree appears healthy.	
202	*Elm*	85					20	10.2		**U**	*Tree leans east, growing on top of neighbours retaining wall. Some adventitious growth at base but otherwise tree is dead.*	*Fell.*
203	*Elm*	85					18	10.2		**U**	*Tree leans east, growing on top of neighbouring retaining wall. Tree is dead.*	*Fell.*
204	Sycamore	85					20	10.2			Tree leans east with canopy mainly to east, appears healthy.	
205	Lime	100					23	12.0			Twin-stemmed from 5.5m, canopy mainly one-sided to east, lots of adventitious growth at base. Tree appears healthy.	
206	Sycamore	70					21	8.4			Twin-stemmed from 3.5m, some dead wood and snags but tree appears healthy.	
207	Birch	29					12	3.5			Tall, thin tree with canopy mostly at height, appears healthy.	
208	Birch	46					12	5.5			Twin-stemmed from 3m, tree leans south with canopy mainly one-sided to south, appears healthy.	
209	Sycamore	70					14	8.4			Twin-stemmed from 1.5m, tree leans south, appears healthy.	
210	Pine	42					14	5.0			Tree leans north,canopy mainly one-sided to north, tree appears healthy.	
211	Birch	33					13	4.0			Twin-stemmed from 3m with scarring at divergent angle well calloused, tree appears healthy.	
212	Birch	30					15	3.6			Tree leans northeast, appears healthy.	
213	Birch	15, 17, 20, 11, 10, 12, 15					12	4.7			Multi-stemmed from base, eastern stem leans east, southwestern stem leans south, one central stem is dead and broken off at 2.2m, main central stem appears healthy.	
214	Sycamore	65, 43, 36					14	10.3			Multi-stemmed from 0.75m, further branching at 1.5 and 2m to form spreading canopy. Tree appears healthy.	
215	Ash	12, 15, 27, 23, 22, 9, 21, 27, 22					14	7.4			Multi-stemmed from base, tree appears healthy.	
216	Sycamore	34, 18, 20					12	5.2			Tree leans south, multi-stemmed from base and 0.6m, tree appears healthy.	
217	Sycamore	48					14	5.8			Tree leans south, twin-stemmed from 2m, tree appears healthy.	
218	Sycamore	20, 31, 36, 14, 15, 35, 45					15	9.5			Multi-stemmed from base, adventitious growth from base, some dead wood but tree appears healthy.	

No	Species	Dia at 1.5m (cm)	Canopy Radius (m)				Height (m)	RPA (m)	Age	Class	Description	Action
			N	S	E	W						
219	Birch	35					12	4.2			Tree appears healthy.	
220	Beech	47, 25, 42, 40, 38, 12					14	10.6			Multi-stemmed from 0.5m, some evidence of dead wood but tree appears healthy.	
221	Sycamore	56, 56, 12, 25, 49					15	11.7			Multi-stemmed from base, all stems lean in their respective directions, dominant stems to west and north, some evidence of dead wood and snags but tree appears healthy.	
222	Cherry	26, 40					13	5.7			Twin-stemmed from base, tree appears healthy.	
223	Spruce	32					13	3.8			Growing up through large laurel, canopy mostly at height, but tree appears healthy.	
224	Cypress	25, 23					13	4.1			Three stems from 1.25m, forms canopy with 225, tree appears healthy.	
225	Cypress	25, 39, 22					14	6.2			Three stems from 0.75m, forms canopy with 224, tree appears healthy.	
226	Fir	52					16	6.2			Tree appears healthy.	
227	Fir	45					18	5.4			Ivy becoming dominant in crown but tree appears healthy.	
228	Cherry	86, 35					14	11.1			Twin-stemmed from 1m, multi-stemmed from 1.75m, forms "witches broom"-like clumps in crown but appears healthy.	
229	*Elm*	*37*					10	4.4		C	*Tree leans east, large limb to north from 0.25m, appears healthy.*	*Fell for health and safety due to position on dyke.*
230	*Elm*	*35, 20, 22*					11	5.5		C	*Tree growing from edge of pavement, three-stemmed from 1m, some dead wood but tree appears healthy.*	*Fell for health and safety due to position on dyke.*
231	*Sycamore*	*35, 33, 29*					15	6.7		C	*Twin-stemmed from 0.5m, eastern stem splits into two at 1m, tree grows from top of boundary wall, leans north, appears healthy.*	*Fell for health and safety due to position on dyke.*

Appendix B Adapted from BS: 5837 2012 Trees in Relation to Construction.

Table 1: Cascade chart for tree quality assessment

Category and definition	Criteria (including subcategories where appropriate)			Identification on plan
Category U Trees which cannot be retained long term (for longer than 10 years)	• Trees that have a serious structural defect which puts them at risk of collapse, including those that will become unviable after removal of other trees • Trees that are dead or dying • Trees infected with pathogens which could affect the health and/or safety of nearby trees, or very low quality trees which suppress trees of better quality *NOTE Category U trees can have existing or potential conservation value which might be desirable to preserve.*			DARK RED
TREES TO BE CONSIDERED FOR RETENTION				
	1 Mainly arboricultural values	**2 Mainly landscape values**	**3 Mainly cultural values, including conservation**	
Category A Trees of high quality and value: in good condition; able to persist for long (a minimum of 40 years).	Trees that are particularly good examples of their species, especially if rare or unusual; or those that are essential components of groups (e.g. the dominant and/or principal trees within an avenue).	Trees, groups or woodlands of particular visual importance.	Trees, groups or woodlands of significant conservation, historical, or other value (e.g. veteran trees)	LIGHT GREEN
Category B Trees of moderate quality with an estimated remaining life expectancy of at least 20 years	Trees downgraded from category A because of impaired condition (e.g. presence of minor defects, including unsympathetic past management or storm damage).	Collections of trees (in groups or woodlands) with a higher rating than they would have as individuals.	Trees with some conservation or other cultural value	MID BLUE
Category C Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm	Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories	Trees present in groups or woodlands, without significantly greater collective landscape value; and/or trees offering low or only temporary landscape benefits	Trees with no conservation or other cultural value	GREY

Appendix C: Drawings

IRC-1708-AA: Arboricultural Assessment
Plan showing positions of all trees, root protection areas and arboricultural assessment.

IRC-1711-TP: Tree Management and Root Protection Areas
Plan showing position of proposed new building, with trees to be felled, root protection areas and tree protection fencing.

IRC-1708-LS: Replacement Planting
Plan showing position of proposed new building, showing retained trees and proposed replacement planting.

Appendix D: Legislation, Guidance and References

Legislation

Town and Country Planning (Scotland) Act 1997 (as amended)
Health & Safety at Work Act 1974
Construction (Design & Management) Regulations 2015
Scottish Government Policy on the Control of Woodland Removal

Appendix E: Professional Qualifications

Nigel Astell has been involved in arboriculture for over 40 years. He holds degrees in Botany and Zoology and is a member of the Arboricultural Association and The Chartered Institute of Environmental and Ecological Management.

Tim Stephen has a BSc (hons) in Ecology from the University of Aberdeen. He has been involved in ecological surveying and monitoring work both in the UK and overseas for four years, and has taught on ecology courses for the University of Aberdeen for the past two years.

Appendix F: Contact Details

Client: Cults Property Development Company Limited
11 Bon Accord Crescent,
Aberdeen.
AB11 6DE

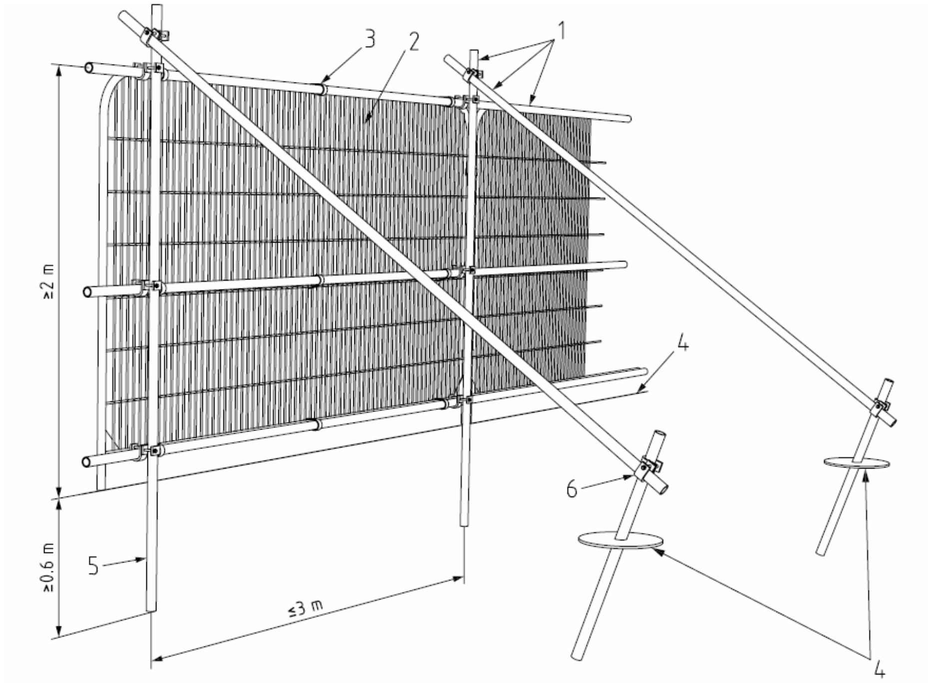
Architect: Fitzgerald + Associates Ltd
53 Albert Street,
Aberdeen
AB25 1XT
1224 633 375

Environmental Consultant:
Nigel Astell
Astell Associates
26 Binghill Crescent
Milltimber,
Aberdeen
AB13 0HP
Tel 01224 8686458
email: info@astellassociates.co.uk

[redacted]

Nigel Astell
Astell Associates

Figure 2 which is taken from BS: 5837 2012 "Trees in Relation to Design, Demolition & Construction – Recommendations" illustrate the systems to be employed for ensuring an adequate Construction Exclusion Zone about retained trees. Refer to BS: 5837 2012 for more details.



1. Standard scaffold poles
2. Heavy gauge 2m tall galvanized tube and welded mesh infill panels.
3. Panels secured to uprights and cross members with wire ties.
4. Ground level.
5. Uprights driven into the ground until secure (minimum depth 0.6m)
6. Standard scaffold clamps

Figure 2. Protective Barrier

All-weather notices should be attached to the barrier with words such as: "CONSTRUCTION EXCLUSION ZONE – NO ACCESS".