Aberdeen Local Development Plan Review

Main Issues Report Response Form 2019

Aberdeen City Council has published a Main Issues Report (MIR) which is part of the process of preparing a new Local Development Plan. It is designed to gather views on specific proposals and sets out options for dealing with the key planning matters facing Aberdeen over the next 20 years such as the location of new housing and employment development, the future of retailing and the City Centre, housing needs and tackling climate change. It also includes a number of potential new policies which would be used in the determination of planning applications.

The MIR has been published alongside a Monitoring Statement and Environmental Report. Copies are available to view at Marischal College, Broad Street. Aberdeen. These, and other supporting documents, are available at: - www.aberdeencity.gov.uk/aldp2022

Everyone now has the chance to comment on the report and associated documents. All comments received will be considered and used to inform the preparation of the Proposed Aberdeen City Local Development Plan. There will be a further opportunity to comment on the Proposed Plan when it is published in early 2020.

The consultation runs from 4 March 2019 to 13 May 2019.

Responses to the published documents can be:

- made online at:- http://consultation.aberdeencity.gov.uk/planning/mir2019;
- emailed to:- ldp@aberdeencity.gov.uk; or
- by post to:- Local Development Plan Team, Strategic Place Planning, Aberdeen City Council, Business Hub 4, Ground Floor North, Marischal College, Broad Street, Aberdeen, AB10 1AB.

Completed response forms should be with us no later than 13 May 2019.

YOUR DETAILS

Name	Theresa Hunt
Organisation (if relevant)	Burness Paull LLP
On behalf of (if relevant)	Cults Property Development Company Limited
Address	[redacted]
Postcode	
Telephone	
E-mail	

Thank you for taking the time to complete this response form. If you wish to be added to the LDP e-mailing list to be kept informed of our progress in producing the next Local Development Plan, please tick here ☑

If yes, please provide an e-mail address [redacted]

PRIVACY STATEMENT

As part of the review of the Local Development Plan, Aberdeen City Council (ACC) will offer you several opportunities to submit your views and comments. These opportunities will range from the current consultation stage, the Main Issues Report, where we will ask you to comment on specific proposals and alternatives to the Proposed Plan stage where the set view of ACC has been established.

ACC are legally required to consult at this stage and at Proposed Plan stage. This is set out in the Town and Country Planning (Scotland) Act 1997 (as amended) and supporting regulations. The Environmental Assessment (Scotland) Act 2005 also requires us to consult on a Strategic Environmental Assessment Environmental Report.

By submitting a response to the consultation, you understand that ACC can use the information provided in this form, including personal data, as part of the review of the Aberdeen City Local Development Plan. ACC will not share or disclose any personal data about you to any organization or person unless it is authorized or required to do so by law.

The data controller for this information is ACC. We understand our legal basis for processing this information as Article 6(1)(c) of the General Data Protection Regulation as this is an activity we are legally required to carry out under the Town and Country Planning (Scotland) Act 1997 (as amended) and supporting regulations and The Environmental Assessment (Scotland) Act 2005. The data on the form will be used to inform the preparation of the Proposed Aberdeen City Local Development Plan 2022. At the end of the consultation, where contact details have been provided, the Local Development Plan team will provide you with a respondent number. You may also be contacted about the comments you have made and, as obliged by the Town and Country Planning (Scotland) Act 1997 (as amended) and supporting regulations, the Local Development Plan team will contact you to inform you of the publication of the proposed Aberdeen Local Development Plan in early 2020. If you chose not to provide your contact details, your comments will still be valid but we will not be able to contact you in the future.

Responses will be collated, redacted, summarised and stored electronically or in locked cabinets in Marischal College. All redacted responses will be published, alongside the respondents name (if provided), on the Aberdeen City Local Development Plan website. Contact details will not be made public, but your name and respondent number will be published.

Aberdeen City Council will only keep your personal data for as long as is needed. Data will be kept until the emerging Local Development Plan is itself replaced – this is likely to be around 5 years following its adoption in 2022 – so 2027. Following this, data will be disposed of in a secure manner.

YOUR DATA, YOUR RIGHTS

You've got legal rights about the way ACC handles and uses your data, which include the right to ask for a copy of it, and to ask us to stop doing something with your data. Please contact the Council's Data Protection Officer by e-mailing DataProtectionOfficer@aberdeencity.gov.uk or writing to Data Protection Officer, Aberdeen City Council, Governance, Level 1 South, Marischal College, Broad Street, Aberdeen, AB10 1AB. More information is available at: - https://www.aberdeencity.gov.uk/your-data

YOUR COMMENTS

Which document(s) are you commenting on?	• Main Issues Report ☑ • Strategic Environmental Assessment Environmental Report ☐ • Monitoring Statement ☐

Please indicate the document and the specific Issue, Question, Site, Policy, Map or Table you are commenting on. Please provide your comments below and explain your reason for supporting, opposing or commenting on this specific part of the document.

NCHGARTH, CULTS

Inchgarth, Cults - Bid 0944
These representations are submitted on behalf of Cults Property Development Company Limited.

Our clients object to the failure of the Main Issues Report (MIR) to identify bid site B0944 Inchgarth Road, Cults as a preferred new housing site (Section 2 of the MIR).

This representation requires to be read in conjunction with the Development Bid submitted at the pre-M R stage (copy attached for ease of reference). t is respectfully requested that the Inchgarth site should be allocated for a residential development of circa 95 units for the elderly/retirement housing, 50 bedroom care home, with small ancillary retail/community use units (500m2 – such as a café doctors' surgery, pharmacy) and 3 hectares of open space, in the Proposed Aberdeen LDP. The original bid and this representation demonstrates the capability of the site to accommodate residential development in line with the Council's aspirations both for new housing site allocations (section 2) and the need to cater for an increasingly elderly population as noted in Section 8 of the MIR.

Officer assessment of the Site

The MIR identifies a shortfall of 640 units which needs to be met through new housing site allocations. Whilst brownfield sites are to be prioritised, it is recognised that greenfield housing allocations will be required. It is the stated preference that such greenfield housing allocations be small scale, have limited impacts on the environment and infrastructure and should not be extensions to existing sites identified in the Aberdeen LDP 2017.

As our clients' bid confirms, the Inchgarth site can accommodate circa 95 housing units. This site is similar in scale to the new housing sites (which range from 14-100 houses) identified in the M R and thus can be considered appropriately small scale and in line with the size of sites which officers have identified as being preferred.

The site lies within the River Dee Catchment Area, but some 300m outwith the boundary of the River Dee Special Area of Conservation (SAC). Tree Protection Order (TPO) 237 covers the site, but is not a barrier to nor prevents development. The tree survey and environmental information already submitted with the bid confirms that the site is not an important ecological resource and that no protected species will be adversely affected by development on the site. The proposed tree and shrub planting and creation of wildlife corridors, will help improve biodiversity and habitat potential. The site can be sensitively developed without impacting on the environment, as required by the officers. The scoring by officers in respect of natural conservation does not take into account the technical information submitted with the bid. The officer's scoring of the site is unjustifiably low and should be a 2.

Development in conservation areas is permitted and there are no historical features of note on the site itself. The officers have marked the site unjustifiably low in regard to built and cultural elements.

Our clients' site is not an extension to an existing site and can be developed independently given it is under option to our clients. Our clients' development proposals, as shown on the indicative masterplan submitted with the bid, demonstrates how appropriate access will be maintained and enhanced. The minor existing informal footpaths will be upgraded and new paths provided. The development will not appear isolated from Garthdee or Cults, as the site is already surrounded on all sides by residential development. The officers have marked the site with a low score without due consideration to the context surrounding the site. The proposed housing development nestles against the existing residential development to the east with the green wildlife corridor ensuring easy access to the west whilst maintaining visual separation. Improved accessibility to the Deeside Way for all users will be secured through the development along with benefits for pedestrians and cyclists who currently use routes in the areas, such as Pitfodels Station Road, which is narrow, has poor visibility and no footways. The link (relief) road provided as part of the development will assist in providing and substantially improving connectivity north to North Deeside Road and south to Garthdee.

In scoring the site in relation to proximity to facilities, the officers have not given due weight to the facilities which are to be provided as part of the development. The small ancillary retail/community use units will serve residents and also be of benefit to neighbouring communities.

Information in respect of how the development will fit within the landscape has been submitted, which demonstrates that the proposed development will not significantly alter the character of the landscape, given the way in which the design of the development has been approached. Further LVIA work is currently being carried out in support of our clients' application (reference 181244/DPP) to illustrate the nature of the impacts further. The visual impact of the development is assessed as being low within both Aberdeen, Cults and the countryside of the Dee Valley and its southern banks. Tree cover in the landscape mean that views of the development are restricted to the areas immediately adjacent to the site on the Deeside Way, North Deeside Road and Inchgarth Road. The perseveration of the majority of the boundary tree cover along with enhanced landscape buffers to the shared boundaries and throughout the site will help mitigate residual impacts significantly.

The Officer's assessment of the site marks the site low when considering the slope of the site. In fact the site provides a great opportunity for innovative designs, with the fall of the land from north to south enabling all of the proposed properties to have outstanding views. It should be recognised that the proposed indicative layout has been designed to respond to the constraints and opportunities presented by the site.

There are no infrastructure constraints, such as education, as the proposed development is for the elderly. Drainage is not an issue as demonstrated by the Drainage Assessment submitted with the Bid. The scoring for this aspect should be a 3 rather than a 2. The proximity to employment opportunities is not required given the nature of the proposed development being for retired and elderly residents. The proposed retail and community facilities proposed, such as a café, doctor's surgery and pharmacy, will overcome any perceived lack of facilities in the area. The pylons have been incorporated into the design and layout of the site, with the link (relief) road crossing the Deeside Way at a point to both minimise impacts and ensure the link (relief) road provides suitable access for all users.

For all of these reasons the site should be allocated for housing in the Proposed Plan 2022.

Other considerations

Furthermore, national predictions are for the over-65 population to be one of the fastest growing age groups. The Aberdeen City and Shire HDNA (2017) has demonstrated significant changes in the demographic profile in Aberdeen, with a continued increase in the older population. The need for housing for the growing elderly population is clearly identified in the M R, at Issues 9 and 10.

The unmet demand for this type of housing was evident during the consultation events held with local residents for the proposed development. Of the various development options considered, there was strong and significant support for a retirement led development scheme. It should be noted that the live planning application (reference 181244/DPP) has attracted a large level of support for the type of development proposed, including support from Cults Bieldside and Milltimber Community Council. This proposed development has been able to be designed to focus entirely on the needs and requirements of the retired and elderly community, which is exactly what the emerging policies of the Proposed Plan 2022 requires to do. Given that the proposed plan is looking to address the ageing population, it is appropriate to consider allocating sites now, such as this Inchgarth site, which are being promoted for retirement living. There can be no guarantee of any of the other allocated sites being brought forward to address this identified need in the short term.

Conclusion

Section 2 of the MIR identifies the Council's preferred list of housing sites and confirms the criteria for the greenfield allocations which are being sought. Our clients' site has been scored negatively and without, it appears, cognisance of the supporting technical information and the benefits that the proposals would bring. When considered against the need for the ageing population to be catered for, this site focusses entirely on the needs and requirements of the retired and elderly community. For the reasons stated it is respectfully requested that the Inchgarth site should be allocated for a residential development for the elderly/retirement housing in the Proposed Aberdeen LDP.
Enclosures – Copy Bid for Inchgarth site submitted May 2018

Aberdeen Local Development Plan Review

Proposal for a site to be included in the Main Issues Report

The Strategic Development Plan (SDP) review is currently at its Main Issues Report (MIR) stage and therefore does not have a settled position in terms of proposed housing allocations. While these numbers are still to be determined, given the number of large allocations across Aberdeen City it is the intention of the council to focus on smaller sites. We would therefore particularly welcome proposals for greenfield or brownfield sites up to 100 units. We are also keen to identify new brownfield sites for housing or for other uses.
Please use this form to provide details of the site that you wish to have included in the Main Issues Report for consideration as a proposal in the next Aberdeen Local Development Plan.

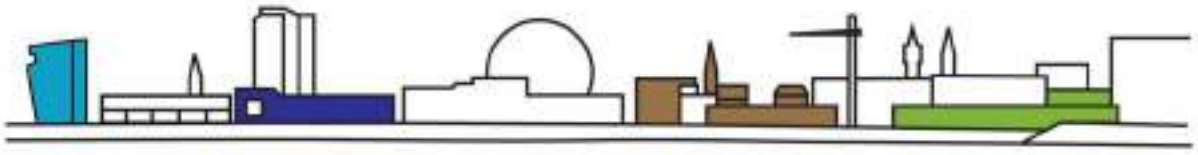
One of the purposes of this form is to inform a public debate on the merits of the different sites being proposed. All information submitted will therefore be made available to the public to promote a transparent and open process.

Please feel free to provide any further information you feel appropriate to support your submission. The City Council has produced a Sustainability Checklist which provides guidance on the issues which will be used to help us judge the merits of competing development options. This can be found on www.aberdeencity.gov.uk.
Please ensure your proposal is with us by **8 May 2018**. **Please note the deadline has been extended to <u>Monday 28 May 2018.</u>**

<u>Using your personal information</u>
Information you supply to Aberdeen City Council (ACC) in this questionnaire will be used to prepare the Local Development Plan**.** The information provided will be made public and will be placed on the Council's website. This will include the name and address of the proposer and landowner.

The Local Development Plan team may use your contact details to contact you about the comments you have made.

For further information on how your information is used, how ACC maintain the security of your information, and your rights to access information ACC holds about you, please contact Andrew Brownrigg, Team Leader, Local Development Plan Team, Strategic Place Planning, Aberdeen City Council, Business Hub 4 Marischal College, Broad Street, Aberdeen AB10 1AB.



aberdeen local development plan

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	No available connections			
		Limited range of connections			
	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)	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

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

Bus Stop on North Deeside Road

Disabled Access from North Deeside Road

Existing Deeside Walkway

Wildlife Corridor / Green Space Retained

Wildlife Corridor Natural Path Access Points [Typ]

Existing Deeside Walkway

Wildlife Corridor / Green Space Retained

Emergency Vehicle Access Only

Disabled Access from Inchgarth Road

INDICATIVE OVERALL MASTERPLAN

Rev :	Date :	Comments :

2

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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

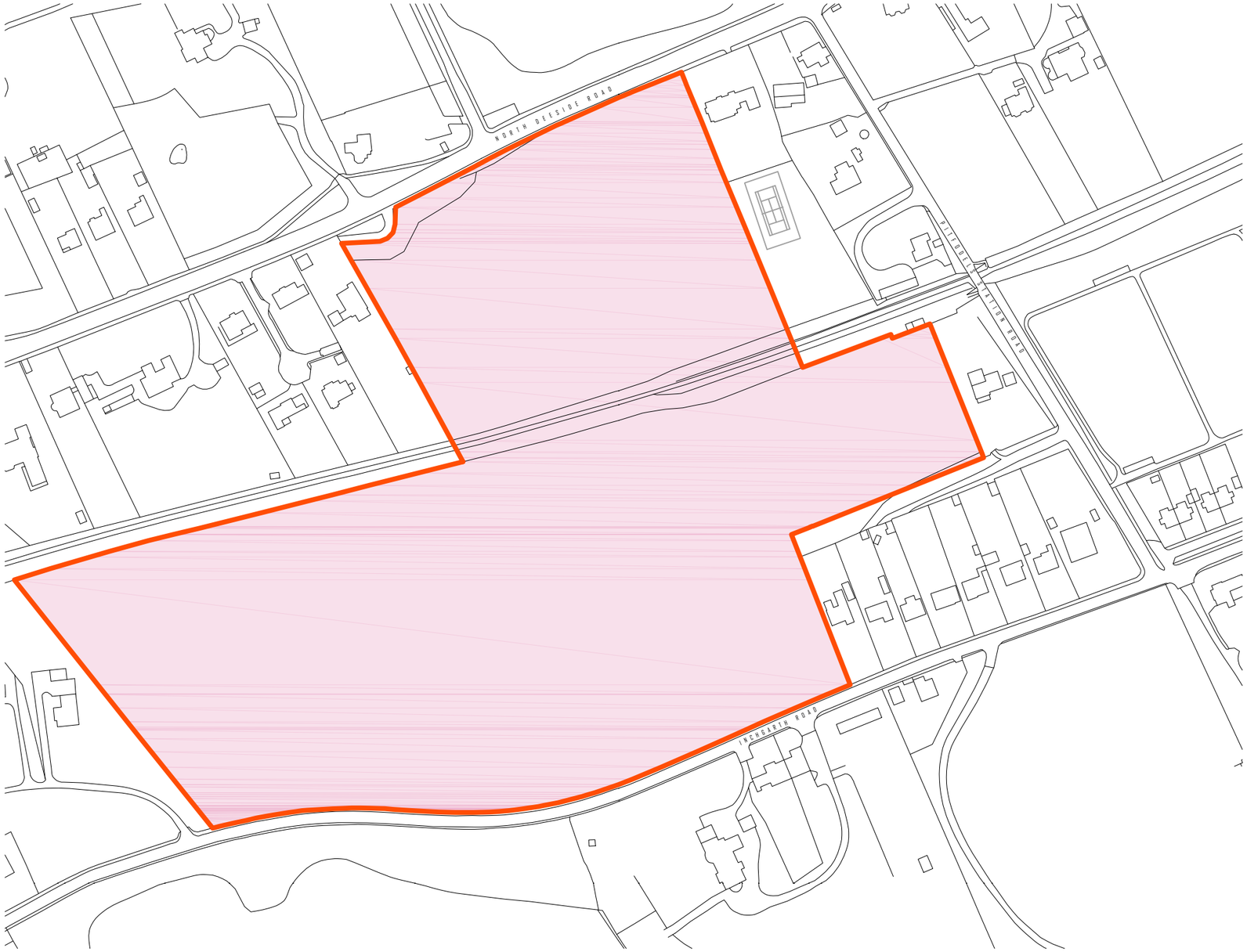
Proposed Community Retirement Village
North Deeside Road / Inchgarth Road Aberdeen
May 2018

CIAT
Registered Practice

Site Location

CONTENTS

Scope 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

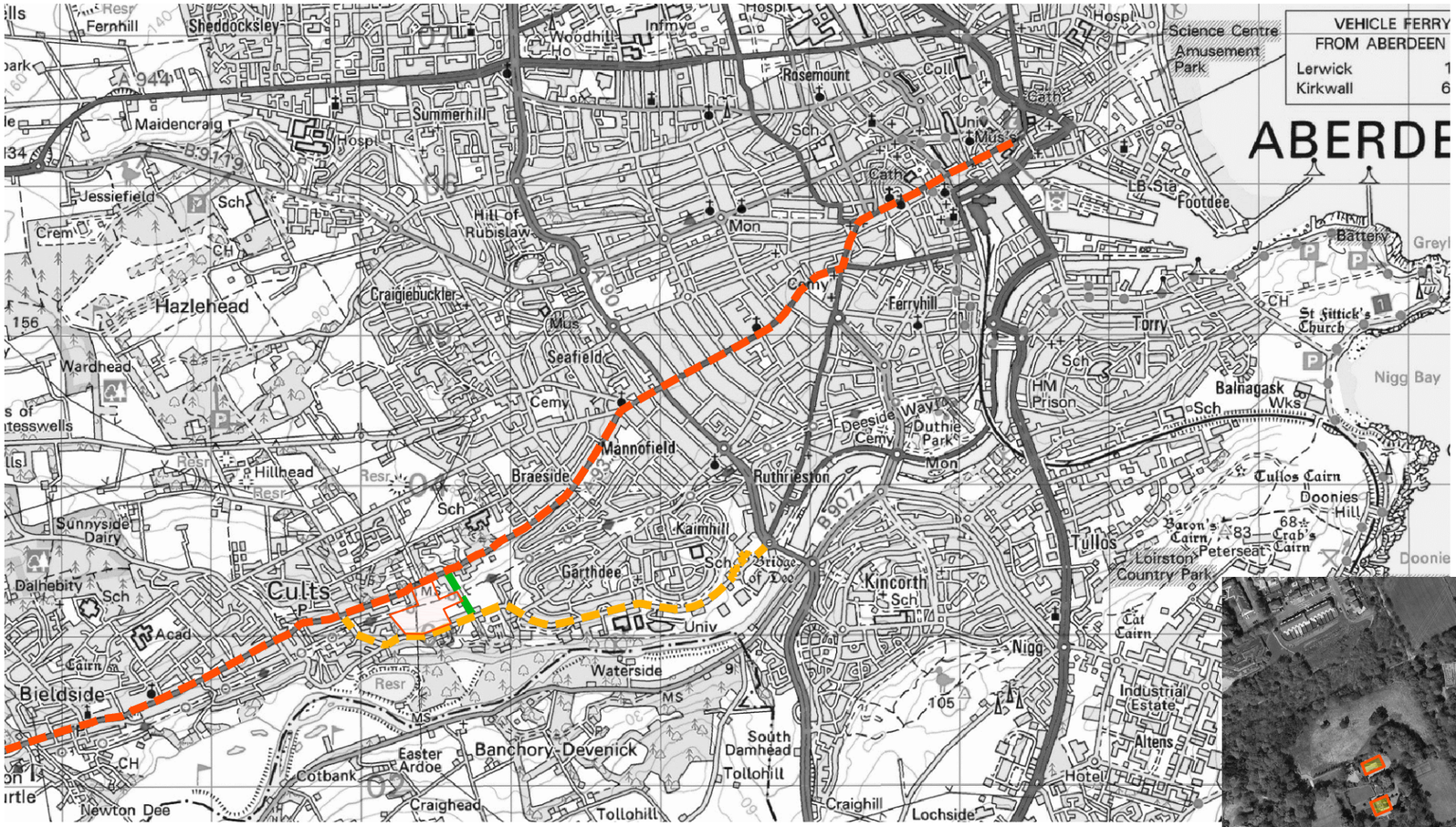
Located to the West of Aberdeen City Centre and just to the east of Cults, the Site sits between North Deeside Road to the north, and Inchgarth Road to the south, with the "Deeside Way" intersecting from east to west Pitfodels Station Road lies to the east of the Site. Westerton Road lies to the west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

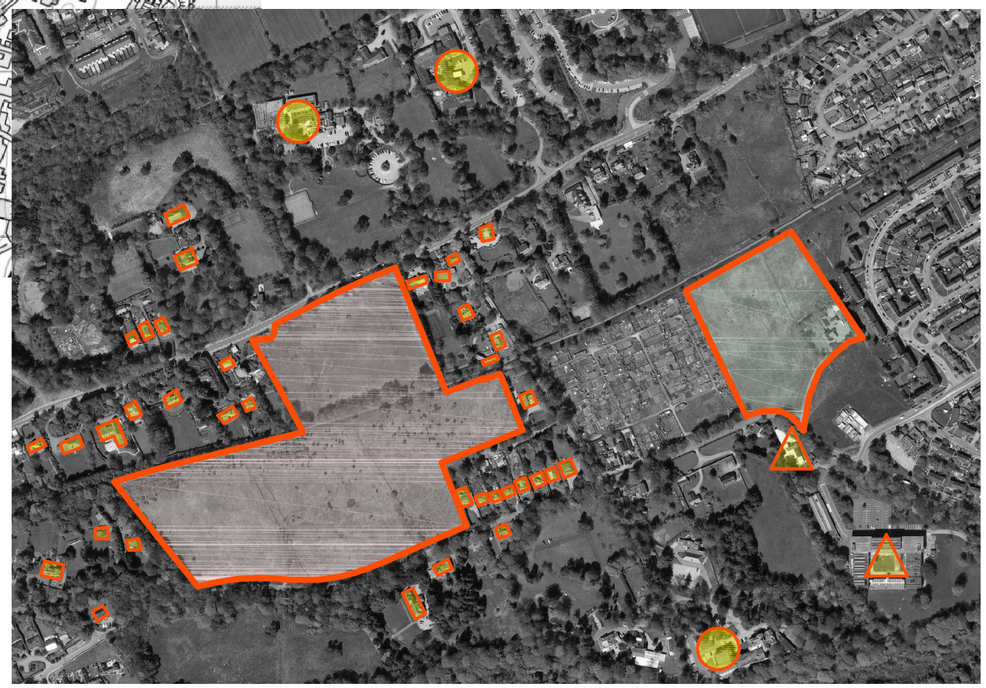
North Deeside Road is itself an arterial route offering direct access to both the city centre to the east and to Cults and the western suburbs of the city.

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





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 Context

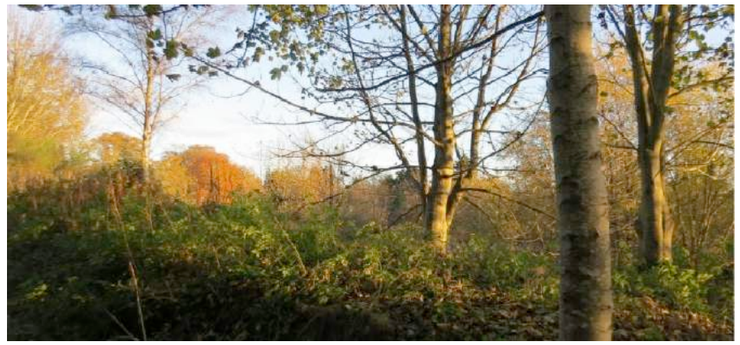
The Site lies between the residential areas of Cults to the west and Garthdee to the east. Both areas include a variety of house types. There are hotels to he north and south.

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.

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

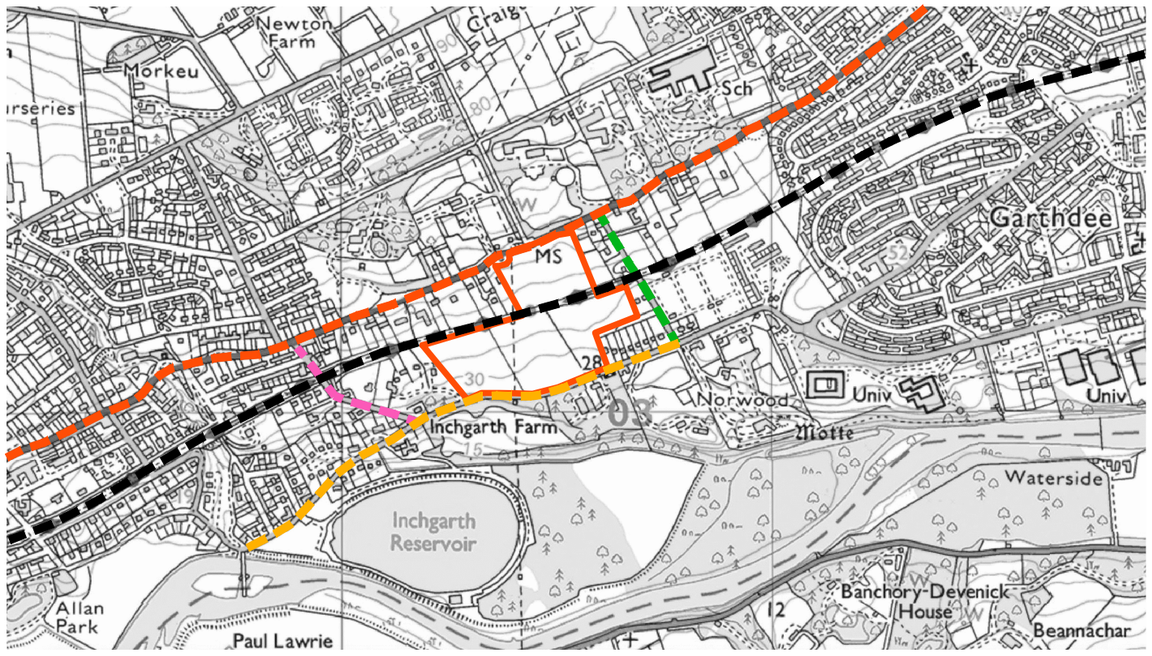
The area is made up of two private unkempt fields and scrubland divided by the Deeside Way / Old Deeside Railway line. The northern field is bordered on the south and east by old beech hedges which have grown to maturity. On the northern edge of this field there is a row of mature, mixed, deciduous trees,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



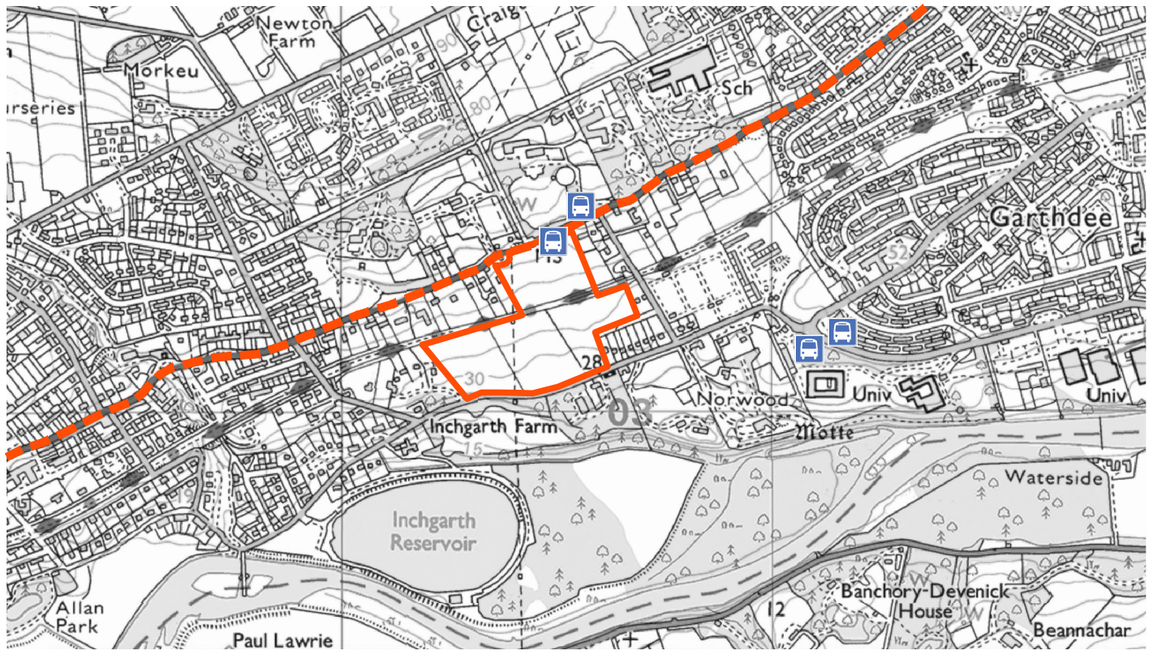
North Deeside Road - major route to city centre

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 $2\frac{1}{2}$ 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

Approach

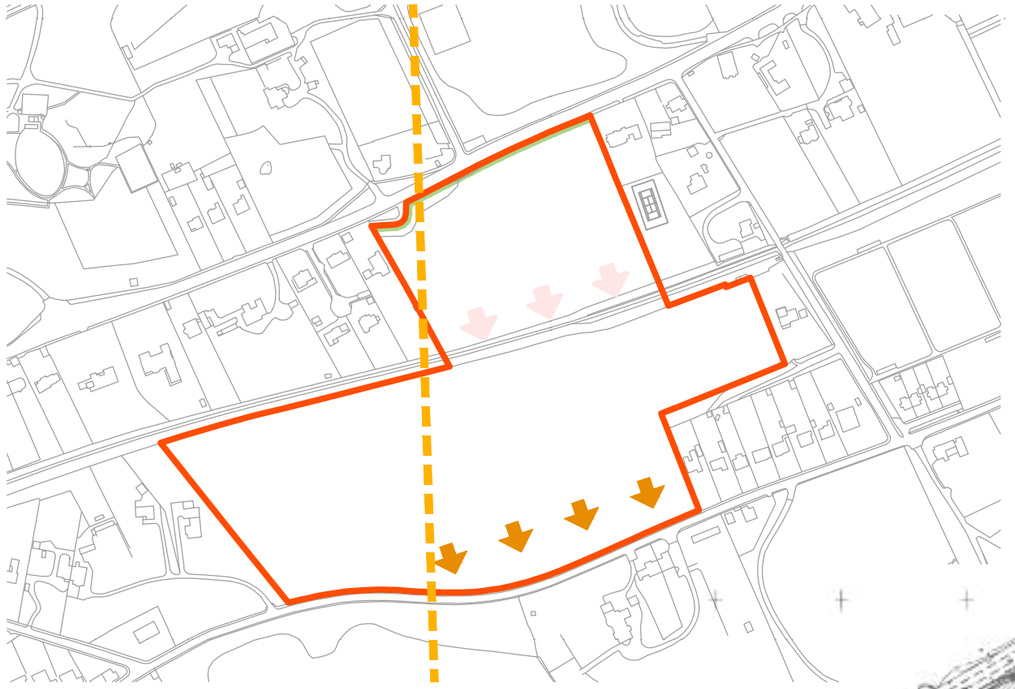


Fig_01

- 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.

Fig_03

Approach

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

Fig_05

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_06

Approach

Fig_07

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.

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.

Design

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.

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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**

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1	23/05/18	FINAL	Update report to refer to a total of 95 retirement units rather than 105 units.	By	M Peters
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2	25/05/18	FINAL	Update report to reflect client changes and new masterplan..	By	M Peters
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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 s*trategic *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 CO2 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

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

Bus Stop on North Deeside Road

Disabled Access from North Deeside Road

Existing Deeside Walkway

Wildlife Corridor / Green Space Retained

Wildlife Corridor Natural Path Access Points [Typ]

Existing Deeside Walkway

Wildlife Corridor / Green Space Retained

Emergency Vehicle Access Only

Disabled Access from Inchgarth Road

INDICATIVE OVERALL MASTERPLAN

Rev :	Date :	Comments :

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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 [redacted]
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 [redacted]
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

[redacted]

Website: http://www.fairhurst.co.uk

From: Scott Lynch [redacted]
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 [redacted]
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

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[redacted]

[redacted]
Email: [redacted]
Website: http://www.fairhurst.co.uk

From: Scott Lynch [redacted]
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 [redacted]
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

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[redacted]
Website: http://www.fairhurst.co.uk

From: Scott Lynch [redacted]
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 [redacted]
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

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[redacted]
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

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[redacted]
Website: http://www.fairhurst.co.uk

From: Scott Lynch [redacted]
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 [redacted]
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

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[redacted]

[redacted]
[redacted]
[redacted]
Email: [redacted] Website: http://www.fairhurst.co.uk

On 24 Nov 2016, at 11:07, Scott Lynch <[redacted] 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 [redacted]
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

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[redacted]
[redacted]
[redacted]
[redacted]
[redacted] Website: http://www.fairhurst.co.uk

Begin forwarded message:

> **From:** "Mark Peters" [redacted]
> **To:** "Scott Lynch" [redacted]
> **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

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[redacted]
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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:

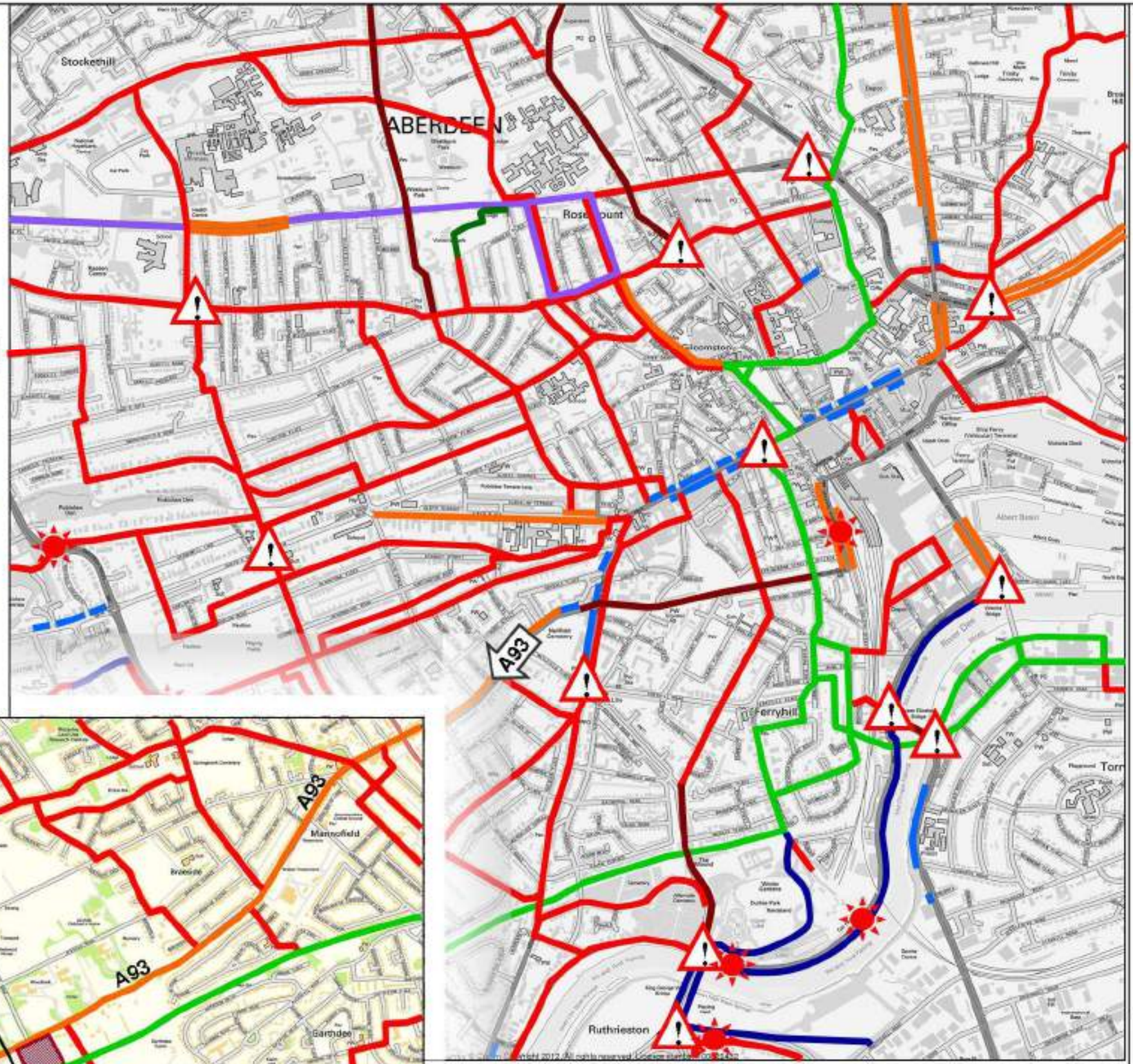
Drawn by: MP

Date: 01/06/17

88 Queens Road
Aberdeen
AB15 4YQ

T: 01224 321222
F: 01224 323201

A93 North Deeside Road



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'.

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

Client:

Drawn by: MP

Date: 01/06/17

88 Queens Road
Aberdeen
AB15 4YQ

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Appendix D

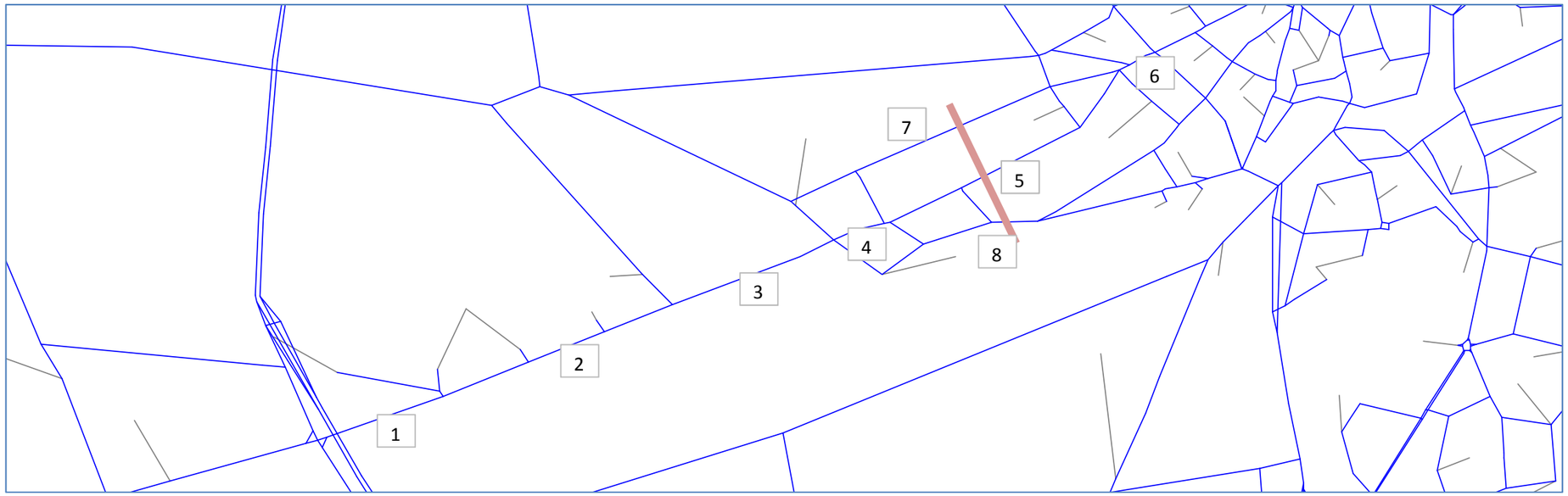
ASAM4a Traffic Data

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) AM	PM	AADT	2018 With AWPR (W30 C417) AM	PM	AADT	2018 Ref Case - AWPR AM	PM	AADT	% 2018 Ref Case - AWPR 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 (Locations 5, 7 & 8)	EB	1,234	738	8,719	973	531	6,640	-260	-207	-2,079	-21%	-28%	-24%
		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.

A93 NORTH DEESIDE ROAD

445mm XX 1220mm JUNCTION VISIBILITY

445mm XX 1220mm JUNCTION VISIBILITY

ROAD GRADIENT 1:25 DEVELOPMENT ACCESS

4.5m X 90m JUNCTION VISIBILITY

90m FORWARD VISIBILITY

90m FORWARD VISIBILITY

180mR

CYCLEWAY ACCESS TO THE DEESIDE WAY

THE DEESIDE WAY

ROAD GRADIENT 1:25 DEVELOPMENT ACCESS

40m TRANSITION CURVE

40m TRANSITION CURVE

4.5m X 90m JUNCTION VISIBILITY

180mR

90m FORWARD VISIBILITY

ø28.0mR

INCHGARTH ROAD

INCHGARTH ROAD

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:	Status:	
1:500	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

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	0.028	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

	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	0.047	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.

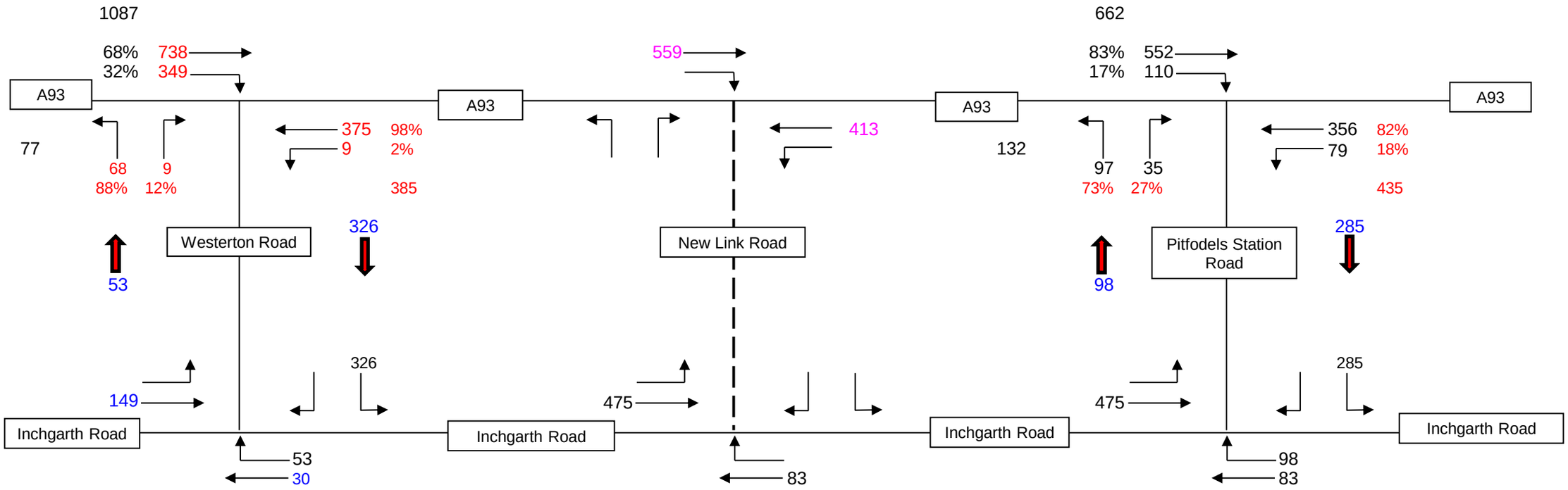
Parameter summary

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.

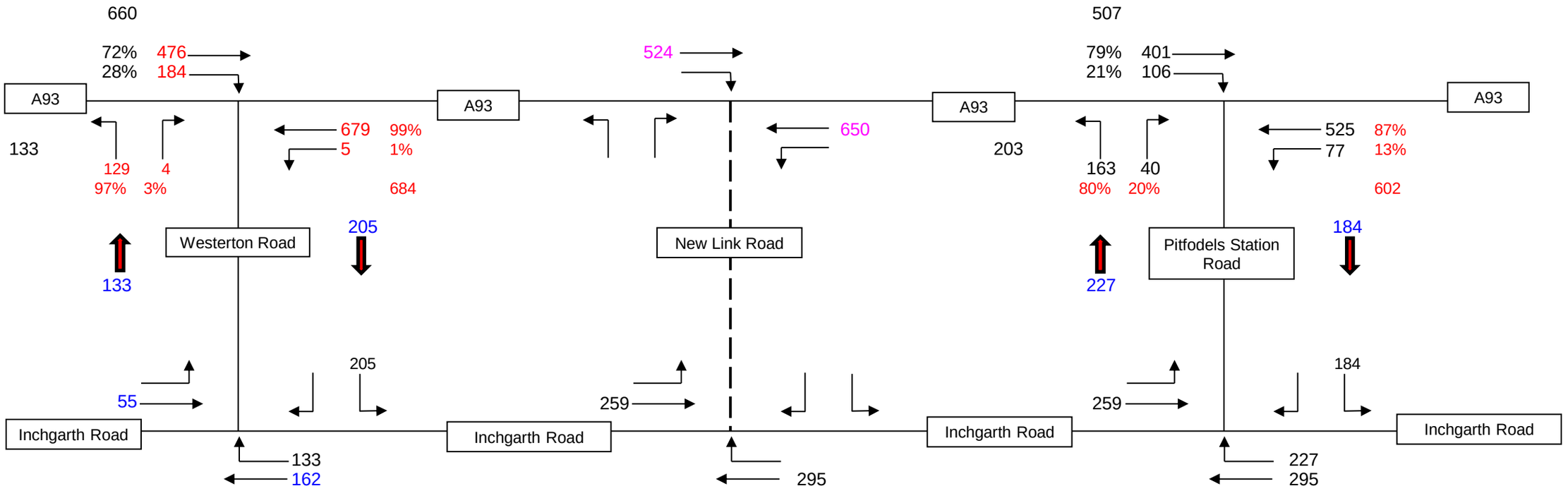
Appendix G

Network Diagrams



XX 2010 Counts
XX 2011 Counts
XX 2013 Counts
XX 2015 ATC Counts

Figure A1: Base AM Peak Hour



XX 2010 Counts
XX 2011 Counts
XX 2013 Counts
XX 2015 ATC Counts

Figure A2: Base PM Peak Hour

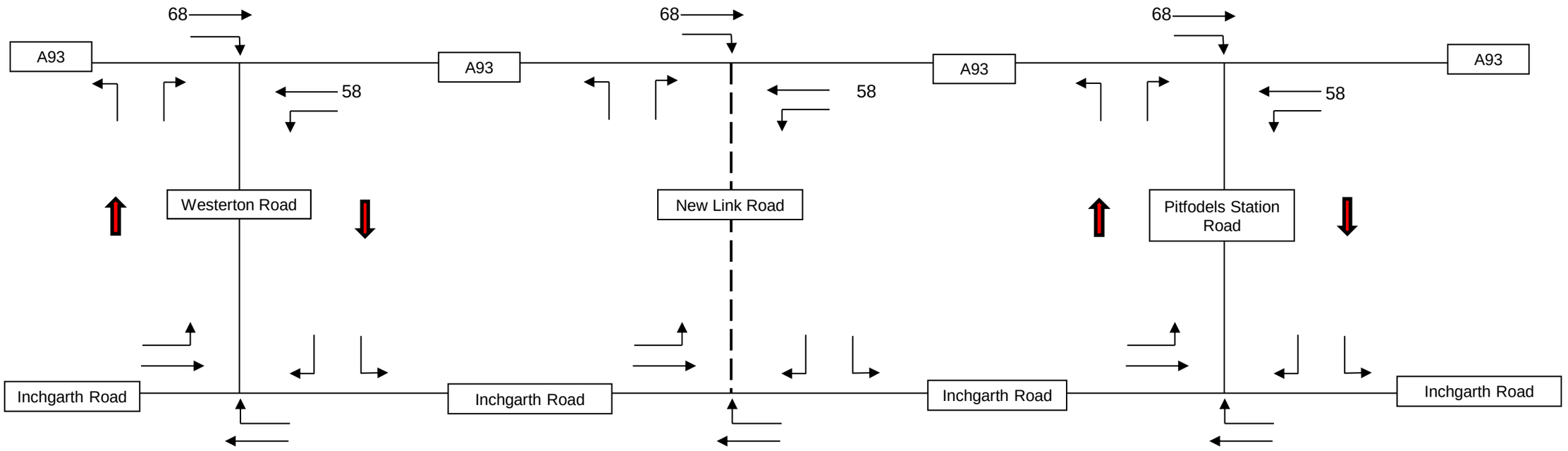


Figure A3: Committed Development (excluding Oldfold) - AM Peak Hour

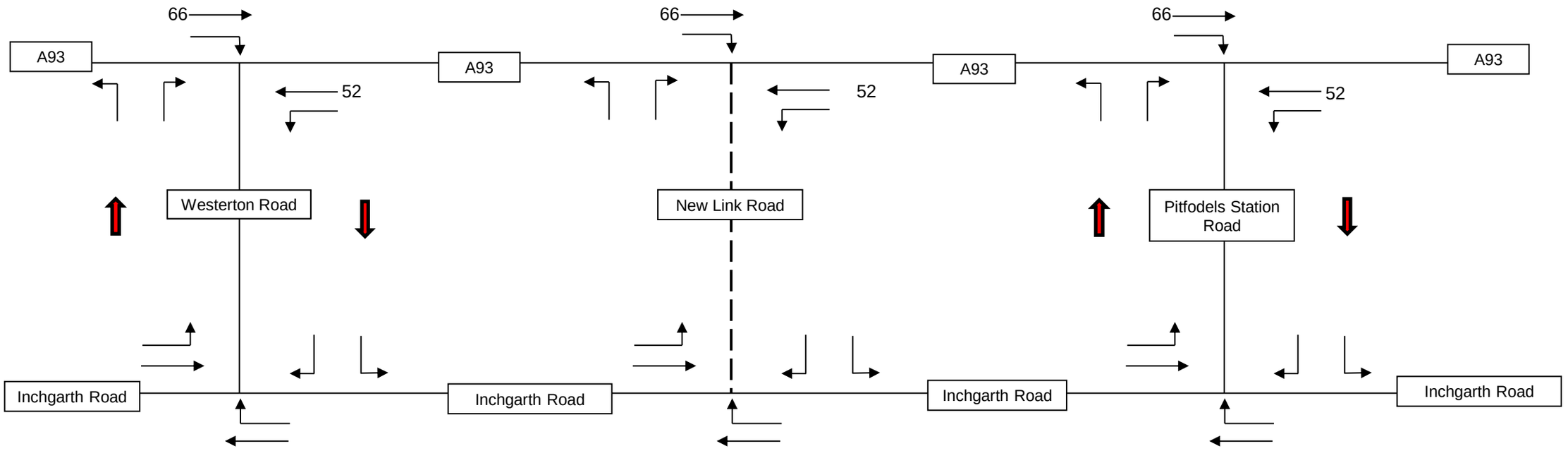


Figure A4: Committed Development (excluding Oldfold) - PM Peak Hour

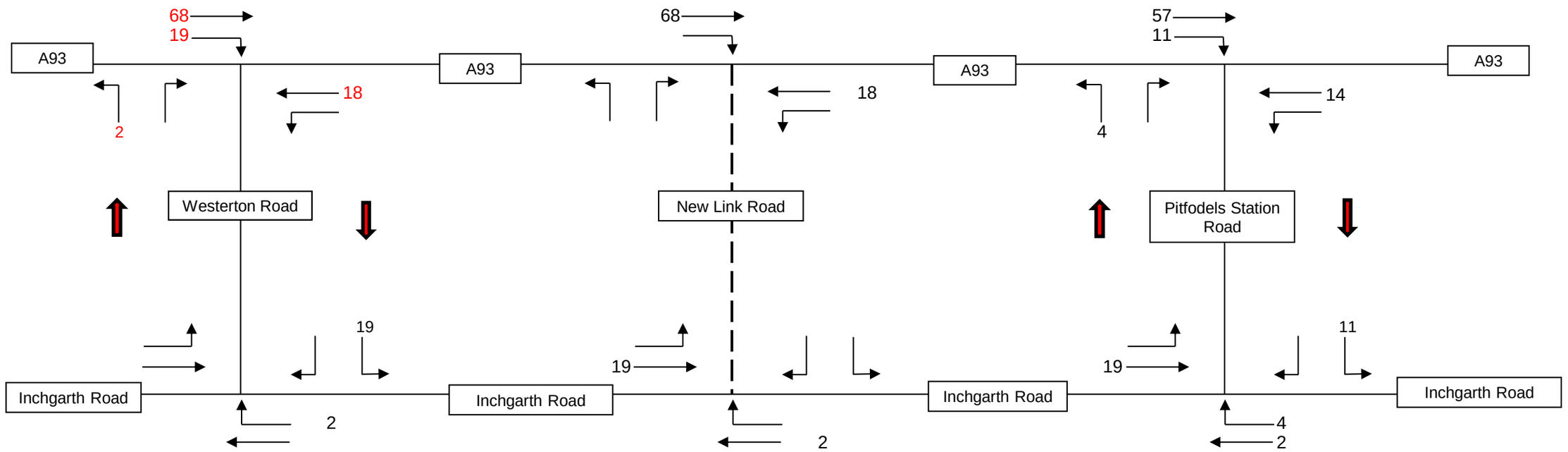


Figure A5: Oldfold Development - AM Peak Hour

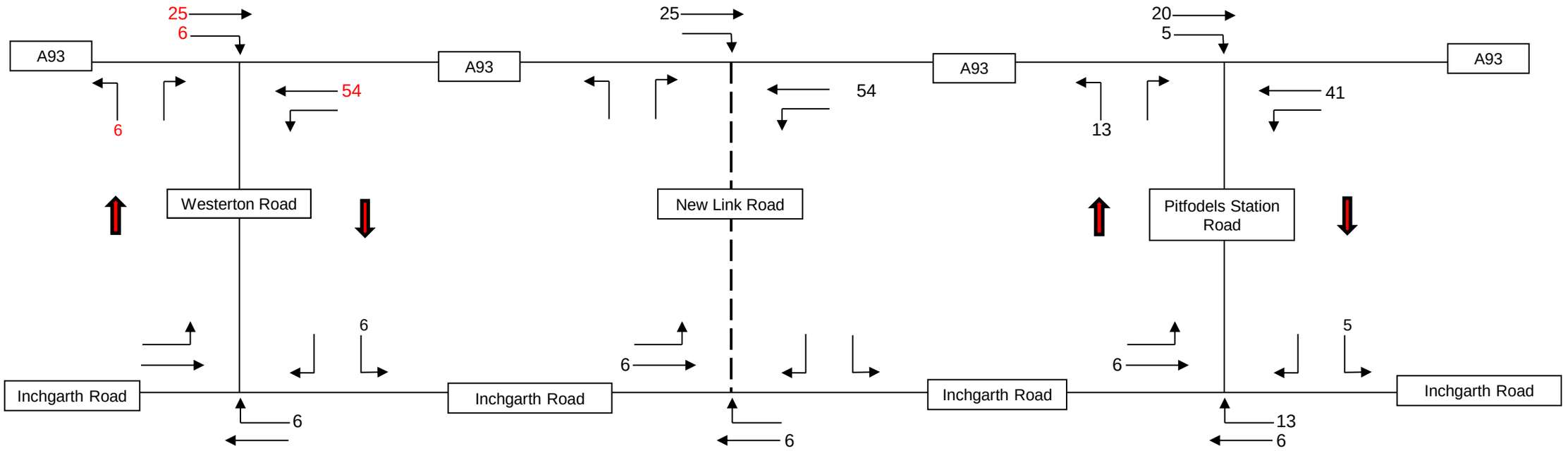


Figure A6: Oldfold Development - PM Peak Hour

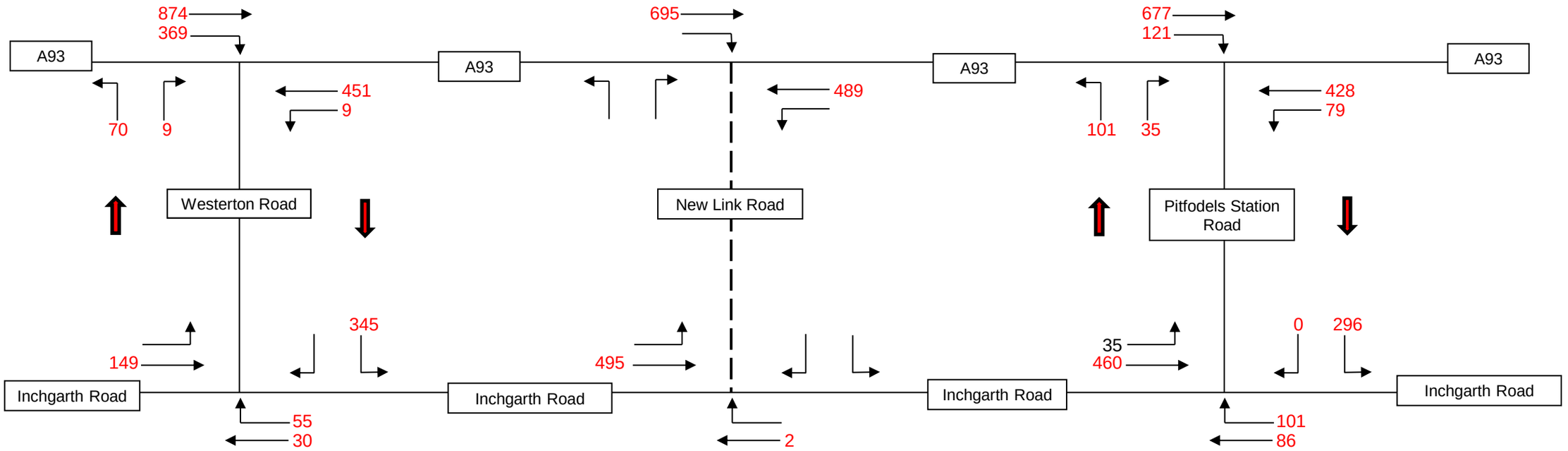


Figure A7: Base plus Comm Development - AM Peak Hour (Pre WPR)

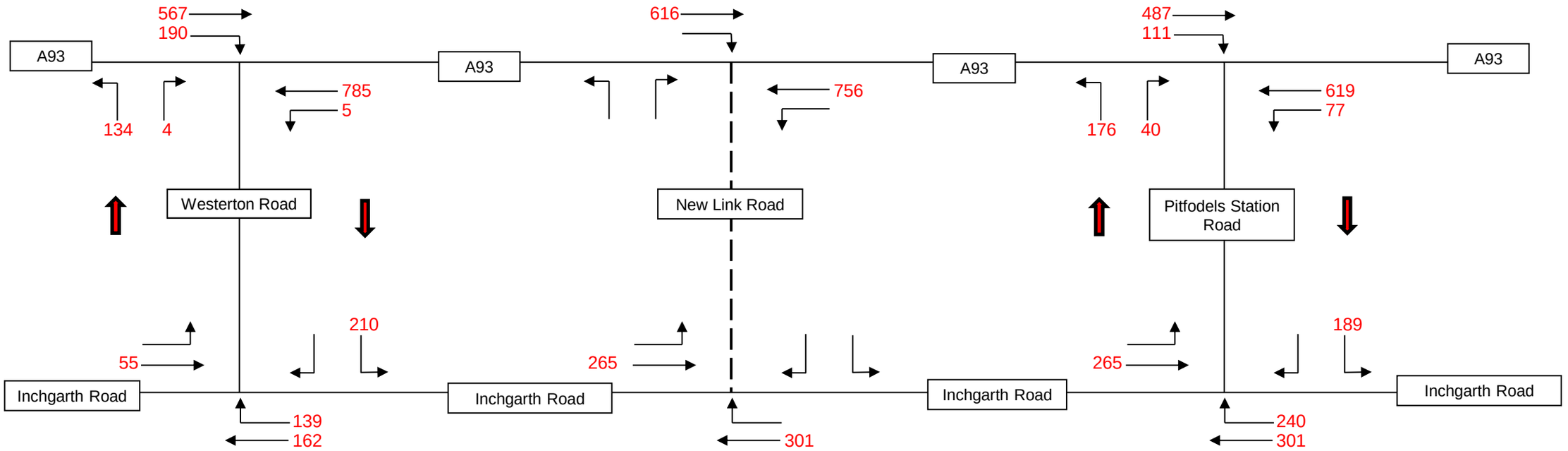


Figure A8: Base plus Comm Development - PM Peak Hour (Pre WPR)

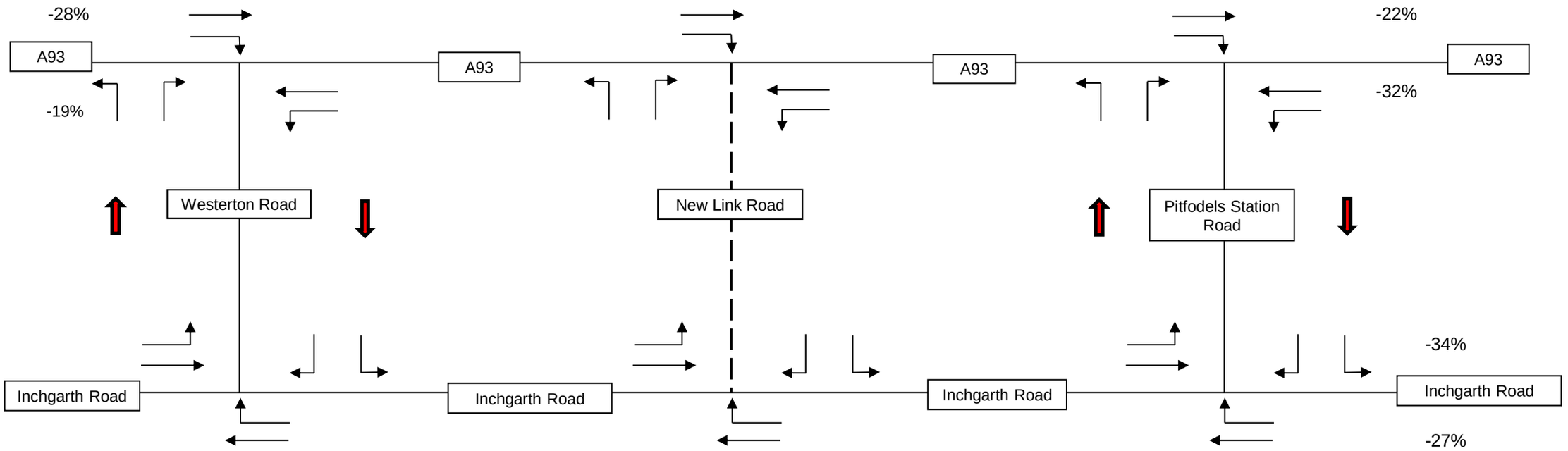


Figure A9: A93 Corridor Post-WPR Reductions - AM Peak Hour

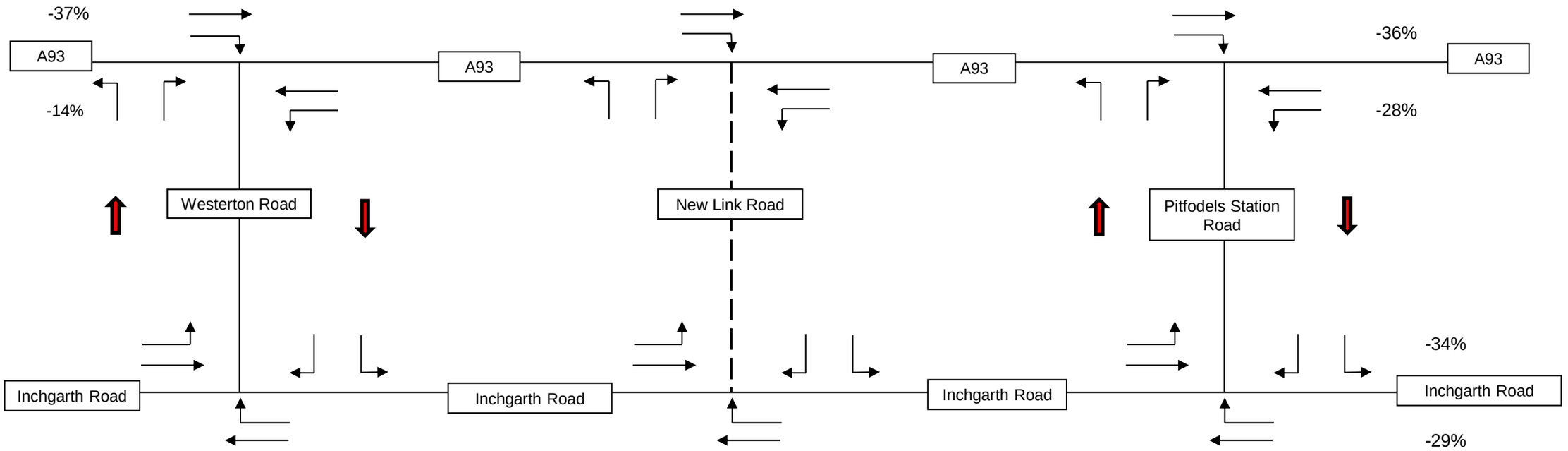


Figure A10: A93 Corridor Post-WPR Reductions - AM Peak Hour

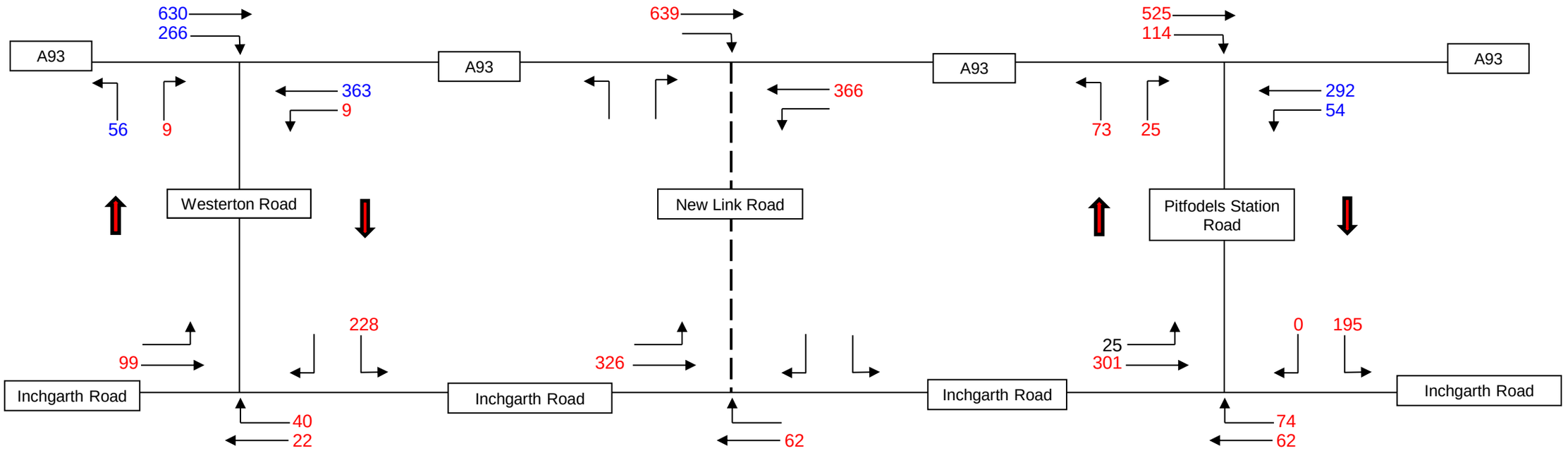


Figure A11: Base plus Comm Development - AM Peak Hour (Post WPR)

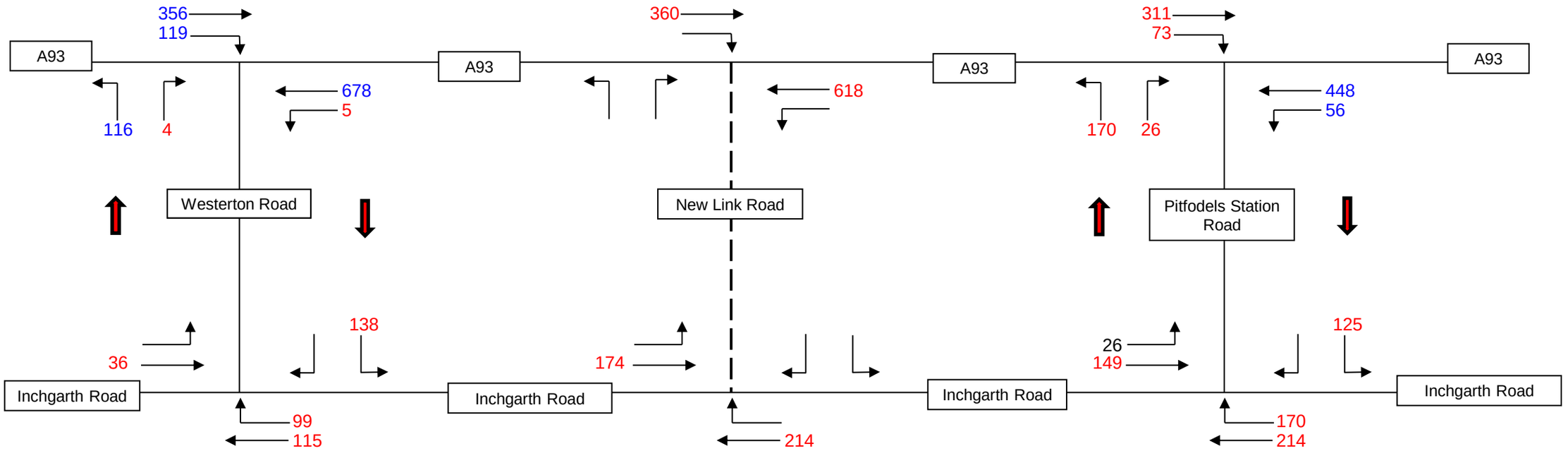


Figure A12: Base plus Comm Development - PM Peak Hour (Post WPR)

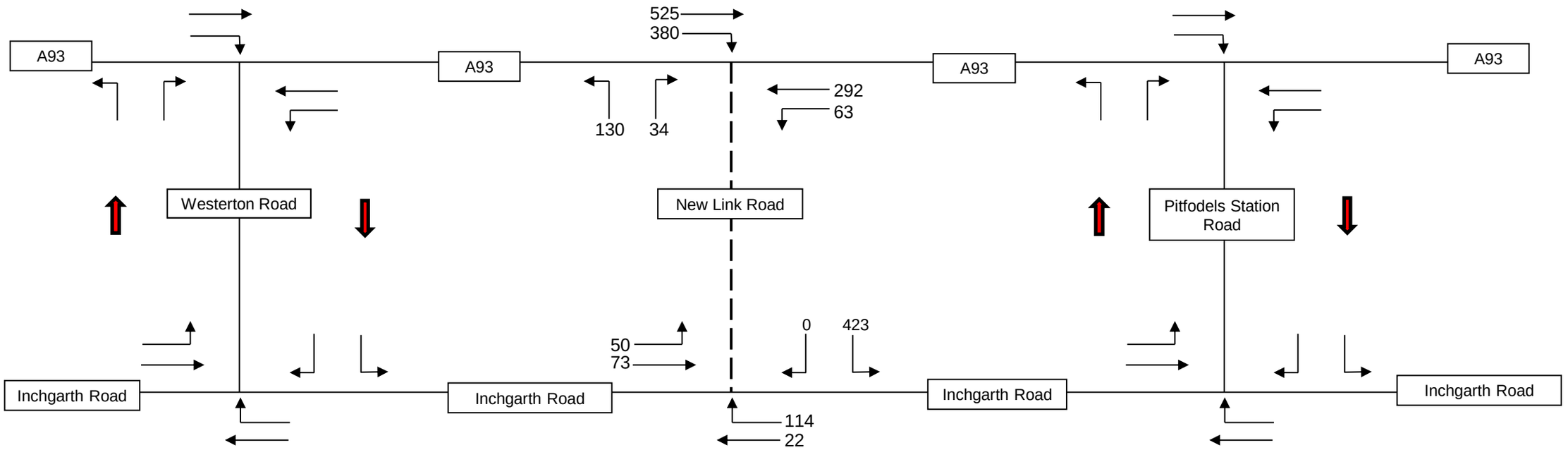


Figure A13: Inchgarth Link Road - Base AM Peak Hour (Post WPR)

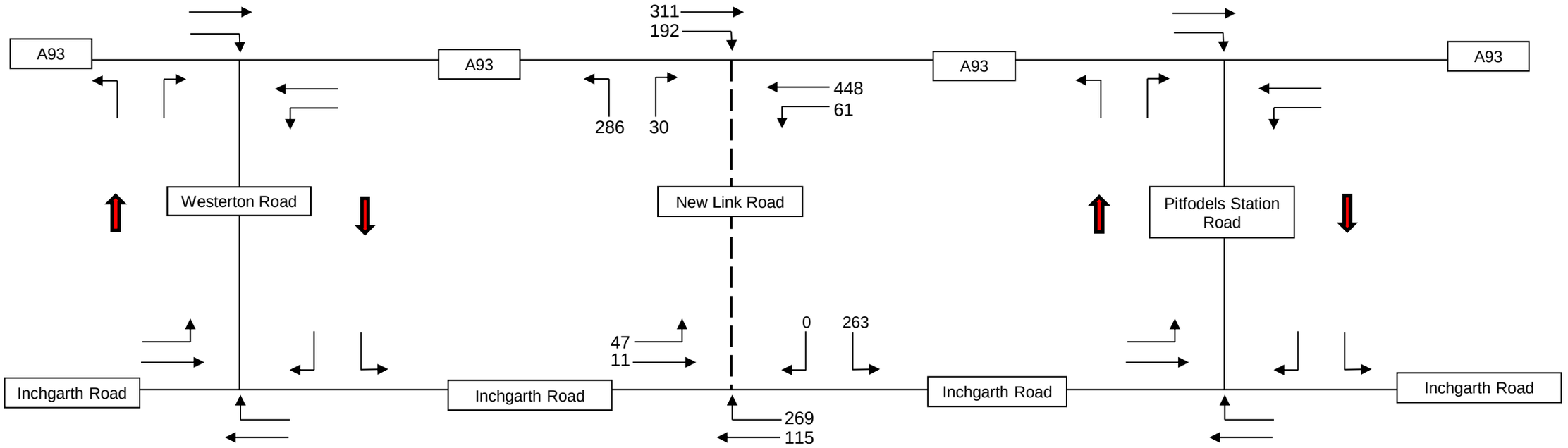


Figure A14: Inchgarth Link Road - Base PM Peak Hour (Post WPR)

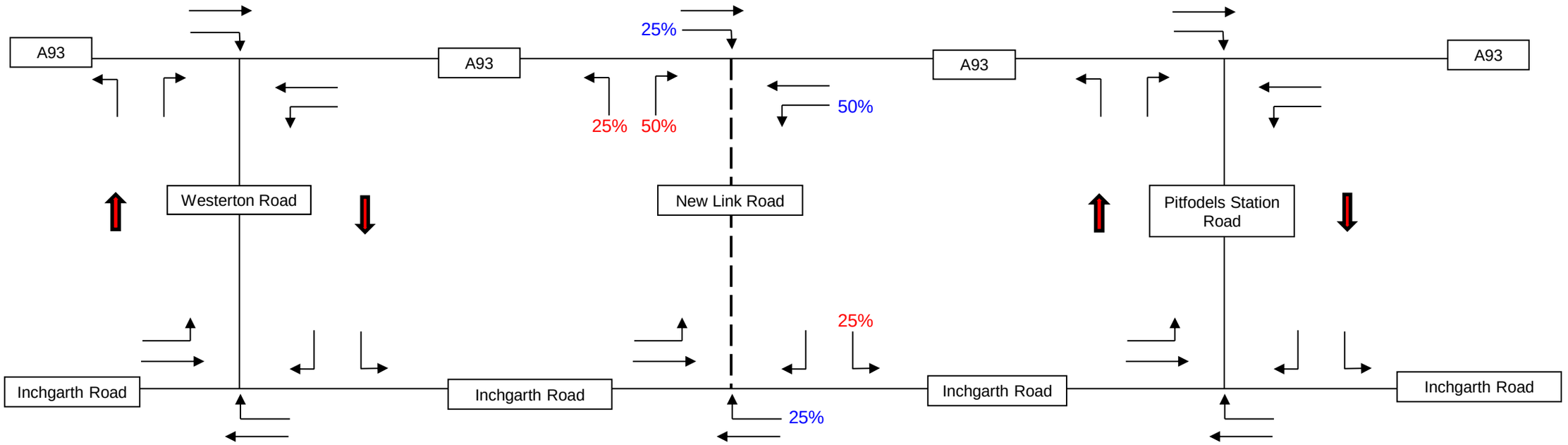


Figure A15: Proposed Development Trip Distribution

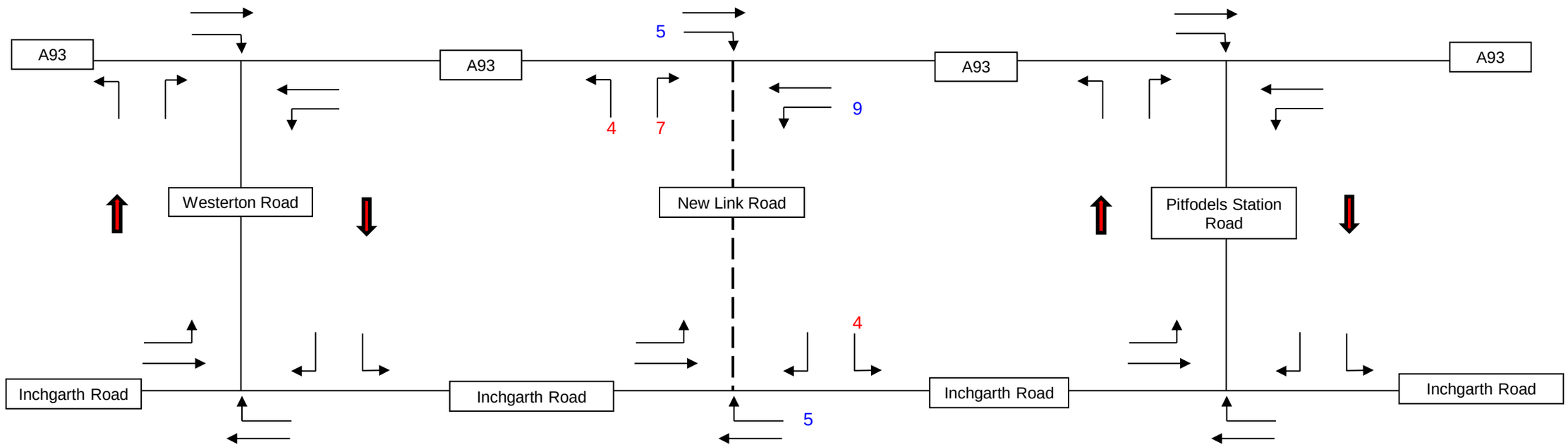


Figure A16: Proposed Development Traffic - AM Peak

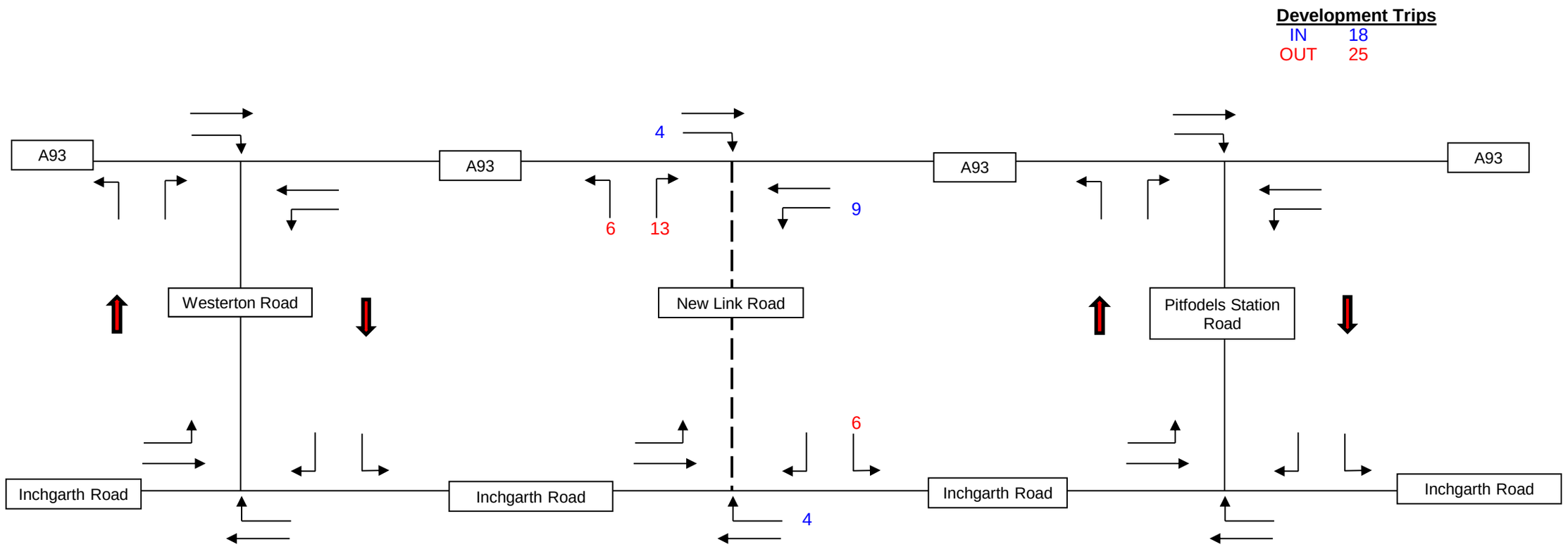


Figure A17: Proposed Development Traffic - PM Peak

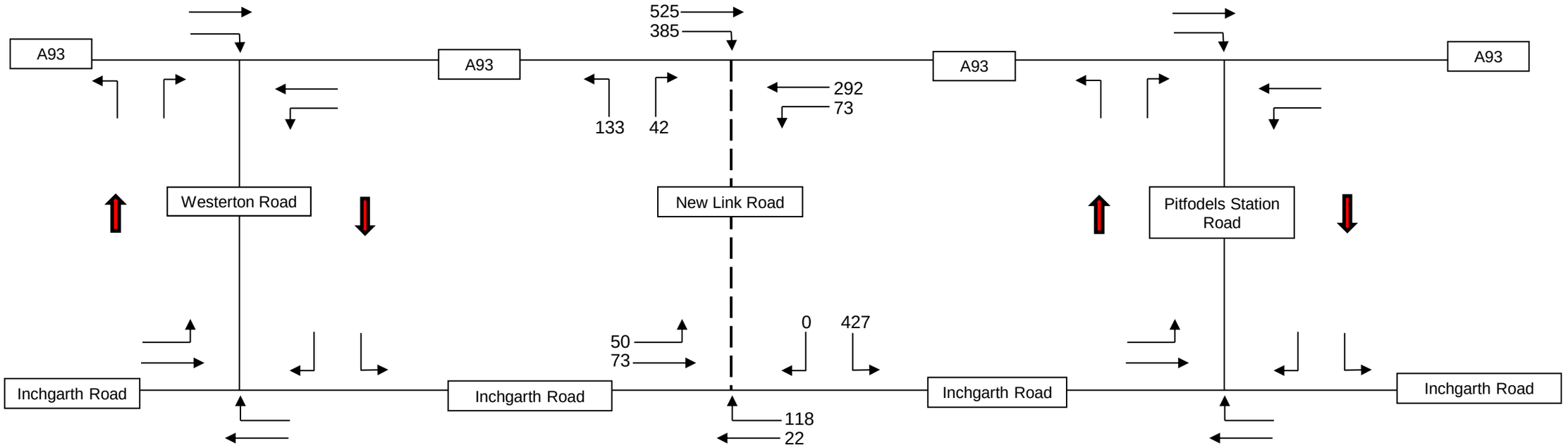


Figure A18: Inchgarth Link Road - Base AM plus Development Traffic (Post WPR)

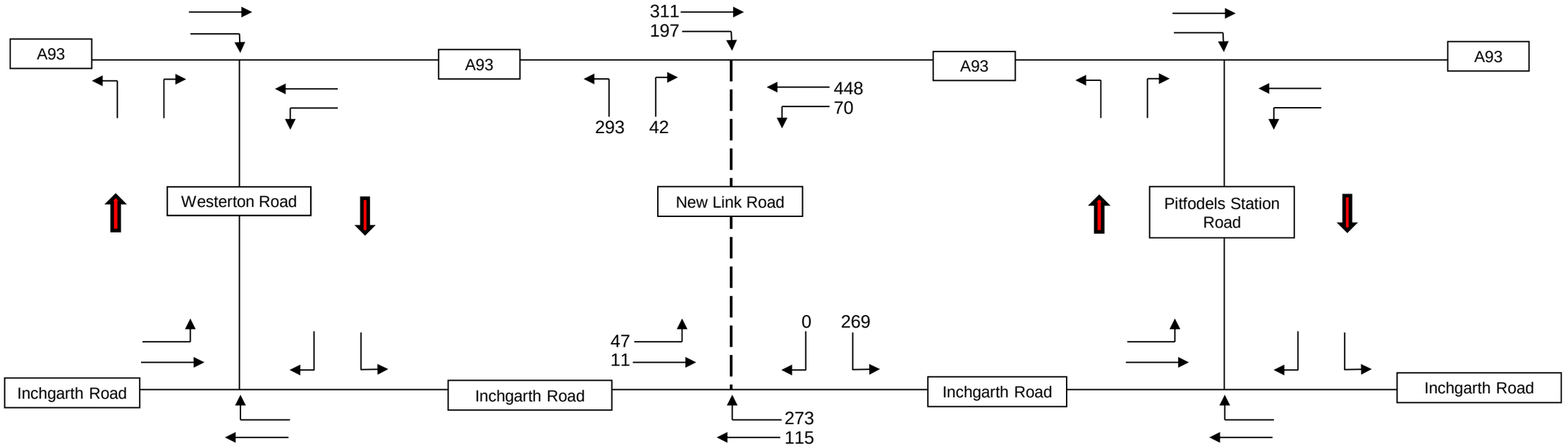


Figure A19: Inchgarth Link Road - Base PM plus Development Traffic (Post WPR)

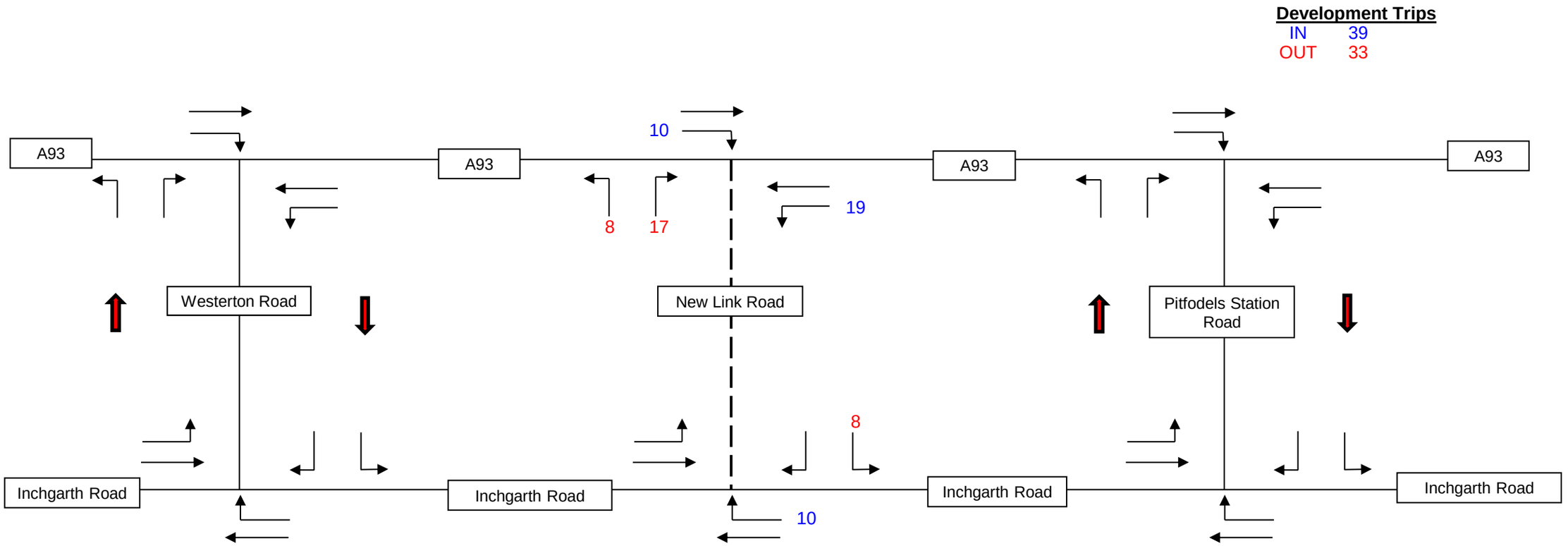


Figure A20: Proposed Development Traffic - AM Peak 'Sensitivity' Analysis

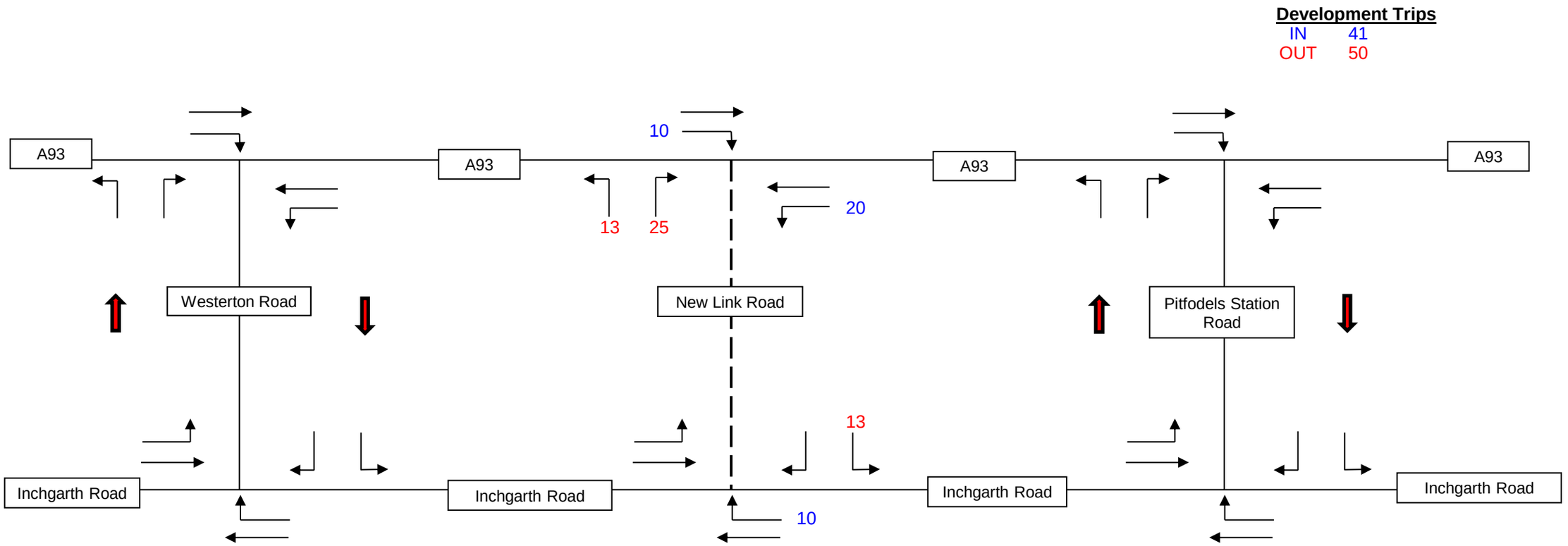


Figure A21: Proposed Development Traffic - PM Peak 'Sensitivity' Analysis

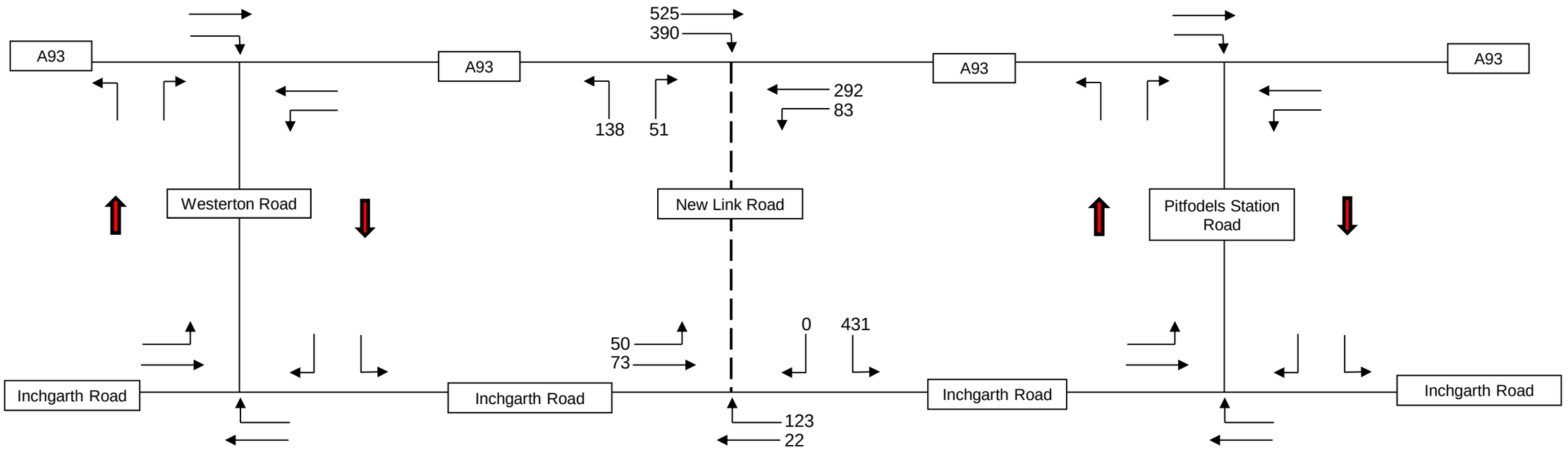


Figure A22: Inchgarth Link Road - Base AM plus Development Traffic (Post WPR) 'Sensitivity' Analysis

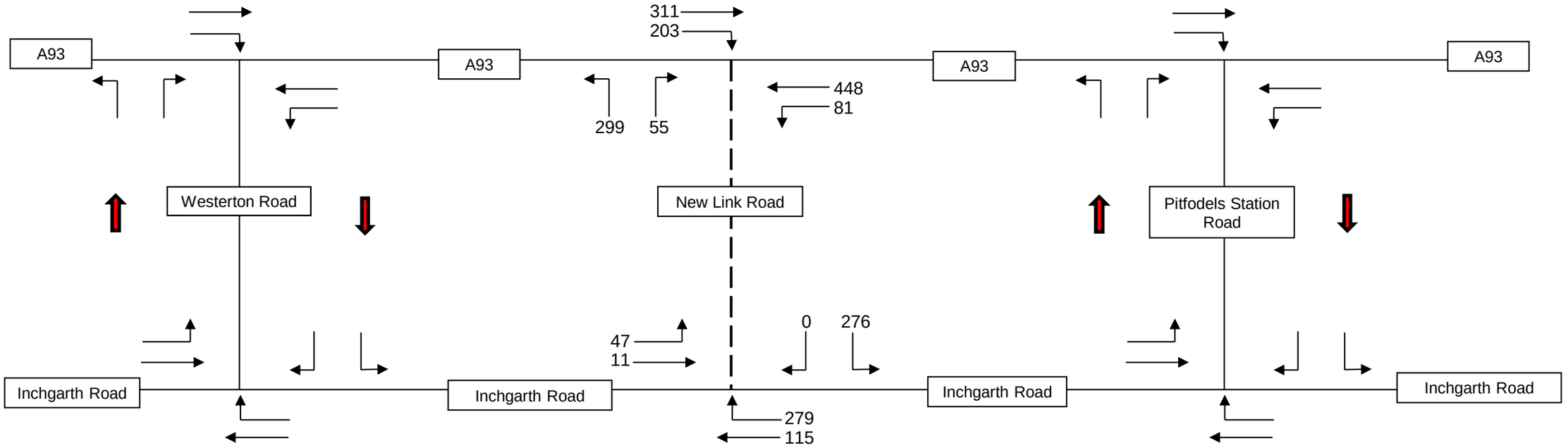


Figure A23: Inchgarth Link Road - Base PM plus Development Traffic (Post WPR) 'Sensitivity' Analysis

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)	I' - 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		
		Inchgarth Road east	Inchgarth Road west	Inchgarth Link Road
From	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		
		Inchgarth Road east	Inchgarth Road west	Inchgarth Link Road
From	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

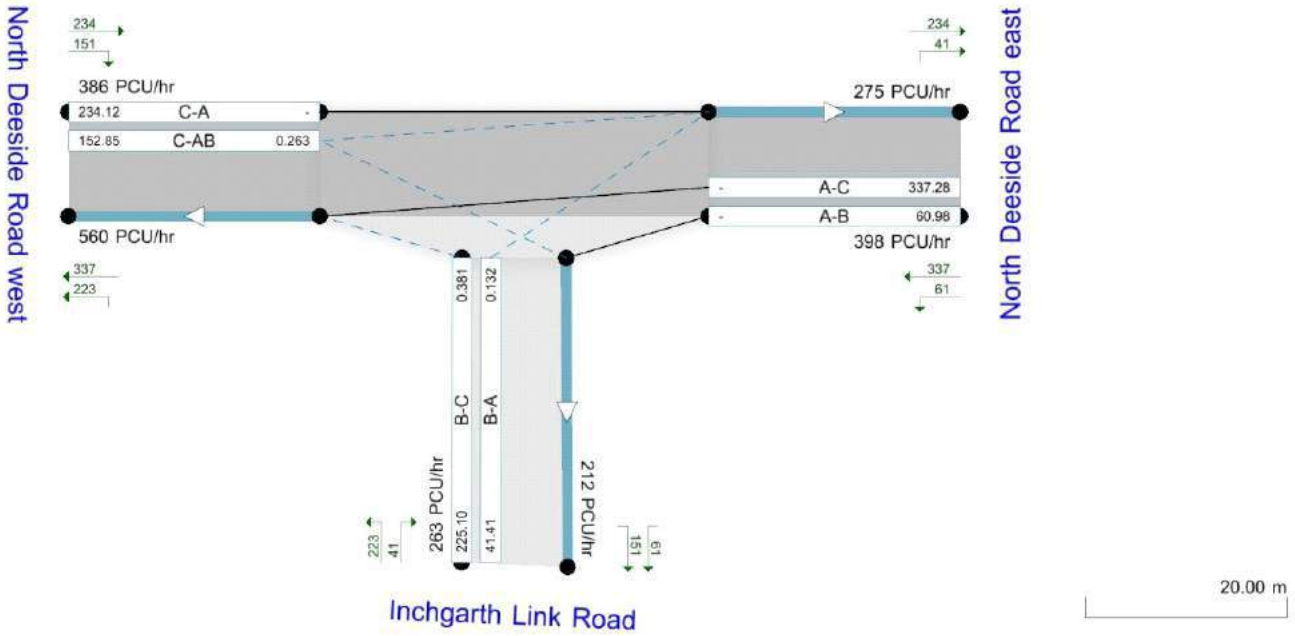
Title	(untitled)
Location	
Site Number	
Date	06/06/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	michaela
Description	

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		
		North Deeside Road east	Inchgarth Link Road	North Deeside Road west
From	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		
		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	0.28	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		
		North Deeside Road east	Inchgarth Link Road	North Deeside Road west
From	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		
		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	0.64	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

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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		06/06/17
	Approved by	L Morrison		06/06/17

Revision Record	Rev.	Date	Status	Description	Signature	
	1	06/07/17	Final	Appendix A updated	By	[redacted]
					Check	
					Approve	
	2	16/05/18	Final	Minor changes made to text	By	
					Check	
					Approve	

	3	25/05/18	Final	Development area amended.	By	[redacted]
					Check	
					Approve	

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

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

ExMH 4301
ExMH 4302 (Assumed Location)
ExMH 4303 (Assumed Location)
ExMH 4201 (Assumed Location)
ExMH 4202 (Assumed Location)
CP1
CP2
CP3
CP4
CP5
CP7
CP8
CP9
CP10
FMH1
SMH1
FMH2
SMH2 (SILT TRAP)
FMH3
FMH4
FMH7
SMH7
FMH8
SMH8
FMH9
SMH9
FMH10
SMH10
FMH11
SMH11
FMH13
SMH13
FMH14
SMH14
IC
DC
RE
FW 150ø
SW 150ø
SW 225ø
CELLULAR STORAGE (27.0 x 3.0 x 0.8m)
PERMEABLE PAVING WITH BELOW GROUND FILTER TRENCH AND CELLULAR STORAGE
CONTROL MH DISCHARGE LIMITED TO 4.34l/s (MAX) IN A 1 in 10 YEAR RETURN EVENT.
INDICATIVE SW SEWER DIVERSION
TO SURFACE WATER SEWER TO BE ABANDONED
SURFACE WATER SEWER TO BE DIVERTED FOLLOWING CONSULTATION WITH SCOTTISH WATER.
ROAD SIDE FILTER TRENCHES PROVIDED ALONG SPINE ROAD IN LINE WITH THE SIMPLE INDEX APPROACH – CIRIA C753.

SHEET KEYPLAN

SHEET 1
SHEET 2

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	06/01/17	DRAINAGE UPDATED IN-LINE WITH NEW SITE LAYOUT.	MC	DA	LAM
A	06/06/17	UPDATED TO INCLUDE NEW SITE LAYOUT.	MC	DA	LAM

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Tel: 01224 321222
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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.
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CONSTRUCTION
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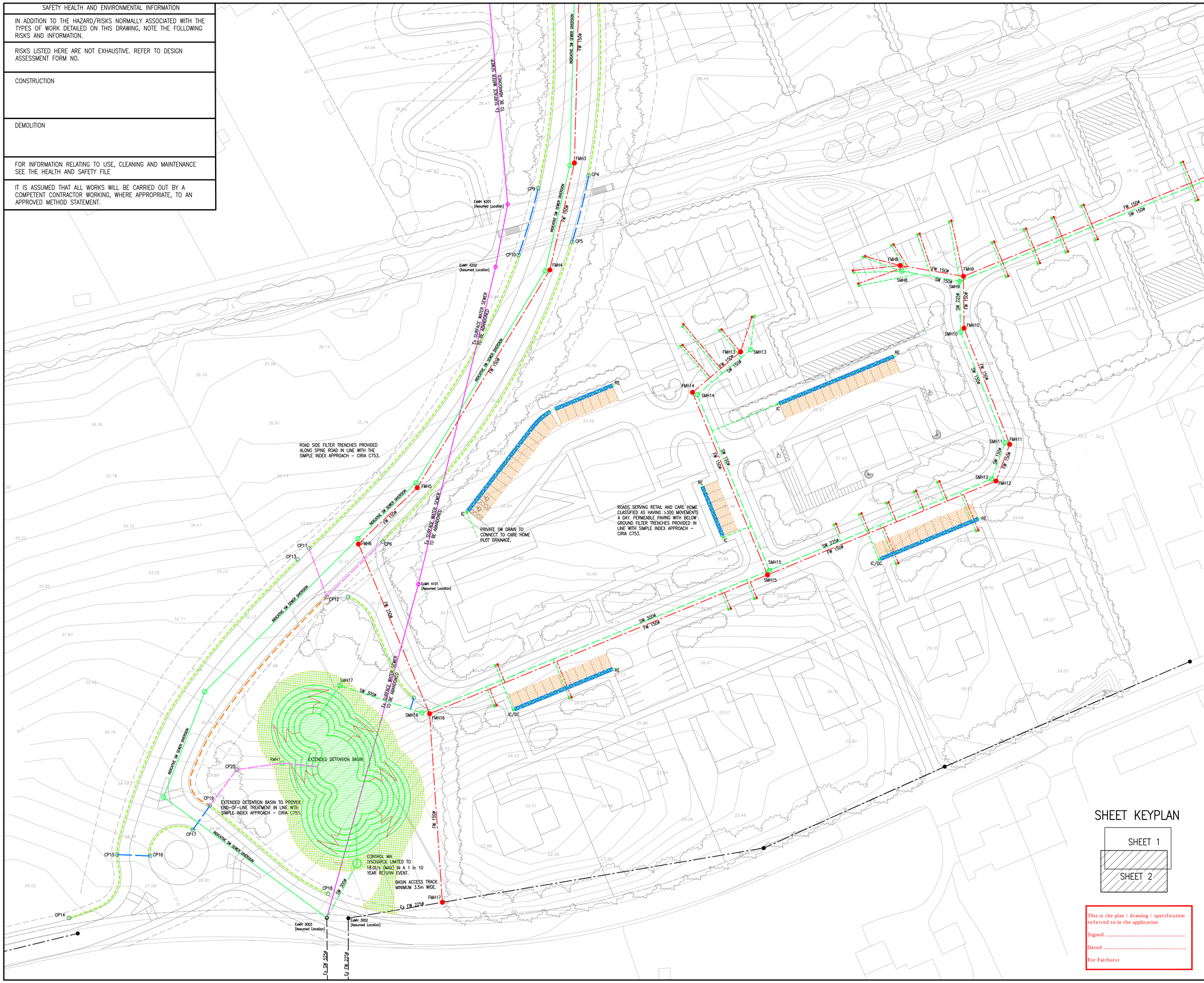
FOR INFORMATION RELATING TO USE, CLEANING AND MAINTENANCE SEE THE HEALTH AND SAFETY FILE
IT IS ASSUMED THAT ALL WORKS WILL BE CARRIED OUT BY A COMPETENT CONTRACTOR WORKING, WHERE APPROPRIATE, TO AN APPROVED METHOD STATEMENT.

Do not scale from this drawing.



LEGEND

- EXISTING COMBINED SEWER
- EXISTING SURFACE WATER SEWER
- INDICATIVE SW SEWER DIVERSION
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- FILTER TRENCH (1.0m WIDE)
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Dated .....

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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:	Status:	
1:500	For Information	
Drawn:	Checked:	Approved:
MC	DA	LAM
Date:	Date:	Date:
20/12/16	20/12/16	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					
TSS	>0.95	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	>0.95				
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					
TSS	0.85	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	0.85				
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	PROJECT	JOB No.	106859	Calculated by	MC
Cults Property Development Company Ltd		SHEET No.	1		
Inchgarth Road				Checked by	DA
Cults		DATE	18/05/17		
Pre-development Run-off Calculation					

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

[redacted]	106859 Inchgarth Road Aberdeen
Date 01/06/2017 File BASIN 10YR.SRCX	Designed by MC Checked by DA
Micro Drainage	Source Control 2016.1.1

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 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

[redacted]
106859
Inchgarth Road
Aberdeen

Date 01/06/2017 | Designed by MC
File BASIN 50YR.SRCX | Checked by DA
Micro Drainage | Source Control 2016.1.1

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 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

[redacted]	106859 Inchgarth Road Aberdeen
Date 01/06/2017 File BASIN 100YR.SRCX	Designed by MC Checked by DA
Micro Drainage	Source Control 2016.1.1

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

[redacted]	106859 Inchgarth Road Aberdeen
Date 01/06/2017 File BASIN 200YR.SRCX	Designed by MC Checked by DA
Micro Drainage	Source Control 2016.1.1

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

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106859
Inchgarth Road
Aberdeen

Date 01/06/2017 | Designed by MC
File CELLULAR STORAGE 10YR.SRCX | Checked by DA
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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 Σ (l/s)	Max 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

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Inchgarth Road
Aberdeen

Date 01/06/2017 | Designed by MC
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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 (m³)	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 (m³)	Discharge Volume (m³)	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		

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Date 01/06/2017	Designed by MC
File CELLULAR STORAGE 50YR.SRCX	Checked by DA
Micro Drainage	Source Control 2016.1.1

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 Σ (l/s)	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		

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Date 01/06/2017	Designed by MC
File CELLULAR STORAGE 100YR....	Checked by DA
Micro Drainage	Source Control 2016.1.1

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 Σ Outflow (l/s)	Max 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		

[redacted]	106859 Inchgarth Road Aberdeen
Date 01/06/2017	Designed by MC
File CELLULAR STORAGE 200YR.SRCX	Checked by DA
Micro Drainage	Source Control 2016.1.1

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 Σ (l/s)	Max 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

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Inchgarth Road
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Date 01/06/2017 | Designed by MC
File CELLULAR STORAGE 200YR.SRCX | Checked by DA
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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

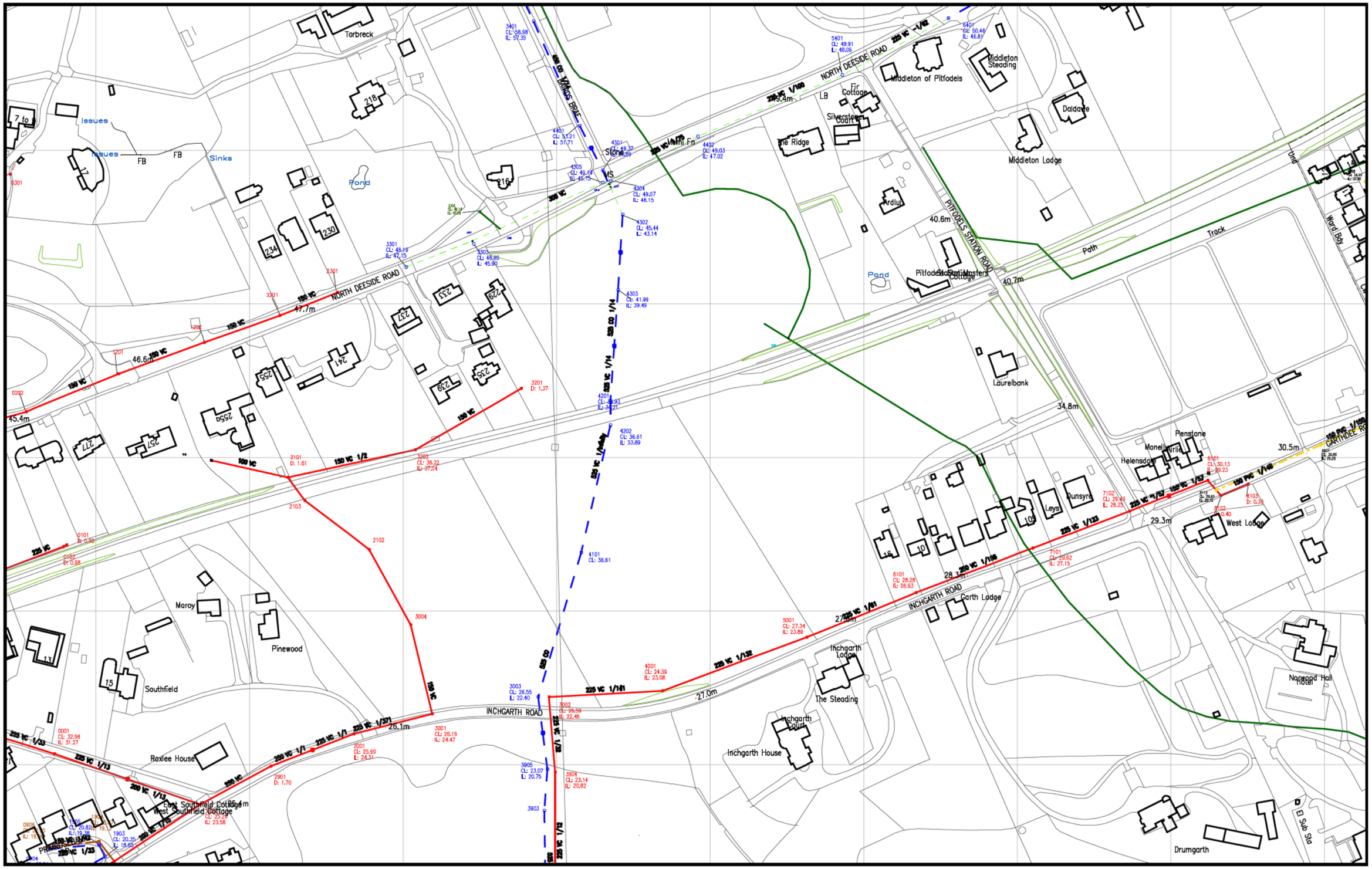
Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.400	4.4	Kick-Flo®	0.309	3.9
Flush-Flo™	0.163	4.4	Mean Flow over Head Range	-	3.5

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



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

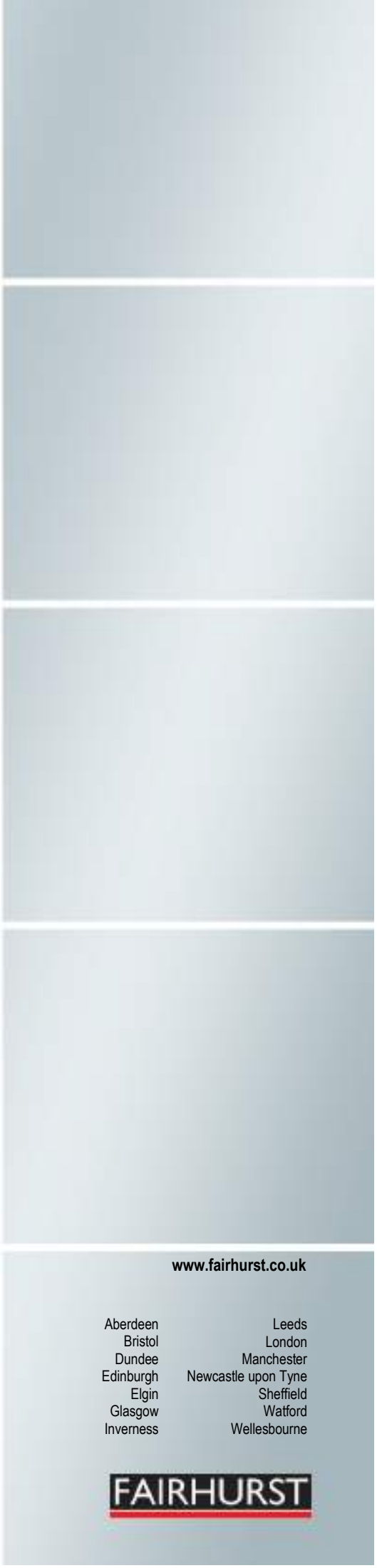
Wastewater Plan

0 236 metres

Scale: 1:2500

Plotted By: ptocl01

Scottish Water
Always serving Scotland



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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		07/11/2016
Approved by	Lyndsay Yuille		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)

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

106859/9100	Site Location Plan
106859/9101	Site Walkover Survey Plan
3847/102-C	Overall Masterplan (Fitzgerald Associates)

Appendices

Appendix 1	Envirocheck Report
Appendix 2	Consultation Reponses
Appendix 3	Site Walkover Photographs
Appendix 4	Service Plans
Appendix 5	Radon Map
Appendix 6	Principles of Environmental Risk Assessment

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

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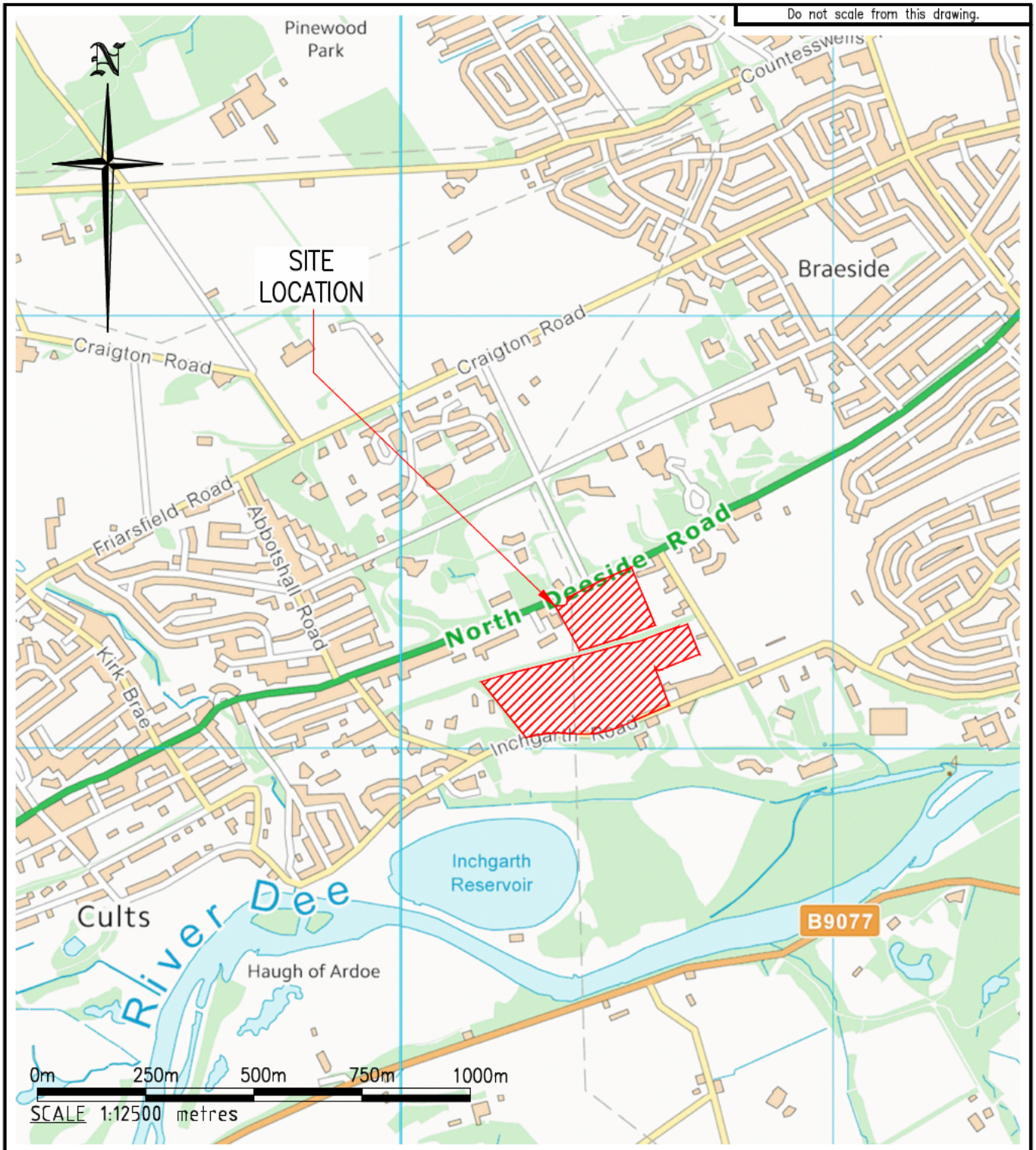
Drawings

106859/9100	Site Location Plan
106859/9101	Site Walkover Survey Plan
3847/102-C	Overall Masterplan (Fitzgerald Associates)

Do not scale from this drawing.



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

Scale at A4:	Status:	
AS SHOWN	For Information	
Drawn:	Checked:	Approved:
RD	JB	CS
Date:	Date:	Date:
13/10/16	13/10/16	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
- (1) PHOTO REFERENCE

Rev.	Date	Description	Drwn.	Chkd.	Appd.

FAIRHURST

Client:

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

Drawing Title:
SITE WALKOVER PLAN

Scale at A3:	Status:	
1:1000	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:

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

Bus Stop on North Deeside Road

Disabled Access from North Deeside Road

Wildlife Corridor / Green Space Retained

Existing Deeside Walkway

Wildlife Corridor Natural Path Access Points [Typ]

Existing Deeside Walkway

Wildlife Corridor / Green Space Retained

Emergency Vehicle Access Only

Disabled Access from Inchgarth Road

INDICATIVE OVERALL MASTERPLAN

Rev :	Date :	Comments :

2

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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		