Additional Information Submitted On Behalf of:

ANGUS ESTATES – LAND AT CARLOGIE, CARNoustie

- LETTER FROM EMAC PLANNING (28 FEBRUARY 2014);
- DRAINAGE IMPACT ASSESSMENT;
- SCHEDULE OF SITE AREAS
- LETTER FROM ANGUS ESTATES (13 MARCH 2014)
Dear Kevin,

**ANGUS LOCAL DEVELOPMENT PLAN:**
**CARLOGIE STRATEGIC DEVELOPMENT AREA**

I write further to our MIR submissions, subsequent meeting and discussions regarding the above strategic development proposal.

Further to your most recent e-mail, we discussed again and I provided an update e-mail with background to the work being carried out on the DIA, etc. The purpose of this correspondence is to respond to your specific queries as follows:

1. The envisaged phasing of new development, and how this would relate to the development of the new road.
2. The overall scale of new housing development that is envisaged (the approximate number of new homes).
3. Details of the ‘significant developer interest in all promoted land uses’.
4. The timescale for the commissioned Drainage Impact Assessment and whether the outcomes will be reported to the Council.

Taking each of these in turn I have set out below further information on the intended form, scale and phasing of development. Reference is also made to the attached indicative phasing plan which, based on the previously submitted Development Framework, seeks to assist an understanding and provide a context for the following information.

**Phasing of Development and Relationship to New Road**

The resolution to grant consent for the Business Park will shortly be formalised through the signing and registration of the Section 75. Upon release of the consent, the intention remains to implement a first phase of the Business Park in areas E1 and E2 as identified on the attached plan. Providing a net area of 3.6 ha, this is considered to be a deliverable first phase. Accessed from the north, the first two phases provide a context and setting for the new Carlogie Road link, which of course benefits from the extant planning permission for the A92 Dualling.

Specifically regarding the new link road, on behalf of Angus Estates Ltd, Fairhurst have recently re-examined the approved alignment, cuttings, embankment, road services provision, etc and provided a programme and cost estimate for its implementation. The commitment to the delivery of the road and its integration with the phased delivery of the Business Park therefore remains and is ongoing subject to the imminent approval of the Business Park planning permission.
It is important to reiterate this point as the MIR specifically recognises that, leaving aside the viability of the road improvements, there are a number of reasons why the Carlogie option would be suitable for new development.

Firstly, the MIR recognises that the Carlogie area benefits from a landscape framework that can be further enhanced to successfully accommodate new homes and businesses. Furthermore, the site is accessible to both primary schooling and secondary schooling and, lying within the Carlogie catchment area, there is primary school capacity. In comparison with the Upper Victoria option, the Carlogie proposal therefore has a better landscape fit, better primary school capacity and is in fact closer to the town centre.

**Scale of Housing Development**

The following response seeks to address your query on scale but also draws context and reference from density and tenure. As way of local comparator, we’ve also made reference to the MIR findings on scale for Upper Vistoria and hope this provides a useful context.

The MIR clearly recognises that Upper Victoria does not have an appropriate strategic context, having an area and land take significantly in excess of the TAYplan housing requirement and requires extensive landscaping over the long term to seek to mitigate the current adverse impacts of the development on an open site with no defensible boundaries.

The first principle regarding the scale of the proposed housing development at Carlogie is that it has been designed in such a way as to accommodate but not exceed the approved TAYplan housing requirement. We consider this to be an important principle to seek conformity with the recently approved TAYplan and not prejudice future strategic planning beyond tested and approved planning principles and timeframes.

In terms of specific housing numbers, the attached plan and schedule set out the net areas available for development. Subject of course to the final approved layout of the development, the current plan demonstrates that available housing land equates, net of roads and open space, to approximately 16 hectares (approx 40 acres). Taking an average density of 25 houses per hectare (10 per acre) this allows for approximately 400 houses, i.e. entirely in keeping with an appropriate level of development for a third tier settlement within the South Angus Housing Market Area.

With regard to Affordable Housing, the size of the site and the form of layout lends itself well to integrated but adaptable spaces and within this structure we welcome the opportunity for an appropriate level of Affordable Housing as a mixed tenure approach to development.

**Delivery / Developer Interest**

Angus Estates and their Directors have extensive experience in owning and operating Business Parks and remain committed to working with Angus Council to deliver the current allocation. Constructing and leasing therefore remains an option and Angus Councils recent budget pledge for financial assistance to the delivery of the Business Park is of course welcomed. There is therefore now a good balance between experience and available funding.

Angus Estates and their agents also remain in ongoing dialogue with two major supermarket operators, both of whom have confirmed that they are interested in acquiring the supermarket site, in terms acceptable to Angus Estates, once planning permission is achieved.

Specifically with reference to the developer interest in the housing area, although confidential at this stage, I can inform that the preferred developer is Central Scotland based with experience of building in Carnoustie and has a strong 30 year track record of delivering both housing and business developments within Angus and throughout Scotland. Again, subject to confirmation of allocation, the housebuilder remains interested in acquiring the land, in terms acceptable to Angus Estates.
Drainage Impact Assessment

As intimated in last weeks e-mail, the Drainage Impact Assessment has been undertaken by Fairhurst on behalf of Angus Estates Limited and covers the entire MIR identified site. A copy of the final report is attached.

In summary the DIA identifies that the topography of the site lends itself well to the creation of a conventional separated foul and surface water drainage system; foul water sewers from the site will discharge into the public system and a number of connection points local to the site are available; an acceptable SUDS system can fit into the draft development framework in an acceptable and integrated manner and in such a way as to enhance public open space and provide additional and varied habitat within the site; the surface water can then be discharged at a controlled rate to the Lochty Burn west of the site and to the Monikie Burn to the north in a manner that will not cause detriment to the local hydrological environment; and the site is not considered to be at risk of flooding from either the Lochty Burn or from the Monikie Burn. The DIA therefore confirms that an integrated and sustainable drainage system can be achieved for the proposed development.

Summary

We trust the above provides sufficient information although should you have any queries please do not hesitate to get in touch on the usual number. As intimated in your e-mail, if you consider a meeting to be appropriate we would be happy to accommodate.

Kind regards.

Yours sincerely,

EWAN A MACLEAN M.R.T.P.I.
EMAC PLANNING LLP

Cc Gordon Pyper
Executive Summary

A Drainage Impact Assessment has been undertaken by Fairhurst on behalf of Angus Estates Ltd for a prospective development site at Carlogie, situated to the north of Carnoustie, Angus.

The Angus Local Development Plan, Main Issues Report (MIR) published in 2012 considers options for the immediate and longer term development of Carnoustie. The subject land is identified within the MIR as a reasonable option for the future mixed use growth of Carnoustie.

It is also material that the land above the raised beach is identified within the Adopted Angus Local Plan 2009 as employment allocation C7, suitable for approximately 15ha of land for Class 4 (Business), Class 5 (General Industrial) and Class 6 (Storage and Distribution) so the principle of development on part of the subject land is already clearly established. This land also benefits from a resolution to grant planning permission in principle for such use.

The Drainage Impact Assessment identified that the topography of the site lends itself well to the creation of a conventional separated foul and surface water drainage system. Foul water sewers from the site will require to discharge into the public sewerage system and a number of connection points either local to the site or further afield appear possible.

It will be possible to incorporate a Sustainable Urban drainage System (SUDS) into the draft development framework, in an acceptable and integrated manner and in such a way as to enhance public open space and provide additional and varied habitat within the site. Surface water could be discharged at a controlled rate to the Lochty Burn west of the site and to the Monikie Burn to the north, in a manner that will not cause detriment to the local hydrological environment.

The site is not considered to be at risk of flooding from either the Lochty Burn or from the Monikie Burn.

The Drainage Impact Assessment concluded that an integrated and sustainable drainage system can be achieved for the proposed development.
CONTROL SHEET

CLIENT: Angus Estates Ltd

PROJECT TITLE: Carlogie Development Site, Carnoustie

REPORT TITLE: Drainage Impact Assessment

PROJECT REFERENCE: 98288

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This report has been prepared in accordance with procedure OP/P02 of the Fairhurst Quality and Environmental Management System.
Contents

1.0 Introduction ............................................................................................................. 1

2.0 Planning Context .................................................................................................... 2

3.0 The Site .................................................................................................................. 5
   3.1. Site Location and Topography ............................................................................ 5
   3.2. Ground Conditions ............................................................................................ 6
       3.2.1. Superficial Geology .................................................................................. 6
       3.2.2. Solid Geology ......................................................................................... 6
       3.2.3. Hydrology ............................................................................................... 6
       3.2.4. Hydrogeology .......................................................................................... 6
       3.2.5. Ground Investigation and Infiltration testing .............................................. 7
   3.3. Existing Sewerage Infrastructure ....................................................................... 7
   3.4. Local Watercourses ........................................................................................... 8
   3.5. Surface Water Runoff ....................................................................................... 9
   3.6. Flooding ............................................................................................................ 9

4.0 The Proposed Development ................................................................................... 11
   4.1. Development Layout ....................................................................................... 11
   4.2. Development Drainage Strategy ...................................................................... 12
   4.3. Foul Water Drainage ....................................................................................... 12
   4.4. Surface Water Drainage / SUDS Strategy ......................................................... 14
       4.4.1. Preliminary Hydraulic Calculations .......................................................... 17

5.0 Summary and Conclusions .................................................................................... 20

Appendices

Appendix A – Figures
Appendix B – Preliminary Hydraulic Calculations
1.0 Introduction

Angus Estates Limited has aspirations to develop a large Greenfield site located at Carlogie to the north east of Carnoustie, as a mixed commercial and housing development. The site under consideration is featured as an option in the Angus Local Development Plan – Main Issues Report¹.

Fairhurst has undertaken a Drainage Impact Assessment for the development site in order to demonstrate that an integrated and sustainable drainage system may be achieved for the development. This report presents the findings of the assessment and forms the basis of a sustainable drainage strategy for the development site, considering both foul water and storm water drainage issues.

The objectives of this assessment are as follows:

- To investigate the existing catchment regime.
- To make an estimate of existing and post-development drainage flows.
- To review the existing sewerage provision in the proximity of the site.
- To demonstrate how the application of appropriate SUDS may be used to mitigate the effects of development on the environment.

The Drainage Impact Assessment provides an estimate of the foul water flows likely to be generated by the development and addresses issues associated with conveyance and disposal of waste water.
2.0 Planning Context

In early 2010, Scottish Planning Policy document SPP7 on “Planning and Flooding” was revoked to be superseded by the new Scottish Planning Policy document\(^2\). The new document offers the following guidance in relation to Drainage:

209 The Water Environment (Controlled Activities) (Scotland) Regulations 2005 require all surface water from new development to be treated by a sustainable drainage system (SUDS) before it is discharged into the water environment, except for single houses or where discharge will be into coastal water. The aim of SUDS is to mimic natural drainage, encourage infiltration and attenuate both hydraulic and pollutant impacts on people and the environment. Surface water drainage measures proposed as part of a planning application should have a neutral or better effect on the risk of flooding both on and off the site. Where flooding is an issue, SUDS should be designed to mitigate the adverse effects of a storm inflow into the watercourse or sewer. Local development plans should incorporate the legal requirement for SUDS, promote a coordinated approach to SUDS between new developments and set out expectations in relation to the long term maintenance of SUDS. Planning permission should not be granted unless the proposed arrangements for surface water drainage are adequate and appropriate long term maintenance arrangements will be in place.

210 Sites identified as appropriate for development can sometimes be constrained by a lack of water supply or waste water infrastructure capacity. If a proposed development is considered acceptable in a location where the current water or drainage infrastructure would be insufficient, stakeholders should work together to identify the best practicable option to accommodate the development. For large scale development proposals in areas where drainage is already constrained or otherwise problematic or if there would be off-site effects, a comprehensive drainage assessment will be required. Drainage assessments cover both surface and foul water.

Planning Advice Note 61 (PAN61) “Planning and Sustainable Urban Drainage Systems” (2001)\(^3\) gives good practice advice for planners and the development industry complementing the Sustainable Urban Drainage Systems Design Manual for Scotland and Northern Ireland (2000)\(^4\). Drainage of land is required to make it suitable for development, to protect existing and proposed development from the effects of flooding, and to deal with pollution arising from the interaction of rainwater and the development. Flood risk and other environmental damage can be managed by minimising changes in the volume and rate of surface run-off from development sites through the use of sustainable drainage systems.

Planning Advice Note 61 suggests that a Drainage Impact Assessment provides the following information in relation to surface water drainage associated with the urbanisation of parts of the catchment.
• An indication of the types of measures to be used.

• Which measures will be considered in the detailed design.

• Evidence of sub-soil porosity and suitability for use of infiltration SUDS.

• Pre and Post-development runoff calculations to determine the scale of SUDS required.

• An assessment of flood risk where this is deemed appropriate.

• Proposals for integrating the drainage system into the landscape or required public open space.

• A demonstration of good ecological practice including habitat enhancement.

• Estimates of land take for different drainage options based on initial calculations carried out to size any significant drainage structures.

Within the Angus Local Plan Review\(^2\), Angus Council outlines the following policies with regard to Drainage Infrastructure:

**Policy ER24 : Surface Water Disposal**

*Sustainable Urban Drainage Systems are preferred in dealing with surface water drainage from all new development. In considering development proposals Angus Council will consult and liaise closely with SEPA, Scottish Water and developers in order to ensure that appropriate methods of surface water run-off collection, treatment, decontamination and disposal are implemented to minimise the risk of flooding and the pollution of watercourses, lochs and groundwater.*

*Proposals that adopt ecological solutions to surface water management which promote local biodiversity by the formation of ponds and/or wetlands for example, and create or improve habitats will also be encouraged.*

**Policy ER22 : Public Drainage Systems**

Within towns and villages served by public sewers all development proposals requiring drainage must be connected to the public drainage system. Private drainage solutions will not be permitted within areas served by public sewers, even where they are subject to constraint.

**Policy ER23 : Private Drainage Systems**

Development proposals requiring the private provision of waste water treatment plants, biodiscs, septic tanks or similar arrangements will only be acceptable where:-

(a) The site is located outwith the public sewerage network.
(b) The proposed development is in accord with the development strategy and other relevant policies of the local plan.

(c) There is no detrimental effect to a potable water supply, or supply for animals or an environmentally sensitive water course or loch, including ground and surface waters and

(d) The requirements of SEPA and/or The Building Standards (Scotland) Regulations 1990, as amended, are met in relation to installation, e.g. proximity to other buildings.

The Angus Local Development Plan, Main Issues Report (MIR) was published in 2012 and considers options for the immediate and longer term development of Carnoustie. The subject land is identified within the MIR as a reasonable option for the future mixed use growth of Carnoustie.

It is also material that the land above the raised beach is identified within the Adopted Angus Local Plan 2009 as employment allocation C7, suitable for approximately 15ha of land for Class 4 (Business), Class 5 (General Industrial) and Class 6 (Storage and Distribution) so the principle of development on part of the subject land is already clearly established. This land also benefits from a resolution to grant planning permission in principle for such use.
3.0 The Site

3.1 Site Location and Topography

The prospective development site is situated to the northeast of Carnoustie in Angus, on land located to the east of the A930 Carlogie Road. The National Grid Reference for the site is NO 5644 3584. The development area is presently in agricultural usage, being predominantly arable farm land with a small wooded area located within the north eastern corner of the site. The surrounding land to the north, east and west is agricultural and to the south comprises established residential development. Privately owned residential properties also exist within the general development area and adjoining the western site boundary adjacent to the A930. These properties do not form part of the prospective development land.

The site of total area 42.5 Ha, is comprised of two fairly regularly shaped rectilinear areas situated either side of Carlogie Road. The section of land to the east of Carlogie Road, measures approximately 36.8 Ha and forms the major part of the development site. This area is bounded to the west and northwest by Carlogie Road, to the north east and east by a minor unnamed road, the U508(2) and to the south by Panbride Road and a number of existing domestic properties. The adjoining and smaller development area of approximately 5.7 Ha is bounded to the east by Carlogie Road, to the south by a recreation ground and the adjacent housing development, to the west by the Lochty Burn and to the north by farmland and a partial field boundary.

A topographic survey of the site has not yet been undertaken, but examination of contours on the Ordnance Survey plan of the area and general observation on site, indicates that the land within the northern end of the site forms a gentle ridge aligned west to east. The ground falls away from the ridge towards the northeast and the southwest at fairly uniform and moderate gradients. The ridge across the site forms the watershed between the natural catchments of the Monikie Burn to the north and the Lochty Burn to the southwest. Ground level along the crest of the ridge appears to be around 40m to 42m Above Ordnance Datum (AOD). Ground level at the south west corner of the site is around 25.5m AOD and at the north east corner is around 36.2m AOD.

A site location plan is included as Figure 1, Appendix A, of this report.
3.2. Ground Conditions

A Geo-environmental desk study or ground investigation not yet been commissioned for the site. However published information on the local geology of the area has been examined, from which an indication of ground conditions and soil infiltration potential may be estimated.

3.2.1. Superficial Geology

British Geological Survey (BGS) map 1:50,000 Drift Edition (Sheet 049E Arbroath) states that the site comprises an area of mixed superficial geology. The northern area of the site is shown to be Glacial Till, compact sandy CLAY containing clasts of local rock and far travelled erratics. The central area of the site is shown to be Glacial Meltwater deposits, SAND and GRAVEL, commonly giving rise to moundy and kettled topography. The southern area of the site is shown to be Raised Marine deposits, including Littoral SAND and GRAVEL and intertidal SILT and CLAY (Carse Clay).

3.2.2. Solid Geology

The 1:50,000 BGS mapping shows the solid geology of the site to be predominantly Lower Devonian Cross-Bedded Sandstone, In the Garvock group (Arbroath Sandstone and Red Head formation) the Sandstones vary from red to purple and contain abundant intraformational Limestone Detritus.

3.2.3. Hydrology

There are two watercourses close to the site. The nearest is the Lochty burn flowing in a southerly direction alongside the south western edge of the development area. The Monikie Burn, whose course lies approximately 200m to the north east of the site flows in a south-easterly direction. Water is likely to shed from the site to both these burns. The nearest major water feature to the site is the Tay Estuary at Carnoustie Bay, which lies around 1.3km to the south of the site.

3.2.4. Hydrogeology

The BGS Hydrogeological Map of Scotland (1:625,000) (1988) shows the site to be in a region of Lower and Middle Old Red Sandstone, locally important aquifers in which flow is dominantly in fissures and other discontinuities.

Groundwater in the Carnoustie area is generally very shallow, approximately 1.5 to 2.5mbgl and present within the raised beach deposits. In this area groundwater is likely to be dominated by the historical glacial groundwater channels that are noted to be present within the site boundary. Groundwater direction is likely to be overall draining to the south, however, influence of the local burns may alter the direction of groundwater flow.
3.2.5. Ground Investigation and Infiltration testing

The British Geological Survey Onshore GeoIndex provides Borehole Logs from a previous Ground Investigation undertaken at Carlogie Primary School, approximately 300m south of site. The logs identify Gravels, Sands, Silts and Clays underlain by possible Sandstone between 7.00 and 10.00mbgl. Borehole logs from a separate Ground Investigation undertaken at Woodlands Caravan Park, approximately 500m south west of the site identify Sands, Gravels, Silts and Clays underlain by possible Sandstone between 3.00 and 4.00mbgl. Geological mapping/previous investigations have identified that there may be shallow rock head, soils of potentially low permeability and shallow ground water present and that this should be investigated. It is recommended that an intrusive site investigation is undertaken on the site to ascertain the ground conditions and determine the extent of the potential geotechnical constraints at the site. The site investigation should include a number of in-situ infiltration tests, carried out in accordance with the procedure described in CIRIA Report 156 Infiltration Drainage – Manual of Good Practice and focusing particularly on areas where SUDS facilities are likely to be installed as part of the development.

3.3. Existing Sewerage Infrastructure

Record information on existing public sewerage in the vicinity of the site and extending to include the area Carnoustie to the south was obtained from Scottish Water (Figure 3, Appendix A).

The plan indicates that the existing housing estates located immediately to the south and west of the Carlogie development area, are served by a separate system of foul and surface water sewers. Further south, in the older areas of Carnoustie, the sewers operate on a combined system, with trunk sewers running generally from north to south along the main thoroughfares, picking up branches feeding in from east and west along the side streets. The trunk sewers cross the main Dundee to Aberdeen Railway line in a number of places to be intercepted by large diameter combined trunk sewers running from west to east between the railway and the foreshore. The combined trunk sewers discharge to the Westhaven PFI pumping station and Combined Storm Overflow facility situated adjacent to Admiral Street. This pumping station lifts sewage flows into the large diameter pumping main which feeds the Hatton Waste Water Treatment Works from the west.

The land south of the site falls naturally southwards. The foul sewers serving the housing estates south of Panbride Road, form a system generally running south, following the road network and converging to connect into the combined sewers in Westfield Road at two points. The surface water sewers serving this area run generally southwards in parallel with the foul sewers, but turn west and link into a large diameter surface water outfall sewer, which is routed along Guthrie Street to discharge into the Lochty Burn at a point just to the southeast of Brookfield Carehome.

The housing estate south of Newton Road is similarly served by a separate sewerage system, the foul sewers flowing southwards to a Waste Water Pumping Station (WWPS) at Newton Crescent, which pumps sewage up to discharge into the combined sewer in Carlogie Road. The surface water sewers for this housing area also outfall into the Lochty Burn.
The recent housing developments to the north of Newton Road are served by a separate sewerage system. The foul sewers converge on a Waste Water Pumping Station (WWPS) located on Newton Road adjacent to the Lochty Burn. The pumping station lifts sewage up through a short length of pumping main running eastwards along Newton Road, to discharge into the upstream end of the foul sewer in Newton Crescent. From here it is carried under gravity to a connection with the combined sewer in Carlogie Road.

Photograph 2 – WWPS, Newton Road

A 225mm diameter combined sewer is shown to serve the housing cluster at Carlogie Farm Road (just south of the Carlogie Hotel). The sewer follows Carlogie Road flowing south past the site, to link with the combined sewerage system and continue southwards through Carnoustie. The record plan also indicates a number of septic tanks associated with the houses in the Carlogie Farm Road group. Reference to an older sewer record plan dated December 2005 indicates that, although these houses were in existence at that time, this sewer was not recorded. As it does not appear that this sewer was laid recently, it seems likely that the sewer may have originally served solely as road drainage for the A930, but was possibly extended to connect these properties into the public sewerage system and remove the need for each household to rely on private sewage treatment units. Site inspection has identified a manhole chamber located on the verge of Carlogie Road at the junction with Panbride Road which is not shown on the Scottish Water plan. The pipe appears to be around 225mm diameter, running from north to south and although not in the position shown on the plan, it seems to be the combined sewer referred to on the plan. This sewer is considered to be at a sufficient depth and in an ideal location to receive foul water from the future development site immediately to the north east.

Photograph 3 – Existing Manhole, junction of Carlogie Road and Panbride Road (South West corner of site)

3.4. Local Watercourses

The site straddles the natural catchments of both the Lochty Burn, lying to the southwest and the Monikie Burn, which lies to the north. The watershed bisects the northern part of the site.
The Lochty Burn is a minor watercourse draining an area of farmland to the west of the site. The Lochty Burn flows south through Carnoustie to a confluence with the River Tay. The Burn is generally in open channel on the majority of its course through the town, but on route it does pass through various culverts crossing under roads and under the main Aberdeen Dundee railway line.

The Monikie Burn flows generally from northwest to south east through a series of Dens to its confluence with the River Tay around a kilometre east of Carnoustie. The burn is fed by a number of small tributaries and drainage ditches serving a rural catchment area to the north and west of the site.

Photograph 4 – Lochty Burn at Newton Road

3.5. Surface Water Runoff

The site is in Greenfield condition and may be considered to produce 132 l/s runoff during a two year return period storm event (Greenfield runoff calculations are included in Appendix B).

On the basis of topography and probable ground conditions, it is likely that rainwater falling onto the site will either permeate the ground and recharge the local water table, or flow overland, following the natural falls on the ground towards the south west and northeast in the direction of the Lochty and Monikie Burns respectively. Antecedent conditions of weather and soil saturation, crop cover and type, together with ploughing patterns and the possible presence of field drainage, will affect the degree to which water either permeates the soil or runs off. Ground water is likely to flow towards the burns north and south.

It is unlikely that overland flows of surface runoff from the undeveloped site would cross intervening roads and land to reach the burns except in very extreme weather conditions. However it is evident that water running off the fields at present, flows onto Carlogie Road at a number of points and enters the combined sewer via the road gullies. From silt deposits observed in the road channel and within the gullies, it is clear that the current runoff carries quantities of silt into the public sewer to the likely detriment of the drainage system. There is a good argument therefore that development of the site and installation of SUDS systems, would prevent the current uncontrolled runoff from entering the combined sewers, and potentially free up capacity in the system for foul water generated by the development.

3.6. Flooding

The Scottish Environment Protection Agency (SEPA) Indicative River and Coastal Flood Map (Scotland) denotes that the proposed development site does not appear to be in an area which is at risk from flooding. However the land directly adjacent to both the Monikie Burn and the Lochty Burn is designated as being ‘at risk of flooding from rivers’ and as a
result, this may cause inundation on land immediately adjacent to each burn. The level of the site is generally much higher than the Monikie Burn, which is located approximately 200m from the site at its nearest point, and separated by arable farmland. The development site is therefore not considered to be at risk of flooding from this burn.

The Lochty Burn borders the south western section of the site. However aside from the area in the immediate vicinity of the burn, the site from its geographically location and higher elevation, it is unlikely to be at any significant risk of flooding from this Burn. Care must be taken however when siting any SUDS facilities, to ensure that they are located outside the potential flood zone adjacent to the burn. Generally however it is considered that such drainage features can be installed within the major part of the site without undue risk of inundation by river or coastal flooding.
4.0 The Proposed Development

4.1 Development Layout

A preliminary development Masterplan for the development has been prepared by EMac Planning (Figure 2 Appendix A). The mixed use proposals are likely to include housing development (with associated communal facilities and public open space) in the central section of the site and a commercial / business development zone to the north. It is anticipated that the development area to the south west of Carlogie Road will feature a supermarket site and a care home further east.

The intention is that the site will be accessed from a new distributor road running north to south through the development, forming what is essentially a realignment of the A930. The realignment would extend directly south (from a point on the north boundary of the site where the existing road currently turns sharply west into an abrupt “S-bend”) and converge again with the Carlogie Road at a new roundabout constructed at a point approximately 140m north of the Panbride Road junction. The main site accesses will be facilitated by formation of new road junctions on this distributor road. Internally the site will be served by a network of general access roads and a number of linked cul-de-sacs and shared vehicle / pedestrian accesses.

The residential development areas will offer a range of housing densities and feature a significant provision of linked soft landscaped open space/community area and strategic landscaped zones. It is anticipated that the development land available would accommodate around 400 houses. The house plots will generally feature conventionally sized gardens thus maintaining a reasonable proportion of soft landscaped terrain within the development area.

The commercial / business development zone/light industrial/storage and distribution area is likely to feature buildings with large roof area and significant areas of parking and hard standing. However the intention is to maintain soft landscaping throughout these areas and where appropriate to utilise porous paving materials within non-public vehicle areas and parking facilities.

The prospective hard surfaced area within the development residential site, comprising house roofs, driveways, roads footways and parking areas is estimated to be around 7.3 hectares (assuming 40% of development area). The hard surface area within the commercial zone including the hotel and care home, comprising roofs, roads and footways and car parks is estimated to be 8.5 hectares assuming it equates to between sixty and seventy percent of area available. The supermarket is estimated to potentially comprise up to 2.5 hectares hard surfaced area which equates to 80% of developable area. Combining these figures gives a potentially impermeable area resulting from the development of the site of around 18.3 hectares, which equates to approximately 43 percent of the total available development site area.
4.2. Development Drainage Strategy

In accordance with current good practice and taking cognisance of the relevant Angus Council planning policies (referred to in Section 2.0), the development will require to be served by a separated foul and surface water drainage system. Where possible, there is a preference that foul sewerage from developments should be connected to the public sewerage system. Appropriate provision will also be necessary to allow surface water runoff from the development to be collected, treated and attenuated through the use of suitable Sustainable Urban Drainage Systems (SUDS).

The topography of the site features a natural watershed near to the northern end of the site. The majority of the site drains naturally in a south westerly direction away from this watershed and towards the Lochty Burn. However the area of site north of the watershed will tend to drain naturally northwards towards the Monikie Burn. It is likely that the development drainage system will reflect the natural drainage pattern, falling in part northwards, but mainly being routed south and westwards towards the Carlogie Road and the Lochty Burn and taking advantage of the topography and available falls to achieve an hydraulically acceptable drainage system.

The proximity of the Lochty and Monikie Burns to the site should also be considered as an advantage in terms of drainage, as the site lies within their natural catchments, and provided suitable and sufficient treatment and attenuation is incorporated in the drainage design, the burns will provide an accessible and suitable point for controlled discharge of surface water from the development, avoiding reliance on connection to the existing public sewerage system.

Foul water generated in the major part of the site south of the watershed will be collected in a conventional gravity sewerage system and be conducted to the low point at the south west corner of the development. Foul water flows from the northern site area will likely drain initially northwards towards the low point at the northern site perimeter and from there be pumped up to discharge into the upstream end of the southern catchment drainage system which will carry it south. From the low point at the southern end of the site the foul water will be discharged at an appropriate point into the public sewerage system.

The anticipated foul and surface drainage systems are discussed in more detail in the following sections.

4.3. Foul Water Drainage

On the basis of guidance provided in Sewers for Scotland 7 400 dwellings may be considered (for design purposes) to discharge around 1600 m³ of waste water daily. This equates to a design flow of 18.5 l/s. From other published data sources, the (commercial) residential developments (ie. the Care Home and the Hotel) are likely to generate a design flow of around 5 l/s. It is estimated also that the commercial/business zone would generate a design flow of around 10.2 l/s of wastewater. This suggests a total design wastewater flow of 38.2 l/s being generated by the entire developed site. However this total figure is misleading as the composite flow rates each incorporate a design flow factor of 6, which is applied to
reflect periods of peak flow. In reality the peak periods for domestic residential sewage generation (early morning and early evening), will not coincide with peak times for the commercial / industrial wastewater flows (during business hours / mid-day). It would be reasonable therefore, to consider the demand placed on the sewerage system from each development type to be non-coincident and for design purposes, to accept the combined residential peak of 28 l/s as being the critical design flow to be accommodated by the public sewerage system.

The existing natural gradients suggest that for the flow rates anticipated, foul sewerage pipes within the development are unlikely to exceed 225mm in diameter.

The Scottish Water sewer records have shown that there is a number of existing foul and combined sewerage systems in close proximity to the southern boundary of the site, which may provide a prospective connection point or points for the foul sewerage outlet from the development. In particular the 225mm diameter combined sewer running below Carlogie Road, adjacent to the southern part of the site is the nearest potential connection point. The existing manhole chamber in the verge adjacent to the low point of the site, is at sufficient depth to permit a connection from the development, and would appear to offer an ideal point for development foul sewers to connect into the existing network.

The development zone west of Carlogie Road (supermarket and Carehome) falls to the south west and may be able to obtain a connection into the foul sewers serving the adjacent housing scheme. A small (private) pumping station may be required to a pumping main to cross under the Lochty Burn and connect into an existing foul manhole chamber on the opposite bank.

Figure 4 Appendix A proposes a foul water drainage strategy for the development and suggests the location of a number of alternative or potentially complimentary foul sewer connection points. Each is considered to be possible in terms of accessibility and invert level, but may or may not be feasible in terms of hydraulic capacity.

Confirmation of the preferred connection point to the existing public sewerage will require to be agreed with Scottish Water. An application has been submitted to Scottish Water (via Business Stream) for a Development Impact Assessment (DIA), but a formal response had not yet been received at the time of issue of this report. However it is understood that there are network capacity issues in Carnoustie and there is a possibility that the foul drainage from the development may have to be connected to the public sewer at a point some distance from the site. It is considered likely that the outcome of the DIA application to Scottish Water, will be a requirement for a Drainage Impact Assessment involving hydraulic modelling of the public sewerage system to be undertaken and indeed Scottish Water have indicated as much within the Angus local Development Plan – Main Issues Report (Carnoustie Section, Clause 5 and Summary Table).
Should difficulties be present with the existing sewers in close proximity to the site, an alternative approach may be to construct a new pumping station within the southwest corner of the site, to pump wastewater either to the nearest existing foul sewer with sufficient capacity, or possibly directly to the Westhaven PFI pumping station and Combined Storm Overflow facility situated adjacent to Admiral Street. The pumping main could follow a route east through the site and then south around the eastern periphery of Carnoustie as depicted on Figure 5 Appendix A.

The feasibility of pumping southwards around Carnoustie into Westhaven PFI Waste Water Pumping Station is dependant on finding a route not subject to undue wayleave restrictions. It would be possible to route the pumping main entirely along public roads / verges which would ease future maintenance access and accord with Scottish Waters normal routing policy. The pumping main would be approximately 150mm in diameter. Achieving a crossing of the railway line may require careful engineering consideration, and the use of existing crossing provision would have to be investigated. A possibility might be to discharge into the large diameter trunk sewer at the junction of Arbroath Road and McGill Road from where an existing 525mm pipe, crosses the railway and connects to the WWPS. However as with the suggestion of direct gravity connection from the development in close proximity to the site, this possible option would have to be evaluated and sanctioned by Scottish Water.

In general therefore, it is considered that the topography of this site lends itself favourably to creation of a straightforward conventional drainage system, capable of conducting foul water to a low point at the south western corner of the site, within close proximity to the existing public sewerage network. From that point there are a number of potential connection points into the public sewerage system locally, and should network capacity here be found to be an issue, a pumped solution is potentially feasible to conduct wastewater around the eastern periphery of Carnoustie to link with the main WWPS at Admiral Street.

4.4. Surface Water Drainage / SUDS Strategy

The surface water drainage system will require to be designed in accordance with the principles of sustainable development, taking into account the local topography and ground conditions and providing integrated facilities to control quantity and quality of runoff and where possible enhance site amenity.

It would not be acceptable to discharge the storm water from the development directly into a watercourse or into the existing public sewerage system. The application of appropriate Sustainable Urban Drainage System (SUDS) will therefore form an integral part of the successful development of the site.
The objective of SUDS drainage systems is to manage surface water runoff from the developed site by providing flow attenuation, water treatment and controlled discharge or dispersal. The aim is that the rate and quantity of surface water runoff post-development does not exceed that exhibited by the site pre-development. Normally this would be achieved by agreeing a pre-development “Greenfield” runoff rate (such as from a two year return period storm event) and by then designing the surface water drainage system to limit the post-development discharge rate to this value for all storm events typically up to 100 year return period. In addition the surface water runoff should be managed to minimise pollutants entering the receiving watercourse (where one is present).

The preferred approach for incorporating SUDS within a development is to provide a series of features forming a stormwater management train throughout the site. Source control facilities such as individual soakaways, porous vehicle surfaces and roadside infiltration trenches or swales are provided at the upstream end of the train and features such as detention basins, ponds or wetlands may be incorporated into the lower end of the system. The choice and feasibility of SUDS measures appropriate to any particular development is dependent on the topography of the site, the ground conditions, the development layout and the availability and sensitivity of any receiving watercourse.

The SUDS manual (Ciria C697, 2007) suggests that sites greater than 2 ha do not drain to a single component, but that the catchment is split into sub-catchments and several smaller features are included that drain to a final site control. The number of components is dependent on the runoff characteristic, where residential roads and parking surfaces would require two treatment stages. For roof runoff on its own, a single treatment stage is likely to be sufficient.

Because of the potentially low soil permeability likely to be prevalent within this site, the use of source control techniques relying solely on infiltration to the ground is liable to be very limited. It may be feasible in certain areas of the site to install individual soakaways within house plots or commercial premises, to receive runoff from the roofs but only in areas where a sufficient depth of sands and gravels exists and infiltration testing can confirm adequate permeability within this material. Such soakaways would be maintained by the property owner. Shallow localised roadside infiltration trenches to accept and treat carriageway runoff may also be feasible where sands and gravels of sufficient depth exist. Alternatively roadside swales could be provided where longitudinal gradients are not excessive. Maintenance of dedicated roadside infiltration systems / swales would become the responsibility of the Council Roads Department. Porous paving is not currently accepted by local authorities as a surface treatment for use in adoptable roads. However it may be possible to use porous materials to construct the private accesses, house driveways and private car parking areas.

As ground conditions may be only moderately permeable, it is possible that such pavements will require to be provided with an under drain to facilitate gradual drain down into the surface water sewerage system. Water permeating the surface will be treated and attenuated by passage through the sub-base.

It is fairly certain that an overflow facility will be required from each of the infiltration systems previously suggested, linked to a public surface water sewerage system within the adjacent...
roadways. This will permit overflow discharge of surplus flows during storm events which exceed the dispersal capabilities of the source control facilities. The surplus flows will require to be conducted to an “end of pipe” storage facility to provide further attenuation and treatment prior to controlled release.

The provision of rain water storage tanks or even individual water butts may also be considered as an ecologically friendly means to collect and store runoff from roofs for use by the householder (for irrigating the garden for example). Overflow from any tank or water butt would however require to be conducted to the surface water drainage system and any beneficial effect in attenuating flows would have to be discounted in the design of the downstream SUDS system, to allow for the butt being full at the start of the critical storm.

The Masterplan layout has been arranged such that it could accommodate inclusion of a series of such storage and attenuation facilities, which would themselves discharge to a conventional storm water sewerage system leading to a further regional SUDS features downstream. These storage facilities are likely to be formed by shallow detention basins, possibly linked by swales.

**Figure 6 Appendix A** provides an indicative surface water drainage strategy, suggesting flow routes and the manner in which a surface water management train, incorporating SUDS facilities could be incorporated into the development layout in an integrated manner.

Detention basins could be provided which would have grass covered side slopes at a maximum gradient of 1 in 4 and would be provided with a low flow channel at the base to conduct flows to a controlled outlet. The basin would at most times remain dry, only containing water for short periods following rainfall events. The basin sides and base would be grassed covered and it would be possible to landscape the slopes by planting trees. Such features, apart from its primary function to attenuate and treat development runoff, could be arranged through sympathetic design and appropriate planting, to enhance the public open space and provide additional varied habitat.

It is envisaged that each basin would be arranged to have a low longitudinal gradient, sufficient to facilitate emptying but also to prevent scour and provide adequate water treatment. Each detention basin would be provided with an engineered outlet and a high level overflow arrangement to ensure a controlled through-flow. The inlet and outlet structures would be designed to minimise erosion and to deal with any debris or litter which may enter the drainage system. The facility would require to be sized to provide containment of surplus storm water which would be stored and released at an acceptable rate (greenfield rate).

Maintenance of the basins would be fairly minimal, involving a regular grass cutting regime and occasional inspection of the outlet structure and flow control mechanism including removal of any debris particularly from the area of the outlet structure as necessary.

Outflow from the basins would discharge to the new surface water sewerage system and continue to flow generally southwards.
The site topography and preliminary road layout proposals will allow the provision of a generally shallow depth conventional gravity sewerage system. The proposed arrangement of roads and connecting footways takes general cognisance of the existing surface contours and features, potentially facilitating a fairly straightforward sewerage system to collect and deliver surface water from the majority of the development, to the natural low point at the south of the site and at relatively shallow depth. This should facilitate the creation of a regional surface water detention feature such as an extended detention basin or a pond in this area. The choice of detention facility will depend on site conditions such as soil type, water table ground level etc. However, from information currently available either an extended detention basin or pond are considered feasible. The extended detention basin / pond would discharge controlled flows to the Lochty Burn at pre-development runoff rates.

A pond would be designed to remain permanently wet but to provide sufficient storage capacity above normal water level to contain and attenuate surface water runoff. Through-flow of water would be controlled to promote settlement of suspended solids and biological treatment of surface water runoff. The pond would support aquatic vegetation particularly around the shallower margins, which would help provide water treatment and diversify wildlife habitat.

A range of measures can be used to optimise the quality of wildlife habitats created by attenuation ponds. Siting the pond near existing watercourses and avoiding over-planting with imported plants will promote colonisation by native plant and animal species. Creating a range of habitats, deep and shallow water, variation in planting to produce light and dark areas and irregular shapes will encourage a diversity of species. Use of upstream attenuation will limit the variation of water level in the pond, mimicking natural conditions more closely. These provisions should be considered at the detailed design stage.

Overall the approach to provision of SUDS facilities proposed is in general accordance with current CIRIA guidance and also guidance now being offered by Scottish Water in their second revision to Sewers for Scotland.

Figure 6 shows the proposed surface water drainage strategy, including prospective locations of the SUDS detention facilities and gives an indication of the routes of the storm water collection pipes feeding these and of the possible outfall routes to both the Monikie Burn in the north and the Lochty Burn to the southwest.

It is anticipated that maintenance of these surface water attenuation facilities would become the responsibility of Scottish Water, following their approval and subsequent adoption of the drainage system. The design of the SUDS ponds and basins would require to be in accordance with guidance given in the second revision of Sewers for Scotland. Any proposed discharge to the burns or to the ground will require to be sanctioned by SEPA and will, if necessary, require to be suitably licensed.

4.4.1 Preliminary Hydraulic Calculations

In general terms it is accepted that the rate and volume of surface water run-off from a developed site should not exceed that of the site pre-development. In order to meet this
criterion, an assessment must be made of the pre-development or “Greenfield” runoff rate. SUDS measures are subsequently designed to ensure post-development rates are comparable.

Methods are available to assess pre-development runoff rate on the basis of site location and local climatic, topographic and soil conditions. A common approach is to estimate the runoff generated by a two year storm event and to adopt this as an acceptable flow rate from the developed site for storms of up to 100 year return period. Attenuation measures within the site are then designed to limit the site discharge to the adopted rate and to provide sufficient storage to contain the additional storm water until it may pass through the flow control.

Cognisance must also be taken of the effects of longer return period storms such as the 200 year event. These must be managed to avoid flooding damage to property within and beyond the site.

In order to examine the feasibility of the proposed SUDS system, calculations have been prepared to assess the degree of storm water storage which would be necessary to accommodate runoff from the development. Calculations are included in Appendix B to this report for reference.

A 2 year pre-development runoff rate of 132 l/s has been calculated for the entire Carlogie Site. This has been sub-divided to take account of the watershed directing runoff to the north (Monikie Burn) and to the south (Lochty Burn) and to separate the site area to the east and west of Carlogie.

Size estimates for the main SUDS facilities envisaged have been made using the Source Control module of the Micro drainage computer aided design package. Typically such facilities have been sized on the basis of containing a 100 year storm event and providing an adequate treatment volume. The results are as follows and provide a general; guide as to storage volumes potentially required within the various sections of the development site.

<table>
<thead>
<tr>
<th>Area Ref</th>
<th>Location Receiving Watercourse</th>
<th>Impermeable Area (m2)</th>
<th>Greenfield Runoff (l/s)</th>
<th>Storage Required (m3)</th>
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<tr>
<td>A</td>
<td>North of watershed Monikie Burn</td>
<td>5.9 Ha</td>
<td>48.7</td>
<td>2289 - 3985</td>
</tr>
<tr>
<td>B</td>
<td>South of watershed Lochty Burn</td>
<td>8.37</td>
<td>65.4</td>
<td>3337 - 3985</td>
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<tr>
<td>C</td>
<td>South of watershed Lochty Burn</td>
<td>4.0</td>
<td>17.7</td>
<td>2080 - 3553</td>
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</table>

For the full scope of development currently anticipated (to both north and south of the natural watershed), preliminary calculations indicate that limiting outflow to 132 l/s will necessitate transitory storage capacity within the site in the range 5,598m³ to 9,758m³ to accommodate the 100 year storm event. This storage would be provided throughout the surface water management train, including water stored within permeably surfaced vehicle areas, within
detention basins and within ponds to be created within the site and as such is an entirely feasible proposition.

Basin diameter would typically be in the range of 30m to 50m depending on location and catchment area. Assuming maximum depth of water retained does not exceed 1m, basins of this size would store approximately 1,605m$^3$ and 5,000m$^3$ and represent a land-take of around 1,200m$^2$ to 2,000m$^2$ respectively, (assuming circular plan and side slopes of 1 in 4 for purposes of calculation). Should a pond containing a permanent volume of water be considered as a more suitable SUDS facility, the regional SUDS facility for example this would require to be of greater volume and would occupy a larger area of the site.

Geotechnical site investigation may establish that certain areas of the site are moderately permeable. Where topographic constraints permit, it may be possible to introduce localised “at source” infiltration systems. The contribution of such devices would allow the size of the downstream SUDS storage to be reduced.
5.0 Summary and Conclusions

- Angus Estates Limited proposes to develop a site located at Carlogie, to the northeast of Carnoustie, Angus a mixed commercial and housing development with associated infrastructure.

- Fairhurst has undertaken a Drainage Impact Assessment in order to show that an integrated and sustainable drainage system may be achieved for the development.

- The site occupies a total of approximately 42.5 hectares of arable farmland.

- The ground within the site falls (from an east west aligned ridgeline) towards the northeast and the southwest at fairly uniform and moderate gradients.

- The site straddles the natural catchments of both the Lochty Burn, lying to the southwest and the Monikie Burn, which lies to the north. The watershed bisects the northern part of the site.

- The British Geological Survey map indicates that site comprises an area of mixed superficial geology, varying from Glacial Till comprising compact sandy CLAY in the north, to Glacial meltwater deposits of Sand and Gravel in the central area and Raised Marine deposits of SAND, GRAVEL, SILT and CLAY in the south.

- Intrusive site investigation has not yet been undertaken within the development area, however the nature of soil anticipated is likely to be generally of moderate to low permeability.

- It has been recommended that Infiltration testing is carried out to determine soil porosity as part of an intrusive ground investigation.

- On the basis of topography and observed ground conditions, it is likely that over the majority of the site, rainwater falling onto the undeveloped land will either permeate the ground to drain through the system of field drains or to an extent recharge the local water table, or will flow overland generally towards the Lochty Burn to the southwest or the Monikie Burn to the north.

- Records of existing public sewerage in the vicinity of the site were obtained and examined. This confirmed the presence of an extensive network of public sewerage serving the conurbation of Carnoustie to the south of the site.

- The housing areas immediately south of the site are served by a separate sewerage system, foul sewers generally flowing south to connect with the predominantly combined sewerage system of the older part of Carnoustie and surface water sewers generally flowing south west to discharge to the Lochty Burn at various points.
The proposed development will require to be served by a new separated system of foul and storm water drainage.

The foul water sewerage system will likely consist of a network of gravity sewers routed beneath the site roads, flowing generally southwards following the natural lie of the land.

Foul sewers serving the upper northern part of the site will initially flow northwards following the natural falls of the land, to be conducted to a new pumping station which will deliver sewage back southwards into the upstream end of the sewers serving the southern section of the site.

The foul sewers from the development will require to discharge into the existing public sewerage system and a number of alternative connection points are possible in terms of compatible levels in the vicinity of the site. However nearby sewers may have capacity issues requiring the connection to be made further afield.

Should local connection to the public sewer by gravity be discounted by Scottish Water, a wastewater pumping station could be provided as an alternative to serve the development. Located adjacent to the south eastern site boundary and designed to deal with a design flow of around 28 l/s, a pumping main of around 150mm diameter could be routed around the eastern periphery of Carnoustie, potentially to connect to the combined trunk sewer in Arbroath Road and providing a link to the system in close proximity to the West Haven pumping station.

Scottish Water will be able to confirm the most suitable connection point for foul sewage from the development. A Development Impact Assessment application has been made to Scottish Water via Business Stream which will determine any constraints. The response to the DIA application had not yet been received at the date of issue of this report.

An indicative foul water drainage strategy plan has been prepared to suggest how the development could be served.

The surface water drainage system would require to be designed in accordance with the principles of sustainable development, taking into account the local topography and ground conditions and providing integrated facilities to control quantity and quality of runoff.

The application of appropriate Sustainable Urban Drainage Systems (SUDS) will form an integral part in the development of the site.

The SUDS manual (Ciria C697, 2007) suggests that sites greater than 2 ha do not drain to a single component, but that the catchment is split into sub-catchments and several smaller features are included that drain to a final site control.

The potentially moderate to low permeability ground conditions may limit the significant application of SUDS techniques involving infiltration. The provision of localised source
control systems such as permeable driveways within house plots and private parking areas may however be feasible in certain areas of site where conditions permit.

- It is suggested that by means of limited localised source controls such as filter drains and swales overflowing to a conventional gravity drainage system feeding localised detention basins / ponds located at points throughout the site and ultimately discharging to a regional control such as an extended detention basin or pond, an integrated sustainable drainage system could be created to provide attenuation, treatment and controlled discharge of runoff from the development.

- Because the site naturally sheds water to north and south, it is likely that a twin surface water management train will be necessary to deal with the disposal of storm water either side of the site watershed.

- It is anticipated that the regional SUDS facility for the southern part of the site will outfall at a controlled rate to the Lochty Burn and the northern counterpart to the Monikie Burn.

- An indicative foul water drainage strategy plan has been prepared to suggest how the development could be served.

- Total runoff from the pre-developed site is calculated as 132 l/s, split between the sites north and south of the watershed. The SUDS system requires to be designed to limit outflow for storm events to pre-development flow rates.

- Preliminary design calculations and typical descriptions have been provided to demonstrate the arrangement, scale and feasibility of the main SUDS detention systems proposed.

- Preliminary calculations indicate that for the size of development anticipated, limiting flows to the pre-development rate will necessitate a storage capacity in the range 5,598m³ to 9758m³ for the site as a whole. This storage would be provided throughout the surface water management train within a range of SUDS facilities.

- The SUDS facilities envisaged could be readily integrated within the proposed development layout, and with appropriate landscaping and attention to detail, could be used to enhance the public open space and provide additional varied habitat within the site.

- Although the development will cause an increase in the impermeable area, it has been shown that by employing the various SUDS techniques proposed, there will be no significant increase in run-off from the site.

- The drainage impact assessment has demonstrated that by provision of a properly designed and managed SUDS drainage system it would be possible to safely develop the site as proposed, without causing any detriment to the local hydrological environment.
• Consideration of the extreme 100 year storm event has shown that the drainage system envisaged could be arranged to fully accommodate the runoff generated without increasing flood risk to the site or adjacent properties.
REFERENCES

2. Scottish Planning Policy Document (SPP), Feb 2010
5. Angus Local Plan Review, 19 February 2009
Appendix A –Figures
Appendix B – Preliminary Hydraulic Calculations
### Housing Development Zones

<table>
<thead>
<tr>
<th>Zone Reference</th>
<th>Development Type</th>
<th>No of Dwellings (allow 25 per ha)</th>
<th>Average No Residents</th>
<th>Daily Foul Flow per Person (litres)</th>
<th>Daily Foul Flow per Dwelling (litres)</th>
<th>Daily Foul Flow per Zone (litres)</th>
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<th>Total Daily Foul Flow per Zone (litres)</th>
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### Commercial Development Zones

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<th>Daily Foul Flow per ha (l/s) incl infiltration</th>
<th>Area (ha)</th>
<th>Factored Foul Flow per Zone (l/s)</th>
<th>Factored Daily flow (Litres)</th>
<th>Unfactored Daily Foul Flow (litres)</th>
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Total DWF for development = 6.4 l/s  
Total 6 x DWF for development = 38.2 l/s

Residential peaks and Commercial Peaks unlikely to coincide - Domestic Peak is likely to be critical design flow = 28 l/s
### Surface Water Drainage Calculations

<table>
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<tr>
<th>Zone Reference</th>
<th>Development Type</th>
<th>Area (m²)</th>
<th>% Impermeable</th>
<th>Impermeable Area (m²)</th>
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### Greenfield Calculation

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<th>Area Reference</th>
<th>Total Area (ha)</th>
<th>Greenfield Rate (l/s/ha)</th>
<th>Controlled discharge Rate (l/s)</th>
<th>Proposed Discharge to Monikee Burn (l/s)</th>
<th>Proposed Discharge to Lochty Burn (l/s)</th>
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Greenfield Runoff Rate for Development Site (ICP SUDS method using Microdrainage) = 131.75 l/s (2 year rate)
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</tbody>
</table>
Ewan A. Maclean MRTPI  
Emac Planning LLP  
Town Planning Consultants  
Ballinard House  
3 Davidson Street  
Broughty Ferry  
Dundee DD5 3AS

13th March, 2014

Dear Ewan,

Planning Application 14/00043/PPPM – Employment Land Carlogie

I refer to Ruari Kelly’s e-mail addressed to you, in relation to the above, dated 10th March, 2014.

I am very surprised that Angus Council Planning Department continue to focus on this subject. My comments are as follows:

1. The reason that the Business Park was not progressed during the period 2008-2012 is very straightforward. D.J. Laing (Homes) Ltd. had insufficient financial resource to carry out the obligations imposed by the Section 75 Agreement. It is perhaps unfair to attribute all of the blame on D.J. Laing for this failure to deliver. After all, most house builders in the UK were under very severe financial constraints during this period.

This was all explained to both George Chree and Ian Mitchell when we met them on 2nd February, 2012. I also talked this through with the various Carnoustie Councillors, namely Bill Bowles, Brian Boyd and Helen Oswald when we met them on 14th August, 2013.

2. My second main reason for the failure to deliver is, perhaps unlike the first reason, wholly down to D.J. Laing. When Laing’s Option over the Carlogie land expired and it continued to be obvious that he was unable to fulfil the various obligations we (Angus Estates Limited) agreed to progress the Section 75, get it signed off, Planning Consent issued and begin opening up the Business Park. The first two steps were achieved and the Section 75 was signed off with Angus Council last April and registered in the Land Register on 1st April, 2013. D.J. Laing then withdrew the application 2-3 days before Angus Council released the Planning Consent. This was after no consultation with ourselves and he presumably took this action because by this time he was pursuing his promotion of housing land etc. at Pitskelly. Had Dave Laing not withdrawn the application last April then the Business Park would be progressing this year –
2014. For what it is worth, there are a number of existing employers in and around Carnoustie who feel extremely aggrieved by his actions.

I will, if I may, now return to Ruari Kelly’s e-mail. He raises two questions and my response, using his numbering is as follows:

1. Yes, the proposed development is deliverable without enabling development. This is exactly the position we were willing to accept last April and continues to be the case.

2. We never assumed that the £1m, allocated by the Council, for the Carnoustie Business Park was a certainty.

Lastly, I would add that Angus Estates are now in a Joint Venture with The Muir Group. Of all the house builders in Scotland The Muir Group has withstood the financial crisis of 2008-13 better than any of the rest. Angus Council are extremely lucky to have had them as their Joint Venture partner at Orchardbank. The combination of Angus Estates and The Muir Group for Carnoustie is one that should be welcome and embraced by both planning officials and Local Councillors. I know that local businesses are very positive about the approach.

I hope this answers Ruari Kelly’s queries. Needless to say if there are any lingering doubts then I would be delighted to come along with a representative from Muirs to see any of the planning officials.

With all good wishes and kind regards.
Yours sincerely,

Simon W.D. Laird