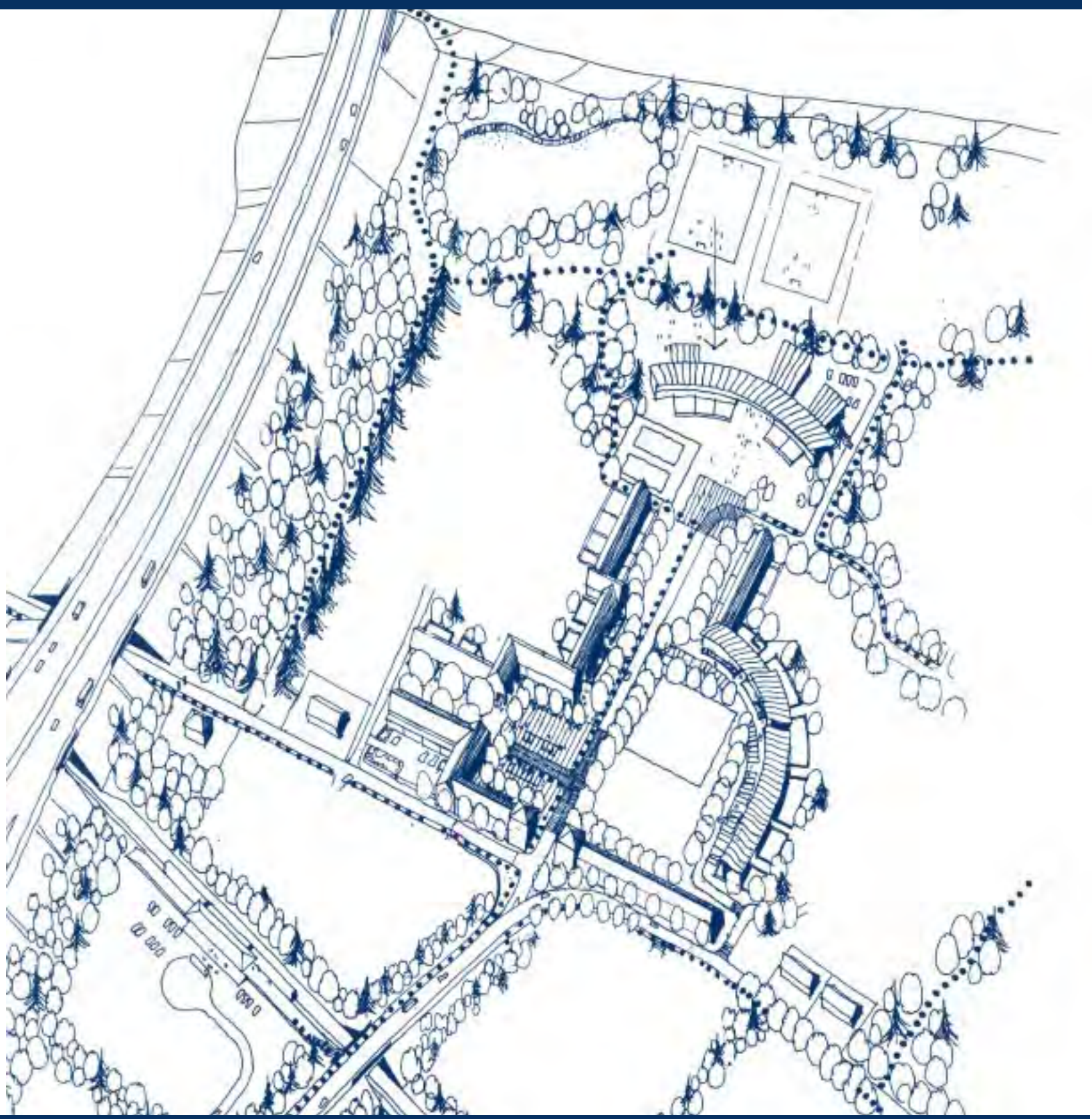
Oudenarde Masterplan and Design Principles



Final Report
May 2001

G.S. Brown Construction and Wimpey Homes

Outline Planning Application

Oudenarde Masterplan and Design Principles

Final Report

Prepared by

GILLESPIES

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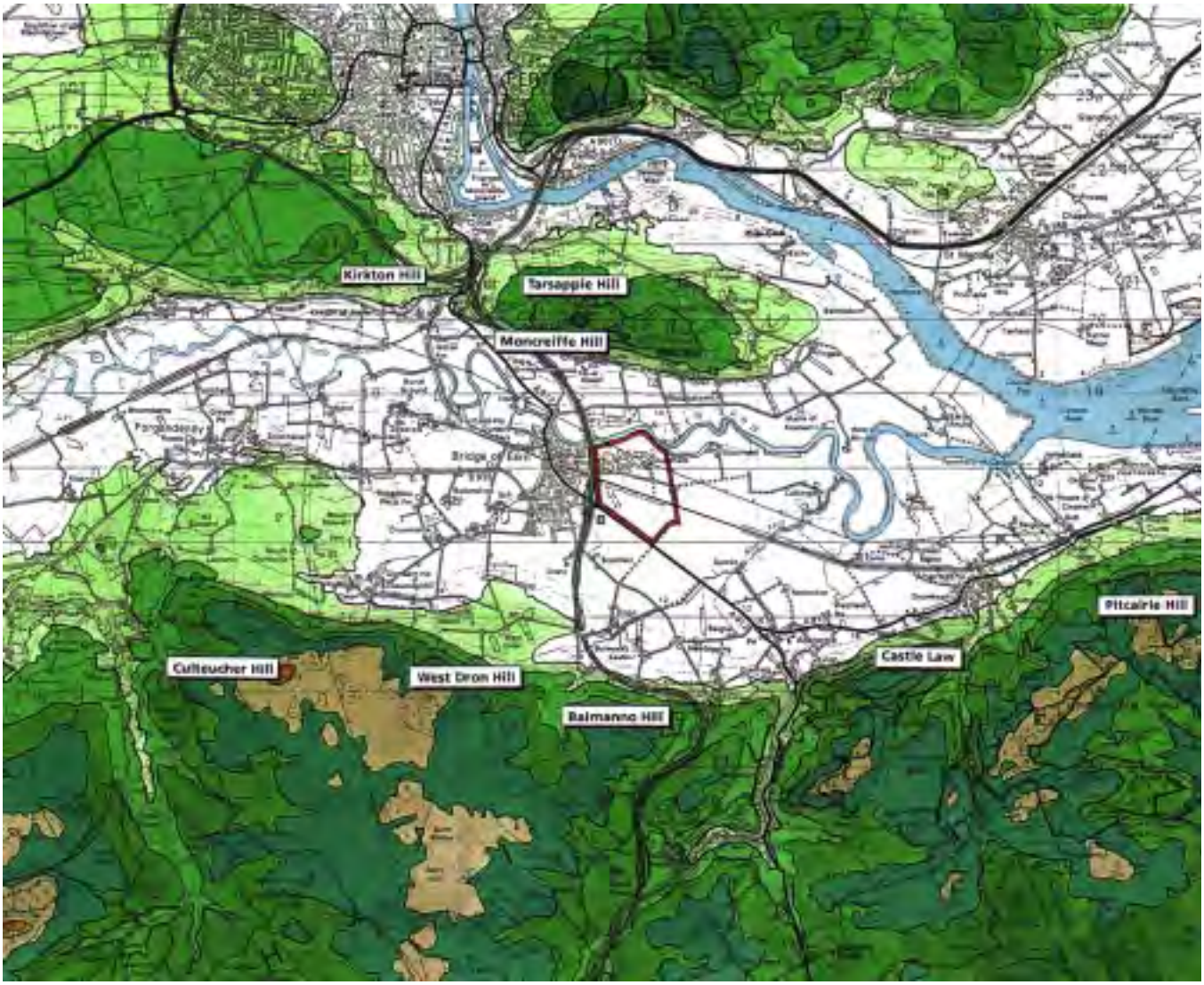

Figure 1 Site Location

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1.0 Introduction

1.1 Site Description

The proposed development site for Oudenarde is located approximately eight (8) kilometres south of the centre of Perth, and is shown in Figure 1. The site lies to the east of the M90, which links Edinburgh and Perth, and is bordered along its southern boundary by the A912, which links Bridge of Earn to Abernethy and Fife. The site sits within a broad river valley, which is bounded by the Moncreiffe and Kirkton Hills to the north and the Ochil Hills to the south. The River Earn is situated along the site's northern edge, three kilometres from its confluence with the River Tay to the east. Agricultural fields flank the land to the east. The site is predominantly flat. The gross site area is 122 hectares.

Clayton Road extends under the M90 from the Bridge of Earn and passes through the site, to farmsteadings to the east. The former Oudenarde Hospital, which was closed in 1993, is situated to the north of this road. The railway line from Edinburgh to Perth via Fife passes through the site, and divides it into two distinct areas.

Based on the past agricultural uses of the land, there is limited existing vegetation on the site. An avenue of mature trees is located along Clayton Road. A mature row of trees exists between the hospital and M90, and random trees are located throughout the hospital site, particularly along the northern edge of the developed land. The landowner has funded the planting of woodland stock at the base of the motorway embankment in the north-west corner of the site, which has now successfully established. He has also implemented extensive woodland planting alongside the A912 and part of the railway line.

A high voltage electricity line (132kV) supported on pylons runs across the north-eastern part of the site. Two pipelines (Shell UK Pipeline (gas) and BP Line (oil)) run underground along the south-eastern boundary.

1.2 History of Development Proposals

In 1996, a review of housing land in the Perth area was undertaken, in order to bring the housing land allocations in the Local Plan in line with the approved Tayside Structure Plan 1993 (Approved March 1997). A need for substantial new housing allocation was realised. Oudenarde was the preferred site for the new settlement and was chosen to be promoted in an alteration to the Local Plan.

Perth and Kinross Council was supportive of Oudenarde's inclusion in the Perth Area Local Plan Alteration at a Public Local Plan Inquiry held in June 1999. The Reporter concluded that, if the Council were satisfied that the new settlement was compatible with the Structure Plan, then Oudenarde was the best of the sites considered at the Inquiry.

G.S. Brown Construction have commissioned Gillespies to develop a Masterplan for Oudenarde, which incorporates residential development; business and retail use (Petrol Filling Station and Travelodge), a single stream primary school, a community facility, and land for a 'Park and Ride' and rail halt.

A number of background surveys were previously undertaken to prepare for the Public Inquiry, including a Landscape and Visual Assessment which was undertaken by Gillespies in March 1999, and an Ecological Assessment and a Traffic Impact Assessment by the TA Millard Partnership. These reports have been utilised to inform the masterplan, which has been developed by the 'development team' of G.S. Brown, Wimpey Homes and their consultants, in close association with the Perth and Kinross Council.

This report has been prepared to support the Masterplan in its submission to the Perth and Kinross Council for the Outline Planning Application.

1.3 Site Analysis/ Opportunities and Constraints

The constraints and opportunities for the site have been illustrated in Figure 2. The site at Oudenarde presents an opportunity to develop a comprehensively designed new sustainable settlement. A sustainable settlement is one that embraces and promotes principles that meet the needs of the present generation while ensuring that the needs of future generations can be met. Sustainable development seeks to protect the environment, use natural materials where appropriate, and achieve inclusive social development. The site is located adjacent to the M90 motorway and the A912 trunk road, providing good and easy access to major town and business centres, and thus making the site attractive for business and residential use. The site is situated within a broad river valley, so views from the site are extensive; toward Moncreiffe Hill to the north, the Ochil Hills to the south and across agricultural fields to the east. Views to the west are largely limited by the embankments of the M90. The site is located adjacent to the river, and the siting, layout and design of residential

development to the north of the site should take advantage of the riverside location. The area between the river's edge and the edge of the development is to be positively utilised for public open space, with the potential for links to external pedestrian and cycle networks to the open countryside.

The M90 is elevated along the site's western edge, and serves to visually and physically divide the village of Bridge of Earn and the proposed Oudenarde settlement. A noise survey has been undertaken during peak periods of traffic along the M90 and A912 and these results confirm that the noise from these roads is of an acceptable level as to not unduly affect residential development. The noise survey report will be submitted as part of the outline planning application.

Woodland planting has already been established along the embankments of the motorway supplemented by additional planting carried out by the developer, and shelterbelts are to be introduced along the western and southern edges of the site. Access to the site from the A912 is proposed at two locations via new roundabouts.

The Oudenarde Hospital is to be demolished, but the existing farm properties on the site are to be retained and integrated into the design of the settlement. Potential exists in the long term to convert these buildings for housing or other associated uses. The existing overhead 132kV power line is to be re-routed along the northern boundary of the site along the river's edge, to avoid the future residential areas to the south.

Clayton Road is to be retained as a spine road through the northern part of the site. However, it will not remain as a vehicular through route to Bridge of Earn, because of a low bridge, poor horizontal geometry and potential constraints on the existing road network. However, the road is to be utilised as a pedestrian and cycle link between Oudenarde and Bridge of Earn, and emergency vehicle access will be possible. It is intended that as many of the mature avenue of trees and hedgerows along this road are to be retained and integrated into the design of the road corridor.

The Perth to Edinburgh railway line which runs through the site, promotes the possible future introduction of a rail halt, which will facilitate alternative transport links to Perth and Edinburgh. However, the railway line divides the site and has been identified as a major constraint. It requires to be crossed at one location to allow access to the northern part of the site and a wayleave for this bridge crossing has been agreed in principle with Railtrack. A number of existing agricultural crossings are to be closed. Screening is required between the railway line and residential properties, to visually and physically separate the two uses.

The petro-chemical lines (Shell UK Pipeline (gas) and BP Line (oil)) which run underground along the south eastern boundary of the site are recognised as a constraint to development. Negotiations are underway with the Health and Safety Executive to determine precisely the restrictions on residential and business development in proximity to the pipelines. The outcomes of these negotiations are discussed in the relevant sections of the report.

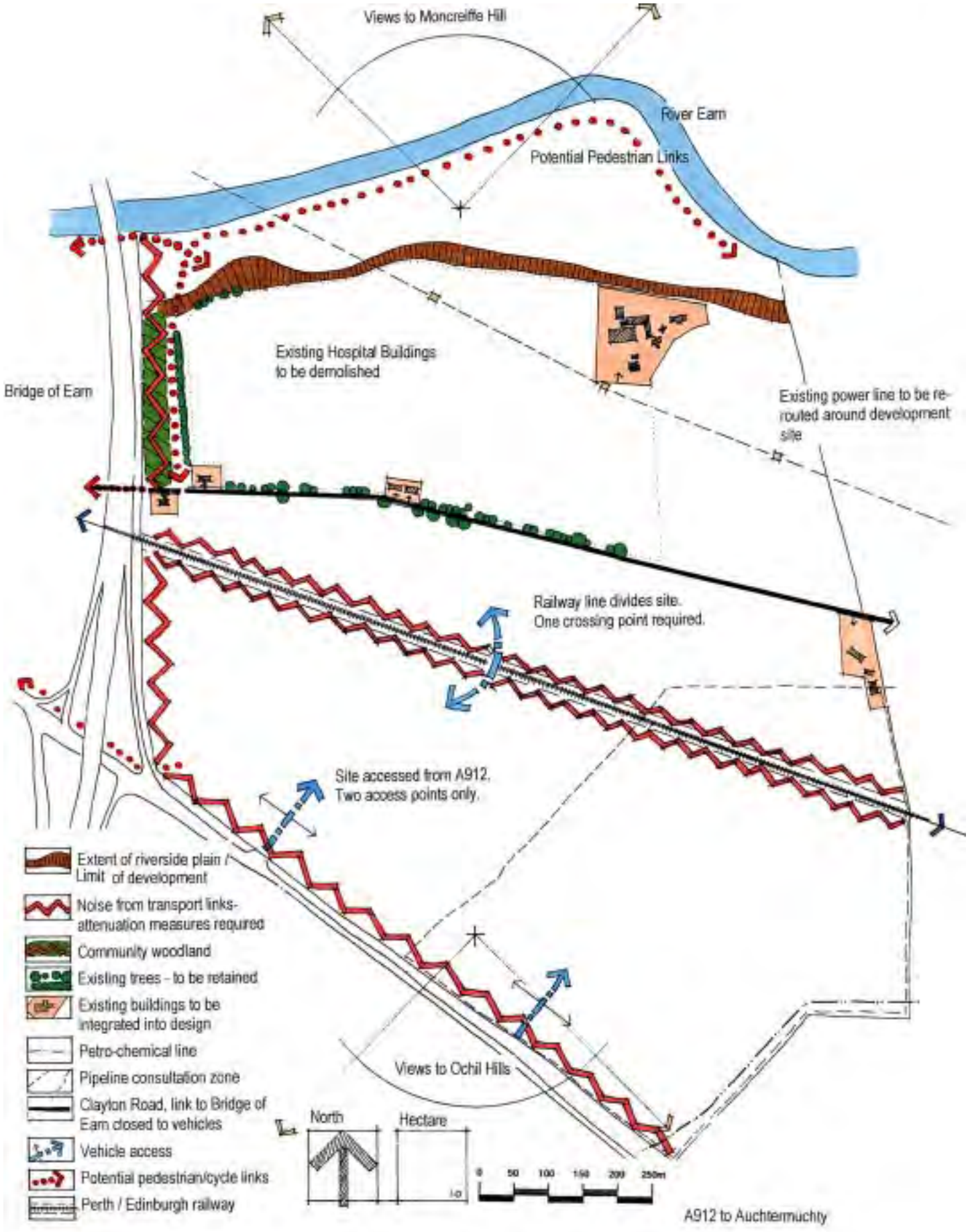

Figure 2 Opportunities & Constraints

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2.0 Objectives of Masterplan

The Masterplan has been developed in line with the following objectives, which have been derived from relevant planning documents, consultation with the Perth and Kinross Council, and direction from the development team. The Planning Advice notes (PAN 44, 46, 52 and 57) and the National Planning Policy Guidelines (NPPG 17, and NPPG 3) were utilised.

The settlement of Oudenarde is to:

- Respond to the principles of PAN 57 and NPPG 17, by providing a rational, legible and safe road system that promotes ease of traffic movement and allows good access to jobs and facilities. In addition, the settlement is to promote alternative transport modes by providing an effective, safe and interconnecting network for pedestrians, cyclists and public transport. (PAN 57 & NPPG 17-Transport and Planning)
- Embrace the principles of PAN 52, which promote the recognition and maintenance of the character of small Scottish towns (PAN 52-Planning in Small Towns);
- Incorporate a recognisable, vital and viable settlement core, which captures and promotes the local identity of the community, and provides a mix of retail and community uses to adequately service the local community (PAN 52-Planning in Small Towns);
- Respond to the principles of PAN 44, such as structure and hierarchy, scale and density, and height and massing to develop a traditional physical village structure (PAN 44- Fitting New Housing Development into the Landscape);
- Integrate the principles of NPPG 3, in the siting and design of the new settlement, and achieve within a balanced range of densities, tenures, and housing types to create a broad range of housing opportunities to accommodate a rich and varied social mix (NPPG 3 (Revised 1996)-Land for Housing);
- Be integrated into the surrounding landscape by introducing a strong landscape framework that recognises and reinforces existing landscape patterns (PAN 44- Fitting New Housing Development into the Landscape);
- Integrate separate and identifiable neighbourhoods into a cohesive whole to contribute to the village identity of Oudenarde;
- Utilise environmental design principles to maximise crime prevention in line with PAN 46 (Planning for Crime Prevention);
- Demonstrate a commitment to the principles of sustainability, and promote innovative design, sensitive siting of buildings and improved standards of layout to achieve a sustainable settlement.

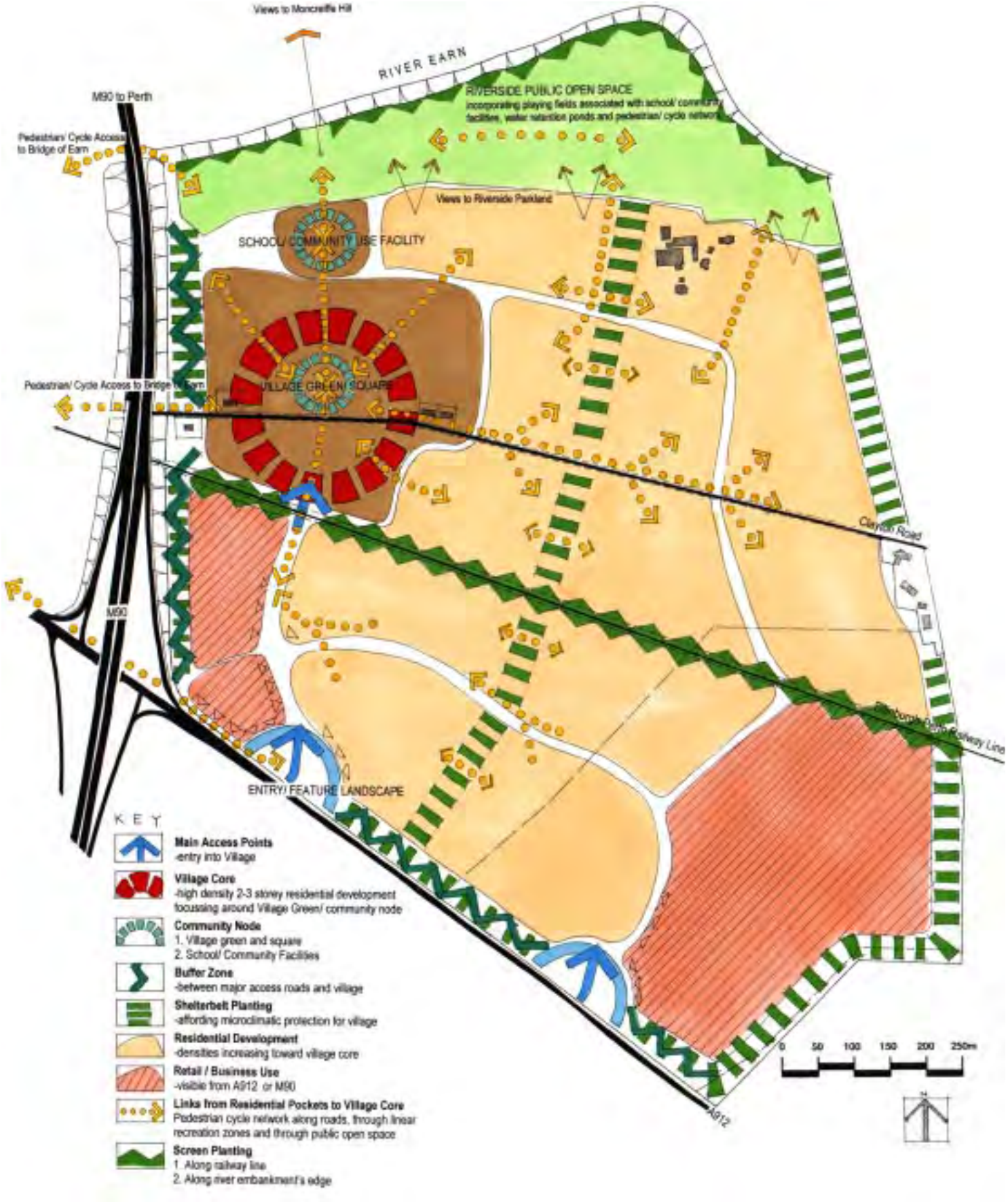

Figure 3 Concept Masterplan

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3.0 Concept

A concept for the Masterplan has been developed, in response to a comprehensive brief from the development team and the Council, and from identification of the opportunities and constraints of the site (refer to Figure 3).
One of the key issues in the creation of a settlement of this size is the identification of a recognisable core or 'heart'. This is the location within the settlement which will act as a focus for community activities and incorporate and engender a 'sense of place'. The core should be the locus for modest retailing, with potential for the inclusion of personal services and health and social care facilities, to service the needs of the local community. The core should also be the area of greatest density in terms of built development. Opportunities for the inclusion of a small public square and 'village green' for social community activities should be an integral part of the core. The concept plan indicates the core to the north of Clayton Road. The sweep of the distributor road after crossing the railway line allows traffic to bypass the centre in the construction phase. The village centre also lies in close proximity to the proposed location for the rail halt which will contribute in the long term to the vitality of this central core.

The primary school and associated community facility are integral to the concept of a 'heart' to the community and should be located in close proximity. The school will generate vibrancy and activity and will provide a focus for community activities in the evenings and at weekends. The link between the school and the village centre is to be strong in both physical and visual terms. A wide avenue is to be introduced along the residential core road, with the school terminating the axis.

The concept illustrates the structural landscape framework into which the settlement is to 'fit'. The definition of the boundaries with shelterbelt planting reflects the character of the surrounding field patterns, and will serve to integrate the settlement into its landscape, as well as providing microclimatic shelter within the settlement (refer to Section 4.75-Shelterbelts). The location of planting is also to reflect the historic landscape patterns, drawn from historic maps of the area (Refer to Figure 4, Ordnance Survey Map 1866). A broad band of generally uniform width shelterbelt planting existed along the eastern edge of the site and is to be reinstated to assist in the microclimatic protection for the settlement. The thicker band which runs east-west from this linear belt and the block of planting to the south of the railway line will not be incorporated. However, the lines of trees which flanked the farm access roads will be retained and reinforced and some planting is to be introduced to respond to the original field boundaries. Along the western and southern edges, the natural woodland planting will serve to screen the roads from the development areas; introducing a physical separation that will ameliorate the visual impact of passing traffic.

The concept plan divides the site into broad areas of development. To the south of the railway line, retail and business uses are located adjacent to the motorway and A912, to allow easy access and visibility from these transport routes (refer to Section 4.5-Retail; Section 4.6-Business). The main entry road separates the residential and business/retail uses to the south of the railway, and the retail uses introduce a physical buffer between the motorway and the 'neighbourhoods'. Two roundabouts on the A912 provide access to the development at which entry feature landscapes are to be introduced. Business uses are to be located in the south western corner of the site. This area is to be accessed from the eastern roundabout along the A912. The remainder of the land south of the railway is to be utilised for residential use (refer to Section 4.3-Residential use).

The main entry road crosses the railway line to the west of the site, promoting easy access between the business uses, the rail halt and the residential neighbourhoods to the south of the railway, and the village centre. The location of the bridge allows development to occur in stages; initially adjacent to the motorway and Bridge of Earn, expanding to the east as the settlement grows.
The pedestrian and cycle network is to radiate from the village core, and link each of the development 'pockets' to the community facilities and areas of public open space. In addition, external links are to be made to the village of Bridge of Earn to the west; the riverside areas to the north and along the A912 to the east (refer to Section 4.91-Pedestrian and Cycle Network).

The residential densities are to vary throughout the development to promote a traditional physical village structure. Densities are to be higher in the core, and decrease toward the periphery of the site (refer to Section 4.31-Residential Densities).

Figure 4 Historic Landscape

The lower land adjacent to the River Earn is to be utilised for Public Open Space, and is to incorporate playing fields, associated with the school and community, and pedestrian and cycle paths. A surface treatment and attenuation pond will be integrated into the design of the riverside area in order to add amenity, and to hold and filter the runoff from the settlement prior to its entry to the River Earn. It is envisaged that the pond will be a feature of the riverside area, developed into a wetland and nature area which will link into the wildlife corridor along the river (refer to Section 4.7 - Public Open Space).

3.1 Towards a Sustainable Settlement

In summary, the following principles of sustainability informed the development of the concept and the masterplan for the settlement at Oudenarde.

- The overall layout of the settlement is to promote the reduction of car use, by placing key components within the village (i.e. village centre, school) in walking distance from the residential neighbourhoods. Pedestrian and cycle routes are to be integrated to link all neighbourhoods to these areas and the public open space. External links from the settlement to nearby local towns are to be facilitated by public transport provision (i.e. park and ride, potential Rail Halt).
- Necessary facilities/services are to be provided within the settlement or are to be easily accessed in neighbouring centres.
- The microclimate of the settlement is to be moderated by the introduction of shelterbelt planting along strategic boundaries, which will assist in the integration of the settlement into the landscape by reflecting historic landscape patterns, as well as providing wildlife corridors which will increase the ecological biodiversity of the site.
- The site is to be drained using best practice methods which respond to the constraints of the existing soil conditions and protect the water quality of the River Earn.
- Where possible, buildings are to be orientated and designed to exploit the available sun and achieve protection from wind, in order to increase their energy efficiency and develop a positive microclimate.

Figure 5 Masterplan

4.0 Description of Masterplan

This section gives a brief description of the masterplan proposals, outlining the key development components that combine to create a coherent settlement plan. The Masterplan is illustrated in Figure 5.

4.1 Access and traffic movement

The site is located to the east of the M90, between the A912 and the River Earn. The M90, which links Perth to Edinburgh is constructed on an embankment along the western boundary, and is elevated above the general level of the site. Access is limited to the A912, which is currently linked via slip roads to the M90. Two roundabouts are to be introduced at the intersection of these slip roads and the A912, to facilitate traffic movement to Bridge of Earn to the west and the Oudenarde site to the east. Modest traffic calming measures will be introduced in the main street of Bridge of Earn in order to reduce traffic speeds through the village and improve safety for pedestrians. It is proposed that 'village gate' features are introduced on the A912 to signal entry into Bridge of Earn, and a mini roundabout be incorporated at the junction of Main Street and Station Road (refer to Traffic Impact Assessment).

4.11 Road Hierarchy

Two points of access into the site have been located along the A912 in the form of roundabouts which are required in order to facilitate traffic movement, while maintaining existing flows of traffic along the A912. The introduction of the roundabouts is to be staged. The first will feed a Traffic Distributor Road, which allows access to the retail units and the residential development areas to the south of the railway line in the early stages of development. As the settlement is expanded, the Traffic Distributor Road will provide access into the residential areas to the north of the railway via a proposed new bridge.

The second roundabout is located further to the east, and will be introduced once the business uses allocated in the south-western part of the site area are realised, and when the remainder of residential areas to the south of the railway are developed. This second route into the site will be to Industrial Core Road standards to give access to the business park, decreasing in its status to a Residential Core Road as it passes through the residential areas. The Residential Core Road will link back into the Traffic Distributor Road by means of a roundabout. The specification for these roads will be in accordance with the Perth and Kinross Council Road's Guide (1999).

The Perth- Edinburgh Railway runs east west through the site, dividing it into two distinct areas. A proposed bridge crossing over the railway is located in the western half of the site, giving direct access between the first roundabout on the A912 and the proposed settlement core to the north of Clayton Road. The bridge is to be designed to Traffic Distributor Road standards with adequate pedestrian and cycle path provision. It is to be approximately 12.1 metres in width, rising at a gradient of 1:20, to a height of 6.1 metres above the railway line (4.3 metre clearance is required for trains). Due to its elevation within a very flat site, the bridge will become a significant feature within the urban form, and will heighten the sense of arrival into the village centre (refer to Section 4.2-Village Centre).

Spatial provision has been made in the masterplan to allow the possible construction of a pedestrian footbridge over the railway towards the eastern half of the site. The requirement for a footbridge will be assessed as the development progresses over the next 10 – 15 years. In early discussions with Railtrack on this matter they have indicated concerns over isolated pedestrian footbridges particularly with regards to operational safety of the line. Detailed negotiations will be required nearer the time to resolve these issues with them.

Clayton Road which currently links Bridge of Earn to farms to the east is to be retained and upgraded to Residential Core Road standards, allowing access to the residential development areas to its north and south. The proposed distributor road which passes over the railway line is to sweep away from the village centre to align with Clayton Road, to encourage the majority of through traffic away from the core.

A separate road heads north from the distributor road through the village centre toward the school. Both Clayton Road and the road which accesses the village centre will be reduced in standard to a Residential Core Road. This will have the effect of reducing the scale of the road in the residential areas, in doing so slowing the traffic speeds. All Residential Core Roads are designed to accommodate bus movement, to allow the provision of a public transport network throughout the settlement (refer to Section 4.92-Public Transport).

Clayton Road will be closed to vehicular traffic to Bridge of Earn, once access over the bridge is provided. However, it is intended that the road will continue to function as a pedestrian and cycle link to Bridge of Earn, and access for emergency vehicles will be retained. The road hierarchy is illustrated in further detail in Appendix 4 (Road Options).

4.12 Road Corridor

The road corridor of the Traffic Distributor Road and the Residential Core Roads is to be, on average, twenty (20) metres in width, to accommodate the carriageway, services, footways, street trees and landscaping. It is recognised that the mature trees along Clayton Road make a valuable contribution to the existing landscape of the area. The trees will only be removed as part of the road upgrading where absolutely necessary and every effort will be made to create road design solutions which will enable the maximum number of trees to be retained. Options for carriageway narrowing, splitting the carriageway and localised diversion will be considered at the detail design stages, but will all be subject to approval from the roads authority. Detailed condition surveys of the trees will be undertaken to establish their health and potential longevity.

The landscape treatment within these road corridors can be adapted to reinforce the road hierarchy and is integral to the creation of the village character of the settlement. Options for landscaping within the road corridors is illustrated in the Design Principles: Structure Planting.

4.13 Traffic Calming

The residential development areas (referred to as neighbourhoods) are accessed off the Residential Core Road, which has junctions located at close intervals (minimum 25m) in order to slow the traffic through the neighbourhoods. In order to slow the traffic further, additional traffic calming will be employed, including:

- Introducing tight curves into the horizontal geometry, avoiding long straight sections of road,
- dividing the carriageways,
- introducing mini roundabouts,
- implementing landscaping, to emphasise the enclosure of streets,
- reducing the width of carriageway in certain sections,
- changing the surface treatment to the road.

An indicative plan incorporating these design concepts for traffic calming is included in Figure 6. The axonometric sketches (Figure 7 to 9) illustrate how the urban fabric may respond to the changes in road alignment, to develop a 'sequence of events' along the journey through the settlement. These and the traffic calming concepts contained within the Perth and Kinross Council 'Roads Development Guide' will be further explored at detailed design stage.

In addition, the concept of 'play street' may be considered at selected locations within the neighbourhoods. Traditional traffic calming methods such as speed bumps are to be avoided.

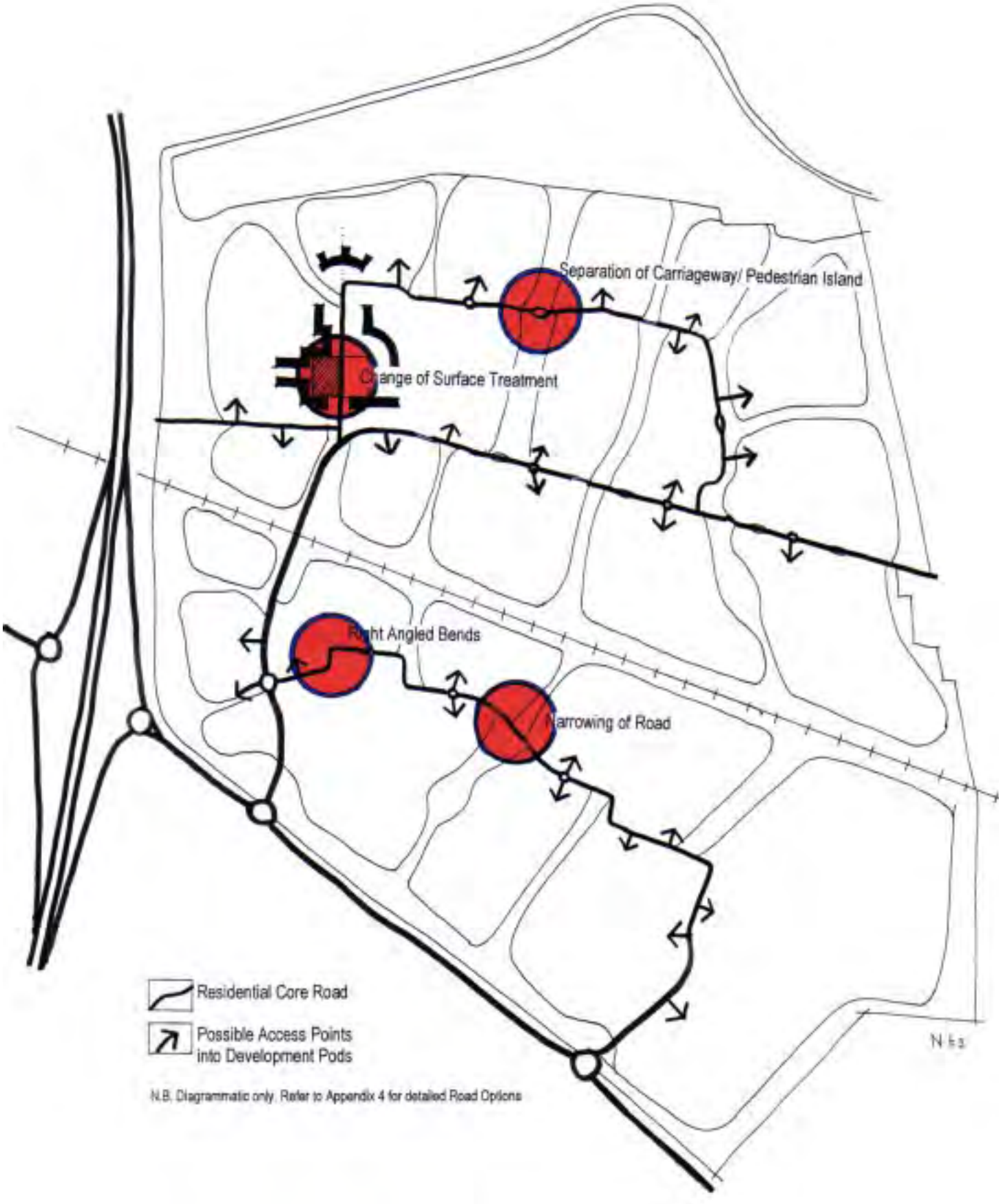

Figure 6 Concept: Traffic Calming

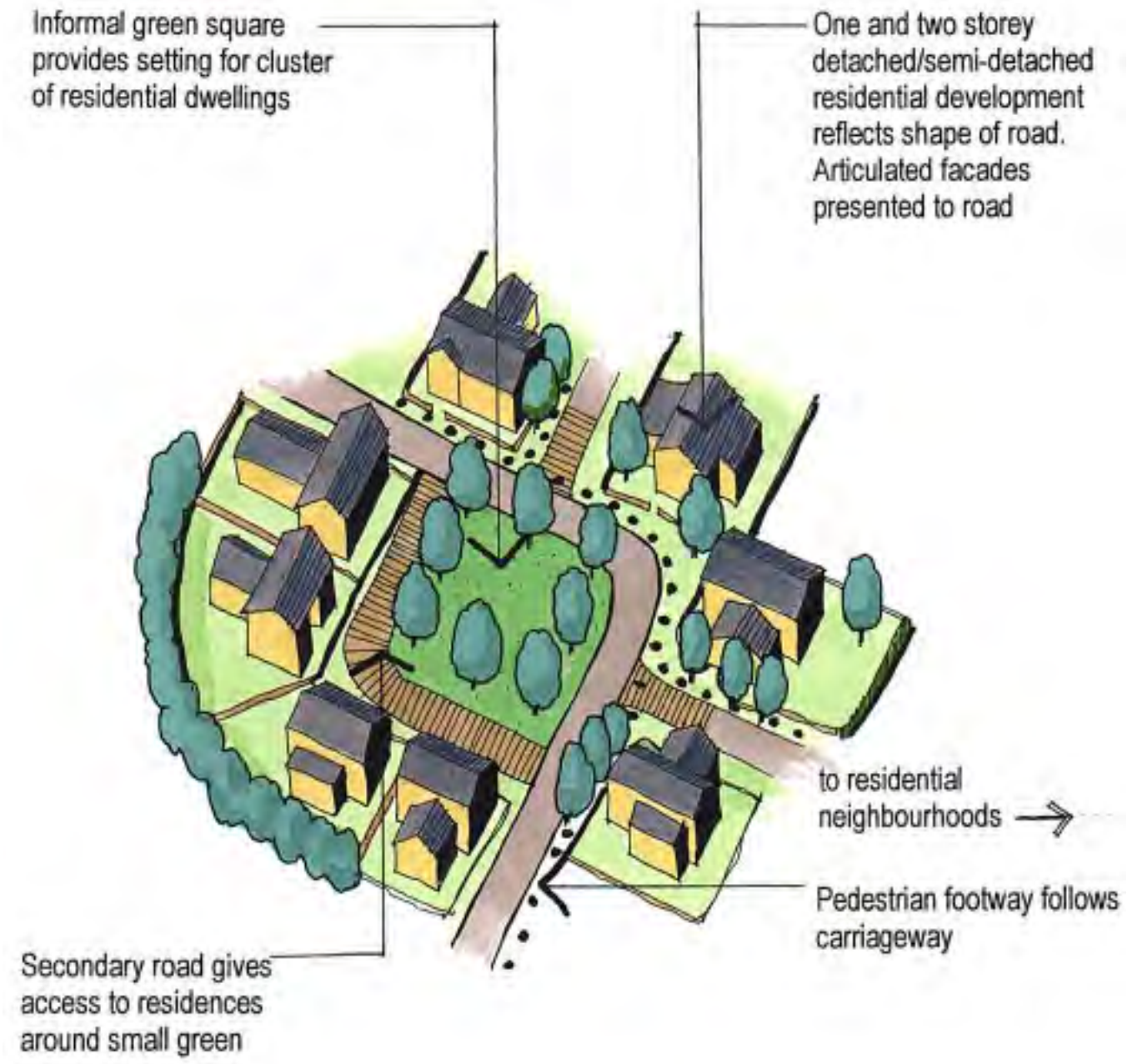

Figure 7 Traffic Calming - Right Angled Bends

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Figure 8 Traffic Calming - Change in Surface Treatment

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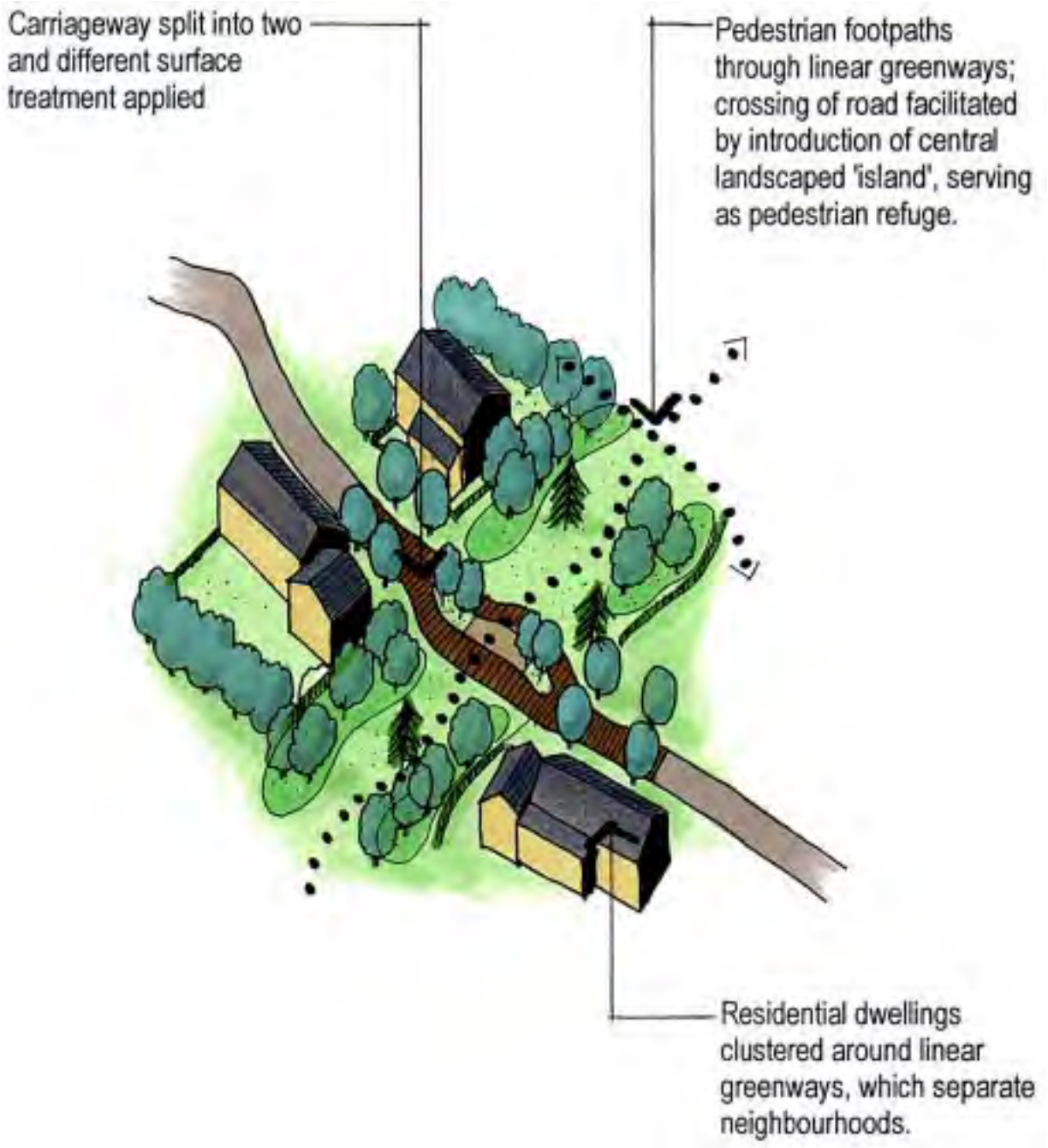

Figure 9 Traffic Calming - Divided Carriageways

4.14 Road Network

A concept for developing a hierarchical network of roads is illustrated in Figure 10. The plan conceptually illustrates:

- a traffic-calmed Residential Core Road;
- possible access points into the residential neighbourhoods,
- a loop system within the neighbourhoods; and
- emergency access and pedestrian and cycle links between the neighbourhoods.

The aim of the road system is to promote permeability and accessibility throughout the settlement.

4.15 Creating 'Streets'

It is proposed that dwellings should address the street along some sections of the Residential Core Road, and not turn their back to the road as in many 'New Town' developments. By orientating the first line of dwellings toward the Residential Core Road, a 'street' will be created, along which a cohesive village character can be developed. The Residential Core Road, therefore, does not simply serve as an access road to the residential neighbourhoods but reads as a 'street' in the road hierarchy (refer to Section 4.34 - Orientation of Dwellings to Roads).

The quality of the road environment is important and careful attention to the detail design of carriageway surfaces, footway surfaces, kerbs, signage, lighting and soft landscaping will clearly be necessary. The concept of creating streets which encourage safe use by pedestrians and cyclists is an integral part of the development proposals and innovative approaches to layout materials and finishes is important and will be thoroughly discussed at the detail design stage with the Roads Authority.

4.16 Pedestrian Network

Pedestrian footways are to be provided along the road network and are to be designed to promote pedestrian safety and comfort. The footways link with footpaths which permeate through the 'linear greenways' and the neighbourhoods (refer to Section 4.72-Linear Greenways). These paths, in turn, link to external pedestrian paths, in order to provide a permeable pedestrian and cycle network throughout the settlement, which is illustrated in concept in Figure 11.

Figure 10 Concept: Road Network

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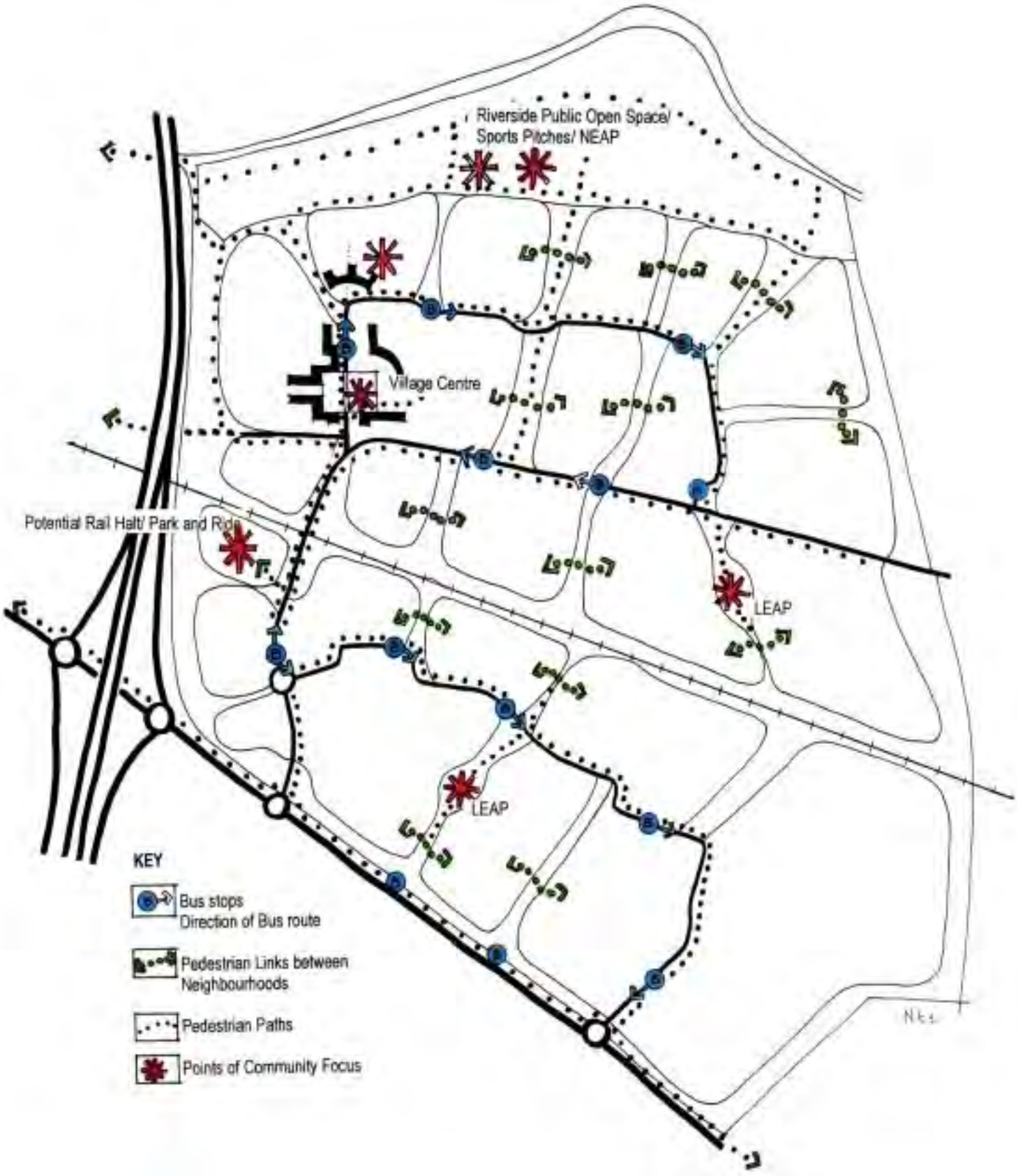

Figure 11 Concept: Alternative Transport Network

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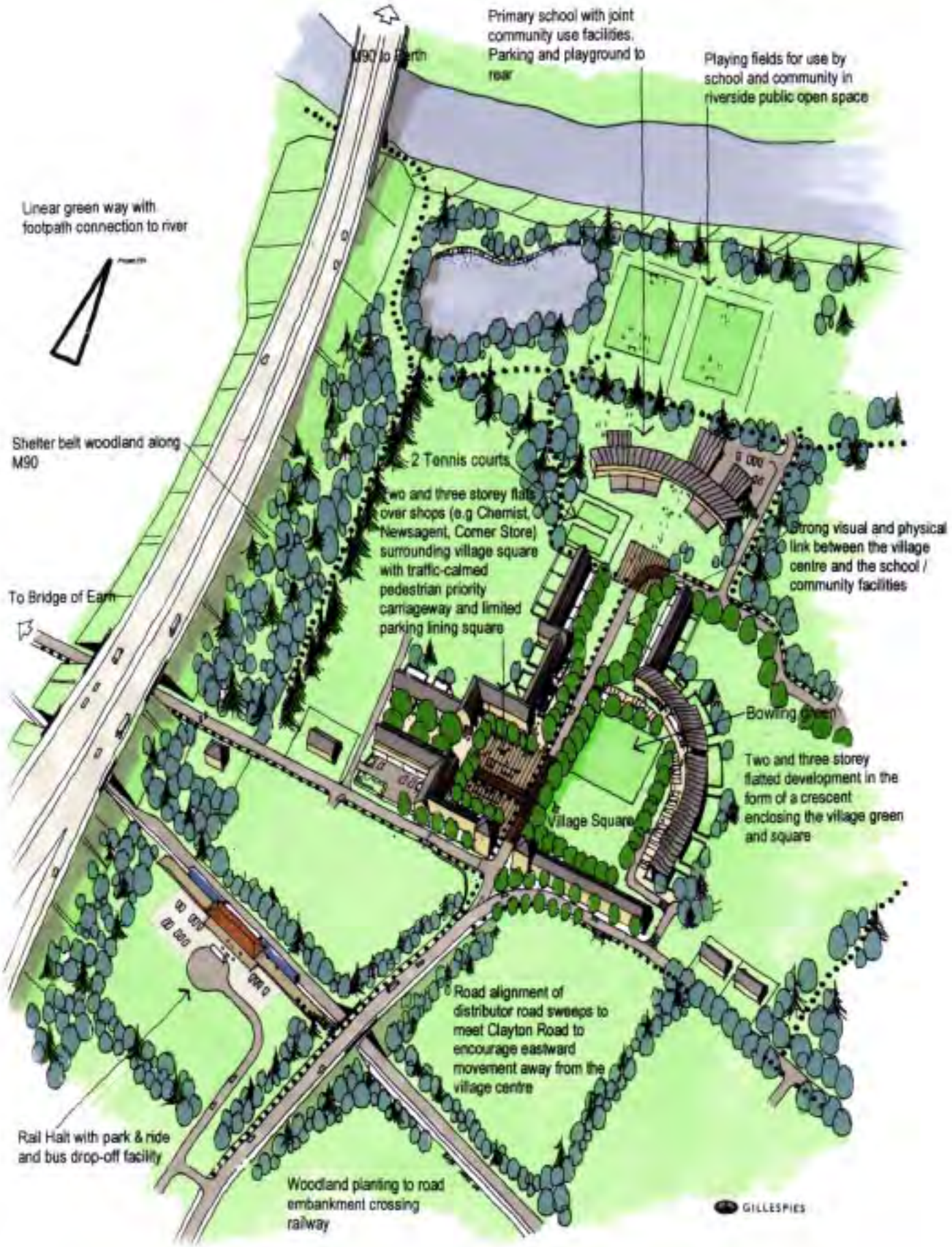

Figure 12 Village Centre: Axonometric

4.2 Village Centre

The core of the community is located to the north of the railway line and has been located so that easy access is facilitated from each neighbourhood. Its location is thus associated to the bridge which allows the only point of crossing over the railway line. In addition, the village centre is located in close proximity to the potential Rail Halt, and Bridge of Earn.

The core is intended to serve as a point of community focus, capable of accommodating organised events and gatherings as well as facilitating casual social interaction and shopping. The local centre must be recognisable, with facilities that promote its vitality and viability, as well as being easily accessible from the neighbourhoods.

The village centre may incorporate the following uses to service the needs of the community and add to the life of the central public spaces:

Retail use including grocer, butcher, baker
Health and social care facilities, including doctors, dentists
Leisure functions i.e. café
Workshops for small business

The development would also have the capability to support a branch library either as part of the village centre or as an integral part of the primary school building.

The uses in the village centre will be determined at a later stage based on need and viability and in response to the changing needs of the community as it grows. These uses will be incorporated in the ground floor of the buildings surrounding the village square.

Within the centre, pedestrian spaces have been introduced in the form of a village square and green. The edges of these spaces are to be defined and enclosed by the architectural facades of surrounding residential buildings, in order to promote a comfortable pedestrian scale and enclosure.

4.21 Village Square

The village square is located to the north of Clayton Road and acts as a key public space at the heart of the development. It is intended that only the traffic accessing the village centre, the school or residential neighbourhoods directly to the south of the riverside land pass through the village centre. The majority of the traffic is to be encouraged to turn east along Clayton Road through manipulation of the road geometry. The traffic will add a degree of animation and vitality to the village centre, while still creating a positive pedestrian environment.

In addition, the speed of cars between the village square and the green is to be controlled to promote safe and easy pedestrian movement between these spaces and the school. Sufficient space is given over to a hard landscaped pedestrian square which provides a setting for the surrounding 2 to 3 storey residential development and a place of social meeting and interaction. The ground floor of some of the surrounding buildings could be given over to local retail or social/ community uses.

The square would be surfaced in high quality hard landscape materials and incorporate formal tree planting, seating, lighting and other street furniture. A limited amount of short term parking would be accommodated in the design of the square to facilitate the local retailing. Further parking requirements will be assessed at the detailed design stage. Artwork could be integrated into the village square where it adjoins the village green, to provide a focal point feature.

4.22 Village Green

The village green provides a public open space at the heart of the community for small village events and gatherings; markets, and performances. A bowling green for local community use is also integrated into this area.

It is a predominantly open, grassed space, with trees around its perimeter to give vertical emphasis. One edge of the village green is in the shape of a crescent, which is reflected and reinforced by the facades of the enclosing residential buildings. These buildings are to be 2-3 storeys in height and of a consistent architectural style to provide a visual coherency.

The vitality of the local centre will be created from the movement of traffic through the village centre, the pedestrian movement from the residential neighbourhoods to and through the square and green, and the introduction of activities and uses such as shopping into the surrounding buildings. The square and green must be of a scale that is comfortable and inviting, and of a character that relates to the village as a whole and reinforces the identity of its community. The local centre should have a village shop/ local grocery store, which provides essential day to day needs for its residents; in particular the disabled, the elderly and those without access to the car.

Figure 12 depicts the village centre and illustrates the relationship of the core to the bridge and school, and the relationship of the residential/mixed use buildings to the central public open space.

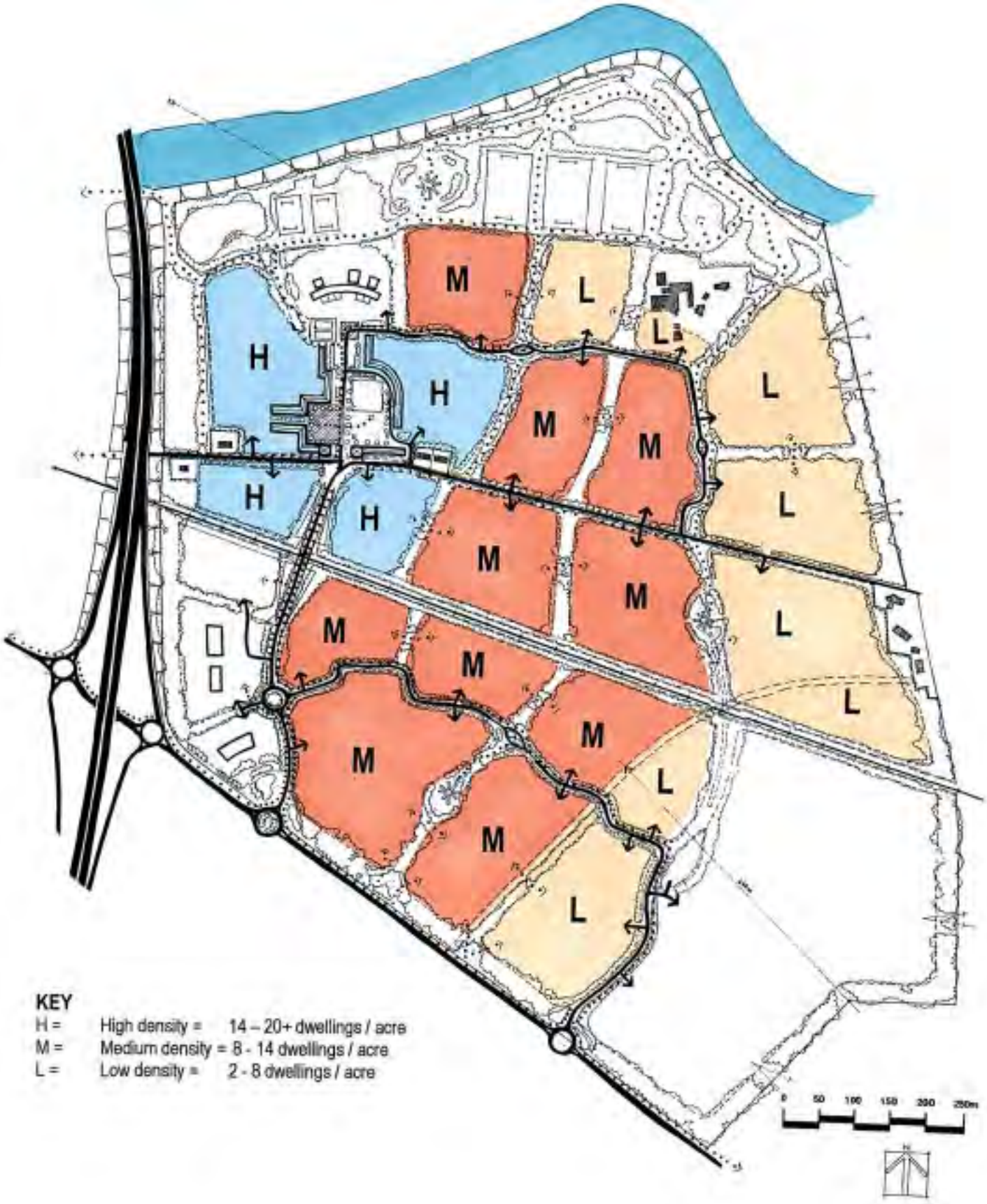

Figure 13 Proposed Residential Densities

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4.3 Residential Development

Oudenarde will be a predominantly residential development, with neighbourhoods located to the north and south of the railway line. The neighbourhoods will vary in size from 1 to 3.6 hectares for affordable and specialised housing to 2 to 5 hectares for all other residential housing types. It is likely that the neighbourhoods will be purchased and implemented by different developers or builders. It is thus imperative that a set of design principles is developed to inform the design of each of these discreet units, so that a cohesive overall urban character is achieved. The character is to be unique to the village yet suit the wider context into which the settlement sits (refer to Appendix-Design Principles). In addition, the residential neighbourhoods are to be set within a strong landscape framework.

4.31 Residential Densities

The densities within the residential neighbourhoods are to be higher in the village core, to concentrate the number of people around the community facilities and shops, and create a functional, active and vibrant centre. The densities are to decrease as the distance from the core increases. The neighbourhoods toward the periphery of the settlement would therefore be of low residential density; semi-detached and detached housing. By varying the densities in this way, a hierarchy is developed and the legibility of the village is promoted through its urban form. This, along with manipulating the streetscape treatment and building groupings; developing a palette of materials, and introducing open space areas, gateways and nodes provides a traditional physical structure, which is recognisable to the residents of the community (refer Design Principles). The proposed densities for the settlement are illustrated in Figure 13 and are classified in terms of high, medium and low densities. The densities are defined as follows:

Low	2-8 houses /acre	(4.9 - 19.8 houses /ha)
Medium	8-14 houses /acre	(19.8-34.6 houses /ha)
High	14-20 + houses /acre	(34.6 - 49.4 + houses /ha)

In addition, the residential areas which are located within the 460m pipeline notification zone are to be developed at densities of 12 persons/ha to the south of the railway line and 20 persons/ha to the north of the railway line, based on recommendations from the Health and Safety Executive. Consultation is ongoing with HSE to improve and maximise the land usage within the consultation zone.

On this basis, the estimated average number of houses for the settlement of Oudenarde will be 1250 houses, with a range in the order of 900 - 1600, dependent on market demand.

It must be stressed that the determination of densities for housing is market led, and thus flexibility within the ranges stated is to be adopted based on the extended period over which the settlement of Oudenarde is to be built.

4.32 Residential Layouts

The following urban design guidelines are common to all residential neighbourhoods, regardless of density.

'Gateways' or entrance features are to be introduced at the point where each neighbourhood is accessed from the Residential Core Road. This may take the form of an entry wall, landscaping or the introduction of a feature building or buildings to create a pinch point around the junction. Within each neighbourhood, secondary 'gateways' may be introduced to improve the legibility of the neighbourhood by introducing markers or recognisable elements along the 'journey'. The secondary gateway could indicate a change in density, scale or housing style within the neighbourhood.

A progression of building elevations and a variation in the setbacks of houses is to be introduced to create interest along the streets within each neighbourhood. It is the preference along the Residential Core Roads that parking be accommodated to the rear of the houses with access from the front, but along the neighbourhood roads, a mix of integrated garages and parking to the rear or front will be introduced.

Building groups will be designed to provide interest in their juxta position, rooflines and materials and finishes (refer to Appendix 2-Building Design Guidelines).

Indicative annotated layouts for high and low density housing are shown in Figures 14 - 17 of this report, to highlight the urban design guidelines which are to be employed in the design of the neighbourhoods.

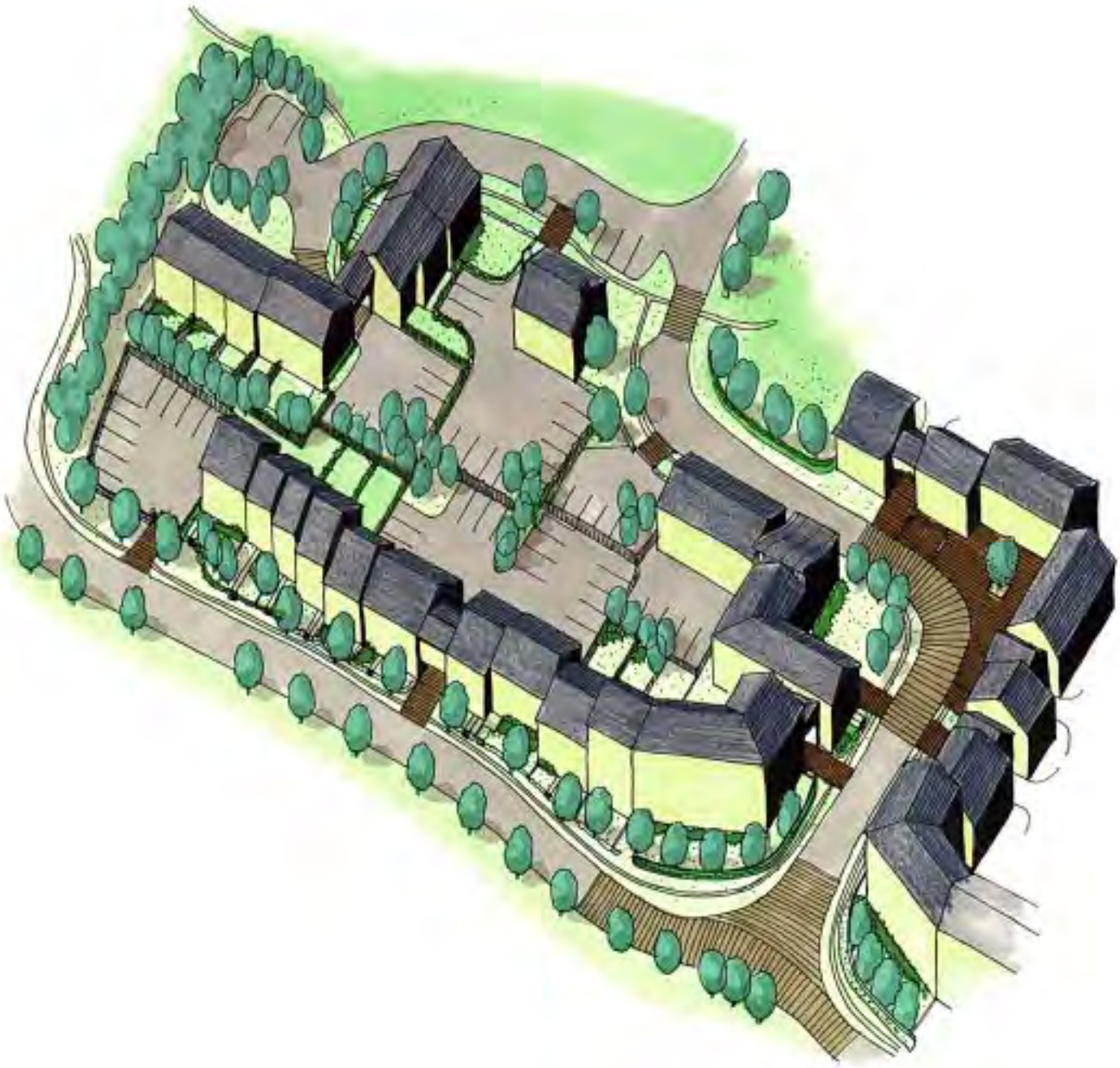

Figure 14 Axonometric - High Density Residential Layout

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Figure 15 Example - High Density Residential Layout

Figure 16 Axonometric - Low Density Residential Layout

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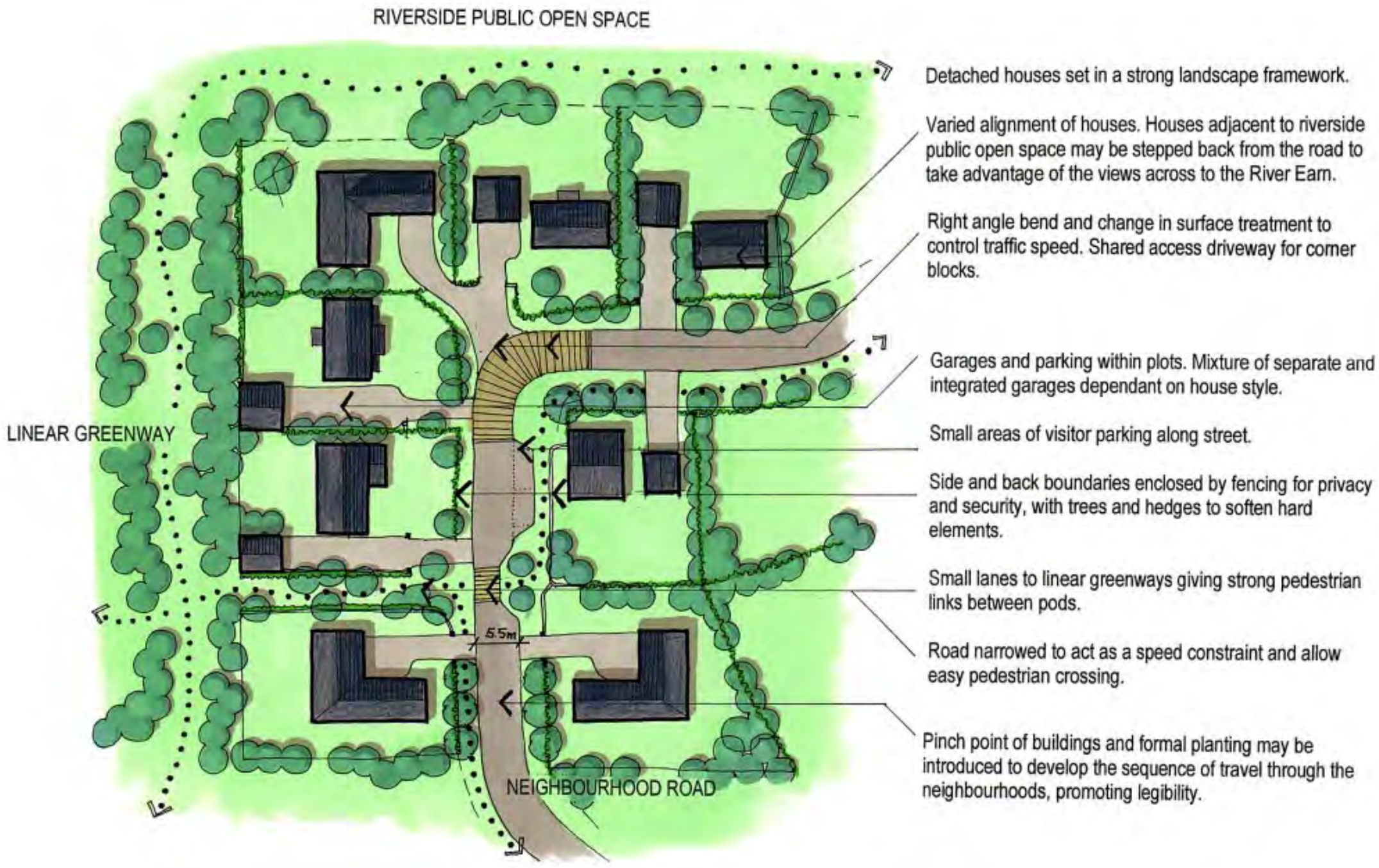


Figure 17 Example - Low Density Residential Layout

4.33 Accessibility

Each neighbourhood is to have one or more points of access off the Residential Core Roads. The internal road layout will be determined based on housing type and orientation of dwellings, yet will be designed to promote permeability within the neighbourhoods (refer to Section 4.14 - Road Network and Appendix 4 of this report). Each of the neighbourhoods is to be accessible to the village centre, school, and community facilities. Strong pedestrian routes are to be achieved between the neighbourhoods and these facilities.

4.34 Orientation of Dwellings to Roads

Frontage access on to the Residential Core Road has been considered and is deemed desirable for a number of reasons.

- buildings have a relationship with the street
- it produces a more vibrant and active street with pedestrian and vehicular movement combined
- it avoids the rear of properties and back gardens fronting on to the street
- it is the traditional urban form within settlements. The road becomes a street with a sense of place and not simply a traffic route
- if carefully designed, this principle could assist in the overall traffic calming measures for the site.

In order to successfully create a street along the Residential Core Road, the following guidelines are promoted:

- The setbacks of the houses should be adapted to reflect their location within the village. For example, near the village centre, the dwellings may abut the back of the footpath with occasional front gardens. In areas where the density is decreased, the set back of the dwellings may be greater and a substantial front garden may be introduced. In this case, the plot boundaries should be defined by a wall or a hedge to develop a continuity of line along the street.

- The parking on the plots is to be sensitively designed to ensure that the front gardens of the dwellings are not dominated by driveways but contribute vitality to the street.

- It is proposed that in some selected areas along the Residential Core Road, a cluster of dwellings may share a car parking area to the rear of the plots, minimising the access points off the Residential Core Road.

- The use of free standing garages are promoted as they can be located anywhere on the plot i.e. to the rear of the dwelling. Figures 18 illustrates concept proposals for dwellings which address the Residential Core Road.

Within each of the neighbourhoods, the dwellings will be orientated toward the neighbourhood roads. Their layout will be developed in the detailed stage in line with the design principles and building design guidelines included in the Appendix of this report.

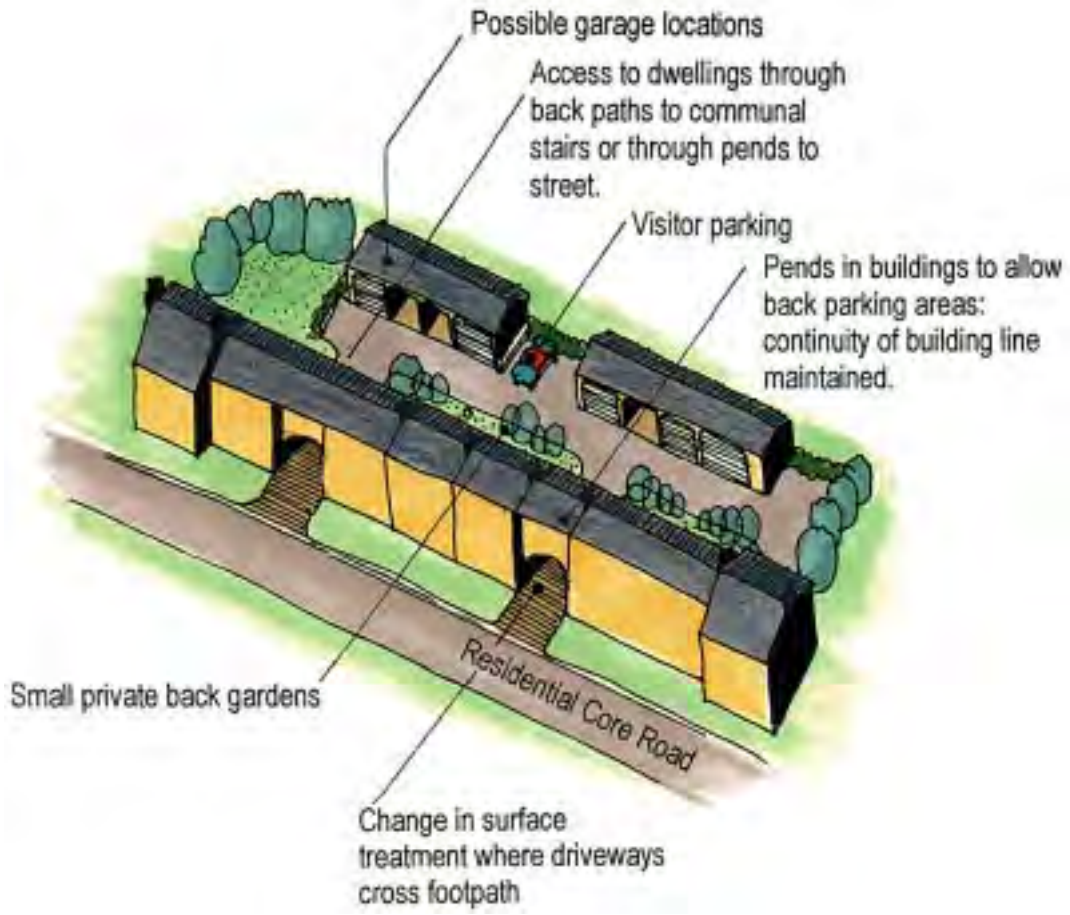
4.35 Specialised Housing

There is a commitment in principle from Scottish Homes to prioritise available resources toward major new settlement options around Perth. Detailed discussions with Scottish Homes and other housing associations have been undertaken and it is intended that at least 25% of the development will be given over to affordable housing of mixed tenure and type.

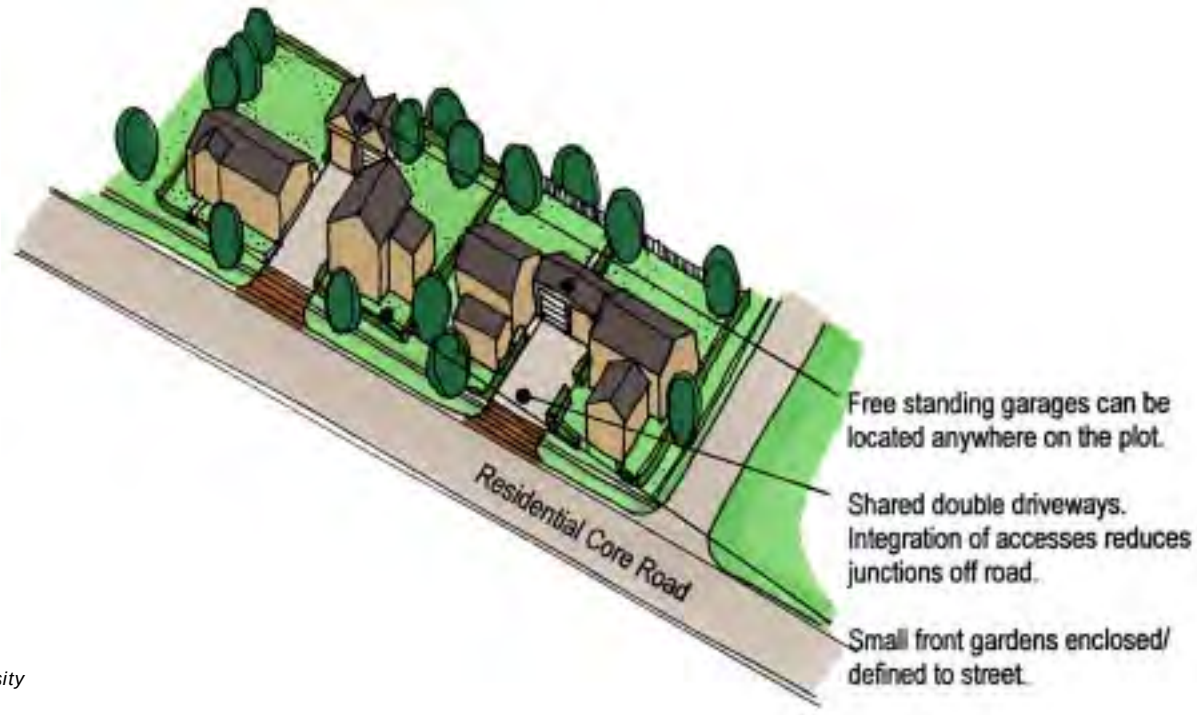
A proportion of this has been located in, or proximate to, the village centre. This promotes the integration of this housing type into the settlement and allows good accessibility to the community facilities. The design and quality of this type of housing can be controlled, and thus the architectural form can contribute to developing a strong urban form around the village centre.

Any flatted development would be concentrated around the village core area along with two storey semi-detached or terraced properties. Other affordable housing will also be located in the high density residential zones identified around the outer edges of the village centre.

The specialised and affordable housing will be designed in accordance with 'Secure by Design' specifications where possible.



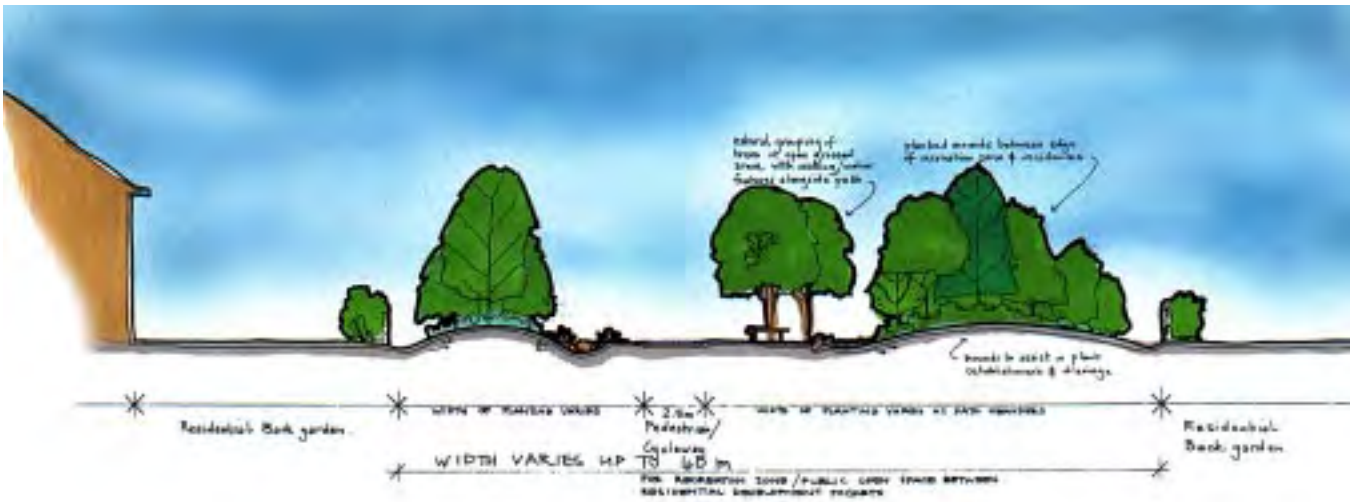
High Density



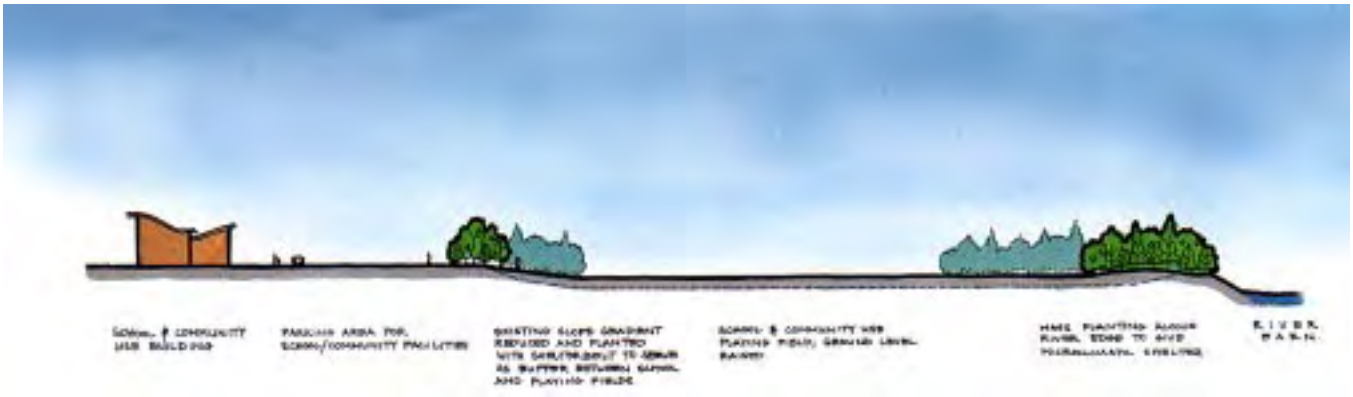
Low Density

Figure 18 Orientation of Dwellings

LANDSCAPE TREATMENT ALONG A912
Section



LINEAR RECREATION ZONES
Section



SCHOOL & PLAYING FIELDS
Section

4.4 Community Facilities

The single stream primary school and the community facilities are located close to the village centre. They are sited at the end of the road that passes through the village centre, which is accessed from the Traffic Distributor Road as it sweeps east to align with Clayton Road. The building which houses the school and the community facilities will terminate the view upon passing through the village square., and could serve as a 'landmark' building within the village. An element of height could be introduced to its architectural form (ie clock tower), to allow the building to serve as a point of reference that is visible throughout the village. The siting of landmarks promotes legibility within a settlement.

The community facilities are combined with the school. The buildings/ pavilions into which these facilities could be housed should be adaptable, so that rooms and spaces can be manipulated for a variety of uses and functions (ie class rooms, hall, meeting rooms, for community gatherings, workshops, lectures, presentations, temporary exhibitions etc). The parking and services are located to the rear of the buildings, and will be shared by the school and community facility.

A 'drop off' area for children is provided to the front of the school, and a separate access to the car park is located to the east of the building. This road gives access to the public open space and sporting pitches in the land adjacent to the river. Good pedestrian links are provided to encourage walking and cycling and reduce the need for car use and consequent congestion on the Residential Core Road.

An area has been allocated for a playground around the school building which should be designed according to 'learning through landscapes' principles. The school may also utilise the adjacent public open space if required. To the north of the playground, in the Riverside Parkland (Refer to Section 4.7- Public Open Space), two 7 a-side grassed football pitches have been provided for the school's use, while three full-sized grassed pitches have been located further to the east. Two tennis courts are indicated to the south of the school, and a bowling green is located in the village green, to comply with the PKC's requirements. A section, illustrating the relationship of the school, the football pitches and the River Earn is provided in Figure 19.

A spatial allocation of 250m^2 approx has been made in the south-west area of the site for the provision of a cemetery. This would have easy vehicular access from the A912 and would not require access through residential areas. It would be bounded by hedges to afford a degree of privacy and would be integrated into the landscape shelter belt.

4.5 Retail

The retail uses are located between the M90 and the Traffic Distributor Road, between the A912 and the railway line. These businesses would be visible from the slip roads by means of appropriate yet well designed signage, but would be accessed from the Traffic Distributor Road. Access into the retail facilities and the 'Park and Ride' facility are combined into two points, so as to limit the number of junctions along the Traffic Distributor Road. As this road services the entire residential component to the north of the railway line, it is imperative that ease of traffic movement along this road is achieved. It is proposed that the following uses could be integrated into the retail area to the west of the main entry road; a Travelodge, a Petrol Filling Station, a Park and Ride facility, and ancillary and complementary business units. This list is not exhaustive and market analysis and further discussion with the Planning Authority will be undertaken to determine appropriate uses for this location.

4.51 Travelodge

The Travelodge is located to the west of the entry roundabout with its frontage addressing the A912, and its services and car park located to the rear. The building must be of a high architectural standard and should be set in a high quality landscape, which forms a statement at the entry to the settlement.

4.52 Petrol Filling Station

A petrol filling station is located in this area. Complementary business units have been introduced, and may share parking and servicing facilities. The buildings accommodating these uses are accessed from the distributor road with the service areas and parking facilities located to the rear adjacent to the motorway.

4.53 Park and Ride facility

Land has been allocated for a 'Park and Ride' facility to the south of the railway line, adjacent to the preferred location for a future rail halt facility. The developer will provide a surfaced area for 50 cars initially, and a turning area for cars and buses. The remainder of the area will be grassed, until further capacity is needed and an extension is required. The space allocated on the masterplan can accommodate up to 250 cars. It is likely that buses will service the 'Park and Ride' for the present, until such time as the rail halt comes into operation. A small area within the spatial allocation for the park and ride site would be given over to allow the provision of a small recycling facility such as bottle banks and paper recycling bins. These are preferably located in places with easy vehicular access but away from residential areas.

4.54 Rail Halt

Land has been set aside on the plan for the rail halt facility and allows for a single 150 metre long platform.

4.6 Business

An area for a business park has been allocated in the south-eastern corner of the site with access directly off the A912 from the eastern roundabout. This area will be developed as the market demand for business use in this area is realised. This area of business land falls within the Pipeline Notification zone and is to be developed in line with the Health and Safety Executive's 'Category B' criteria which states that the development within this zone is to provide for less than 100 occupants per building and the height of each building is to be less than three storeys. The density is to be restricted to 30 persons/hectare. This is in line with HSE's recommendations.

The business park is adjacent to residential neighbourhoods and therefore screening has been introduced to reduce the visual impact. A linear area of woodland planting of a minimum width of 25 metres is indicated to separate these different development areas. This width of planting reflects the width of shelterbelt planting along the site boundaries. As the business park may not be developed in the short term, the area allotted for this purpose may remain as an agricultural field for some time. This belt of woodland planting will therefore define the boundary to the site and provide microclimatic shelter for the residential properties.

4.7 Public Open Space

Thirty percent (30%) of the site area is to be utilised for public open space and landscaping. Public open space is inclusive of the following elements; Riverside Parkland, linear greenways, the village green and square, 'entry' landscapes, areas of play, and shelterbelt planting. The village green and square are described in Section 4.2 – Village Centre.

4.71 Riverside Parkland

The majority of the public open space is concentrated in the area along the southern edge of the River Earn. In the Public Inquiry, it was stated that the corridor of the River Earn was the 'most ecological notable feature' within the Oudenarde site. Within this area, an opportunity exists to promote ecological habitats and links. Native species of trees are to be planted in natural groups in order to develop wildlife corridors and refuge areas. In addition, the river's edge is to be densely planted to aid in bank stabilisation, promote wildlife links and provide an improved microclimate in this flat and exposed riverside area. Access and visibility to the river's edge will be possible at strategic locations only. Trees are also to be introduced along the edge of the developable land, to provide shelter to the residential properties. In the detailed design stage, further consideration must be given to the design of this public open space, in order to ensure that the water regime of the River Earn is not compromised.

Within this area, land has been allocated for two 7-a-side grassed football pitches, three full sized grassed football pitches, and a play area. Pedestrian and cycle networks meander through this area and are to link with paths from the settlement and the existing external paths. A link to Bridge of Earn already exists under the M90 alongside the river.

4.72 Linear Greenways

Linear greenways are distributed throughout the settlement to link important community facilities, and increase the permeability of the village. These greenways accommodate pedestrian and cycle paths and will separate the residential neighbourhoods; with planting concentrated along the edge of property boundaries with informal groupings of trees within. The width of the planted edges can vary on either side; to accommodate larger open grassed areas, seating and feature landscapes. The greenways primarily serve as links between the neighbourhoods, village centre and community facilities, offering an alternative to the footways associated with vehicular carriageways. A section through one of these greenways is illustrated in Figure 19.

Maximum natural surveillance will be promoted in the greenway's design, which will be developed in the detailed design stage. They provide very valuable green spaces for general recreation and dog walking in particular and will be furnished with dog bins at regular intervals.

4.73 Entry Landscapes

At the point of access from the A912 into the site, a high quality landscaped area has been incorporated to develop the 'sense of arrival' into the settlement. It is proposed that water features be integrated into the design of these spaces. The water features will not form part of the drainage system. As these areas will be the point of arrival into the settlement, the quality of these landscapes is to be extremely high, incorporating tree and shrub planting and cut grass areas with bulb planting.

4.74 Play Areas

The Perth and Kinross Council have identified that three children's play areas are required for a settlement of this size based on their 'Playground Strategy'. 2 Local Equipped Areas of Play (LEAPs) and 1 Neighbourhood Equipped Area of Play (NEAP) have been provided. The play areas are evenly distributed throughout the development so that all the residential neighbourhoods can access the play areas by foot.

The LEAPs are located within the greenways so that they are easily accessible along the pedestrian and cycle paths and are visible from the adjacent dwellings to allow casual surveillance. They are to be a minimum of 3600m^2 incorporating 400m^2+ of active space, include five (5) types of play equipment and allow for a small games area. The NEAP is located in the Riverside Parkland, and is to be a minimum size of 8500m^2 incorporating 1000m^2+ of active space. Eight (8) types of play equipment and a small games and cycling area are to be provided.

The masterplan allows for the provision of buffer zones between the play areas and the residential development of 20m for a LEAP and 30m for a NEAP.

Further refinement of these facilities will be undertaken at the detailed design stage.

4.75 Shelterbelts

Shelterbelts will be established to provide microclimatic protection to the residential pockets within the settlement and delineate the boundary of the site, and provide a strong landscape structure into which the development is to 'fit' (refer Section 4.8-Landscape Framework). The planting belts will consist of a mixture of native deciduous and evergreen trees and will be planted to a minimum width of 25 metres. The shelterbelts are to be predominantly impermeable, except where strategic views to the adjacent fields are selected or pedestrian routes penetrate through to link with external networks. The shelterbelts are to be planted on mounds to assist in plant establishment and drainage, reusing excavated material arising from construction works.

The shelterbelt along the eastern boundary reflects the location of a shelterbelt of Oudenarde farm, as illustrated on the Ordnance Survey map of Strathearn (1866). The shelterbelt will assist in integrating the settlement into the landscape and providing microclimatic protection.
The shelterbelt along the southern boundary is to be densely planted to serve as a screen between the residential neighbourhoods and the A912. The section through this shelterbelt is illustrated in Figure 19. The shelterbelt is to be broken at strategic locations to allow views in and out of the development, and allow pedestrian links to join the external network along the motorway.

The Council's recommendation to avoid large trees within 10m of a dwelling will assist in the long-term maintenance of this landscape structure. To achieve this the principal shelterbelts would be locally widened to 30m or 40m in width to allow larger trees to be planted away from properties. In order, however, to maintain the developable area some of the greenways would be less than 25m in width but this would increase the variety of the landscape structure for the site whilst still maintaining a suitable framework for residential development and meeting the requirements for shelter.

Refinement of the landscape structure belts would be agreed with the Council as each development cell comes forward for detail planning consent.

4.76 Screen planting

The Perth-Edinburgh railway line is to be screened along its length to the residences. It is proposed that an earth mound be constructed to each side of the railway line to allow the deposit of excavated material, serve to reduce the impact of passing trains and provide a planting medium for shrubs and trees. The embankments which flank the railway line are to be grassed, while those which address the residential back gardens will be densely planted utilising native species, to create a visual and physical separation between the railway line and the residences.

Phase 1

- Structure planting along M90 and A912 and around the pods which are to be developed in the first stage.
- Advance planting to north of rail to allow establishment of landscape structure for future stages (i.e. for village core)
- Planting along south eastern boundary

Phase 2

- Bridge over railway line and construction of village centre and primary school
- Structure planting introduced between the residential neighbourhoods. Main central shelterbelt planted.
- Advance planting to allow establishment of landscape structure for future stages (i.e. for central development are and along railway line)
- Advance planting along eastern edge of site to allow establishment of landscape structure for future stages

Phase 3

- Central area developed
- Structure planting introduced between residential neighbourhoods
- Riverside area enhanced and structure planting introduced to develop ecological habitats and wildlife corridor along river's edge

Phase 4

- Peripheral residential neighbourhoods developed
- Structural planting introduced between development pods and completed along roads and railway line

Figure 20 Proposed Phasing of Landscape Framework

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4.8 Landscape Framework

The development will be phased over a number of years with the residential neighbourhoods developed in all likelihood by several developers. It is therefore imperative that a strong landscape framework is established in order to unify the character of the settlement and promote its 'fit' into the surrounding landscape. The landscape framework is to be planted in stages, prior to the development of the residential areas, so that the planting can establish and microclimatic protection can be provided. The proposed phasing of structural planting is indicated diagrammatically in Figure 20 and corresponds to the proposed building stages. In the future stages (i.e. other than the first stage) the intention is to plant shelterbelts and linear greenways 2-3 years ahead of development, to promote the establishment of a strong landscape framework.

The landscape framework will assist to reduce the wider landscape and visual impacts of the development, which were defined in the Landscape and Visual Assessment (Gillespies, 1999). While it is acknowledged that the settlement will have effects, the landscape capacity of the site to accommodate the development will be increased by the introduction of shelterbelts and structure planting. An aerial perspective illustrates the way in which the landscape framework assists in integrating the development into the surrounding landscape (refer to Figure 21). The annotations highlight how the impact of the development is ameliorated from certain viewpoints, which were identified in the Landscape and Visual Assessment.

Shelterbelts will define the southern, eastern and western boundaries of the site. In addition, a shelterbelt runs north south through the centre of the site to reinforce the geometry of the overall layout and afford microclimatic protection to neighbourhoods to the east. Screen planting or linear greenways are provided between each of the development pockets, to delineate their edge and provide a common backdrop to each of the neighbourhoods. This will achieve a cohesion of character throughout the settlement.

Along the road corridors, structural planting will be introduced (refer to Design Principles). Along the Traffic Distributor Road and Residential Core Roads, boulevard planting is to be designed into the road corridor to acknowledge and reinforce the status of these roads within the network. A unified treatment along these roads will also develop a unified character through the settlement.

Planting within the structural landscape framework of shelterbelts and greenways will be made up of predominantly native species. This encourages wildlife and broadens the ecological base of the area. The use of ornamental / amenity tree and shrub planting will be considered for the entrance landscapes, boulevard and street tree planting and key pedestrian spaces in the neighbourhoods.

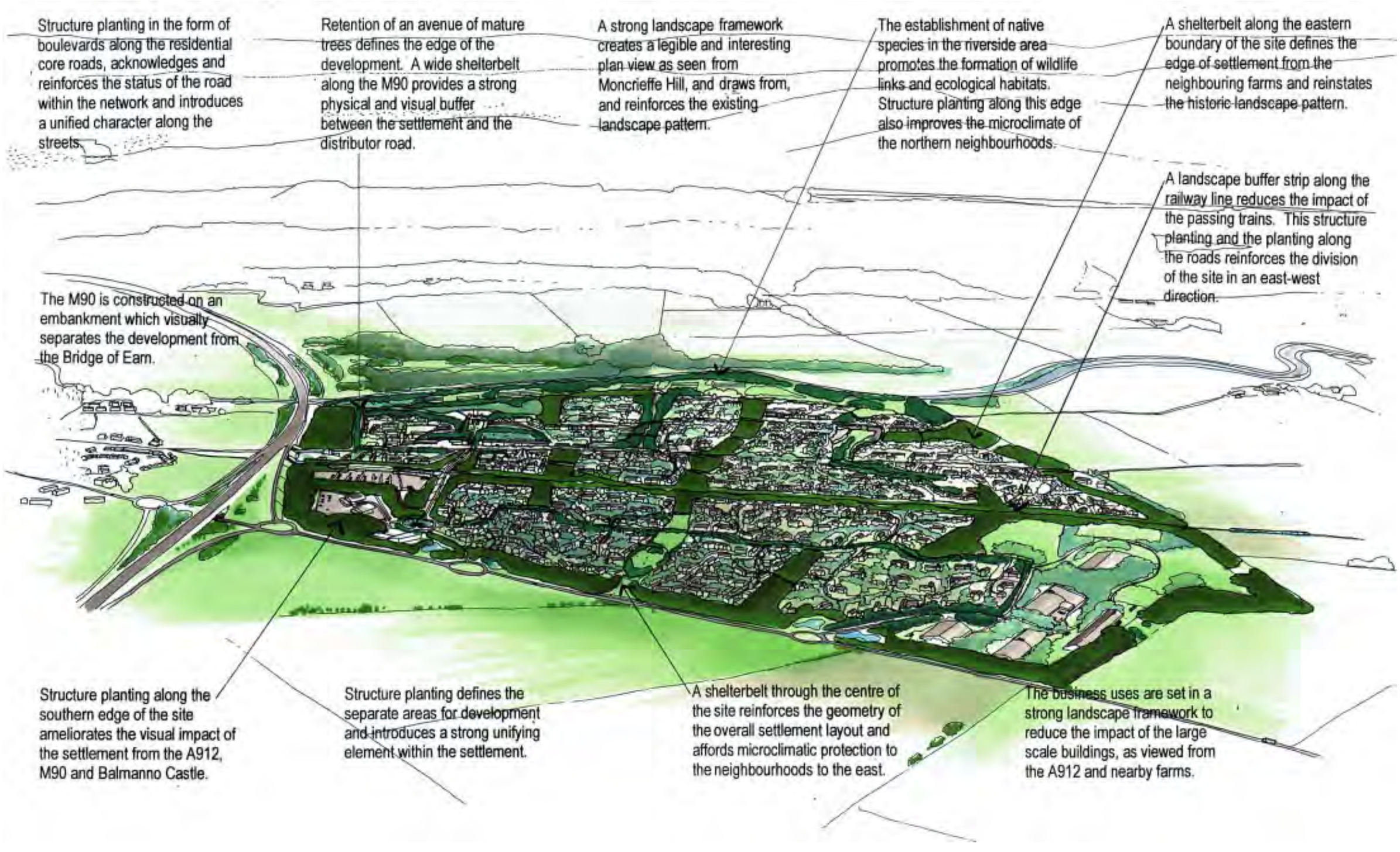


Figure 21 'Fitting' the Development into the Landscape

4.9 Alternative Transport Provision

4.91 Pedestrian and Cycle Network

In line with the NPPG 17-Transport and Planning (April 1999), alternative modes of transport are promoted within the Oudenarde settlement to facilitate a reduction in car use. A pedestrian and cycle network has been incorporated into the design of the settlement, and is to permeate throughout the site. A hierarchy of paths has been introduced, which reflects the importance of routes and linkages between elements within the development. Shared pedestrian and cycle paths are to be a minimum width of 3 metres, reducing to 1.8 metres for 'pedestrian only' paths. Figure 11 illustrates the proposed paths and required links.

Footways are to follow the road network on at least one side, with crossing points at strategic locations. A remote footway will be provided on one side of the carriageway along the Residential Core Road to correspond and link with the public transport routes around the village.

Within the neighbourhoods, a footway will be provided on one side of the road abutting the kerb. However, based on the implementation of traffic calming techniques, and adoption of shared surface roads wherever possible within the neighbourhoods, the need for the provision of a separate footway will be considered for each residential neighbourhood at the detailed design stage. The underlying principle is to provide a network of routes which allow safe and convenient pedestrian movement throughout the village.Where pedestrian paths cross the carriageway, traffic-calming devices are to be introduced to slow the traffic and facilitate ease in crossing. Footpaths run through the linear greenways, alongside shelterbelts, and through public open space areas (ie riverside parkland). Pedestrian and cycle links are required between the following elements within the development.

- Village Centre and Residential neighbourhoods
- Village Centre and Community Facilities/ School
- Residential neighbourhoods and Community Facilities/ School
- Retail Uses and Village Centre
- Park and Ride/ potential rail halt and Village Centre
- Residential Neighbourhoods and Public Open Space (ie Riverside Parkland)

The internal pedestrian and cycle network is to link with external paths, in particular the following;

- Under the M90 along river's edge to Bridge of Earn
- Under the M90 along Clayton Road to Bridge of Earn
- Along the A912 into Bridge of Earn to the west

The footways within the road corridor and the footpaths which make 'true' linkages between community facilities will be adopted by the Perth and Kinross Council Roads Department. The paths that run through the recreation areas may be adopted by the Leisure and Cultural Services Department. The pedestrian and cycle networks will be designed to comply with the Council's standards of safety and comfort. The paths are to be close to development to allow casual surveillance and to increase pedestrian safety.

4.92 Public Transport

Public transport links are to be provided throughout the settlement and are illustrated in Figure 11. It is proposed that a one-way bus route be provided along the Residential Core Roads. Bus stops should be located at appropriate intervals and in locations that link with pedestrian paths.

Negotiations have been undertaken with Stagecoach to provide a bus stop at Oudenarde in conjunction with the 'Park and Ride' facility, to enable commuting to Perth and Edinburgh. The 'Park and Ride' facility is to serve as a catchment for the local area.

5.0 Services

5.1 Foul Water

Proposals for foul water are to allow it to drain by gravity to a low point in the north west corner of the site. It will be pumped from there to the existing Sewage Treatment Works (STW). NoSWA have indicated that they propose to install a raising main from Bridge of Earn to the main works at Sleepless Inch east of Friarton Bridge.

5.2 Surface Water Runoff

Surface water management for the area has been discussed in detail with SEPA, in the context of the application of Sustainable Urban Drainage System (SUDS), and an end-of-line treatment system has been accepted. Existing ground conditions are such that soakage principles cannot be adopted. Therefore, the River Earn has been established as the discharge point for the surface water on the site, due to its proximity and capacity to absorb the anticipated volumes. A drainage strategy has to be applied which permits all surface water to discharge to the north-most boundary of the site. Constraints such as the rail-line impose further design considerations on the optimum drainage solutions. Liaison with Railtrack confirmed that works at depths less than 2 metres will not be permitted within the vicinity of the rail way line bisecting the site. Preliminary drainage modelling exercises indicate that a gravity based system and end-of-line lagoon facility can be accommodated on-site and within the guidelines set out by Railtrack "Guidance for Developers" documentation.

It is proposed that a wetland could be developed in the lagoon to enhance the ecology and habitat, and to aid in the filtering of the water, before it enters the river.

The provision of the ponds illustrated at the entrance to the site will be investigated at the detailed design stage with a view to enhancing ecological habitats. Detailed designs would be discussed and agreed with SEPA at all stages.

5.3 Statutory Services

Services such as electricity, gas, water and telecommunications are readily available and the requirements for reinforcement works are already established.

5.4 ISDN link

Confirmation has been received from BT that ISDN (2) telecommunications infrastructure is immediately available to serve the site. ADSL technology however has only recently been installed, with only 400 exchanges in the UK presently offering this facility. BT's forward programme does confirm however that such infrastructure could be made available for use on-site within 2-3 years timescale.

Provision of such advanced infrastructure will ensure that the site will create an environment appropriate for business and home working opportunities.

6.0 Summary

The concept masterplan for Oudenarde has been developed to reflect a modern, sustainable approach to new settlement planning. It provides for 143.1 acres (57.9 ha) of residential development, 47.2 acres (18.9 ha) of business /retail uses and 91.4 acres (37 ha) of green open space. The masterplan recognises the need for a settlement of this size and scale to achieve an integration with the surrounding landscape and achieves this through a comprehensive approach to a structural landscape framework. This framework reduces the visual impact of the development from external viewpoints, increases the woodland cover and the ecological base of the area and improves the microclimate within the development itself. This strong framework will also be beneficial when the settlement is viewed from elevated viewpoints such as Moncreiffe Hill and the M90.

The masterplan also recognises the need for the settlement to have a central core which acts as the focus for the community. The location of the primary school, any local retailing, community facilities and affordable housing close to the core reinforces this area as the heart of the development. Close links with the future rail halt and park and ride facility also strengthen this concept.

The railway provides a significant constraint to the development and the provision of a bridge crossing which gives access to the northern portion of the site becomes a key and integral part of the proposals.

Access remains via two roundabouts off the A912, the construction of which could be staged to suit the development phasing. The treatment of the road corridors with the settlement are important, with emphasis being given to the creation of streets with a mix of vehicular and pedestrian movement and not simply a traffic dominated route. Traffic calming measures will be considered throughout the development using restrictions in horizontal geometry, road narrowing and surface texture changes. A secondary network of footpaths and cycleways throughout the settlement have been considered in order to create positive links between the various components of the community. In many instances these routes use the linear greenways to increase safety and amenity of the users.

The residential density is intended to increase from the outer boundaries of the development towards the core, to reflect the traditional form of settlements and villages. The periphery of the development will probably include detached and semi-detached properties contrasting with 2 or 3 storey terraces of flatted developments at the village core.

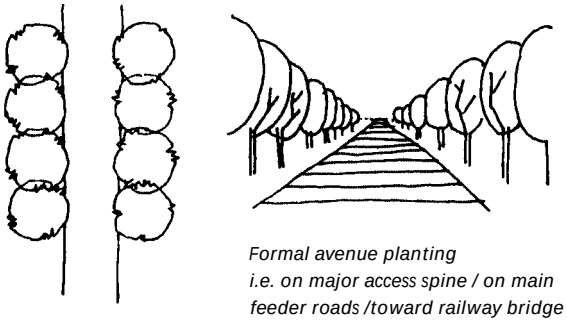
The masterplan reflects a sustainable and contemporary approach to a new settlement design. Further work on the design guidance for the architectural approach to the built form is set out in Appendix 1 and 2.

Appendix 1:
Design Principles

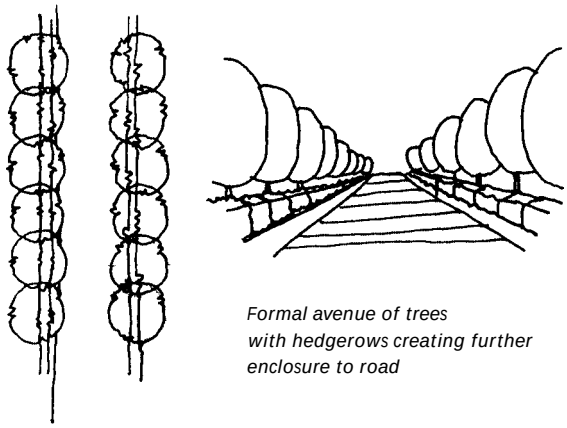
Existing avenue of mature oaks with boundary edge define by clipped / box hedge

Avenue planting –
Directs / funnels vision and movement particularly effective on straight roads creating a vista, framing a 'landmark'

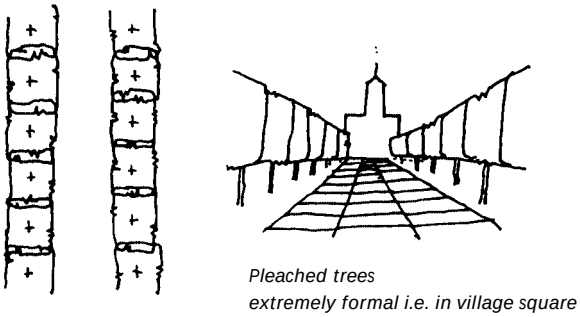
Single avenue of trees



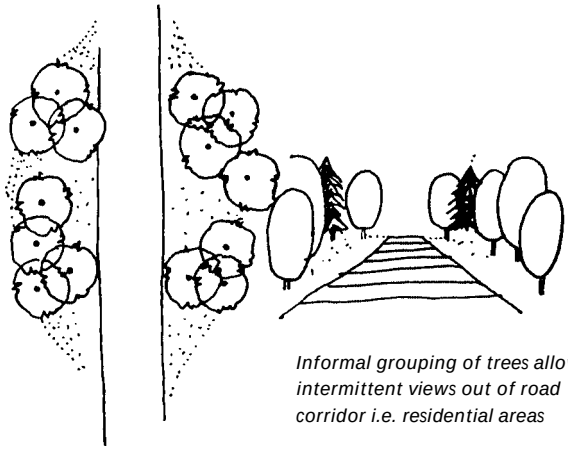
Formal avenue planting
i.e. on major access spine / on main feeder roads /toward railway bridge



Formal avenue of trees
with hedgerows creating further enclosure to road



Pleached trees
extremely formal i.e. in village square



Informal grouping of trees allowing intermittent views out of road corridor i.e. residential areas

Structure Planting along the Roads - Principles

Structure planting may be used to develop and reinforce the hierarchy of the street network by introducing varied and appropriate planting treatments in the road corridors.

Avenue planting

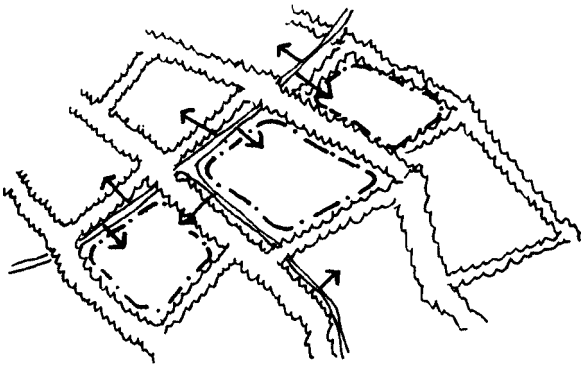
- Develops a formality and linearity in the road corridor
- Can be used to funnel/direct vision and movement toward a vista point; frame views
- Generally used on important access roads and primary feeder roads. Also in grid road networks (where the grid is reinforced by the planting)
- May be used to heighten the sense of arrival into the village
- A single species is usually chosen for avenue planting; transitions in the character of the street may be achieved by changing/alternating species; species form creates the character of the avenue
- Edge/boundary definition (i.e. walls and hedges) may be used to reinforce the linearity of the avenue planting
- Trees may be pruned, pleached or boxed or left in natural state

Formal planting configurations

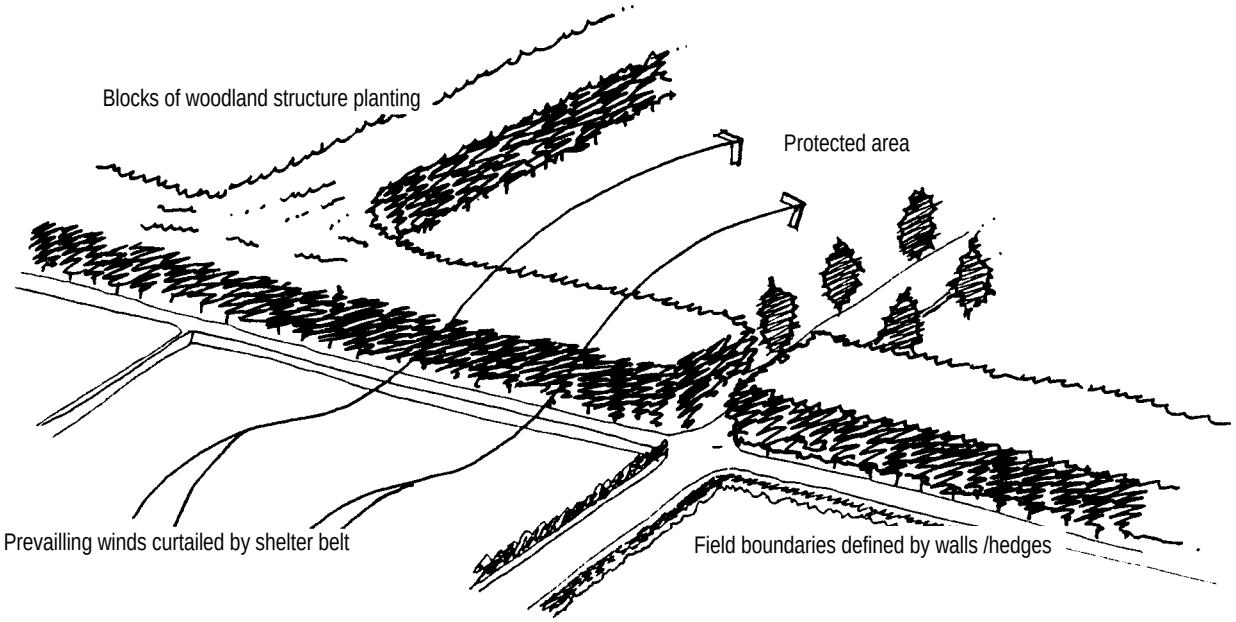
- Used in village centres, square and greens to signal importance of the 'place' and develop legibility of the space
- Trees may be set in hard stand or grassed areas dependent on village centre/courtyard use
- May signal pedestrian node

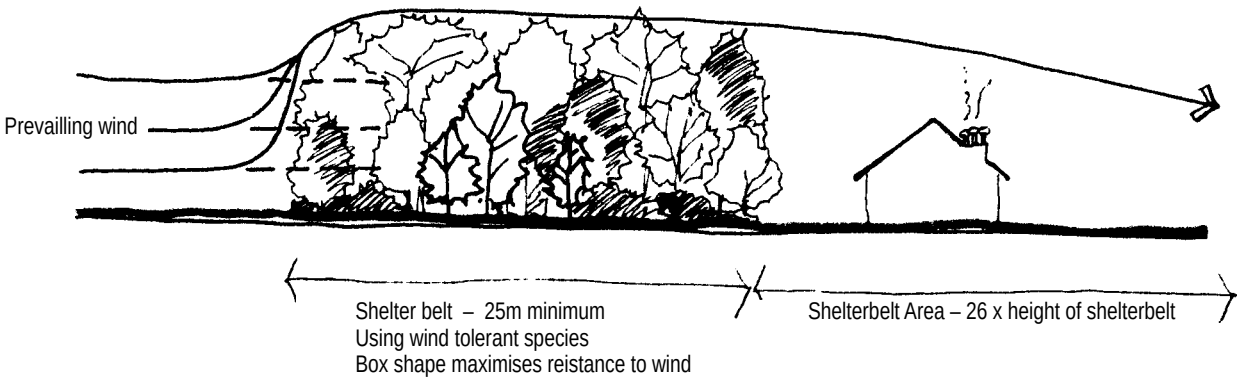
Informal Planting alongside Roads

- Random groupings/clumps of trees of same or varied species to develop informal and natural character along road edge
- Trees may be planted in grassed areas/verges or in planting areas with shrubs and groundcovers; introducing varied layers in the structure
- May be suitable for secondary roads/ neighbourhoods streets, and informal recreation zones.



- *Reinforcement of exiting landscape pattern*
- *Development areas protected; edges defined*
- *Increase capacity of the landscape to integrate development*





Remnants of Shelter belts on Oudenarde site, require reinforcing. Predominant species, Oak

Existing shelterbelt to west of the M90 25 metred in width. Predominant species - conifers / larch.

Woodland Planting-Principles

- Increases the 'landscape capacity' so that the development will 'fit' into the existing landscape structure
- Assists in defining the edges of the settlement area and the divisions between the different areas/zones of development
- Recognises and reinforces existing landscape character of rural setting
- Develops a favourable microclimate by affording protection from prevailing winds; particularly relevant in exposed sites such as Oudenarde
- Reduces the visual intrusion of development in the landscape
- Can be used as a screen (i.e. to roads)
- Develops a character within the development
- Can be used as an area for recreation with careful design i.e. integration of footway, cycle paths

Design parameters

- Wind tolerant species are to be used
- Minimum width of shelter belts to be 25 metres in width, affording protection to an area which is 26 times the height of the woodland planting
- Box shape to shelter belts affords the best protection to wind
- Mixture of species of varying heights, form and structure are to be utilised to develop layers of planting; predominantly native species to be used
- Fast growing species may be utilised to develop initial structure to planting, which will then afford some protection to the slower growing species. Evergreen species to be incorporated into the planting design.
- Maintenance regimes (particularly in the early stages) are necessary to promote rapid and healthy growth of planting
- Design of woodland planting belts may be informal to reflect native woodland (i.e. mixed species, random placement) or formal (i.e. views etc). Shelter belts may be broken at strategic intervals to allow 'windows' to development (i.e. landmark) or to a view from within the development

Field boundary along B935
Rough cast stone wall, mature trees behind

Stone wall along B935
Using field stones, rough coping

Low stone wall alongside bowling green, Kinross
Semi-circular coping

Main Street , Bridge of Earn
beech hedge

Residential area, Kinross
Combination of low stone wall and shaped hedge

Residential area, Bridge of Earn
Formal hedge

Residential area, Kinross
Formal 'exclusionary' wall, planting

Boundaries - Principles

Walls and hedges:

- Define boundaries; delineate edges
- Enclose properties/road corridors/fields
- Distinguish between public and semi-public or private space
- Divide the landscape into discrete units
- Are part of, and add to the character of the rural setting
- Can introduce a unique yet cohesive character to a development
- Can be located to screen development
- Vary in scale / design to suit their locality / character within the development (i.e. boundary treatment along major access road more formal and of larger scale than in a residential area)

Hedges create softer boundaries while visually tying the building to the site. Through careful detailing of walls and consideration of modern construction techniques, the cost of enclosing sites using this method may be reduced.

Church /Clock Tower
Main Steet, Kinross

Visible from residential area

Visual reference to village centre

Round Tower
Village Centre, Abernethy

Visible from entry road

Landmarks at each end of settlement

Landmarks - Principles

- Add to the legibility of the settlement from both external vantage points (i.e. from roads) and from within the settlement (from residential areas)
- Serve as a visual point of reference for movement around the town
- Are often in the form of a tower, elevated so as to be visible from selected points within the town
- Usually denote the village centre or Main Street of a settlement
- Are often adjacent to the village square, village green, or central vehicular or pedestrian node
- Usually have a community function/focus, central to the village i.e. church, school building, town hall, library, railway station
- Are often located to terminate a vista, i.e. at junction of roads; 'framed' within a view
- Should be of a scale which relates to the size and scale of the town (i.e. a landmark in a city would be of a much larger scale than that within a village)
- Should be of an architectural style which is relevant to the character of the area and of the settlement.

Appendix 2:
Building Design Guidelines

1. Introduction

In solving any current problem in environmental development, there generally remains choice between several alternatives, which all adequately satisfy the practical and economic requirements of the project. Design guidelines address this choice. They 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, unless guided, can lead to visual anarchy.

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 Oudenarde.

The design guidelines, as quasi rules, must 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 masterplan and sketches. Creative and innovative contributions must be encouraged, whilst the inappropriate are corrected or prevented. It is vital to appreciate when a talented design solution, outwith these guidelines, is nevertheless worth pursuing for the greater urban good. The flexibility and vision to achieve this demands great skill and tact from both the development design team and the controlling authority.

In the final analysis 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 being involved with the selection of the team.

House at Stavanger, Norway.
Built of timber and other organic materials, this house has transfusive walls that allow it to breathe.
Architect: GAIA Architects Group

Jacobs House, Wisconsin, USA.
Designed for passive solar gain with sun trap in front and earth mound to deflect cold winds.
Architect: Frank Lloyd Wright

2. Energy Efficiency and Sustainability

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

- Materials to be from sustainable sources where practicable using the least energy in their manufacture, transport, erection and maintenance.
- High energy-saving insulation standards.
- Exploitation of solar and other renewable energy sources wherever possible.
- Natural lighting and ventilation preferred.
- Layouts to encourage walking, cycling and public transport in preference to private car use.
- Layouts to be sheltered by landform, and by treebelts 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 46 “Planning for Crime Prevention”. (Scottish Office 1994)
- Street lighting, whilst conforming to the code of practice for lighting subsidiary roads and pedestrian areas (BS 5489 1992), 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

3. General Building Design

Certain building design guidelines are of a general nature,applicable to all development in Oudenarde, and these are set out below. Building-specific guidelines follow later.

- Respect the Scottish cultural heritage
  - observe the time-honoured response to climate and landform in vernacular architecture
  - respect original style and detailing when converting old buildings, and demolish only as a last resort. With the exception of Oudenarde farm house however there are very few buildings on site worthy of retention.
  - work with the climate, contours and scale of the locality

- Layouts should conform to the two Scottish Office advisory notes, PAN 44 "Fitting New Housing Development into the Landscape", and PAN 52 "Planning in Small Towns".

- 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
  - use style and scale consistently throughout each neighbourhood
  - 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 limited range of colours and materials for 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 a 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
  - Contrasting colours can be used selectively to emphasise certain elements of a building
  - 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. Consider life expectancy and maintenance

- The scale of a building should be appropriate for its use and relate to that of its neighbours.

- Built form and layout for this new settlement 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 etc.

- Buildings should be suitable for disabled access.

- The preferred style for development should be a high standard of modern environmental friendly design, at most 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 must be continued, adapted to modern needs and challenges. Creating an appropriate built heritage for the future will require a greater awareness of, and respect for, the design principles of the past.

The importance of creating a focal point and sense of place in a town. Round tower and central square - Abernethy.

The use of building form, boundary walling, hedging and a focal point to create a sense of urban enclosure - Kinross. Note how by these means the footpath indicates a route to the town centre.

The round tower as a focal point at Abernethy. Note how the stone boundary walls tie the buildings to the ground.

A detached house at Aberargie using slated roofing with white roughcast and stone banding around the windows. The private garden space is defined by stone wall, gate and hedging.

4. Housing

The local Perthshire tradition for housing includes the following features:

- house walling in grey or red natural sandstone, wetdash render or roughcast, painted white or buff, drydash roughcast in the white/buff/grey range. Brickwork has been generally uncommon

  - roofs are generally steep pitch in slate, with some use of pantiles or modern interlocking tiles. Dormers were common with accommodation in the roof space

  - boundaries and divisions frequently used natural stone walling, wrought iron railings and gates, beech or privet hedging, sometimes in combination.

  - in town centre situations houses were frequently terraced, and located on the back pavement line, whereas in more rural locations the houses tended to be detached and set back behind a garden

  - window openings with a vertical emphasis, sometimes with smooth band surround. Void to wall area between 20% and 25%

  - recent developers housing has often used a lower pitch roof with interlocking concrete tiles in the grey, brown and orange range. Buff brick has been introduced. Also, in combination with roughcast, precast stone and riven facing blocks (Fyfestone) have sometimes been used. Boundaries have tended to be down graded to low quality timber or chainlink fencing, sometimes with open front gardens.

Bearing this context in mind the following housing design guidelines are recommended:

- Neighbourhoods have been defined on the masterplan by their enclosing structure planting to provide shelter and to create their own identity. Such neighbourhoods may well be built by different developers, contributing to this individuality, whilst the wooded separation will avoid juxtaposition of disparate styles.

- Arrange for frontage of housing on to and accessed from the residential core roads, to provide more economical road use, to enhance liveliness and to avoid “dead” back garden fences.

- Aim to link groups of housing into a meaningful composition to create enclosure and to provide contrast to detached houses, eg. flats around the village square, housing terraces around the focal green to a neighbourhood, and linked groups of housing as in traditional farm steadings.

- Car parking preferred in attached garages or in-curtilage. Any common parking areas to relate closely to their respective dwellings.

- Aim to develop a three dimensional hierarchy of buildings to emphasise the village nature of this settlement. The tallest flats at three or four storeys and the highest density should be grouped around the village centre, two storey dwellings in the main body of the layout, and lower density larger dwellings and bungalows reserved for the periphery.

- Steeper roof pitches recommended in certain locations, with the facility to use the roof space for present accommodation, for extra room height, or for future expansion, with dormers or rooflights as necessary.

- In key areas such as the village centre the principal streets and entrance areas to the neighbourhoods walling could be in natural stone or painted wet dash roughcast/render. Drydash roughcast would be considered for the housing within the neighbourhoods. Preferred colours are in the white and buff range, with stronger earth colours for points of emphasis, such as venetian red, ochre etc.

- Colour for both roofs and walls to be applied to any housing group in a meaningful composition, rather than as a random scatter.

- Front facades could well be modelled, utilising balconies, bay windows and dormers, to improve views out, to enhance natural surveillance and to create a more lively frontage. Use gable windows to further increase surveillance.

- Good quality boundary treatment is essential to provide security, define private space, and tie the building into its location. Walling should match house walling and may often be treated as an extension of the house façade. Beech and privet hedging provides a softer low cost 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 larch-lap style timber fencing should be avoided in street frontage areas and the public realm. Use in back garden areas would be preferable where they are out of public view.

- Small retail units (corner shop, newsagent, chemist) set below flats are proposed for north of the village square. It is possible that these could be set back behind a covered arcade to give weather protection. Any service yards to the rear should be screened by full height walling. These small retail units are aimed to provide focus and activity to the village square, as well as satisfying an essential community.

A Terrace of stone built Cottages at Kinross.

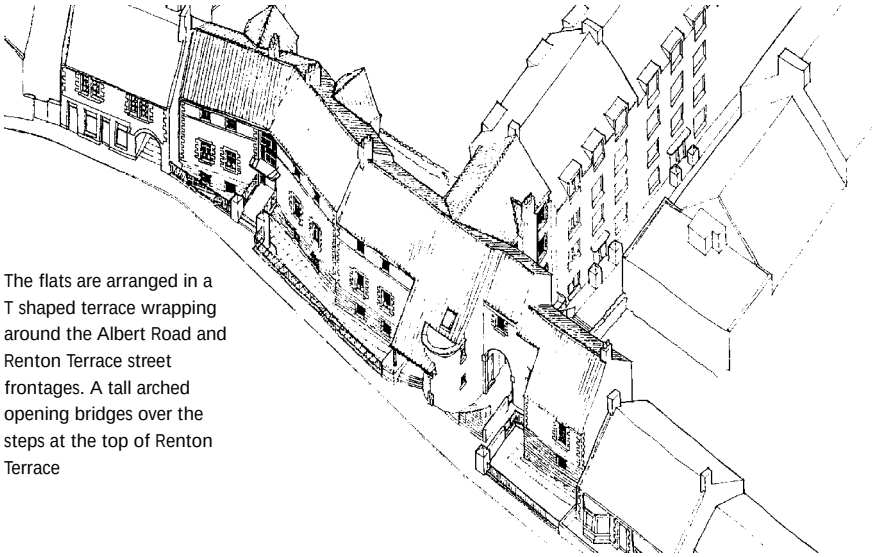
A detached stone house, with Dormers permitting accomodation in the roof space - Kinross. Note :Stone division walling, railing and hedging used together.

Excellent grouping of housing. Isle of Bute Housing Association. John Boys Architects.

Interesting housing grouping. John Jamieson Close, Lerwick. R Gibson, Architects.

Positive use of colour. Harbourside Housing, Irvine.
Architects: Irvine Development Corporation.

Flats designed to mark the meeting of two thoroughfares in an excellent urban composition, Albert Road, Eyemouth
Architects: Bain Swan Architects



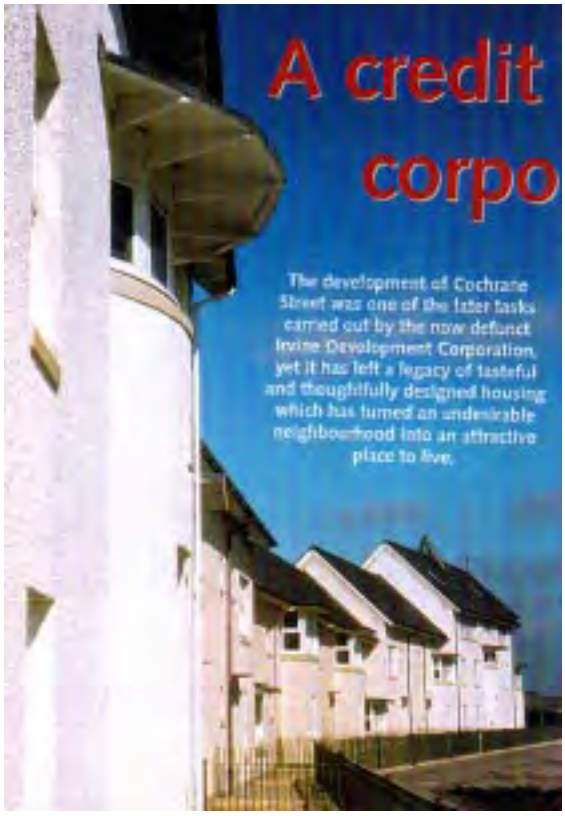
The flats are arranged in a T shaped terrace wrapping around the Albert Road and Renton Terrace street frontages. A tall arched opening bridges over the steps at the top of Renton Terrace

Good infill old persons flats at Marine Square, Eyemouth, respecting the character of this traditional fishing town, and usingh colour as a positive design element.
Architects: Bain Swan Architects

Use of a pend as a gateway to 'frame' a view into housing courtyard.
Collingwood CT. Morpeth.
Architect: Jane Darbyshire. Note colour.

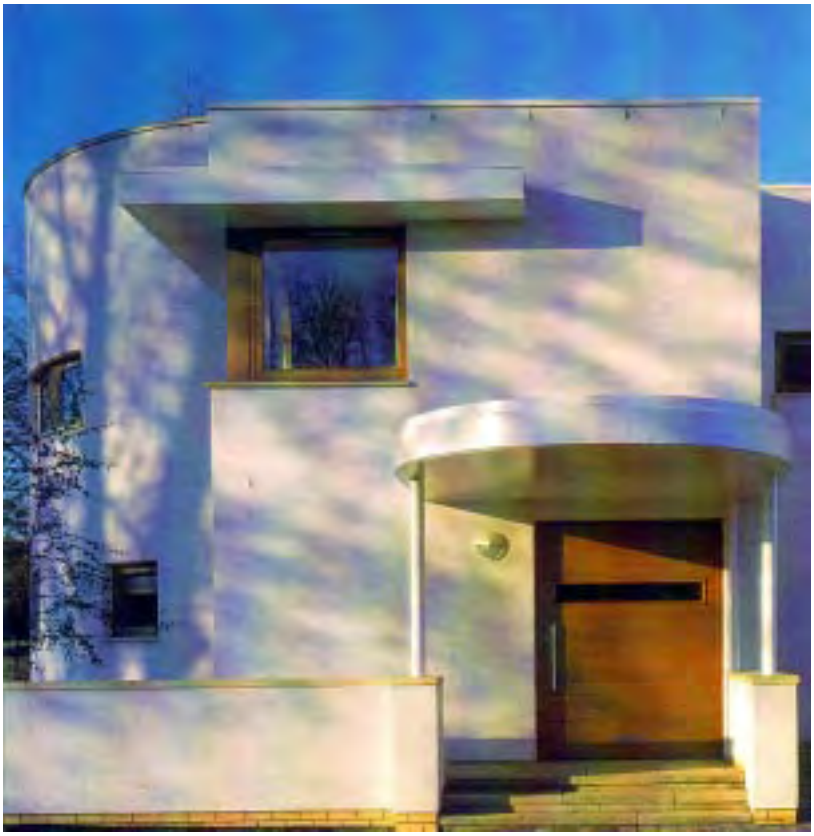
Example of good modern enclosure of an urban space.
Bowland Yard Mews, London.
Architect: Donald Insall.

Successful combination of timber, glass and natural stone for housing at Kinfauns, Perthshire.
Architects: McLaren, Murdoch and Hamilton.



Three and a half store flats with two and a hlaf story terraced housing at Cochrane Street , Irvine . Slate harling an cast stone,timber windows.
Architect: R Rutherford

An example of a housing development as a sympathetic new build adjunct to an old converted mill; exploits dormers, balconies, colour and water. Weavers Close, Arbroath.
Architects: Baxter, Clark and Paul.



Individual detached house finished in off-white render with natural timber windows. Principal's house for Strathclyde University, Glasgow.
Architect: McNeish Design Partnership

The importance of light entering from several directions, with enhanced views out, offered by bay windows. Gustafson House, Nacka, Sweden.
Architect: Anders Wilhelmson

Elegant small holiday house in timber with tiled roof. Boathouse, Inner Skerries, Stockholm. Architect: Anders Landström.

A mixed development of single storey terraced housing for the elderly at Folbe, Finland intended to create a village-like atmosphere. Architects: Kelkkinen and Komonen.

Four storey flats in natural stone on a corner of Byres Road, Glasgow. Part of the ground floor accommodates lettable retail space.
Architects: Simister Monaghan

Four/Five storey flats in roughcast and concrete block at Scrimgeour's Corner, Crieff, incorporating a ground floor retail unit. The flats turn an important corner site.
Nicol Russell Architects.

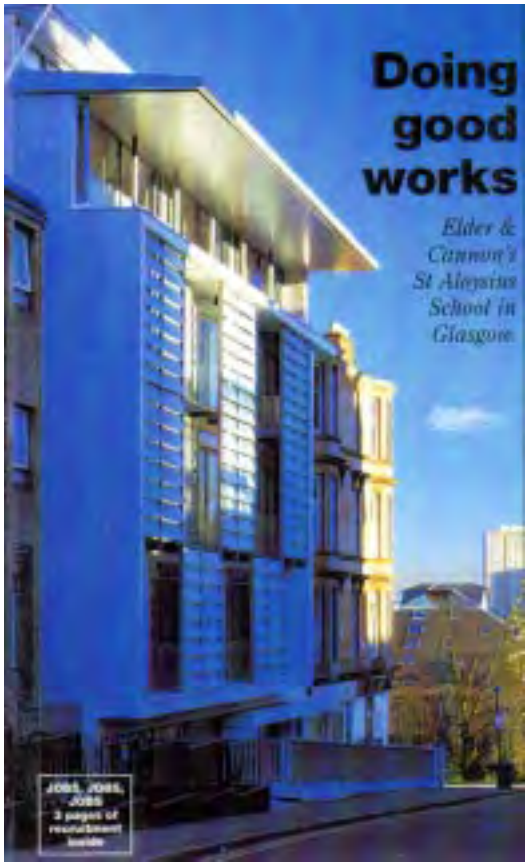
5. Primary School

There has been a long tradition over the last 50 years of excellent innovative school design in Britain. The best characteristics have included a flexible approach to teaching spaces, multi-purpose use, providing out of hours accommodation for the community, offering light airy and colourful spaces, set within a building envelope of our time.

It is proposed that the following design guidelines be adopted for the primary school on the Oudenarde site:

- In urban design terms the school should provide a focal point to the end of the tree lined avenue running north from the village square.
- Part of the school at two storeys to increase this impact.
- School to be suitable to encourage joint community use.
- Associated playing fields nearer the river for both school and community use.
- If possible the incorporation of fine weather outdoor teaching spaces on the sunny southern side.
- Full disabled access.
- School to utilise natural light and ventilation with an airy colourful interior to stimulate the children.
- There are likely to be considerable areas of glazing to achieve this. The material and colour for external walling should acknowledge that of the adjacent housing, but need not be the same.
- The roofing material should be dark in tone; slate would be an acceptable option but the roof profile and plan shape may suggest a metal roofing system, as more flexible.

Primary School in Jersey demonstrating a light colourful atmosphere, stimulating for children. Architect: Architecture PLB



St Aloysius Junior School, Glasgow, showing a light and airy atmosphere on several storeys. Note adjustable solar control louvres to facade. Architect: Elder and Cannon

Haute Vallée school in Jersey. Architect: Architecture PLB

6. Business Uses

Business uses at Oudenarde are proposed south of the railway line, to the west adjacent to the M90, and also in the south east corner. They could include such facilities as a petrol filling station, small business and workshop accommodation, a travelodge and a park and ride rail halt. It is the intention to show glimpses of these from the M90 through thinnings in the adjacent wooded shelter belt.

Such structures in the past have frequently been uninspired and utilitarian. At Oudenarde it is recommended that this complex develops, using the best modern structures within a parkland landscape setting.

- Establishment of landscaped spaces at the junctions with the A912 road, where views of the business park are revealed.

- Provide clear signage at these entrances 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.

- 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, viewed from eye level or from the raised motorway. 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, 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 disabled access

Hydro Texaco petrol station, Vinterbro, Norway.
This design for a multi-national company is the result of negotiations with Norsk form and the Norwegian Government and conforms to new design guidelines, recommended for all filling stations.
Architect: Odd Thorsen Design and Arkitektur.

Marketing suite for Edinburgh Zoo, showing successful use of curved metal roofing and coloured roughcast on a business building, adjacent to an older structure.
Architect: Smith Scott Mullan

Dundee Business Park
Business buildings set in high quality landscape.

Model making studio/business building, Windsor.
Modern use of steel and glass.
Architects: Corrigan, Soundy Kilaiditi

Budget speculative industrial /business units at Irvine, Scotland.
Architect: Irvine Development Corporation

Office and Administrative unit at Stockley Park, London.
Architect: Troughton Macaslan

Appendix 3:
Indicative Plant Schedule

Indicative Plant Schedule

1. Shelterbelt Planting

Width of planting areas to be 25 metres. Larger trees to be located toward centre of shelterbelt, to promote a positive microclimate in the adjacent back gardens (i.e. allow sun enter, while providing shelter from the wind).

Trees

Acer campestre	Field Maple
Betula pendula	Silver Birch
Betula pubescens	Common White Birch
Salix caprea	Goat Willow
Sorbus aucuparia	Rowan
Populus tremula	Aspen

Shrubs

Crataegus monogyna	Hawthorn
Ilex aquifolium	Holly
Prunus spinosa	Blackthorn
Rosa canina	Dog Rose
Vibirnum opulus	Guelder Rose
Pinus mugo	Mountain Pine

2. Linear Greenways

To be densely planted on edges to define boundaries. Central area of greenway to include pedestrian and cycle paths with groups of specimen trees set in open grassed areas.

Trees

Acer campestre	Field Maple
Betula pendula	Silver Birch
Betula pubescens	Common White Birch
Salix caprea	Goat Willow
Sorbus aucuparia	Rowan
Prunus padus	Bird Cherry

Shrubs

Crataegus monogyna	Hawthorn
Ilex aquifolium	Holly
Prunus spinosa	Blackthorn
Rosa canina	Dog Rose
Vibirnum opulus	Guelder Rose
Pinus mugo	Mountain Pine
Sambucus nigra	Elder

Specimen Trees

Prunus avium Gean
(to be planted in ones, twos or threes, with each tree between 7 to 10m apart)

Sorbus aucuparia Rowan
(to be planted in groups of three to seven, each specimen planted at least 5m apart)

Betula pubescens Common White Birch

(to be planted in groups of ten to twenty as feathered or whip specimens, from one to two metres apart)

3. Boulevard Planting

Sorbus aucuparia	Rowan
Tilia cordata 'Green Spire'	Hybrid Lime
Sorbus intermedia	Swedish Whitebeam
Carpinus betulus 'Fastigiata'	Hybrid Hornbeam
Flaxinus excelsior 'Westhof's Glorie'	Hybrid Ash

4. Planting along Railway Line

To be planted in a continuous belt to create a physical and visual buffer between the residences and the railway line.

Populus tremula	Aspen
Betula pendula	Silver Birch
Sorbus aucuparia	Rowan
Acer campestre	Field Maple
Salix caprea	Goat Willow
Sambucus nigra	Elder
Crataegus monogyna	Hawthorn
Ilex aquifolium	Holly

Appendix 4:
Road Options

(*prepared by* The TA Millard Partnership)

OUDENARDE ROAD NETWORK CONCEPT

Rev	Amendment	Drawn	Approved	Date
A	REV FROM CORE ROAD TO HOUSING ROAD ON CLAYTON ROAD	G.A.S.		

PERTH OFFICE
2 Whitefriars Cresent
Perth PH2 0PA
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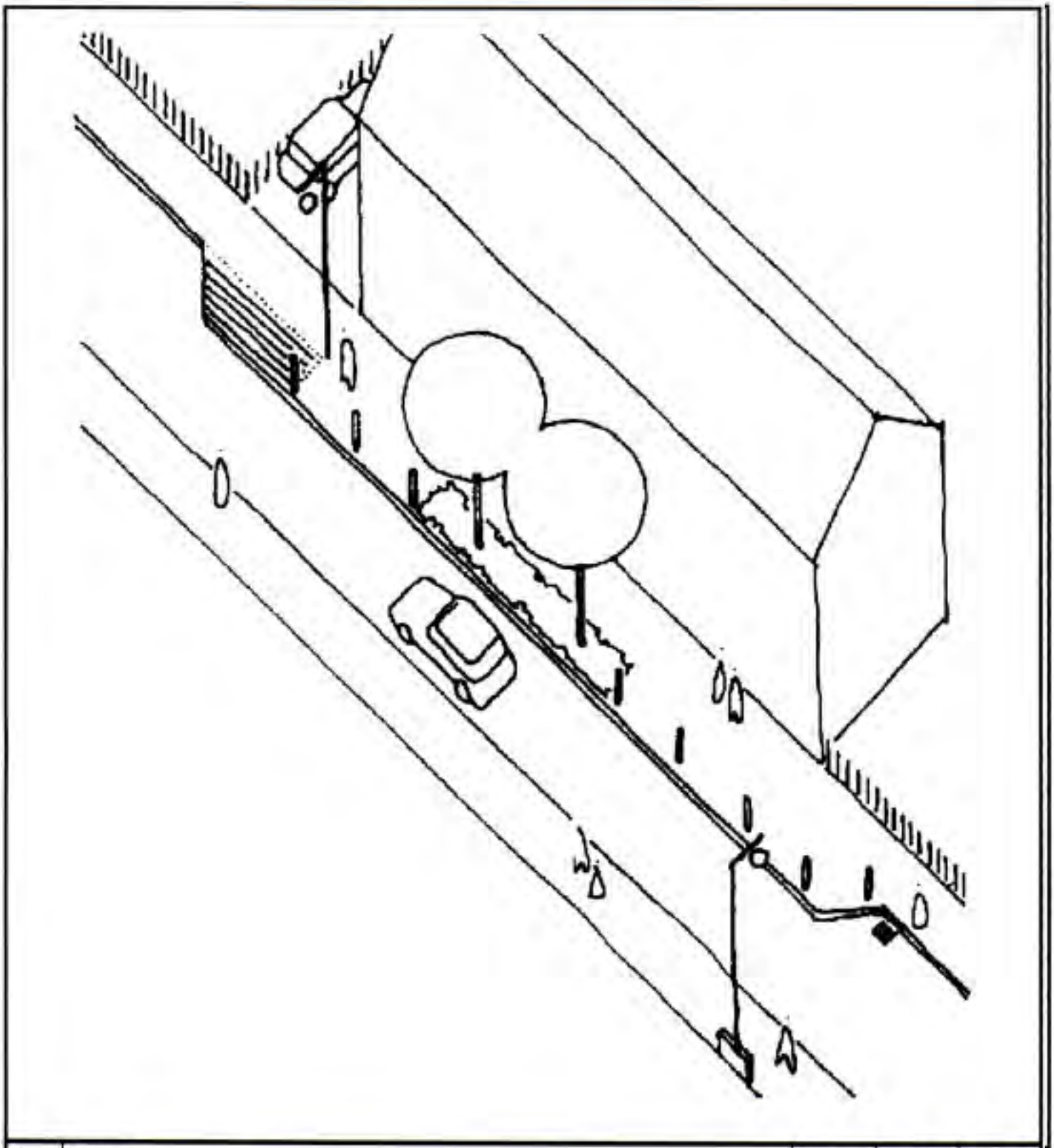
The TA MILLARD Partnership
CHARTERED CIVIL AND DEVELOPMENT ENGINEERS

Project: OUDENARDE	Drawn by: G.A.S.	Designed by: G.A.S.	Checked by: K.J.P.
Drawing Title: AS ABOVE	Approved by: K.J.P.	Date: 13/07/00	Scale: N.T.S.
	Cad Reference File No:		
Client: G.S. BROWN/WIMPEY HOMES	Drawing No.: SK2068/03/20		Rev.: A



Rev	Amendment	Drawn	Approved	Date

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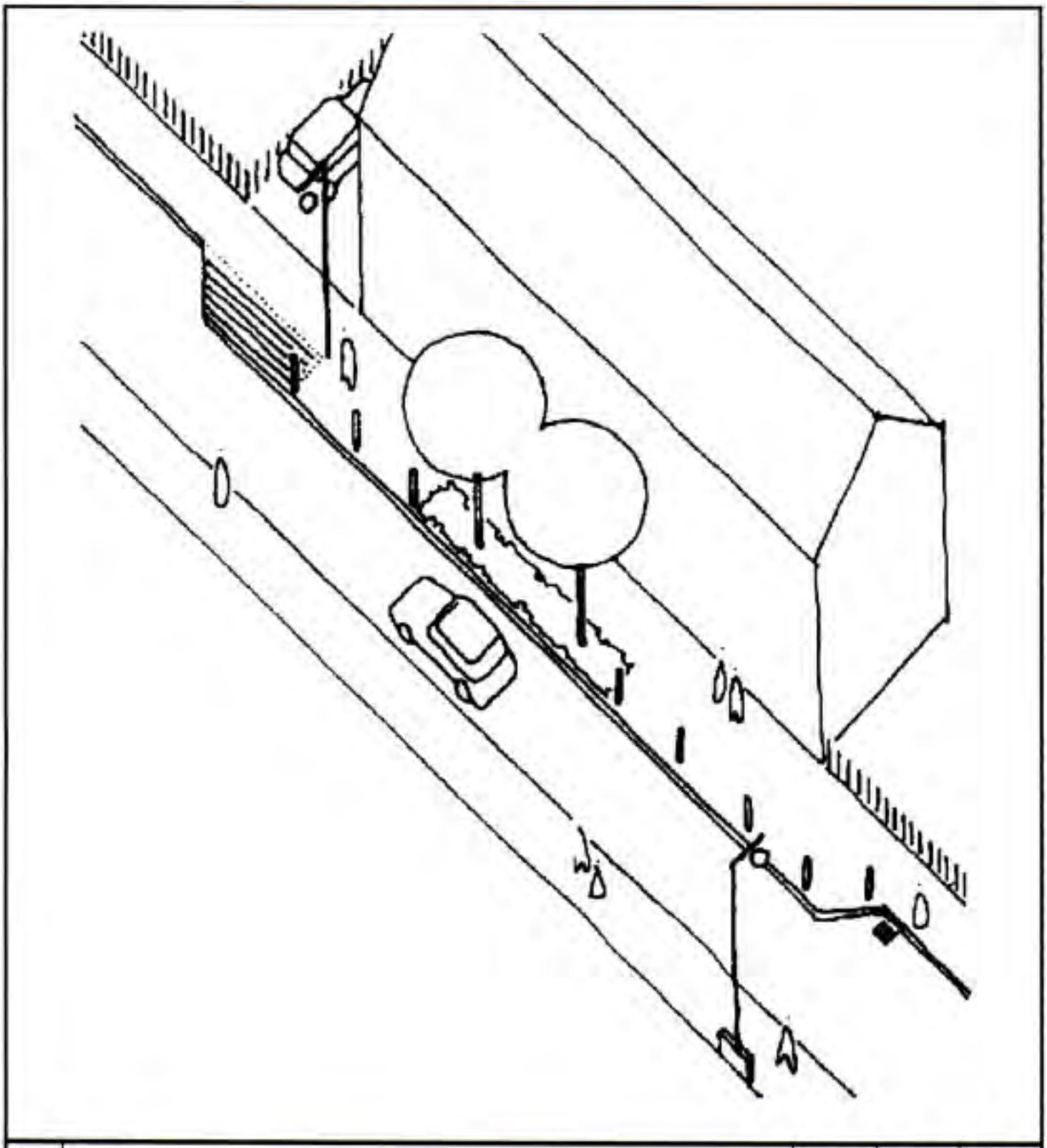
Project: OUDENARDE	Drawn by: G.A.S.	Designed by: G.A.S.	Checked by: K.J.P.
Drawing Title: TRAFFIC CALMING MEASURE WIDTH RESTRICTION TO CARRIAGEWAY	Approved by: K.J.P.	Date: 13/07/00	Scale: N.T.S.
	Cad Reference File No		
Client: G.S. BROWN / WIMPEY HOMES	Drawing No.: SKETCH 2		Rev.



Rev	Amendment	Drawn	Approved	Date

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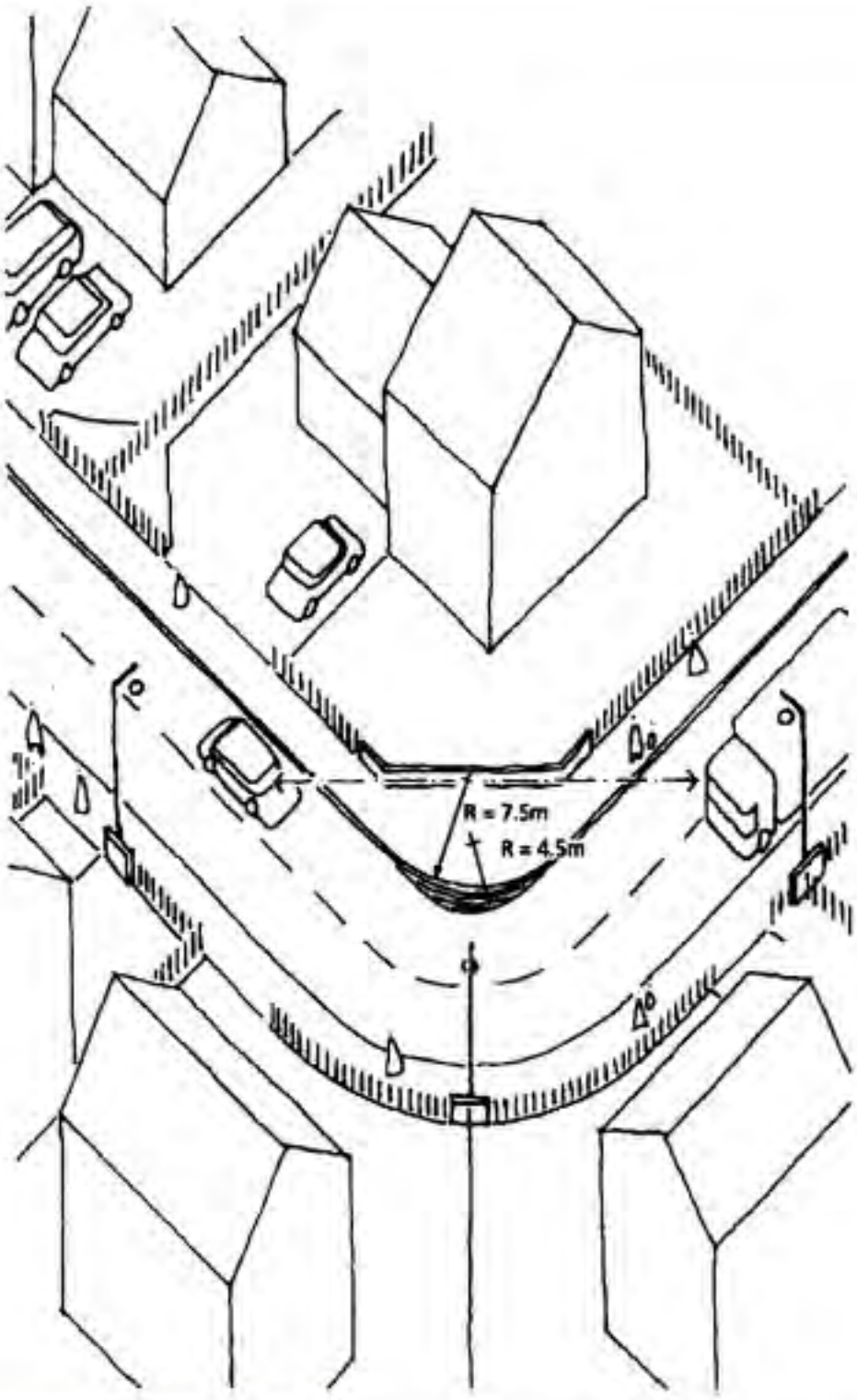
Project: OUDENARDE	Drawn by: G.A.S.	Designed by: G.A.S.	Checked by: K.J.P.
Drawing Title: TRAFFIC CALMING MEASURE WIDTH RESTRICTION TO CARRIAGEWAY	Approved by: K.J.P.	Date: 13/07/00	Scale: N.T.S.
	Cad Reference File No		
Client: G.S. BROWN / WIMPEY HOMES	Drawing No.: SKETCH 2		Rev.



Rev	Amendment	Drawn	Approved	Date

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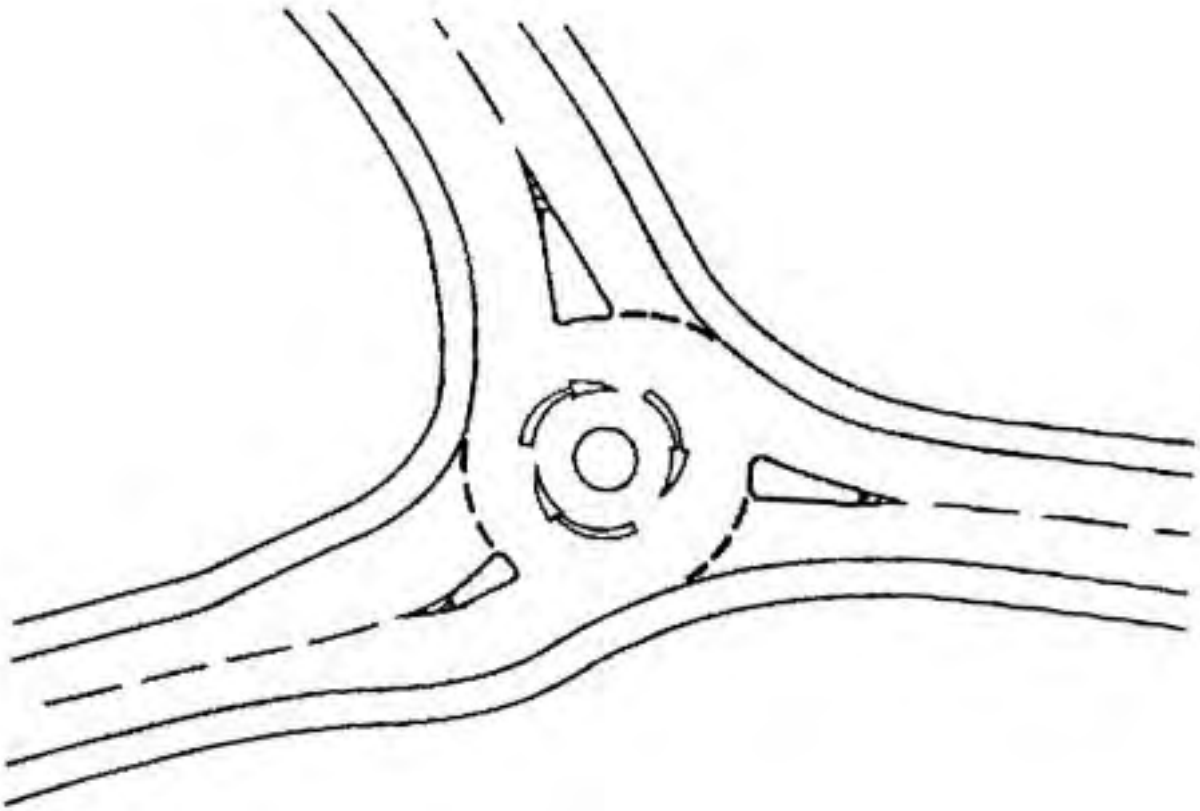
Project: OUDENARDE	Drawn by: G.A.S.	Designed by: G.A.S.	Checked by: K.J.P.
Drawing Title: TRAFFIC CALMING MEASURE SPEED CONTROL BEND	Approved by: K.J.P.	Date: 13/07/00	Scale: N.T.S.
	Cad Reference File No:		
Client: G.S. BROWN / WIMPEY HOMES	Drawing No.: SKETCH 3		Rev.



Rev	Amendment	Drawn	Approved	Date

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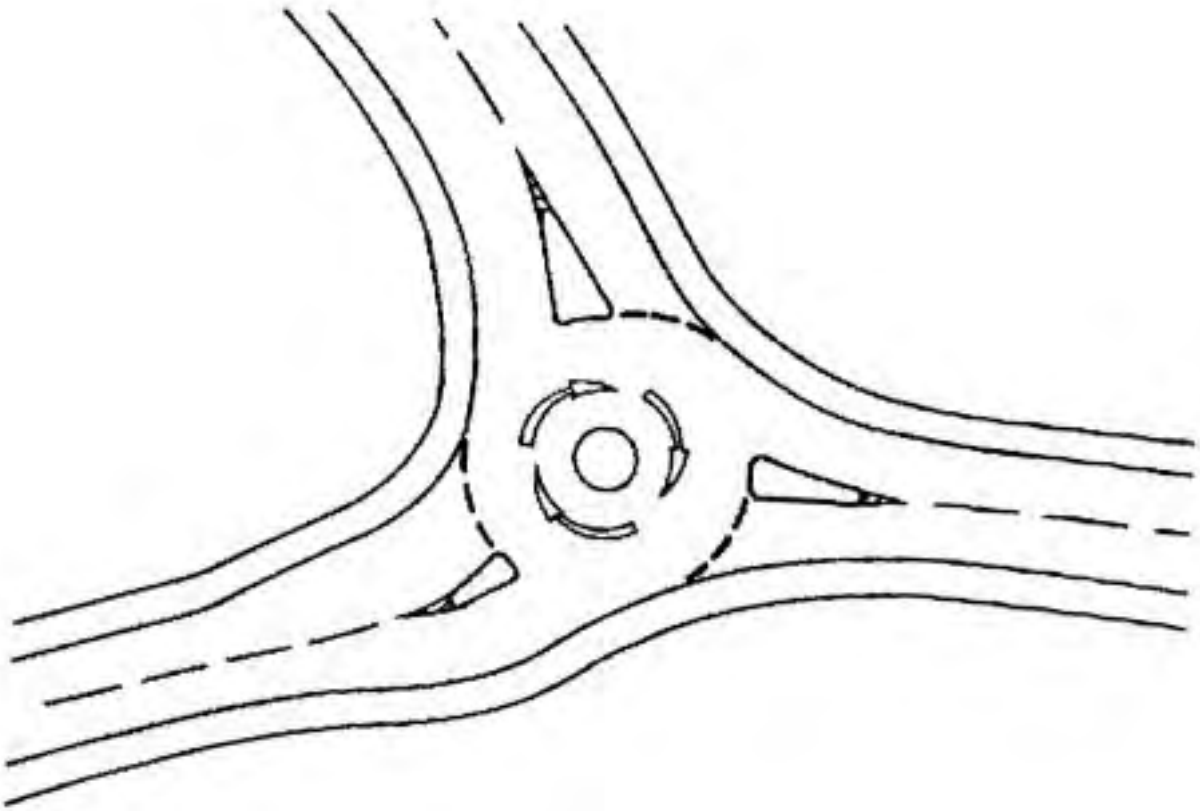
Project: OUDENARDE	Drawn by: G.A.S.	Designed by: G.A.S.	Checked by: K.J.P.
Drawing Title: TRAFFIC CALMING MEASURE MINI-ROUNDABOUT	Approved by: K.J.P.	Date: 13/07/00	Scale: N.T.S.
	Cad Reference File No		
Client: G.S. BROWN / WIMPEY HOMES	Drawing No.: SKETCH 5		Rev.



Rev	Amendment	Drawn	Approved	Date

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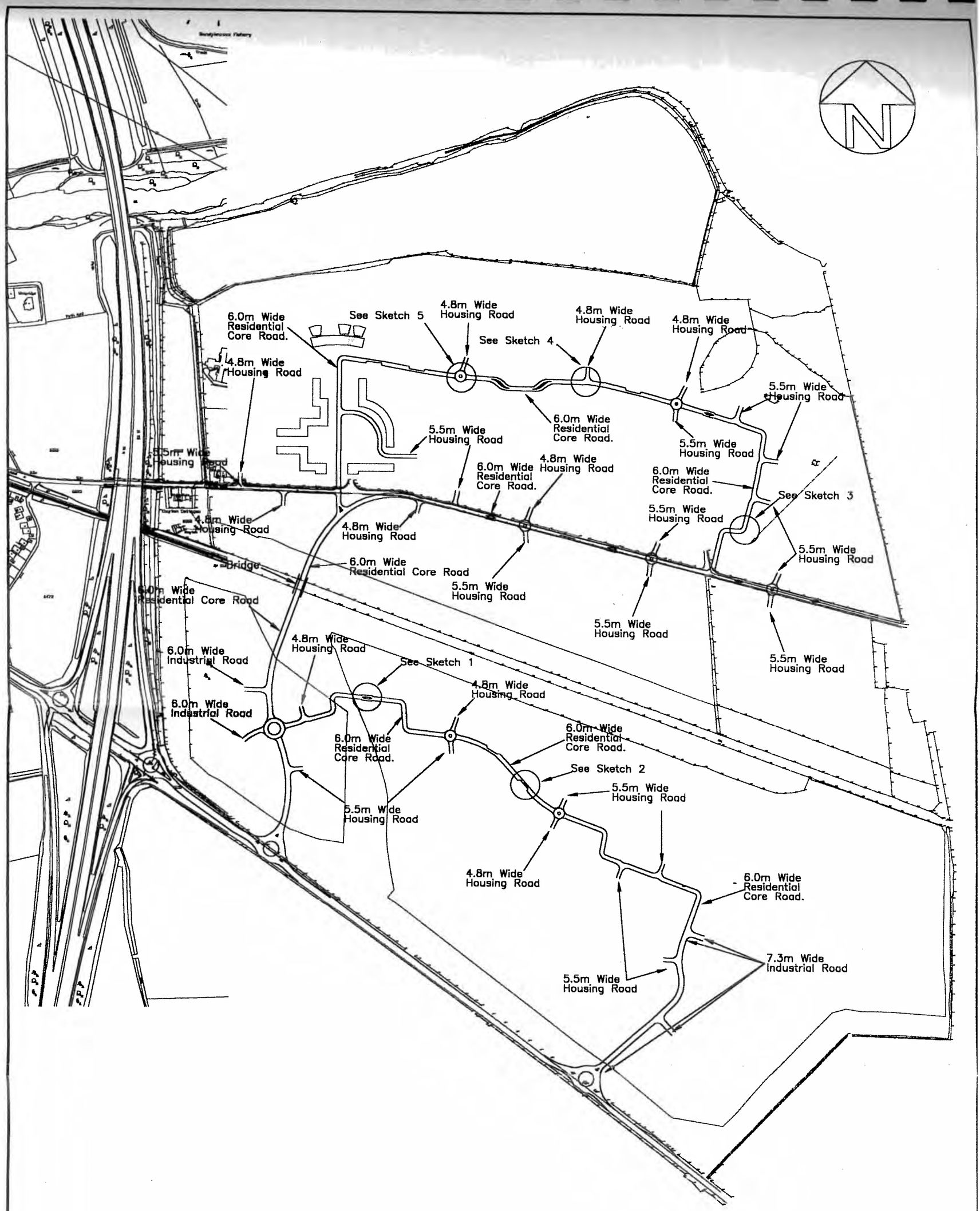
CHARTERED CIVIL AND STRUCTURAL ENGINEERS

Project: OUDENARDE	Drawn by: G.A.S.	Designed by: G.A.S.	Checked by: K.J.P.
Drawing Title: TRAFFIC CALMING MEASURE MINI-ROUNDABOUT	Approved by: K.J.P.	Date: 13/07/00	Scale: N.T.S.
	Cad Reference File No:		
Client: G.S. BROWN / WIMPEY HOMES	Drawing No.: SKETCH 5		Rev.



Rev	Amendment	Drawn	Approved	Date
A	Bridge narrowed to 8.0m	JMcD	KJP	24/7/00

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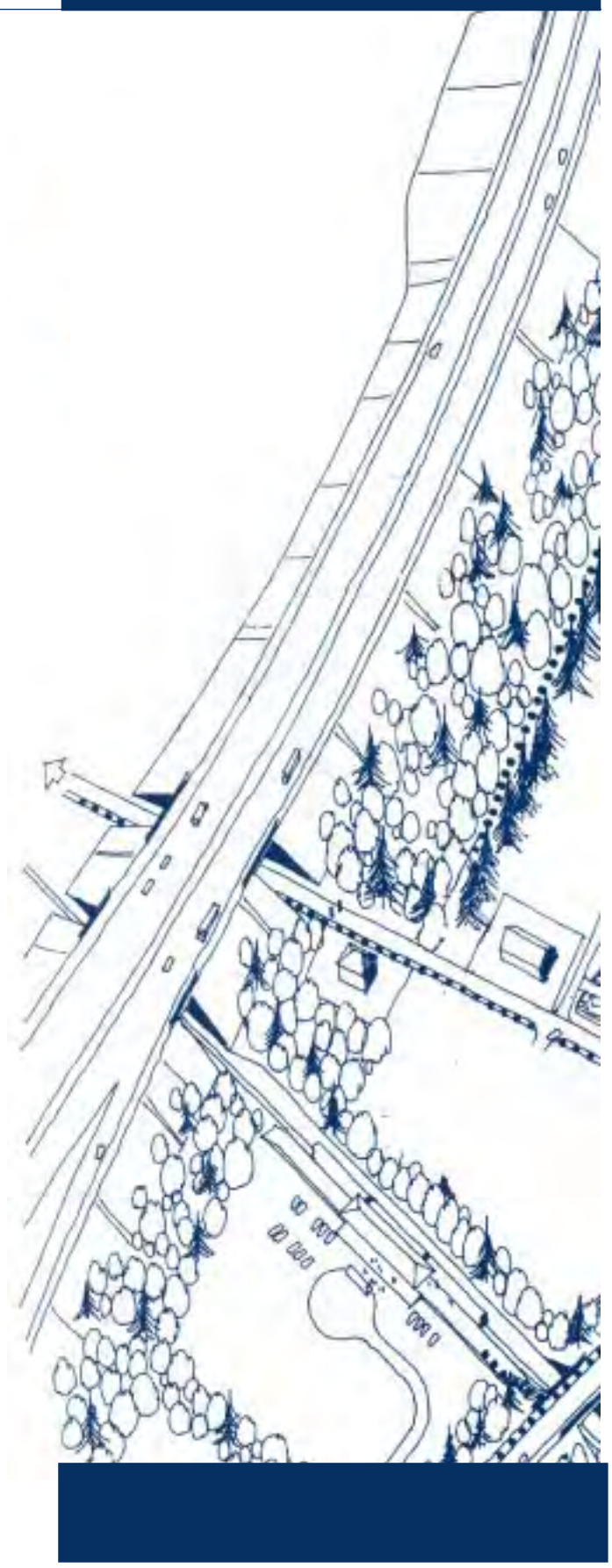
The TA MILLARD Partnership
CHARTERED CIVIL AND DEVELOPMENT ENGINEERS

Project: OUDENARDE			
Drawing Title: SCHEMATIC TRAFFIC CALMING MEASURES			
Client: G.S. BROWN / WIMPEY HOMES			
Drawn by: G.A.S.	Designed by: G.A.S.	Checked by: K.J.P.	
Approved by: K.J.P.	Date:	Scale: 1:5000	
Cad Reference File No:			
Drawing No.: SK2068/03/18		Rev.: A	

GS Brown
CONSTRUCTION

Wimpey Homes



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