Auchterarder Expansion

Townhead & North East Development Framework

February 2008

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Introduction

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1.0 INTRODUCTION

1.1 Background

The adopted Strathearn Area Local Plan was published in 2001, and made provision for a mixed use housing development on the northern edge of Auchterarder. The Council, in conjunction with landowners, developers, the local community, statutory and non-statutory bodies agreed to undertake the preparation of a Development Framework for such development.

Consequently, early in 2001 the client, a consortium of developers, comprising of Muir Homes, Stewart Milne Homes and Richmond Homes, commissioned Gillespies in conjunction with Dougall Baillie Associates to prepare the Development Framework for Castlemains and Kirkton sites to the north, and for the Townhead site to the south-west of Auchterarder. In support of this Development Framework, the study was required to include a review of planning policies, a landscape and townscape assessment, a noise assessment with regard to the A9 and a transportation statement. After lengthy negotiations regarding the upgrading of Auchterarder water treatment works and ongoing discussions with the Scottish Government regarding the upgrading of the A9, the Development Framework process was finally concluded in February 2008.

1.2 Methodology

The study has adopted the following methodology:-

- Site visits, photography and cartography, as a basis for analysis of existing landscape and townscape character
- Study of historical records and mapping
- Study of relevant local authority planning documents
- Site measurement and assessment of noise levels emanating from the A9
- Assembly of information on existing services and their capacities
- Assessment of transport/traffic implications of proposals
- Preparation and presentation of alternative draft plans
- Incorporation of public consultation feedback

Following this introductory chapter, the Report has been organised into four further sections, including an assessment of the existing settlement character, a description of the masterplan, an engineering section covering transport and services. The appendix sets out other reference material.

1.3 Strategic Environmental Assessment

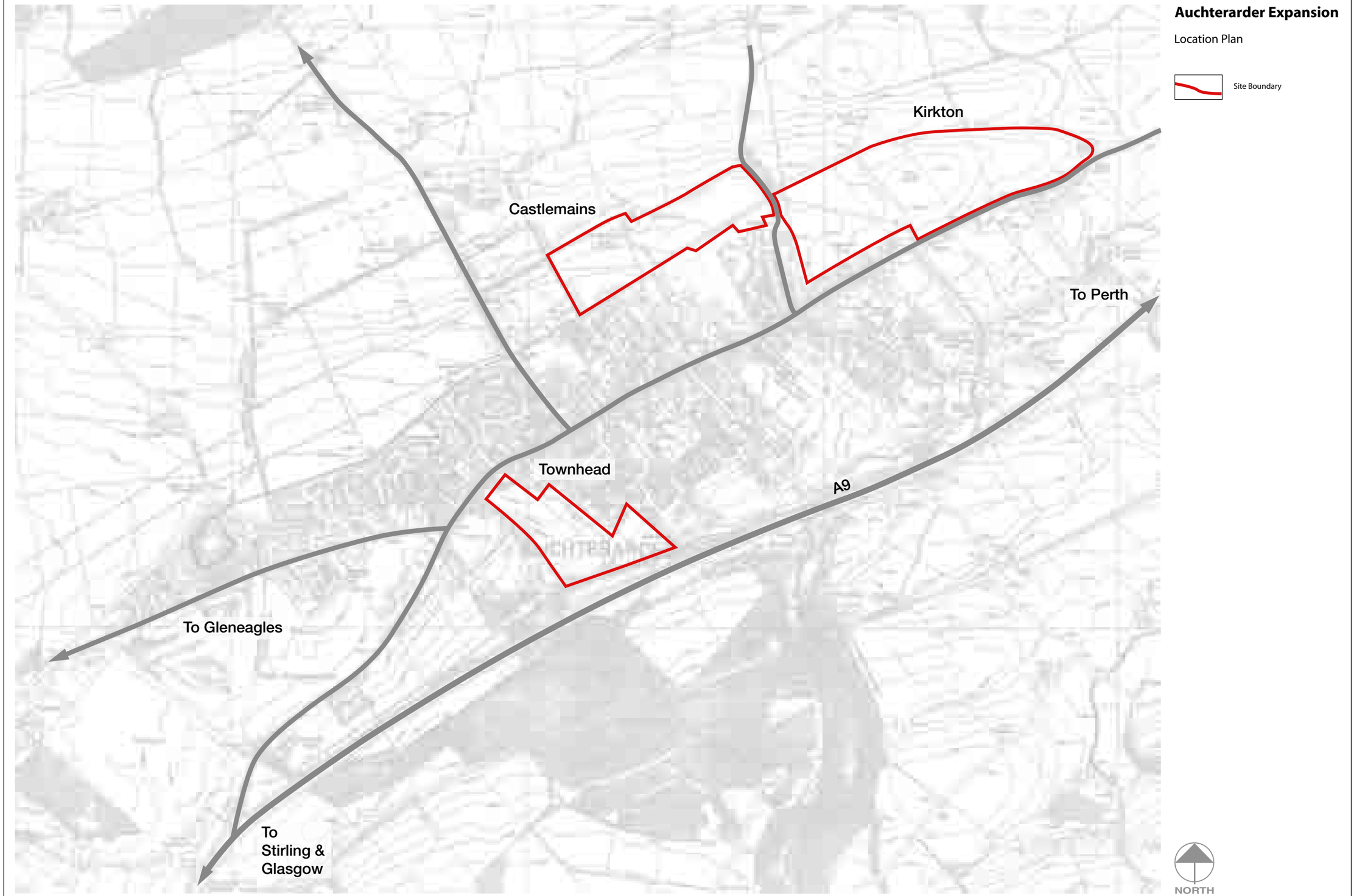
The Development Framework document has also been subject to a Strategic Environmental Assessment (SEA) required under The Environmental Assessment of Plans and Programmes (Scotland) Regulations 2004. This is because the first formal preparatory act on the Development Framework was prior to February 2006, after which date the Environmental Assessment (Scotland) Act 2005 applies. The purpose of the SEA was to assess and mitigate the predicted significant environmental effects of adopting the Development Framework as public policy. The SEA is reported in an Environmental Report which is a separate but complementary document to the Development Framework.

1.4 Consultations / Liaison

Perth and Kinross Council has held public consultations through the Strathearn Area Local Plan process and by arriving at the decision to include the expansion area in the Local Plan, the principle of residential development has been established.

Throughout the study to date, liaison has been maintained and consultation carried out with the following organisations:

- The Developer Consortium (Client)
- Perth & Kinross Council (Planning, Roads, Education, Housing and Environmental Services Departments)
- Scottish Environmental Protection Agency (SEPA)
- Scottish Water
- Transport Scotland
- Auchterarder Masterplan Steering Group
- Anderson Christie, Architects for Auchterarder Community School Project
- Acoustic Consultancy Services
- Scottish Natural Heritage
- Historic Scotland
- Royal Commission on the Ancient and Historical Monuments of Scotland (National Monuments Record of Scotland)
- Scottish Wildlife Trust
- Perth and Kinross Heritage Trust (Area Archaeologist)



Figures 1. Location Plan

Research and Assessment

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2.0 RESEARCH AND ASSESSMENT

2.1 Historical Survey

Auchterarder is a town of approximately three thousand one hundred inhabitants, located just off the A9, twelve miles south west of Perth. Archaeological remains and burials in the locality indicate settlements from 2,700BC, whilst the line of the Roman road, with its associated camps, lies 4 miles north. Tradition asserts that King Malcolm Canmore (1052-93) established Auchterarder Castle as his favourite royal seat, and that by 1200 Auchterarder achieved the status of Royal Burgh. The town had association with King Robert the Bruce in 1323, and during the Reformation, Mary of Lorraine, mother to Mary Queen of Scots. Wealth followed from such royal patronage, and Auchterarder developed as a centre of the chain mail industry in Scotland.

By 1707, with the Union of the Scottish and English Parliaments, this prosperous situation had fallen into decline and, unable to pay its dues, Auchterarder lost its privileges as a Royal Burgh. Following the Jacobite Rising of 1715 the town was sacked by the retreating Jacobites, and a large proportion of its people died of cold and starvation in the severe winter. During the eighteenth century Auchterarder gradually recovered prosperity, with the economy based on agriculture, on its by products, on the town market and on handloom weaving. The coming of the railway with a network of good roads during the nineteenth century encouraged further commerce and prosperity. Auchterarder briefly regained its status as a Royal Burgh in 1951, but in 1975 local government reorganisation determined that the town became part of Perth and Kinross District.

Today Auchterarder has become a community based loosely on agriculture, and associated service industries. It provides support services for the adjacent Gleneagles Hotel, and benefits from its affluent clientele. Commuter accommodation for Perth is important, and Auchterarder is popular for the retired, with a good mix of shops, hotels and cafes, conveniently concentrated in the High Street. The recently completed Community School acts as a civic focus at the heart of the town. The secondary is six year, comprehensive, non-denominational and caters for pupils of all abilities. It serves the rural catchment area of Auchterarder and surrounding district. The pupil roll as at September census 2006 comprised 449 and the projected roll for 2007-2008 is 463.

Figures 2 & 3. Newly completed Community School to the immediate south of Castlemains expansion site

Figure 4. Direct path link from Community School to Main Street

2.2 Development Plan

The Development Plan consists of the Perth and Kinross Structure Plan (2003) and the adopted Strathearn Area Local Plan (2001). The Local Plan was subject of two rounds of modification prior to adoption, the first round of modifications followed a Local Plan Inquiry in October 1999 and Committee consideration in March 2000. Additional modifications, with specific reference to Auchterarder, were presented to Committee and ratified in December 2000, leading to eventual adoption of the plan in May 2001.

It should be remembered that the Local Plan allocation of the framework area at North Auchterarder took place in the context of the approved Tayside Structure Plan (1997) and an emerging (draft) structure plan for Perth & Kinross. Since adoption of the local plan in 2001, the Tayside Structure Plan has been replaced by the new Perth & Kinross Structure Plan, approved by Ministers in 2003 and having a time horizon to 2020.

2.3 Perth & Kinross Structure Plan

Within the new structure plan, Auchterarder is a key settlement identified within the Lowland area of Perth & Kinross. The spatial strategy for the Lowland area is to promote greater self sufficiency and diversification of this largely rural economy. In housing land terms, major new development should be directed to the larger towns and their hinterlands along with a complement of opportunities in smaller villages (see Sustainable Communities Policy 6). The strategy also dictates that prime business and industrial land should be allocated to areas which are deficient.

For the purposes of housing land supply, Auchterarder is considered as part of the Strathearn Housing Market Area where the structure plan housing land requirement is some 1,305 units between 2000 and 2020 (see Schedule 1). A shortfall of 595 units within the Strathearn HMA is identified over this 20 year period.

In the interim, discussions with the planning authorities about short to medium term infrastructure constraints have been able to resolve the concerns of the TRA on the basis that the developers contribute to a major junction upgrading.

2.4 Strathearn Area Local Plan

The original proposal for the expansion of Auchterarder, as contained in the Finalised Strathearn Local Plan, was indicatively for 1000 units. However, following the Local Plan Inquiry, the Reporter recommended modification of the extent of the land identified for housing around Auchterarder. Subsequent further modification rationalised the extent of the land to three sites in total, removing the land known as Upper Boreland and that to the north of the Castlemains Farm Steading.

The adopted Strathearn Area Local Plan now delineates the extent of land for housing around Auchterarder as the Northern Edge at the Feus and Castlemains as well as the site at Townhead Farm. The number of housing units on these sites is to be identified within the framework which will address issues of infrastructure and services as well as other policy considerations. The adopted plan also identifies the Northern Edge of Auchterarder for mixed use development, specifically allocating an area of 4 ha at Pow Hillock for Class 4, 5 or 6, principally to meet local needs. This allocation is again to be progressed through the framework exercise.

The expansion area is set out within Policy 60 which states:

“The Council, in consultation with the relevant parties including the local community, will prepare a framework for the development of the land identified as Opportunity 3. This will include proposals to deal with private sector contributions towards removal of infrastructure constraints”.

Opportunity 3 states:

“Northern Edge and Townhead Farm – Development Opportunity for residential and compatible uses, including an allocation for general business uses. The Details of land allocation will be set out in a Master Plan.”

2.5 Planning Policy

The perception and quality of a place is ultimately underpinned by the character of its streets and spaces. By creating a successful place, the local community will benefit in terms of their use, enjoyment, happiness, appreciation and safety. The Framework has been developed with regard to the following planning policy documents:

SPP1: The Planning System confirms the Scottish Executive's commitment to achieving sustainable forms of development in appropriate locations in the long term community interest. It advises that effective planning involves partnership working, community involvement and dialogue and negotiation with developers to enable a high quality of development on the ground. Whilst policy favours use of brownfield land, paragraph 8 states that conflicts between objectives inevitably arise and that planning decisions should be taken in line with local priorities and needs as identified in the Development Plan. Local Plans must identify realistic, effective opportunities for development and encourage investment in an area (Para 37). The planned expansion of Auchterarder is established within the Strathern Local Plan. SPP1 sets out the Scottish Executives commitment to integrating the following principles into the policy agenda:

- Sustainability: the measure of the likely impact of development on the social, economic and environmental conditions of people in the future
- Social Equality: considering the diverse needs of local communities and ensuring accessibility for all
- Environmental Quality: guiding the location and design of development, the management of land use, energy efficiency and the need to travel
- Design: signaling the importance they attach to achieving improvements in the design and quality of new development, and bringing long term benefits to the urban and rural environment. The architectural design, siting and setting of development in its surroundings being valid concerns of the planning system.

SPP3: Planning for Housing explains the role of the planning system in the delivery of housing, including standards and approaches in relation to the provision of new housing development.

The principle of a planned expansion to Auchterarder is established with SPP 3, which states that where brown-field and infill sites cannot meet the full range of housing requirements, it will be necessary to release green-field land next to built-up areas. Meeting housing requirements through extensions to existing towns and villages has a number of advantages. Servicing costs can be reduced and new housing may benefit local centres by helping to sustain local schools, shops and services.

SPP6: Renewable Energy - the Executive has vowed that Scotland must increase its capacity for renewable energy production, specifically by committing to 40% of Scotland's power produced from renewable sources by 2020. In helping to ensure the realisation of these renewable energy targets, the potential for renewable energy sources will be explored further at design statement and detailed planning application stages.

SPP7: Planning and Flooding sets out measures to prevent development which would have a significant probability of being affected by flooding or which would increase the probability of flooding elsewhere. The sustainable use of land and resources has been explored with particular regard to the objectives and guidance set out within PAN 61 Planning and SUDS.

The importance of identifying priorities for the provision of water, drainage and waste infrastructure is highlighted in PAN 63 – Waste Management Planning, PAN 79 – Water and Drainage and the forthcoming SPP10 Planning for Waste Management.

SPP8: Town Centres and Retail highlights the need to focus retail and commercial leisure development in highly accessible locations, particularly town centres. The development of the Framework will support local services, retail, community and business uses within the existing town centre of Auchterarder.

SPP 11 Physical Activity and Open Space sets out national planning policy for sports and recreation in urban and rural settings and for provision and protection of open space within and on the edges of settlements. It introduces national minimum standards for open space in new developments, which open space provision within the Framework will meet.

SPP15 Planning for Rural Development sets out a framework to ensure that the planning system recognises and responds to the differences within rural areas (that is the countryside and settlements of 3000 population or less). In particular, SPP15 establishes a very positive message about the need for rural Scotland to become more confident and forward looking in both accepting change and benefiting from it, welcoming newcomers and providing for existing residents. More people now live and work in rural areas without being part of the traditional or agricultural economy. The clear goal is therefore to maintain the viability of existing communities and bring new life to many places which have experienced years of decline, building on their long term potential as places in which to live and work. One example is that the planning system can enable development opportunities in sustainable locations where infrastructure capacity and good access exist, or can be provided at reasonable cost (para 9).

SPP 17: Planning for Transport states that 'land use planning should assist in reducing the need to travel; in creating the right conditions for greater use of sustainable transport modes; and in avoiding or mitigating adverse environmental impacts'. The Framework seeks to maximize sustainable transport modes and reduce the dependency on car travel, through the provision of safe and accessible pedestrian and cycle routes throughout the site linking play spaces, SUDS, the local community school and links to the town centre. It also promotes healthier lifestyles by linking into the existing pedestrian and cycle network throughout the town and its boundaries.

Policy Statement for Scotland 'Designing Places' argues that good design is an integral part of a confident, competitive and compassionate Scotland. The buildings and spaces being developed now will shape the way our villages, towns and cities work in the next 50 years and beyond.

Auchterarder expansion presents an opportunity to create a high quality, well connected place, which enhances the urban and landscape character of the town. This can be achieved by holistically thinking about the site and how the various elements of development, buildings, streets, spaces and landscape can be brought together in an integrated way which responds to the specific character and sensitivities of the site.

'Designing Places' recognises the physical qualities that can make Scottish towns, cities and villages distinctive, welcoming and memorable. It identifies six key qualities of successful places:

- Identity,
- Safe and pleasant spaces
- Ease of movement
- A sense of welcome
- Adaptability
- Good use of resources

2.6 Planning Advice

This framework has been developed while taking into account the aims and objectives of the following relevant planning advice as set out by the government.

PAN 44 Fitting New Housing Development into the Landscape seeks to ensure that the country's small towns and villages are not adversely affected by unsympathetic development on the settlement edge. Thus, the PAN sets out a number of design principles, with reference to case studies, to ensure that new development is sensitively integrated into the landscape setting of small towns and villages. In particular, it is advised that the landscape capacity of sites should be established at the outset to determine the subsequent scale and density of development that will be appropriate.

PAN 67 Housing Quality requires consideration of the views of all parties on the location, scale and nature of new development. It promotes a place-making approach to development in line with Designing Places, which setting out the executive's aspirations for design and the role that the planning system has towards delivering better quality. This will be achieved through ensuring the design of new housing reflects an understanding of context, reinforces local and Scottish identity and is integrated into the movement and settlement patterns of the wider area.

PAN 68 Design Statements was published in November 2001 and sets out expectations of the planning system to deliver high standards of design in all development. It explains what a design statement is, why it is a useful tool, when it is required and how it should be prepared and presented to accompany planning applications. Design Statements will be required to accompany detailed planning applications relating to the Framework.

PAN 72 Housing in the Countryside supersedes and reinforces many of the key themes set out in PAN 36 Siting and Design of New Housing in the Countryside (published in 1991). This new PAN acknowledges that there will continue to be a need for new houses in the countryside and this demand will have to be accommodated. However, it states that our landscapes are evolutionary, not static, and most are able to accommodate change. New developments in the countryside, if properly planned, sited and designed, can contribute to the quality of a landscape and enhance local character.

PAN 72 supports opportunities for good quality rural housing which respects Scottish landscapes and building traditions but without constraining innovative and contemporary designs. Together with SPP3 and SPP15, the guidance indicates that the amount and location of housing that can be developed in rural areas is determined by three main factors:-

- Context - Fit in the landscape.
- Identity - Design details which reflect the local character, as well as an increased awareness of energy efficiency linked to design standards.
- Connection - Proximity to services, e.g. schools, shops (ideally within walking or cycling distance), ease of access (from an existing road and foot path and to a rail station or bus route); drainage and sewerage capacity (from combined septic tanks or links to public systems).

Development principles have also been formulated to examine the effectiveness of h ousing land supply and this framework relates to objectives set out within PAN 38 Housing Land and PAN 74 Affordable Housing.

PAN 74 Affordable Housing sets out the significant role that the right range of housing types, prices, tenure and location have towards promoting and maintaining the viability of communities. It also seeks to ensure that affordable housing requirements incorporated into development plans are realistic and can be met through Structure and Local Plans. An affordable element has been determined and will be interspersed throughout the Framework area.

PAN 76 New Residential Streets highlights the importance of creating well designed new streets to provide a safe environment in which people can interact with one another, by encouraging measures for traffic speed reduction, improved road safety and ultimately putting pedestrians at the top of the transport hierarchy.

PAN 77 Designing Safer Places supersedes PAN46 Planning for Crime Prevention (1994). It reinforces many of the key themes outlined in PAN46, and bringing them up to date with a greater emphasis on both design and quality. It sets out the role that planning has in contributing towards attractive, well-managed environments, discouraging antisocial and criminal behaviour by ensuring there are no feelings created towards hostility, anonymity or alienation. This PAN emphasises a number of general design principles that can be easily applied to improve safety:

- Use (encourages mixed use)
- dentity (sense of place can provide a feeling of safety)
- Landscape (boundary treatments, lighting)
- Location (local characteristics, orientation of buildings)

ODPM Safer Places highlights the attributes of well designed places and design prompts to creating safer places. It focuses on seven attributes of sustainability that are particularly relevant to crime prevention.

1. Access and movement
2 Structure
3. Surveillance
4. Ownership
5. Physical protection
6. Activity
7. Management and maintenance

These attributes should be considered as prompts to thinking about crime prevention and promoting community safety through the planning system. The document sets out the importance of well designed and attractive environments towards being places that are free from crime, with safety and security being a key factor towards building sustainable communities and improving the quality of life for the people who live and work in these places. It therefore challenges those who influence the design and layout of developments to think in a more holistic manner about each new development.

PAN 78 Inclusive Design looks at the importance in creating an environment that can be enjoyed and accessed by everyone regardless of their age, gender or disability, and in doing so promoting equality in the areas that people live and work in. It sets out the roles and responsibilities of all those instrumental in the process of inclusive design and their inter-relationship. It encourages the consideration of inclusive design at as early a stage as possible in the whole design process.

PAN 81 Community Engagement - Planning with People- Scottish Ministers are determined to make the planning system more inclusive and accessible to people, with greater openness and accountability in the decision-making process. Under the new planning system, applicants will have a statutory duty to consult local communities before an application is made for certain types of developments. The Consortium with Perth and Kinross Council has engaged with local communities voluntarily in advance of making planning applications and view pre-application consultation as an opportunity to consult with people to develop proposals which have minimal adverse impacts on communities.

A Good Neighbour Agreement (GNA) may be put in place as the Framework evolves, as the expansion is a significant development and sufficient in scale to require a GNA under the new Planning Act. GNAs are essentially voluntary arrangements between a community body and developer, or site operator, and as such should not be imposed on either party. Benefits include providing communities with a clearer role in developments that affect them - providing a basis for communication, exchange of information and dispute resolution between the developer and community representatives.

2.7 Design Considerations

Towards Better Design (consultative draft): Perth and Kinross Design Guide

This guide sets out an approach for the development of new buildings in Perth and Kinross to encourage innovative, sustainable, high quality construction that enhance local character and respect context. The guide sets out the following design principles aimed towards encouraging the development of high quality sustainable developments that will;

maintain and improve the identity and character of Perth and Kinross
encourage innovation and sustainability in design

- encourage well connected welcoming places

This guide endeavours to ensure that the designing of places in Perth and Kinross, whilst aimed at improving the both character and identity, complies with the following urban design objectives in order that the overall objectives of sustainable development can be achieved;

- character
- continuity and enclosure
- quality of public realm
- ease of movement
- understanding
- diverse and adaptable

This document will be used to guide the Development Control process alongside Scottish Executive guidance and Local Plans in determining the material considerations of design in planning applications. In order to demonstrate compliance with these design principles, the Council will seek to ensure that, where required, planning applications provide this information in the form of a design statement.

2.8 Summary

The allocation of land for a settlement expansion at Auchterarder is founded in the Development Plan which identifies a shortfall of suitable sites to meet housing land requirements in the medium to long term.

The framework area at North Auchterarder was promoted through the Strathearn Local Plan Inquiry, and incorporated within the adopted plan of 2001. The original proposal, as contained in the Finalised Local Plan, was for some 1000 units (indicative only) but the extent of land made available for the development of housing was to be addressed by the framework.

Subsequent to this, a new Structure Plan for Perth & Kinross was approved in 2003 and at that time the programming for Auchterarder was adjusted to reflect junction capacity on the A9. This has since been reviewed with the relevant planning authorities and on the basis of agreed junction improvements, a capacity of 800 units has now been agreed for the framework area.

It is considered that the principle of the expansion area is consistent with Scottish planning policy guidance on sustainable development, land for new housing and development in rural areas. In addition, Design Guidelines have been developed for the framework area on the basis of townscape and landscape assessments, as advocated in best practice advice notes on the design of new housing development.

2.9 Townscape Assessment

Auchterarder is known locally as 'the Lang Toon', a name derived from its extended High Street. This straight thoroughfare, two kilometres long, forms the backbone of the settlement, accommodating most of the shops, hotels, public buildings and parking. The High Street is orientated north east to south west on a steady rise, sited centrally on the whaleback topography defining Auchterarder.

Narrow agricultural holdings or rigs extended originally at right angles either side of the High Street properties up to 500 metres, giving the recognisable fishbone plan form seen in other towns such as Haddington or Forres. Historic plans clearly show this arrangement (Fig 4). The current Pathfinder O.S. map revised 1988, along with the accompanying aerial photograph, still demonstrate the pattern, with radial roads, wooded strips and adjacent field boundaries aligned likewise (Figs 5 and 6).

Figure 4. Historic map showing rig pattern extending from High St. properties

Figure 5. Pathfinder OS map (revised 1988) showing pattern of rigs and field boundaries

Figure 6. Aerial photograph of town viewed from south – Pattern of rigs. Field boundaries, hedges and woodland

Due to the nature of the topography, the present settlement of Auchterarder is largely unseen, nestling in a matrix of woodland and individual trees, and is virtually invisible from the A9. However, from within the town, glimpses are revealed of the Ochil Hills to the south, whilst from the north there are superb views across the broad strath of the River Earn to the distant Grampians (Figs 7 and 8).

Figure 7. Montrose Rd. showing views south to Ochils

Figure 8. Hunter St. with views north across the Earn Strath to the Grampians

The High Street itself consists of two and three storey terraced properties, with flats or offices above shop fronts, the taller buildings clustered towards the centre. Houses and shops are individually expressed, with stepped roof lines, varying storey heights, etc, and the line of the street is punctuated by towers of public buildings, such as Aytoun Hall and the former Free Church (Figs 9, 10 and 11). Terraces are frequently interrupted by lanes leading back to the rigs or connecting with the towns, the lanes being emphasised by stone boundary walls continuous with the terrace gables (Figs 12 and 13). Roofs are steep pitch in slate, generally parallel to the road, relieved by dormers and chimneys, together with the occasional gable or turret. Walling is natural sandstone in buff, grey/purple or red, with traditional vertical sash windows. Banded or quoined trim is often included around windows and to corners. A number of facades have been rendered and painted in white or off-white (Figs 14 and 15), with a few highlighted in strong colour. Upper storeys are generally retained in use above traditional shop fronts (Figs 16 and 17). The recent Co-op supermarket is a satisfactory example of integrating a new large shop into the High Street (Fig 18). Accessed off the High Street through the War Memorial Gates lies the historic Kirk Tower and Graveyard dating from 1660 (Figs19 and 20).

Figure 9. High street looking east with Aytoun Hall on the left

Figure 10. High St. looking east with former free church on right

Figure 11. High St. looking east with Barony Church and Former free church on right

Figure 12. Lane to St. Kessog's Church

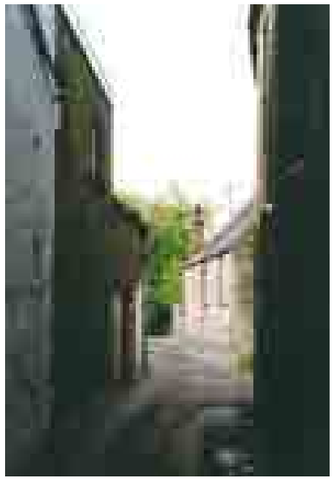


Figure 13. Typical lane off High Street

Figure 14. High Street façade detail

Figure 15. High Street façade viewed from lane

Figure 16. High Street shopfront treated in strong colour

Figure 17. Typical High Street shopfront

Figure 18. Co-op Supermarket, with separate parking, satisfactorily integrated into the High Street.

Figure 19. Kirk Tower and Graveyard

Figure 20. War memorial gates

The centre of the High Street has recently been traffic calmed and whilst the main surface remains tarmac, use has been made of block paving for crossings and parking bays, with grey anti-skid surfacing adjacent. Some crossings are light controlled. Pavements are in square precast concrete with concrete kerbing (Fig 10). Outside the central section, pavements remain tarmac finish, with concrete or granite kerbs (Fig 11). Finish to the lanes is tarmac or gravel (Figs 12 and 13). To the visitor the perception is of a busy high street with kerb side and off-street parking convenient to the shops, the frequent car movement creating natural traffic calming. It is understood and appreciated however that the residents of Auchterarder consider there to be an existing parking problem.

Away from the High Street, particularly to the south side, two storey Victorian terrace and villa development has followed the line of the original rigs using stone boundary walls softened by hedges and trees (Figs 21 and 22). Larger residencies in their own grounds display baronial style turrets and gables, as the Coll-Earn Castle Hotel and the Ruthven Tower Nursing Home, both by William Leiper, architect, in the 1860's/1880's.

Figure 21. Montrose St. looking south

Figure 22. Abbey Rd. with two storey terraced housing. Note stone boundary wall with overhanging trees.

Recent housing has largely ignored the historic rig based plan form. This has been achieved by the assembly of a number of rigs together into wider parcels of land, for development as stand-alone housing estates. This applies both to the council housing off Sydney Crescent, and to the private housing spread through a number of locations in Auchterarder. For this later housing, roofs are pitched between 30° and 45° with slate or with tile finish in blue/grey or brown. Some dormers and roof lights are employed to utilise living areas within the steeper roof spaces. Most wall finish is white or buff roughcast; a limited amount of buff brickwork was also observed. Selected windows on the roughcast walling have smooth rendered surrounds. Building height is one or two storey. Roads and pavements are tarmac with concrete kerbing, whilst some concrete paviors are used for driveways or traffic calming. Front gardens may be open, or enclosed with walling, fencing or a hedge. Boundary and division fencing is generally employed in preference to walling, even in the public domain. Some estates such as Bridgewater Avenue and North Crofts incorporate public grassed or shrubbed areas, communally maintained. (Figs 23 and 24)

Figure 23. Bridgewater Avenue, Auchterarder – Note retention of large trees.

Figure 24. Bridgewater Avenue, Auchterarder – Note boundary and division fencing.

Illustrations comparing the densities of existing housing within the town are included within Appendix 1. An example of the council housing at Sydney Crescent is shown, laid out at 22 houses per hectare (9 per acre). Private housing varies between 10 and 14 per hectare (4 to 5.6 per acre) Fordyce Way shows one of the few examples of brick housing.

2.10 Summary

In summary Auchterarder is perceived to be a pleasant prosperous rural town set in the attractive Perthshire scenery of hills and fields. It is strongly identified by its High Street, which forms the focus for communal life. Recent built extensions, whilst ignoring the historic plan form, have nevertheless avoided introducing totally alien materials or colours.

2.11 Landscape Character Assessment

An analysis of the landscape character of the countryside surrounding Auchterarder will assist in deriving design principles to ensure that the proposed addition to the existing settlement will 'fit' comfortably into its setting and have only minor effects on the landscape character of the Strathearn Valley.

The Tayside Landscape Character Assessment, undertaken by Land Use Consultants in March 1997 was used as the basis of this study to assist in the classification of the landscape character of Auchterarder and its surrounding countryside.

Regional Character Area

The settlement of Auchterarder lies to the north of the Ochils in the Strathearn Valley and is situated in the regional character area of the Tayside Lowlands.

- The Tayside Lowlands are characterised by the following:
- The lowland valleys of Strathallan, Strathearn and Strathmore were formed due to the geology of the area - a combination of Old Red Sandstone, volcanic lavas and tuffs which were subject to erosion during glaciation because of their softness. The Ochils resulted from the harder lavas and tuffs being more resistant to erosion.
- The land is very fertile, with much falling into Land Capability Classes 2 and 3 (1), which is prime agricultural land capable of growing a wide range of crops.
- Extensive woodland is rare, except in areas which are less fertile or more exposed on higher ground.
- The Tayside Valley was the most northern area occupied by the Romans and this is reflected in the pattern of place names. The area's productivity and its relative proximity to Perth and Edinburgh are reflected in the large number of wealthy landed estates.
- The formal policy woodland of planned estates and informal woodland along with the associated structure of field boundary trees influence the character of the area. The contrast between the richness of the Tayside Lowlands and poorer quality land of neighbouring Highland areas has, over the centuries, generated considerable conflict. Hillforts, medieval castles and fortified manor houses reflect this turbulent history.

Landscape Type

The Tayside Lowlands are divided into three distinct landscape types around Auchterarder (refer Figure 25).

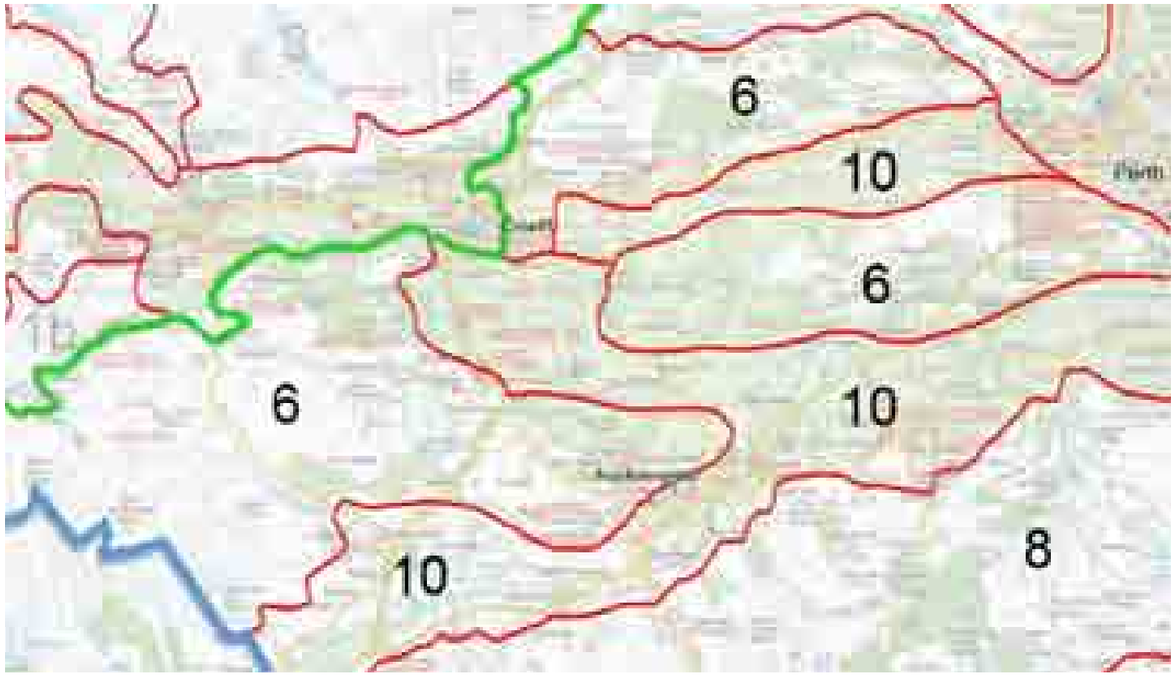


Figure 25. Landscape Types. Landscape classification Tayside Region.

Based on Tayside Landscape Character Assessment – SNH, Land Use Consultants 1997.

Auchterarder falls within the 'Broad Valley Lowland' landscape type, which is described below. The 'Lowland Hills' abut the settlements north western edge, while the 'Igneous Hills' are located to the south-east. While these two landscape types affect the prospect and views from the site, a physical change will only occur and affect the character of the 'Broad Valley Lowlands'. Descriptions of the latter 2 units will therefore not be included.

Broad Valley Lowland
The Broad Valley Lowland is characterised by broad straths formed by glacial erosion and deposition, which has developed a complex local topography. The character of the landscape is influenced by the number of large estates, particularly in terms of woodland and policies; dominance of arable and root crops, and distinctive red soils and building stone. Tree loss along roads and field boundaries has weakened the rich and textured landscape. The following table is drawn directly from the 1997 Tayside Landscape Character Assessment Report and summarises the main components of this landscape type:

Objective Description	Broad Valley Lowland
Phyiscal Scale	In the case of Strathmore, up to 10km wide and 30km long. Strathallan and Strathearn up to 5km.
Woodland	Extensive broadleaf woodland limited to inner policy woodland and few areas of unimproved land.
▸ Broadleaf	Coniferous plantations an areas of poorer land, especially on valley sides. Geometric plantation in Stathallan
▸ Coniferous	Dominant agricultural use - cereals, potatoes and oil seed rape.
Agricultural arable	Limited
▸ Pasture	Medium size, regular, some enlarged.
▸ Fields	Most dating back to parliamentary enclosure.
▸ Field Boudaries	Characteristically hedges with high density of mature hedgerow trees.
Settlement Pattern	Pattern weakened as trees felled. Strathallan has fewer hedges and trees.
Building materials	Small, often planted, villages, small market / processing towns, and larger market towns.
Historic features	Red Sandstone. Comaratively limited, reflecting intensity of agriculture use.
Natural heritage feature	Fluvial- glacial landforms. Ecological interest limited to a few unimproved areas.
Otehr landscape features	Large, modern agricultural buidlings. Dominance of eastates and historic houses.

Subjective Description	
Views	Corridor
Scale	Medium
Enclosure	Pen
Variety	Varied to simple
Texture	Texture to smooth
Colour	Colourful
Movement	Active
Unity	Interrupted
'Naturainess'	Tamed

Forces of Change

The 'forces of change' for this landscape type include:

- Changing farm practices toward maximising areas under cultivation, requiring hedgerow removal to create bigger fields. The once dense network of hedgerow and field boundary trees has not been replaced and has weakened the rich, textured character of the Tayside Lowlands. Roads, traffic and the buildings in the landscape have thus become more visible.
- Incorporation of major roads which impacted on the adjoining character of the local landscape, particularly where pockets of land are trapped between these roads and settlements e.g. Townhead Farm site.
- The character of minor roads has altered due to the failure to re-establish hedges and hedgerow trees at points of widening as well as the introduction of kerbs which promotes a suburban character in the countryside.
- Hedgerow trees are reaching maturity and require phased replacement.

Guidelines
The following guidelines from the Landscape Character Assessment are relevant to the expansion of Auchterarder.

Reduce further loss of field boundaries and field boundary trees.

- Replant trees, where appropriate, along field boundaries and roads - oak, sycamore, beech, and ash.
- Increase woodland cover by creating new woodland belts, particularly where there is a need to screen development.
- Encourage new planting to complement the existing landscape and to provide screening of traffic.
- Encourage new development to reinforce the existing settlement pattern. New development should respond to the morphology of existing settlements.
- Encourage a phased programme of replanting and managing hedgerow trees, to maintain and restore the historic legacy of 'strath' trees.
- Create an integrated pattern of new small woodland and woodland belts in open areas.

Auchterarder in its Landscape Context

The settlement of Auchterarder sits on a ridge with the land sloping away to the north and south of the High Street. It is within this context that the visual impact of the northern expansion at Kirkton and Castlemains as well as the development of the Townhead farm site must be assessed.

Auchterarder is predominantly surrounded by agricultural land, undulating in nature with mature planting:

- Concentrated along field boundaries in either linear blocks, or as individual trees in avenues or alignments,
- As small woodlands,
- Along water corridors (e.g. Ruthven Water),
- Along roads,
- As part of estates, or as part of community /civic uses (e.g. hospital, schools) within the towns,
- As maintained landscapes, such as golf courses (e.g. Gleneagles).

Another characteristic of the agricultural landscape which surrounds the town is the definition of the field boundaries by stone walls or hedges. This landscape infrastructure is integral to the character and setting of the town and is illustrated on Figure 26.

The combination of the undulating landform, existing vegetation and boundary definition provides a mixture of open, long distant views, enclosed limited visibility (e.g. within the road corridor) or framed views through breaks in the trees.

Figure 27. Dry stone wall with rough rounded coping, delineating edge between field and road.Site Analysis of Castlemains, Kirkton and Townhead Farm Sites

The three sites have been analysed in terms of their landscape context, including their neighbouring uses, existing vegetation, existing paths, views and contours. The landscape character plans for the three sites are included in Appendix 2.

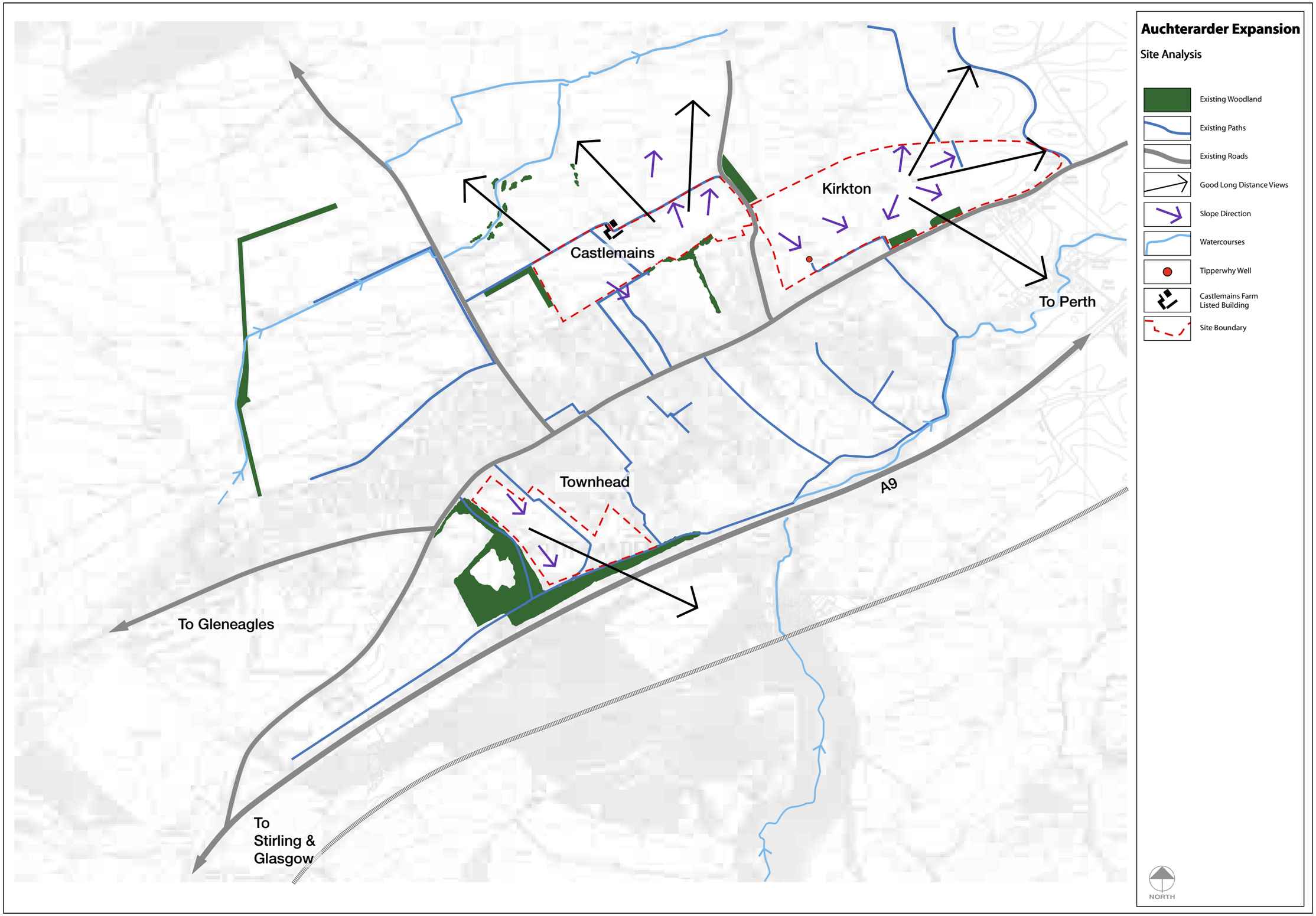


Figure 28. Site Analysis Plan

Kirkton

General Description

The site is typical farming land located to the north of the existing settlement, with access from either the A824 or Hunter Street. The highest point of the site is 84m and there is a small hillock with two mature trees towards the centre of the site.

Agricultural land is located to the north and east, with residential land to the south. The site abuts the A824 along its southern boundary, providing potential vehicular access and egress. Commercial uses, a children's play area and residential development is located to the west. The site abuts the Hunter Street road corridor, walled along both sides.

Views

There are extensive views from the raised section of the site. Agricultural land is located to the north and east, promoting long open views to the surrounding countryside, typified by undulating land with agricultural fields with boundaries defined by mature trees. Dense woodland copses separate agricultural land in the middle and background of this view to the north. The ridgeline on the horizon to the north east is heavily vegetated.

Views into the site

Along Hunter Street, a stone wall along the back of the kerb encloses the views at certain points. However, the site is very visible from this corridor, particularly across the play area.

Along the A824, the site is screened at certain points by existing vegetation comprising mature trees (beech and oaks) or stone walls (some retaining) with existing planting on top. However, this screen is broken in many places, allowing direct views into the site. As this road is an important entry road into the town and its integrity must be retained, to maintain the positive perception of the town. (refer to landscape guidelines?).

Main Issues

- Retention of existing features e.g. trees, walls, hillock, views
- Reinforcing patterns in the landscape to create 'development parcels' e.g. extend/reinforce field boundaries across the site
- Maintenance of character of access roads and entry to Auchterarder
- Extension of network of existing footpaths
- Screening between different uses e.g. commercial and residential
- Delineation of boundaries
- Tying in new residential development to existing

Castlemains

General Description

The site is located to the north of the existing settlement. Land gently falls to the north east. There are agricultural fields to the north and existing farm steadings adjacent to the site. To the west are fields and residential. Along the southern boundary is Auchterarder Community School, which has recently been constructed, an hotel and residential. The eastern boundary of the site abuts the B8602 providing potential access. Walls and vegetation enclose the corridor to the north of the site. Overhead power lines dot through the site.

Views

To the north, Castle Mains farm and slightly undulation fields with field boundaries delineated by lines of mature trees, fences and hedges forms the foreground view. There are long distance views across the fields to the north east to rising land on the horizon. Along the ridgelines, there are large areas of woods and plantations. There is also a mosaic of cleared (worked land) and mature vegetation. To the south views are enclosed by the existing settlement.

Main Issues

- Links to community facilities
- Powerlines
- Reinforcement of patterns in the landscape e.g. field boundaries extended/reinforced, used as 'guides' in creating development parcels
- Tying in new residential development to existing
- Farm use on adjacent road to be retained
- Path links to the High Street

Townhead

General Description

The site is located to the south of the existing settlement, and is accessed off the A824 Western Road/Townhead Street. The land falls to the south east at an approximate 1:5 slope. There is residential development and a children's play area along the eastern boundary. To the west are community facilities, including a public park and recycling facilities. The A9, to the south is separated from the site by planted berm and there is low lying land along the western boundary. Existing walking paths including Provost's Walk run along the western and southern boundary of the site.

Views

The A9 is not visible because of berm along its length. Views to the south east are across a heavily wooded area in the foreground to the hills behind, characterised by mature vegetation delineating fields boundaries and woodland copses. Views to the east are enclosed by a residential area. To the west views are enclosed by mature vegetation along the boundary of the public park. Views into the site are from the children's play area and existing residential area.

Main Issues

- Connections to community facilities
- Noise attenuation required from the A9
- Extension of paths into settlement
- Good access from main road
- Tying in new residential development to existing

Visual Appraisal of the Opportunity 3 Expansion

The proposed expansion of the town to the north lies on a low hill, it therefore will be visible, in varying degrees, from the surrounding roads and countryside.

A visual appraisal has been undertaken from the surrounding visitor destinations, main roads and tourist routes, public walks and other areas where people congregate, to ascertain the visual effect (if any) of the proposed development in its landscape context. The approximate visual envelope has been estimated by desk review and site visits and takes in the following roads and areas:

- A824, B8062 and secondary country roads
- Tullibardine Chapel
- Strathallan Airfield
- Roman Signal Station
- Innerpeffray Library (off B8062)
- Walks on northern face of hills to south-east

The proposed development will have the most visual effect on the roads, particularly the A824 and B8062. However, views to the sites are sporadic due to the existing landscape structure providing enclosure to the road corridor. In the areas where the roads run alongside the sites and the visual impact will be high, appropriate landscape responses can be employed to minimise the impact (refer Section 3: Landscape Guidelines).

All of the sites mentioned are sufficiently distant and separated from the site, by a combination of undulating landform and mature vegetation, to have a low level of visual impact (if any at all). From the walks on the northern face of the hills to the south, the development will read as a consolidation to the edge of the existing settlement, confined and delineated by field boundaries, absorbed within the existing landscape pattern.

2.12 Conclusion

Design guidelines have been developed to minimise the potential visual impact of the proposed expansion to Auchterarder and reduce the change to the landscape setting and character of the town (refer Section 3). These guidelines draw from PAN 44 - "Fitting New Housing Development into the Landscape", as well as those promoted in the Tayside Landscape Character Assessment. It is important to state that the proposed development is an extension to an existing urban settlement and the visual effect must be evaluated in this context. The new development must therefore respond to its rural edge as well as the existing town. By careful treatment of the property boundaries and by the introduction of new planting as well as retention of existing walls and hedgerows.

2.13 Community Infrastructure Audit

The existing community facilities are identified on Figure 27 overleaf and are described below. They consist of:

- Playing fields, indoor sports courts, greens and a golf course.
- Children's play areas.
- Others, including cemetery, graveyard, and civic amenity site.
- Walks around the settlement.

Sports Facilities

There are 2 areas reserved for pitches in the town. Western Road Public Park, located to the south of Western Road, is an open flat grassed space which accommodates one playing field demarcated by fixed goal posts at the north-eastern and south-western end (Fig. 28). Moveable goal posts are also provided, allowing matches to be played across the pitch, or to either side.

Figure 29. Sports pitch in public park

The Community School of Auchterarder provides new indoor and outdoor sporting facilities within the town. A new sports hall containing 5 multi-use courts can provide for many sporting tastes including tennis, basketball and five-aside-football. Externally, a new all weather, floodlit pitch has been provided to cater for field sports and can accommodate rugby, hockey and football. There is also a grassed rugby pitch. In addition to serving the needs of the school, all of the facilities offer a variety of organised activities and are available for private hire.

A bowling green is located to the south of this area, accessed off Castle Wynd.

The Auchterarder golf course is located to the south-west of the settlement extending into the area known as the Muir of Auchterarder. The Gleneagles golf courses are located to the south-west of the town.

Figures 30 & 31. Outdoor sport facilities at Auchterarder Community School

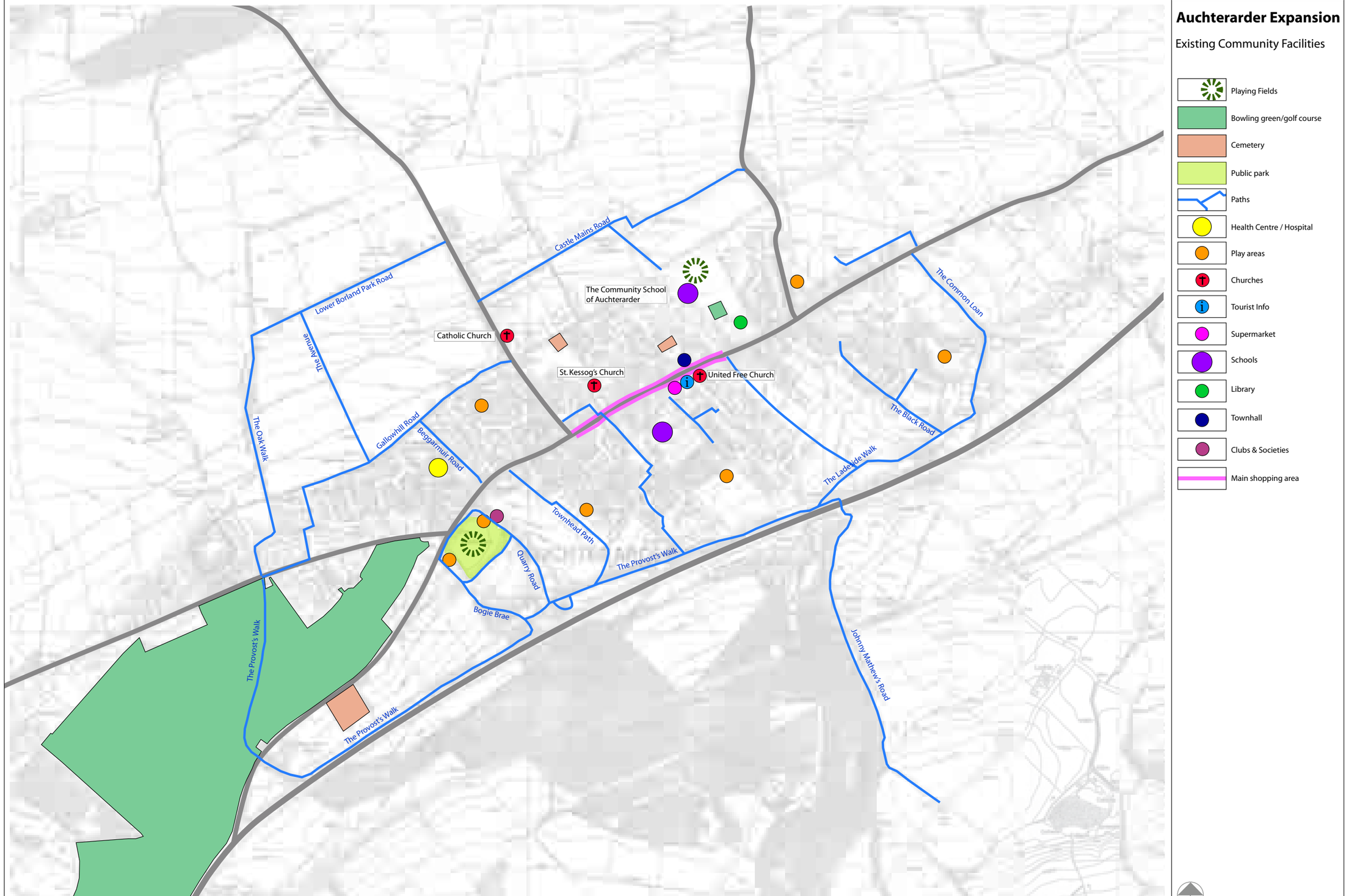


Figure 32. Existing Community Facilities

Play Areas

There are five designated play areas for children in Auchterarder, located within the Western Road Park, on Kincardine Road, Victoria Road, Hunter Street and Bridgewater Ave. The play area in the public park is located toward the road and has recently been upgraded to incorporate a range of play facilities and seating. (Fig. 33). A new skateboard facility at the eastern side of the park has recently opened and proves popular. (Fig.34).

The play area on Kincardine Road is a long narrow grassed area, which runs along the length of the road, its boundary defined by post and wire fencing (Fig.35). The northern end has 2 sets of swings, slide, picnic tables and seats. The southern end is an informal open grassed area, suitable for a kick about space. The space is adjacent to fields, with views over woodland to the nearby hills. Semi-mature trees are dotted along the boundary to the road, the boundary to the field, and between the organised play and open grassed area.

The play area on Victoria Road has no play equipment and is basically a maintained grassed space between residential properties. Three semi-mature trees are located in the block, with dense planting along its western boundary, which is adjacent to open fields. Hedges and fences line the edge of the residential properties.

The play area on Hunter Street is an open grassed area with play equipment (Fig.36). It is fenced to the road with pedestrian access from the streets. Screen planting is located along both the northern and southern boundaries. The 'Opportunity 3' site is located to the north-east, a stone wall delineating the boundary.

The play area at Bridgewater Avenue is well equipped, enclosed by fencing and enclosed to the south by mature trees. (Fig 37.).

Figure 33. Western Road Park play area

Figure 34. New skateboard park within Western Road Park

Figure 35. Kincardine Road play area. well maintained and well equipped.

Figure 36. Hunter Street play area has recently been upgraded.

Figure 37. Bridgewater Avenue play area looking NE towards adjacent housing

Other Civic Uses

There is a cemetery located to the south of the A824 which is visible on entry to the town from the south. A historic cemetery is located adjacent to the library on the High Street, while a graveyard is located in the north-eastern corner of the Churchyard.

The Civic Amenity site is a recycling centre located to the south of the Public Park, with access down a lane to the east. Vehicular access to the site is controlled at designated times.

Paths

A number of paths and 'bridle paths' are located around and through the settlement of Auchterarder. These paths, when linked, form an almost complete circuitous route around the town. The paths afford panoramic views across Strathearn to the Ochils to the south and Grampians to the north. These paths are indicated on the masterplan diagrams and include:

- The Common Loan
- The Ladeside Walk
- The Provost's Walk
- The Oak Walk
- Gallowhill Road and the
- Castlemains Road
- The Avenue

As illustrated in the photos these paths enjoy very varied characters (Figs. 36 - 39). These are to be used as a reference for the design of the paths in the expansion of the settlement (refer Section 3: Landscape Design Guidelines). This pedestrian network is a valuable asset for Auchterarder, being well used by local residents, as well as providing an attractive and educational activity for visitors, passing through areas closely associated to the town's history.

Figure 38. Bridle Path

Figure 39. Quarry Road

Figure 40. Bridle Castlemains farm access/footpath

Figure 41. Path to north of Castlemains site

2.14 Noise Assessment

Site noise from the A9 on the Townhead site has been measured and the resulting report and figures are included in Appendix 4, with a summary of the findings below.

The site noise from A9 traffic varies with location and the levels reduce with distance from the road. The reduction is less than expected by theoretical calculation as the rising ground exposes higher parts of the site to noise from sections of the A9 to the east and west. The noise from these areas varies with wind direction and traffic flow.

However, the assessed and measured levels indicate that the site is not subjected to traffic noise levels which would have an adverse effect on the proposed development. The levels in the report refer to existing and projected site levels and there may be some variation in actual façade levels when the houses are built. There may be some increases if houses are close to the A9 and are multi storey, whilst these will be decreased further from the road due to the screening effect of the intervening buildings.

As Category B of PAN 56 requires that houses are to be adequately protected from noise, it will be necessary to take account of this in the final plans for the site layout.

2.15 Parking Assessment

A recent study by Perth and Kinross Council on the current parking provision within Auchterarder recognises that the current parking provision within the town centre has been under pressure for some time.

Current provision is largely covered by either on street parking to High Street or by the central off-street car park. Available parking on High Street is toward the east and west ends of the street, some distance from the central destinations. The geometry, road layout and residential nature of side streets mean that beyond offering residential parking they do contribute greatly to the parking provision within the town centre.

The current parking provision is for 165 spaces within the town centre, an estimate by Perth and Kinross Council predicts a 12% increase by 2015 bringing the provision to 185. A development of 800 units (Opportunity 3) would increase the town size by approximately 30% requiring an additional 56 spaces, a total of 76 spaces being required further to the current provision by 2015.

To alleviate the parking problems the council have proposed a number of solutions which either control the existing parking by the use of time limits or charges or by the provision of additional parking. Within the statement by Perth and Kinross Council the 76 additional spaces required by 2015 could be more than accommodated within the town centre on two possible sites. The Council are also looking into the potential relocation of business uses to the new employment site in order to free up land in the town centre, perhaps for car parking. Initial market appraisals for new employment land will investigate potential demand.

The Consortium will continue to work with the Council in developing a strategy for the additional parking requirements for the town.

Summary of Parking Provision / Future Requirements: - Auchterarder	
On-street: - Rossie Place to Montrose Steet	105
Off-street:- Crown Wynd Car Park	60
2005 Total	165
Allow 12% growth in 10 years	20
2005 total	185
An 800 house development would increase the town by approx. 30%	56 additional spaces required in 10 yrs
Total additional spaces required by 2015	56+20=76

Figures provided by Perth and Kinross Council

Vision, Development Framework Principles and Design Guidelines

3

Chapter 3 Vision and Design Principles

3.1 Vision Statement

The vision is to create a distinctive and well connected planned expansion that supports and enriches the existing town of Auchterarder. The Framework forms a development structure that is economically, environmentally and socially sustainable in the long term. Local character and built form are important issues in considering the context of a new development.

The new development will be designed to be “a successful place”, that is:

a) a distinctive development responding to local context
b) safe and pleasant
c) easy to access and get around

3.1.1 Objectives

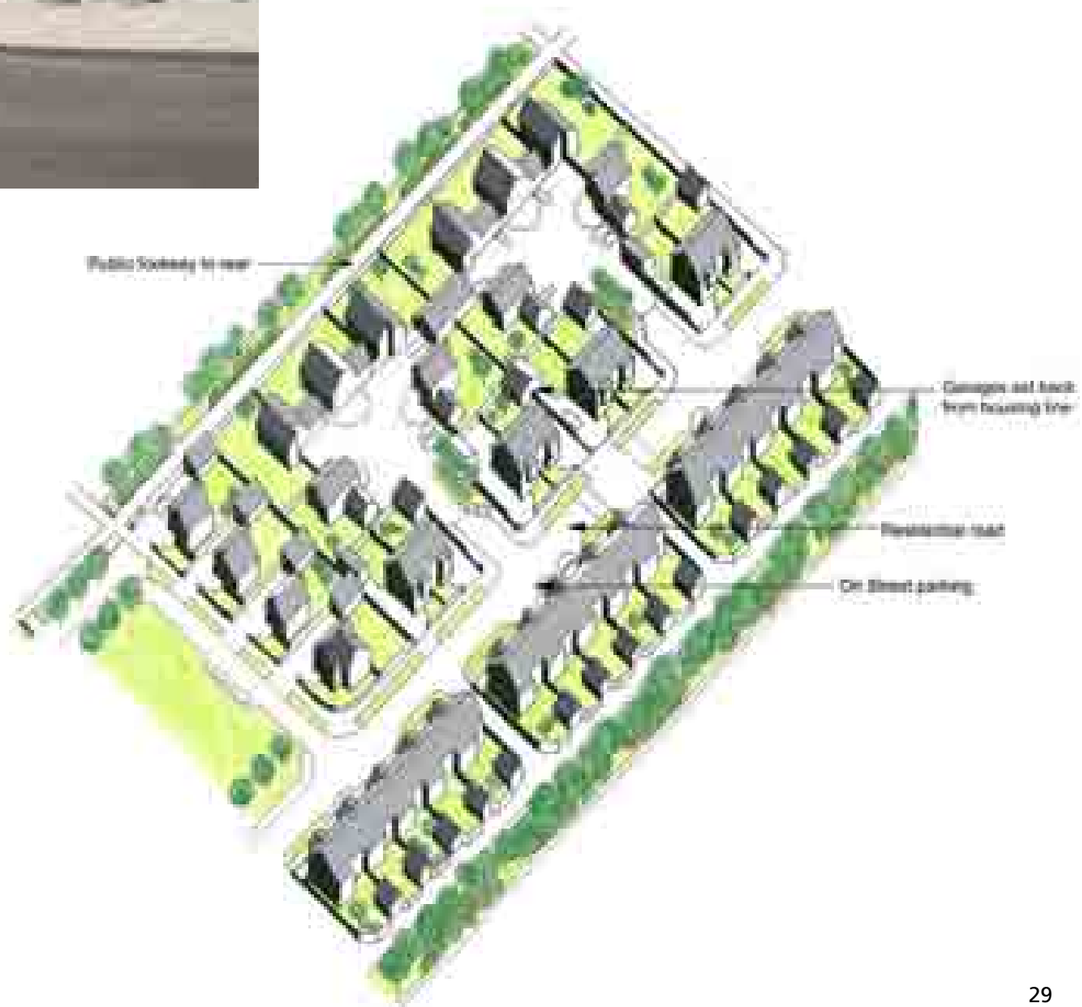
It is predicated on the following aspirational objectives, which are shared by the developer consortium, Perth and Kinross Council and the community:

- To create a well planned extension of Auchterarder through the continuation of movement and green space networks, the sensitive treatment of built detail and development edges to ensure the expansion area merges into context
- To create a logical and safe movement network linking existing and new communities, through direct pedestrian, cycle and vehicular routes
- To provide opportunity for all to access and enjoy the surrounding countryside
- To develop open spaces which link inherent site qualities such as hedgerows, points of interest and other landscape features
- To encourage better use of natural resources such as key views and topography
- To form a well defined settlement edge
- To build household capacity to support existing town services and community infrastructure
- To make sure that people are able to use the facilities they need without necessarily requiring to use a car. This sort of accessibility is not just about alternative methods of transport it is also about access to local shops, employment, leisure, health and community facilities and schooling.
- To provide housing choice for local people, through a range of house types, styles and sizes

Place making principles are to be adopted throughout to achieve a positive townscape character incorporating people friendly streets and spaces. An attractive and varied public realm will enliven streets and spaces and provide natural surveillance.

Boundary treatments such as low walls can help define private gardens.

The Village of Cornwall



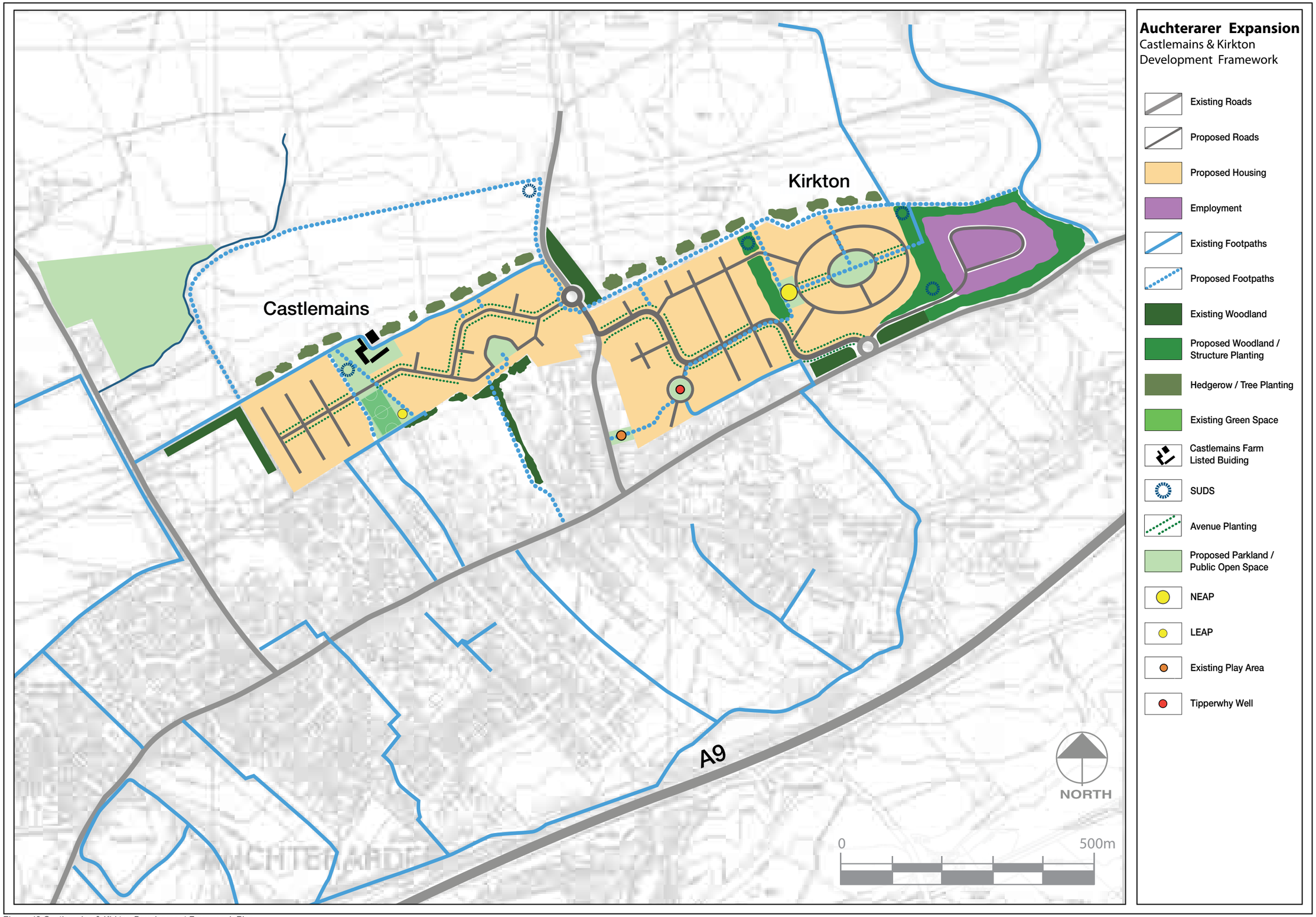


Figure 42.Castlemains & Kirkton Development Framewrok Plan

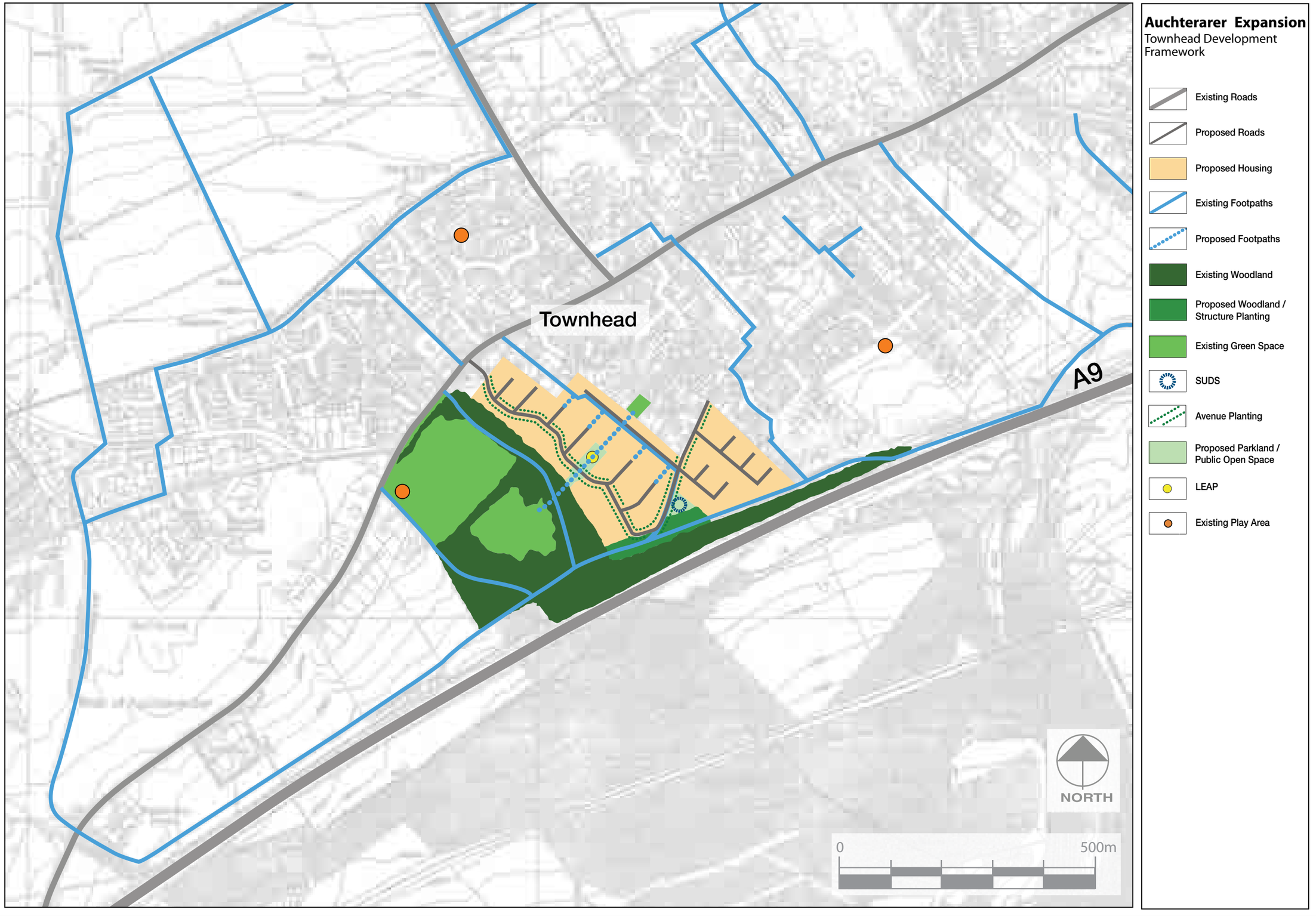


Figure 43.Castlemains & Kirkton Development Framewrok Plan

3.2 Development Framework

The framework deals specifically with the development of the Castlemains and Kirkton sites on the northern edge of Auchterarder, and of the Townhead site to the south-west. These developments when completed after a 10-15 year period would increase the town's population and significantly augment the towns range of housing stock.

3.2.2 Kirkton

Kirkton, the easternmost and largest site of the three, will contribute considerably to the form of the town along its northern edge. Within the Kirkton site development will be primarily residential with land toward the eastern edge reserved for employment. Existing landscape features such as field boundaries, the Tipperwhy Well and the Pow Hillock will inform the structure of the site with these features acting as pathway routes through the site and contributing to the open space provision. Vehicle access to the Kirkton site will be via a new roundabout formed on the A824 with a new distributor road serving the residential areas and providing a connection to the Castlemains site. Access from this roundabout will serve the employment land to the east.

3.2.3 Castlemains

To the north of the town, the Castlemains site extends from Hunter Street in the east to Castleton in the west and bordered by Castlemains Farm Road to the north. This site is currently agricultural land with an open aspect northwards over rolling pastureland. The southern field boundary borders the existing edge of the settlement with existing properties, hotel and Auchterarder Community School immediately adjacent.

As with Kirkton, the existing landscape structure will inform the landscape and open space strategy for the site. Public open space will be provided at intervals within the development to coincide with key junctures such as new pathways and play areas. Vehicle access will be via a new roundabout from the B8062 (Hunter Street) with a residential core road extending to the west towards Castleton Road. An all weather junior football pitch will be provided within the Castlemains site, adjacent to the Auchterarder Community School, with a dedicated pedestrian access route between the school and the all weather sports pitch and beyond.

The form and character of development at Castlemains will create an attractive approach into the town from this northern access, incorporating varying house types and styles with a variation in materials, finishes and detailing, will provide a strong identity for the development within the overall settlement.

3.2.4 Townhead

To the south of the town opposite Beechtree Place, the Townhead site consists of two parcels of land extending down the hill towards the A9; the former Townhead farm site and the field directly south of Glenburn Rd. The Townhead site lies on the south-west margin of Auchterarder and is approximately 10.7 ha in area. The principal access to the site is from the A824, the main thoroughfare, by means of a proposed mini roundabout. The site is screened from the main street (A824) by existing buildings. Access from the south is via Glenburn Road which will be extended and widened to connect into the Townhead site.

Significant existing woodland belts to the west and south of the Townhead site offer shelter and structure and are to be augmented by additional planting belts and open space connecting through to Victoria Road. The existing footpath down through these fields which links to the Provosts Walk will be integrated into the development.

3.3 Development Framework Principles

Design guidelines seek to give direction, coherence and meaning to incremental development, where the components may be separated by time, by site location and by different developers.

In earlier ages building coherence was automatically achieved by a limited range of local materials, coupled with the adoption of simple and repeated solutions. Today's wide choice of materials, variety of structural solutions, complexity of development economics, and breadth of design philosophies will be monitored to ensure a visual coherency throughout the development.

Design guidelines are therefore self imposed disciplines, which whilst respecting the general grain and direction imposed by the economics of the situation, fine tune these to enhance the best quality inherent in any location, and characteristic of this region of Perthshire. The examples given are intended to show the standard of good design sought, or to illustrate various detail points in the text; they are not presented as specific solutions directly applicable to Auchterarder.

The design guidelines, will be interpreted sensitively and imaginatively, for each development proposal, with respect to the relationship to the existing settlement and to the aspirations for the local community, as illustrated in the framework. Creative and innovative contributions must be encouraged, whilst the inappropriate are corrected or prevented. The flexibility and vision to achieve this, demands great skill and tact from both the development design team and the controlling authority.

The quality of any design depends upon the flexibility of the developer, the skill and experience of the design team and the vision of the approving/ controlling authorities who may be in a position to assist this process, by encouragement and assistance.

3.4 Design Guidelines

3.4.1 Urban Form and Structure

The way in which development is structured, its green space and movement networks and how it responds to environmental and sustainability objectives are all key components of the Framework. National and local design policy and guidance has informed and shaped the creation of the Framework.

Structure
Streets and spaces will be arranged in an irregular grid to allow for direct and frequent connection throughout the area. Existing routes, principal points of interest and landscape features have influenced this layout.

Buildings should face onto the public realm where possible and offer good levels of enclosure and surveillance, while maintaining secure private spaces within back gardens. This model allows for a wide variety of house types, densities and layouts including detached, semi-detached, terraced properties and apartments.

Car parking will be accommodated through a variety of designs, including small communal parking courtyards, in-curtilage parking and on-street parking along residential streets. Where parking is provided within the property curtilage, this should be to the side or rear of the property where appropriate to encourage the desired level of residential street enclosure. Parking for residents and visitors will be in close proximity to residential curtilage.

Housing styles should be mixed to create an interesting and varied streetscape rather than a single house-type dominating each area. Exceptions may exist where particular style and order is desired, for example, in creating a more formal frontage to a main road or entrance point.

Building features that contribute to the positive treatment of public spaces will be encouraged and wherever possible, corner buildings will address both streets/spaces that they face onto. Featureless and windowless side gable walls will be avoided wherever possible.

Design Statements
Detailed design statements are acknowledged as being important elements in the design development process, these will be submitted to accompany future planning applications and will cover in detail issues such as specific site densities, tenure mixes and building form and heights.

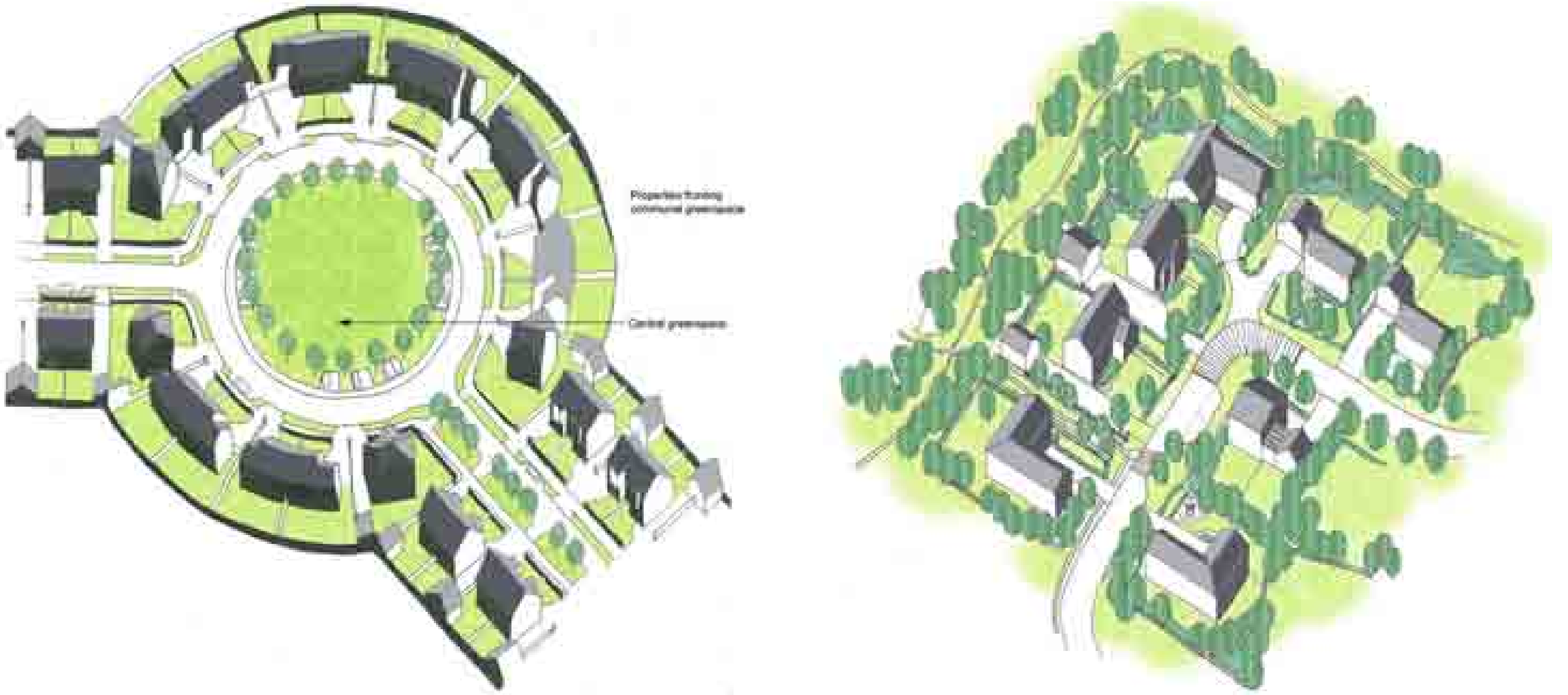
Entrances and other key nodes
Principal entrances or gateways into the site will be marked out by changes in the building line, elevation and/or height. For example, the corner of a block may be set forward, raised higher, and/ or chamfered to emphasise a key junction or public space. The principal public spaces, in particular may be highlighted through variation in building heights.

Edges
Visible sections of the new settlement edge will be addressed by the fronts or sides of buildings, wherever possible with regular pedestrian links through to the established path network. Boundary treatments at the edge of the settlement will be carefully designed to ensure views out across the landscape can be maintained and that views back to the development are softened by new tree and hedgerow planting. The existing hedgerows and walled boundaries should be retained and careful consideration given to the property boundaries, particularly the heights and types of boundary fencing.

Public Realm Network
Streets and spaces will form the principal part of the public realm hierarchy, usually the most accessible areas and with the greatest levels of activity and movement. Activity and frontage onto these streets and spaces will create safe movement routes for people.

Working with Topography
Particular attention will be given to changes of level to ensure a positive relationship between development frontages and the street over sloping parts of the site. Depending upon the results of further market research and technical investigation, it may be possible to develop parts using 'one-off' split level units.

Terraced properties making use of a sloping site, active frontages onto public space.



Example of integrated garages in terraced properties

Lower back garden fences ensures overlooking onto community spaces

3.4.2 Place Making Principles

Certain building design guidelines are of a general nature, applicable to all development in Auchterarder. These are set out as follows:

- Acknowledge and respect the existing architecture an heritage
  - Observe the time-honoured response to climate and landform which is reflected in the vernacular architecture
  - Respect original style and detailing when converting old buildings, and demolish only as a last resort.
  - Work with the climate, contours and scale of the locality
  - Open to innovative design
- Design the setting to be in character with the surroundings
  - Treat each neighbourhood as an entity, and design buildings and landscape together
  - Use planting, hedges and boundary walls in key locations to create shelter and enclosure, and to tie the buildings into the landscape
- Built form and layout should be functional and appropriate
  - Design both internal and external spaces so that their functions and relationships are easily perceived, with a clear distinction between private and public use
- Use a range of colours and materials to achieve visual unity
  - Use complementary and earth colours for harmony, and bold colours for contrast and emphasis
  - Use of a preferred colour palette throughout, but with opportunity for surprise to aid legibility
  - The use of too many different materials in a building will have
  - disruptive effect on visual unity
  - Earth colours will best complement the natural environment throughout the seasons in the countryside
  - Bright colours appear to advance and expand, whilst dark colours appear to retreat and contract
  - Buildings look more stable and less conspicuous if the roof is darker than the walls
  - The same colour can be used to unify a group of disparate buildings, while different colours can be used to break down a building of large bulk
- Materials should be appropriate for the climate, ecology, texture and scale of the site and should be capable of weathering well over time.
- The scale of a building should be appropriate for its use and relate to that of its neighbours.
- Built form and layout for the development should acknowledge existing character, where this is of quality. Extensions and modification to existing buildings should respect their style, detail and materials.
- Careful checks to be made that in addition to fulfilling operational needs, developments meet their urban design function of spatial enclosure, appropriate frontages, creation of focal points, vistas, etc.
- Buildings should be suitable for disabled access and where required should be barrier free.
- The preferred style for development should be a high standard of modern environmentally friendly design with allusions to building details within the locality. Period reproduction or pastiche styles such as mock Tudor boarding and neo classical pediments should be excluded. Imported inappropriate materials and styles whether from abroad or from other parts of Britain should be avoided.
- The detailed design of buildings has always varied to suit the local climate, site conditions, materials, skills and tradition. This flexibility should be encouraged and valued as the generator of local character. Creating an appropriate built heritage for the future will require a greater awareness of, and respect for, relevant design principles of the past.
- Good quality boundary treatment is essential to provide security, define private space, and tie the building into its location. Walling should match building walling and may often be treated as an extension of the façade. Beech and privet hedging provides a softer boundary, but requires trimming. Stoutly constructed galvanised railings and gates provide security, whilst permitting views through. Creative use can be made of a combination of all three. The extensive use of timber fencing should be avoided in street frontage areas and the public realm however use in back garden areas would be acceptable

3.4.3 Perthshire Context

The local Perthshire tradition for housing includes the following features:

- House walling in buff, grey or red sandstone, wet-dash or roughcast, painted white or buff roughcast. Brickwork is relatively uncommon.
- Roof pitches are varied but generally steep; grey roof colours predominate. Dormers are common providing accommodation in the roof space.
- Boundaries and divisions frequently use stone walling, wrought iron railings and gates, beech or privet hedging, sometimes in combination.
- In town centre situations houses are frequently with entrances onto the pavement whereas in more rural locations the house tend to be detached and set back behind a garden.
- Window openings with vertical emphasis, sometimes with smooth band surround.

3.4.4 Housing Design Guidelines

In recent housing in the vicinity, a lower pitch roof with interlocking concrete tiles in the grey or brown range has been used and buff brick has been introduced. Boundaries have often been timber or chain-link fencing, sometimes with open front gardens. Bearing this context in mind the following housing design guidelines are recommended:

- Aim to link groups of housing into meaningful composition to create enclosure and to provide contrast to detached houses, e.g. housing groups around the focal feature to a neighbourhood.
- Aim to develop a three dimensional hierarchy of buildings: two or three storey dwellings reserved for the periphery.
- Preferred walling materials to be coloured wet dash roughcast/render roughcast. Preferred colours are white, buff and sandstone, with stronger earth colours such as Venetian red, ochre, etc. for points of emphasis.
- Colour for both roofs and walls to be applied to any housing group in meaningful composition, rather than as a random scatter.
- Front facades could well be modelled, utilising bay windows and dormers, to improve views out, to enhance natural surveillance and to create a livelier frontage.
- Wherever possible homes should be designed flexibly to permit extension and alterations to be elegantly achieved.
- Front gardens and drives may be open or enclosed to suit the design theme.
- On steeply sloping sites house designs to be selected which sympathetically address the topography to limit cut and fill, e.g. narrow plan form following the contours, or stepped/split level plan utilising under-building space.
- Garden boundaries backing on to fields along the northern edge of the extension area should be animal proof, with low hedging/smaller trees to create a softer edge to the settlement and to facilitate views north.

3.4.5 Movement Systems

The framework has been prepared in accordance with guidance within SPP 17 which seeks to maximize sustainable transport modes and reduce the dependency on car travel. The framework prioritises accessibility for walking, cycling, public transport and then motorised modes, as identified within SPP 17.

Principal Road Network and Strategic Links

The proposed traffic distributor road through the Kirkton site will generate the majority of traffic movement on completion and result in less traffic activity in Castlemains.

Junctions on distributor roads have not been prescribed as this allows for future design flexibility, acknowledging the lengthy period for implementation. The development of junction spaces will make a positive contribution to the character of the public realm with enclosure patterns that are determined by the desire to achieve high townscape quality. For example, in Castlemains instead of the standard distributor road treatment, the framework introduces a core road in short section converging into civic squares, framed by buildings and groups of buildings to create enclosure, reduce speeds and create a sense of place.

A variety of access and parking configurations onto the local distributor road could be explored within the layout, including the use of car parking courtyards, parallel shared surface routes, parallel parking and property access to achieve placemaking and streetscape enriched by variety.

Residential Streets
Houses will front onto all types of roads to create 'streets' that are designed as movement channels for people as well as cars. These streets may, where appropriate incorporate avenues with trees and/or existing hedgerows.

Shared surface streets may be adopted in the residential areas where appropriate to create a pedestrian and cyclist friendly street network. It will be important to avoid wide or straight streets that tend to encourage higher vehicle speeds and are unfriendly to more vulnerable users. Residential streets will be designed to discourage speeds exceeding 20 mph and giving priority to pedestrians and cycle movements, in line with Perth and Kinross Council Roads Guidance.

Pedestrian and Cycle Network
Overall a permeable, relatively fine-grained network is proposed that will provide ease of movement to pedestrians and cyclists and ready access to bus routes. The principles within the Scottish Executive 'Cycling By Design' should be adopted where practical. Connectivity has been considered throughout the expansion area and every possibility to link existing and proposed communities, community facilities such as the Community School and other points of interest has been taken.

Public Transport
The national bus service operated by Stagecoach/First Bus is available on the High Street providing links to Perth, Stirling and beyond. The new distributor road through Kirkton will provide a standard suitable for accommodating bus routes and where appropriate bus stops. Castlemains residential core road will also be capable of accommodating a local bus service, should such a facility be required.

Access to the rail network can be gained at Gleneagles Railway Station approximately 3km south of Auchterarder.

Shared surface residential street, active frontage onto public open space, garages to the rear

Retaining and extending the path network

3.4.6 Landscape Design Guidelines

The Development Framework will adopt the following landscape design guidelines:

1. Maintain the visual integrity of the entry roads into the town. Minimise the visual impact of the development on the road corridors, by

- Retaining mature trees and hedgerows along the roadsides (particularly native species);
- Supplementing the existing planting with further native tree and shrub species to develop a full and dense screen along the roads (A824) and enclose the corridor and restrict views into the housing/employment land area;
- Retaining and maintaining existing walls and/or hedges along the edges of the roads/field boundaries;
- Continuing the stone walls and/or hedges (built using the same materials and methods where possible and practical) to entirely enclose the sites which directly abut the roads;
- Introducing planting (hedges and trees) along the north of Castlemains and Kirkton sites to break up the views into the proposed development areas, including the sports pitch area;
- Introducing sympathetic and appropriate entry treatments into the sites.

2. Draw reference from the vernacular of the stone walls, hedgerow planting and field boundary trees, to introduce a consistent and coherent edge treatment to the external extent of the sites. Reference should be drawn from these local examples, as they are very much part of, and contribute to the agricultural landscape as well as rural character of the area.

3. Respect and reinforce the existing patterns in the landscape, by

- Reflecting the principles established in the historic rigs, where practicable
- Drawing reference from the species used in hedgerows and trees along the field boundaries, (beech, hawthorn, oak), to delineate the rural edge
- Planting using historic clues and patterns will increase the capacity of the landscape to accommodate change and can also be used to provide shelter from winds, provide screening, provide an attractive setting for walks, or simply delineate the edge of development in staged development.

4. Retain and promote the natural features of each of the sites to maximise the landscape setting, which will assist in its successful integration into the town of Auchterarder and wider countryside. These opportunities include:

- Maximising views from the sites, particularly from vantage points, such as Pow Hillock, to take advantage of the open and attractive views to the north and south;
- Retaining any existing trees along the site's boundaries and the mature trees in Pow Hillock site;
- Protecting the vegetation which occurs along the boundaries of the sites e.g. Civic Amenity/Public Park, Castlemains Farm etc;
- Exploiting the changes of level in the sites, such as Pow Hillock, and making this an integral part of the design;
- Investigating the potential to develop Sustainable Urban Drainage Systems (SUDS) taking advantage of the gradients and proximity of burns.

5. Extend the network of paths around and through Auchterarder in order to connect the new development areas into the existing town.

   There are a number of connected paths around the periphery of the existing settlement of Auchterarder, which are well used by the residents for walking, jogging, cycling, dog-walking and other forms of informal recreation in the mornings and evenings. The paths are informal and go between agricultural fields. Paths and tracks along field boundaries link these established paths back into the settlement and around the edge of the existing town.

   The existing network of paths and rights of way will be extended throughout the new development sites. Reference should be drawn from the existing character of the walks in the design and detail of the 'new' network.

   The new paths where practical will provide connections into the town centre and offer alternative walking routes for use by the residents. An important issue to be considered in the design of these paths is to ensure that they are safe in both actual and perceived terms.

The following guidelines have been developed for the extended path network using PAN 77 Designing Safer Places, as well as best practice knowledge.

Paths should:

- Enjoy maximum natural surveillance from adjoining residences, high points and open play areas;
- Lead somewhere e.g. roads, play areas;
- Be able to be viewed along their length, with no concealed areas, blind corners or recesses;
- Be well maintained to ensure that sight lines into them are maintained and that they are perceived as well used/looked after;
- Should have open aspects;
- Be well lit, where most appropriate

6. Within the residential areas, the property boundaries will be physically defined along the road corridors, drawing reference from the existing vernacular in Auchterarder. In addition, a hierarchy of roads will be established through varying the levels of landscape treatment, according to the status (dependent on traffic levels and width of the streets). This will aid in the legibility of the residential settlement. In Auchterarder, the residential properties are frequently defined by walls, hedges or a combination of the two. They vary in style, construction technique, but always delineate a strong and defined boundary line between the public realm and private front gardens. Within the older residential areas in Auchterarder, the front gardens are delineated by walls, or hedges or a combination of the two. This develops enclosure to the road and creates attractive residential streets, where the delineation of ownership and access is clear.

Within shared surface areas, there will be less regulation as to the type of boundary definition to the street, whether it be a wall, hedge, or more open and permeable solution.

Use of sustainable urban drainage as landscape feature

Lower boundary walls can increase vews to the countryside

Within the premise that all property boundaries to the road will be defined, a hierarchy of landscape treatment should be introduced to develop the legibility and character within the settlement.

Green Space Network
Greenspace is a multi-functional asset offering social, environmental and economic benefits to communities. A network of open space has been designed to enhance connectivity and green space value in terms of amenity, access, biodiversity and sustainable greenspace management. It will take advantage of the site's natural features and topography and will be designed to act as a multi-functional community resource with formal and informal spaces/uses and accommodating sustainable urban drainage. Connectivity of green space including the provision of quality path networks and habitats are key outputs to meet the objective of sustainable places.

Green Space Management
Quality green space requires ongoing care and management if green space is to be provided that is 'fit for purpose' and can deliver meaningful benefits to communities at both local and wider regional levels. Specific measures setting out the sustainable management of both local greenspace and green networks and the mechanisms for their funding and management will be developed at planning stage. The Greenbelt company (factoring management) or similar would be recommended for future management, however as an alternative, maintenance and management by Perth and Kinross in accordance with their Maintenance Agreement policy could provide a suitable and sustainable solution.

Green Edge
The aim is to establish a definitive boundary between the landscape setting and the expansion area which will take into account the role of the edge as part of the countryside setting to the conurbation.

Sports, Play and Recreation
The aim is to integrate the provision of sports, play and recreation amenities with the landscape and green network strategy to ensure maximum accessibility and use. Thus the green network will support and be enhanced by a network of sport, play and recreational amenities.

Open space will be centralised to the development neighbourhoods providing an opportunity to set the character of the development. Sports provision comprising three grass football pitches, two tennis courts and a pavilion will be located to the north of Castlemains, accessed off Castleton Road. In addition an all weather junior football pitch and a LEAP will be provided adjacent to Castlemains Farm and Auchterarder Community School.

The type of equipment to be provided within play areas will be identified by discussion and agreement with officials from the Community Services/ Parks and Recreation Department but would include the equivalent of one Locally Equipped Area of Play (LEAP) and one Neighbourhood Equipped Area of Play (NEAP).

3.4.7 Energy Efficiency/Sustainability

All aspects of development must be evaluated to ensure the least long term damage to the environment and minimise the use of resources, the most effective use of energy and the achievement of public safety and security. This approach must apply both to the initial outlay and to the long term in-use and maintenance effort.

- Materials to be non-toxic from sustainable sources using the least energy in their manufacture, transport, erection and maintenance.
- High energy-saving insulation standards.
- Exploitation of solar sources wherever possible.
- Natural lighting and ventilation preferred.
- Layouts to encourage safe walking, cycling and public transport in preference to private car use.
- Layouts to be sheltered by landform, and by tree belts from excessive exposure and cooling winds.
- Layouts and buildings to be designed to enhance public safety and security, and should conform to the recommendations of PAN 77 "Designing Safer Places".
- Street lighting, whilst conforming to the code of practice for lighting subsidiary roads and pedestrian areas, should be shielded from glare and restricted to the minimum required for safe use, to reduce night sky pollution and to preserve the quality of dark skies in this Perthshire landscape.

The development consortium are familiar with the development of houses which are highly insulated, energy efficient timber frame constructed, with high quality timber windows, energy saving hermetically sealed double glazing units, detailed to limit infiltration and thermal bridging and energy efficient central heating systems – all to fully comply with the latest government building standards regulations.

Sustainable Drainage
The aim is to ensure that the new development will not be affected by flooding, and that the new development will not increase the probability of flooding elsewhere. Sustainable drainage systems will help to improve the existing surface water run-off. The provision of wetlands/ water features as part of a SUDS strategy will be integrated into the green network (and public urban space) to provide recreational and landscape amenities.

Environmental Performance
Perth and Kinross Council is seeking to support improvements in environmental performance across all development. To this end the standard provided through EcoHomes / BREEAM will be explored and applied where appropriate.

Embedded Sustainability Provision
A number of mechanisms exist to allow the Consortium flexibility of response whilst encouraging better levels of environmental performance. The Consortium will consider the use of the Building Research Establishment (BRE) Sustainable Checklist for Developments to assess performance and to bring forward innovative new measures. These will consider:

- Integration of SUDS and Biodiversity - Early design integration to secure habitat and nature conservation benefits through sustainable urban drainage.
- Integration of SUDS and Climate Change - Provision of measures to reduce storm water flows with porous surface pavings; household provision of water butts; provisions for grey water recycling
- Green Networks, Landscape, Gardens and Biodiversity - Ensuring greenspace, public realm and gardens support biodiversity and habitat development with native plant assemblages and good connectivity
- Energy, Climate Change and Renewables – Insuring buildings utilise passive solar gains and other emerging best practice opportunities are captured for exemplar and pilot schemes and services provide for adaptability to meet future opportunity.
- Waste Management - Ensuring provision for neighbourhood waste management and provision at nodes; local centres and schools and supporting measures for recycling and composting.
- Green Materials – Ensuring building specifications and detailing pay regard to environmental impacts and all material specifications are rated C or above in the BRE Green Guide to Housing Specification unless otherwise agreed.

Properties fronting on to public open space, garages set to rear.

3.4.8 Employment Land Guidelines

Business uses at Auchterarder are proposed north of the A824 on the eastern extremity of Pow Hillock. This is defined as Classes 4, 5 & 6 (light industrial uses, offices, general industry, storage and distribution) and is intended principally to meet local needs. The site is on rising ground and highly visible from the east. It is vital that the quality of the buildings, their siting into the topography, and their landscape setting reflect the importance of this location at the eastern approach.

- At Auchterarder it is recommended that this complex develops, using the best modern structures within a parkland landscape setting.
- Establishment of landscaped space at the junction with the A824 road, where views of the business park are further revealed.
- Provide clear signage at this entrance listing the business facilities.
- Establish a landscape framework to supplement existing woodlands, to provide shelter and screening to the business park development, and to tie the complex into the topography.
- Buildings to be fitted into the sloping terrain sympathetically, by following the contours, by reducing building depth or by utilising split level form, avoiding excessive terracing alien to the landform. Use of boundary walling or hedging as extensions to the buildings to further integrate them into the landscape.

The role models for these buildings should be examples of the best business parks together with their supporting high quality landscape setting.

- Quality materials proposed as appropriate options that might be considered:

  - Stainless steel
  - Polished structural concrete
  - Structural glass
  - Sun control louvres
  - Proprietary smooth cladding systems
  - Painted wetdash roughcast
  - Natural stone and slate

In a building group of considerable complexity as here, guidelines to recommend any particular roof form would seem over restrictive. More important is that each building must relate and contribute to the overall composition. Pitched, barrel vault or double curved roofs could all be considered, but it is preferred that roofs be dark in tone.

- It is proposed that neutral, buff, off white or white cladding is appropriate for the larger areas of walling, with stronger earth colours reserved for points of emphasis.
- All buildings to be fully accessible for the disabled.
- Parking and service areas to be fully screened from public view by walling or landscape.

Development Framework Elements

4

4.0 DEVELOPMENT FRAMEWORK ELEMENTS

4.1 Community Infrastructure

Sports Pitch Provision and Associated Facilties

The Development Framework identifies the sport pitch provision and associated facilities that are to be provided in line with the residential development.

Wider Context

The most popular form of football in the UK is now 5-a-sides as opposed to 11-a-sides, and this requires either indoor facities or artificial turf. As it is essential to maximise the capacity of pitch facilities and ensure maximum availabilty irrespective of the weather, the most appropriate option is to develop artficial rather than grass pitches. Another advantage is that artificial turf pitches are significantly cheaper to maintain per match than grass ones.

Pitch Provision

The proposed Sports facilities are identified at the specific locations with the provision of and all weather junior football pitch adjacent to Auchterarder Community School plus grass football pitches (1 no. senior and 2 no. junior) together with 2 no. tennis courts and the related pavilion located to the north of the Castlemains. Parking would be located adjacent to Castleton Road.

This will offer the capacity to accommodate higher overall levels of use every day of the week with less dependency on decent weather, than the Council's requirement. This will benefit the existing community.

The all weather junior football pitch located adjacent to Aucherarder Community School will be linked directly to the school by a dedicated pedestrian access route and will be set within the proposed landscaping and open space area north of the School that will form the linear greenway linking through to Castlemains House and beyond.

The sports Pitch Provision and related facilities at Castleton will be provided within a parkland setting north of Castlemains development area together with associated landscaping, vehicular access and pedestrian links to the footpath network between existing town centre, the community facilities, the school and the new residential areas.

Summary

The Sports Pitch facilities will be provided in accordance with the guidelines set out by the National Playing Fields Association as appropriate for the scale of development identified by Auchterarder Development Framework. Finalised detailed design of the development will ensure that the best possible solution is provided for the new residential areas and the existing community.

Children's Play

Perth & Kinross Council has identified that three children's play areas are required for a settlement of this size based on their 'Playground Strategy'.

1 Neighbourhood Equipped Area of Play (NEAP) and 2 Local Equipped Areas of Play (LEAPs) are to be evenly distributed throughout the development to ensure that the play areas can be accessed from the residential areas by foot.

The play areas are located within widened areas of the structure planting belts, which divide the residential development areas and accommodate footways which link into the existing path network of the town. Siting the play areas in these linear greenways ensures that an adequate buffer is provided between the residences and the play areas. 20 metres is required for a LEAP and 30 metres is required for a NEAP.

The NEAP is located in the Kirkton site and is to be a minimum of 8500m², incorporating 1000m²+ of active space, eight types of play equipment, and a small games and cycling area. LEAPs are provided in both the Castlemains and Townhead Farm sites. These will be a minimum of 3600m² and incorporate 400m²+ of active space, include five types of play equipment and allow for a small games area.

The LEAP in the Castlemains site is located in close proximity to the school and community facilties, with direct access from the school and residential areas through the landscaped greenway. It is proposed that the development design should ensure safe and secure usage of walkway and play areas, to afford natural surveillance.

Paths

The existing network of walks described in Section 2.13 is to be extended into the new residential sites. These will serve to create positive pedestrian connections into the existing town, and introduce alternative routes through and around the town for the residents, as well as connecting into the wider path networks in the countryside. Reference for the design of these walks should be drawn from the existing networks and guidelines offered in Section 4.2 - Linear Greenways - and the landscape guidelines in the Appendix of this report.

The strategic approach to creating new multi-user paths and pedestrian routes is one of integrating with and augmenting the existing provision within the town. New connections to existing paths and bridleways will be created by providing penetrative routes through the development area at key junctures. These internal routes will form connections between areas of open space, play areas and destinations both on the high street and to the north of the town. Where appropriate and where pedestrian routes do not take the form of a footway adjacent to a road, they will be designed to a standard which allows for inclusive access by a range of non-motorised users.

4.2 Landscape Infrastructure

Approximately 19% of the total site area is indicated in the masterplan for public open space and landscaping. This includes areas of play (refer to Section 3.3 for description); linear greenways or structure planting belts which incorporate walks; screen planting between different land uses, boundary treatments, central greens and pitches.

Linear greenways/structure planting belts

It is proposed that linear areas of structure planting be introduced in a north-south direction to reflect and reinforce the historic rig pattern and field boundary lines. These divide the sites into 'developable' parcels of land, which will correspond in size and configuration to the surrounding fields, and wider landscape context. This landscape structure will increase the capacity of the site to accommodate change.

Within the greenways, footpaths are provided which link into the town centre and the existing network of paths. The paths will also provide access to the children's play areas, which are located in a widened section of these landscaped strips.

The greenway adjacent to the school in the Castlemains site provides very important pedestrian links between the existing town centre, the community facilities at the school and the new residential areas.

It is proposed that development design should ensure safe and secure usage of walkway and play areas promoting a high level of natural surveillance and thereby increase their safety and security. The avoidance of high screen fenced boundaries along the frontages to the greenways would be preferable in order to increase the inter-visibility between public and private space.

The linear greenways will be landscaped using predominantly native species of trees and shrubs, set in grassed areas. The paths will be well lit. They will be designed in detail at a later stage, but will be developed in accordance with the landscape guidelines contained in Section 3.

Screen Planting

On the Kirkton site, screen planting will be introduced around the 'employment land' area, between the site and the A824 and to the residential properties to the west. The planting will be a minimum of 25 metres in width and consist of a mixture of native woodland planting which will reduce the visual impact of the development from the road and the houses.

Screen planting will also be introduced between the existing business uses along Hunter Street and the western edge of the Kirkton site, to provide a physical separation and visual barrier.

In addition, the existing mature planting which occurs along the A824 will be supplemented with further native species to develop a vegetative buffer between the residences and the road, retaining the attractive rural approach into the town from the east.

Boundary Treatments

The boundary of the proposed residential settlements are shared with roads, community uses, fields and vacant land, existing residential settlements and existing 'other uses' such as farm steadings. Each of these boundaries will require a suitable landscape treatment to define their edge and introduce a suitable division between the uses.

Road Edge

All existing walls along the road corridors abutting the sites will be retained and repaired. Sections where the boundary to the sites is not defined, new walls will be introduced to continue the line of the existing - along the back of the footway. Traditional techniques and materials where practicable will be utilised in the wall construction, to develop a consistent road edge and boundary definition. All trees and intact hedges will be retained where practicable

A824

The line of mature trees and shrubs along the south-eastern edge of the Kirkton residential site will be retained and protected in order to assist the screening of the development from the road and maintain the attractive approach into the town. However some trees will be lost in order to allow the construction of the new access and roundabout. Further native species will be added in the areas where there are gaps in this vegetative screen, to promote the visual integrity of the road corridor.

B8062/Hunter Street

The stone walls which exist along the boundaries of the Kirkton and Castlemains sites adjoining the B8062 will be retained and repaired where practicable. Planting will be introduced behind the walls to minimise the direct views into the site and create an attractive 'edge' to the development. This will increase the privacy of the residential dwellings to the road, as well as reinforce the visual integrity of the road corridor.

There is no inter-visibility between the A9 and the Townhead Farm site, but it is nevertheless important that the planting along the southern boundary of the site is retained and supplemented where necessary, to develop a vegetative buffer between the road and the residential areas. This planting contributes to the visual amenity of the area and provides a valuable resource for wildlife.

Fields

At the field edges, (e.g. northern boundaries of Castlemains and Kirkton sites), a post and wire agricultural fence will be introduced, with a native hedge planted behind. The hedge will be maintained to form a dense hedgerow along the boundary. Gates, and/or 'stiles' will be provided where walks extend from the residential settlements into the existing network of paths. At these junctions, it is proposed that native tree species be introduced in line with the hedgerow, in order to 'signal' the entry to the path and introduce height along the boundaries. This will assist in visually softening the impact of the residential edge. This landscape treatment will define the rural edge in a sympathetic way, in keeping with the landscape character of the area.

Existing residential settlements

Where new development backs onto existing residential settlements, the boundary should be defined by the introduction of shared back walls or fences, built to a height to provide privacy of the back gardens of both the existing and new properties.

Existing 'other' uses

Where existing vegetation or boundary walls abuts a development site boundary e.g. to east of Castlemains or Townhead Farm site, it will be retained and protected. These often mature trees provide a vegetative screen and will assist in reducing the visual impact of the residential development in the landscape. These existing tree belts also provide a valuable visual amenity as well as wildlife resource.

Feature/Gateway Planting

Street trees will be introduced at junction situations or at key locations to form 'gateways' throughout the residential areas. This has been developed in the Landscape Guidelines, but will require further consideration at a later stage, in order to accommodate services and ensure appropriate sightlines.

Central Greens

Within each of the residential development areas or neighbourhoods, an area has been allocated as public open space. These will serve as a central focus for each of the neighbourhoods, and take the form of a village green or informal gathering space.

The area indicated at the highest point of the Kirkton site is fixed in its location, in order to allow the preservation of the existing mature trees and also afford views across the Strath. The other areas which are indicated on the masterplan plan are not fixed in their location, and will be integrated as part of the layout of the residential areas in the detailed design stage.

4.3 Housing Phasing

The table below shows the number of residential units and phasing for each of the housing development sites.

Housing Development Sites and Phasing

	Kirkton Phase			Castlemains Phase			Townhead Phase		
	1	2	3	1	2	3	1	2	3
Gross area (hectares)	13.50	10.87	4.77	4.67	7.78	1.55	4.70	4.0	2.0
Area for Other (ha)* Housing Densities	2.30 19.6	1.72	0.57	0.62 19.3	1.68	0.15	0.66 19.6	0.65	0.39
Phase 1 (Years 1-4) total units	200			100			**92		
Phase 2 (Years 5-8) total units		150			73			65	
Phase 3 (Years 9+) Total units			50			50			20
Total Units	400			223			177		

Note: All dates and areas are indicative only, and exclude the areas proposed for formal recreational facilities north of the Castlemains site.

* eg open space, structure planting, paths, etc.
** Including flatted affordable housing.
*** Housing densities calculated based on net area for housing.

4.4 Housing Densities

Based on information received from Perth and Kinross Council, the client has assumed 200 affordable houses in total would be allocated to this project over its development period, beyond 2006 (and possibly up to 2020).

It is further proposed that mainstream private dwellings be laid out on the remaining 35.7 hectares at a density of 17.8 per hectare (7.2 per acre). Calculating both together averages out at 19.6 dwellings per hectare (7.9 per acre), with the distribution as set out in the following table:

	Gross Area (ha)	Open space (ha)	% Open space / Gross Space	Net Housing Area (ha)	19.6/ ha 7.9/ area
KIRKTON (Employment)	4.0				
KIRKTON (Residential)	25*	4.6	18%	20.4	400
CASTLEMAINS 1	14.0	2.6	19%	11.4	223
TOWNHEAD	10.7	1.7	16%	9.0	177
OPPORTUNITY 3 SUB TOTAL	49.7	8.9	18%	40.8	800

In addition to and closely associated with the housing are the allocations of open space for landscape wedges, for local and neighbourhood equipped play areas for a junior football pitch, and for the space reservations in the heart of each neighbourhood for landscaped greens and focal points.

*NB - This area excludes 4.0 hectares of Employment Land and the area allocated for pitches to the north of Castlemains road.

4.5 Affordable Housing Provision

The Auchterarder Development Framework acknowledges the need for additional affordable housing in Auchterarder and that the provision sought through the Development Framework should reflect the Council's current affordable housing policy of 25%. The DTZ Pieda 2003 Survey which covered the five year period from 2003 to 2008 recommends that around 25% of the additional affordable housing should be social rented accommodation with the remaining 75% being low cost home ownership. An updated review of the needs assessment is awaited.

Through discussions with the Council's housing service, it has generally been accepted that these criteria should be deliverable through the period of this Development Framework. Given the Development Framework provides for 800 houses, the affordable housing currently required should be circa 200 units of which 50 require to be social rented and 150 require to be low cost home ownership.

The Consortium has been in discussions for some time with a registered Social Landlord (RSL) for the provision of affordable housing at the Townhead location to the east of Glenburn Road and to the west of the Provost's Walk and A9.

It is fully intended that the Consortium will provide serviced land at an agreed DV valuation to an RSL, in line with Phase 1 housing development. Detailed plans have already been prepared for a Phase 1 and Phase 2 affordable housing release at Townhead (see plan). Phase 1 is 53 units of which there is a mix of flats, cottages and various terraced house types. Phase 2 is a further 22 flatted units and from preliminary discussions with Hillcrest Housing Association, it is envisaged that these units will provide mixed tenures of both social rented, shared ownership, homestake as well as discounted properties for sale.

The proposed release of Townhead Phase 1 (53 affordable units) will be in line with the first phase of private housing (for sale) with the second phase of 22 affordable units being released after the completion of 350 units, as part of a wider affordable housing proposal within the Development Framework.

This is initially being limited to 16% due to the constraint being placed on the Consortium by Scottish Trunk Roads until the Shinafoot Junction Improvement can be delivered. Thereafter, the following phases inclusive of the 22 units will bring the % of affordable units back up to the 25% provision currently sought by the Council's policy.

Phase 1 Townhead is also included by Hillcrest Housing Association in the context of their Strategic Housing Investment Plan which programmes site start in January 2009 and will also form part of their Strategy and Development Funding Plan submission for Perthshire to Communities Scotland in December this year.

The balance of the affordable housing provision for the rest of the development framework (i.e. 125 units) will assume the tenure mix relevant to any applicable housing needs assessment at the appropriate time.

The Consortium is now in a position to progress discussions with Hillcrest for the planned delivery of this initial phase of affordable housing provision which will be programmed to parallel with initial phases of house building within the wider Development Framework.

4.6 Employment Land

The Development Framework Plan identifies four hectares of employment land to be located on the northwest section of Kirkton immediately adjacent to the approach to Auchterarder from Aberuthven. This location although clearly identified within the Development Framework, has through the consultation process thrown up certain shortcoming in terms of its suitability.

These disadvantages can be summarised as follows:

- The high visual impact on the northern approach to Auchterarder.
- The topography of this location is particularly steep to the north of Pow Hillock and therefore does not lend itself well to the siting of business units in terms of both ground works, servicing and visual impact.
- As this employment area is immediately adjacent to the residential areas proposed for Kirkton, a dedicated road access to the employment land will be a necessity. This has specific disadvantages in terms of the timing for its delivery and the other essential services required to bring this employment land forward in line with early phases.
- As it is intended to access the initial phases of Kirkton and Castlemains from Hunter Street, the availability of the identified employment land is not in line with the sustainable phasing of the development as established by the Development Framework.

Furthermore the Consortium commissioned a study by GVA Grimley in 2004 into the likely demand at that time for business space within the Auchterarder & Strathearn catchment. The findings of this report clearly confirmed that evident demand at that time was lacking given the availability elsewhere in the cities of Perth and Stirling.

Since that time, the Council has intimated that there has been growing enquiries for business units, however the recent commencement of the Aberuthven Enterprise Park demonstrates that demand is still weak in that there are currently 14 serviced business plots of varying sizes available. This availability is over and above business space currently for let at Glenruthven Mill, Auchterarder and Bridgend, Crieff and Barbush, Dunblane.

The Consortium is therefore of a view that there are a number of factors which need to be taken into consideration when agreeing to the timing of the release of the Employment Land within the Master Plan. These are:

- The suitability of the proposed location in terms of its topography, visual intrusion and traffic impact.
- The timing of infrastructure and servicing, as well as the delivery of the necessary access from the proposed Feus roundabout.
- The availability of supply at Aberuthven and other local locations to meet short term demand appears to be adequate until such times that the proposed housing reaches a level of completion to generate additional employment opportunities.
- The high level of investment required by the Consortium to remove other constraints such as upgrading of the WWTP and A9 Road Junctions coupled with the Planning Gain and Community Benefits sought by the Council in the form of affordable housing and commuted sums for Social Infrastructure.
- It is understood that the Council is keen to participate in the provision of serviced plots and small industrial business units for rent and a reasonable period of time should be built into the development's programme to negotiate and implement the delivery of this opportunity.

The Consortium further considers that a better location for the proposed Employment Land may be identifiable in the short to medium term. This may well offer a better solution in terms of immediate access to the A9, improved marketability, appropriate topography and reduced visual impact to immediate and distant local environs.

It is therefore proposed that an alternative site within the Auchterarder area which is acceptable to the Council in terms of its location, size and delivery timescales is brought forward to ensure that it provides an effective supply and sustainable solution. Furthermore, as the agreed area to be provided for Employment Land within the Development Framework is 4 hectares for the 800 residential units it is acknowledged there should be the provision of at least 1 hectare (i.e. 25%) in line with Phase 1.

The Consortium will undertake through the Section 75 to provide a minimum of 1 hectare of serviced Employment Land either at Kirkton or an acceptable alternative location prior to the occupation of the 200th dwelling house. Thereafter, the second hectare of Employment Land would be made available by the time 50% of the first hectare of Employment Land has been occupied.

In any event, the Consortium will commit to the first hectare of Employment Land being made available within 18 months of the first house occupation within Opportunity 3.

4.7 Sustainability

Energy efficiency and the reduction of pollution are key elements complementary to achieving the sustainability objectives of SPP6. Whereas the promotion of renewable energy as a means of reducing carbon emissions is recognised, the Development Consortium consider that this objective can best be managed in the short to medium term by using resources effectively to ensure enhanced energy efficiencies and reduction of carbon dioxide pollution. These sustainability principles will be embraced by the Development Consortium within this Development Framework which will encourage energy efficiency through the promotion of siting, form, orientation and layout of buildings to realise the benefits of solar energy, passive solar gain, natural ventilation, natural lighting and the use of landscaping boundary treatments to control temperature extremes and minimise heat loss due to exposure by creating shelter.

The key factors that impact on the energy efficiency of a building are; site, location and building design. The gradient and orientation of a site together with the spacing between the buildings and their heights have an impact on the amount of exposure a building has to direct sunlight and therefore its potential for solar energy gain.

Heat loss is influenced by the construction of external walls and on exposed sites by the presence of planting and other types of wind breaks. The choices of construction type, materials, amount of insulation, and where possible, the use of renewable energy sources can contribute to the efficiency of resources. The local sourcing of elements of the construction also contributes to the conservation of resources and should be incorporated into the development proposals where practicable. The type of house construction and specification shall meet the requirements of the new Scottish Building Standards and in addition will, as a minimum, meet the target CO2 emission reduction rates (TER) of 15% across the development, as set in SPP6.

To achieve energy efficiency to deliver the target improvements, there are a range of areas that can be considered for delivery of improved carbon emission reduction. These will then be balanced against sustainability, lifecycle, perceived user value and deliverability to optimise the best solutions to deliver the improvements. Examples of these are, increased insulation levels and the use of alternative materials to provide increased thermal resistance to reduce U values within the building fabric. Additionally, improving air permeability will enhance the heat retention of our buildings whilst improving comfort levels for the occupants.

Auchterarder presents an opportunity to approach things differently. The Development Framework will promote a sustainable and environmentally sensitive approach with all new development being designed with a view to reducing greenhouse gas emissions and pollutants, conserving resources and to facilitate an optimised approach to recycling through innovative energy efficient and low energy solutions to building operation and functionality.

Our aim is to achieve significant savings in carbon emissions through:

1. energy efficient building design and technology
2. renewable energy technologies
3. in Phase 2 consider the potential for site wide district heating incorporating tri-generation from distributed combined heat and power (CHP).

In Phase 1, we aim to achieve a 15% target reduction in carbon emissions over and above the Scottish Building Regulation's requirements, through the careful selection of building fabric, design and technology. As the Scottish Building Regulations tighten, so will our target.

In Phase 2, we will achieve further carbon savings through the use of available technologies which are technically feasible and commercially proven and in evaluating these options, we will consider CHP/energy centres and incorporating the use of bio fuels once the supply chain is renewable and cost-effective.

The Auchterarder development will where required, to achieve the target reduction sought by Government Standards, implement the appropriate technologies to meet the industry benchmark with a view to reducing carbon emissions by as much a 30% by 2010.

We would propose to implement a strategy that increases the energy standards of the units through the lifetime of the development in accordance with the applicable standards. We believe this has a number of positive benefits to all parties:

1. It would align with likely Scottish Government Policy.
2. Allows measurement against the regulatory requirements.
3. Lessons of positive and negative impacts of measures from previous phases will be fed back through the design for future phases.

Energy is an ever increasingly important consideration for Council policy, the public and the construction industry and as part of the sustainability statement we will investigate possible means to reduce energy consumption and therefore associated carbon emissions. This will include consideration in a stepped strategic approach to meet the standards applicable.

1. Reduce energy demand (energy efficiency, fabric standards and air tightness).
2. Supply energy efficiently (product selection).
3. Incorporate low carbon/renewable energy technologies (e.g. combined heat and power biomass/solar thermal, ground source heat pumps and photovoltaics).

Waste

New residential developments provide an ideal opportunity to establish best practice principles of waste management, from the domestic provision of internal and external spaces for waste separation and collection, to community based facilities.

By educating householders to reduce and re-use objects, this should cut down on the quantity of waste created, which would in turn have to be collected and disposed of. Domestic waste should be separated into organic and non-organic waste, the former of which can go to generate compost, and the provision of a dedicated space for composting should be created within the curtilage of each new dwelling. Non-organic waste (paper, glass, plastic) should be separated at home for collection, reducing the requirement for this process further down the line.

Those objects which cannot be recycled at home should be able to be disposed of at a centrally located community recycling centre, which is made accessible to all.

4.8 Contribution to Community Facilities

The delivery of the Opportunity 3 Development Framework of 800 houses within Auchterarder will assist significantly with sustaining and developing local services provision for the community going forward. The Developer Consortium recognises that the planned housing proposal will impact on the level of existing services provision provided by community facilities such as the Aytoun Hall and the Library as well as other more wide ranging resources such as parking provision and footpath networks. To this end it has been agreed with the Authority through the consultation process that the most appropriate way to deal with this is by way of a commuted payment per house. These contributions would then be used by the Local Authority over the life of the development to improve the wider community assets as demand on these facilities increases.

PKC acknowledge that the level of contribution for community facilities requires to reflect the terms of Circular 12/1996 and the tests of reasonableness in scale and kind. In this particular case, the Developer Consortium is challenged with significant costs in delivering badly needed road junction improvements to the A9 at both the Western Road to the south and Aberuthven to the north. The latest costings for these junction improvements now stands at £10.5 million with no confirmed contribution forthcoming from the Scottish Executive at this time.

Furthermore, there is also the cost of paying £2.85 million to Scottish Water for the necessary upgrade to the Waste Water Treatment Plant. This is to provide not only the capacity required for the development of 800 houses, but to provide a further 200 surplus connections for the wider benefit of Auchterarder.

Over and above these direct payments the Developer Consortium is obliged to provide sports pitches on land to be provided adjacent to the High School and at Castleton Road. This pitch provision consists of one junior allweather sports pitch at the school site plus two junior grass pitches and one senior grass pitch as well as two tennis courts at Castleton Road. The Castleton Road location will effectively provide a new Public Park facility with the pitches as well as Changing Facilities and other amenities. Before identifying the level of commuted sum as a rate per unit for community facility improvements, the remaining significant community benefit which will be delivered by the Consortium and which impacts on the development economics of the proposals, is the Consortium's contribution to affordable housing provision in Auchterarder.

It has to be recognised that up to 200 affordable units (25%) is a significant commitment and as such these units are unable to contribute to the funding of community facilities. Accordingly, when allocated effectively over 600 private homes for sale, the Consortium's financial contributions before accounting for commuted sums for community facility improvements, equates to a rate per unit of £27,615.

Taking all of the above into consideration, the Consortium will make a contribution of £1000 per unit over 600 units as a cash contribution of £600,000.

In the event that Transport Scotland or another party contribute to the Loaninghead Junction, the Developer Consortium will increase the proposed commuted sum for community benefit by an amount equal to 15% of the total contribution received by the Consortium. This sum will be added to the £1000 per unit as stated above.

In summary, with the projected cost of the A9 trunk road junctions currently at £10.52 million, £0.5 million for the local road network improvements, the drainage upgrade at £2.85 million, sports pitches and changing facilities at £2.7 million and the proposed commuted sum facilities at £0.60 million, the total costs for community infrastructure equal £17.17 million which over the 600 private houses proposed in the development framework equates to a total benefit per unit of £28,615.

Engineering Audit and Support Studies

5

5.0 ENGINEERING AUDIT and SUPPORT STUDIES

5.1 Road Network

A9 Strategy
Transport Scotland, in its role as Highway Authority responsible for the trunk road network, has been in discussion with Perth & Kinross Council regarding a strategy for the improvement of junctions on the A9 Trunk Road to address road safety issues. This Strategy includes the closure of central reserve gaps on the A9 between the Loaninghead (A823) Interchange and the Aberuthven (A824) junction.

The BEAR consortium on behalf of Transport Scotland produced the A9 Auchterarder / Aberuthven Junction Improvement Strategy report (December 2001) and subsequently a Small Scheme STAG Appraisal Report for the A9 at Loaninghead, Auchterarder and Aberuthven (August 2005) which identified measures to improve road safety on the A9.

This report proposed the closure of the central reserve gaps at the A9 Auchterarder South and Aberuthven junctions which would eliminate the hazardous at grade right turn manoeuvres to and from the A9 trunk road southbound carriageway. The existing Auchterarder South and Aberuthven junctions would be retained but would only accommodate left turn manoeuvres to / from the A9 northbound.

The closure of the gap at the Auchterarder South junction would result in traffic from Auchterarder onto the A9 southbound diverting onto Orchil Road and the A823 to access the A9 at the Loaninghead Interchange. The Loaninghead Interchange is a grade separated junction and the traffic diverted from the Auchterarder South junction would increase the traffic flow on the southbound on ramp. The existing southbound on-ramp terminates in a priority 'Giveway' junction instead of a typical simple merge taper. The BEAR report recommended that an improved southbound merge taper would be required to accommodate the increased traffic flow. A southbound merge taper could not be provided onto the existing ramp due to the proximity of the abutment to the existing A823 overbridge. Consequently it is proposed that a new southbound on ramp and merge taper are provided on the solum of the old A9 in the southwest quadrant of the existing Interchange.

In order to accommodate traffic to/from Auchterarder and the A9 (southbound) diverted by the central gap closure at Aberuthven the BEAR report proposed the construction of a new grade separated junction on the A9 at Shinafoot Road (B8062). The new Interchange at Shinafoot would include the provision of southbound on and off slips and would utilise the existing Shinafoot Road underpass below the A9 to accommodate the grade separated crossing of the A9 from the southbound carriageway. In order to accommodate increased traffic volumes on Shinafoot Road it was also recommended that the horizontal alignment of Shinafoot Road should be improved between the A9 overbridge and the A824 as well as the layout of the A824 / B8062 junction.

Implementation & Development Constraints
Transport Scotland are of the opinion that the road safety issues at the Auchterarder South and Aberuthven junctions would have to be addressed before additional development could be accommodated within Auchterarder.

Transport Scotland have indicated that the current funding program does not include an allocation for the improvements to the A9 at Auchterarder but nevertheless the following staging of the improvements and development would be appropriate :-

- A modest development of 50 residential units would be acceptable without junction improvements.
- The Loaninghead improvement (permitting the closure of the central reserve gap at Auchterder South) should be implemented first, followed by Shinafoot (permitting the closure of the gap at Aberuthven)
- The full Masterplan development at Auchterarder would require the provision of both Loaninghead and Shinafoot Junction Improvements.
- Detailed assessment would be required to establish an acceptable intervening level of development that could be accommodated with the Loaninghead Improvement.

The A9 junction improvements are proposed to address safety issues and not operational capacity restrictions. Consequently the level of appropriate development associated with the Loaninghead improvement would be determined by an assessment of the accident potential arising from network/junction alterations and development traffic generation rather than a conventional assessment of junction operation.

DBA examined the existing accident record on the A9 at Loaninghead, Auchterarder South and Aberuthven junctions and prepared an assessment of the impact of the proposed junction improvements and development phasing on accident levels using the NESA road network cost benefit analysis program.

This assessment confirmed that the accident potential on the A9 with the total masterplan development and the junction improvements at Loaninghead and Shinafoot would be considerably lower than the existing situation when assessed over a 30 year period. In addition the assessment identified that up to 350 dwellings could be accommodated at Auchterarder with the Loaninghead junction improvement without increasing accident rates over existing levels.

Traffic Diversion Effects – Auchterarder South
The closure of the gap in the central reserve at the Auchterarder Western Road junction will result in the existing right turning traffic finding an alternative route. During the weekday AM peak hour there were 90 vehicles turning south onto the A9 out of Western Road and 6 vehicles turning into Western Road from the A9 southbound. Equivalent figures for the PM peak were 79 right turn out and 18 right turn into Western Road.

As a worst case it could be assumed that all of the traffic turning right out of Western Road would divert onto Orchil Road (westbound) to utilise the Loaninghead Interchange. Likewise traffic turning right into Western Road would divert to use the new Shinafoot Interchange.

The proposed Masterplan development at Auchterarder would obviously produce additional traffic movements at Loaninghead. The predicted trip generation / distribution for the Masterplan development illustrated in Figures 3a and 3b (Appendix 3) indicates that the traffic attracted to the A9 south of Auchterarder would be 220 vehicles during the AM peak and 109 during the PM peak. The Kirkton and Castlemains areas of the overall Opportunity 3 development are well located to take advantage of the Shinafoot Interchange and therefore a considerable proportion of the traffic travelling south would utilise this interchange rather than travelling through Auchterarder and Gleneagles to reach Loaninghead. The traffic attracted to Orchil Road would therefore be southbound trips from Townhead (41 AM peak, 18 PM peak) and say 25% of southbound trips from Kirkton and Castlemains (45 AM peak, 20 PM peak).

The existing, diverted and generated traffic flows on Orchil Road during the typical weekday AM and PM peak hours are shown in Table A below.

	AM Peak			PM Peak		
	Northbound	Southbound	Total	Northbound	Southbound	Total
Existing	147	175	322	217	163	380
Diverted	90		90	79		79
Generation	86		86	38		39
Total	**323**	**175**	**498**	**334**	**163**	**497**

Table A – Traffic Flows Orchil Road

Although there would be a significant percentage increase in traffic flow on Orchil Road (+55% AM, +31% PM) the total level of traffic flow is well within the capacity of the existing road. Orchil Road has a road carriageway which varies in width between 5.5m and 6.5m. According to the Design Manual for Roads & Bridges (DMRB) a single carriageway road (width 6.1m) with frontage access and unrestricted parking and bus stops at the kerbside would have a capacity of 900 vehicles per hour (busiest direction of flow). This capacity far exceeds the maximum predicted demand (334 vehicles per hour) with the Opportunity 3 development and the closure of the Western Road central reserve in place.

Traffic Diversion Effects – Aberuthven
The closure of the gap in the central reserve at the Aberuthven junction will result in the existing right turning traffic diverting to Shinafoot. During the weekday AM peak hour there were 5 vehicles turning south onto the A9 out of Main Road and 98 vehicles turning into Main Road from the A9 southbound. Equivalent figures for the PM peak were 2 right turn out and 160 right turn into Main Road.

In addition traffic turning right into Western Road from the A9 southbound at the Auchterarder South junction would divert to use the new Shinafoot Interchange. This movement was 6 vehicles during the AM peak and 18 vehicles during the PM peak.

The proposed Masterplan development at Auchterarder would obviously produce additional traffic movements at Shinafoot. The predicted trip generation / distribution for the Masterplan development is illustrated in Figures 3a and 3b (Appendix 3). All traffic attracted to the Masterplan development from the A9 north of Aberuthven (115 vehicles AM peak, 225 vehicles PM peak) would divert to the Shinafoot off ramp. The Kirkton and Castlemains areas of the overall Masterplan development are well located to take advantage of the Shinafoot Interchange to travel south and therefore a considerable proportion of the traffic (75%) generated by these areas (134 vehicles AM peak, 71 PM peak) would utilise the Shinafoot southbound on ramp.

The existing, diverted and generated traffic flows on Shinafoot Road during the typical weekday AM and PM peak hours are shown in Table B below.

	AM Peak			PM Peak		
	Northbound	Southbound	Total	Northbound	Southbound	Total
Existing						
Diverted	98	5	103	160	2	62
Generation	115	134	249	225	71	296
Total	**213**	**139**	**352**	**385**	**73**	**358**

Table B – Traffic Flows Shinafoot Road

Although there would be a significant percentage increase in traffic flow on Shinafoot Road (+??% AM, +??% PM) the total level of traffic flow is well within the capacity of the existing road. Shinafoot Road has a road carriageway which varies in width between 5.5m and 6.5m. According to the Design Manual for Roads & Bridges (DMRB) a single carriageway road (width 6.1m) with frontage access and unrestricted parking and bus stops at the kerbside would have a capacity of 900 vehicles per hour (busiest direction of flow). This capacity far exceeds the maximum predicted demand (??? vehicles per hour) with the Opportunity 3 development completed.

5.2 Development Impact

Traffic surveys were obtained for the following 5 existing junctions within and surrounding Auchterarder during the typical weekday AM and PM peak periods.

- A9(T)/A824 Western Road Priority Junction
- Western Road / Orchill Road Priority Junction
- Townhead Road / Castleton Road Priority Junction
- High Street / Hunter Street / Abbey Road Priority Junction
- A9(T) / A824 (Aberuthven) Priority Junction

The survey traffic flows are shown in DBA Figures 1a & 1b (Appendix 3) for the AM and PM peaks respectively. As can be seen the maximum 2-way traffic flow on the main Western Road-High Street- Feus Road corridor is some 560 vehicles per hour between Ruthven Street and Hunter Street during the AM peak and 630 vehicles per hour between Castleton Road and Ruthven Street during the PM peak hour. This level of traffic flow is well within the capacity of the road and there is no significant traffic congestion.

These surveyed flows were projected to a design year of 2013, some 10 years beyond 2003 the anticipated year development construction would commence using National 'Low' Road Traffic Growth Forecasts. This represents a 4.2% growth in traffic over the 12 year period from 2001 to 2013. The predicted design year traffic flows are shown in DBA Figures 2a & 2b (Appendix 3) respectively.

The additional traffic generation of the proposed masterplan development was estimated utilising surveys of existing similar developments. The additional traffic generated by the proposals is shown in DBA Figures 3a & 3b (Appendix 3) for the weekday AM and PM peaks. The trip distribution reflects the directional bias of traffic movements on High Street and the A9.

The total trip generation of the various development areas is summarised in the following table.

Masterplan Development Generation Rates

Land Use	Units	Vehicle Trip Rate in / out Weekday AM Peak	Vehicle Trip Rate in / out Weekday PM Peak
Residential	No Dwellings	0.16 /0.61	0.52 / 0.24
Business / Emplyment	Gross Floor Area	0.60 / 0.84	0.22 / 0.54

Masterplan Development Trip Generation

Land Use	Size	Vehicle Trips in / out Weekday AM Peak	Vehicle Trips in / out Weekday PM Peak
Townhead	177 units	27 / 102	87 / 40
Castelmains	223 units	34 / 130	111 / 51
Kirkton	400 Units 12300m2 GFA	63 / 244 74 / 103	208 / 96 27 / 66
Total		198 / 579 (777)	433 / 253 (686)

The calculated masterplan generated traffic was superimposed onto the base design year traffic flows to provide traffic flow forecasts for the design year 2013 including the Masterplan development. The predicted traffic volumes are shown in DBA Figures 4a & 4b (Appendix 3). The maximum 2-way traffic flow on the main Western Road-High Street- Feus Road corridor is predicted to be some 900 vehicles per hour between Ruthven Street and Hunter Street during the 2013 AM peak and 960 vehicles per hour between Castleton Road and Ruthven Street during the 2013 PM peak hour. This level of traffic flow is well within the capacity of the road and there will be no significant traffic congestion as a result of the development.

5.3 Public Transport

At present the only public transport available within Auchterarder is travel by bus. Three main services run through Auchterarder, serving the areas of Dunning, Crieff, Stirling and Perth (via Blackford & Greenloaning).

The frequency of these services is approximately one bus per hour in each direction, with the exception of the Service 19/20, which passes every 45 minutes travelling from Stirling to Perth and back.

In addition to these services, there are a number of buses that serve the school only. As expected these buses run only at the school entry / exit times.

P&KC Public Transport Section have advised that the town currently lacks a 'town service' because of the size of the town and the linear nature of the existing settlement. It is considered by P&KC that the proposed development could be the catalyst to deliver this facility by increasing demand and modifying the road system to facilitate a loop/circular bus route. In addition this type of service may also provide a facility for the reduction in traffic generation by means of providing a link to Gleneagles Station for commuter trips to Stirling and Perth.

The provision of a new Traffic Distributor Route from Feus Road to Hunter Street within the Kirkton in tandem with the existing Hunter Street would permit a bus service to circulate from the town centre through Kirkton & Castlemains. This route could extend from the town centre to Gleneagles Station via Muirton and the grade separated A9 / A823 junction.

The new roads infrastructure within the development areas would be designed to accommodate bus services with any traffic calming measures avoiding the use of vertical speed reducing measures, such as speed bumps and raised junction tables. Part of the community facilities conribution of 0.51million will go towards an improved public transport system.

5.4 Drainage & Water Supply

A sewerage pumping scheme to the River Earn from the Auchterarder Sewage Works was commissioned in March 2001. This allows a greater discharge of effluent than the previous systems due to the increase dilution capacity of the larger watercourse.

The improved scheme allows additional effluent to be added to the systems; however the scheme does not have the capacity for the scale of development detailed in the Development Framework.

Scottish Water previously set up working party to address the technical issues of treating the effluent from the development.

The working party set by Scottish Water also addressed the issue of water supply. Auchterarder's current supply is from three reservoirs. This is thought to be limited at present. There is capacity for some additional development (in excess of 200 units) thereafter additional storage capacity will be required for the overall Development Framework. The location of the existing Scottish Water apparatus is indicated in DBA Drawing No. 01075/SL/01.

The surface water drainage for the development will incorporate Sustainable Urban Drainage Proposal in accordance with SEPA requirements. The SUDS design will incorporate a flood assessment and detailed planting proposal.

Waste Water Treatment works

The sewerage (Scotland) Act 1968 as amended obliges Scottish Water to be responsible for the provision of public sewers to effectually drain an area of domestic sewage, surface water and trade effluent.

The development of Auchterarder Opportunity 3 required connections to the public sewers but due to lack of existing sewer capacity certain works to Auchterarder waste water treatment works have now been carried out to allow the necessary connection consents to be provided.

Scottish Water deemed that it was not practical for them to carry out and complete these works at a reasonable cost in terms of section 1(3) of the Sewerage (Scotland) Act 1968 as amended and therefore required that the developers of Opportunity 3 make funding available to provide the necessary increase to the capacity at the waste water treatment works.

In order to ensure/secure the required completion of the upgrade of capacity at the waste water treatment works both Scottish Water and the developers of Opportunity 3 have entered into an agreement in terms of section 8 of the Sewerage (Scotland) Act 1968 as amended for the carrying out and completion of the works. The majority of the funding for upgrading the water treatment works is being provided by the private sector developers.

5.5 Gas, Telephone & Electricity Services (Including Diversions)

Gas

A medium pressure gas main traverses the site. Transco have recommended that if this is located under a development road then an expensive diversion could be avoided. The location of the existing Transco apparatus is indicated in DBA Drawing No 01075/SL/01.

Transco propose to supply the development from the Auchterarder distribution network. Confirmation of the suitability of this proposal and details of supply routes will be provided when Transco receive detailed development proposals.

Telephone Service

BT plans show a network of cables serving Auchterarder. They have confirmed that they do not anticipate problems in supplying the development. They will prepare supply proposals on receipt of the detailed development proposals. There are no extensive cable diversions anticipated. The location of the existing BT apparatus is indicated in DBA Drawing No 01075/SL/01.

Electricity

Scottish and Southern Energy have provided plans, which show a 33kV overhead power line and overhead distribution lines traversing the development site. SSE have recommended that, for aesthetic reasons, these cables should be diverted throughout the site. A quotation for this diversion has been requested.

SSE proposes to serve the development from the existing distribution network which presently serves Auchterarder. This is considered to be a more reliable feed than the overhead cables which experience regular black-outs due to adverse weather. SSE will provide cable routing information and sub-station locations when they receive detailed phasing plans. The location of the existing SSE apparatus is indicated in DBA Drawing No 01075/SL/01.

5.6 Transco Pipeline Implications

A high pressure gas transmission pipeline crosses the north-west corner of the site. Transco have confirmed that, due to the pressure of this pipeline, there is an 85m stand-off zone which must remain free from construction. Beyond this zone there is a further zone of influence extending to 348m from the pipeline where there will be restrictions on population density.

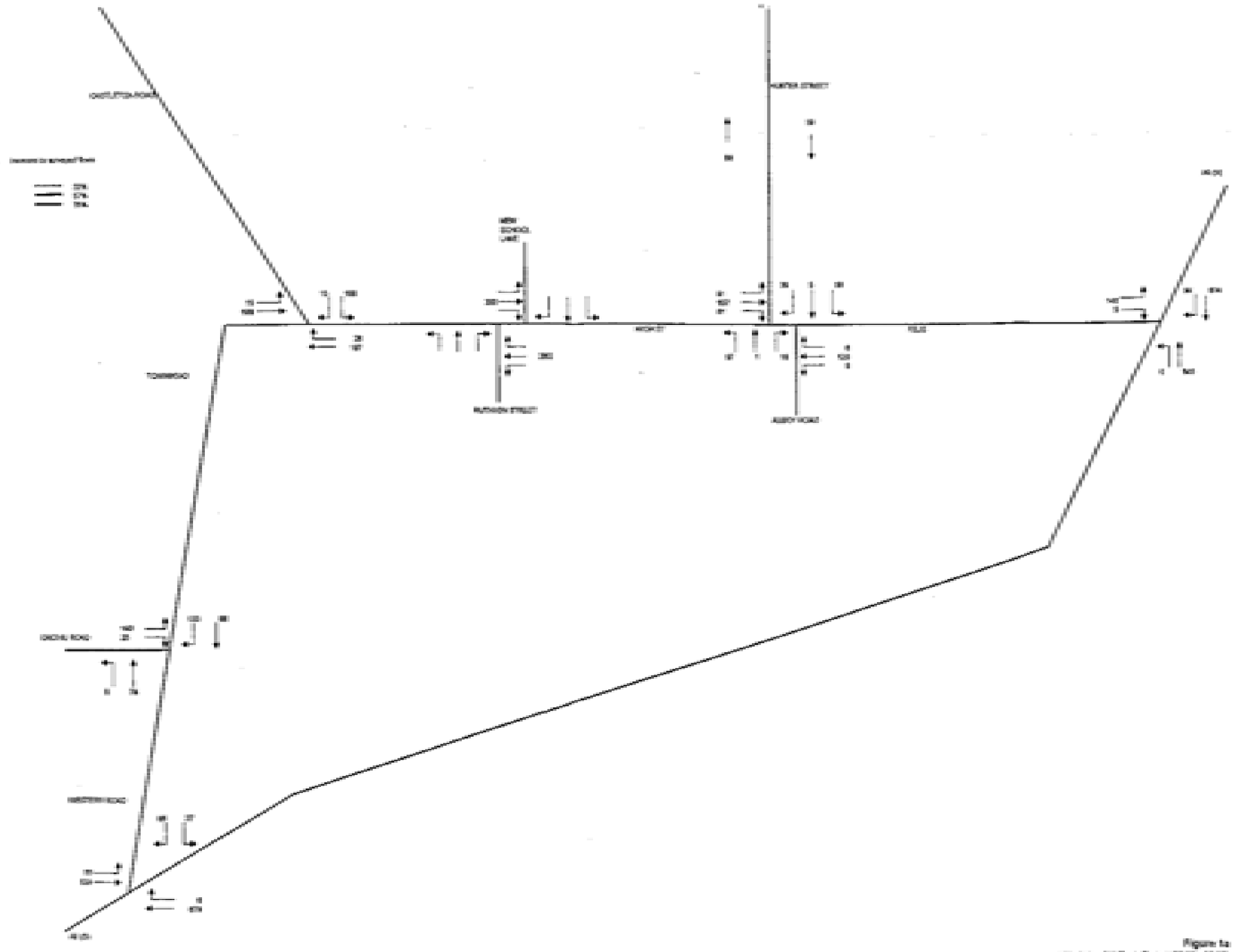
The Health and Safety Executive will be contacted by Transco to advise them of the proposals. HSE will impose their own restrictions, which may be more onerous than Transco's regulations. The location of the existing SSE apparatus is indicated in DBA Drawing No 01075/SL/01.

Appendix 1
Density Comparators

APPENDIX 1
Density Comparators.

Appendix 2
Engineering Diagrams

2



DBA

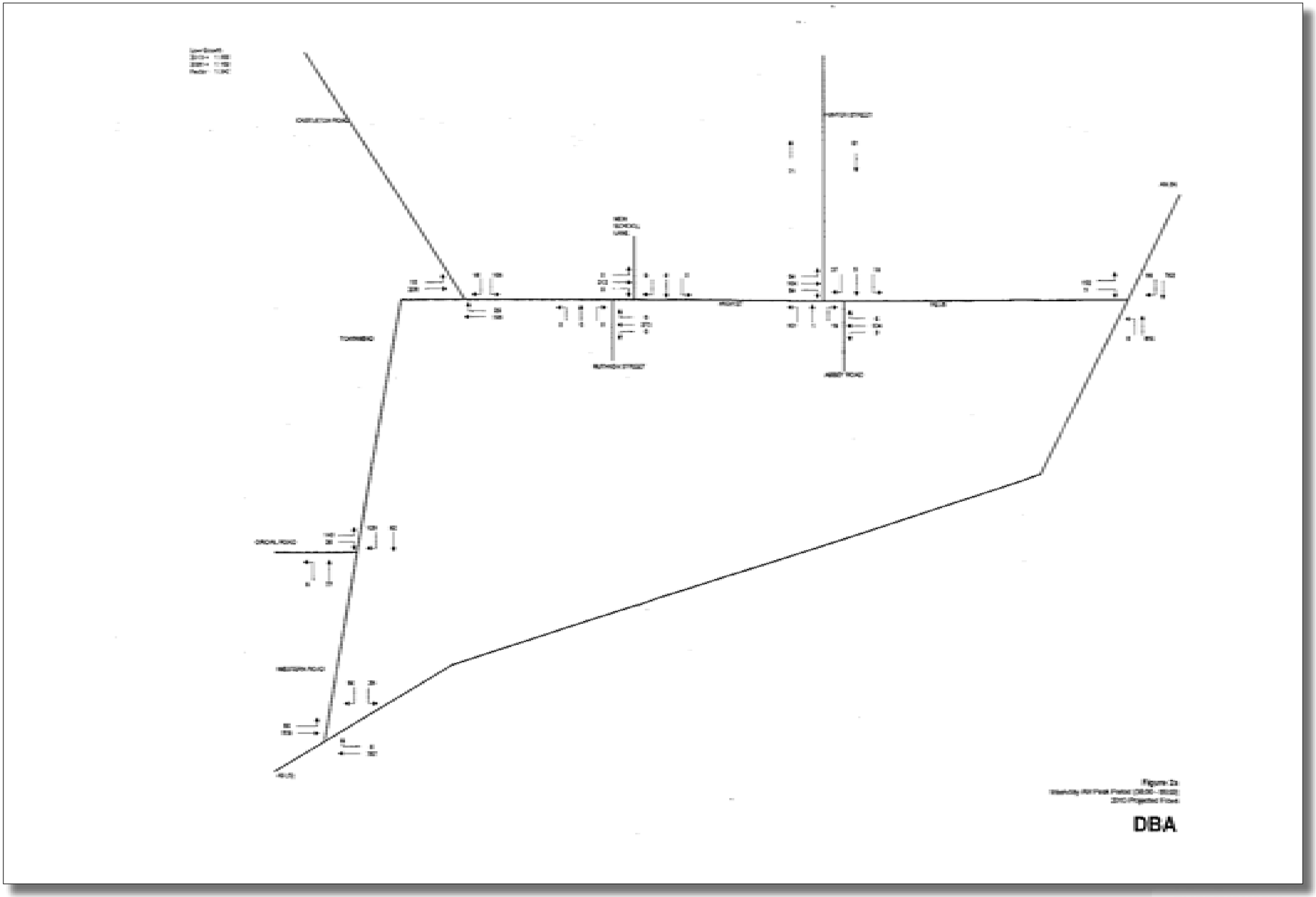


Figure 2a

DBA

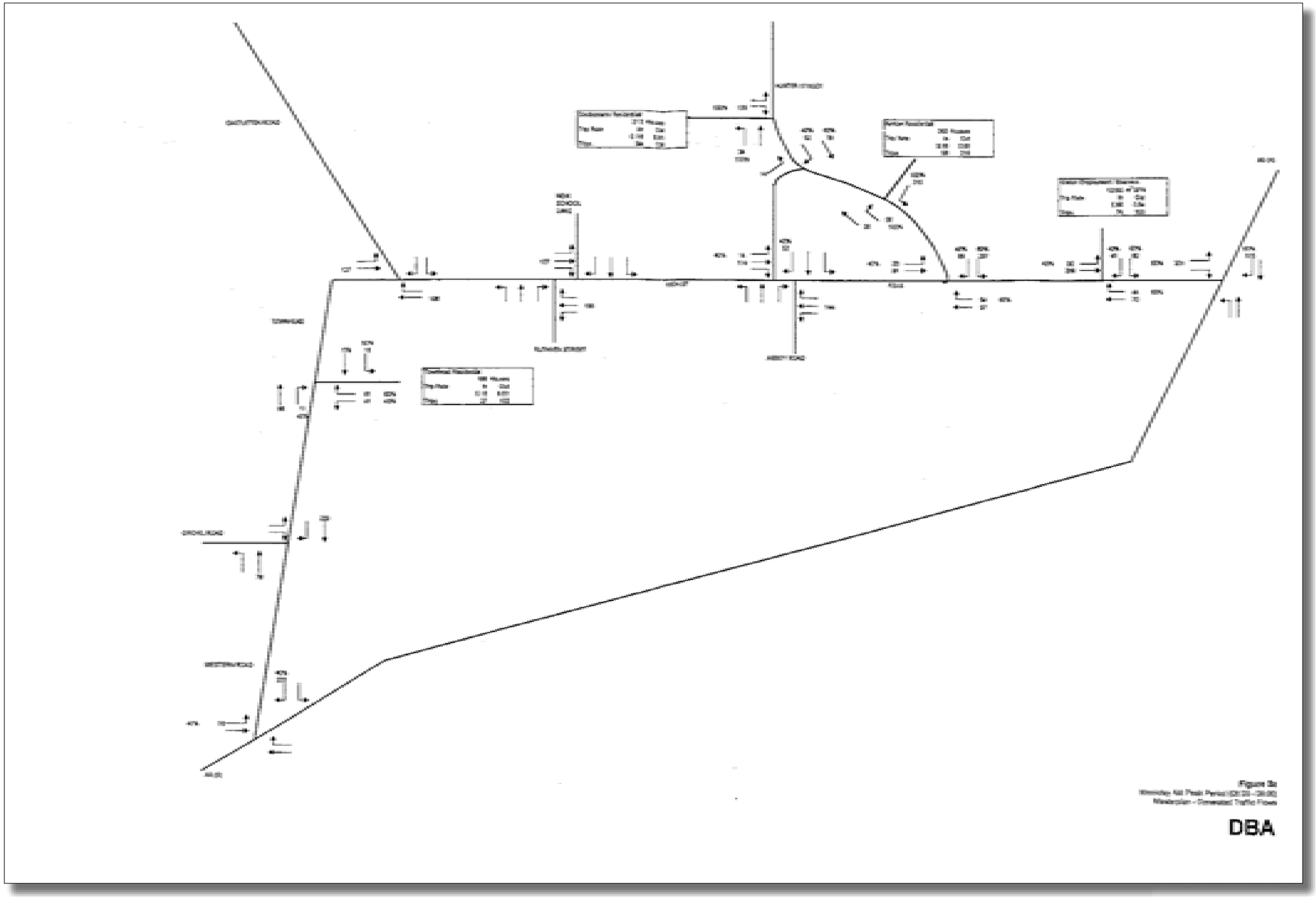
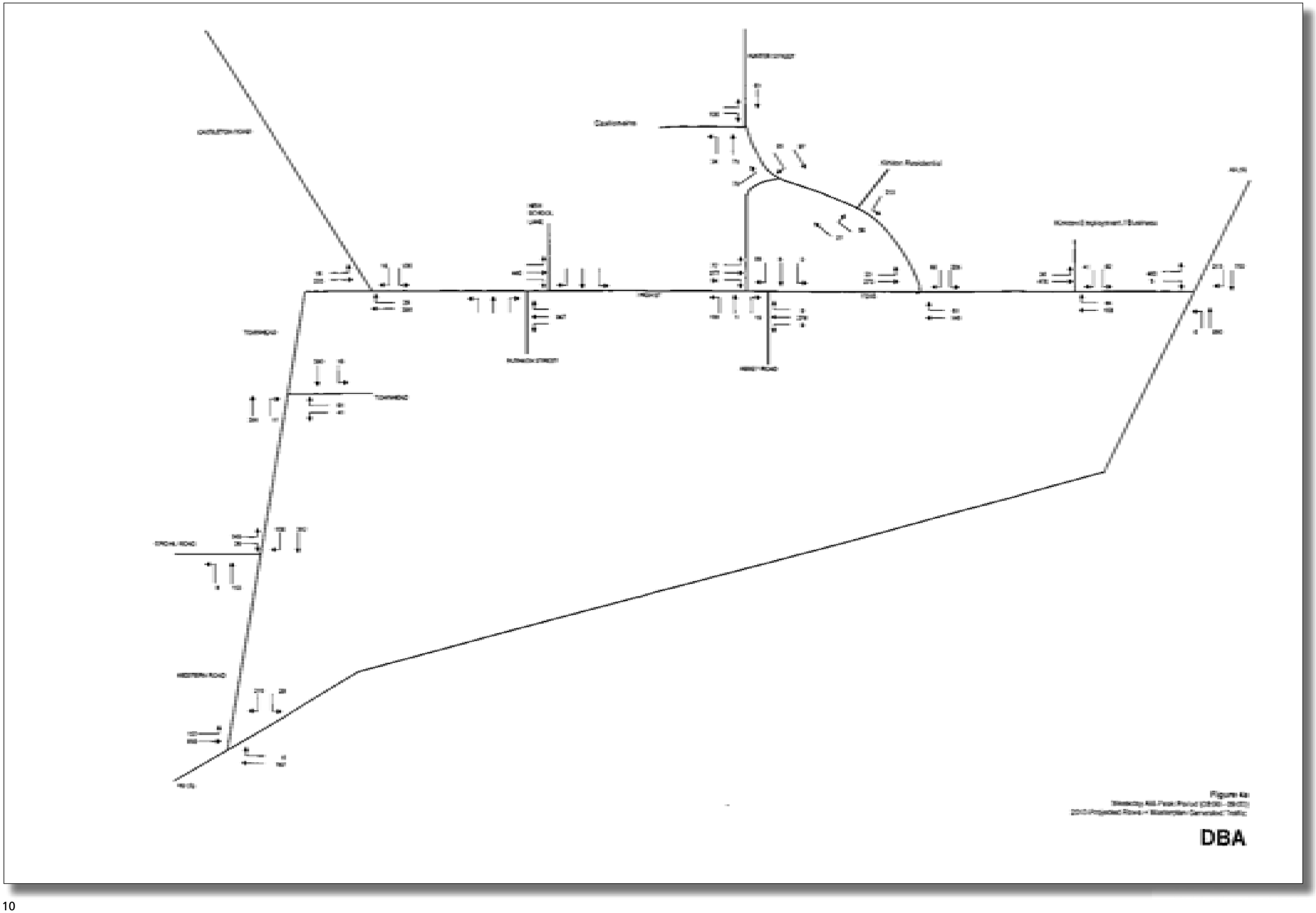


Figure 3a

DBA



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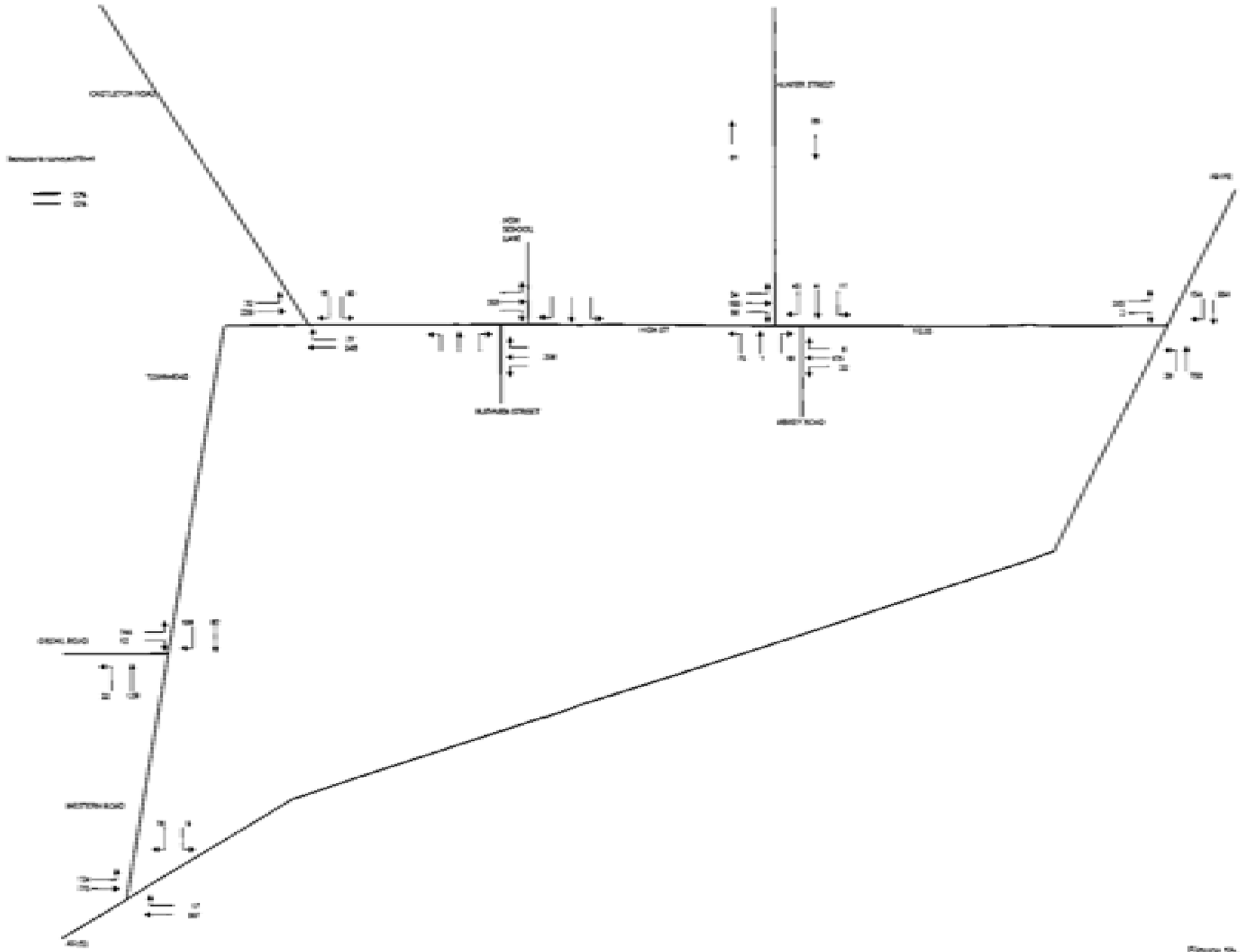
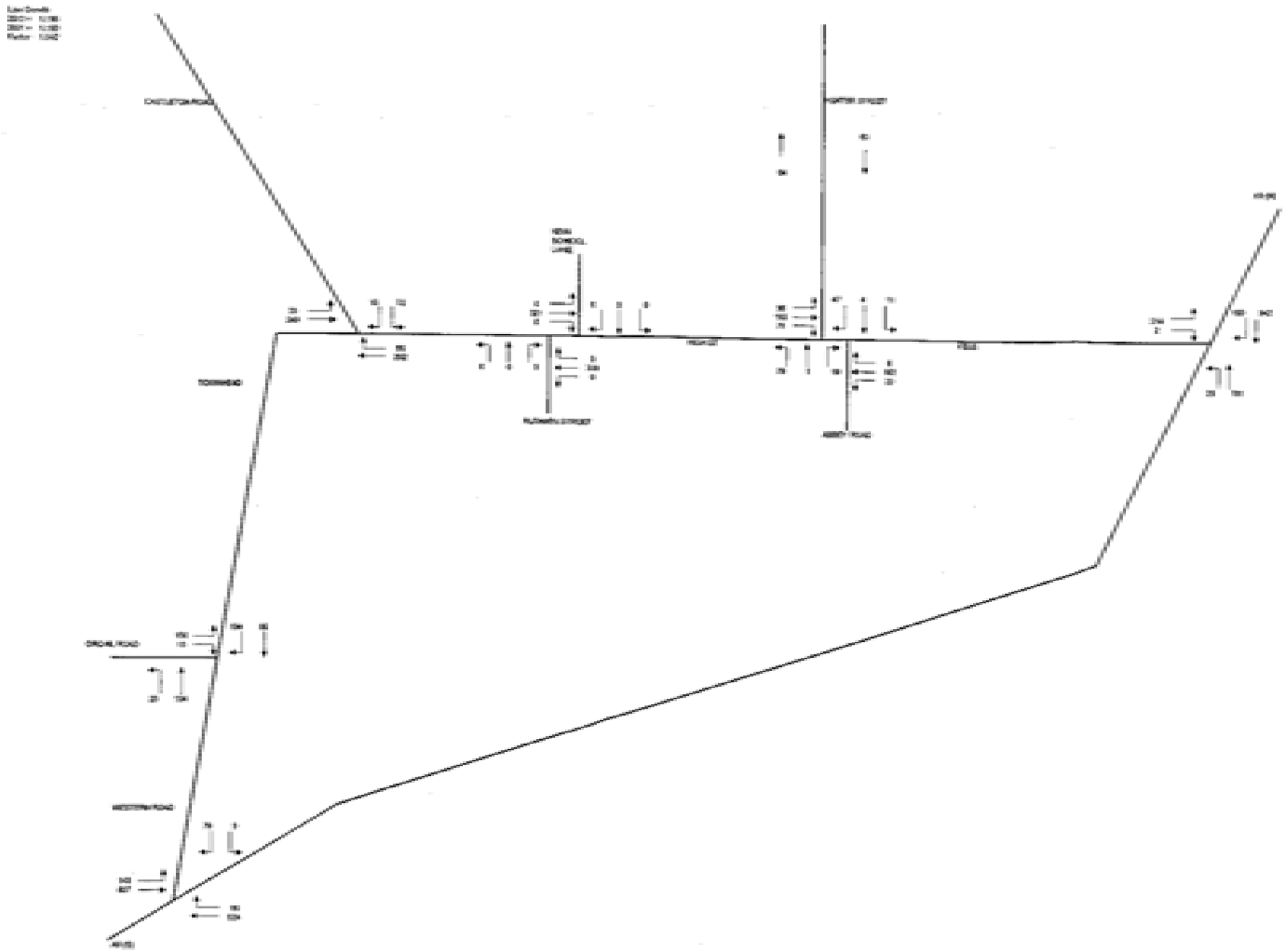


Figure 10
Weekday PM Peak Period (17:00 - 18:00)
2031 Calibrated Survey Flows

DBA



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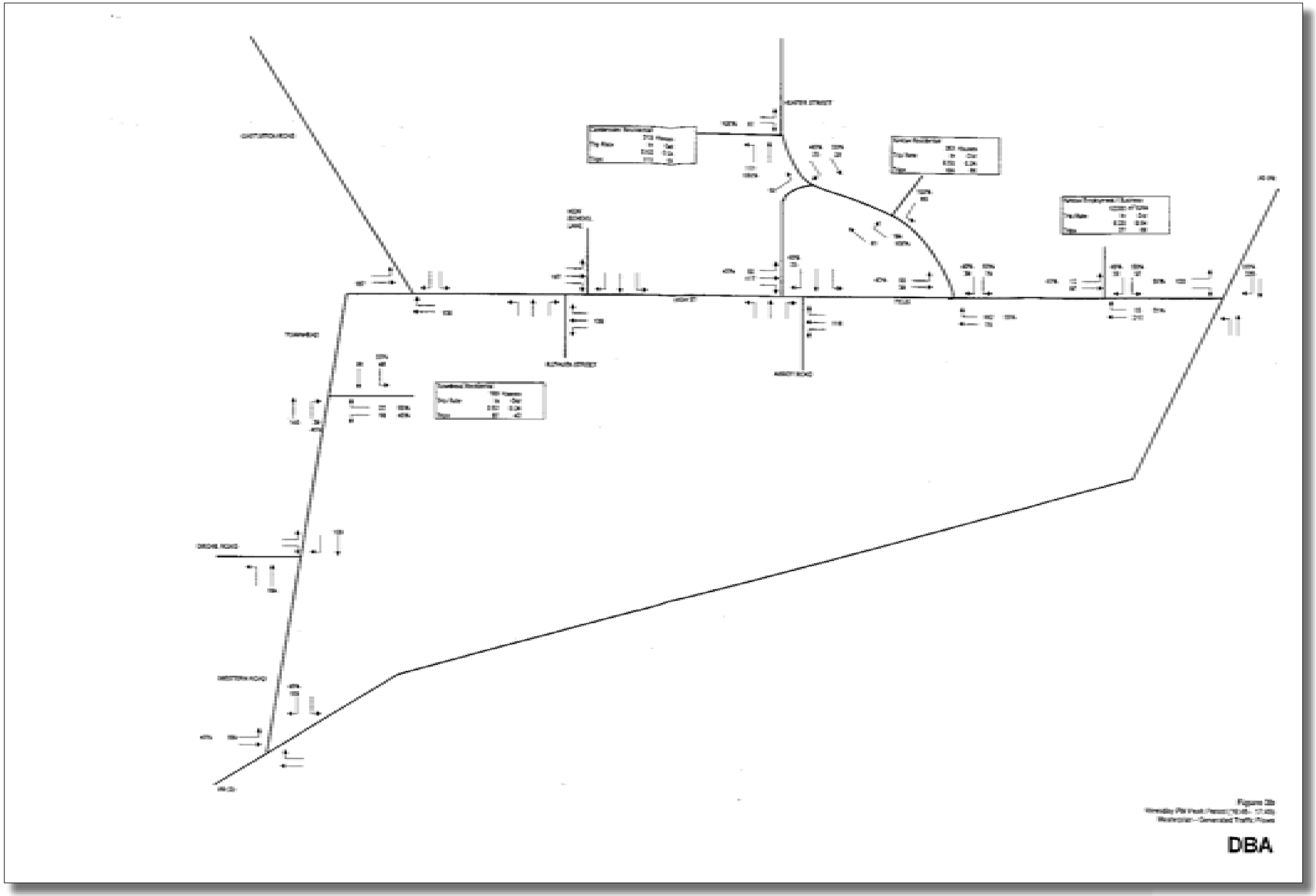

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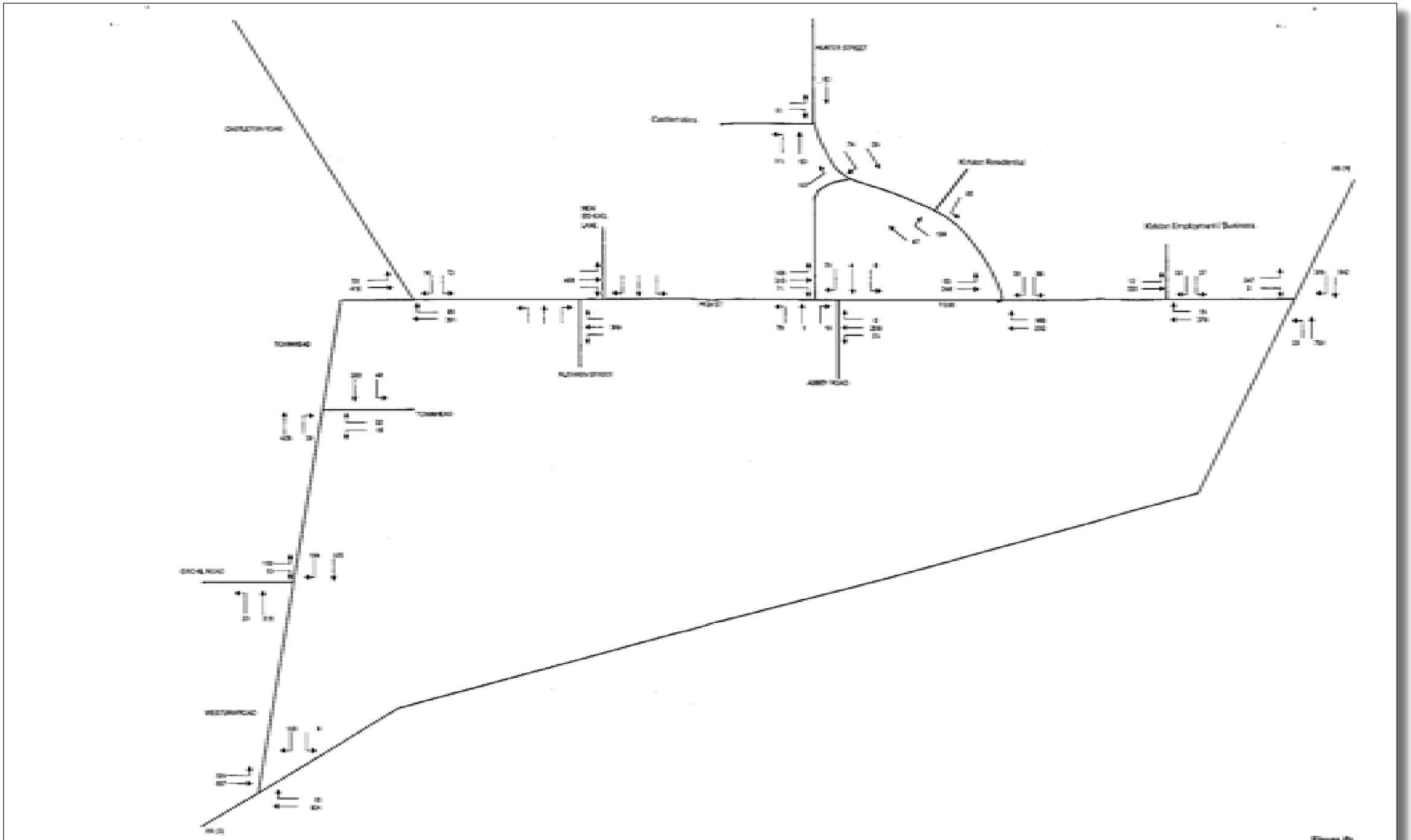
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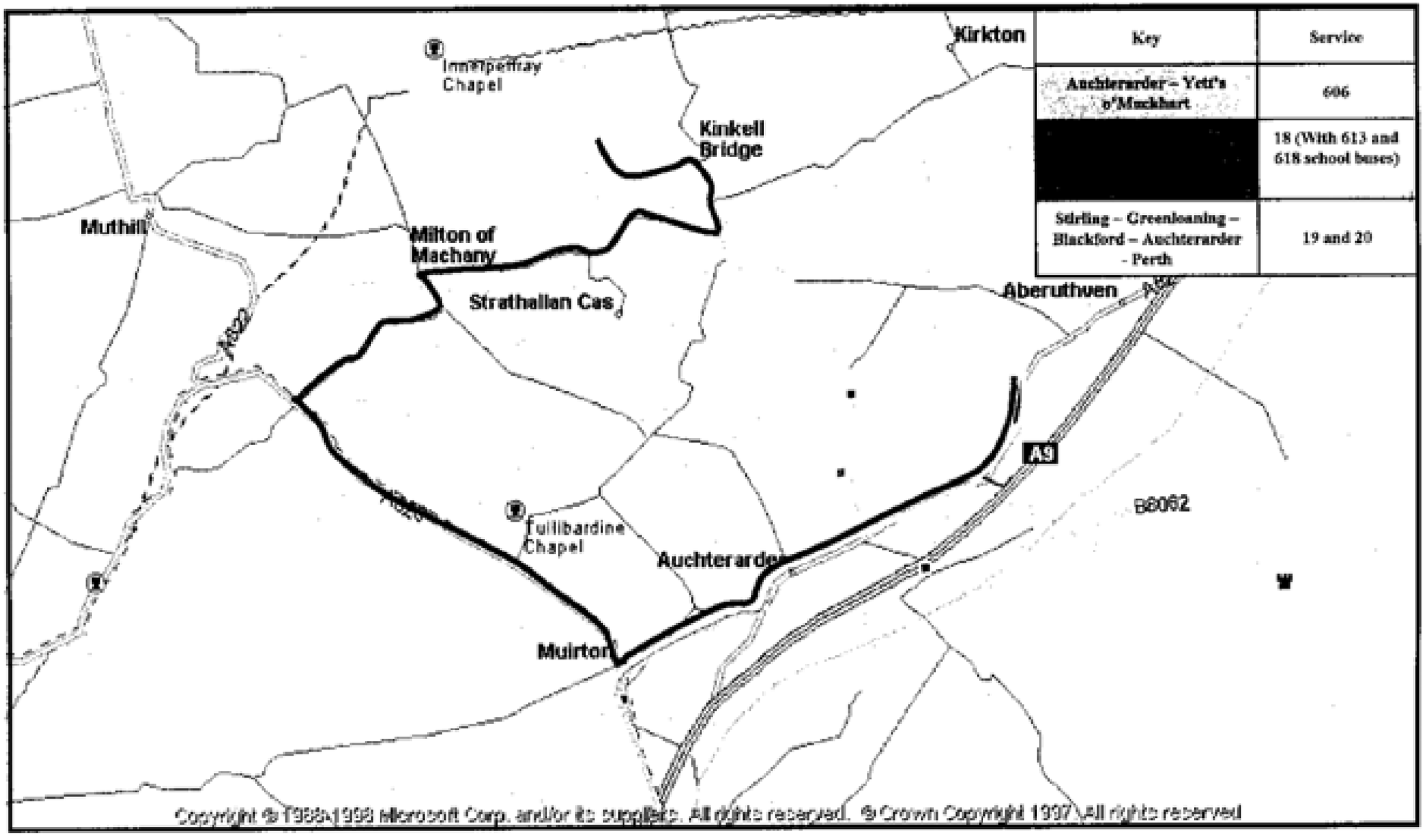
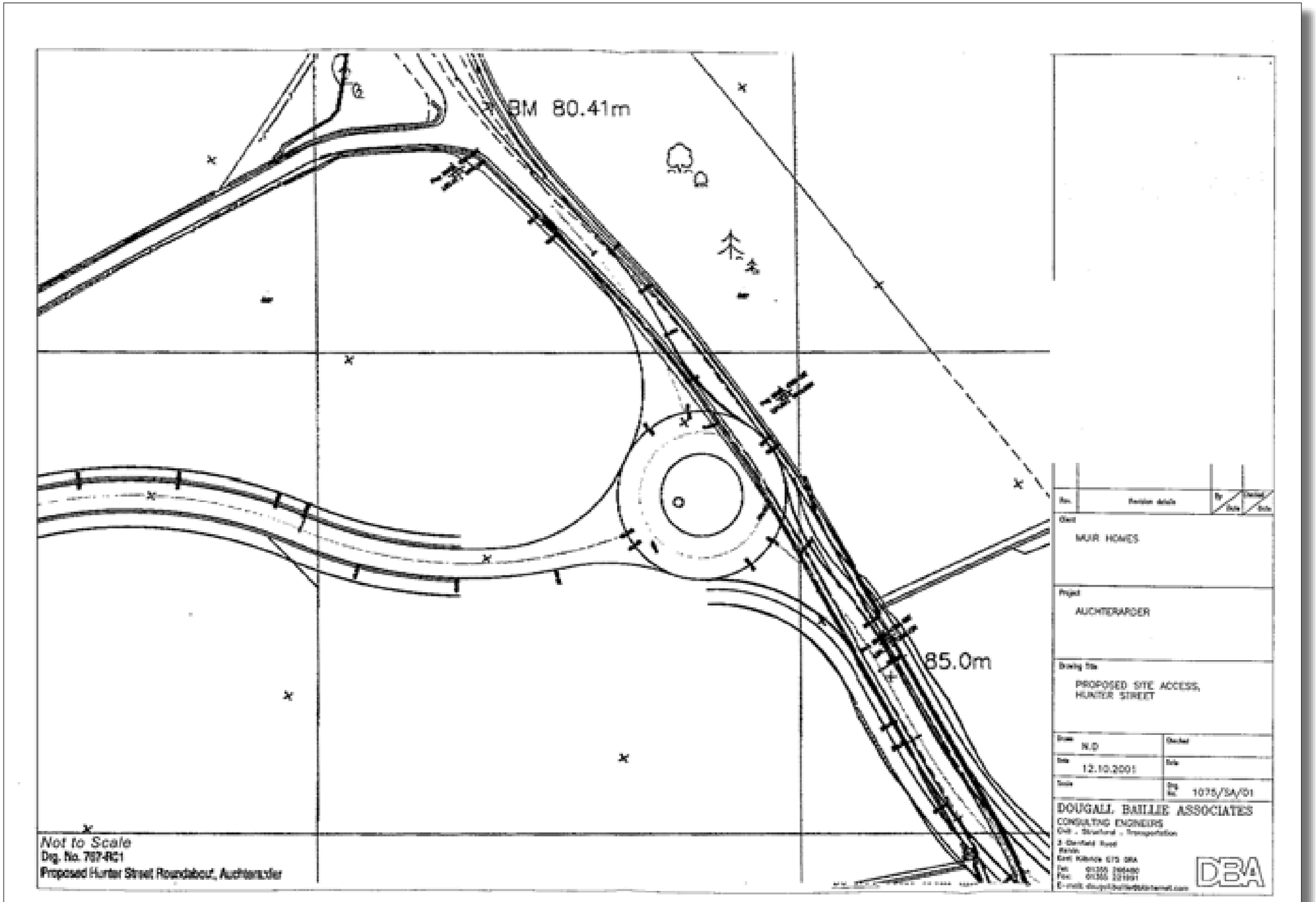


Figure 5

Existing Bus Routes

DBA


BM 80.41m
85.0m
Not to Scale
Dg. No. 7927-RC1
Proposed Hunter Street Roundabout, Auchterarder
Rev. Revision details By Date Checked Date
Client
MUIR HOMES
Project
AUCHTERARDER
Drawing Title
PROPOSED SITE ACCESS, HUNTER STREET
Drawn N.D
Checked
Date 12.10.2001
Date
Scale
Dwg No. 1075/SA/01
DOUGALL BAILLIE ASSOCIATES
CONSULTING ENGINEERS
Civil - Structural - Transportation
3 Glenfield Road
Perth
Kinross PH2 0BA
Tel: 01738 626080
Fax: 01738 631691
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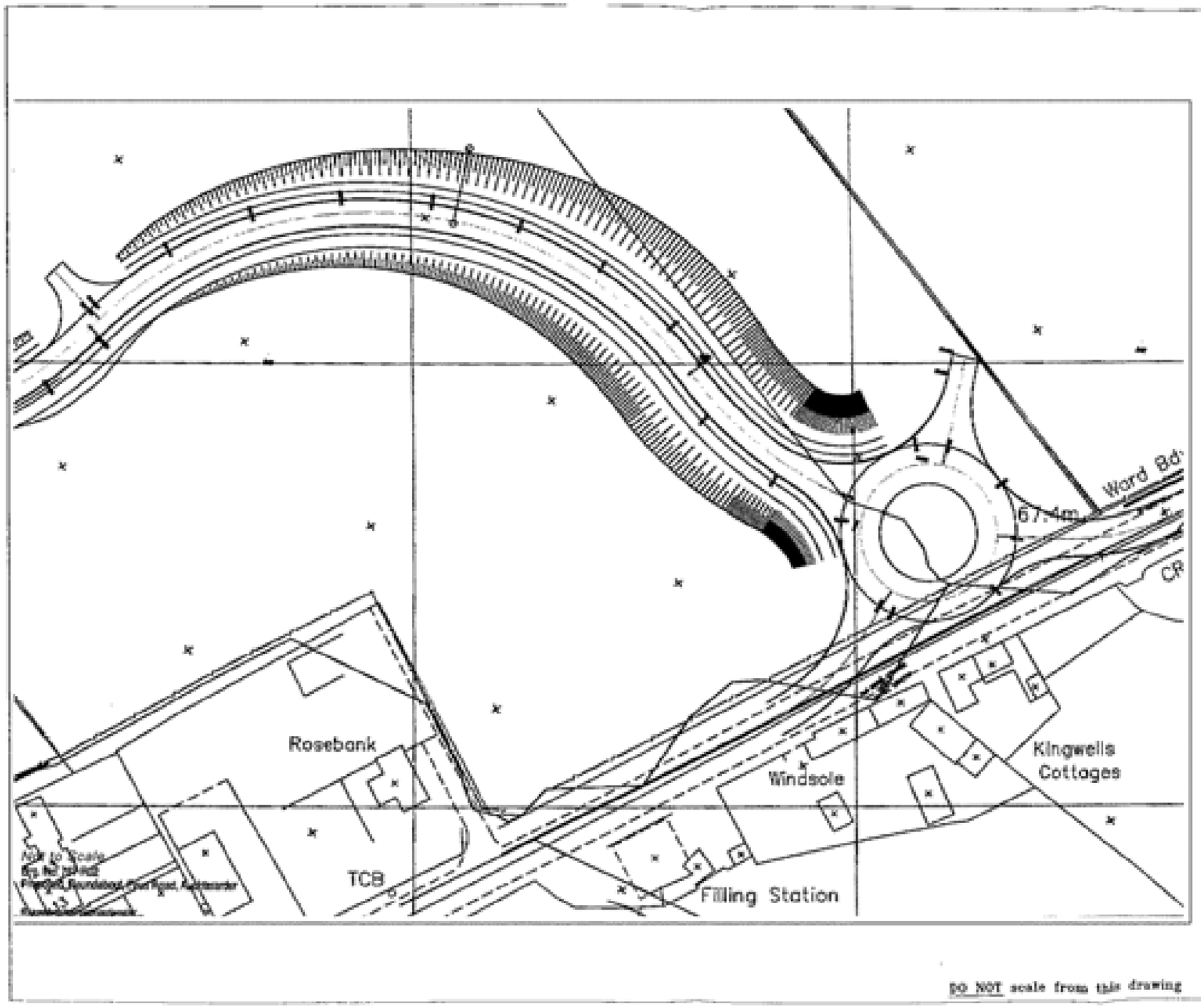
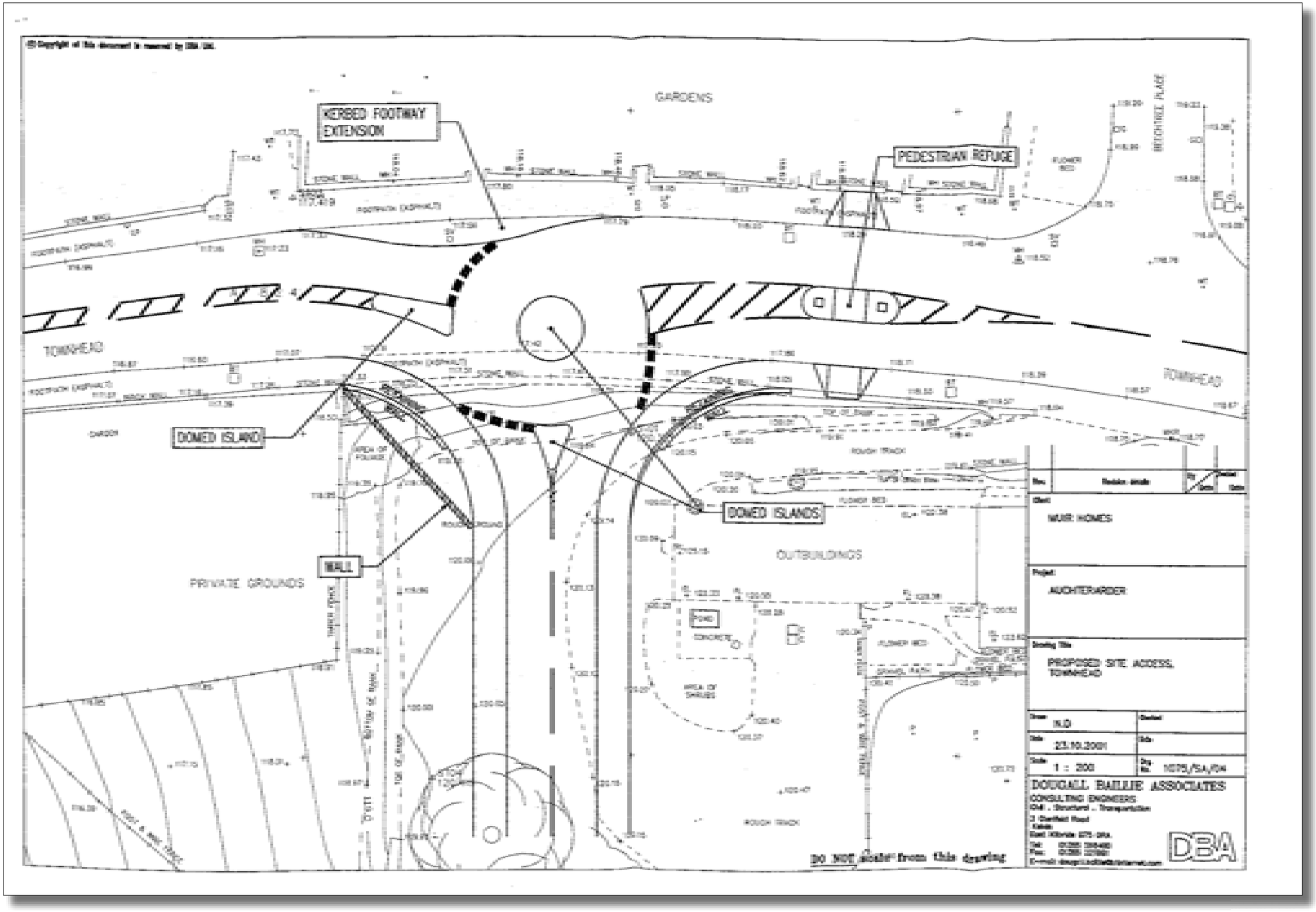
DBA


Rosebank
TCB
Windsole
Kingwells
Cottages
Filling Station
67.4m
Ward Rd
CR
DO NOT scale from this drawing
MUIR HOMES
AUCHTERARDER
PROPOSED SITE ACCESS,
FEUS ROAD
N.D
12.10.2001
1075/SA/02
DOUGALL BAILLIE ASSOCIATES
CONSULTING ENGINEERS
DBA


KERBED FOOTWAY EXTENSION
PEDESTRIAN REFUGE
GARDENS
BEECHTREE PLACE
TOWNHEAD
DOMED ISLAND
DOMED ISLANDS
WALL
PRIVATE GROUNDS
OUTBUILDINGS
FORD
FLOWER BED
ROUGH TRACK
AREA OF DAMAGE
Do not scale from this drawing
MUIR HOMES
AUCHTERARDER
PROPOSED SITE ACCESS, TOWNHEAD
RLD
23.10.2001
1 : 200
1075/SA/04
DOUGALL BAILLIE ASSOCIATES
CONSULTING ENGINEERS
DBA

Appendix 3
Traffic Noise Assessment

3

ACOUSTIC CONSULTANCY SERVICES

Specialists in Noise and Vibration
Instrumentation and Consultancy

2 BELHAVEN TERRACE LANE, GLASGOW G12 9LZ. TEL/FAX 0141-339-7536
e-mail andywatson@talk21.com

TRAFFIC NOISE ASSESSMENT

AUCHTERARDER RESIDENTIAL MASTERPLAN

TOWNHEAD SITE

AUGUST 2001

PREPARED BY: *Andrew E Watson. M.Sc. M.I.O.A.*

PREPARED FOR: **STEPHEN R. NELSON.**
GILLESPIES, GLASGOW.

Partners: Andrew E Watson M.Sc. M.I.O.A. Fiona L. Watson
A Sponsor member of the Institute of Acoustics.

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1. INTRODUCTION.

BRIEF.

To carry out an assessment of impact of traffic noise from the A9 affecting the proposed residential site at Townhead, Auchterarder.

PROCEDURE

The report will be contain 3 sections as follows:

- Assessment of existing and future traffic noise from the A9.
- Measurement of the existing traffic noise from the A9.
- The noise impact from the A9 on the Townhead site.

At this stage, the noise values are those affecting the site area. The actual levels affecting the façade of the proposed houses can not be assessed until more detailed information is available regarding the type and layout of the houses.

DESCRIPTION OF TOWNHEAD SITE.

The site slopes steeply upwards from the A9 cutting. The nearest point is approx. 50m from the A9 stretching to 500m from the road. The area between the road and the site is a steep banking with some trees and undergrowth. (See sketch plan App Fig 1)

The higher parts of the site at 100m from the road are subject to noise from sections of the A9 to the East and West as well as the noise from the cutting. This means that the distance reduction from the road is not as high as expected.

Measurements were made at 3 locations throughout the site to assess the noise levels at different distances from the A9. The results are expressed as noise contours which can be used to determine the various parameters used in the report. (Map Page x)

2. ASSESSMENT OF EXISTING AND FUTURE TRAFFIC NOISE.

METHOD.

The assessment of traffic noise from the A9 was calculated in accordance with CRTN[1], and the results expressed as dB(A)18hour L10 levels. Hourly levels were calculated for the 24 hour period 12:00 -12:00 Wed-Thurs 2nd ,3rd, August 2000. for comparison with the measurement period of Wed-Thurs. 1st, 2nd, August 2001 (Appendix Tables 1/2)

The LA10 level is the noise exceeded for 10% of the measurement period and is used for traffic noise.

The traffic data was supplied by Dougall Baillie Associates from the ATC traffic flow measurements carried out by the SEDD from April 2000 to April 2001. The projected flows to 2016 show an increase of 31% based on NRTF high growth figures.

For planning purposes in Scotland PAN56 is used to place proposed dwellings in a Noise Exposure Category (NEC) and this uses different noise measurement criteria.

The NEC uses day time (07:00-23:00) and night time (23:00-07:00) data based on LAeq levels.

The LAeq level is the equivalent continuous sound pressure level measured over a specified time period and is equivalent to the total energy produced by the varying noise levels over the measurement period.

Summary of assessments. Levels at 10m from A9

LA10 18 hours. 75dB. LAeq 18 hours 73dB(A) By extrapolation.

Increase to 2016 35% Equal to plus 1.5dB on both levels.

1 CALCULATION OF ROAD TRAFFIC NOISE, DOT, 1988.

3. MEASUREMENTS OF EXISTING TRAFFIC NOISE.

The measurement method included a continuous survey of the noise at a base location from Wednesday 12:00 (01/08/01) to 12:00 on Thursday (02/08/01). The object of this measurement was to establish the hourly LAeq and LA10 levels from the A9 over a full 24 hour period. (Appendix Figures 2)

Sample measurements were made at 2 different locations and compared to the base levels to assess the noise levels throughout the site. Location A at 55m and Location C at 350m from the A9. (Appendix Figures 3/4)

Summary of measured levels.

	Loc.A 55m	Base 150m	Loc. C 350m.
LA10 18hours	61	58	54
Day LAeq	62	57	52
Night LAeq	55	50	45

4. NOISE IMPACT.

The site noise from A9 traffic varies with location and the levels reduce with distance from the road. The reduction is less than expected by theoretical calculation as the rising ground exposes higher parts of the site to noise from sections of the A9 to the East and West. The noise from these areas varies with wind direction and traffic flow.

CRTN Criteria. LA10 18 Hours. Levels vary between 61 and 54dB. This is below the 68dB LA10 level which is the trigger level for compensation under the Noise Insulation Regulations.

PAN56 Day LAeq levels vary between 62 and 52dB

Night LAeq levels between 55 and 45dB

This places all the site area in NEC Category B.

Category B is described as: *Noise should be taken into account when determining planning applications and where appropriate, conditions imposed to ensure an adequate level of protection.*

The projected increase in traffic flow to the year 2016 is 31%. This will increase noise levels by up to 1.5dB(A).

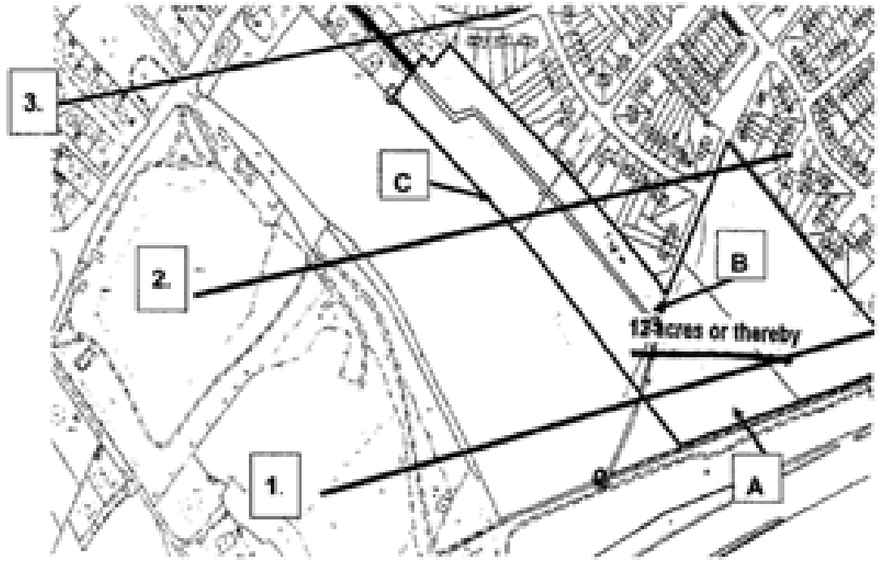
5. CONCLUSIONS.

The assessed and measured levels show that the site is not subjected to traffic noise levels which would preclude the proposed development.

The levels in the report refer to existing and projected site levels and there may be some variation in actual façade levels when the houses are built. There may be some increases if houses are close to the A9 and are multi storey. There will be decreases further from the road due to the screening effect of the intervening buildings.

As Category B of PAN 56 requires the houses to be adequately protected from noise, it will be necessary to take account of this in the final plans for the site layout.

TOWNHEAD SITE NOISE CONTOURS AND MEASUREMENT LOCATIONS



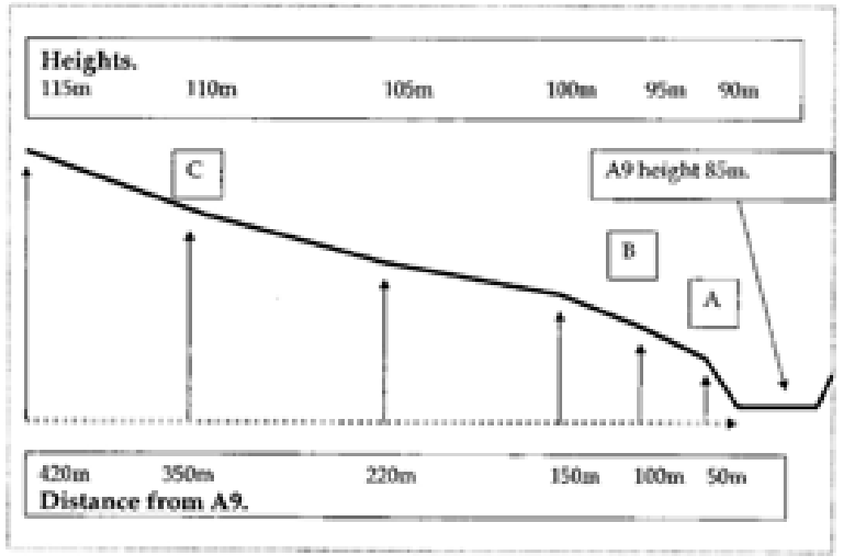
Blue Lines = Noise contours 1,2,& 3		A,B,& C = Measurement Locations.	
	18 Hr LA10	Day LAeq	Night LAeq
Line 1	60	60	53
Line 2	56	55	48
Line 3	52	50	43

TOWNHEAD, AUCHTERARDER. AUG 2001

APPENDIX 1. RESULTS.

1. DESCRIPTION OF TOWNHEAD SITE

FIG 1. SKETCH PLAN.



The site slopes steeply upwards from the A9 cutting. The nearest point is approx. 50m from the A9 stretching to 500m from the road. The area between the road and the site is a steep banking with some trees and undergrowth.

The higher parts of the site at 100m from the road are subject to noise from sections of the A9 to the East and West as well as the noise from the cutting. This means that the distance reduction from the road is not as high as expected.

The base measurement location for the 24 hour measurement was at Location B, m from the road. Sample measurements of 2 hourly periods were made at locations A and C . 55m and 350m. from the road.

TOWNHEAD, AUCHTERARDER. AUG 2001

2. ASSESSMENT OF A9 TRAFFIC NOISE.

The assessment of traffic noise from the A9 was calculated in accordance with CRTN and the results expressed as dB(A)18hour L10 levels. Hourly levels were calculated for the 24 hour period 12:00 -12:00 Wed-Thurs 2nd ,3rd, August 2000, for comparison with the measurement period of Wed-Thurs. 1st, 2nd, August 2001 (Appendix 1 Table x)

The traffic data was supplied by Dougall Baillie Assocs from the ATC traffic flow measurements carried out by the SEDD from April 2000 to April 2001

The projected flows to 2016 show a %age increase of 31% based on NRTF high growth figures.

The detailed calculations are shown in Tables 1-2 on the following pages.

3. MEASUREMENT OF A9 TRAFFIC NOISE.

Traffic noise was measured for 24 hours at base location B from 12:00 1/8/01 to 12:00 2/8/01 Sample measurements were carried out for 2 hours at locations A and C

Equipment

CEL 593 Type 1 Noise Analyser

2x CEL 460 Dataloggers.

CEL 284 Class 1 Calibrator.

All equipment was calibrated and used in accordance with the manufacturer's instructions and carried current calibration certificates from an approved laboratory
The detailed measurements are shown in Figures 2-4 on the following pages.

TABLE 1 LA10 Calculations from traffic flows. CRTN

M&RTH	LIGHT	HGV	FLOW	LOG	10LOG	k	L10dB
12:00 - 13:00	658	115	773	2.89	28.88	42.2	71.1
13:00 - 14:00	630	145	775	2.89	28.89	42.2	71.1
14:00 - 15:00	624	122	746	2.87	28.73	42.2	70.9
15:00 - 16:00	685	131	816	2.91	29.12	42.2	71.3
16:00 - 17:00	684	106	790	2.90	28.98	42.2	71.2
17:00 - 18:00	843	101	944	2.97	29.75	42.2	71.9
18:00 - 19:00	755	79	834	2.92	29.21	42.2	71.4
19:00 - 20:00	593	89	683	2.83	27.60	42.2	70.9
20:00 - 21:00	316	66	381	2.58	25.81	42.2	68.0
21:00 - 22:00	245	57	302	2.48	24.80	42.2	67.0
22:00 - 23:00	195	44	239	2.38	23.80	42.2	65.4
23:00 - 24:00	110	42	152	2.18	21.82	42.2	64.0
00:00 - 01:00	54	28	82	1.91	19.14	42.2	61.3
01:00 - 02:00	44	36	80	1.90	19.03	42.2	61.2
02:00 - 03:00	21	36	57	1.76	17.56	42.2	59.8
03:00 - 04:00	41	43	84	1.92	19.24	42.2	61.4
04:00 - 05:00	34	60	94	1.97	19.73	42.2	61.9
05:00 - 06:00	66	128	194	2.29	22.86	42.2	65.1
06:00 - 07:00	230	155	385	2.59	25.85	42.2	68.1
07:00 - 08:00	533	207	740	2.87	28.69	42.2	70.9
08:00 - 09:00	706	168	874	2.96	29.50	42.2	72.0
09:00 - 10:00	665	186	851	2.93	29.30	42.2	71.5
10:00 - 11:00	671	147	818	2.91	29.13	42.2	71.3
11:00 - 12:00	645	122	767	2.88	28.85	42.2	71.0

M&RTH	%HGV	VCALC	Plan 1	Sum	LOG	k	L10dB
12:00 - 13:00	14.88	0.797	1	1.7659	2.47	2.24	76
13:00 - 14:00	18.71	0.954	1	1.9544	2.93	2.24	76
14:00 - 15:00	16.35	0.843	1	1.8430	2.66	2.24	76
15:00 - 16:00	16.05	0.828	1	1.8273	2.62	2.24	76
16:00 - 17:00	13.42	0.692	1	1.6916	2.28	2.24	76
17:00 - 18:00	10.70	0.552	1	1.5515	1.91	2.24	76
18:00 - 19:00	9.47	0.488	1	1.4883	1.73	2.24	75
19:00 - 20:00	14.59	0.752	1	1.7523	2.44	2.24	76
20:00 - 21:00	17.32	0.893	1	1.8929	2.77	2.24	77
21:00 - 22:00	18.87	0.973	1	1.9729	2.95	2.24	77
22:00 - 23:00	21.25	1.095	1	2.0352	3.19	2.24	78
23:00 - 24:00	27.63	1.424	1	2.4043	3.85	2.24	80
00:00 - 01:00	34.15	1.760	1	2.7601	4.41	2.24	82
01:00 - 02:00	45.00	2.320	1	3.3196	5.21	2.24	85
02:00 - 03:00	63.16	3.256	1	4.2556	6.29	2.24	88
03:00 - 04:00	51.19	2.639	1	3.6387	5.61	2.24	86
04:00 - 05:00	63.83	3.290	1	4.2952	6.32	2.24	88
05:00 - 06:00	65.98	3.401	1	4.4010	6.44	2.24	89
06:00 - 07:00	40.26	2.075	1	3.0752	4.66	2.24	85
07:00 - 08:00	27.97	1.442	1	2.4419	3.88	2.24	83
08:00 - 09:00	19.71	1.016	1	2.0158	3.04	2.24	81
09:00 - 10:00	21.86	1.127	1	2.1256	3.28	2.24	81
10:00 - 11:00	17.97	0.926	1	1.9263	2.85	2.24	80
11:00 - 12:00	15.91	0.820	1	1.8199	2.60	2.24	79

SOUTH	LIGHT	HGV	FLOW	LOG	10LOG	k	L10dB	%HGV	VCALC	Plus 1	Sum	LOG	k	L10dB
12:00 - 13:	604	149	753	2.88	28.77	42.2	71.0	19.79	1.020	1	2.0200	3.05	2.24	76
13:00 - 14:	619	175	794	2.90	29.00	42.2	71.2	22.04	1.136	1	2.1361	3.30	2.24	77
14:00 - 15:	668	178	846	2.93	29.27	42.2	71.5	21.04	1.085	1	2.0845	3.19	2.24	77
15:00 - 16:	706	209	915	2.96	29.61	42.2	71.8	22.84	1.177	1	2.1774	3.38	2.24	77
16:00 - 17:	816	171	987	2.99	29.94	42.2	72.1	17.33	0.893	1	1.8931	2.77	2.24	77
17:00 - 18:	925	136	1061	3.03	30.26	42.2	72.5	12.82	0.661	1	1.6607	2.20	2.24	77
18:00 - 19:	626	128	754	2.88	28.77	42.2	71.0	16.98	0.875	1	1.8751	2.73	2.24	76
19:00 - 20:	441	93	534	2.73	27.28	42.2	69.5	17.42	0.898	1	1.8977	2.78	2.24	74
20:00 - 21:	316	87	403	2.61	26.05	42.2	68.3	21.59	1.113	1	2.1128	3.25	2.24	74
21:00 - 22:	213	64	277	2.44	24.42	42.2	66.6	23.10	1.191	1	2.1910	3.41	2.24	72
22:00 - 23:	143	47	190	2.28	22.79	42.2	65.0	24.74	1.275	1	2.2751	3.57	2.24	71
23:00 - 24:	89	32	121	2.08	20.83	42.2	63.0	26.45	1.363	1	2.3632	3.74	2.24	69
00:00 - 01:	51	39	90	1.95	19.54	42.2	61.7	43.33	2.234	1	3.2337	5.10	2.24	69
01:00 - 02:	21	17	38	1.58	15.80	42.2	58.0	44.74	2.306	1	3.3060	5.19	2.24	68
02:00 - 03:	17	29	46	1.66	16.63	42.2	58.8	63.04	3.250	1	4.2497	6.28	2.24	67
03:00 - 04:	20	23	43	1.63	16.33	42.2	58.5	53.49	2.757	1	3.7571	5.75	2.24	67
04:00 - 05:	40	41	81	1.91	19.08	42.2	61.3	50.62	2.609	1	3.6091	5.57	2.24	69
05:00 - 06:	57	53	110	2.04	20.41	42.2	62.6	48.18	2.484	1	3.4836	5.42	2.24	70
06:00 - 07:	185	71	256	2.41	24.08	42.2	66.3	27.73	1.430	1	2.4296	3.86	2.24	72
07:00 - 08:	487	82	569	2.76	27.55	42.2	69.8	14.41	0.743	1	1.7428	2.41	2.24	74
08:00 - 09:	681	93	774	2.89	28.89	42.2	71.1	12.02	0.619	1	1.6194	2.09	2.24	75
09:00 - 10:	559	122	681	2.83	28.33	42.2	70.5	17.91	0.923	1	1.9234	2.84	2.24	76
10:00 - 11:	617	135	752	2.88	28.76	42.2	71.0	17.95	0.925	1	1.9254	2.85	2.24	76
11:00 - 12:	648	146	794	2.90	29.00	42.2	71.2	18.39	0.948	1	1.9478	2.90	2.24	76

TABLE 2 South Lane Calculations for LA10 levels from traffic flow. CRTN

	L10	L10	L10	Diff S	Diff N		Leq	Leq	Leq	L10	Leq	Leq	L10
TIME	Ass N	Ass S	M base				Mbase	M Loc A	Calc A	Calc A	M Loc C	Calc C	Calc C
12:00 - 13:00	76	76	58	18	18		55		58	61		61	64
13:00 - 14:00	76	77	59	18	17		57		59	62		62	65
14:00 - 15:00	76	77	61	16	15		59		61	64		64	67
15:00 - 16:00	76	77	62	16	15		59		61	64		64	67
16:00 - 17:00	76	77	62	16	14		59		61	64		64	67
17:00 - 18:00	76	77	62	15	14		60		62	65		65	68
18:00 - 19:00	75	76	60	16	16		57		59	62		62	65
19:00 - 20:00	75	74	58	16	17		56		58	61		61	64
20:00 - 21:00	73	74	58	18	17		53		55	58		48	51
21:00 - 22:00	72	72	54	19	19		52		54	57		47	50
22:00 - 23:00	71	71	55	16	16		52		54	57		47	50
23:00 - 24:00	70	69	54	15	16		51		53	56		46	49
00:00 - 01:00	68	69	51	18	17		48		50	53		43	46
01:00 - 02:00	69	66	53	13	16		50		52	55		45	48
02:00 - 03:00	68	67	53	15	16		49		51	54		44	47
03:00 - 04:00	69	67	51	16	18		48		50	53		43	46
04:00 - 05:00	70	69	53	17	18		49		51	54		44	47
05:00 - 06:00	74	70	54	17	20		51		53	56		46	49
06:00 - 07:00	75	72	55	18	21		53		55	58		48	51
07:00 - 08:00	77	74	53	21	24		52		54	57	47		50
08:00 - 09:00	77	75	54	22	24		52		54	57	47		50
09:00 - 10:00	77	76	65	10	12	TRACTOR	62		57	60		50	53
10:00 - 11:00	76	76	60	16	16	RAIN	58	60		63		53	56
11:00 - 12:00	76	76	62	14	14	RAIN	60	60		63		55	58
			BASE			TRACTOR NOISE				LOC A			LOC C
			349			READ VALUE 55				357			318
			699							732			648
			1047							1089			993
	18 Hour LA10		**68**							**61**			**64**
	DAY (Aeq)						57		63			62	
	NIGHT (Aeq						50		55			48	

L10 Assessed levels North and South flow. M base measured levels at B. Leq M base measured levels at base M Loc A /C measured at A and C.

TABLE 3 Calculations for LA10 18 hour and LAeq levels.

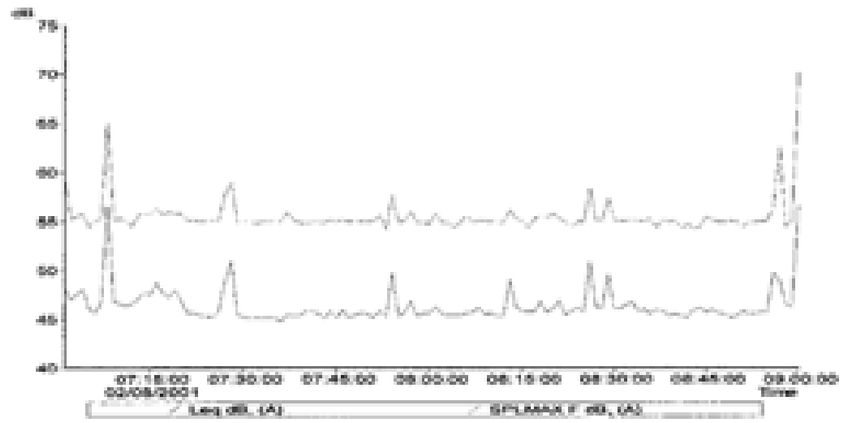
FIG.3

HOURLY LEVELS.

BASE DATA LOCATION B

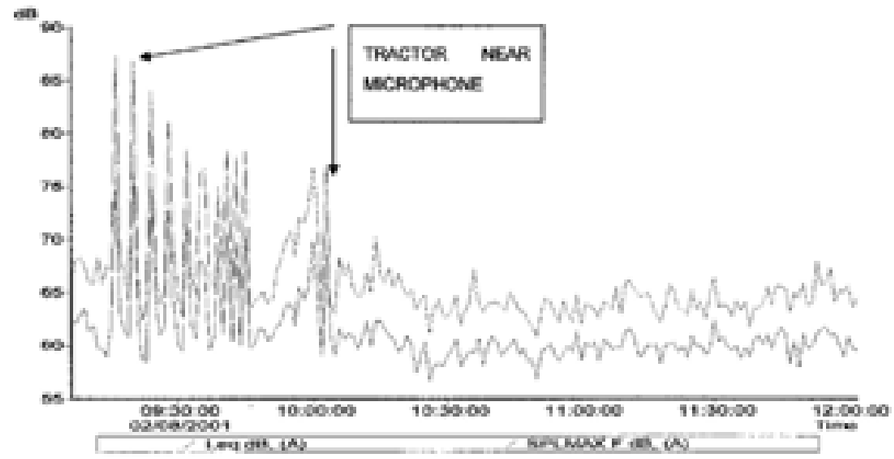
		24 HOUR LAeq LEVELS.	24 HOUR LA10 LEVELS	
		LAeq	LA10	
1	01/08/2001 12:00:00	56.1	58.0	
2	01/08/2001 13:00:00	56.7	59.0	
3	01/08/2001 14:00:00	59.2	61.0	
4	01/08/2001 15:00:00	59.2	61.5	
5	01/08/2001 16:00:00	59.4	61.5	
6	01/08/2001 17:00:00	59.9	62.0	
7	01/08/2001 18:00:00	57.1	59.5	
8	01/08/2001 19:00:00	55.9	58.0	
9	01/08/2001 20:00:00	53.3	56.0	
10	01/08/2001 21:00:00	52.1	53.5	
11	01/08/2001 22:00:00	52.3	54.5	
12	01/08/2001 23:00:00	51.0	54.0	
13	02/08/2001 00:00:00	48.0	51.0	
14	02/08/2001 01:00:00	49.6	52.5	
15	02/08/2001 02:00:00	49.1	52.3	
16	02/08/2001 03:00:00	48.1	51.0	
17	02/08/2001 04:00:00	49.4	52.5	
18	02/08/2001 05:00:00	51.3	53.5	
19	02/08/2001 06:00:00	52.8	54.5	
20	02/08/2001 07:00:00	51.5	53.0	
21	02/08/2001 08:00:00	51.7	53.5	TRACTOR NEAR MIC.
22	02/08/2001 09:00:00	62.4	65.5	
23	02/08/2001 10:00:00	58.3	60.0	
24	02/08/2001 11:00:00	59.6	62.0	

FIG 3 ONE MINUTE LAeq and LAMax LEVELS LOCATION C.



Hourly LAeq at C 07-08 47dB 08-09 47dB.

FIG 4 ONE MINUTE LAeq and LAMax LEVELS LOCATION A.



Hourly LAeq at A 10-11 69dB 11-12 69dB