Archibald B (Brian)

From: Archibald B (Brian)
Sent: 04 April 2016 12:04
To: 'Jennifer.Bell@burnesspaull.com'
Cc: 'malcolm.campbell@knightfrank.com'
Subject: FW: PROPOSED ABERDEEN LOCAL DEVELOPMENT PLAN - FURTHER INFORMATION REQUEST 03 - ISSUE 14 - ALTERNATIVE SITES LOIRSTON & COVE (LAND AT BLACKHILLS OF CAIRNROBIN) (LEI/1067/00017)
Attachments: Letter to Brian Archibald, Scottish Government (with enclosures).PDF

Tracking:

Recipient	Delivery
'Jennifer.Bell@burnesspaull.com'	
'malcolm.campbell@knightfrank.com'	
[redacted]	
[redacted]	[redacted]

Hello Jennifer

I acknowledge receipt of your FIR response. I am also copying the response to Malcolm Campbell representing Hermiston who now has 14 days to comment by 18 April 2016

Thanks
Brian

From: Jennifer Bell [mailto:Jennifer.Bell@burnesspaull.com]
Sent: 04 April 2016 11:14
To: Archibald B (Brian)
Cc: Elaine Farquharson-Black; Pippa Robertson
Subject: PROPOSED ABERDEEN LOCAL DEVELOPMENT PLAN - FURTHER INFORMATION REQUEST 03 - ISSUE 14 - ALTERNATIVE SITES LOIRSTON & COVE (LAND AT BLACKHILLS OF CAIRNROBIN) (LEI/1067/00017)

Brian

I refer to the above and attach a response on behalf of Leiths (Scotland) Limited to Further Information Request 03. I confirm that a hard copy will follow by post. Kindly acknowledge safe receipt.

Regards

Jen

Jennifer Bell
Paralegal
Burness Paull LLP

Direct Dial: +44 (0)1224 261242
Email: Jennifer.Bell@burnesspaull.com

Union Plaza
1 Union Wynd
Aberdeen
AB10 1DQ

T +44 (0)1224 621621
F +44 (0)1224 627437

LP-100 Aberdeen 1
DX AB35 Aberdeen

www.burnesspaull.com

Our Ref LEI/1067/00017/EFB/PMR
Your Ref

Burness Paull

F.A.O Brian Archibald
The Scottish Government
Planning and Environmental Appeals Division
4 The Courtyard
Callender Business Park
Falkirk
FK1 1XR

1 April 2016

Dear Sirs

LEITHS (SCOTLAND) LTD
PROPOSED ABERDEEN LOCAL DEVELOPMENT PLAN 2016
FURTHER INFORMATION REQUEST 03 – ISSUE 14

We refer to your letter of 16 March requesting that Leiths (Scotland) Ltd ("Leiths") consider and comment on the contents of representation 093 submitted by Hermiston Securities Ltd ("Hermiston"), in particular with regards to the stand off distances that may be required between their quarrying operations at Blackhills and any new business development on land to the west.

We are instructed by Leiths to oppose the allocation of land at Blackhills of Cairnrobin for employment uses. This statement will cover:

- Background
- Representation 093
- Additional concerns
- Conclusion

Background

This is not the first time that the allocation of land at Blackhills of Cairnrobin has been proposed - a similar proposal was put forward during the preparation of the extant LDP 2012, but was rejected by the Reporter at Examination. The Reporter concluded that it was appropriate to safeguard quarry operations at Blackhills, and considered it important to give proper regard to the quarry when considering development on nearby land which could lead to incompatible uses and the sterilisation of mineral resources. For the reasons set out below, it is submitted that there have been no material changes in circumstances that would justify a different conclusion being reached now.

Blackhills Quarry is one of only two operational hard rock quarries within the Aberdeen City Council area and is the largest sources of high-quality construction aggregate, asphalt and concrete in the Aberdeen market. The quarry has been worked since at least the early 20th Century and Leiths have operated the site continuously since 1977. Currently, the quarry directly employs fifteen people, as well as indirectly supporting a large number of drivers, mechanics, fitters, technicians, administrative staff and others within Leiths' business.

The quarry also supports the wider construction market in the North-East by providing essential products to contractors, developers, Aberdeen City Council and Aberdeenshire Council. Recent contracts include the supply of material to the AWPR, the Third Don Crossing, Aberdeen Harbour, Aberdeen Airport and many other projects, both public and private.

The importance of mineral production, and the need to safeguard this through the planning system is enshrined in Scottish Planning Policy 2014 (SPP 2014), which states that:

> *"Minerals make an important contribution to the economy, providing materials for construction, energy supply and other uses, and supporting employment. NPF3 notes that minerals will be required as construction materials to support our ambition for diversification of the energy mix. Planning should safeguard mineral resources and facilitate their responsible use."* (paragraph 234)
>
> and
>
> *"Local development plans should safeguard all workable mineral resources which are of economic or conservation value and* ***ensure that these are not sterilised by other development.***" (emphasis added – paragraph 237)

It is against that background that Leiths opposed the inclusion of land at Blackhills of Cairnrobin in the adopted LDP 2012, in the emerging LDP at the MIR stage (Appendix 1) and continue to oppose it now.

Representation 093

Representation 093 puts forward five key reasons why land at Blackhills of Cairnrobin should be allocated for Business and Industry Use, each of which requires to be looked at in turn:

1. That the only reason the site has not been allocated before now (i.e. either in the extant LDP 2012 or the proposed LDP 2016) is on the basis that it falls within 400m of Leiths' quarry at Blackhills, but that no such 400m buffer in fact applies;

2. That the development of land at Blackhills of Cairnrobin for employment use would not prejudice the operation of the quarry, not least because the quarry has continued to operate in close proximity to residential uses at Cove for many years;

3. That land at Mains of Cairnrobin to the South has been allocated for development in the Aberdeenshire Local Development Plan, and has also been granted planning consent;

4. That the allocation would help meet currently unmet demand for employment land; and

5. That the development of the Blackhills of Cairnrobin site is important to achieving wider transport and employment objectives for Aberdeen Gateway and the Mains of Cairnrobin sites, in particular in terms of providing a northern access road to link these two sites together.

1. Buffer Distance between Blackhills Quarry and the Blackhills of Cairnrobin Site

Leiths' primary concern about introducing certain new uses in close proximity to their quarrying operations is the potential for occupiers to complain about noise and vibration from the quarry operations at Blackhills disturbing the enjoyment of their property. This was clearly set out in Leiths' response to the Main Issues Report in 2014, in which it was stated that:

> *"The main issue with regard to bringing development closer to the quarry is the potential for complaints to arise about vibration due to blasting. The vibration which emanates from each blast is dependent on the air pressure and the size of the blast. Each blast requires to be closely monitored. Bringing development closer to the quarry boundary is likely to result in operational changes being required to the proposed quarry development and this may impact on the efficiency of the quarry, resulting in increased costs and potential sterilisation of mineral reserves."*

In other words, the issue is not one of health and safety *per se*, but of ensuring that the quarry operations do not have to be curtailed due to the introduction of new development.

This was a concern for the Reporter in the previous LDP examination and is a serious concern for Leiths, not least because it is established law that the fact the quarry was operational before any development was proposed on the Blackhills of Cairnrobin site does not protect the quarry from complaints of nuisance from future neighbours (see *Webster v Lord Advocate 1985 SC 173*).

In terms of the impact that quarry blasting may have, the two main areas of concern are ground vibrations and air overpressure (the energy transmitted from the blast site within the atmosphere in the form of pressure waves, some of which are audible and some of which are not). PAN 50 – Controlling the Environmental Effects of Surface Minerals (see Appendix 2) describes the potential impact of vibrations and overpressure as follows:

> *"the levels of vibration generated by mineral workings are well below those required to cause structural damage to properties. However, vibration transmitted through the ground and pressure waves through the air ('overpressure') shake buildings and people and may cause nuisance. The effects of the two factors are difficult for even an expert to distinguish without instrumentation. However, the pressure wave may arrive after the ground vibration by up to 2 seconds over a distance of 1 km. The perception of both factors is likely to be stronger inside a building than outside..."*

It also needs to be recognised that there are a large number of factors which can influence the impact that each blast may have on neighbouring properties, including the weather, the wind direction and the ground conditions.

Located on the coastline, weather and wind direction are of course outwith our clients' control, and any change in these will affect the impact that a blast may have on neighbours in any given direction from the quarry site. The more directions in which there are neighbours to be affected, and the closer those neighbours are, the more restricted a quarry operator will be in terms of when blasts can take place without some impact being felt.

The position is further complicated by the fact that different buildings will experience vibrations differently. For example, a tall glass building is likely to be affected to a far greater degree than a low level fabrication workshop due to the nature of its foundations, its height, and the materials used.

To protect neighbouring amenity, the recently granted consent for the extension of operations at Blackhills quarry (Application reference P130480) includes a number of conditions limiting the noise and vibrations that may be produced, and requiring steps to be taken minimise air pressure from blasting operations.

It should also be recognised that the levels on Leiths' planning permission were set on the understanding that the Blackhills of Cairnrobin site was designated greenbelt and on which no development would take place. This is confirmed at paragraph 9.4 of Appendix 5 to the Environmental Statement for the Blackhills Quarry (see Appendix 3), which makes it clear that it was the closest of the existing buildings at Aberdeen Gateway that was used in the blasting assessment.

In terms of vibration, the conditions limit blasts to a peak particle velocity of 6mm/sec-1 for 95% of events, with no blast exceeding 12.0mm/sec-1, consistent with the advice provided in PAN 50, Annex D (see Appendix 4). Based on historic performance at the quarry, Leiths see no reason why these levels should not be met, and currently take all measures necessary to ensure that they are met (i.e. not blasting in certain weather conditions/wind directions etc).

Further, even staying within these levels does not mean neighbours will not complain about the quarry's operations. There is evidence to suggest that complaints are likely from vibrations with a peak particle velocity of 6.00mm/sec and above, and are possible even at levels below this (See Appendix 5[1]).

PAN 50, Annex D, at paragraphs 23 – 24 confirms that:

> *"Although sensitivity to vibration varies significantly between individuals, a person will generally become aware of blast induced vibration at levels of around 1.5mms -1 peak particle velocity, and under some circumstances at levels as low as 0.5mms -1."*
>
> and
>
> *"Once a received vibration is greater than an individual's perception threshold then it is possible for concern to be expressed about the blasting..."*

[1] Jan Cordon and Ian Christie, Explosives in Quarrying (the Institute of Quarrying, 2010) p.167, Figure 11.10

The introduction of business development in close proximity to the quarry operations will increase the prospect of complaints arising from vibration.

Similar considerations apply to overpressure, although no set limits are prescribed in the current quarry consent due to the unpredictable and uncontrollable effects of atmospheric pressure. This unpredictability further increases the risk of complaints, and makes it difficult to effectively address such complaints if/when they do arise.

Taking both ground vibrations and air overpressure together, Leiths are concerned that, even if they are complying with every condition on their planning consent, any further development in the immediate vicinity of the quarry will inevitably lead to a greater number of complaints about vibrations and overpressure. This will, in turn, inevitably lead to restrictions to their operations being put in place to try to avoid ongoing issues.

When taken together with measures already in place to minimise disruption (i.e. not blasting when the wind is blowing in a certain direction etc) this will place an unacceptable burden on Leiths as quarry operators, and have knock-on impacts on quarry production. This runs entirely contrary to the SPP 2014 position that local development plans should ensure that mineral operations are not sterilised by other developments.

2. Proximity of residential development

It is suggested in representation 093 that:

> *"the development of the land at Blackhills of Cairnrobin for employment use will not prejudice the operation of the quarry, especially as the quarry has continued to operate in very close proximity to residential uses in Cove for many years"*

With all due respect, it is submitted that this statement is entirely unsubstantiated. The nearest properties in Cove are approximately 360 metres from the Blackhills Quarry boundary, and approximately 380 metres from the nearest quarry face. The boundary of Blackhills of Cairnrobin site would be directly across the road from Blackhills quarry, a distance of just 10 metres from the boundary, and less than 120 metres from the nearest quarry face. Even the centre point of the Blackhills of Cairnrobin site would be just 200 metres from the nearest quarry face, almost half the distance of the nearest properties in Cove. This is significantly closer, with a significantly greater risk of amenity at the Blackhills of Cairnrobin site being disturbed as a result.

This also does not take into account the directional differences of the two sites respective to the quarry (it is submitted that the prevailing wind from the coast is more likely to result in overpressure complaints from the Blackhills of Cairnrobin site than from properties in Cove) and the potential for there to be different ground conditions which will affect the way in which vibrations from the quarry are felt at the different sites.

As noted above, a tall, glass office building is likely to be affected to a far greater degree than other types of building, including domestic properties which are much smaller in scale.

3. Allocation of Mains of Cairnrobin site in Aberdeenshire

The land at Mains of Cairnrobin is significantly further away from the quarry than the site which Hermiston wish to be allocated at Blackhills of Cairnrobin. The risk of nuisance complaints arising from the Mains of Cairnrobin site is significantly lower than would be the case with Class 4 development at Blackhills of Cairnrobin.

4. Need/demand for employment land

Hermiston's representation 093 refers to reports by Knight Frank and Ryden from Spring 2015 to support the argument that there is an unmet need for additional employment land in the Aberdeen area. Since the representations were submitted the commercial property market in Aberdeen has changed dramatically. The Knight Frank Office Market Activity report from March 2016 (see Appendix 6) states that:

> *"the collapse in oil prices has been devastating, resulting in major oil occupiers reversing expansionary strategies and retrenching. This has led to a sharp fall in new demand for office space leaving a significant amount of vacant space overhanging in the market."*

This corresponds with the view taken in Ryden's 77th Scottish Property Review of October 2015 (see Appendix 7), which states that the slump in the oil price has:

> *"decreased the demand for office space required by the sector and consequently increased the supply as more offices are placed on the market"*

A similar conclusion is also reached in respect of the market for industrial accommodation in Aberdeen.

It should also be noted that the 2012 LDP Examination Report, having considered all the relevant information at that time, concluded that the deletion of the Blackhills of Cairnrobin Site "*will not have any significant effect on the adequacy of the overall supply of employment land in Aberdeen*". It is our clients' position that, given the supply of employment land available in Aberdeen, and the south of the city in particular, at present, and taking into account the ongoing downturn, there is no reason for a different conclusion being reached now.

5. Access road

As submitted on behalf of our clients previously, it is not clear why the Blackhills of Cairnrobin site is said to be necessary to connect Aberdeen Gateway and the Mains of Cairnrobin sites given that there appear to be other opportunities to link these areas without developing this land. For example, the developers' design brief for development at Mains of Cairnrobin (see Appendix 8) only shows the very western corner of the Blackhills of Cairnrobin site being required for a link road, with no other development on this land. This ties in with Design and Access Statement for the extension to the Aberdeen Gateway Development (see Appendix 9) which shows internal roads up to the Eastern boundary of the site, with the potential to connect into a link road in the future (i.e. as shown in the Mains of Cairnrobin design brief).

It should also be noted that our clients would have no objection in principle to a stand-alone proposal for a link road through the Blackhills of Cairnrobin site, as this would not impact on the quarry's operations. Further, a stand-alone proposal for a link road would not require the site to be removed from the greenbelt. It is submitted that, if a link road genuinely is required, it could be supported as essential infrastructure which is permissible in the greenbelt without any need for a change in the site's current designation.

Other concerns

In addition, Leiths also have a number of other concerns about the proposed allocation of the Blackhills of Cairnrobin site as set out in response to the Main Issues Report in 2014, namely that:

- There may be complaints made about the volume of HGVs on Findon Road, which would be immediately adjacent to the extended business park; and

- The area is prone to standing water, which is a continuing problem for the site, as can be seen on the Aerial View of Aberdeen Gateway in Appendix 9.

These concerns are not addressed in Hermiston's representations on the Proposed LDP 2016.

Conclusion

In light of the above , it is submitted that the land at Blackhills of Cairnrobin should remain within greenbelt for the following reasons:

- The risk of complaints from occupiers of any development at Blackhills of Cairnrobin about ground vibrations and overpressure from blasting at Blackhills Quarry;

- The risk of quarry operations being curtailed to prevent complaints, effectively limiting production of minerals contrary to the principles of SPP 2014; and

- The knock-on effects of any curtailments on the quarry's output and, in turn, on construction projects across the Aberdeen City and Shire region as a whole.

Yours faithfully

for and on behalf of Burness Paull LLP

Enc

Appendix 1:	Response to Aberdeen City Main Issues Report Consultation 2014 on behalf of Leiths (Scotland) Ltd
Appendix 2:	PAN 50 – Controlling the Environmental Effects of Surface Minerals
Appendix 3:	Extract from Environmental Statement for Blackhills Quarry Extension
Appendix 4:	PAN 50 – Controlling the Environmental Effects of Surface Minerals, Annex D
Appendix 5:	Figure 10 from Jan Cordon and Ian Christie, Explosives in Quarrying (the Institute of Quarrying, 2010) p.167
Appendix 6:	Knight Frank Office Market Activity Report, March 2016
Appendix 7:	Ryden's 77th Scottish Property Review, October 2015
Appendix 8:	Design Brief for development at Mains of Cairnrobin
Appendix 9:	Design and Access Statement extension to Aberdeen Gateway (marked up)

ABERDEEN
CITY COUNCIL

Aberdeen Local Development Plan 2016

Main Issues Report Consultation
13th January to 24th March

Response Form

The Main Issues Report describes and invites discussion on options for policies and land allocations in the next Aberdeen Local Development Plan. No settled view on the content of the next plan has yet been reached, making the Main Issues Report the key stage for public consultation. Giving us your views will help to shape the future strategy for development and the policies by which future planning applications are determined. You can view a copy of the Main Issues Report on our website at: **www.aberdeencity.gov.uk/planning_environment/planning/local_development_plan/pla_local_development_plan.asp**. A series of accompanying documents, including an Interim Environmental Report, Monitoring Statement and Developer Bids Assessments, can also be viewed online.

How to respond

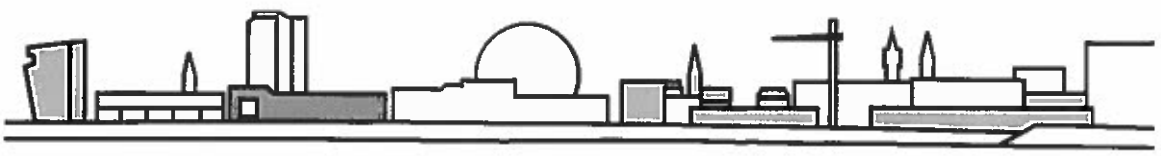
The Main Issues Report contains a series of issues and questions which we would particularly like to hear your views on. Use this form to respond to these, or any other issues raised by the Main Issues Report, Monitoring Statement, Interim Environmental Report or any other accompanying documents. **Please return it to reach us by 5pm on Monday 24th March.**

- **Post:** Local Development Plan Team, Planning and Sustainable Development, Aberdeen City Council, Business Hub 4 Marischal College, Broad Street, Aberdeen AB10 1AB
- **Email:** If you are filling out our online PDF form, please be aware that you cannot save what you have written and come back to it later. Once you have finished filling it in, you can print to PDF. You could also scan your paper form if you have this facility. You can then email your response to ldp@aberdeencity.gov.uk
- If you prefer not to use this form, you could also send us an email or letter with your comments, Please include your name, address, telephone number and email address (if applicable), as well as the details of anyone you are representing.

Data Protection Statement

The comments you make on this form will be used to inform the preparation of the next Local Development Plan. Aberdeen City Council (ACC) will not share or disclose the personal information provided on this form with other parties or organisations unless we are required to do so by law.

The Local Development Plan Team may use your contact details to contact you to seek further detail or information about the comments you have made. Your name and organisation (if relevant) will be published alongside your comments, but personal contact details (address, telephone, e-mail address) will not be made public. If you choose not to provide a name or any contact details, your comments will still be valid.



For more information on how your information is used, how Aberdeen City Council maintains the security of your information, and your rights to access information ACC holds about you, please contact Andrew Brownrigg (LDP Team Leader), Planning and Sustainable Development, Aberdeen City Council, Business Hub 4, Marischal College, Broad Street, Aberdeen AB10 1AB.

Please provide your name and contact details:

Name (Mr/Mrs/Miss/Ms) Mrs Elaine Farquharson-Black

Organisation (if relevant) Burness Paull LLP

Address Union Plaza

1 Union Wynd, Aberdeen

Postcode AB10 1DQ

Telephone 01224 621621

E-mail address efb@burnesspaull.com

If you are completing this form on behalf of an organisation, group or landowner, please provide their details below.
Please tick this box if you wish further correspondence to be directed to this address: ☐

Name (Mr/Mrs/Miss/Ms) Mrs Elaine Farquharson-Black

Organisation/Group Leiths (Scotland) Limited

Address per Agent

Postcode

Telephone

E-mail address

If you wish to be added to the LDP e-mailing list to be kept informed of our progress in producing the next LDP, please tick here: ☐ and provide the email you wish to be added to our database:

E-mail address

Please use a separate box for each issue/question you wish to respond to. If you wish to continue on a separate sheet, please attach to the paper copy or email.

Main Issue and/or Question Number		MIR Page Number	
Land at Blackhills of Cairnrobin, Cove See Paper Apart			

Main Issue and/or Question Number		MIR Page Number	

Main Issue and/or Question Number		MIR Page Number	

Main Issue and/or Question Number		MIR Page Number	

Main Issue and/or Question Number		MIR Page Number	

Main Issue and/or Question Number		MIR Page Number	

Burness Paull

Aberdeen Local Development Plan
MAIN ISSUES REPORT (JANUARY 2014)

PAPER APART

REPRESENTATION ON BEHALF OF LEITHS (SCOTLAND) LIMITED
Relating to Site Reference B1302 – Land at Blackhills of Cairnrobin, Cove, Aberdeen

Our clients, Leiths (Scotland) Limited, wish to object to Bid Reference B1302 which has been submitted by Hermiston Securities Ltd seeking the extension of the Aberdeen Gateway development to include an area of land extending to 7.94 hectares adjacent to the Findon Road. It is submitted that allocating the site for development will restrict the operation of our clients' hard rock quarry at Blackhills, Cove. Access to the quarry is taken directly from Findon Road.

With the scale of development proposed in Aberdeen and its surrounds under the Development Plan, there is an ongoing demand for appropriate construction materials. Blackhills Quarry is the only operational granite quarry in Aberdeen. It provides not only high quality mineral resources, but also added value products in the form of coated products and ready-mixed concrete.

The quarry is zoned in the adopted Local Development Plan under reference OP71. The land is safeguarded for mineral extraction. There is a current planning application (reference 130490) which is with the Council for determination seeking approval to extend the life of the current permission for the site and to extend the excavation area into the land adjacent to Findon Road. It is envisaged that quarrying will continue for another 36 years. A copy of the non technical Summary of the Environmental Statement submitted in support of the planning application is appended to these representations. The application is due to be determined by the Council on 24 April 2014.

The Bid seeks to extend the Aberdeen Gateway development into the land closest to Findon Road and to Blackhills Quarry extension area. A similar bid was submitted to the previous Local Development Plan and was rejected by the Reporter at the examination into objections to the Plan. The Reporter concluded that it was wholly appropriate to identify and safeguard the quarry operations at Blackhills to ensure that proper regard is given to the expansion of the quarry when considering development on nearby land which could lead to incompatible uses encroaching too close and sterilising mineral resources on the grounds of public safety.

Leiths aspire to being a "good neighbour" and comply with the conditions on their current planning consent which are designed to reduce the impact of the quarrying operation on the surrounding area. Noise, dust and vibration are the main areas of complaint.

The current application to extend the quarry has been assessed on the basis that development at Gateway is approximately 400 metres from the quarry boundary. The development programme for the quarry extension has been devised based on the current LDP zonings which includes the Bid site within the Green Belt.

Bringing development closer to the quarry would lead to an increased likelihood of complaints arising, particularly due to increased numbers of people in the area.

The main issue with regard to bringing development closer to the quarry is the potential for complaints to arise about vibration due to blasting. The vibration which emanates from each blast is dependent on the air pressure and the size of the blast. Each blast requires to be closely monitored. Bringing development closer to the quarry boundary is likely to result in operational changes being required to the proposed quarry development and this may impact on the efficiency of the quarry, resulting in increased costs and potential sterilisation of mineral reserves.

Leiths also have concerns that there may be complaints made about the volumes of HGVs on the Findon Road, which would be immediately adjacent to the extended business park. This road is the sole access into the quarry and is therefore in constant use by quarry vehicles.

The officers' assessment of the Bid concludes that identifying the Bid site for development would be undesirable. Leiths support this conclusion. It is noted that the site does not feature in SEPA's flood risk maps, but Leiths would endorse the officers' findings that the area is prone to standing water. This is a continuing problem for the site. As such, it is submitted that the score for flooding/drainage should be lower than set out in the assessment.

The Bid claims that there is an urgent need to supplement the employment land supply in the south of the City. This ignores the fact that the City as a whole is regarded as a strategic growth area. Table 2 of the MIR reveals that there are 130 hectares of employment land already allocated in the current LDP up to 2026, against a strategic requirement of 105 hectares. A further 66 hectares are identified for 2027-2035.

There is considerable land identified for development in Cove, including some 33.5 hectares of employment land. 20.5 hectares are proposed on land controlled by Hermiston Securities at OP78. The existing allocations/safeguarded sites should be developed before further greenfield land is released.

Consideration also requires to be had to the employment allocations just south of the City boundary at Cairnrobin, Portlethen, Blairs, Badnetoy and Chapelton.

The Bid argues that the land should be allocated in order to provide a road linking the Gateway development to the Mains of Cairnrobin. A previous masterplan for the overall development included a link road, without developing on the Bid site. From the plan appended to the bid, there are other opportunities to link into the Cairnrobin site without developing the Bid site. It is noted that the link road is proposed on the eastern boundary of the Bid site, presumably to allow the maximum developable land within the route.

In light of the potential impact on Blackhills Quarry, the existing and proposed employment land supply and the other link road opportunities, the Bid should be rejected and the land remain within the Green Belt on the LDP Review.

LEITHS

PROPOSED EXTENSION TO BLACKHILLS QUARRY COVE, NEAR ABERDEEN

PLANNING AND ENVIRONMENTAL STATEMENT

NON-TECHNICAL SUMMARY

APRIL 2013

DAL
DALGLEISH ASSOCIATES LIMITED

INTRODUCTION

This report is the Non-Technical Summary [NTS] of the Environmental Statement [ES] prepared in support of the planning application by Leiths [Scotland] Ltd, for the continuation of hard rock quarrying and processing, the extension of the excavation area, the continued operation and renewal/relocation of the asphalt and ready-mix concrete plants, and the recycling of construction/ demolition waste and road planings to produce recycled aggregates at Blackhills Quarry, Cove, Aberdeen.

If permitted, the operation will yield an estimated 9 million tonnes of hard rock over a period of 36 years. A further 1 year will be required to complete restoration works on cessation of operations. Planning permission is sought for an overall period of 37 years.

ENVIRONMENTAL IMPACT ASSESSMENT

An Environmental Impact Assessment [EIA] of the potential impacts on the environment of the proposed quarry operations has been undertaken in accordance with the Town and Country Planning [Environmental Impact Assessment] [Scotland] Regulations 2011. The results of the EIA are contained in the Environmental Statement [ES]. The Regulations require that the ES is summarised in a Non-Technical Summary, written in non-technical language.

THE APPLICANT COMPANY

Leiths [Scotland] Ltd is a Scottish Company whose registered office is at Rigifa, Cove, Aberdeen. Leiths is an expanding family firm specialising in quarrying, haulage, road surfacing and civil engineering, and currently operate a number of hard rock and sand and gravel quarries across Scotland.

PROJECT TEAM

The project team responsible for the preparation of the ES was:

- **Dalgleish Associates Ltd** - Project Management, Site Design, Landscape & Visual, Hydrology and Hydrogeology, Ecology, Restoration, Dust and Traffic Assessment.
- **Vibrock Ltd** - Noise and Blast Vibration Assessment.
- **Murray Archaeological Services** – Archaeological Assessment and Mitigation Proposals.

APPLICATION PROCESS AND PROGRAMME

Pre-Application Consultation [PAC] was undertaken in accordance with Part 2 of The Town and Country Planning [Development Management Procedure] [Scotland] Regulations 2008. A public event was held on Tuesday 22nd January 2013 at the Cove Bay Hotel, Colsea Road, Cove Bay, Aberdeen, this being a local venue in the vicinity of the application. The public event, which was advertised in The Press and Journal, allowed interested parties to view and discuss proposals. A report on Community Engagement is appended to the ES.

The Planning Application was lodged in April 2013 with public advertisements in accordance with the regulations. A statutory minimum period of 16 weeks is available to the Planning Authority for determination of the application.

ACCESS TO DOCUMENTATION

A full copy of the Environmental Statement from which this NTS has been prepared can be viewed at:

Aberdeen City Council
Development Management
Enterprise, Planning and Infrastructure
Business Hub 4
Marischal College
Broad Street
Aberdeen
AB10 1AB
Tel: 01224 523470

The ES may also be viewed online at Aberdeen City Council's website: www.aberdeencity.gov.uk.

Copies of the Environmental Statement and Non-Technical Summary are available by contacting:

Dalgleish Associates Ltd
Mineral & Planning Consultants
1 Sinclairs Street
Cathedral Square
Dunblane
FK15 0AH
Tel: 01786 822339 Fax: 01786 822899
email: willie.booth@dalgleishassociates.co.uk

EXPRESSING YOUR VIEWS

For the first 28 days of the consultation period commencing after the proposal has been advertised, the statutory and non-statutory consultees and members of the public have an opportunity to formally lodge their views on the proposals with:

Aberdeen City Council
Development Management
Enterprise, Planning and Infrastructure
Business Hub 4
Marischal College
Broad Street
Aberdeen
AB10 1AB
Tel: 01224 523470

PLANNING

Along with Scottish Planning Policy guidance, the planning policies contained in the Aberdeen City and Shire Structure Plan 2009 and the Aberdeen Local Development Plan 2012 have been examined. The proposals are considered to be consistent with the Development Plan. It is considered that an overall benefit will be derived from the proposal and that there are no over-riding factors which would merit refusal.

NEED FOR THE DEVELOPMENT

To address the question of need for the development, the ES has considered the economic background to this application. Consideration has been given to national and

regional trends; mineral resources in the Aberdeen and Aberdeenshire areas; the North East Scotland landbank and annual demand; market areas and strategic resources and future market demand.

The Aberdeen Local Development Plan acknowledges that the future development of the city will require significant mineral resources and that ensuring that minerals are available within the city to support the level of growth envisioned by the Structure Plan avoids the need to transport minerals over long distances, driving down construction costs and supporting jobs in the city.

The Plan identifies and safeguards the existing Blackhills Quarry and the proposed extension area, steering mineral extraction to the least sensitive areas with workable mineral deposits.

Over the last 10 years there has been a consistent demand for aggregates in North East Scotland Region. Blackhills Quarry is strategically located within the Aberdeen City Strategic Growth Area and the Huntly to Laurencekirk Strategic Growth corridor and is well placed to serve the Aberdeen to Peterhead Strategic Growth corridor, the wider Local Growth and Diversification Area and the southern Regeneration Priority Area.

The deposit at Blackhills Quarry is a high quality mineral resource and the quarry is also a source of added value products in the form of coated products and ready-mix concrete. It has been established that there is a continuing demand for the hard rock aggregate produced at Blackhills Quarry.

SOCIO-ECONOMIC FACTORS

It is envisaged that the proposal would ensure continued long-term employment for 10 full-time staff who all reside locally. A significant number of administration, sales, technical, laboratory and maintenance personnel are based at Leiths nearby main offices and yard at Rigifa, these positions being reliant on the continued operation of Blackhills Quarry.

The site will also generate indirect employment through the use of local firms for supplies, maintenance and specialist support. National research indicates that 1.6 jobs are supported for every 1 direct job in the quarrying sector.

DESCRIPTION OF THE DEVELOPMENT

Site Location and Description

Blackhills Quarry is an existing operational hard rock quarry situated in a semi-rural location on the southern outskirts of the City of Aberdeen, approximately 300m from the closest properties on the south of Cove.

Cove Cottage, owned by Leiths [Scotland] Ltd, is located some 100m to the south of the site; access is gained to this property via the quarry access road. The closest private residential property, Colsea Cottage is located some 250m to the north-east. Industrial and business land is located some 400m to the west of the permitted quarry development and some 300m from the proposed extension area.

The site is composed of the existing quarry operation, the proposed extension area being agricultural land. A vegetated strip of land along the eastern boundary forms a stand-off between the quarry and the East Coast Railway Line.

The lands to the north, south and west comprise agricultural land. The East Coast Railway Line forms the eastern boundary of the site, the land falling sharply away to the coast and the North Sea thereafter. Leiths [Scotland] Ltd's main offices and workshops are located to the west of the site alongside Rigifa Farm. Leiths also have industrial workspace and a workshop located on the south-eastern boundary.

Economic Geology

Blackhills Quarry extracts granite from the Cove Granite Intrusion and is the only operational granite quarry within the Aberdeen City region.

The main rock unit within the site boundary is a medium- to coarse-grained intrusive igneous body [granite] which is variably red to dark grey in colour and is characterised by a network of interconnected fractures that give the rock a blocky appearance. It has undergone some alteration, with the grey areas more representative of the fresh, unweathered rock and the red areas having experienced some minor alteration. The granite mineralogy is characterised by both biotite and muscovite micas, quartz and feldspars.

The resource is suitable for use in a full range of dry quarried products including single size aggregates, hardcores, sub-bases and scalpings and aggregates suitable for incorporation in bitmacs and asphalts and in concrete mixes.

The Proposal

The proposal makes provision for the continuation of hard rock quarrying and processing; the extension of the excavation area; the continued operation, relocation and replacement of the asphalt and ready-mix concrete plants and the recycling of construction/demolition waste and road planings to produce recycled aggregates and the final reinstatement of the land.

The operation will yield an estimated 9 million tonnes of hard rock over a period of 36 years at a production rate of 250,000 tonnes per annum. A further 1 year shall be required to complete restoration works on cessation of operations; planning permission is sought for an overall period of 37 years.

It is envisaged that an average of 20,000 tonnes of construction and demolition waste and road planings might be imported annually for recycling.

In terms of land take the proposed site boundary extends to some 28.59 hectares [ha], the proposed excavation area being some 19.03ha.

Mineral extraction has been split into six individual phases for which the approximate timescales are identified in Table 1 overpage.

Table 1 – Durations for Site Phasing

Phasing	Years Duration	Years Cumulative
Phase 1	4 years 3 months	4 years 3 months
Phase 2	7 years 6 months	11 years 9 months
Phase 3	9 years 2 months	20 years 11 months
Phase 4	6 years 2 months	27 years 1 month
Phase 5	6 years 3 months	33 years 4 months
Phase 6	2 years 8 months	36 years
Restoration	1 year	37 years
Total Years	37 years	37 years

Site Design and Operational Standards

In applying for the proposed development, the applicants have endeavoured to minimise the potential environmental impacts from extraction, haulage and processing operations and the production of added value products and to employ operational standards in line with the requirements of the Quarries Regulations 1999 and the Scottish Environment Protection Agency [SEPA].

The major factors which have influenced the design of the site are:

- the existing quarry;
- landownership boundaries;
- engineering requirements to ensure the stability of working faces and the restored landform;
- the market strategy with regards to quarry production and product type; and
- minimisation of potential impacts: landscape, visual, noise, dust, blasting, traffic and amenity.

Development Programme

Site Preparatory and Infrastructure Works
The existing site is enclosed by boundary fencing which shall be maintained throughout operations. Prior to the commencement of operations within the extension area the site boundary will be assessed and, where required, boundary fencing will be erected for the purpose of public safety and to ensure the operational area is kept stock proof. The development operational boundaries will be maintained throughout the duration of operations until restoration is complete.

Development Programme – Phase 1
The Phase 1 development will extend the existing excavation area to the west. Soils and overburden stripped in advance of the excavation shall be utilised to form a 3m high screening mound along the southern extension boundary. The excavation shall be developed on two levels, the 61m level being developed south and the 74m level west.

As Phase 1 excavation operations near completion, advance soil and overburden stripping shall be undertaken over the remainder of the extension excavation area; the materials being utilised to form a permanent landscaped mound on the western extension boundary. The mound shall have a maximum height of 9m.

As operations progress through Phase 1 it is proposed to replace the older asphalt and ready-mix concrete plants with new plant which shall be located within the south-eastern operational area

Development Programme – Phase 2
The Phase 2 development will further extend operations to the west with the excavation being developed on two levels at 61m and 78m.

Development Programme – Phase 3
During Phase 3 the upper 78m level shall be developed west to the excavation limit in the north or the site, the 63m bench being developed west to the excavation limit in the south within the extension area. Simultaneously, the 48m quarry floor shall be developed south and west.

Development Programme – Phase 4
During Phase 4 the 48m quarry floor shall be developed west to the excavation limit within the extension area. Simultaneously, within the main quarry the middle bench shall be developed west to the northern/western excavation limits at 63m.

Development Programme – Phase 5
During Phase 5 the 48m quarry floor shall be developed west to the northern/western excavation limits.

Development Programme – Phase 6
The eastern quarry faces shall be developed east on two levels to the final excavation limits at 61m and 48m. As Phase 6 progresses the asphalt and ready-mix plants shall be removed to allow extraction to be undertaken to the full permitted extent in the south-east.

Restoration

From the cessation of quarrying operations a period of 1 year has been allowed for the completion of restoration. The restoration will address the stability and safety of the areas that have been subject to excavation or the effects of excavation.

The quarry reinstatement focusses on conservation enhancement with the sculpting of the quarry floor to create ponds and ephemeral wetland and the reintroduction of naturalistic species.

The landscaped screening bund along the western edge of the void will be retained as grassland, some regrading being undertaken along the eastern edge. The soil and overburden from the remaining peripheral bunds will be utilised for restoration works around the periphery of the quarry and within the quarry void.

The slopes of the final quarry void will be lightly seeded with a native grassland mix to provide some vegetation cover and then left to natural regeneration. Dense shrub planting will be undertaken on the quarry benches to discourage access to the steep faces. Some elements of bare rock and scree will also be present to provide areas of additional ecological interest.

The restored quarry floor in the north-east corner will be left at a slightly lower level than the remainder, allowing water to gather and form a small, shallow water body, with an adjacent area of marshy grassland.

At surface, areas of ground affected by operations will be restored to native grassland with scattered elements of shrub planting and bare ground to merge with the vegetation of the surrounding area.

Woodland planting will be undertaken at the north-west corner of the quarry. This will be a relatively small woodland block of shrub species and will provide an element of habitat diversity as well as being a linking feature in the surrounding landscape, enhancing Cove community woodland.

At cessation of operations, buildings and plant shall be removed from the main site infrastructure areas and the processing and stocking areas and these areas shall be reinstated to grassland. The site access is a shared access and shall be retained for the continued use of Cove Cottage and the adjacent industrial workshop.

Restored areas shall be subject to a 5 year aftercare period.

Hours of Working

The proposed hours of working are:

[i] 07.00am to 07.00pm Monday to Friday and 07.00am to 01.00pm on Saturday for extraction, processing and despatch of dry aggregates.

[ii] 06.00am to 07.00pm Monday to Friday and 06.00am to 04.00pm on Saturday for operation of asphalt and ready-mix concrete plants and despatch of materials.

Operations outwith these hours will be confined to maintenance and testing of plant and any other work of an essential emergency nature.

Consideration of Alternatives

The site has been identified as a strategic mineral resource and has the necessary plant and infrastructure in place. Consequently, as the proposal accords with planning policy, and Environmental Impact Assessment has demonstrated that, with appropriate mitigation, there will be no significant adverse impacts, the consideration of alternative sites for quarrying was not considered necessary.

Consideration has been given to the potential to serve the market from alternative sources such as other quarries or the use of renewable, recycled or secondary sources of materials. It has been established that, in terms of haulage distance, quantity and quality these alternatives are not feasible.

SCOPING THE ASSESSMENT

In order to identify impacts which could arise from the development, the project plan and effects of the procedures involved were considered in relation to the following environmental headings which are outlined in the Town and Country Planning [Environmental Impact Assessment] [Scotland] Regulations 2011 these being:

- human beings, fauna and flora;
- soil, water, air, climate and landscape;
- material assets and cultural heritage; and
- the interactions between any of the foregoing.

The key issues identified were:

- the landscape and visual impact of the development;
- the ecological impact of the development;
- the hydrological impact of the development;
- noise associated with the quarry operation and road haulage;
- dust associated with the quarrying and processing operation;
- blast vibration associated with quarrying operations;
- the impact of traffic associated with the development; and
- the impact on cultural heritage.

Assessments of potential impacts were undertaken in relation to all the issues identified above. The survey findings, and conclusions, are summarised in the following sections.

LANDSCAPE

The landscape impact assessment aims to identify and assess the likely impacts which the proposed development will have on the landscape.

Quarrying is an established land use at this location and quarrying operations to date have changed the landscape character of the immediate area. The extension of the quarry excavation will result in additional slight to moderate landscape impacts. However, following sensitive restoration the impacts of the proposed operations will reduce to negligible to slight.

VISUAL

A visual assessment has been undertaken at a number of selected viewpoints that were assessed as being representative of the surrounding area.

Views will be available for visual receptors including residents, recreational users of the area immediately around the proposal, travellers on the road network and workers within farmland and the quarry itself [although these individuals are not considered as sensitive to the development].

Views from outwith the immediate environs of the site are limited by the topography and landcover and are further mitigated by bunding. The impact of the bunds will be limited as they will be grassed, significant impacts only relating to closer viewpoints from which the form of the bunds may be more apparent.

In general visual impacts from viewpoints close to the site boundary are likely to be moderate in the short term and slight in the long term; impacts from views at greater distance being slight to negligible. Following final restoration there will be no significant visual impact. At final restoration there is at worst a slight adverse impact.

HYDROLOGY AND HYDROGEOLOGY

An assessment of the existing hydrological and hydrogeological conditions at the site has been undertaken and the potential impacts attributable to the proposed quarry development have been identified and assessed and mitigation measures set out as required.

Surface water run-off from the surrounding area currently drains around the quarry. There are no ditches or watercourses within the proposed extension area or in the surrounding vicinity that would be affected by quarry development. The screening mounds, which shall be established along the excavation boundaries of the extension area, shall ensure that there is no potential for surface runoff from the surrounding area into the quarry.

The quarry floor has been developed down to around 48m AOD which is above the groundwater table and there is no groundwater flow into the excavation. The proposed extension will be developed to a similar level.

Incident rainfall occurring within the site currently drains to the quarry floor where it either disperses by infiltration or is directed to quarry sumps which are utilised for dust suppression on haul roads and stockpiles during drier spring and summer periods. In the past water was periodically pumped from the sumps to settlement ponds in the north-eastern corner of the site where water dispersed by infiltration within the site boundary. Under the proposed water management system for the extension application it is proposed that any water not utilised for ready-mix concrete production or dust suppression shall be contained and dispersed within the quarry void.

Any oil, fuel, lubricant or other potential pollutant will be handled on the site in accordance with the Scottish Environment Protection Agency [SEPA] guidelines to ensure prevention of pollution of any watercourse or aquifer.

Potential residual impacts to the water environment from physical changes to overland drainage have been assessed as minor. All other potential residual impacts have been assessed as negligible. No residual impacts are anticipated.

ECOLOGY

Consultation has been undertaken with Aberdeen City Council, Scottish Natural Heritage, Royal Society for the Protection of Birds and Scottish Wildlife Trust. In addition, survey information and mitigation advice was sought from several regional/local/specialist interest groups. These included North East Scotland Raptor Study Group, North East Scotland Bat Group, Scottish Badgers and Grampian Badger Surveys. Data was also sourced from the North East Scotland Biological Records Centre [NESBReC].

A desk study, field visits and Phase 1 Habitat Survey have been undertaken. The proposed extension area of 5.48ha is under agricultural management with associated overgrown grass margins. This loss of arable land is assessed as being of low magnitude due to the abundance of similar habitat in the area. Whilst the farmland habitat is common and widespread, the habitat has a low local conservation value due to the presence of red and amber list bird species, as well as species included in the Local and UK BAP. The development has been assessed as having a negligible adverse impact with respect to the agricultural landtake.

Ornithological surveys and species surveys for Badgers have been undertaken. The surveys conclude that, with appropriate mitigation, the proposed development can be undertaken without any significant impact on these species.

The potential habitat impacts identified are temporary in nature and reversible in the medium to long-term through restoration. With appropriate restoration and sensitive management there is potential for a long-term net gain in terms of ecological habitat and interest.

NOISE

In order to assess the impacts of the proposed operations a noise assessment was undertaken by Vibrock Ltd, an independent firm of acoustic consultants.

The noise assessment measured the existing noise levels at the residential properties and business premises in closest proximity to the development. Thereafter assessment was made of the sound power output from the types of plant equipment to be used in the proposed development and, using this information, predictions were then made of the likely operational noise levels which would be received at the individual properties.

Scottish Executive Development Department Planning Advice Note 50 [PAN 50] Annex A sets out guidelines and best practice with regards to noise from mineral workings. The predicted noise levels at residential properties comply with the criteria set out in PAN 50 Annex A. It is considered that the proposed development can be undertaken without giving rise to the likelihood of complaint.

DUST

Scottish Executive Development Department Planning Advice Note 50 Annex B provides guidance on the control of dust at surface mineral workings and recommends that the emphasis in the regulation and control of dust should be the adoption and promotion of best practices on site.

An assessment of potential dust generating sources was undertaken to determine the best methods of limiting or suppressing dust at the proposed quarry. The operators currently implement a Dust Management Strategy to control dust from non-regulated sources, for example, dust arising from vehicle movements on haul roads by water spraying.

Where processing activities can generate and emit significant quantities of dust these processes are regulated under the Pollution Prevention and Control Regulations 2000 and require authorisation from SEPA. At Blackhills this relates to crushing and processing, recycling operations and the operation of the asphalt and ready-mix concrete batching plants; the potential for dust emissions from these activities is therefore controlled.

With regards to health, the nuisance effects of dust centre on the effects of inhalation and respiration of smaller, finer airborne dust particles. The COSHH Regulations for employee protection apply within the quarrying industry. It follows that, if exposure limits are being complied with on-site, it is unlikely that unacceptable dust concentrations will be experienced at nearby residential properties.

With regards to ecology most plants and tree species are relatively dust tolerant. No dust sensitive species have been identified which could be affected by dust. The volume of traffic generated by the proposal is not likely to have any significant impact on air quality.

With the continued implementation of the Site Dust Management Strategy the potential for dust emission from the site is low and it is unlikely that there will be any reduction in air quality.

BLASTING

As rock extraction within the proposed extension area will entail blasting, Vibrock Ltd, an independent firm of environmental consultants, were commissioned to undertake a blasting assessment. A site visit was undertaken by Vibrock Ltd to assess operations.

When blasting takes place two forms of vibration take place which may cause concern: namely ground borne and airborne [known as air overpressure].

Scottish Executive Development Department Planning Advice Note 50 [PAN 50] Annex D provides guidance on the control of blasting at surface mineral workings. For the development the operators have proposed that ground borne blast vibration at sensitive residential and business/industrial properties will be restricted to levels which fully accord with the criteria recommended in PAN 50 Annex D and are entirely safe. All blasts will be monitored to ensure compliance with the proposed criteria.

Appropriate vibration levels have also been proposed to ensure that operations have no impact on the adjacent East Coast Railway Line.

In line with the current best accepted modern practice in the extraction industry, safe and practical measures will be adopted to ensure the minimisation of air overpressure.

At all times the site will work in accordance with the guidance contained in PAN 50 Annex D.

ACCESS AND TRAFFIC

The quarry is accessed from the A956 via the local unclassified road network to the west and south of Cove. The existing access was created under a previous consent to the satisfaction of Aberdeen City Council and affords clear visibility splays in both directions. It is proposed that the existing access route shall continue to be utilised.

The internal access route is surfaced for some 650m from the main road. Access gates are located on the access route and open inwards only. The road slopes to the east-south-east ensuring that all water on the access route drains into the site. Adequate roadside drainage is maintained to prevent flooding of the road surface. The road is cleaned as required to ensure that no mud or dirt is carried onto the road by site vehicles. All vehicles carrying material smaller than 75mm are sheeted. During dry periods, the access route will be subject to dust suppression by water spraying in order to prevent the emission of fugitive dust from these surfaces.

Current production is estimated to be 250,000 tonnes per annum. It is envisaged that up to 20,000 tonnes of construction and demolition waste and road planings might be imported annually for recycling. Over 50 weeks per year and 5.5 days per week, this equates to an average of 124 vehicle movements daily Monday to Friday [62 empty HGVs entering the site, 62 loaded HGVs leaving] and an average of 62 vehicle movements on a Saturday [31 empty HGVs entering the site, 31 loaded HGVs leaving]. Some 20 daily car movements are likely to be generated by people employed on-site.

The proposal relates to the continuation of an existing operation with vehicle movements continuing at similar levels as previously experienced. The local road network is considered to be capable of continuing to accommodate these movements.

The potential impact in respect of traffic associated with the development is assessed as low/negligible.

ARCHAEOLOGY

A desk-based assessment and walkover of the proposed site was undertaken by Murray Archaeological Services Ltd, an independent archaeological consultancy.

With the exception of South Blackhill farm, which has been demolished, there are no known archaeological features within the proposed extension area.

There shall be no physical impact on known archaeological features. There are no archaeological features within such proximity as to give rise to a potential impact on setting.

The potential for an impact on currently unknown archaeological features is assessed as low/negligible.

The potential impact with respect to archaeology is assessed as acceptable in terms of national and local guidance.

RECREATIONAL ACCESS AND RIGHTS OF WAY

On consultation, ScotWays, the Scottish Rights of Way and Access Society, advised that there are no recorded Rights of Way in the area of search.

The Aberdeen City Council Core Paths Plan does not identify any Core Paths within the application area. There are no recognised footpaths within the application area.

The East Coast Railway Line forms the eastern boundary of the site, creating a natural barrier which significantly reduces the potential for informal recreational use and the site is located in a rural location where the number of pedestrians is likely to be limited.

It is considered that the potential for impact on recreational access is low/insignificant.

CUMULATIVE IMPACT

The possibility of a cumulative impact, attributable to two or more mineral workings operating in close proximity, has been considered with respect to landscape and visual,

hydrology and hydrogeology, ecology, noise, dust, archaeology and traffic.

There are two other quarries in the vicinity: North Mains Quarry, Findon to the south, and Blackhills of Cairnrobin Quarry to the south-west.

These quarries have operated in tandem with each other over several years. Over this time period no significant cumulative impacts have been experienced as a result of these operations.

Having consideration of the separation distance, the intervening topography and groundcover and the site management required by planning and environmental legislation, potential cumulative impacts from the operation of these developments in tandem are anticipated to be low/negligible.

WASTE MANAGEMENT PLAN

The Management of Waste from Extractive Industries [Scotland] Regulations 2010 require that all future mineral planning applications/decisions must include a Waste Management Plan [WMP].

At Blackhills Quarry waste materials, as defined in the Regulations, constitute soils and glacial till [overburden]. The temporary/permanent storage/placement of these materials are addressed within the Waste Management Plan.

QUARRY LIAISON GROUP

Leiths [Scotland] Ltd recognises that liaison groups are a worthwhile and valuable means of transmitting information and addressing legitimate local concerns. Accordingly the applicants would be prepared, if it were desired by local interests and the planning authority, to assist in the setting up of, and to participate in, a Quarry Liaison Group.

OVERVIEW

No quarry development can be designed to have no adverse environmental impacts, although mitigation measures can negate many of these, lower the magnitude of others and reduce the probability of significant impacts occurring.

Following the implementation of the mitigation measures described in the Environmental Statement the proposal is considered to have an overall adverse impact of low magnitude during operations which will reduce to negligible following restoration.

Positive benefits will be gained in terms of the longterm maintenance of a strategically important mineral reserve for the Aberdeen City and Aberdeenshire regions and economic benefit to the local construction industry by ensuring competitive pricing. Continuation of operations will also ensure that employment is maintained for a significant workforce. The proposal is considered to be in accordance with national and Development Plan policy.

For further Information contact:

William Booth
Dalgleish Associates Ltd
Mineral & Planning Consultants
1 Sinclairs Street
Cathedral Square
Dunblane, FK15 0AH

Tel: 01786 822339 Fax: 01786 822899
email: willie.booth@dalgleishassociates.co.uk

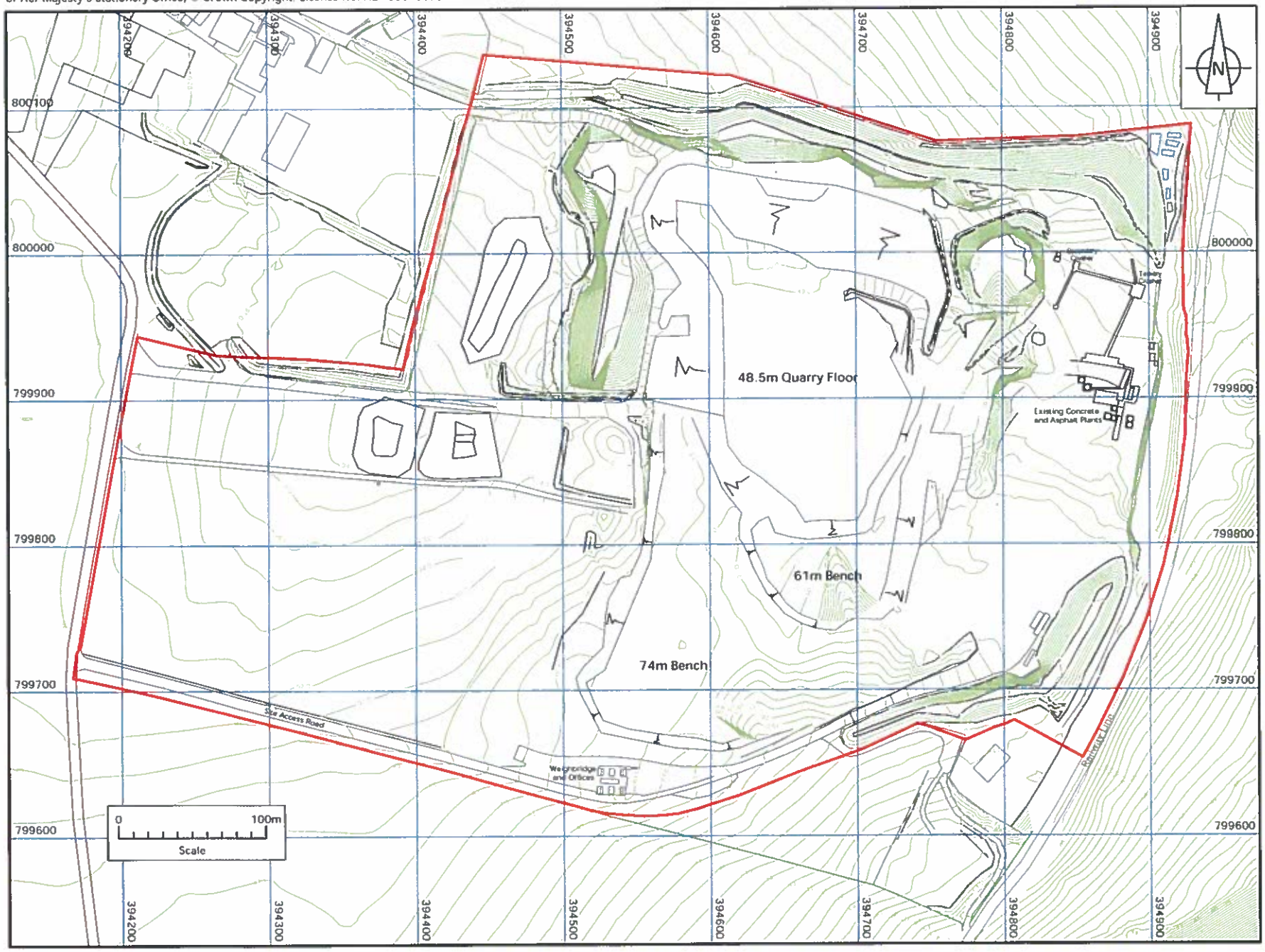
DAL
DALGLEISH ASSOCIATES LIMITED

GENERAL LOCATION PLAN

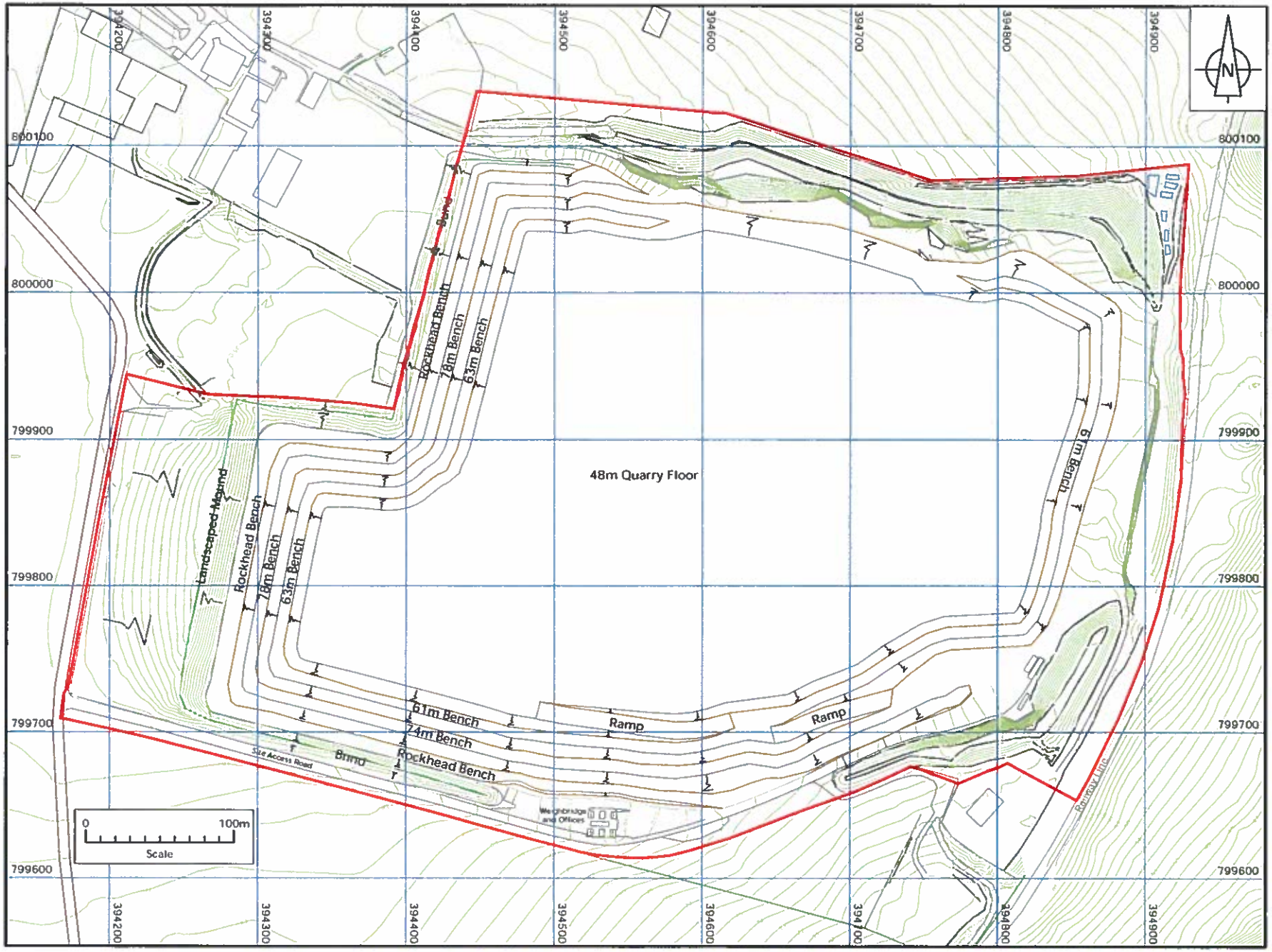
0 1000m

Scale

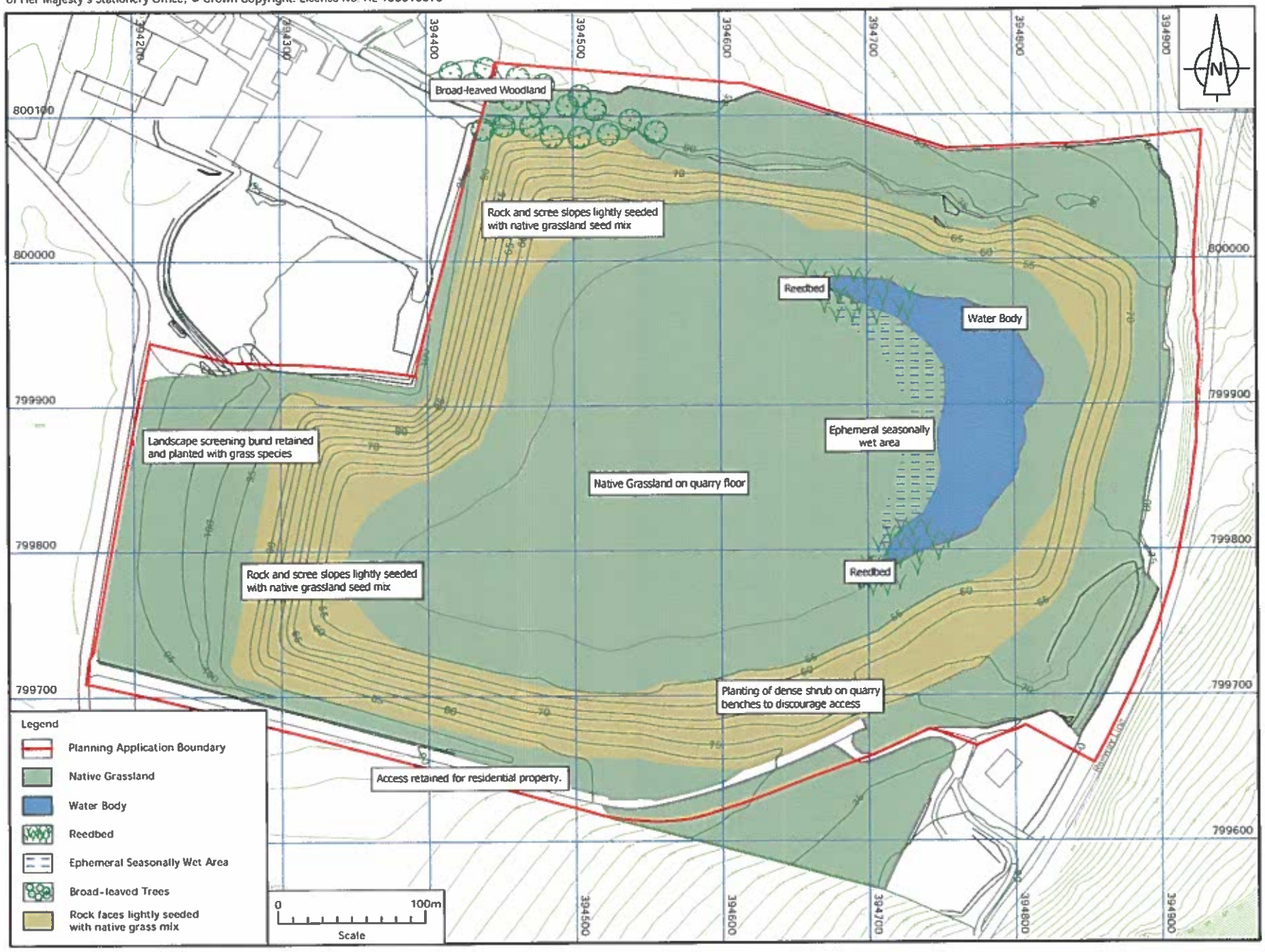
EXISTING TOPOGRAPHY PLAN



FINAL PHASE DEVELOPMENT PLAN



CONCEPTUAL RESTORATION PLAN



THE SCOTTISH OFFICE
Development Department

Planning Advice Note

PAN 50

CONTROLLING THE ENVIRONMENTAL EFFECTS OF SURFACE MINERAL WORKINGS

October 1996

ISSN 0141-514X
ISBN 0 7480 5652 1

- **National Planning Policy Guidelines (NPPGs)** provide statements of Government policy on nationally important land use and other planning matters, supported where appropriate by a locational framework.

- **Circulars**, which also provide statements of Government policy, contain guidance on policy implementation through legislative or procedural change.

- **Planning Advice Notes (PANs)** provide advice on good practice and other relevant information.

Statements of Government policy contained in NPPGs and Circulars may, so far as relevant, be material considerations to be taken into account in development plan preparation and development control.

contents

introduction

1. The policy context for mineral working is set out in NPPG 4 : Land for Mineral Working. Minerals are an important national resource. They make an essential contribution to the nation's prosperity by meeting industry's need for raw materials, creating employment opportunities and assisting the balance of payments through exports and import substitution. However the extraction process can often be disruptive and have significant environmental impact. Whilst acknowledging that minerals can only be worked where they are found, the Government recognises that the need to work mineral resources must be reconciled with care for the environment particularly in relation to the natural and built heritage, and communities.

2. "Sustainable Development : The UK Strategy (1994) indicated that part of the sustainable framework for mineral extraction was :

- To encourage sensitive working practices during minerals extraction and to preserve or enhance the overall quality of the environment once extraction has ceased.

NPPG 4 also indicated that further advice on controlling the environmental effects of surface mineral workings would be covered more fully in future Planning Advice Notes.

Purpose

3. The aim of this Planning Advice Note is to provide advice on the more significant environmental effects arising from mineral working operations. This advice will be relevant :

a) in the framing of policies in development plans,
b) in considering planning applications,
c) in considering existing planning consents in the context of reviews under the provisions of the Environment Act 1995.

4. When considering planning applications, attention should be given to defining the scope of Environmental Assessments, and the acceptability and purpose of any conditions that may require to be attached to any consents. Thereafter, monitoring compliance with any imposed conditions should be a priority so as to determine whether enforcement action is necessary.

5. The advice in this PAN is based on the Government sponsored research report by Roy Waller Associates Ltd. "Environmental Effects of Surface Mineral Workings" and published in 1992 by HMSO. £16 (ISBN 0-11-752637-1)

Scope

6. This PAN deals generally with the environmental effects of surface mineral working and provides the framework for detailed advice in a series of annexes on particular aspects. The first of the planned series of annexes "The Control of Noise at Surface Mineral Workings" is published with this PAN as Annex A. Further Annexes will be published on "Dust", "Blasting", "Traffic" and "Ground & Surface Water", as the current research is completed and evaluated, (see page 29 for relevant references). The PAN and annexes indicate what should be considered 'good practice'. They do ***not*** however cover all environmental effects, where conflict may arise, for example, in relation to designations intended to protect the natural or built heritage. It is the responsibility of the planning authority, to consider in detail any proposal for mineral working in their area, in relation to the particular

site and its environs. In so doing they should have regard to other published planning guidance and, where appropriate consult relevant bodies, such as Scottish Natural Heritage (SNH) and Historic Scotland (HS) where proposals may effect designations intended to protect natural or built heritage. (see NPPGs 4 and 5, and PAN 42)

environmental issues

7. The Environmental Assessment (Scotland) Regulations 1988 require an environmental assessment to be undertaken for proposed mineral working which in the opinion of the planning authority is likely to have significant effects on the environment. Under proposals to amend the Directive, all mineral extraction proposals where the surface of the site exceeds 25 hectares, or peat extraction, where the surface of the site exceeds 150 hectares, may in future be subject to environmental assessment. The new arrangements are scheduled for introduction from December 1997.

8. The environmental assessment process enables greater understanding to be reached between the intended operator, their neighbours and the regulatory authorities. In the event of planning approval there is also the opportunity to use the results of assessments as a basis for determining conditions to be imposed, for monitoring the actual environmental effects and for evaluating the decisions. Some 67 Environmental Statements have been submitted in association with planning applications for mineral extraction in Scotland since 1985.

9. To be effective, environmental assessment requires to be focused (scoping) i.e. the early identification of the issues that are most likely to be significant and therefore have most relevance in determining whether or not the proposal can be allowed to proceed with appropriate mitigation measures. Care should be taken to ensure that steps to deal with one particular aspect of concern do not create others.

10. Generally speaking the main issues that give rise to concerns in connection with surface mineral working are, in broadly descending order of frequency :

- the various effects of road traffic, particularly where this is the primary means of transport,

- the effects of blasting, noise and dust : these issues will vary according to type of mineral and amount of overburden,

- visual / landscape effects,

- contamination of surface water discharges by solids may occur; contamination by oil and its derivatives is less frequent; dewatering also creates difficulties with reduction of flow of wells and streams, over-drainage and occasionally settlement.

11. This PAN gives advice on how to consider the main impacts that may arise from proposals for surface mineral extraction and ways in which these impacts can be controlled or minimised, in order to ensure that sites are designed and operated to environmentally acceptable standards. Each case must be considered on its merits, and planning authorities and the industry will therefore need to consider the applicability and practicability of the advice in the circumstances of particular proposals. Advice on Restoration, Aftercare and After-use will be covered by a separate PAN.

12. Residents living in close proximity to proposed workings may be exposed to some or all of the effects referred to above, to a greater or lesser extent. NPPG 4 fully acknowledges the sensitivities that can arise in such circumstances. Accordingly, it is for planning authorities to take particular care in respect of the conditions they attach to any consent they may be minded to give for working in close proximity to settlements. Where they judge that mitigation measures are not sufficient to safeguard the quality of the local environment, outright refusal or restriction of the proposal may be appropriate.

13. While in the past consents have been given for mineral extraction in close proximity to residential property, experience indicates that in some circumstances it may be difficult to provide adequate protection for nearby residents despite requirements for landscaping works such as bunds, screening and planting, especially where the workings will have an extended life. The negotiation of adequate separation distances should therefore be sought in respect of new proposals where appropriate. Current practice on appropriate distances appears to vary considerably.

14. The aim should be to agree a distance that is reasonable, taking into account the nature of the mineral extraction activity (including its duration), location and topography, the characteristics of the various environmental effects likely to arise and the various amelioration measures that can be achieved. Agreement on an acceptable separation distance at an early stage in the formulation of proposals may help allay many of the concerns of local residents. Working in close proximity to residential property should only be contemplated in exceptional circumstances e.g. where there are clear, specific and achievable objectives e.g. for the removal of instability and preparing land for subsequent development. But such working should be for a limited and specified period without scope for extension. However, the removal of the potential dangers associated with former shallow mining e.g. subsidence, old mine shafts etc., can in itself be an advantage to the local community especially where the restored site has recreational potential.

15. It will also be the case that in many larger sites, working in any one area will be of limited duration as the operation will be phased. Working nearest to occupied dwellings could either be at the beginning of the operation or at the end or at any point in between. This flexibility may be constrained by operational considerations but operators and planning authorities should consider and agree the pattern of extraction which takes account of local residents' views.

16. Some minerals are concentrated in specific areas. For example shallow coal deposits that may be worked by open cast extraction are found within the known coalfield areas mainly in the Central Belt and are generally well documented. Sand and gravel deposits are generally associated with glacial deposits that are widely distributed throughout Scotland but with commercial interest focused within relatively restricted local market areas associated with the main urban areas where most construction activity is concentrated. It is also relevant that the characteristics of the mineral, and hence the suitability for different end uses, will vary from place to place.

17. Situations will therefore arise where commercially attractive deposits will be concentrated in certain areas where the mineral rights may be held by a few or many interests. This can result in instances where there is the prospect of several simultaneous operations over a relatively short period of time or phased operations over a relatively longer period of time. The potential cumulative effects will be

particularly relevant where proposed extraction would be carried out close to existing communities.

18. In these circumstances it will be for the planning authority to determine whether the working of the mineral can be reconciled with the need to protect communities from unacceptable environmental consequences. In coming to such decisions the primary consideration would be that the planning authority should act reasonably. Pointers on current best practice are set out below.

summary of good practice : the relationship of workings to local communities

Planning authorities should :

- consider the possible cumulative effect of proposals,
- avoid inappropriate development and encroachment in the area around the longer-term workings and significant reserves,
- encourage a dialogue between operators and the community,
- encourage elected members to visit sites before making judgements,
- encourage liaison committees and officers and members to participate in them.
- establish effective monitoring i.e. noise, dust and vibration and where necessary enforcement.

Operators should :

- endeavour to be good neighbours, i.e. :
  - ° get to know the neighbours, be concerned about them and try to understand their problems, encouraging them to know site personnel, listen as well as talk,
  - ° set up regular liaison and provide information as freely as possible, hold open days,
  - ° create a good impression by running a tidy and efficient site,
- ensure lines of communication, e.g. :
  - ° appoint a liaison officer; widely publicise name & telephone number,
  - ° support a liaison committee,
  - ° give advance notice and explanation of activities that might cause complaint,
  - ° keep systematic records of complaints and the remedial actions taken,
  - ° follow up complaints by personal visits and action,
- ensure that staff are environmentally aware and are trained to cope with the issues,
- do not rely on the letter of the law where there are obvious problems but culpability cannot easily be proved; be prepared to be flexible,
- offer / provide compensatory measures where the impact is excessive or borderline,
- try to co-operate and avoid being adversarial.
- offer opportunities to see how effective operational (planning) conditions have been in practice elsewhere.

People living in proximity to surface mineral working sites should :

- get to know the operator :
  - ° take advantage of any overtures,
  - ° try not to have preconceptions,
  - ° listen as well as talk,
  - ° encourage site personnel to visit you at home to discuss your queries/concerns,
- try to understand the operator's activities and problems :
  - ° ask for a visit to the site or a similar one,
  - ° speak to people who have lived in the vicinity of similar workings,
  - ° take advantage of open days, liaison committees,
- try to be specific when making complaints, e.g. date, time, clear description,
- try to co-operate and avoid being adversarial.
- seek opportunities to see how effective operational (planning) conditions have been in practice elsewhere.

19. The identification of environmental effects need not necessarily preclude development from proceeding. Planning conditions can enable development to proceed where it might otherwise be necessary to refuse planning permission. The sensitive use of appropriate planning conditions, which address known and anticipated problems and concerns, can provide important environmental safeguards. In turn, they can influence the action that operators might take as good neighbours.

20. To be effective, planning conditions must be enforceable. This means that they must be :

- precise,
- capable of being monitored, i.e. infringements must be detectable,
- defined sufficiently for breaches to be provable.

In addition to being valid, they must be necessary, relevant to planning and to the development, and reasonable. (see SDD Circular 18/1986 'The Use of Conditions in Planning Permissions)

21. 'Conditions' can set requirements in a variety of ways. The principle ones are :

- performance requirements,
- the use of specific amelioration measures,
- the use of "good" practice, e.g. as set out in a code of practice.

Performance Requirements

22. Effective planning requires judgements based upon local circumstances and local objectives. Where feasible, performance requirements are in many ways the ideal basis for planning conditions. They make clear to operators what is expected of them and leave them to decide the most cost-effective way of meeting those criteria. To go beyond this may inadvertently and unnecessarily prejudice the flexibility of operators working methods and profitability. It should never prejudice other statutory controls for health and safety. Performance requirements will usually be designed to achieve a minimum environmental quality or to limit degradation of the environment. An example of such criteria is a maximum acceptable level of noise at sensitive properties and / or other appropriate points.

23. Setting performance requirements should not sanction adverse effects for which there are readily available solutions and which do not involve significant costs. In some cases the operator will be able to achieve worthwhile improvements on the performance requirements without incurring significant expense. Clearly it is desirable that this be done but it can be difficult to provide the appropriate incentives.

24. Monitoring is an essential feature of controls over the consequences of surface mineral extraction. In many cases periodic checks should be sufficient to identify undesirable trends and allow action to be taken to avoid breaching the requirements. In sensitive situations the provision by the operator of continuous monitoring systems can be a condition of the planning permission. Access to the monitoring positions will be essential and this will influence their choice. It may be desirable that monitoring be carried out at a sensitive property not owned by the operator; however, whilst criteria applicable to that property can be set in a planning

condition, it cannot be a requirement that it be a monitoring position because the operator has no right of access.

Amelioration Measures

25. The difficulty or impossibility of defining a criterion which can be readily measured and enforced may lead to planning conditions which require the use of specific ameliorative measures e.g. :

- In order to reduce visual intrusion (see para 47 to 51) , the planting of trees may be required before mineral working begins or it may be specified that processing plant be moved into the quarry away from the entrance when there is room to do so.

- It is a statutory offence for vehicles to deposit material on the roads. The objective is simple enough to understand but it is difficult to enforce. In such a case it may be much easier to require specific action, e.g. the cleaning and sheeting of all lorries prior to leaving a site.

Codes of Practice

26. Environmental management is an integral part of environmental codes being adopted by many sectors of industry in recognition of the public concern for better safeguards for the environment as a whole. Such codes within the aggregates industry are now well established for those operators who are members of the BACMI and SAGA trade associations. At the present time, in Scotland, there are early discussions between opencast coal operators (Confederation of United Kingdom Coal Producers - COALPRO) and planning authorities on the development of a 'Coal Code of Practice'.

specific environmental effects

27. The remainder of this PAN is devoted to providing summaries of good practice points in addressing the main effects associated with surface mineral extraction. The topics covered are traffic, blasting, noise, dust, visual intrusion ground and surfacewater, wastes and severance and footpaths. Details of the more technical aspects are to be addressed in the planned series of annexes to accompany the PAN. The first of these on "noise" is published with this PAN.

Traffic

28. The potential off-site effects of traffic are :

- to add to the number and size of vehicles on the road; this may cause congestion, accidents, difficulties for pedestrians;

- damage to roads or their verges;

- spilled or dropped material onto roads and spreading dust;

- creating visual intrusion, air pollution, dust, noise and vibration in areas adjacent to the roads.

On-site the potential effects are largely noise and dust in neighbouring areas.

29. Concern arises about traffic regardless of the type of mineral extracted. Parts of the industry acknowledge that traffic is one of the most intractable

problems. Complaints arise from 'intimidation' by large vehicles, danger, roads unsuitable for the size of vehicle, damage to verges, dust, spillage, mud from wheels and body of vehicles, noise from early starts and early arrival at sites (parking off site), vibration and congestion.

30. Vehicles carrying minerals (particularly on local roads) are among the heaviest and possibly the largest to use the roads in question. They are often out of scale with the rural and urban roads they use, especially in the vicinity of the workings and customer's site. Even low traffic flows in sensitive areas give rise to complaints.

31. Empty lorries are an equal cause for concern. They tend to travel faster and be noisier because they suffer from 'body-slap' when going over bumps or pot holes. If not sheeted, turbulence in empty bodies of vehicles may scour out dust.

32. Operators may be under commercial pressure to work 'unsocial' hours. Building contractors in urban areas require early delivery of aggregate or pre-mixed concrete to avoid delays during the peak traffic hours. Roads Authorities / contractors need material for the start of the working day. Road maintenance work may be done outwith peak hours (especially at weekends) to avoid disruption to peak hour traffic. Pointers on current best practice are set out below.

Summary of Good Practice on traffic

Planning Authorities should :

- encourage alternatives to road traffic especially onsite between an excavation and processing plant;
- consider the need to agree or specify planning conditions relating to the :
  - ° site entrance, e.g. which way vehicles can turn,
  - ° provision of signposting,
  - ° sheeting of lorries before leaving the site,
  - ° provision of sheeting bays,
  - ° provision of information and instructions to drivers,
  - ° provision of adequate wheel / vehicle washing facilities
  - ° cleaning of roads when deemed necessary by the Roads Authority
  - ° hours of operation (vehicles arriving and leaving the site)
- liaise with the Roads Authority to limit the size, weight or axle loads of vehicles using particularly difficult roads,
- consider the construction of dedicated haul roads in relation to large scale proposals

Operators should :

- seek alternatives to road haulage from excavation to processing plant or depot e.g. conveyors.
- seek alternatives to longer distance road haulage e.g. rail
- avoid sensitive areas and the use of large vehicles in narrow winding roads by agreeing routes,
- require their drivers and others to use agreed routes, use washing facilities and sheet their vehicles where appropriate,
- offer a legally binding agreement on matters that cannot be satisfactorily covered by planning conditions.

See page 29 for ongoing research which will facilitate the production of a further Annex to this PAN .

Blasting - Vibration, Overpressure and Flyrock.

33. The Explosives at Quarries Regulations 1988 were introduced in January 1990 accompanied by an Approved Code of Practice (ISBN 0 11 8854623). These Regulations take into account modern blasting practice and set out particular duties for the quarry owner and manager. One of the primary objectives is to reduce the fly rock from blasting activity. These Regulations and

Codes of Practice are not exhaustive and only set out good blasting principles that should be adhered to in quarry blasting.

34. Blasting at surface mineral working gives rise to a number of effects :

- vibration; the levels of vibration generated by mineral workings are well below those required to cause structural damage to properties. However, vibration transmitted through the ground and pressure waves through the air ('overpressure') shake buildings and people and may cause nuisance. The effects of the two factors are difficult for even an expert to distinguish without instrumentation. However, the pressure wave may arrive after the ground vibration by up to 2 seconds over a distance of 1 km. The perception of both factors is likely to be stronger inside a building than outside,

- audible noise, because it is part of the pressure wave, occurs at the same time as overpressure. It may be augmented by the rattling of windows etc., caused by the overpressure,

- flyrock, i.e. fragments of rock propelled into the air by the explosion. This is clearly potentially dangerous to people and property both inside and out- side the site. Flyrock, in the context of this PAN, always means that crossing the site boundary,

- dust,

- fumes, which may be noticeable in confined spaces.

35. The levels of overpressure and noise can be significantly affected by meteorological conditions. Areas in which levels are enhanced will generally be down-wind. In addition noise can be affected by a range of weather conditions, e.g. temperature inversion or low cloud can concentrate / direct the effects to specific areas around the blast site. Once a blast is set up and the holes charged, firing must proceed under safety regulations, irrespective of the weather conditions. There is also a range of weather conditions which can increase overpressure effects. Because of these factors it will be difficult to define and enforce appropriate planning conditions

36. The need for blasting varies significantly amongst the types of mineral being worked e.g. for sand & gravel, clay and peat working it is unlikely ever to be required. For coal working it may be necessary to loosen or 'heave' the rock overburden or rock strata between seams. Most of the energy stays in the ground because the rock strata is only loosened. In hardrock quarrying it is necessary not only to loosen the rock but to fragment and move it away from the quarry face. Because of this, more energy is lost to the atmosphere than with 'heaving' so the overpressure may be greater. The basis of good blasting design is to achieve the desired degree of fragmentation in the rock safely and economically.

37. As a result of these and other differences in the blasting of coal overburden and rock, less explosive per unit of volume is used for coal than hardrock and levels of ground vibration tend to be higher for coal for a given explosive charge and distance. The converse is true of peak overpressure, i.e. it is greater for hardrock quarries than opencast coal workings for a given charge and distance.

38. Planning conditions should relate, where practicable, to performance i.e. they may set limiting levels for ground vibration. However it is not advisable to do

the same for overpressure as this would imply a degree of control by the operator that is not in fact possible, due to compounding meteorological effects. Use of good blasting practice is the responsibility of the operator and its oversight that of the Health and Safety Executive (HSE). The operator may have more economical ways of achieving the same end or may be asked to do things that create an unsafe situation. The HSE strongly deprecates conditions which set limits on, for example, the charge per hole, because they may lead to unsafe practice and even the specification of a maximum instantaneous charge may cause an operator to work in an unfamiliar way and lead to an error. It should be noted that an operator will always be concerned with maximising the efficiency of a blast, i.e. directing maximum energy into breaking or loosening rock and therefore minimising lost energy, i.e. overpressure. A Glossary of terms associated with blasting and pointers on current best practice are set out below.

Glossary of Terms associated with blasting

Collar	The opening of a borehole
Toe	The bottom of the borehole
Priming & detonation which where	Primer is a package of explosive used to initiate other explosives or blast agents and includes a detonator (or detonating cord to which a detonator is attached). Detonation a charge is passed to the explosive causing it to react.
Decking of Charges	The division of the explosive in a single drill hole into two or more separately detonated charges to reduce the maximum instantaneous charge (MIC).
Secondary Blasting explosive can noisy and uncertain	The initial blasting may leave lumps of rock which are too large to be handled; then be attached to these lumps to make them smaller. This can be a operation. Also called **'plaster blasting'**.
Stemming	An inert material used to confine or separate the explosives loaded into a borehole.
Surface Detonating Cord itself loud sharp noise.	Explosives can be detonated electrically; sometimes a cord is used which is in explosive. It burns so quickly that unless covered, makes a very

Summary of Good Practice on blasting

Planning Authorities should consider the need to agree or specify planning conditions relating to :
- the levels of ground vibration and overpressure to meet the 95% confidence level monitored over an appropriate period
- the prohibition of the use of surface detonating cord and plaster blasting,
- the control of flyrock, after advice from the Health & Safety Executive.

Operators should :
- carry out face surveys
- design blast, including the size of MICs and detonating sequence, to minimise environmental effects,
- check the setting out of holes and record any deviations,
- revise the design, if necessary,
- use correct stemming,
- monitor the blast to provide feed-back for future blast designs.

To limit ground vibration :
- minimise MICs e.g. by using decked charges,
- take special care in unusual situations e.g. in corners.

To minimise overpressure :
- avoid use of surface detonating cord and secondary blasting where possible,
- minimise the area of heave and the total charge,
- avoid blasting in adverse weather conditions when feasible, especially when the wind is towards sensitive premises and there is low cloud.

To avoid flyrock :
- ensure that the design is thorough and follows the Quarries (Explosives) Regulations 1988,
- move fragmented rock horizontally rather than vertically,
- use toe rather than collar priming / detonation,
- use screen nets when in any doubt.

See page 29 for ongoing research which will facilitate the production of a further Annex to this PAN .

Noise.

39. The research report "The Environmental Effects of Noise from Surface Mineral Working" prepared by WS Atkins Engineering Sciences Ltd was published by HMSO in 1990. The detailed technical aspects of 'noise' are discussed in Annex A to this PAN.

40. The potential effects of noise beyond the site boundary of a surface mineral working are to :

- distract or annoy; a noise does not have to be loud to be intrusive, it may be different in character and identified as coming from an unwelcome source;

- mask desirable 'noises' e.g. conversation, lost opportunity to sit in the garden or the effort of close concentration

- prevent or disturb sleep;

- disturb animals and birds that can also be affected, particularly by sudden noises.

41. The prediction of noise levels using the methods of BS 5228 are reasonably accurate, especially when using the specific measured noise values of the proposed or actual items of plant and equipment. In the case of many larger operations predictions can make use of computer models. Weather conditions affect the propagation of noise. Calm weather often means a low background noise level and a uniform propagation in all directions. A light wind enhances levels downwind, up-wind there can be significant reductions. With high winds noise propagation is variable; the background levels are likely to be higher and may mask other sources of noise.

42. Noise is often identified as one of the main problems associated with surface mineral workings, although research suggests that the actual problem of noise can be less intrusive than residents expected it to be. The construction of baffle mounds and soil stores are among the noisier operations that occur in the initial phase. Because noise screens are usually close to noise-sensitive properties, their construction can create considerable nuisance. This highlights the need for the developer to explain to the public the sequence of events and the timetable for particular site works. Other sources of noise include :

- reversing warning signals (often considered as "the most significant additional noise intrusion over the last few years"),

- the squealing of dry caterpillar tracks and the operation of draglines, dumpers, drills and pumps at night,

- operation of fixed plant.

Pointers on best practice are set out below.

summary of good practice on noise.

Planning authorities should consider :

- the ambient noise, predicted likely future noise levels, planning policies and the duration of the noise; discuss any limits, attenuation methods and monitoring with the local Environmental Health Officer.
- the need to agree or specify planning conditions relating to :
  - ° noise limits at "noise sensitive properties", etc., for various periods of the day,
  - ° the provision of monitoring equipment,
  - ° limits on hours of operation,
  - ° noise control measures, e.g. a lower noise limit for the first hour of working,
  - ° adherence to a code of practice

or in the last resort, usually for particular activities :

- ° noise emissions from plant temporarily working close to houses,
- ° types of plant and / or numbers of items in use simultaneously.

Operators should :

- discuss noise pre-application with the planning authority and demonstrate in their application that the proposed conditions can be met,
- plan ahead and ensure that :
  - ° noise has been taken into account in the layout, and the nature and sequence of working,
  - ° night working near sensitive areas is avoided where possible,
  - ° screening is part of the design, e.g. by bunds and working face,
  - ° the quieter of the methods or plant available is chosen,
  - ° especial care is taken with reversing alarms,
  - ° haul-roads are screened and without severe gradients,
  - ° location of on-site loading plant to minimise noise,
  - ° noise emissions from off-site traffic is minimised.
- ensure that site management and operatives are aware of the need to run the site as quietly as possible,
- check the noise characteristics of plant before use and periodically thereafter, where appropriate retro-fit noisy plant, ensure good operation and maintenance,
- make no unnecessary noise and reduce noise emissions, e.g. :
  - ° minimise height which material drops from lorries or plant,
  - ° minimise distance between loading and emptying dragline buckets,
  - ° reduce clanging of dragline buckets and chains by careful operation,
  - ° use rubber linings in chutes, dumpers, trucks, transfer points
  - ° clad plant and ensure that the cladding is kept free of holes,
  - ° start items of plant one by one, possibly behind mounds,
  - ° switch-off equipment when not in use, avoid unnecessary revving of engines,
  - ° keep noise control hoods closed when machines are in use,
  - ° keep lorry tailgates closed where possible,
- as a last resort, reduce the propagation of noise, by the use of :
  - ° temporary bunds,
  - ° portable screens.

Dust.

43. The Government sponsored research report "The Environmental Effects of Dust from Surface Mineral Workings" prepared by Arup Environmental was published by HMSO in February 1996. This work will facilitate the production of an Annex to this PAN in due course.

44. Dust is considered to be any solid matter emanating from surface mineral working, or from vehicles serving it, which is borne by the air and can range in size from 1 - 75 microns (μm). It can be emitted from a stack as a plume or it can be picked up by the wind from the ground, the surface of a road or a stockpile. Depending upon their chemical composition, the particles can be chemically active e.g. limestone, or effectively inert, e.g. sand. Their colour varies from black, e.g. coal, through brown to white e.g. cement or chalk. The finest particles, i.e. less than 10μm in diameter, will be respirable.

45. The main potential effects of dust are :

- visual; dust plumes, reduced visibility, coating and soiling of surfaces (including drying clothes) leading to annoyance, loss of amenity, the need to clean surfaces,

- physical and / or chemical contamination and corrosion of artefacts leading to :

  ° a need for cleaning
  ° mechanical or electrical faults, e.g. with computers, electro-mechanical devices,
  ° abrasion of moving parts,
  ° soiling of finished products, spoiling paint or polish finishes,
  ° contamination of laboratory, quality control, standards room and medical facilities,

- coating of vegetation and contamination of soils leading to changes in growth rates of vegetation and possibly reduced value of agricultural products,

- contamination of water courses.

46. Based on current evidence, it seems unlikely that dust of respirable sizes could be present off-site in concentrations sufficient to affect health. The Waller report suggests however that, in some cases, larger non-respirable particles could irritate the eyes, nose and throat of those exposed. The possibility of the effects of dust on health should be considered by planning departments in collaboration with pollution control authorities in the circumstances of the particular developments proposed. Pointers on best practice are set out below.

summary of good practice on dust.

Planning Authorities should :

- liaise with the pollution control authority under the Environmental Protection Act,
- consider the need to agree or specify planning conditions relating to the :
  - ° layout of the site, design of stockpiles,
  - ° containment of conveyors and processing plant and dust collection equipment,
  - ° use of bowsers, sprays and vapour masts on haul-roads, stockpiles, transfer points,
  - ° design of material-handling systems, drop heights, wind guards, loading points,
  - ° use of binders on haul-roads and stockpiles (after consulting SEPA)
  - ° limiting levels of dust measured in a specific way; provision of monitoring facilities.

Operators should :

- minimise the creation of dust by planning and design, e.g.
  - ° use of conveyors rather than haul-roads,
  - ° locate haul-roads, tips and stockpiles away and down-wind from neighbours,
  - ° create 'sensitive zones' within which activities are limited,
  - ° layout and construct stockpiles, tips and mounds to minimise dust creation; use gentle slopes and avoid sharp changes of shape,
  - ° use crushing and screening plant within its design capacity,
  - ° minimise the height of fall of material,
  - ° use appropriate chippings for stemming,
- control the escape of dust, e.g. :
  - ° enclose conveyors, chutes, process plant, stockpiles,
  - ° provision of dust removal system for the plant,
  - ° use sprays, mists, microfoam or foam,
  - ° fit outlets with cyclones, wet-scrubbers, filters
  - ° insist on good maintenance,
- minimise dust pick-up by wind, e.g.
  - ° compact, grade, surface and maintain haul-roads,
  - ° fit dust extractors, filters and collectors on drilling rigs,
  - ° use mats when blasting,
  - ° restrict dust-making activities to sheltered areas,
  - ° use wind-breaks / netting screens / semi-permeable fences,
  - ° limit drop of falling material,
  - ° fit wind-boards / hoods to conveyors / transfer points,
  - ° reduce speeds and limit movement of vehicles, use upswept exhausts,
  - ° use water bowsers, sprays or vapour masts,
  - ° spray exposed surfaces e.g. unsurfaced haul-roads, stockpiles, with binders (consult SEPA),
  - ° vegetate exposed surfaces e.g. overburden mounds, with quick growing plants,
  - ° limit spillage; facilitate the removal by the use of hard surfaces,
  - ° sweep haul-roads and other dusty surfaces,
  - ° shake-off dirt from vehicles, provide vehicle washing facilities,
  - ° provide a surfaced road between washing facilities and site exit,
  - ° use closed or sheeted vehicles carrying dry material,
- remove dust from the atmosphere, e.g.
  - ° use fine water sprays / mists, with or without additives,
  - ° use trees or shrubs around the site,
- temporarily suspend the activity or operation, if the creation of dust cannot be avoided.

Visual Intrusion

47. Mineral working need not necessarily result in the long term change in landscape. Where sufficient quantities of fill are available, it is usually possible to return to the original landscape. However, the effects of surface mineral working on the landscape are arguably one of the most controversial aspects associated with such developments. Because of the diversity of local landscapes, the impacts vary in their nature. Equally, the methods of working and subsequent restoration can in time ameliorate the impact. At worst, however, the damage to the landscape can be permanent. Thus mineral working can :

- remove some features of the existing landscape, e.g. a hill.

- introduce a feature into the, e.g. a quarry face,

48. Landscape change and visual intrusion are accordingly major issues particularly at the planning application stage and authorities and operators need to address the potential impact both on the local environmental setting and in the wider landscape to see whether the topography and vegetative cover of the area can reasonably absorb the proposed development without significant diminution of its perceived qualities. Clearly the identification of measures to ameliorate the effects is a key part of the planning consideration. Over the years the approach has become more sophisticated. However, there remain important judgements to be made about impacts throughout the various stages of the proposed working, the way the extraction is to be progressed and the specific measures proposed to ameliorate the effects. Thus the main perceived 'damage' is often inherent in the planning permission which may only be partially ameliorated by subsequent treatment.

49. On a smaller scale, but no less significant, height limits sometimes result in overburden mounds having flat tops that are unsightly and result in poor run-off. Although screening mounds may generally be better than a view of the mineral working, they may be seen as alien features in the landscape, especially if obviously man-made. Screening mounds and noise bunds are sometimes regarded as unsightly in themselves. They may have a useful function in relation to short term operations such as opencast coal working, but alternative measures may be preferable where the period of working is likely to be over a longer timescale e.g. hard rock quarries. The visual impact of mounds can be reduced by vegetation. This should be a normal requirement for any mound that is likely to remain for more than a couple of years. Vegetation has the added benefit of preventing erosion and loss of material.

50. A freshly exposed rock face is noticeable by contrast with its surroundings and a break in the skyline is particularly obvious. Where possible the working should not break the skyline, either as a result of removal of the top of a hill, or from the placement of mounds or machinery. The size of the excavation need not of itself be a problem but it could be if it is out of scale with its surroundings. Measures to alleviate the visual impact in these circumstances are much more difficult to identify and thus the topography of the area may become a determining factor in deciding on the acceptability of a proposal. Vehicles on access roads and especially processing plant can be visually intrusive. Lights in workings frequently give rise to complaints due to their adverse effects on amenity, the glare they cause and the distraction and danger to traffic. These are additional factors to be taken into account in the overall landscape appraisal.

51. Landscape considerations are a key aspect in deciding the acceptability of surface mineral workings and if approved require detailed monitoring and management arrangements to ensure agreed measures to mitigate impact are

implemented in the most effective way. Pointers on best practice are set out below.

Summary of good practice on visual intrusion

Planning authorities should consider the need to agree or specify planning conditions relating to :

- the sequence of working,
- progressive restoration procedures,
- preplanting and planting requirements,
- the siting of plant and its visibility,
- geometrical screening and the nature of landscaping,
- the location and shape of soil and overburden mounds and waste heaps,
- the use of conveyors,
- the treatment of haul-roads,
- soil handling, stripping, storage and re-instatement of soils and associated remedial treatments.

Operators should :

- have a positive approach to the landscape,
- plan ahead for :
  - ° planting and management
  - ° direction of working
  - ° progressive restoration
  - ° siting of processing plant,
- plant in the first available season following planning permission
- seek to agree landscaping requirements with the planning authority and only depart from them by agreement
- ensure that the site managers have, and are seen to have, the will to produce a visually acceptable operation,
- have a 'good-housekeeping' policy, keep the site tidy and well maintained, including paintwork.

Groundwater

52. The principal changes in the groundwater regime which may arise are :

- the removal of topsoil, overburden and mineral, and replacement, possibly in combination with imported materials, which may change :

  ° the quality of the infiltrating water recharging the aquifer,

  ° the timing and relative rates of aquifer recharge and surface water flows,

- dewatering of workings or diversion of surface water courses that may, in taking water from one place and discharging it in another :

  ° change the supply of water to abstractions and spring-fed surface water courses and wetlands,

  ° lead to settlement of the ground surface, buildings etc.,

  ° change the quality of the water before discharging it,

- discharges may cause physical and chemical contamination.

Many of the above changes are inherent in a planning permission allowing mineral to be extracted, but in many cases the changes can be ameliorated by appropriate operational practices. Pointers on best practice are set out below.

summary of good practice on groundwater

Planning authorities should :

- Have regard to SEPA policies on groundwater protection at the inception and formulation or modification of relevant development plans,
- after close consultation with SEPA, consider the need to agree or specify planning conditions, to support the protection of aquifers, relating to :
  - ° delaying operations until monitoring data are available to demonstrate the absence of problems or allowing precautionary measures to be agreed,
  - ° nature, area and depth of working,
  - ° arrangements for recharge,
  - ° means to minimise problems from storage of oils / chemicals,
  - ° monitoring of quantity and quality of pumped flows from the site,
- consider the need to seek legally binding agreements regarding :
  - ° monitoring off-site, e.g. of groundwater levels and abstractions,
  - ° compensatory measures, e.g. for abstraction likely to be adversely affected,
  - ° long term drainage and / or water quality problems.

Operators should :

- consult SEPA at an early stage,
- monitor base-line before design and planning application,
- define and assess the hydrogeological regime pertaining to the site and its environs,
- monitor during operations :
  - ° ground water levels,
  - ° neighbouring abstractions,
  - ° quantity and quality of recharge flows,
  - ° neighbouring land, crops, ecology for incipient problems,
- plan to minimise potential problems as well as to meet SEPA or planning authority conditions,
- consider not dewatering or, if unavoidable, dewatering progressively in cells and reduce the inflow of water by sealing,
- leave effective filter layers between aquifers,
- use codes of practice for temporary spoil mounds and slope stability,
- provide for recharge of aquifers,
- bund waterlogged archaeological sites and provide water supply,
- provide impervious bases and bunding for oil / chemical stores and wet-process plant,
- avoid seepage of contaminated run-off through floor of quarry,
- encase polluting backfill in impermeable material or dilute it with inert fill.

See page 29 for on going research which will facilitate the production of a further Annex to this PAN.

Surface Water

53. The main potential effects of on the surface water regime are to :

- alter the surface over which water flows,

- change the pattern of surface water flows i.e.

  - reduction because of lack of recharge from groundwater or seepage from the stream bed or decreased catchment ; or

  - increase because of discharge or increased catchment which may increase scour and be too great for points of limited capacity downstream,

  - change the quantity and physical and chemical quality of those flows.

54. The number and seriousness of problems vary significantly with the depth of working compared to the water table, the extent of dewatering, the nature of the mineral and overburden and the method of working. The main problems are changes in surface water flows and their contamination by particulate matter. Pointers on current best practice are set out below.

summary of good practice on surface water

Planning authorities should :

Consider the need, after consultation with SEPA as statutorily required, to agree or specify planning conditions relating to the :

- siting and landscaping of flow balancing reservoirs,
- siting of settlement lagoons and disposal of silt,
- siting of overburden mounds and waste heaps,
- provision of hard standing and bunding of storage / process areas,
- diversion of water courses,
- provision of monitoring,
- restoration contours and proposed after use.

Operators should :

- consult SEPA and SNH (with respect to SSSIs) about ways of avoiding or minimising the effects of changing the water table, polluting the water course or otherwise changing the hydrology of the area if this would otherwise impinge on any neighbouring SSSI and especially if the proposed site has hydrological links with a wetland area,
- consult SEPA about any alterations to existing surface water courses, nearby river corridors and any fixed discharges,
- undertake a baseline survey and establish a monitoring system,
- provide an appropriate drainage system to keep surface water out of workings,
- design water management system, including dewatering flows, in an integrated way covering :
  - ° flow balancing by sumps and pumping,
  - ° control of particulates by settlement in sumps and lagoons,
  - ° control of water chemistry
  - ° oil and scum removal,
  - ° use of water in processing plant and treatment of effluent including vehicle washing water,
  - ° containment of spillage from storage and processing areas,
  - ° use of water in dust control
  - ° use of appropriate water to counteract groundwater lowering, e.g. in nearby pools,
  - ° regular cleaning and maintenance of water system,
- limit erosion by :
  - ° rapid vegetating exposed areas,
  - ° vegetating, physically protecting the surfaces of overburden, soil or waste mounds,
  - ° progressively restoring working areas,
  - ° lining water courses,
- design sumps and lagoons to cope with all conditions, including agreed or specified storm return periods, by ensuring that :
  - ° they are big enough,
  - ° scouring is avoided,
  - ° the retention time is adequate, if necessary, enhancing settlement by use of agreed (with SEPA) flocculants or mechanical means,
- leave adequate margins around water courses, river corridors and other sensitive areas,
- minimise obstruction of flood flows by inappropriate placing of mounds of overburden or waste.

See page 29 for ongoing research which will facilitate the production of a further Annex to this PAN.

Mineral Wastes

55. Mineral wastes are considered as any excavated material not removed from the site for a useful purpose; it can be considered as either 'temporary' or 'permanent'. 'Permanent' waste will be regarded as that dumped outside the excavation and which will remain there. 'Temporary' waste is immediately or ultimately backfilled or otherwise utilised within the excavation.

56. The main effects of waste are to :
- occupy space within or outside the working area,
- be visible,
- be a source of dust,
- be a source of sediment and other contamination in run-off,
- affect the surface water regime, e.g. by charging surface water flow in a flood plain.

57. Sand & gravel workings do not produce much, if any permanent waste; some produce volumes of clay and silt. Silt from the settling ponds may be used during restoration. Granite and other hard rock may produce permanent waste especially in winter when clay sticks to stone and makes it unsaleable. Mineral wastes may have a role as soil forming materials where conventional sources may be unobtainable. Large volumes of temporary waste from overburden are produced by opencast coal extraction. Whilst top- and sub-soil mounds can have some of the effects of wastes, they are irreplaceable materials for restoration and should be carefully conserved and not regarded as waste. Pointers on current best practice are set out below.

summary of good practice on mineral working waste

Planning authorities should consider the need to agree or specify planning conditions relating to :
- the location of waste heaps both temporary and permanent,
- means of controlling of leachate and run-off,
- the height and shape of waste heaps,
- surface treatment, e.g. vegetation,
- progressive restoration, preferably within the workings,
- the period within which temporary heaps must be removed.

Operators should :
- minimise the production of waste,
- try to find a use for waste e.g. landscaping,
- site waste heaps within workings wherever possible,
- use waste as part of a programme of progressive restoration,
- landscape and vegetate waste heaps as soon as possible,
- site waste heaps having regard to potential effects upon :
  - ° the landscape,
  - ° groundwater,
  - ° surface water courses,
  - ° the flood regime,
- ensure that waste with a physical or chemical contaminant is encased, e.g. by clay, to prevent escape to the atmosphere or be leached to aquifers or surface water courses, store top- and sub- soil and overburden, in a manner that is compatible with ultimate restoration.

See page 29 for on going research which will facilitate the production of a further Annex to this PAN.

Severance and Footpaths

58. Severance can be direct as a result of cutting roads and paths and by diversions making journeys longer and less useful. Severance can also be the result of more subtle effects. Existing paths may be made less attractive than they were due to dust, noise or by enclosure between fences. As a result they may become less frequented.

59. The results of severance are to :

- remove access to leisure / informal facilities, e.g. paths for walking the dog, meadows for enjoyment of flora and fauna,

- make access more difficult, e.g. by having to make detours to visit neighbours,

- cut-off animals from feeding areas.

Pointers on best practice are set out below.

summary of good practice on severance

Planning authorities should consider the need to encourage or agree or specify planning conditions relating to :

- those routes which are to be retained,
- those routes to be diverted, pointing out the necessary statutory procedures,
- the treatment of these routes :
  - ° physical, e.g. surface, stiles,
  - ° landscaping,
  - ° signposting,
  - ° maintenance,
- the provision of compensatory measures where no alternative route is available.

Operators should :

- understand the prior use of their site by people and wildlife,
- retain existing facilities as far as possible,
- otherwise make alternative provision where necessary and practicable,
- maintain the availability and quality of these alternatives, in terms of :
  - ° landscaping
  - ° surface
  - ° stiles
  - ° signposting
  - ° fencing
  - ° safety,
- provide compensatory facilities where necessary.

conclusions

60. Generally, surface mineral workings is contentious because of potentially significant impacts on a wide range of environmental issues. Great care and detailed analysis backed up by close monitoring of approved developments is essential. The industry has demonstrated a desire to carry out its operations responsibly but still important judgements are required of planning authorities. Controlling the environmental effects of surface mineral working is a continuous three stage process:

pre- and application stage

- identifying the likely environmental effects, consideration of amelioration measures and acceptability on planning grounds.

post approval (operational stage)

- monitoring the operation for compliance with approved development and conditions. Periodic review of conditions and updating to current environmental standards. Progressive restoration where specified.

post operational stage

- completion of restoration, aftercare and progress to approved afteruse.

61. Best practice clearly points to the need and benefit of a continuing dialogue between the planning authority and the developer, and where appropriate, the local community so that there is a good understanding of what is being proposed, how it is to be managed over the life of the project and what the long term prospects are when the operational stages are complete. Good practice is continuing to develop and the aim is to
ensure it is applied where ever appropriate.

note

62. Enquiries about this PAN should be addressed to Brian Spiers (0131 244 7546). Further copies, together with other PANs, NPPGs and a list of current advice and guidelines, are available from SODD Planning Services, Rm 2-H, Victoria Quay, Edinburgh EH6 6QQ (0131 244 7538).

selected references

Government Published Research

Environmental Effects of Surface Mineral Workings 1992 : Roy Waller Associates Ltd : HMSO (London) 176 pp. Price £16 ISBN 0-11-752637-1

W S Atkins Engineering Sciences Ltd 1990 : The Control of Noise at Surface Mineral Workings : HMSO (London) 122pp. Price £11.95 ISBN 0-11-752338-0

Arup Environmental 1996 : The Environmental Effects of Dust from Surface Mineral Workings : HMSO (London) Vol. 1 Summary Report and Best Practice Guides, Vol. 2 Technical Report. Price £65. ISBN 0-11-753186-3

Government Research in Preparation

Environmental Impact of Traffic Associated with Mineral Workings : Entec UK Ltd [to be published shortly]

The Environmental Effects of Production Blasting from Surface Mineral Workings : Vibrock Ltd [to be published early 1997]

Environmental Effects of Surface Mineral Workings on Ground and Surface Water : Symonds Travers Morgan : [just started, due for completion 1998]

The Use of Soil Forming Materials in Mineral Working Restoration and Other Land Reclamation : Wye College / Forestry Commission : [for completion early 1998].

9.4 Aberdeen Gateway Business Park

9.4.1 To the west of the quarry there is a relatively new business park and it is the closest of the buildings there that has been used in the assessment. As for the previous receptor, it is blasting at the western end of Phase 2 that would be closest to the building.

9.4.2 The highest predicted levels from the use of an 80 kg instantaneous explosive charge weight at the closest approach distance are in the range 2.1 – 4.8 mms^{-1}, levels which would be acceptable for residential dwellings albeit the effects will be perceptible.

9.4.3 When work is taking place in Phases 3 and 4 the range of worst case predicted levels from the use of an 80 kg charge is 1.8 – 4.2 mms^{-1}. These continue to be below the most stringent limit for residential properties, 6 mms^{-1} at a 95% confidence level. In the initial and final two phases the vibration effects from the use of anticipated 80 kg charge would result in limited perception.

9.5 Lochinch Gardens

9.5.1 To the north west of the quarry extension and also north and west of Cove Road, is the Lochinch residential area. The representative receptor location used in the assessment is the dwelling that is positioned directly opposite the Cove Road junction with the minor road that gives access to the quarry.

9.5.2 It is again Phase 2 that gives the highest predicted worst case vibration levels when an 80 kg instantaneous explosive charge is employed, the range on this occasion being 1.3 – 3.0 mms^{-1} which would give rise to limited perception whilst being comfortably below the most stringent limit given in PAN 50 Annex D, 6 mms^{-1} at a 95% confidence level.

9.5.3 In the more distant and later Phases of the development the received vibration levels are correspondingly lower, simply as a function of increased separation distance.

9.6 Tigh Na Tor

9.6.1 This receptor is also located close to the north side of Cove Road, but east of the previous receptor. In this location relative to the quarry extension, it is Phase 3 when the existing void advances to its western limit, which brings blasting closest to this receptor.

9.6.2 At the minimum separation distance the use of an 80 kg instantaneous explosive charge would result in vibration levels in the range 2.5 – 5.5 mms^{-1} which meet the PAN 50 Annex D, and extant planning permission, vibration criterion.

9.6.3 The minimum separation distances to blasting in Phases 4 and 5 reduce slightly with a corresponding reduction in the predicted worst case levels. As the minimum separation distance in the other Phases increases the received vibration levels from the use of an 80 kg charge reduces, as shown on Table 6.

SCOTTISH EXECUTIVE
Development Department

Planning Advice Note

PAN 50 Annex D

CONTROLLING THE ENVIRONMENTAL EFFECTS OF SURFACE MINERAL WORKINGS

Annex D: The Control of Blasting at Surface Mineral Workings

Planning Series

SCOTTISH EXECUTIVE
Development Department

Planning Advice Note

PAN 50 Annex D

CONTROLLING THE ENVIRONMENTAL EFFECTS OF SURFACE MINERAL WORKINGS

Annex D: The Control of Blasting at Surface Mineral Working

February 2000

ISSN 0141-514X
ISBN 0 7480 9230 7

- **National Planning Policy Guidelines (NPPGs)** provide statements of Scottish Executive policy on nationally important land use and other planning matters, supported where appropriate by a locational framework.

- **Circulars** which also provide statements of Scottish Executive policy, contain guidance on policy implementation through legislative or procedural change.

- **Planning Advice Notes (PANs)** provide advice on good practice and other relevant information.

Statements of Scottish Executive policy contained in NPPGs and Circulars may, so far as relevant, be material considerations to be taken into account in development plan preparation and development control.

contents

introduction

Background

1. This Annex to PAN 50 *Controlling the Environmental Effects of Surface Mineral Workings* provides advice to planning authorities and the minerals industry on how to keep the effects of blasting from surface mineral workings within environmentally acceptable limits. This Annex is based on the DETR commissioned research by Vibrock Limited *The Environmental Effects of Production Blasting from Surface Mineral Workings*, published by The Stationery Office 1998 [ISBN 0-11-753412-9] This Annex supersedes the advice in pages 13 to 15 of PAN 50 *Controlling the Environmental Effects of Surface Mineral Workings.*

2. Blasting at quarries and opencast coal sites can have adverse impacts that extend beyond the site boundary. Potential environmental impacts of blasting at surface mineral workings include ground vibration, air overpressure, noise, dust and flyrock. Where these effects are perceived at adjacent premises, particularly residential properties, there can be problems of reconciling the needs of efficient and economic mineral extraction with the comfort and well being of the site's neighbours.

see NPPG16 Opencast Coal and Related Minerals, paragraph 2

3. Planning authorities should give full weight to the environmental effects of blasting at surface mineral workings and the potential disturbance to local communities. Where a proposal would cause demonstrable and material harm, permission should not be granted except where the benefits of the development proposal to the community would outweigh the potential harm. However, the planning system can control blasting times, set allowable levels of ground vibration, control overpressure, ensure monitoring of vibration levels and control dust and noise. The Scottish Executive seeks co-operation between operators and planning authorities so that sensible blasting regimes can be agreed for individual sites. The reasonable use of planning controls by planning authorities, in particular the use of conditions attached to planning permission, is an important means of ensuring that the effects of blasting at mineral sites do not pose a threat to the amenity of communities. Controls should be fair and reasonable, and should avoid measures that impose costs or constraints on the operator where there is no real benefit to local communities.

4. The advice within this Annex should be used when considering new applications as well as reviewing and updating Interim Development Order (IDO) permissions and other old mineral permissions.

5. The advice within this Annex will also be relevant when reviewing and updating conditions attached to old mineral permissions.

Existing Controls

6. Planning authorities have an important role in controlling the environmental effects of blasting operations at surface mineral workings, but care should always be taken to ensure that planning controls do not conflict or replicate other existing statutory controls. It is vital that planning authorities are aware of other existing controls over blasting, so that they can properly assess proposals and respond to complaints.

7. Blasting operations at surface mineral workings were controlled by the *Quarries (Explosives) Regulations 1988.* These regulations detailed the duties of the

site owner, manager and shotfirer in the conduct of blasting operations. The health and safety implications of general quarry operations were controlled by *The Quarries Miscellaneous Health and Safety Provision Regulations 1995*. These regulations provided control over the possibility of flyrock. Both Regulations have been revoked by *The Quarries Regulations 1999*, which came into force on 1 January 2000.

8. Part 3 of the *Environmental Protection Act 1990* places a mandatory duty on local authorities to investigate any complaints of nuisance and then take action where a nuisance is found, this includes nuisance from noise emissions and vibration. The relevant British Standard are: *BS 5228 Noise and Vibration Control on Construction and Open Sites*; *BS 6472 Guide to Evaluation of Human Exposure to Vibration in Buildings*; *BS 7385 Evaluation and Measurement for Vibration in Buildings*.

the need to blast

9. Blasting is not always an essential part of mineral operations, it is generally only required at rock quarries and opencast coal workings. However, at these sites the operators invariably consider blasting as an essential element of economic mineral extraction. There is usually no need for blasting at sand and gravel or peat mineral workings. Blasting may be required as part of the restoration scheme to create visually acceptable land forms or provide long term stability of a rock face.

10. Blasting in hard rock quarries is needed to break up in-situ material which cannot feasibly be removed by mechanical equipment. The most important factors that determine whether blasting is necessary are the hardness of the rock and the type of machinery available for extraction. In the case of opencast coal sites it is not the coal itself which may require blasting, but rather the rock strata or overburden above and in between the coal seams. The strata often needs to be loosened by the use of explosives in order that mechanical excavators can remove the material and thereby gain access to the coal. The need to blast overburden at opencast coal sites commonly increases with the depth of the mineral working, since the deeper layers of overburden contain fewer weaknesses in the form of joints, particularly in the case of sandstone layers. If there is uncertainty over whether blasting is required at an opencast coal site then a precautionary approach should be taken. It is better for mineral operators to plan for blasting than not to and find out that blasting is required once extraction starts.

11. Blasting as a means of rock removal is relatively expensive. A balance is required between the financial and environmental costs associated with blasting and the degree of fragmentation needed for mechanical extraction and/or crushing operations to be viable. Blasting can also be disruptive to the continuous operation of a site since personnel are required to be removed from the immediate blasting area in order for safe detonation to proceed. Hence, it is only when the immediate geological conditions render alternative extraction techniques either impossible or uneconomical that blasting is considered.

ground vibration

12. When an explosive detonates within a borehole it causes the rock in the immediate vicinity to crack or distort. Outside this immediate vicinity of the blast site permanent deformation does not occur, instead the rapidly decaying stress waves from the explosion cause the ground to exhibit elastic properties whereby the rock particles are returned to their original position as the stress waves pass. This causes ground vibration to radiate away from the blast site, the effect reducing as distance increases.

13. It is always in the operator's interest to reduce both ground and airborne vibration from blast events to the minimum possible for any specific blast design because it is this that substantially increases the efficiency, and therefore, economy of blasting operations. Despite this, even the best designed and executed blasts will generate a certain amount of unwanted energy in the form of ground vibration waves which will radiate away from the blast location.

Measurement

14. British Standard 7385: Part 1, 1990 discusses the measurement of vibration in buildings in general terms with more specific advice for damage investigation given in BS 7385: Part 2, 1993 and for human perception in BS 6472, 1992.

15. There are four interrelated parameters that may be used in order to define ground vibration magnitude at any location. These are:

Particle Displacement - the distance that a particle moves before returning to its original position, measured in millimetres (mm).

Particle Velocity - the rate at which particle displacement changes, measured in millimetres per second (mms^{-1}).

Particle Acceleration - the rate at which the particle velocity changes, measured in millimetres per second squared (mms^{-2}) or in terms of the acceleration due to the earth's gravity (g).

Frequency - the number of oscillations per second that a particle undergoes measured in Hertz (Hz).

16. In all standards the preferred parameter of measurement is peak particle velocity (ppv). The measurement of particles by vibration waves is usually measured in 3 mutually perpendicular directions, as particles will be oscillating in 3 dimensions, these are:

Longitudinal (sometimes termed radial) - back and forth particle movement in the same direction that the vibration wave is travelling.

Vertical - up and down movement perpendicular to the direction the vibration wave is travelling.

Transverse - left and right particle movement perpendicular to the direction the vibration wave is travelling.

Magnification Levels

17. The great majority of vibration recordings from surface mineral workings are undertaken either in order to demonstrate compliance with the sites planning conditions or in response to complaints. When recording vibration following receipt of complaints most commonly the complainant is concerned over the likelihood of damage to their property and therefore, in line with good practice and the guidance given in the relevant British Standard BS 7385, recordings are undertaken outside of property at ground surface immediately adjacent to the closest facade to the blast location.

18. It is vibration within a property which people experience most often and therefore in order to assess complaints regarding nuisance it may be necessary to monitor vibration within a property and at a location where the complainant considers the effects most noticeable in line with the BS 6472, 1992. These measurements should be taken in conjunction with those taken outside in order to be able to quantify any magnification effects. Magnification levels from 0.5 to 2.0 are most likely within low rise residential type structures. The actual magnification will depend upon many factors, but primarily the frequency content and to a lesser extent the duration of the incoming vibration and the natural frequencies of the building or parts of the building concerned.

19. In terms of damage, potential magnification effects are well known and are allowed for in the relevant standards. Guide values are invariably related to recordings to be undertaken at the base of the buildings or on the ground immediately outside of the building. This is the case with BS 7385 which also notes that maximum vibration will be found at mid-span locations on walls or floors but that such vibration is usually unrelated to structural integrity.

Effects of Frequency

20. The frequency content of blast vibration is a significant factor in determining magnification levels and both human and structural response to vibration. It is very largely determined by the geological conditions between the source and receptor, the distance from the source, and to a lesser extent, blast design and borehole geometry.

21. The more competent or solid the transmission medium, then the more the high frequency motions tend to be reduced or filtered out over shorter distances. Thus, ground motion frequencies will be relatively high when monitored close to a blast and/or when solid rock is present. Ground motion frequencies will be relatively low when monitored at a greater distance from a blast and/or when the transmission medium is relatively weak, such as clay or soil.

22. The typical range of ground vibration frequency for surface mineral workings is from 5 to 40 Hz, with levels predominantly from 20 to 30Hz in the case of hard rock quarries and 5 to 15Hz in the case of opencast sites with less competent transmission media. Hence, magnification of vibration within a structure is, perhaps, more likely with opencast blasting.

Human Response

23. Human response to blast induced ground vibration is a relatively complex phenomenon and is dependent upon a range of factors of which the actual vibration magnitude is only one and not necessarily the most important. It is well recognised that the human body is very sensitive to the onset of vibration albeit very poor at distinguishing relative magnitudes. Although sensitivity to vibration varies significantly between individuals, a person will generally become aware of blast induced vibration at levels of around 1.5mms^{-1} peak particle velocity, and under some circumstances at levels as low as 0.5mms^{-1}.

24. Once a received vibration is greater than an individual's perception threshold then it is possible for concern to be expressed about the blasting. Such concern normally relates to the vibration's potential for causing damage to the complainant's property. Concern may be expressed that damage has already occurred due to the recent discovery of cracking that may have been present for some time or have been caused by natural processes. More often, however, concerns are based on the fear that damage will be caused at some time in the future as a result of repeated vibration.

25. The degree of concern and whether or not it leads to complaints is governed by many factors. Perhaps the most obvious is the vibration itself in terms of its magnitude, duration and frequency. However, the vibration magnitude at which complaints arise varies greatly from site to site such that no common complaint threshold exists. This is considered to be in part a reflection of the fact that individuals are very poor at distinguishing between vibrations of differing magnitudes.

26. The susceptibility of individuals to vibration will vary from person to person depending on factors such as age, health and, to a large extent, previous exposure. It is usually the case that adverse comments are less likely once a neighbour has become accustomed to the perceived effects of blasting. An explanation of the need to blast and the significance of the vibration levels being received by a site's neighbours are paramount as is an understanding and sympathetic attitude from the operator.

Effect on Structures

27. When defining damage to residential type structures the following classifications are used:

Cosmetic or threshold damage - the formation of hairline cracks or the growth of existing cracks in plaster, drywall surfaces or mortar joints.

Minor damage - the formation of large cracks or loosening and falling of plaster on drywall surfaces, or cracks through bricks/concrete blocks.

Major or structural damage - damage to structural elements of a building.

28. BS 7385 1993 gives guide values with respect to all 3 of these damage classifications for residential structures in terms of peak particle velocity and frequency. These values are based on the lowest vibration levels above which damage has been credibly demonstrated.

29. In terms of cosmetic damage, at a frequency of 4 Hz the guide value is 15mms^{-1} peak particle velocity, increasing to 20mms^{-1} at 15 Hz and 50mms^{-1} at 40 Hz and above. Minor damage is possible at vibration magnitudes that are greater than twice those given for the possible onset of cosmetic damage with major damage to a building structure possible at values greater than four times the cosmetic damage values. These values apply even when a structure experiences repeated vibration events.

30. Although damage or the fear of damage is the major concern for neighbours of surface mineral workings the reality is that vibration levels at adjacent residential properties rarely if ever even approach the levels necessary for even the most cosmetic of plaster cracking. Engineered structures such as industrial and heavy commercial buildings and underground constructions are able to sustain higher levels of vibration than those applicable to residential type properties by virtue of their more robust design.

31. British Standard 7385: Part 1, 1990 and Part 2, 1993 discusses the resistance of structures to blast induced vibration and specifies guide values to preclude damage to various buildings types from blast induced ground vibration.

Prediction

32. Variations in instantaneous charge weights at any specific site relate closely to variations in vibration magnitude. It is this parameter that, together with distance from the blast, that forms the basis of vibration prediction.

33. The accepted method of prediction is to plot measured peak particle velocity values against a scaled distance value for each measurement. The scaled distance value is taken as the blast/receiver separation distance divided by the square root of the maximum instantaneous charge weight of explosive in the shot from which the measurement was taken.

34. When a number of such values are plotted on logarithmic axes a straight line relationship is seen to exist for any particular site. Taking vibration recordings at increasing separation distances from a blast ensures that geological effects are covered and if a number of blasts at any one site are monitored then variation between blasts can also be quantified.

35. Vibration transmission may not always be the same in all directions from a blast site. Vibration recordings may be required therefore, in different directions in order to quantify any such differences. It is the upper confidence level, generally taken as 95%, that forms the basis of most vibration regulations.

Effects of Geology

36. Once the vibration is generated at source it is the geology of the intervening ground that will largely determine the manner in which the vibration is transmitted and hence the predominant characteristics of the vibration including its magnitude at any given distance. An important factor in this regard is the propagation velocity which is an indirect measure of geological properties that affect the rate of decay of vibration. The more competent and less weathered the rock mass then the greater is the propagation velocity in any particular rock type. However, variations in propagation velocities within one rock type and between rock types can be significant, hence the importance of site specific vibration measurements.

air overpressure

37. Air overpressure is energy transmitted from the blast site within the atmosphere in the form of pressure waves. As these waves pass a given position, the pressure of the air rises very rapidly then falls more slowly then returns to the ambient value after a number of oscillations. The maximum excess pressure in this wave is known as the peak air overpressure, generally measured in decibels linear (dB).

38. The pressure waves consist of energy over a wide range of frequencies, some of which are audible and hence may be sensed in the form of noise, but most are at inaudible frequencies of less than 20 Hz. This relatively low frequency component can be sensed by people in the form of a pressure wave known as concussion. The noise and concussion together is known as air overpressure.

Measurement

39. Measurement of air overpressure levels must always be undertaken with microphones that have an adequate low frequency response in order to fully capture the dominant low frequency components.

40. Practical problems may arise when measuring air overpressure under windy conditions since wind is itself a pressure variation that may mask the blast generated pressure wave.

41. It is also the case that due to the unpredictable and uncontrollable effects of prevalent atmospheric conditions, the location at which the maximum air overpressure is expected cannot be determined with any degree of accuracy. Hence, demonstration of compliance with any specific air overpressure limit is not a practical possibility.

42. The routine measurement of the air overpressure level together with groundborne vibration is clearly of great importance in terms of both public relations and a clearer understanding of any environmental disbenefit of an operator's blasting practices.

Human Response

43. Human reaction to a blast event will be in response to the resulting effects of both ground and airborne vibration and in particular the combined effects that these exhibit within a property when secondary noise effects can be readily induced by relatively low values of air overpressure or by groundborne vibration alone.

44. Routine blasting operations regularly generate air overpressure levels at the closest of adjacent property of around 120 dB. The pressure equivalent of 120 dB will be generated by a constant wind velocity of just $5ms^{-1}$ (Beaufort force 3, gentle breeze) whilst an air overpressure of 130 dB is equivalent to a wind velocity of less than $8ms^{-1}$ (Beaufort force 4, moderate breeze). Such magnitudes will be perceived by individuals although they are entirely safe.

45. The response of an individual to any such event is dependent upon the same factors as that of groundborne vibration with the understanding of the phenomenon through public relations and the attitude of the operators being of utmost importance.

Effects of Topography

46. Wavelength differences associated with this frequency range mean that any effects of topography are likely to be more pronounced for the audible component of air overpressure rather than the concussive component. Thus a topographic feature forming a barrier between the blast site and the receiver may reduce the blast's audible component but have relatively little effect upon the concussive component. Whilst any reduction in the audible nature of an air overpressure wave is to be welcomed such energy is relatively low within the overall pressure wave and, therefore, barriers are seen to have little effect unless they are substantial. For example, man made features such as acoustic fences and earth amenity bunds commonly placed along a site's boundaries would not be expected to reduce to any significant degree the value of air overpressure received off site, although they are beneficial in reducing noise from other sources. More substantial barriers such as a series of quarry faces can reduce air overpressure values when blasting at depth.

Effects of Meteorological Conditions

47. Because air overpressure is transmitted through the atmosphere, meteorological conditions such as wind speed and direction, temperature, cloud cover and humidity will all affect the intensity of the air overpressure experienced at a distance from the blast site.

48. If a blast is detonated in a motionless atmosphere in which the air temperature is constant, then the air overpressure intensity will decrease purely as a function of distance and will, once outside of the immediate vicinity of the blast, reduce by 6 dB as the distance from source doubles.

49. Such conditions are very rare and it is more usual for temperature to vary with altitude in a fairly complex and changing manner. Winds are also invariably present at differing velocities and directions at differing altitudes. The overall result is that the nominal 6 dB reduction may be greater in some directions from the source and less in others.

50. Given sufficient meteorological data concerning the relevant parameters of wind speed and direction and air temperature, and how these vary with altitude, it is possible to predict these expected increases or decreases. In practice, however, the data is obtained from meteorological stations at some distance from the blast site and at some time before the blast is to be detonated. As such, it is therefore doubtful whether the data will be relevant at the specific site and at the proposed time of blasting, the situation being further complicated by the variable Scottish weather.

51. Minimising air overpressure at source, such that, even under unfavourable weather conditions, all such energy is within acceptable criteria at distance, remains the best practicable approach. It is an approach that all surface mineral sites are obliged to follow under the provisions of The Quarries Regulations 1999.

Effects of Blast Design

52. There are five principal sources of air overpressure from blasting at surface mineral workings:

- The use of detonating cord which can produce high frequency and hence audible energy within the air overpressure spectrum.
- Stemming release, seen as a spout of material from the boreholes, gives rise to high frequency air overpressure.
- Gas venting through an excess of explosives leading to the escape of high-velocity gases, give rise to high frequency air overpressure.
- Reflection of stress waves at a free face without breakage or movement of the rock mass. In this case the vertical component of the ground-vibration wave gives rise to a high-frequency source.
- Physical movement of the rock mass, both around the boreholes and at any other free faces, which gives rise to both low and high-frequency air overpressure.

53. Detonating cord should be used as sparingly as possible, and any exposed lengths covered with as much material as possible. Just a few feet of exposed cord can lead to significant amounts of audible energy and, hence, high air overpressure levels. Stemming release can be controlled by detonation technique, together with an adequate amount of good stemming material. Drill fines, while readily available, do not make good stemming material. The use of angular chippings is better. It should be noted however that detonation cord and stemming release have been virtually eliminated with the use of in hole initiation techniques.

54. Gas venting results from overcharging with respect to burdens and spacings or, perhaps, a local weakness within the rock, and is also typified by the occurrence of

fly rock. Its control is essential for economic and safe blasting, and is considerably aided by accurate drilling and placement of charges, together with regular face surveys.

noise

see PAN 50 Annex A: The Control of Noise at Surface Mineral Workings and PAN 56 Planning and Noise

55. Although the majority of energy generated within the atmosphere from any surface mineral blasting will be of a sub-audible nature, there will also be a component that is audible, i.e. at frequencies greater than 20 Hz, and as such can be heard as noise and measured in terms of dB(A).

56. Peak levels from blasting are comparable to the sort of levels typically generated at properties by passing cars, etc., only in the case of blasting the noise would exist for around a second and occur relatively infrequently. It is because of this very brief duration and its infrequent occurrence that blast noise is rarely measured in terms of dB(A) but rather looked at as part of the air overpressure generated and measured by the more meaningful parameter of dB.

57. If the use of exposed detonating cord is avoided the characteristic noise of a blast is no longer a sharp crack but rather a dull thump. This is partly due to the detonating sequence and partly due to natural energy dissipation and reduction. Whilst some of the noise perceived by a neighbouring resident would be directly from the blast itself, the lower frequency components of the air overpressure might well induce secondary rattling of windows and ornaments within a property which could augment the overall effect.

58. Thus in terms of noise control or reduction the care and attention to blast design and subsequent implementation, including initiation, necessary for the control of air overpressure is equally applicable to noise.

dust

see PAN 50 Annex B: The Control of Dust at Surface Mineral Workings

59. Dust from blasting activities can arise from two potential activities, namely the drilling of the boreholes and from their subsequent detonation.

60. Drill rigs have potential for the emission of significant quantities of dust if the waste air that is vented to atmosphere is not first filtered. Such dust suppression techniques are commonplace and hence the relatively high potential for dust emissions from this source is rarely if ever realised.

61. Detonation of the explosives results in either ground heave in the case of opencast coal site blasting or the formation of a rock pile in the case of typical quarry blasting. Both involve the generation of dust depending upon specific ground conditions.

62. Mitigation measures can involve the bagging and removal from the blast zone of the drill returns. An adequate quantity and quality of stemming material is also of importance in order to prevent the explosives' rapidly expanding gases from ejecting such material from the blast holes and acting as a source of dust generation. This latter precaution will also reduce the potential air overpressure and noise generation associated with a blast event. In practice, however, these measures can only be partially effective in reducing overall dust emissions that originate primarily from within the previously undisturbed rock mass.

63. Flyrock is the unexpected projection of blast debris beyond the designated danger zone as defined by the person who prepares the specification. This may involve projection beyond the site boundary in which case the incident must be reported to the Health and Safety Executive.

Causes of Flyrock

64. The most common causes of flyrock include:

Insufficient Burden - When there is insufficient burden or stemming on the column of explosive then the potential for flyrock exists, as the energy released from the explosive is likely to be greater than that required to solely fragment the rock mass in its immediate locality resulting in excess energy available to project rock debris beyond the danger zone.

Insufficient Training - The Quarries Regulations 1999 state that it is the operators responsibility to ensure that those dealing with explosives are trained to a suitable standard. There is already greater awareness of the need for proper training and this has been reflected in a reduction in the number of flyrock incidents.

Inadequate Specification Factors - The Quarries Regulations 1999 give the factors to be considered when designing blasts and all should be taken into account.

Hole Deviation - This can be in the form of drilling at the wrong angle in any direction resulting in either reduced toe burden or toe charges in consecutive holes being too close together giving too high a concentration of explosives at one point.

Incorrect Delay Sequence - Care must be taken to ensure the correct delay sequence is used. Delay periods must be chosen such that underburdening of subsequent shot holes does not occur.

Cavity - It has to be recognised that in certain rock formations, such as some limestones, cavities may exist and are a potential problem since if inadvertently filled with explosive they can give rise to a local concentration of explosives that is too great with respect to the surrounding rock mass or burden. This can only be countered by careful checking of the explosive column length during loading to ensure the explosive is not filling a cavity. Cavities provide a greater source of danger when using bulk loading explosive systems due to the faster loading rate employed.

Explosives in the Stemming Line - Explosives can be introduced into the stemming line either deliberately in an attempt to break hard top bands or accidentally usually as a result of employing bulk loading methods. In both cases any excess of energy from the rapidly expanding explosives gases may result in debris projection.

Unforeseen Geological Weakness - This is the most difficult to detect and counter and is often the main cause of flyrock.

Weathered or Loose Rock in the Stemming Line - Extra care must always be taken when blasting operations take place in these conditions.

Prevention of Flyrock

65. Flyrock can never be completely eliminated. The number of incidents however can continue to be reduced by ensuring blasts are carried out exactly to the

specification. Under The Quarries Regulations 1999 a written specification must be prepared for each blasting operation to ensure, so far as is reasonably practicable, that when blasting occurs it will not give rise to danger. The specification should take account of all possible causes of flyrock. Should deviations to the specification occur then management must be informed and be aware of the potential hazard. Training of all personnel is essential to ensure these incidents are minimised. Work carried out to date on methods to reduce flyrock, such as buffer blasting and the use of blasting nets, has been limited and inconclusive. Planning authorities can seek advice from the Health and Safety Executive if they have concerned at the risk of flyrock.

Risk Based Approach to Flyrock

66. When considering planning proposals involving blasting the possibility of flyrock should be taken into account especially if property or public access is nearby. However, it is not reasonable to sterilise significant areas of land on the remote possibility that a flyrock incident may occur at some time in the future. Risk assessment and its growing acceptance as a safety management tool means that flyrock danger zone distances can be based on acceptable risk levels rather than the potential consequences of infrequent events. Methods of working should be designed and agreed at the planning stage. This should include direction of working, face height and face angle together with expected borehole diameters, burdens, spacings, explosive type and initiation system if possible.

limitations of blasting

67. Virtually all aspects of blast design can affect the performance and efficiency of a blast and therefore the resulting vibration levels generated at source. The maximum instantaneous charge weight of explosive, that is, the maximum explosive charge detonated at any precise instant of time, has the greatest effect upon vibration levels for a given optimum design of blast. However, this parameter cannot be considered alone because it is connected to most other aspects of blast design, the relationship being expressed by the term blast ratio. The blast ratio is a measure of the amount of work per unit of explosive, measured for example in tonnes of rock per kilogram of explosives detonated (tonnes/kg), and is dependent upon virtually all aspects of a blast's design, for example, hole diameter and depth, burden, spacing, explosives, loading density and initiation technique.

68. Generally the optimum blast ratio at any specific site not only gives rise to optimum fragmentation but also to the minimum ground borne vibration for the specific blast under consideration. If less than the optimum amount of explosive is utilised then an increase in ground vibration occurs, because the lack of sufficient explosive energy required in order to efficiently fragment the rock results in an increase of energy transmitted to the surrounding ground largely in the form of vibration. Thus the most useful and practical method of reducing ground vibration levels in order to meet vibration specifications is to reduce the maximum instantaneous charge weight of explosive detonated in any blast event whilst maintaining the blast ratio through reductions in the other relevant parameters of blast design such as loading density, burden and spacing.

69. Typically each hole within a blast is detonated individually by the use of detonators with inherent delay periods. Thus the maximum instantaneous charge is usually the maximum amount of explosive on any one specific delay detonator in any one blast hole. A reduction in instantaneous charge weight may be obtained by reducing the total amount of explosive placed into the boreholes drilled for the blast, typically from 10 to 30 boreholes depending on the specific site conditions.

70. Deck loading may be employed whereby a relatively small amount of the column of explosive within the boreholes is replaced by inert stemming material in order to separate the explosive into two discrete decks. If each of these decks is then initiated with detonators of differing inherent delays then the maximum instantaneous charge may be virtually halved. Any number of decks within a blast hole are possible in theory, being limited only by the requirements of the given blast ratio and the need for sufficient stemming between the decks so that the simultaneous detonation of the separate charges is prevented. Thus, there are relatively few purely technical limitations on blasting operations in the sense that maximum instantaneous charges can be reduced in order to reduce the resulting ground vibration levels as sensitive locations are approached. In practice several important considerations must always be recognised:

- Maximum instantaneous charges are, in the absence of any restrictions, typically of the order of 20 to 40 kg in opencast coal site blasts and 100 to 200 kg at quarries. Whilst reductions in instantaneous charges by factors of 2 to 3 by means of decking and/or reductions in hole depths and diameters may be practicable on certain sites, depending upon the initial blast designs, these reductions are only possible whilst maintaining the require blast ratio. In practice this has the effect of significantly increasing the number of boreholes required in order to dislodge the same volume of material. This increase will in turn significantly increase the drilling and detonator costs.

- Even when using optimum blast designs it is the case that blasting as a means of rock removal is relatively expensive at both quarries and coal sites. Because of this, any increase in blasting costs due to the factors above readily renders blasting operations uneconomic, albeit technically feasible.

- The economics of surface mineral working are largely related to a given rate of material removed by blasting so any significant decrease in the number of holes drilled per blast will also tend, in practice, to increase the number of blasts needed to fragment the same volume of material. This use of smaller, more frequent blasts leads to smaller but more frequent vibration impacts. Whether this results in a perceived improvement in environmental intrusion will depend upon whether it is the magnitude of the events or the frequency of their occurrence that is of most concern to a potential complainant. In each case the balance between these factors needs to be assessed by discussion with interested parties.

- Also of importance is the effect that reductions in burdens and spacings may have upon the variability and the safety of blasts.

conditions

see NPPG 16 Opencast Coal and related Minerals, paragraphs 53 – 60, SODD Circular 34/1996 Annex L and SODD Circular 4/1998

71. Conditions and their wording should be a matter for discussion between the planning authority and site operator and will depend upon the specific details of each individual site. These details will include the type of mineral being worked and the form of blasting operation required for its economic recovery. Conditions should be in accordance with SODD Circular 4/1998. In all cases, it will be necessary to ensure that planning conditions accord with good and safe practice under the Quarries legislation. Advice can be sought from the Health and Safety Executive before conditions to control blasting are imposed.

72. **It is recommended practice that conditions should provide for:**

- **the unacceptable days and times of blasting operations**

- **the allowable level of ground vibration**
- **a scheme by which air overpressure is controlled**
- **a scheme of vibration monitoring so that compliance with the set limits can be demonstrated.**

73. All planning conditions should have due regard to the requirements of The Quarries Regulations 1999. Accordingly, specific aspects of blast design, such as the number of boreholes or the amount of explosives to be used, should not be included in the blasting conditions. Blast design criteria must always be the direct responsibility of the site operator as defined by The Quarry Regulations 1999. Flyrock control and warning systems are also integral parts of these Regulations and as such are not appropriate subjects of blasting conditions.

74. Conditions should, wherever possible, state the desired objectives rather than the methods by which they can be achieved. One exception to this is in respect of air overpressure, the off-site magnitudes of which are difficult to always accurately control or predict due to atmospheric conditions. Accordingly an alternative approach is suggested whereby a scheme of control of air overpressure is detailed by the operator for subsequent agreement with the planning authority.

75. When formulating conditions the following points require consideration.

Days and Times of Blasting Operations

76. Whilst specific blasting hours should be a matter for discussion between the planning authority and operator they should allow, where possible, for blasting to take place at regular times within specified periods on Mondays to Fridays. The need for Saturday morning blasting should be given separate consideration and blasting would not normally be allowed on Saturday afternoons, Sundays, Bank Holidays or National Holidays.

77. In the event of an emergency, any conditions should be able to be relaxed, in which case the planning authority should be notified immediately of the details of the event.

see PAN 50 Annex C: The Control of Traffic at Surface Mineral Workings, paragraph 97-99

78. A public road adjacent or near to a surface mineral workings may need to be temporarily closed during blasting operations, for instance when the public road comes within the designated danger zone. If this is the case, full consideration should be given to the impact on traffic caused by the temporary road closure. The relevant roads authority should be consulted to determine what traffic management measures are necessary. Restricting blasting to set times will allow the public to plan journeys and avoid any temporary road closures.

79. An example of a condition controlling blasting times is as follows:

No blasting shall be carried out on the site except between the following times [1000 and 1200 hours] and [1400 and 1600 hours] on Mondays to Fridays and [1000 and 1200 hours] on Saturdays.

There shall be no blasting or drilling operations on Sundays, Bank Holidays or National Holidays.

The above condition shall not apply in cases of emergency when it is considered necessary to carry out blasting operations in the interests of safety. The planning authority shall be notified in writing immediately of the nature and circumstances of any such event.

Allowable Ground Vibration Levels

80. Allowable ground vibration levels should be specified in terms of peak particle velocity measured in millimetres per second. The recommended criterion is the maximum of 3 mutually perpendicular directions. It should be noted that in order to demonstrate compliance with BS6472, concerning perception, that additional recordings may be necessary within a building at a point of disturbance to an occupant. (see paragraph 97)

81. In determining the precise level of peak particle velocity it should be recognised that imperceptibility is not a realistic criterion, but that a limit should always be chosen to minimise groundborne vibration according to good practice and safe and efficient blasting operations. As such, the individual circumstances of a particular site must be considered. Specified values should be compatible with current guidance on this matter given within the relevant British Standards publications, namely, BS 6472, 1992 concerning perception and BS 7385, Part 2: 1993 concerning the likelihood of damage.

82. In determining the specific time period, consideration should be given to the anticipated frequency of blast events in order that a representative number can be assessed. It may also be necessary to consider what time period would be representative of any site variations in blast locations and/or design where appropriate.

83. In order to be able to assess compliance with the 95% probability criterion, the number of blasts considered should ideally be 100 or greater. However, in practice it would be unreasonable to extend the time period greater than 12 months before an assessment could be undertaken even if the number of events is relatively small. Blasting within opencast coal sites is within specific cuts or linear areas of a site which progress across the excavation area relatively quickly compared with the progress of quarry faces. Hence, a suitable time period for an opencast coal site may be that time typically taken for any one cut to be fully worked. A minimum time period of 3 months would generally be considered as sufficient to be representative of blasting variations within both opencast coal sites and quarries.

84. The values chosen should recognise the fact that blasts in practice must be designed so that the intended level of 95% confidence is rarely approached or exceeded. In theory therefore, blasts must be designed for mean or average vibration values of around half of the 95% confidence level. In practice, more values will in fact be generated below this average value.

85. Once the threshold of perception is exceeded, the likelihood of complaints is largely independent of vibration magnitude but greatly influenced by the relationship between an operator and the local community.

86. Generally, individual blasts should not exceed 12 mms^{-1}. Average levels should not exceed 10 mms^{-1}, and usually will not be below 6 mms^{-1} in 95% of all blasts. These levels conform with the BS 6472, 1992 and BS 7385, Part 2: 1993.

87. Whilst it is recognised that under exceptional circumstances it may be appropriate that level are set beyond the range of between 6 to 10 mms^{-1} such circumstances should be carefully examined because levels greater that this may give rise to a likelihood of damage at properties. Levels lower than the recommended range may well, in practice, result in a greater number of blasting events in order to produce the same extraction rate which could be environmentally counterproductive.

88. Lower levels may need to be considered in proximity to hospital operating theatres or precision laboratories where delicate tasks or the use of sensitive equipment may coincide with blast times. In determining the permitted vibration levels detailed consideration should be given to any such potential blasting constraints. A fully reasoned justification should be given by a planning authority when they impose a condition requiring vibration levels outside the recommended range.

89. Historic Scotland should be consulted when it is considered that blasting at a surface mineral working may affect a category A listed building or its setting or the site of a scheduled monument or its setting. If necessary vibration levels at historic structures may be set below the recommended range. A condition could require that monitoring of a historic structure is agreed to the satisfaction of the planning authority in consultation with Historic Scotland. This might include a thorough survey of the building, recording width, length and breadth of all defects before commencement of blasting and continued monitoring of defects during blasting operations, until such time as monitoring indicates that no damage has occurred due to blasting.

90. An example outline of a condition limiting ground vibration follows:

Ground vibration as a result of blasting operations shall not exceed a peak particle velocity of [6 mm^{-1}] [10 mm^{-1}] in 95% of all blasts measured over any period of [6 months] and no individual blast shall exceed a peak particle velocity of [12 mm^{-1}] as measured at vibration sensitive buildings. The measurement to be the maximum of 3 mutually perpendicular directions taken at the ground surface at any vibration sensitive building.

Limiting the Number of Blasts

91. Occasionally permissions include a limitation as to the number of blasts permitted on a daily or weekly basis, typically varying from one or two blasts per day to one or two blasts per week. With the adoption of suitable site specific vibration criteria such a condition is unnecessary.

Vibration Sensitive Buildings

92. Planning authorities and mineral operators should consider the effects of ground vibration on vibration sensitive buildings. A vibration sensitive building being any building occupied by a person or persons either on a regular or irregular basis as a form of dwelling, workplace, meeting place, etc (for example, residential property, school, offices, industrial premises, church, village hall). Such occupation need not necessarily occur at the time of the blasting event.

Scheme of Air Overpressure Control

93. A scheme which details the intended methods to be employed in minimising air overpressure from blasting operations is recommended in preference to limit values, as previously advised in PAN 50 page 15. This is because of the nature of this phenomenon and because conditions that are intended to control its effects need to be both precise and enforceable. Such a scheme would need to be detailed by the operator and agreed with the planning authority.

94. Although air overpressure can be controlled to a great extent at source by careful attention to blast design and implementation, once detonation occurs the prevailing atmospheric conditions play a significant role in determining air overpressure values at distance from the blast site.

95. A scheme of air overpressure control should address:

- the adequate confinement of all explosive charges through sufficient quantity and quality of stemming material;
- the adequate confinement of all charges by means of an accurate face survey and subsequent judicious placement of explosive charges;
- the precautions to be taken in areas known to exhibit weaknesses in the ground;
- the detonation techniques preferred, including the practicality of prohibiting the use of surface lines of detonating cord;
- the practicality of prohibiting the use of secondary blasting; and
- the procedure to be followed in the event of a misfire.

96. An example of a condition requiring that a scheme of air overpressure control is submitted for approval of the planning authority is as follow:

> *Prior to the commencement of blasting operations details of the methods employed to minimise air overpressure from blasting operations shall be submitted to the planning authority for written approval. All blasting operations shall take place only in accordance with the scheme as approved or with such subsequent amendments as may receive the written approval of the planning authority .*

Scheme of Vibration Monitoring

97. The precise requirements of any scheme for the monitoring of blast induced vibration should be a matter of discussion between the planning authority and operator. Requirements will be site dependent and must take into account local conditions. Any such scheme should consider:

- The location and number of monitoring points

  Usually the closest vibration sensitive building to current blasting operations would be the preferred monitoring location. Where blasting takes place in more than one area within a site then more than one monitoring location may be necessary. It may also be appropriate to monitor at other vibration sensitive locations that are not the closest to the blast site.

  In some situations access to a vibration sensitive building may not be practicable. In this case, consideration should be given to the selection of a location away from the building in a general line with the area to be blasted and at which monitoring could be regularly undertaken. Such locations may be at or just within the site boundary.

- The type of equipment to be used and the parameters to be measured.

  The measurement of vibration should be undertaken using specialist monitors designed for the purpose of blast vibration monitoring. Such instrumentation, termed seismographs, should be capable of recording both ground and airborne vibration. Ground vibration should be recorded in terms of peak particle velocity in millimetres per second and in 3 mutually perpendicular directions. Airborne

vibration should be measured in terms of decibels (dB) or on a linear scale in terms of pounds per square inch (p.s.i.).

- How often the measurements are required to be taken.

  It would generally be the case that all blasts are monitored in order to be able to demonstrate compliance with a vibration limit. In a situation where measured vibration levels are relatively low when compared with the site limit it may be appropriate that only a representative sample of blasts are monitored over a given time period. In all cases the scheme should precisely define what is required.

- The method by which such data are made available to the planning authority.

  The results of monitoring should be freely available to the planning authority. Typically the results would be kept at the site and made available for inspection by the planning authority at all reasonable times with copies being supplied to the planning authority upon request.

- The method by which such data are used in order to ensure that the site vibration limit is not exceeded and to mitigate any environmental effects of blasting.

  Procedures may be specified if recorded values exceed an agreed level. Typically these procedures would involve notification of the planning authority of the event together with an assessment of its implication with respect to future blasting activity and the site's vibration limit.

98. An example outline of a condition requiring that a scheme of vibration monitoring is submitted to the planning authority for approval is as follows:

> *Prior to the commencement of any blasting operations a scheme for the monitoring of blasting including the location of monitoring points and equipment to be used shall be submitted to the planning authority for written approval. All blasting operations shall take place only in accordance with the scheme as approved or with such subsequent amendments as may receive the written approval of the planning authority.*

complaints procedures

see PAN 54 Planning Enforcement

99. The role of the planning authority and environmental health officer can be paramount in influencing the level of concern expressed about blasting operations. Generally viewed as independent by a site's neighbours, the planning authority and environmental health officer should be in the position of being able to investigate such concerns thoroughly. If concern has been expressed, after having evaluated the situation they should be able to explain the significance of the vibration received at property in comparison with site conditions and recognised standards. If appropriate they may be in a position to enforce conditions.

100. The following can facilitate this role:

- Maintain regular contact with relevant site personnel and the local community, preferably by means of a site liaison committee.

- Liaise with the site operator concerning their complaints procedure and their site monitoring procedures.

- Establish the procedures to be followed in the event of complaints received by the local authority.

101. A complaints procedure should include the following:

- A log of the complaint in a specific register to cover:

  - the date and time that the complaint was received;
  - the nature of the complaint;
  - the name, address and telephone number of the complainant; and
  - subsequent follow-up details.

- The complainant should be contacted as soon as is practicable so that a meeting to discuss the complaint can be arranged.

- Have due regard to the fact that site blasting activities may be wrongly identified as the prime source of concern. This may result either from the source of vibration being wrongly identified by the complainant or from a general dissatisfaction with the site due primarily to other reasons.

- Discuss the complaint with the site operator to explore the possibility of minimising all vibration irrespective of whether or not the site conditions are being met.

- Inspect site records to ensure compliance with all blasting conditions. In the event of non-compliance, discuss with the operator the methods by which he intends to conform in future. Consider the necessity for enforcement action.

- Arrange to monitor subsequent blast event or series of events as appropriate. In some cases it will be adequate to view the operators results of vibration monitoring. In other cases local authority staff may wish to attend the monitoring to check results. Some local authorities have the necessary equipment and skills to carry out monitoring themselves, others get professional assistance when needed. It is a matter for the planning authority to decide what action to take. In the event of unattended monitoring it is advantageous if the instruments used can generate a time history of any vibration event.

- After monitoring, immediately show the results to the complainant and relate all results to the relevant site conditions, the relevant British Standards and Government guidelines, and every day occurrences.

- A written explanation of the situation may be an appropriate form of reassurance.

- In the case of persistent complaints consider the involvement of complainants by means of a regular log of perceived events which will be discussed upon completion with the site operator.

102. The correct monitoring and recording of vibration levels from blasting activities is an essential part of maintaining good public relations and in ensuring an operator's compliance with blasting conditions. The onus for carrying out such monitoring should fall on the operator, with the results being made available to the planning authority. Conditions are not the appropriate mechanism to outline the detailed requirements for a scheme of monitoring. Instead a condition should specify that a scheme of monitoring should be submitted for the approval of the planning authority. Detailed requirements for a scheme of monitoring can be agreed as part of

a Section 75 Agreement. Any planning agreements should comply with SODD Circular 12/1996.

environmental impact assessment

see PAN58 Environmental Impact Assessment and SODD Circular 25/1998

103. The Environmental Assessment Directive (85/337/EC) has been amended by Directive 97/11/EC which has been transposed into Scottish planning law by the Environmental Impact Assessment (Scotland) Regulations 1999 (SEDD Circular 15/1999). Under the new regulations an Environmental Impact Assessment will be mandatory for proposed quarries and opencast mining where the surface area of the site exceeds 25 hectares. Smaller sites will continue to be considered for Environmental Impact Assessment under Schedule 2. It also states that changes or extensions to Schedule 2 projects already authorised which may have significant adverse effects on the environment are, themselves, considered to be Schedule 2 projects. Guidance on 'Review of Old Mineral Permissions and Environmental Impact Assessment' can be found in SODD Circular 25/1998.

104. The effects of blasting could be among the issues to be addressed in the assessment. The planning authority may wish to specify that the assessment includes blasting trails in order to establish the actual ground vibration and air overpressure levels and their environmental impact. However, in some instances it may not be appropriate to carry out full scale test blasting. In such cases data from a comparable surface mineral working may be helpful in understanding the effects from blasting.

see NPPG14 Natural Heritage and SOEnvD Circular 6/1995 Habitats and Birds Directive

105. The planning authority may also wish to specify that the assessment addresses the impact of ground vibration and air overpressure on wildlife. Bodies such as Scottish Natural Heritage, Scottish Wildlife Trust and the Royal Society for the Protection of Birds can be valuable sources of information and advice on wildlife. Planning authorities and operators should be aware of the protection provided by the European Community Habitats and Bird Directives.

development plans

see NPPG4 Land for Mineral Working

106. Development plans should provide clear guidance to mineral operators and the public as to the consideration that will be relevant in assessing planning applications. This will include policies to ensure protection of the environment. Standards should therefore be identified which are judged necessary to control the environmental effects of blasting. Mineral operators should be guided by this as to the need to mitigate blasting disturbance and incorporate appropriate controls within any proposals for mineral extraction.

107. In preparing their development plans, planning authorities should have regard to the need to protect communities and areas prized for their environmental, historic, recreational or amenity value from the environmental effects of blasting. In drawing up policies in their development plans, planning authorities will wish to consider the advice in this Annex on the steps that might reasonably be taken to control blasting and also the approach to setting blasting controls that will be incorporated in planning conditions. Where the planning authority proposes to include development plan policies that go beyond the British Standards a fully reasoned justification should be provided.

implementation and review

108. This Annex provides the basic framework for the consideration of blasting at surface mineral development proposals and for the monitoring and control of operations.

109. The Annex has been based on the best information currently available. It may need updating in the future to reflect changes in technology and environmental standards, and in the light of any future relevant research findings.

110. This advice for controlling the environmental effects of blasting should at all times be considered in the light of the requirements of the appropriate legislation, specifically The Quarry Regulations 1999 must always take precedence.

note

111. Enquiries about the contents of this PAN should be addressed to Ben Train, Scottish Executive, Development Department, Planning Services Division, Room 2H, Victoria Quay, Edinburgh, EH6 6QQ, (0131 244 7532) or by e-mail ben.train@scotland.gov.uk. Further copies, together with other PANs, can be obtained by contacting Lynn Jameson at the same address. (Tel: 0131 244 7543, e-mail: lynn.jameson@scotland.gov.uk) NPPGs and Circulars are available from Planning Division (Tel: 0131 244 7067, e-mail: planningdivision@scotland.gov.uk) This PAN, along with other planning series documents is accessible within the Scottish Executive web-site at www.scotland.gov.uk/planning.

Summary of good practice on blasting on next page

summary: good practice on blasting

Planning authorities should:

- Provide guidance in development plans to mineral developers on the appropriate development control criteria for blasting that will be used in determining planning applications for mineral development.
- Consider the need to agree or specify planning conditions relating to:
  - The allowable level of ground vibration to meet the 95% confidence level monitored over an appropriate period;
  - A scheme by which air overpressure is controlled;
  - A scheme of vibration monitoring so that compliance with set limits can be demonstrated; and
  - The unacceptable days and times of blasting operations.
- Consider the need for an Environmental Impact Assessment and whether blasting should be amongst the issues it addresses.
- Maintain regular contact with relevant site personnel and the local community, preferably by means of a site liaison committee.
- Liaise with the site operators concerning their complaints procedure and their site monitoring procedures.
- Establish the procedures to be followed when the local authority receives complaints.
- Ensure monitoring and recording of vibration levels from blasting activities to maintaining good public relations and ensure an operator's compliance with blasting conditions. Where a planning authority has no access to monitoring equipment they may consider attendance at monitoring by the site operator.

Mineral operators should:

- Ensure that the blast area is accurately surveyed and recorded according to The Quarries Regulations 1999.
- Ensure that the correct design relationship exists between burden, spacing, and hole diameter.
- When bench blasting choose the correct burden with due regard to the local geological conditions and the face survey information.
- Drill accurately in order to maintain the intended blast pattern and keep subdrilling to the minimum required.
- Ensure there is an adequate dust collection system for each drill rig.
- Bag and remove all collected dust from the immediate blast zone.
- Make maximum use of existing free faces.

- If necessary, revise the intended blast design following inspection of the survey data.
- Ensure that the maximum amount of explosive on any one delay interval, the maximum instantaneous charge, is optimised by considering:
    - reducing the number of holes per detonator delay interval
    - reducing the instantaneous charge by in-hole delay techniques
    - reducing the bench height or hole depth
    - reducing the borehole diameter
- Ensure that the optimum blast ratio is maintained in any changes of blast design.
- Ensure that the detonator delay sequence optimises the internal free faces developed during the detonation sequence, particularly in multiple row blasting and in corners.
- When practicable ensure that the direction of detonation is away from the nearest vibration sensitive location.
- Have due regard for any local weaknesses in the strata, including back break from any previous shot, clay joints, and fissured ground.
- If loading explosives through fissured or broken ground, or through cavities of any kind, consider only the use of pre-packaged explosives and/or check the hole depth regularly during loading.
- Whenever possible the use of unconfined charges should be avoided; also consider prohibiting surface lines of detonating cord and secondary blasting.
- All surface detonators and explosives should be adequately covered with suitable material.
- Stemming material should be of sufficient quantity and quality to confine adequately all explosives upon detonation. A coarse stemming material such as angular chippings should be considered for use. Drill fines should not be used.
- Consider bottom initiation in preference to top initiation.
- Misfire procedures should have due regard to under-burdened charges.
- If air overpressure levels are a problem give consideration to a reduction in the area to be blasted.
- Blast at regular times, ideally on the hour.
- Regularly monitor the ground and airborne vibration generated by blasting events so the information can be employed in any necessary modification of future blast designs.
- Maintain good public relations with those who live and work near the blasting site.
- Always attempt to minimise the resulting environmental effects of blasting operations and recognise the fact that the perception of blasting events occurs at levels of vibration well below those necessary for the possible onset of the most cosmetic of damage; but nevertheless at levels that can concern neighbours.
- Be aware that relatively small changes in blast design can produce noticeable differences in environmental emissions and that it is very often in response to changes in these emissions rather than their absolute value that complaints may be made.

glossary of technical terms

Air Overpressure: A pressure wave in the atmosphere produced by the detonation of explosives. Consists of both audible (noise) and inaudible (concussion) energy.

Bench blasting: A method of blasting in quarries and opencast sites by means of steps or benches with holes positioned parallel to the bench face.

Blasting nets: Nets manufactured usually from heavy section steel mesh which are placed over the blasting area in an attempt to reduce flyrock.

Buffer blasting: The practice of firing a second shot before completely excavating the previous shot. This is usually an attempt to reduce flyrock.

Burden: The distance measured at right angles between a row of holes and the free face, or between rows of holes.

Concussion: The inaudible energy within the air overpressure generated by the detonation of explosives.

dB: Decibel, a unit of measure on a logarithmic scale used to quantify pressure fluctuations such as those associated with air overpressure.

dB(A): Decibels measured within an A weighted frequency curve that differentiates between sounds of different frequency in a similar way to the human ear.

Deck loading: Dividing the borehole to be charged with explosives into two or more sections usually to reduce the instantaneous explosive charge. The space between the separate charges or decks is filled with stemming material.

Drill fines: Material displaced from the borehole during drilling.

Flyrock: The projection of material from the blast site to any area beyond the designated danger zone.

Free face: A rock surface bounded by air.

Frequency: The number of cycles per second of a vibration usually expressed in units of Hertz, Hz.

Maximum Instantaneous Charge Weight: The maximum amount of explosive detonated at any one precise time.

Three Mutually Perpendicular Directions : The three dimensions which particles oscillate in; longitudinal, vertical and transverse. See paragraph 16.

Peak Particle Velocity: A measure of ground vibration magnitude which is the maximum rate of change of ground displacement with time, usually measured in millimetres/second.

Secondary blasting: The blasting of rock which has not been adequately fragmented by the primary blast. Also called plaster blasting.

Stemming: An inert material used to confine or separate explosives loaded into a borehole, typically stone chippings.

Toe: The bottom of a borehole

Toe burden: The distance between the blasthole and the free face measured at the floor of the bench.

Vibration sensitive building: Any building occupied by a person or persons either on a regular or irregular basis as a form of dwelling, workplace, meeting place, etc.

bibliography

Legislation :
Environmental Protection Act 1990
Health and Safety, The Quarry (Explosives) Regulations 1988, SI No. 1930
Health and Safety, The Quarries and Miscellaneous Health and Safety Provisions Regulations 1995, SI No. 2036
Health and Safety, The Quarry Regulations 1999, SI No. 2024. (Comes into force on 1 January 2000)

National Planning Policy Guidelines (NPPGs) :
NPPG 4 Land for Mineral Working
NPPG 14 Natural Heritage
NPPG 16 Opencast Coal and Related Minerals

Planning Advice Notes (PANs) :
PAN 50 Controlling the Environmental Effects of Surface Mineral Workings
PAN 50 Annex A The Control of Noise at Surface Mineral Workings
PAN 50 Annex B The Control of Dust at Surface Mineral Workings
PAN 50 Annex C The Control of Traffic at Surface Mineral Workings
PAN 56 Planning and Noise
PAN 58 Environmental Impact Assessment

British Standards and Guidance :
British Standard 7385: Part 1, 1990, Evaluation and measurement for vibration in buildings. Guide for measurement of vibration and evaluation their effects on buildings

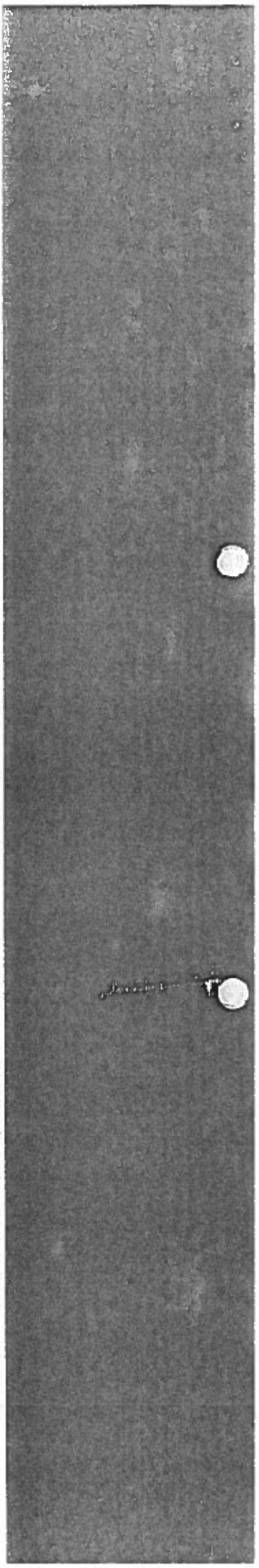
British Standard 7385: Part 2, 1993, Evaluation and measurement for vibration in buildings. Guide to damage levels from groundborne vibration

British Standard 6472, 1992, Guide to evaluation of human exposure to vibration in buildings (1Hz to 80 Hz)

British Standard 5228: Part 3, 1997, Noise and vibration control on construction sites, Part 3.Code of practice applicable to surface coal extraction by opencast methods.

Circulars :
SODD Circular 26/1994 The Environmental Assessment (Scotland) Amended Regulation 1994
SOEnvD Circular 6/1995 Habitats and Birds Directive
SODD Circular 12/1996 Planning Agreements
SODD Circular 34/1996 Annex L Illustrative Guide to Conditions
SODD Circular 4/1998 The Use of Conditions in Planning Permissions
SODD Circular 25/1998 Review of Old Mineral Permissions and Environmental Impact Assessment
SEDD Circular 15/1999 The Environmental Impact Assessment (Scotland) Regulations 1999

Other Relevant Publications :
The Environmental Effects of Production Blasting from Surface Mineral Workings. (Vibrock Ltd, in association with University of Leeds, Department of Mining and Mineral Engineering and Swift Research Partners, 1998, The Stationery Office, ISBN 0 11 753412 9) This contains a full bibliography of blasting related publications.



ISBN 0-7480-9230-7

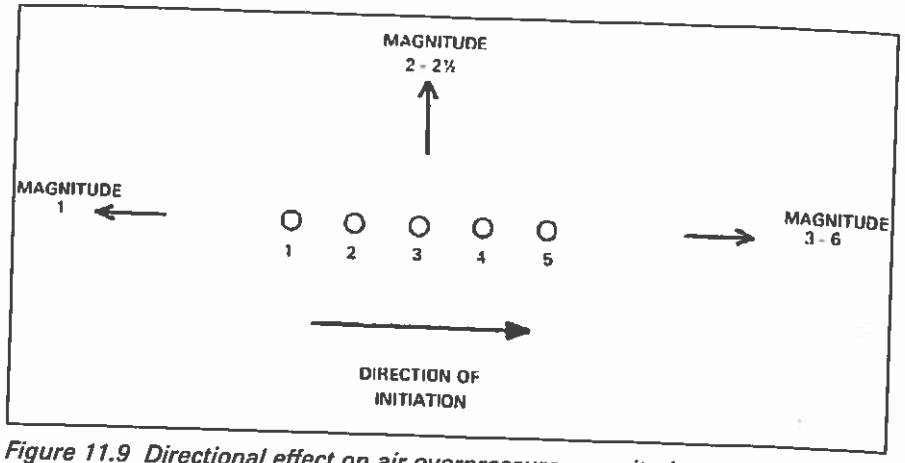


Figure 11.9 Directional effect on air overpressure magnitudes.

economic and social requirement of blasting.

The variable nature of air overpressure propagation due to meteorological factors will increase the expected intensity at some locations and potentially generate subjective concern. This concern is invariably based on alleged damage or the fear of future damage to property. A good public relations pro-

Study	Source	Safe air overpressure, dB	Sensitive element
Windes	Single unconfined charges	151	Glass, poorly mounted
Perkins	Single unconfined charges	151	Glass, poorly mounted
Poulter	Single unconfined charges	141	Glass, poorly mounted
Reed	Large surface blasts	136	<6m² window
Reed	Blasting	140	Glass
ANSI	Single unconfined charges	146	Glass
Redpath	Blasting	141	0.3m² window
Taylor	Small line charges	<140	1 in 100 chance
USBM	Production blasting	134	35,000 panes in greenhouses 0.7%
			Based on human response and associated ground vibration

Table 11.4 Summary of studies to determine air overpressure damage

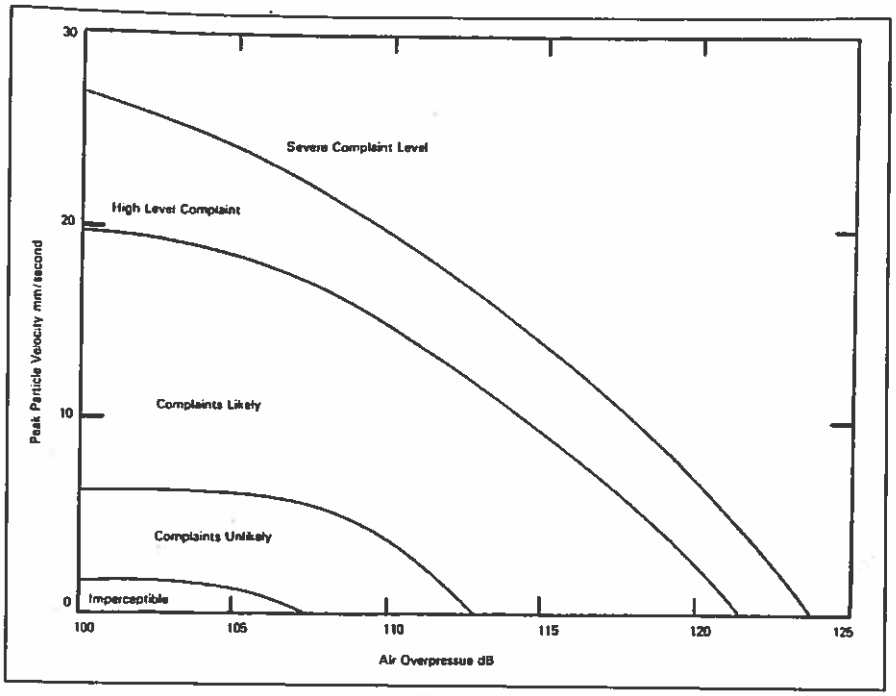


Figure 11.10 Graph showing a summary of a complainant's response to a combination of ground and airborne vibratio.

gramme can mitigate these circumstances. This is emphasised in the case study, discussed by one of the authors, fig 11.10, in which a regular complainant coexisted amicably with the operator following a programme of monitoring, associated discussion and explanation of the phenomena involved.

Vibration Limits

Residential type property

With regard to blasting within open pit workings, planning conditions can be stipulated by Mineral Planning Authorities/Planning Authorities, as discussed within Mineral Planning Guidance Note 2. District Environmental Health Departments may be consulted, and limits may be based on safe criteria to prevent damage to buildings and structures, or more usually and more conservatively based on human tolerance to whole body vibration. Maximum vibration limits currently applied to open pit operations within the UK are seen to be up to 10mms-¹ at 95% confidence. Over the 30 years that the authors have been

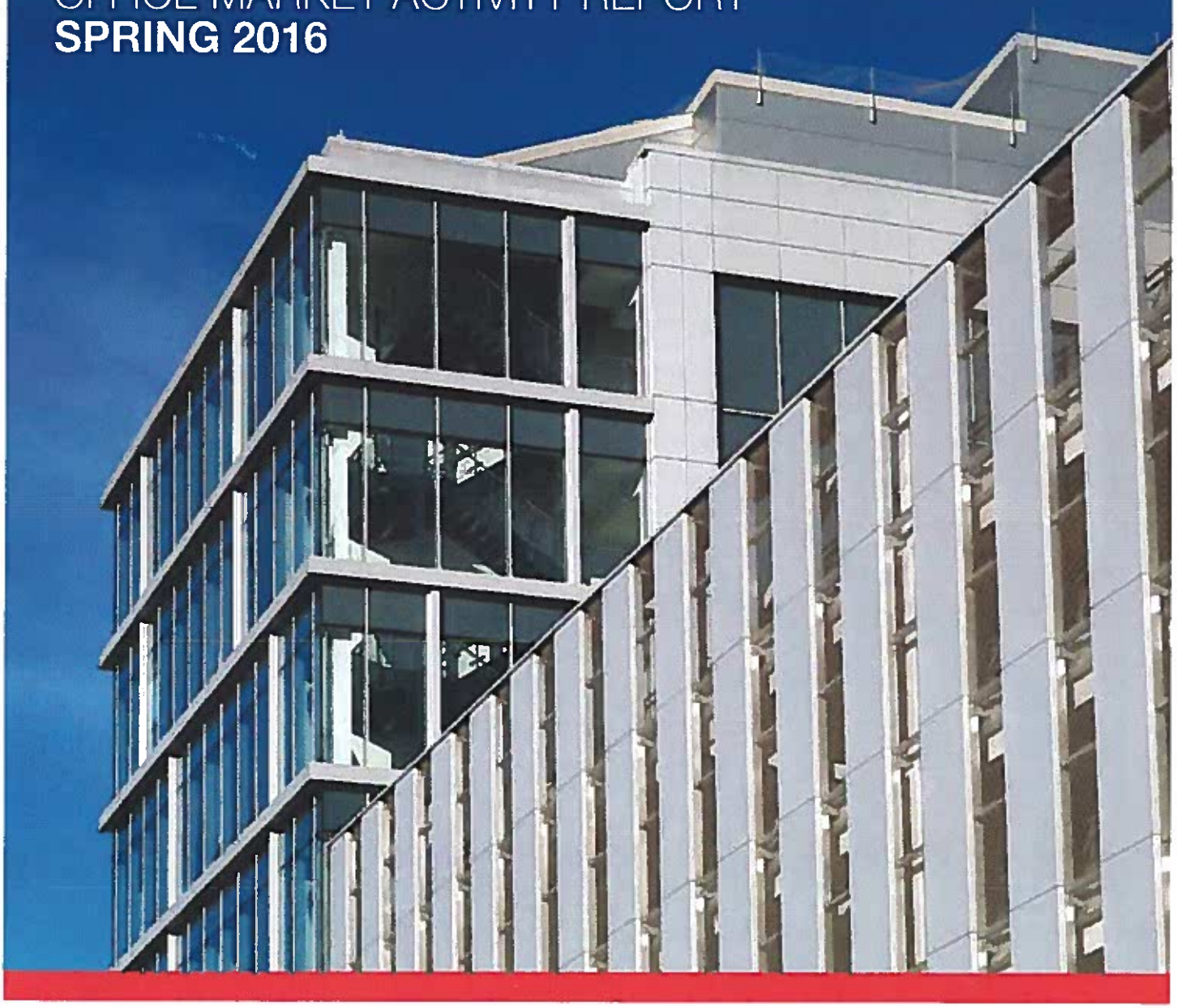
RESEARCH

Knight Frank

Appendix 6

ABERDEEN

OFFICE MARKET ACTIVITY REPORT
SPRING 2016



HIGHLIGHTS IN 2015

Office take-up falls by 61% to 401,000 sq ft in 2015

Supply reaches a record level of 1.8m sq ft

Investment volumes drop by 82% from 2014

Occupier incentives at record levels

ECONOMIC OVERVIEW

For 2016, the consensus forecast is for UK GDP to grow by 2.2%, which is in line with the 2015 figure.

This represents a healthy level of projected growth, and is better than that expected for most other G7 nations this year, with the exception of the US. However, downside risks are elevated for two main reasons.

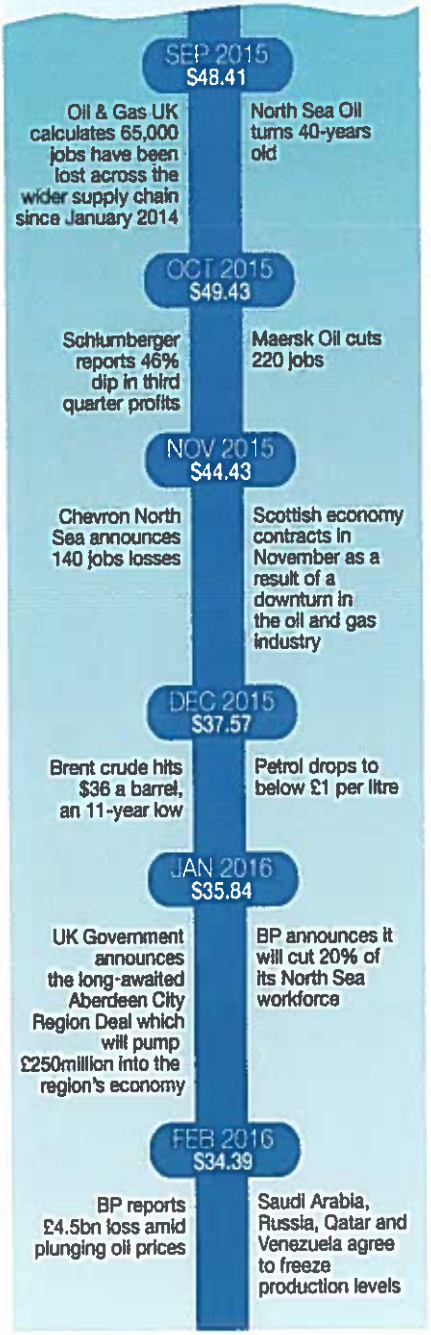
Firstly, June 2016 will see the UK's EU 'in/out' referendum. We believe economic growth will decelerate in the run-up to the poll, as firms take a wait-and-see approach. If there is a vote to leave, our expectation is for business activity to remain subdued while new trade treaties are negotiated.

Secondly, the UK faces headwinds from the global economy, which are particularly acute for the energy sector; the driving force behind Aberdeen's economy. Brent crude oil is currently trading in the mid-$30s a barrel, down from over $100 in mid-2014. Figures from the International Energy Agency show global oil production exceeding demand by 1.4 million barrels per day. Inevitably this has led to job losses in the North Sea.

Given the high level of supply, we see little reason to expect a short-term rebound for oil prices, which has already impacted on Aberdeen's local economy. In the long-run, cheap energy should support global economic growth, leading to increased demand for oil over the long-term.

Moreover, in contrast to last autumn when there was growing speculation that UK interest rates might rise in 2016 – a move which would have been badly timed for Aberdeen's economy – most City analysts are now forecasting no change for this year. The very low rate of inflation at present supports that view, which should help firms and consumers at a time when the pressure to control costs is high.

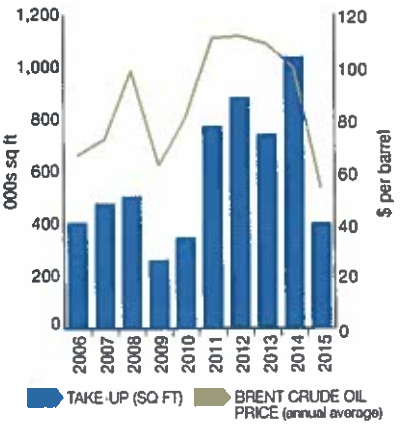
Consequently, our outlook for the Aberdeen economy is cautious for the short-term, but more optimistic for the medium-term as ultimately the oil price will move into a new cycle.



Source: Knight Frank Research
Spot price 1st of each month

FIGURE 1

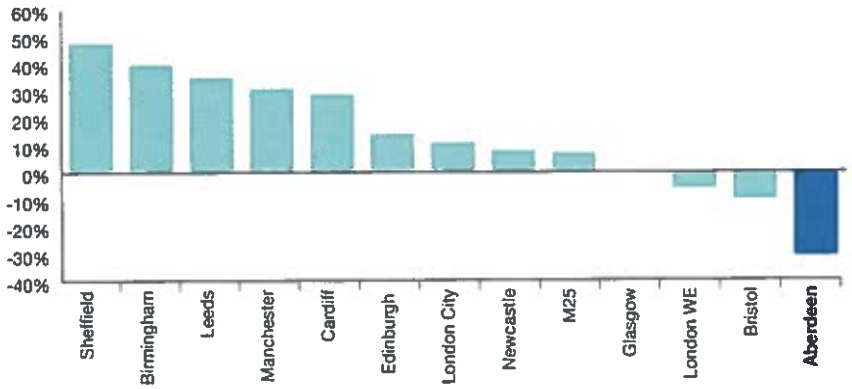
Aberdeen office take-up and oil prices



Source: Knight Frank Research / Thomson Reuters

FIGURE 2

2015 take-up vs 10 year average



Source: Knight Frank Research

Aberdeen 10-year average: 583,500 sq ft

OCCUPIER MARKET

What a difference a year makes…

Following the unprecedented market of 2014, volatility in the oil sector in 2015 had a significant impact on market conditions in Aberdeen. A total of 401,000 sq ft of office space was transacted during the year, 61% less than in 2014.

The collapse in oil prices has been devastating, resulting in major oil occupiers reversing expansionary strategies and retrenching. This has led to a sharp fall in new demand for office space leaving a significant amount of vacant space overhanging the market.

Notably, more than 50% of take-up, and the largest transactions of 2015 were "out of town" pre-lets agreed prior to the fall in oil prices. The largest transaction was the 100,000 sq ft pre-let to LR Synergy at the Prime Four Business Park. This was one of two deals at Prime Four during the year with Anderson, Anderson and Brown taking 45,000 sq ft in Q2. Preceding these was the 70,000 sq ft pre-let to KCA Deutag at City South.

The largest transactions involving existing stock were confined to the city centre. These included Enquest's sub-let of 42,800 sq ft to AMEC at Annan House. Aberdeen Asset Management also secured their first new tenant at the refurbished AB1 development, with the Oil and Gas Authority (OGA) taking 12,029 sq ft. There were two other transactions in the region of 10,000 sq ft during 2015. These were the leases to MOL Energy at Riverside House and DNV GL at The Exchange. Both completed in the first half of the year.

By the end of 2015, active requirements in the market totalled circa 200,000 sq ft. Of this, over 71% was for space below 5,000 sq ft. Only one requirement was for over 20,000 sq ft.

With demand falling sharply, availability increased to 1.83m sq ft in 2015, the highest recorded level. Significantly, the level of available Grade A space had risen seven-fold to 526,000 sq ft by the end of 2015.

Despite the market slowdown, speculative development has continued in the city centre. The Knight Property Group and M&G's 73,000 sq ft joint venture 'The Capitol' is scheduled to complete in March 2016. This will be followed by Titan/BA Pension Fund's 132,000 sq ft Silver Fin development at Union Street. Muse's 170,000 sq ft Marischal Square development is also under construction and will complete in Q2 2017. Significantly, Dandara's proposed 80,000 sq ft 'Point development' has halted with planning permission now obtained for student accommodation. Similarly, the proposed 100,000 sq ft R7 development at Rubislaw Quarry has not been progressed.

Prime rents remained unchanged at £32.00 per sq ft in 2015. Net effective rents, however, have fallen as a result of an increase in incentives. The winners are occupiers who can choose to take advantage of these exceptional market conditions.

The Capitol – M&G and Knight Property Group JV

TABLE 1

Key office transactions in 2015

Address	Tenant	Size (Sq ft)	Rent (£ per sq ft)
Phase 2, Prime Four Business Park, Kingswells	LR Synergy	100,000	Undisclosed
City South, Portlethen	KCA Deutag	70,000	£21.50
Phase 2, Prime Four Business Park, Kingswells	Anderson, Anderson & Brown	45,000	£28.75
Annan House, Palmerston Road	AMEC Foster Wheeler Group Ltd	42,800	£24.50
AB1, Huntly Street	Oil & Gas Authority	12,029	£26.00
Riverside House, Riverside Drive	MOL Energy UK Ltd	10,578	£24.00
The Exchange, Market Street	DNV GL	9,100	£25.50

Source: Knight Frank Research

KNIGHT FRANK VIEW

- The volatility of the oil price will continue to impact the office market for the remainder of 2016.
- There will be a continued downward pressure on rents in 2016 and incentives will move out further.

INVESTMENT MARKET

The volume of investment transactions deteriorated substantially in 2015, following the collapse in occupier demand.

The slowdown in activity highlighted the level of apprehension in the market, as investors opted to 'wait and see' before making any decisions on whether to buy, or indeed sell.

Investment in Aberdeen's offices reached £90m, an 82% decrease on the previous record year of 2014 and 46% lower than the 10-year average. The last time Aberdeen saw such a lack of investment activity was in 2009, when the city faced the impact of the global financial crisis and the last oil price crash. In 2015, Aberdeen accounted for 10% of investment in Scottish offices, set against a ten-year average of 25%.

The Aberdeen market was effectively dominated by a handful of sales comprising new or refurbished Grade A stock let on long leases to secure covenants. With less competition being witnessed from the mainstream Funds and Institutions which had been extremely active for the previous three years, we saw the market open up to a more diverse range of buyers during 2015.

There were only four transactions above £10m in the Aberdeen office market in 2015, compared to 14 the previous year. The largest transaction of the year was the 20 year sale and leaseback of Annan House by EnQuest which sold to Rockspring for £44.1m reflecting a yield of 6.36%. Together with developer Dandara's 20 year forward commitment sale of the KCA Deutag HQ at City South for £23.5m – reflecting a yield of 6.03% – this appeared to confirm that yields have softened 25 to 50 BPS in 2015.

In addition to the listed property transactions, The iQ building on Justice Mill Lane changed hands as part of a three building equity finance transaction. The deal saw Aerium sell the portfolio to Mapletree Investments for close to £365m reflecting a yield of 5.7%. The iQ building is let to Wood Group and Centrica with an unexpired term of 10+ years so again provides further demonstration of the resilience of the Aberdeen market for prime product.

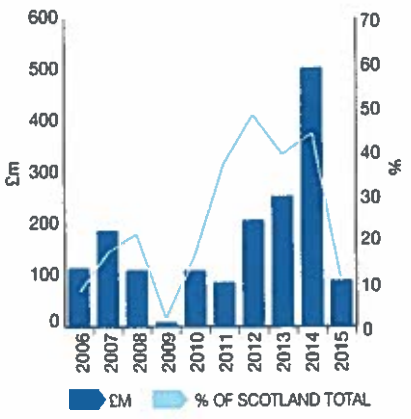
There was however, a notable absence of secondary investment stock being brought to the market. Vendors were fearful of receiving little or no interest as investors monitored the fast-changing occupational market.

In line with the market as a whole, buying activity for private investors was also limited and selective. With many local investors having close affiliations with the oil and gas market, it was unsurprising to see their interest in Aberdeen 'cool' and in some cases divert to the improving central belt markets.

"Investor confidence has been undermined by volatility in the global oil market."

City South, Portlethen – sold by Dandara

FIGURE 3
Aberdeen offices investment volumes



Source: Knight Frank Research/Property Data

On behalf of Enquest, Knight Frank sold Annan House to Rockspring.

"Yields will move out on all stock to varying degrees, although movement will be difficult to prove due to lack of transactions."

TABLE 2

Key office investment transactions in 2015

Address	Size (Sq ft)	Price (£m)	Net initial yield (%)	Purchaser
Annan House, Palmerston Road	120,821	£44.10	6.36%	Rockspring
KCA Deutag, City South, Portlethen	70,000	£23.50	6.03%	Private Family Trust
6 Queens Road & 31-33 Union Grove	23,294	£10.88	5.88%	Beauchamp Investments
Peregrine House, Peregrine Road, Westhill	31,314	£10.20	6.24%	Capital Trust Group

Source: Knight Frank Research

KNIGHT FRANK VIEW

- Given the current supply in the occupational market we envisage very limited long income buying opportunities. Those that do become available should see reasonable demand as Aberdeen offers perceived value compared to other regional cities.
- As the market re-adjusts and money is required to be recycled we expect to see more secondary opportunities come to the fore.
- As values are written down, we would expect some assets to be bought for future redevelopment.

RESEARCH

Lee Elliott
Head of Commercial Research
+44 20 7861 5008
lee.elliott@knightfrank.com

Darren Mansfield Associate
+44 20 7861 1246
darren.mansfield@knightfrank.com

ABERDEEN

Eric Shearer Partner
Development & Investment
+44 1224 415 948
eric.shearer@knightfrank.com

Katherine Monro Partner
Disposals & Acquisitions
+44 1224 415 962
katherine.monro@knightfrank.com

Chris Ion Associate
Investment, Disposals & Acquisitions
+44 1224 415 969
chris.ion@knightfrank.com

Douglas Garden Partner
Building Consultancy
+44 1224 415 940
douglas.garden@knightfrank.com

Richard Evans Partner
Valuations & Rent Reviews
+44 1224 415 952
richard.evans@knightfrank.com

Malcolm Campbell Associate
Planning
+44 1224 415 949
malcolm.campbell@knightfrank.com

Fiona Alsop Associate
Management
+44 1224 415 944
fiona.alsop@knightfrank.com

Knight Frank

Newmark Grubb Knight Frank

Knight Frank Research provides strategic advice, consultancy services and forecasting to a wide range of clients worldwide including developers, investors, funding organisations, corporate institutions and the public sector. All our clients recognise the need for expert independent advice customised to their specific needs.

RECENT MARKET-LEADING RESEARCH PUBLICATIONS

Central London Quarterly Q4 2015

M25 Quarterly Q4 2015

Global Cities The 2016 Report

Global Cities Skyscrapers 2015

Knight Frank Research Reports are available at KnightFrank.com/Research

Appendix 7

Ryden

OCT/15

Economic growth in Scotland was marginal in Q2 2015. Underlying economic activity is finely balanced and unemployment has increased. The slowdown was unexpected as surveys had suggested that economic expansion had been sustained.

The country's property markets clearly believe that this is a temporary dip. The markets continue their cyclical upturn. Activity is however highly concentrated in prime locations, mainly Glasgow and Edinburgh. The ripple of growth to other locations is not yet evident and some sectors, particularly those related to the oil industry, continue to suffer from weak markets.

The investment markets are responding to inflows of funds to prime sector-regions where the market balance is positive. Even for less well-positioned assets, opportunistic investment interest can be identified.

A rapid return to normal economic performance is required in late 2015 and early 2016 to avoid any harm to this nascent property market recovery.

DR MARK ROBERTSON, PARTNER

Economy

The Scottish economy weakened during the first half of 2015. Growth fell to marginal levels, underlying economic activity became very finely balanced and unemployment increased. A "charting" approach might see a cyclical downturn emerging; a more considered approach would recognise that factors such as the downturn in the North Sea oil industry – which affects regional economies beyond Aberdeen – and slowing global growth may have converged during the first half of the year.

Gross Domestic Product (GDP) in Scotland grew by a marginal 0.1% in the second quarter of 2015. This was driven by quarterly growth in the construction sector (3.5%), however output in the dominant services sector was static, while output contracted in the production sector (-0.8%). On an annual basis, Scottish GDP grew by 1.9%.

The most recent Bank of Scotland Purchasing Managers Index (September 2015 PMI = 49) reports a fall in both manufacturing and service sectors, confirming this downturn in economic activity, although the index is only marginally below a stable reading.

The Scottish unemployment rate for the three months June to August 2015 rose to 6.1%, a rise of 0.7 percentage points over four quarters, to sit above the UK rate of 5.4%. The Scottish claimant count however was 2.9% for September 2015, which is down by 0.4 percentage points over 12 months.

The Committee of Scottish Clearing Bankers confirms that the number of new business accounts opened during the first half of 2015 totalled 6,191; this is down by 5% from the same period of 2014. The largest share of new businesses (28%) was in the real estate, renting and other business sector.

The Insolvency Service reports a total of 224 company insolvencies in Scotland in the second quarter of 2015. This is down by 18% on the same period of 2014, but is similar in number to the 221 company insolvencies recorded in the first quarter of 2015.

The retail sector presents a mixed picture. According to the Scottish Government's Retail Sales Index for Scotland, sales grew by 0.8% during the second quarter of 2015, and by 2.4% on an annual basis. This is a positive trend for the retail sector as real wages are now rising, but is significantly below the 4.4% retail sales growth recorded in Great Britain over the same 12 month period. More recent data from another source indicates that total retail sales in Scotland were 1.3% lower over the 12 months to September 2015 (Scottish Retail Consortium/KPMG).

According to the Department of Energy and Climate Change, indigenous production of crude oil was 14.8% higher in the second quarter of 2015 compared with the same period in 2014. This may indicate a degree of stabilisation within the industry, which has been challenged by low oil prices, leading to cost-cutting and job losses.

The Consensus Forecast for UK Economic Growth published by HM Treasury in October 2015 predicts 2.5% growth in 2015, followed by 2.3% in 2016. The EY ITEM Club's summer forecast predicts UK growth of 2.7% for 2015 and 2016. The International Monetary Fund's forecast for the UK in 2015 is 2.5%.

For Scotland, Fraser of Allander Institute's central forecast – published in June 2015 – is for growth of 2.5% in 2015 and 2.3% in 2016 and 2017. EY Scottish ITEM Club's summer forecast raised its growth forecast by 0.2% to 2.2% for the Scottish economy in 2015. These forecasts pre-date and may be challenged by the particularly weak Q2 output growth.

Job gains:

Defence and security contractor Lockheed Martin plans to create more than **300 positions** over the next two years at its new offices at Skypark in Glasgow.

ScotRail operator Abellio plans to recruit around **100 new train drivers** across Scotland, with driver roles being created in Aberdeen, Ayr, Bathgate, Edinburgh, Glasgow, Gourock, Helensburgh, Inverness, Perth, Stirling and Tweedbank.

Business services firm HGS Europe is to create **200 new front and back office roles** at its call centre in Selkirk, as part of a wider **500 new jobs** announcement.

Contact centre operator Parseq plans to add a further **250 full and part-time positions** at its new base in Pacific Quay, Glasgow.

Financial services support firm International Financial Data Services (IFDS) is to add **100 new positions** at its office in Craigforth, Stirling.

Global enterprise solutions business Genpact is opening a new 'centre of excellence' in Glasgow and will employ around **140 wealth management professionals**.

Spire Global plans to create more than **50 new jobs** establishing a nano-satellite design facility at Skypark in Glasgow.

Call centre firm Ascensos intends to double its workforce in Motherwell by creating an additional **200 new jobs**.

Discount gym operator PureGym is opening three new outlets across Scotland (Charing Cross and Shawlands in Glasgow and in Motherwell) creating **60 new jobs**.

Job losses:

Gore-Tex fabrics maker W.L. Gore & Associates announced plans to cut **120 jobs** at its fabric manufacturing plant in Livingston.

Energy firm Hydrasun is consulting on around **97 job losses** within its Aberdeen headquarters.

Technip UK is consulting with its subsea workforce over up to **80 job losses** at its Westhill base on the outskirts of Aberdeen.

Young's Seafood is to cut **650 jobs in 2016: up to 200 jobs will be lost** at its plants in Fraserburgh and Grantown-on-Spey in January, followed by **450 others later in the year**.

Papermakers Tullis Russell went into administration with the **loss of 325 jobs** at its plant in Markinch.

Local Authorities confirming probable job losses include City of Edinburgh Council (**2,000**), North Lanarkshire Council (**1,095**), and Argyll and Bute Council (**400**).

Steel firm Tata confirmed it is to close its two plants in Scotland with the **loss of 270 jobs; 225 jobs will be lost** at the Dalzell plate rolling works in Motherwell and **45 posts** at the Clydebridge plant in Cambuslang.

Planning

Planning Reforms

In early September Scotland's First Minster announced a further review of the Planning System. This comes ten years after the White Paper on *Modernising the Planning System*, which resulted in the changes introduced in the *Planning etc (Scotland) Act 2006*.

The focus of the First Minster's announcement was on increasing the delivery of high quality housing developments. That has since been widened by the Social Justice Secretary's setting up of an independent panel to carry out a "game changing review of Scotland's planning system". It will look at six key issues;

- Development Planning
- Housing Delivery
- Planning for Infrastructure
- Further Improvements to Development Management
- Leadership, Resourcing and Skills; and
- Community Engagement

Whether this is an acknowledgement that the previous reforms have not worked is neither here nor there, and the review should be welcomed by the development industry.

The provision of infrastructure is essential to the delivery of development. Ryden's recent research report into *Planning for Infrastructure* undertaken for the Scottish Government contained 35 recommendations, many of which will provide essential input to the review process. The key to swifter conclusion of Section 75 Agreements is better links between planning, infrastructure and delivery of development. Planning needs to take the lead role and the review provides an opportunity to facilitate this.

Whilst infrastructure is a major hurdle, it also takes far too long from a site first appearing in a Local Development Plan (LDP) to its delivery on the ground. The development planning and development management processes are inextricably linked and need to be looked at closely if delivery is to speed up. If a site has been identified through the LDP process it will already have been the subject of robust public scrutiny, and may even have been considered at an Examination in Public. In those circumstances, so why subject it to yet further scrutiny at the planning application stage? The principle of development should be firmly established through the development plan and not re-opened for debate at the application stage.

Once a site is allocated in a LDP, developers should be able to move straight to an application for full planning permission, with any masterplan requirements being an integral part of that process rather than a pre-cursor to it. Significant time savings could be made simply by streamlining the development plan and development management processes. Further consideration must also be given to the conditions imposed on a planning permission and the likelihood that they will further delay the delivery of development.

In certain areas, once a site is identified in a LDP, there may be opportunities to include it as part of a simplified planning zone, in an effort to encourage development and speed up the delivery process. The necessary controls could be imposed through the use of Design Codes and Supplementary Guidance.

More fundamentally, is a two-tier Development Plan system necessary in some areas and not others? Often the information or statistics that the Strategic Development Plan is predicated upon is outdated by the time the requirements have filtered down and found their way into adopted LDP. Planning is a dynamic process and the system needs to be flexible and responsive enough to deal with upturns, or indeed downturns in the economy. All too often LDPs come up with the required land supply only after demand has peaked.

Improvements to the planning system will inevitably require additional resources, particularly if Officers are to be given the added responsibility to ensure infrastructure, and consequently development, is delivered on time.

Offices

Office markets in Scotland's cities diverged during 2015. Edinburgh is enjoying a period of strong take-up which is rapidly eroding Grade A office supply. Glasgow has experienced a temporary dip in lettings. Aberdeen's market is weakened by the low oil price. Dundee's active small office sector is now extending into the market for medium-sized offices.

Glasgow enjoyed a very active run of larger deals during Q4 2014 and Q1 2015. This has been followed by a lull in major letting completions over the last six months. Larger activity was limited to Teleperformance taking 2,557 sq.m. at Cuprum, Argyle Street, along with smaller but notable lettings at: new-build 1 West Regent Street where Arup has taken 1,264 sq.m.; 141 Bothwell Street where Genpact secured 1,184 sq.m. and 2 West Regent Street where the rapidly expanding fantasy sports company FanDuel opened a Glasgow office (785 sq.m.). Further lettings are understood to be close to completion in the new schemes at 110 Queen Street and 1 West Regent Street and Abstract Securities is reporting strong interest in floors at St. Vincent Plaza.

The summer slowdown on the timing of completions has resulted in a rather exaggerated reduction in total take-up of c.50% to 28,648 sq.m. for Q2 and Q3 2015 compared to the previous six month period. Of this take-up, 15,576 sq.m. was in the city centre. Combined with the previous six month period, this nevertheless produces a strong 12 month take-up of 88,280 sq.m.

A significant number of live requirements are expected to take Grade A and higher quality refurbished accommodation during Q4 2015 and Q1 2016. This is expected to boost take-up going forward and show that the most recent period has been a temporary phase. This occupier momentum will further reduce the choice for those companies seeking high quality large floors. There are only five new or refurbished city centre buildings capable of providing floors over 1,394 sq.m. and only the refurbished space at Tay House, 300 Bath Street can offer floors over 1,858 sq.m.

Glasgow continues to need new development to replace older existing stock and to compete with other UK cities to attract inward investment. The healthy undercurrent of existing and anticipated demand set against reducing new supply sets the scene for the next cycle of speculative development. A limited number of schemes are in a position to trigger development, with completions now likely to be in 2018. BAM Properties, jointly with Taylor Clark Properties, has secured planning permission for a new development at Atlantic Square which will include 25,000 sq.m. of Grade A offices; Titan Investors has secured planning permission for New Exchange, Cadogan Street (8,826 sq.m.) and is expected to receive planning permission for its Broadway Two scheme on Renfield Street (16,723 sq.m.). Other developers are also reviewing options for new build and major refurbishment opportunities.

Meantime, the quality of space available to smaller and medium sized indigenous companies and professional firms, typically seeking floors 400-800 sq.m., is improving. The active refurbishment of buildings such as Aviva's The Beacon, St Vincent Street (3,039 sq.m.), EPIC UK's 9 George Square (4,317 sq.m.), Whiteburn's 100 West George Street (2,408 sq.m.), Cornerstone's 220 St Vincent Street (1,410 sq.m.) and Esson Properties' 100 Queen Street (4,831 sq.m.) are adding to supply and market choice in this important sub-sector for the city.

There has been relatively limited addition to existing supply over the last six months. This allied to the temporary slowdown in take-up means that total supply rose by 5% to 352,811 sq.m., with a 4% increase in the city centre at 223,918 sq.m. and periphery up 7% to 128,893 sq.m.

On the periphery, there has been an encouraging flurry of activity across a range of properties. Parseq has taken space at One Central Quay (1,287 sq.m.); WebHelp expanded at Citypark (additional 839 sq.m.) and The University of Glasgow at The Olympic Building, Bridgeton (702 sq.m.). Skypark has secured lettings of refurbished space in Skypark 5 to Spire Global UK Limited (591 sq.m.) and Everis Consulting Limited (436 sq.m.), along with lettings in Skypark 1 and 3 and small suites within The Skyhub. Morrison Construction (652 sq.m.) and Enchanted Forest Nursery (345 sq.m.) have taken space at Rowan House and Orion House respectively at Nova Business Park; Compliance First (307 sq.m.) and Children 1st (301 sq.m.) at Academy Office Park; three lettings have completed at The Hub, Pacific Quay; five lettings at The Whisky Bond; Fairfield, Govan has secured lettings to Brookfield (390 sq.m.) and Algiz (100 sq.m.); a further five new tenants have taken space at Inovo Building, George Street; and Clyde Gateway secured MadeBrave (292 sq.m.) as the first tenant at The Albus, Bridgeton, as well as six

new lettings at their Red Tree Business Centres in Bridgeton and Rutherglen. Clyde Gateway is also reporting good interest in the recently completed 3,166 sq.m. new office building, One Rutherglen Links, at Farmeloan Road in Rutherglen.

Glasgow office supply and take-up

The out-of-town market has been relatively slow over this period. Northern Marine Group bought a building of 1,306 sq.m. at South Avenue, Clydebank; AMCO leased 719 sq.m. at Antonine House, Broadwood Business Park, Cumbernauld; Maxim Office Park has let 433 sq.m. to Digital Health & Care Institute (DHI) along with further lettings within their small business suites in Maxim 3 to Proact UK (260 sq.m.), Allied Glass (194 sq.m.) and Arran Aromatics (193 sq.m.). There were also further small suite lettings at Willow House, Strathclyde Business Park and Coatbridge Business Centre.

There continues to be strong demand within Glasgow city centre for the best office space and it is anticipated that a number of active enquiries will proceed to take space over the coming months. With no new development starts announced as yet for the next cycle, it will be 2018 before new build schemes complete. The majority of indigenous occupiers will require to consider the balance of space remaining in the existing new builds or the range of refurbished space that is being brought to the market to fill the gap.

Prime headline rents have increased to £306-£317 per sq.m. allied to a tightening of incentives, with potential for rents to breach £323 per sq.m. over the coming months.

High quality refurbished space may benefit; the rental range is wide at £247-£269 per sq.m. with potential to increase as the market continues to improve.

Edinburgh's office market achieved 42,040 sq.m. of take-up during the six months to October 2015. This represents a 14% decrease in activity from the previous six month period. However that was a high point for the market and total take-up for the 12 months to October 2015 is 91,103 sq.m., which is the highest recorded figure since 2004. City centre take-up was 33,000 sq.m. across 79 deals and representing 78% of total take-up, down 18% from the previous six month period. Grade A and good quality refurbished accommodation accounted for 15,852 sq.m. or 48% of city centre office take-up. West Edinburgh saw a total of 1,926 sq.m. transacted across five deals, a 13% decrease in activity from the previous six month period.

Larger office deals in Glasgow over the last six months include:

Address	Size	Occupier
Cuprum, Argyle Street	2,557 sq.m.	Teleperformance
One Central Quay	1,287 sq.m.	Parseq
1 West Regent Street	1,264 sq.m.	Arup
141 Bothwell Street	1,184 sq.m.	Genpact
Spectrum Building, 55 Blythswood Street	877 sq.m.	Arthur J Gallagher UK Ltd
Centura Court, Hillington	857 sq.m.	FEP Heatcare
City Park, Alexandra Parade	839 sq.m.	WebHelp UK

Edinburgh office supply and take-up

City centre take-up was led by notable lettings including: FreeAgent at Edinburgh Quay One (1,034 sq.m.); The Law Society of Scotland at Atria One (1,772 sq.m.); Whitespace at Norloch House, King Stables Road (1,208 sq.m.); Harper Macleod LLP at Citipoint, Haymarket Terrace (748 sq.m.) and Capita Business Services at 145 Morrison Street (2,499 sq.m.). Pre-letting activity has also returned to the market as competition to secure the best space increases, with FanDuel signing a pre-let for 5,441 sq.m. at Quartermile 4, the most significant office transaction across the period.

Other notable office deals across the city centre include: Brocade Communications at Caledonian Exchange, Canning Street (595 sq.m.); Hays Plc (650 sq.m.) and Environ UK (410 sq.m.) at 7 Castle Street; The Scotch Whisky Association at Quartermile 2 (614 sq.m.); and Codeplay at Argyle House, Lady Lawson Street (642 sq.m.).

City centre activity also includes sales of office buildings for alternative uses such as residential. Notable examples include: 41-44 Drumsheugh Gardens (2,530 sq.m.) and 15-19 York Place (702 sq.m.) to Square and Crescent; 12-18 Torphichen Street (570 sq.m.) to Stoneacre Properties; and 25-27 Drumsheugh Gardens (1,753 sq.m.) to Sundial Properties.

The most notable transaction recorded in West Edinburgh was the letting to Blyth + Blyth of 1,096 sq.m. at The Cornerstone, South Gyle Business Park. This market is expected to improve significantly over the next six month period with a number of buildings reporting space presently under offer, including HSBC at 6 Lochside Avenue (c.3,716 sq.m.). An upturn had been anticipated in West Edinburgh due to the availability of cost-effective modern office space and the launch of the tram service in 2014, and it now appears that this is underway.

In North Edinburgh, notable transactions include: Duthus Investments taking 395 sq.m. at Commercial Quay and LEWIS Creative Consultants taking 363 sq.m. at 1 Rennie's Isle. A number of buildings are reporting increased activity levels with space under offer which will translate into take-up in Q4 2015. This is a result of decreasing supply of open plan accommodation in the city centre and is evidence of the ripple effect across Edinburgh's compact urban area which was anticipated in our last Review.

Total office supply across Edinburgh at April 2015 is 194,846 sq.m., a decrease of 7% from the previous six months' recorded figure.

Prime office rents in central Edinburgh remain around £300 per sq.m., although pre-letting activity is occurring at rents above this level. Incentives remain around 18-20-month's rent free for a 10-year lease commitment to a high quality covenant, although this is inevitably coming under further downward pressure. No significant rental growth has been demonstrated yet other than for the aforementioned pre-lets, but with incentives reducing further the prospects for real rental growth are improving.

Larger office deals in Edinburgh over the last six months include:

Address	Size	Occupier
Quartermile 4	5,441 sq.m.	FanDuel
145 Morrison Street	2,499 sq.m.	Capita Business Services
Atria One	1,772 sq.m.	The Law Society of Scotland
Norloch House, Kings Stables Road	1,208 sq.m.	Whitespace
Edinburgh Quay One	1,034 sq.m.	FreeAgent
The Cornerstone, South Gyle Business Park	1,096 sq.m.	Blyth + Blyth

The lack of immediate Grade A supply in Edinburgh city centre is evident and this will undoubtedly lead to further pre-letting activity. There are a number of larger requirements circulating across the city, which will take out the remaining space at Atria and other new buildings. Ernst & Young is rumoured to have settled with The Haymarket development for their 3,716 sq.m. requirement; Phase 1 of this Tiger Developments/ Interserve mixed-use development will include 8,361 sq.m. of Grade A office accommodation. It is understood the first phase will be ready during late 2017/early 2018.

M&G Real Estate is constructing 12,077 sq.m. of speculative Grade A office development at Quartermile 4 (completion Q2 2016) and has already announced the partial pre-letting to FanDuel. Further announcements are about to be made on the remaining floors and it is strongly rumoured that they are to be occupied by Cirrus Logic.

Standard Life Investments and Peveril Securities are pushing forward to completion with 6 St Andrews Square, which was pre-let to Standard Life Investments with completion due in 2016.

The next phase of the development cycle is gradually beginning to take shape. The Chris Stewart Group has secured planning for the Mint Building on West Register Street with an HQ office proposal (c.5,574 sq.m.) as part of the mixed-use development of the former HBOS offices on St Andrew Square. Hermes Investment Management and Parlison Properties secured planning consent for the 11,326 sq.m. Capital Square development, which could be ready Q2/3 2018. IVG has now commenced refurbishment of 40 Torphichen Street (5,050 sq.m.). Following the purchase of offices on Semple Street by GSS from Scottish Widows, the building will be demolished and c.4,645 sq.m. of Grade A offices will be provided. Other design and build opportunities include: Quartermile 3 (M&G); Freer Street at Fountainbridge (Interserve); and New Waverley (Artesian Real Estate Group).

The slump in the oil price continues to hit the **Aberdeen** office market as the oil and gas sector deploys austerity measures to counter difficult trading conditions.

At the time of writing, the price of Brent Crude Oil is trading at just under $50 per barrel and has been fluctuating between low $40s and low $50s for the last six months. This low level of global pricing has caused many organisations in the sector to re-appraise their investment strategies for the North Sea region; subsequently resulting in decreased capital expenditure in light of lower revenues.

This continues to hurt the operation, production and supply chain in the oil and gas sector, meaning a decrease in the volume of white collar employees. Ultimately this has decreased the demand for office space required by the sector and consequently increased the supply as more offices are placed on the market.

In the last six months office supply has increased by 22% on the previous six months, which was already up 56% on the six months prior to that. Total supply is currently sitting at 162,860 sq.m. This has created an unprecedented and polarised mix of supply in the market: poorer quality leased premises on the market which are deemed surplus to requirements or obsolete; and new speculative developments being completed following activity in the development pipeline.

City centre development remains on course to deliver three major new office projects; The Capitol by Knight Property Group (6,503 sq.m.) is due for completion in January/February 2016; Titan's Silver Fin (11,613 sq.m.) is due for completion Q2 2017; and work has now started on site for Muse's Marischal Square project (office content 16,258 sq.m.). Despite the increase in office supply, these three developments are widely regarded as good news for the city centre market which still has a lack of Grade A office space.

Aberdeen office supply and take-up

Across the city and periphery, Grade A supply accounts for only 36% of total supply. What this means is that there is an abundance of secondary stock that is unlikely to be fit-for-purpose going forward. This is confirmed by occupiers' drive to secure better quality accommodation, as take-up of Grade A space accounts for 77% of all office deals in Aberdeen during the last six months. Surplus, obsolete office stock in Aberdeen is therefore less of an office market challenge, and more of a regeneration opportunity for other market sectors.

Only 26,160 sq.m. of office space was taken up over the six months to October 2015, a decrease of 15% on the previous six month period, contributing to an annual decrease of 46%. However the number of transactions in the six months to October 2015 reduced by only three to 45 in total. This tends to bear out Ryden's previous analysis that it is the size rather than the number of office requirements which has declined.

Total take-up for the last six months was underpinned by four sizeable transactions: Lloyds Register (9,290 sq.m.) and Anderson Anderson & Brown LLP (4,180 sq.m.) at Prime Four, Kingswells; AMEC (3,995 sq.m.) at Annan House, North Dee Business Quarter; and Oil and Gas Authority (1,115 sq.m.) at AB1, Huntly Street. Aker Solutions is now occupying its new 31,590 sq.m. HQ premises in Dyce, a transaction which was recorded in previous take-up data.

Larger office deals in Aberdeen over the last six months include:

Address	Size	Occupier
Prime Four, Kingswells	9,290 sq.m.	Lloyds Register
Prime Four, Kingswells	4,180 sq.m.	Anderson Anderson & Brown LLP
Annan House, North Dee Business Quarter	3,995 sq.m.	AMEC
AB1, Huntly Street	1,115 sq.m.	Oil and Gas Authority

Take-up in the **Dundee** office market continues to be in the smaller serviced office sector. This has been demonstrated at District 10, the new modular office development constructed from recycled shipping containers, which is now 100% occupied.

City Quay has been the focus for regeneration through commercial and residential development in recent years. Demand for ownership opportunities remains strong here. In the last six months, Unit 17 (156 sq.m.), Unit 18 (154 sq.m.) and Unit 19 (66 sq.m.) have been sold and a further six units are currently under offer. Nearby at DundeeOne, River Court, Handelsbanken, continues its UK expansion after taking a suite of approximately 232 sq.m.

Larger requirements are more limited, however there are some tentative signs of an increase in occupier activity demonstrated by an increase in the number of office requirements larger than 464 sq.m. Game developers Kobojo Ltd and Tag Games have both relocated to modern office accommodation within the Vision Building (527 sq.m. and 352 sq.m. respectively) on new 10-year leases. Outwith the city centre, Robertson Construction has taken over the former headquarters office of the collapsed Muirfield Contracts at 1 George Buckman Drive (838 sq.m.).

Prime city office rents 2015 (£ per sq.m.):

Industrial

Continued industrial property market activity in Central Scotland and little new development has led to low vacancy and frustrated demand. Of that property available to the market, only a small percentage is truly prime. There is frustration on both sides of the market as developers juggle appraisals to justify new development at rents which are acceptable to occupiers. The low oil price has adversely affected demand not only in Aberdeen but in supply chain locations throughout Scotland.

The industrial market in the **West of Scotland** has become extremely active in Q3 2015, after a prolonged summer period when enquiry levels were unpredictable and generally lower than expectations. In particular, the market for space of less than 1,000 sq.m. was down on normal levels but is now pressing ahead. Over the year to date, there has been increased demand for smaller units with a number of estates fully occupied or approaching full occupancy. This smaller end of the market is extremely tight and occupiers will struggle to identify options in prime and good secondary locations. In such locations, landlords are now able to dictate terms; pressing for longer lease commitments at higher rents and with incentives reducing from levels earlier in the year. Landlords are also reluctant to allow leases to run on tacit relocation and it is becoming more common for notices to be served with the confidence that a new agreement will be reached or a replacement occupier found in early course.

The most interesting sector is from 1,400 sq.m. – 5,600 sq.m., where there is a dramatic shortage of available space with limited supplies of prime product. Across the Greater Glasgow market there are perhaps fewer than 15 quality buildings in this sector. A range of covenants are competing for the remaining space and as noted above, landlords are increasingly able to dictate terms leading to rental growth and longer lease commitments. An example of this new confidence is the recent letting of 40 Cambuslang Road, **Cambuslang** (2,590 sq.m.) where multiple parties were interested in the space and it was finally secured by Hydrasun on a straight 10-year lease at £67 per sq.m. for a building which is now 12 years old. New build remains a problem for both occupiers and developers. Occupiers would generally prefer existing space at current rental levels and a number of agent searches have been issued repeatedly after failing to identify suitable existing space in previous rounds. In some cases this had then led to the occupier initiating direct searches in the belief that the retained agent must have missed something. However, the reality is that there are acute shortages and increased supply is needed in the form of new build space or through the less likely event of second hand space becoming available in an improving market.

Development remains limited, despite the very positive leasing story. Appraisals point to the need for a significant rise in rents to combat rising costs. For example, the required rent on a 2,000 sq.m. unit is above £80 per sq.m. This is due to increases in construction costs because of inflation on material prices and increased building standards plus fewer contracting businesses to carry out the work. This is placing pressure on site values but the land element is a relatively small part of the overall cost. Prime industrial land is now likely sitting at £0.43 million per hectare. More importantly there is an urgent need for a re-basing of industrial rental levels and an acceptance of longer leases by occupiers in order for a strong development market to return.

Lack of occupiable space is now restricting take-up and the vacancy level has plateaued not because of a lack of demand, but more that the available space is unsuited to current needs. There remain thousands of square metres of obsolete industrial buildings in the market but in spite of this the current vacancy rate is as low as c.8% for the Greater Glasgow area rising to c.12% with the inclusion of leasehold interests for sale. The true figure for modern, well located space of sizes in demand will be much lower; less than 5% of the available supply is graded by Ryden as prime.

Over the past 12 months 0.24 million sq.m. of industrial space has been taken up within the defined market, which is slightly below the 5-year average. Take-up figures for the final quarter of 2015 are expected to be higher, although as noted above, demand is being suppressed by lack of suitable supply, and a number of requirements remain active, which would have taken space had it existed.

Larger industrial deals in the West of Scotland over the last six months include:

Address	Size	Occupier
40 Cambuslang Road, Cambuslang	2,591 sq.m.	Hydrasun
2129 London Road	2,800 sq.m.	Voyage Decoration
75 Keppochhill Road, Glasgow	2,308 sq.m.	Lomond Foods
Zenith, Eurocentral	8,547 sq.m.	Amazon

Some developers are committed to a speculative build programme. C&W Assets is currently on site to construct a 2,024 sq.m. unit at Belgrave Point, **Bellshill**. A completion date is set for May 2016 and the quoting rent is likely to be above £80 per sq.m.

Fusion Assets is set to continue with its sixth investment and is again utilising the Scottish Government and European Union's SPRUCE fund taking the total invested so far to over £43 million. Strathclyde Business Park will be the next location where 15 smaller units are planned.

At **Hillington**, Patrizia AG and Oaktree are appraising projects with the aim of bringing new product to the thriving estate in 2016.

Shortages will remain even if all of these projects make it to site over the coming 12 months as development pipeline delivery is well below the 10-year average of c.50,000 sq.m. per annum for the Greater Glasgow market area, which includes the dampening effect of a recession.

The big box market has been disappointing. There have been relatively few transactions and the list of requirements is down on the same period last year. However, at **Eurocentral**, Amazon completed on the 8,500 sq.m. Zenith at a rent of £59 per sq.m. and the 5,200 sq.m. Atlas is under offer, leaving Vertex at 12,000 sq.m. as the only vacant building at Eurocentral. The Eurocentral Partnership is now investigating a new phase of development, mixing a number of mid-sized units with larger stock of up to 6,500 sq.m. The timing could be spot-on, as it is unlikely that requirements will remain low, particularly from the parcel delivery market which continues to expand and as Eurocentral remains the prime distribution location in the West of Scotland.

The distribution sector will be further stimulated by the M8, M73 and M74 motorway improvement project which is now well underway. The short-term disruption will hopefully lead to a further enhancement of this key area for industrial and distribution property.

In April 2015, a significant increase in take-up was reported alongside strong enquiry levels for all size sectors in **East Central Scotland**. This has resulted in a market which, in common with the West of Scotland, has little supply, but where the overall level of demand can only now be described as steady at best.

Due to the limited supply, incentives being offered to ingoing tenants are being reduced, but to counteract this, tenants are seeking longer leases in order to secure attractive terms.

In prime locations, mainly within **Edinburgh** and the surrounding area, rental levels are holding at between £75 – £81 per sq.m. for unit sizes of up to 1,393 sq.m. There are a number of landlords now seeking to improve upon this rent level due to the limited supply. For the best located trade and quasi-retail accommodation, higher rents of between £97 – £118 per sq.m. are achievable for small to medium sized units up to 700 sq.m.

In selected areas in East Central Scotland the reduced oil price has had an impact on the industrial market as the supply chain is affected. Areas such as Fife, West Lothian, Falkirk and Grangemouth have experienced a reduction in enquiries from this normally active business sector.

Speculative development is still scarce, but encouragingly the C & W Assets scheme at Inchwood Business Park, **Bathgate** is now close to being fully let at a rent of £70 per sq.m. The same company developed 2,440 sq.m. of speculative accommodation at West Edinburgh Business Park, South Gyle; 50% of the accommodation within Phase 1 is reported to be under offer and the quoting rent is £81 per sq.m.

In July 2015 the City of Edinburgh Council announced it would commence the speculative development of 16 small industrial units totalling 1,600 sq.m. on Cultins Road, **West Edinburgh** with completion expected Q4 2016.

A notable transaction also in West Edinburgh was the purchase by Peveril Securities of three business units (totalling 4,935 sq.m.) on a 2.4 hectare site, situated on Bankhead Crossway South, Sighthill Industrial Estate. The purchasers have consent for 7,430 sq.m. of additional new industrial space and will be named Seven Hills Business Park.

Adjacent to this site, Scot JCB Ltd purchased 6 Bankhead Drive, a site of 0.95 hectares for c.£1.2 million per hectare. The new owner will build new premises here for its own occupation and will relocate within the estate.

Larger industrial deals in the East of Scotland over the last six months include:

Address	Size	Occupier
20 West Shore Road, Edinburgh	4,686 sq.m.	Schlumberger Oilfield UK Ltd
Unit 3 Seafield Way, Edinburgh	2,107 sq.m.	Rexel Senate
Buko Business Centre, Southfield Industrial Estate, Glenrothes	1,209 sq.m.	Textile Care Supplies Ltd
Ainslie Street, Dundee	2,331 sq.m.	Gillies of Broughty Ferry

With investment demand for industrial accommodation remaining strong and rent levels now firmly established for medium sized accommodation between £75 and £81 per sq.m. it is anticipated that there will soon be new development proposals in Edinburgh and the immediate market area. Away from Edinburgh, no new speculative development is expected in the East of Scotland unless support funding is available from local authorities or government funded organisations.

One of the largest recent deals in Edinburgh has been the letting of 4,686 sq.m. by Philip C Smith Ltd to Schlumberger Oilfield UK plc at 20 West Shore Road on a 5-year lease. Elsewhere in the city, Rexel Senate took Unit 3 Seafield Way (2,107 sq.m.); Stevenswood Ltd leased Unit 4a at Seafield Way (464 sq.m.) at £81 per sq.m.; and Wolseley leased 410 Gorgie Road (551 sq.m.) at £73 per sq.m.

The largest distribution building in East Central Scotland is **J4M8** 380, this property has recently been purchased by Logicor who will commence a new marketing campaign for the building which will include offering the accommodation in two sections of approximately 13,000 sq.m. and 22,300 sq.m.

Elsewhere in West Lothian at Nasmyth Court, Houstoun Industrial Estate, **Livingston**, ArjoHuntleigh took 139 sq.m. at £68 per sq.m. and Environmental Energy Controls took 287 sq.m. at £54 per sq.m. At Eliburn Industrial Park, Livingston units were let to Shine Cleaning Solutions (110 sq.m.), Marionville Models (106 sq.m.) and Knightsridge Garage Services Ltd (221 sq.m.) at rents from £62 – £65 per sq.m.

The occupancy levels of industrial accommodation in the Bridgehead area of **Fife** remain high with some estates, for example Belleknowes Industrial Estate in Inverkeithing and Hillend and Donibristle Industrial Estate in Dalgety Bay, remaining close to fully let; a recent transaction here is unit 12B Ridge Way (592 sq.m.) being let to Avtek Solutions.

At Pitreavie Business Park on the south side of Dunfermline, there is limited availability of industrial units above 464 sq.m. Dunnottar Estates has completed the refurbishment of their last remaining unit (1,483 sq.m.) and this accommodation now provides modern units at a quoting rent of £43 per sq.m.

Although demand in central Fife over recent months has been limited, due to a combination of factors including the subdued oil price and some larger company closures (Tullis Russell and Velux), there have been some deals to note including in Glenrothes the purchase of 70 Nasmyth Road, Southfield Industrial Estate (1,888 sq.m.) by Euroquilt Ltd and a letting at Buko Business Centre (1,209 sq.m.) to Textile Care Supplies Ltd. Industrial rents in this area for traditional accommodation remain between £21 and £43 per sq.m., which should now be seen by occupiers as good value for money in comparison to other locations in Scotland.

The last six months has been a challenging period for the **Aberdeen** industrial market due predominantly to the fluctuating low oil price (see office market commentary). As a consequence, the vast majority of the oil and gas operators and service companies have continued to implement measures in order to further reduce their cost bases. It remains uncertain when the situation is likely to improve, but current conditions are predicted to continue well into 2016.

Industrial take-up in the last six months totals 28,413 sq.m. which represents a 60% decrease on the previous six months figure. Interestingly, take-up is significantly down across all size ranges, with the exception of industrial units between 0-464 sq.m. where take-up is actually up by 28%. The total number of deals transacted over the six month period is down from 45 to 28 which represents a decline of 38%. A large portion of the take-up is actually larger new build deals, where terms were agreed in 2014 in a more buoyant market.

Supply has increased by 26% in the last six months from 63,242 sq.m. to 79,747 sq.m. The number of properties available has risen from 53 to 82, which is a 55% increase. Supply in the 464-929 sq.m. size range has increased substantially by 53%, which is worrying in the context that take-up in this size bracket is down by 66%.

Rental levels have remained strong, with new build rents remaining at around £97 per sq.m. for warehouse accommodation, £191 – £194 per sq.m. for offices and £19 – £21 per sq.m. for secure concrete yards. Underlying this however is a shift from a landlords' to a tenants' market. Developers are now considering 10-year lease term commitments for new build properties and incentives

Larger industrial deals in the North of Scotland over the last six months include:

Address	Size	Occupier
Aberdeen Gateway Business Park, Cove	5,611 sq.m.	Cameron
Aberdeen Gateway Business Park, Cove	1,347 sq.m.	Ruthven Properties Ltd
Peregrine Road, Westhill	5,079 sq.m.	Forum Energy Technologies UK Ltd

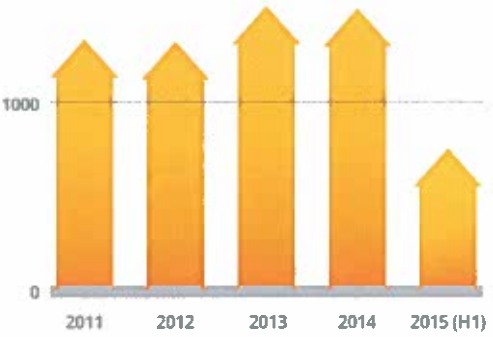
are now having to be offered to ingoing tenants in order to get them to sign up to 5 to 15-year leases. Landlords of secondary industrial stock are having to accept and offer more flexible lease terms in order to reduce or eliminate rental voids.

Despite the tougher market conditions, it is clear that occupiers are still seeking new build or modern industrial units that satisfy occupier needs, i.e. higher eaves heights, capacity for overhead craneage, high specification offices, etc. – but the problem appears to be getting the necessary consents and approvals to commit to the lease terms that the landlords and developers are presently seeking in the market place. A number of developers across the city have undertaken speculative industrial developments which are presently being actively marketed. Some developers have committed to building new stock, even in these tougher market conditions, and these are: The Core Bridge of Don, by Mountgrange comprising warehouse (1,951 sq.m.), offices (557 sq.m.) and yard (3,035 sq.m.); Units 1 & 2 Aberdeen Gateway Business Park, Cove by Muir Group comprising warehouse (929 sq.m.), offices (418 sq.m.) and yard (929 sq.m.); and 25 Silverburn Crescent, Bridge of Don by Nu-Style Products Ltd comprising warehouse (540 sq.m.), offices (372 sq.m.) and yard (207 sq.m.).

The industrial property market in **Dundee** experienced lower levels of take-up over the past six months, primarily due to the limited number of good quality buildings available. As such, a number of long standing requirements remain unsatisfied. Activity is concentrated on small to medium sized transactions within second hand stock. There continues to be a shortage of affordable prominent sites for industrial/trade counter development, where competition from higher value uses exists. Approximately 2.4 hectares at Dunsinane Industrial Estate was sold to Peter Vardy for its CarStore "car supermarket" concept. In close proximity, the site of the former Bonar House at Faraday Street, extending to 1.8 hectares, has been sold to a developer considering alternative uses.

Recent industrial deals include the sale of former Brown Construction premises at Ainslie Street (2,331 sq.m.) to Gillies of Broughty Ferry; the sale of a former Arnold Clark garage at 5 Annfield Road (681 sq.m.) to Moark Ltd; the letting of Unit 1 (464 sq.m.) and Unit 2 (743 sq.m.) Lochee Road to Easityre and Tayside Autocentre respectively; and Unit 5 Taygate Trading Estate, Coldside Road (557 sq.m.) to Stevenswood Holdings Ltd.

Number of industrial transactions in Scotland



Retail and Leisure

The improving landscape of the Scottish economy over the past three years – the most recent dip notwithstanding – has little positive impact on occupancy rates in town centres.

High Street voids most recently increased from 10.4% to 10.6% quarter on quarter. The economic commentary earlier highlights the ongoing challenges month-to-month, despite overall increases in available consumer expenditure. The steady growth of online retailing is part of this challenge and the market response by some retailers, such as Argos, John Lewis Partnership and IKEA (below) is to pursue a multi-channel model.

Locations which have shown improvement are those that have adapted to demand from a diversity in local and national retail occupiers, together with leisure-based operators such as cafes, bars and restaurants (with 'casual dining' proving to be popular) and health and fitness. Health and fitness has also moved on from its previous incarnation with companies now targeting 464 – 3,716 sq.m. premises both in and out-of-town.

The diversity shown in the market at this time may act as a reminder to the planning authorities that retail protection policies may now be inappropriate and do not reflect the modern High Street. The dividing line between retail and leisure will continue to blur and a diverse high street or retail park with retail and leisure offerings is more likely to draw customers, widen the expenditure base and increase dwell times within town centres and malls.

In **Glasgow**, the main news is the delay in the proposed extension to the Buchanan Galleries which will accommodate a pre-let to Marks & Spencer, Next, a 10-screen Showcase Cinema de Lux, together with other retail and restaurant space. The delay is reportedly due to re-sequencing of the construction programme in order to accommodate works to be carried out to Queen Street railway station. The 41,800 sq.m. extension forms part of a £400 million investment by Land Securities.

Gieves & Hawkes has taken the former Phones 4 U store at 131 Buchanan Street on a new 10-year lease (subject to tenant-only break option at year 5) at an initial rent of £200,000 per annum (£269 per sq.ft. Zone A). The tenant received six months rent free.

In the leisure sector, occupiers continue to add to the city centre portfolio. Recent openings include: Anchor Line, Five Guys, Gourmet Burger Kitchen, Bill's, and Côte Brasserie, with the addition of Byron which is due to open on West George Street later in the year.

Silverburn has added Thaikhun to its stable of restaurant offerings with a 310 sq.m. unit adjacent to the 11 new restaurants and 14-screen cinema added to the centre earlier in the year. **Braehead** has announced the proposed opening of a Krispy Kreme store within the former Clydebuilt Maritime Museum.

In **East Kilbride**, Orion Capital Managers continues to work on letting activity within the town centre with recent deals to Bella Italia, Frankie & Benny's, Filling Station, Chiquitos, Nando's, Handmade Burger Co and Pizza Express who have all taken space within the new leisure quarter alongside Pure Gym. The leisure quarter is now 80% let with works due to commence on 15th November and completion due in September 2016.

TH Real Estate's **Edinburgh** St James represents a massive £850 million project due to transform the current St James Centre with in excess of 92,900 sq.m. of retail, leisure, residential, hotel and multi-level car parking. The developers propose to close the existing Centre after the New Year period with the projected demolition start date reported as April 2016. With Land Securities' recent experience in Glasgow, it remains to be seen if demolition will commence on programme due to concerns raised over the potential impact of elements of the development on Edinburgh's World Heritage status.

The development of the north side of St Andrews Square by Standard Life Investments and Peveril Securities is underway with the 15,330 sq.m. development including a TK Maxx store, office accommodation for Standard Life Investments' occupation, residential apartments and six restaurant units due for completion in 2016. It is understood that restaurant occupiers are likely to pay record rental levels within the development. Two top London restaurants will be opening their first restaurants in Scotland here: Busaba Eathai (634 sq.m.) and Drake & Morgan (655 sq.m.).

Jewellers Laing plans to relocate its flagship store from Frederick Street and secured an assignation of the former Barclays unit at 72 George Street, where rental is passing at £322,500 per annum on a lease which expires on 2027 with a tenant only break option in 2022. The tenant paid a premium of £115,000 to secure the lease.

In **Aberdeen**, Hammerson reports new lettings to Krispy Kreme and Thaikhun at Union Square Shopping Centre. In addition, the developer has announced a £200 million expansion to accommodate 30 new retailers, a 120-bed hotel and food court, adding 22,300 sq.m. with a further 600 car spaces over a multi-level car park.

Out-of-town, the former Makro site at Wellington Road, Aberdeen has attracted IKEA with a new concept 4,270 sq.m. "click and collect" store which will open in Spring 2016.

American burger chain Five Guys has announced it will open a **Dundee** restaurant in October within the Overgate Shopping Centre. This follows the opening of Krispy Kreme earlier this year. The Boozy Cow Restaurant, which already has outlets in Aberdeen and Edinburgh, also hopes to move to the city shortly. At Kingsway West Retail Park, Sofaworks Ltd has taken 1,254 sq.m. of new retail space from Land Securities Properties Ltd.

Inverness Shopping Park is understood to be set to commence with a £13 million refurbishment of the Park which will include a redevelopment of the former Comet space to accommodate Frankie & Benny's, TGI Fridays and Nando's.

In **Perth**, a £30 million development has been announced for the site of the former Thimblerow car park which will include restaurants, bars, speciality shops, cinema, health & fitness and a multi-storey car park. Expresso Property has been selected as preferred developer.

Retail park activity in Scotland has accelerated due to the recent acquisition of 14 sites from Tesco by Glasgow based London & Scottish Investments which intends to develop the sites for out-of-town retail warehouse use. The sites are situated in East Kilbride, Paisley, Crieff, Aviemore, Cupar, Cowdenbeath, Thurso, Dundee, Kilmarnock, Larkhall, Coatbridge, Dalkeith and Glasgow.

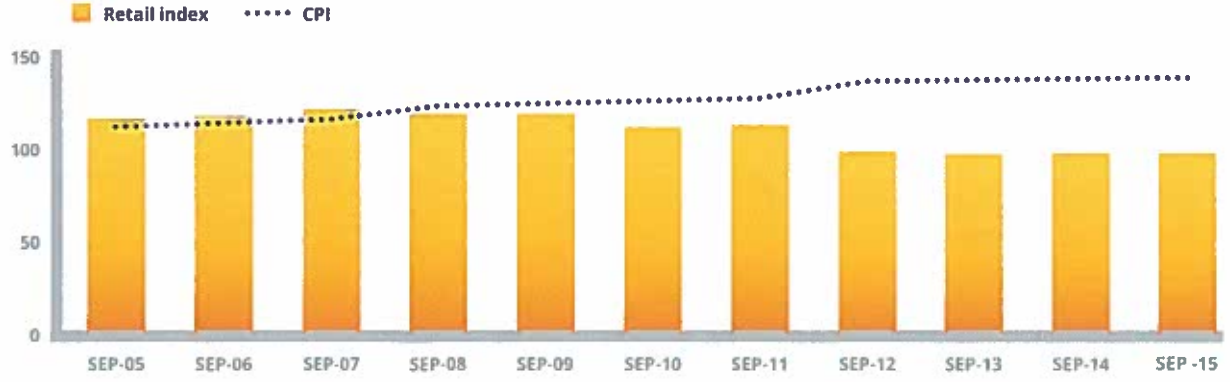
The most active occupiers in the out-of-town market are B&M, Home Bargains, The Range, Dunelm and Poundland. It has been estimated that between the five operators alone, approximately 0.9 million sq.m. of floor space will be taken over the next 5 years. Recent transactions and openings include: Home Bargains taking a pre-let at Edinburgh West Retail Park, Chesser Avenue in Edinburgh; The Range opening at Caledonian Retail Park in Wishaw and to open in Falkirk by the end of 2015. Poundland opened at Wick Retail Park in Wick and Strathkelvin Retail Park in Bishopbriggs; while B&M opened at Telford Retail Park in Inverness, Braidfuite Retail Park in Lanark, Fort Kinnaird in Edinburgh, Glasgow Road in Dumbarton, Springfield Retail Park in Elgin and at Stockbridge Retail Park in Linlithgow.

The local convenience market remains a challenging market for some occupiers, although Sainsbury's and Co-op remain positive about future acquisitions, with Tesco having slowed down activity and Morrisons having stepped out of the convenience market entirely.

The grocery market continues to be led by budget chains Aldi and Lidl with the former commanding a 5.6% share of the UK's grocery market, up from 4.8% a year ago and Lidl growing from 3.6% to 4% in the same period.

Once again there is no change in Ryden's prime retail rental index (covering Scotland's top twenty shopping locations, see chart below). In real terms, when price inflation is factored-in, this represents a steady fall in the value of rents even in prime locations. Some latent upward pressure does however exist within particularly strong shopping pitches where vacancies are negligible, and these may nudge the index up during 2016.

Retail rent index



Investment

The continuing uncertainty over Scotland's political future Post-Referendum as we approach finalisation of the Scotland Bill 2015/16 is undoubtedly having an adverse effect on the Scottish property investment market and as a result, dampening transactional activity.

Market overview

Notwithstanding robust and improving occupational markets, it must be a concern that Scotland appears to be 'off limits' for a number of UK-based institutions until the picture is clearer. In the short to medium term these investors may seek to maintain a neutral or reduced weighting to Scottish assets – particularly in the secondary market - in their portfolio as a response to the perceived exposure to risk. Overseas investors, perhaps due to their experience in dealing with a range of political circumstances across European markets, appear to be less concerned.

The fall in oil prices and slow down in the occupational markets in Aberdeen has, unsurprisingly, led to a hiatus in investment activity as investors draw breath and wait for that market to find its new level.

In addition to the adverse impact on the key commercial investment sectors as a consequence of wider political uncertainty, proposed new legislation such as the Private Housing (Tenancies) Bill could also have a significant impact on future investment into the currently very active student accommodation and nascent private rental sector (PRS) sectors. There is a growing frustration within the property community that the detail of such legislation and its potential ramifications for the development, construction and investment sectors have not been fully appreciated.

All Property Total Returns for Scottish property for the four quarters to June 2015 were recorded at 11%, a slight reduction on the equivalent period to June 2014 of 11.8% and below the UK All Property Total Return of 15%.

Office

Investment activity in the Scottish office sector has continued to be patchy, although some active periods were recorded either side of the summer shutdown. Noticeable differences between the three principal cities have also intensified during the review period, with Glasgow and Edinburgh now higher up investors' shopping lists than Aberdeen.

This shift in demand has been driven largely by the fortunes of the occupier markets in the three cities. Aberdeen has historically been a counter cyclical city and this is evident again; while the outlooks for Glasgow and Edinburgh have improved, the opposite applies in Aberdeen as the oil industry correction continues. There have still been decent levels of activity in Aberdeen, just not as frantic as during the height of the market in early 2014. Transactions are still occurring, some of significant size. EnQuest's 20-year sale and leaseback of Annan House on Palmerston Road to Rockspring for £45.1 million grabbed the headlines in the late summer. The unfortunate timing played a part in the 6.5% yield, which was somewhat generous for this striking new Grade A city centre building. There have been no sizeable transactions of stock with shorter leases in Aberdeen, as owners anticipate limited demand due to the risk factors associated with re-letting.

Elsewhere in Aberdeen it was encouraging to note a couple of successful purchases by foreign investors, namely Peregrine House in Westhill and 6 Queen's Road/31-33 Union Grove in the West End which were sold together. The buyers were Capital Trust Group (Middle East) and Beauchamp Investments (Singapore). The details are outlined in the table of transactions.

There has been considerable activity in the asset management category in Glasgow, which is encouraging and demonstrates investors' confidence in the occupier market in that city. The stand-out deal was Moorfield's £60.7 million purchase of 1,2 & 3 Atlantic Quay from M & G Real Estate for a net initial yield of 8.54%. The WAULT to the break options was just under three years. Other asset management buys include 180 St Vincent Street by Northwood and 180 West George Street by Picton Capital.

The most notable yield and income transaction in Glasgow was Almundi's £33.4 million acquisition of the Equinox building, Cadogan Street, in a portfolio transaction. The building was let to esure.com for 15 years and the allocated price reflected a yield of 5.25%.

Investor demand for Edinburgh offices has continued to strengthen over the review period with interest from UK Institutions, overseas investors, European funds and equity rich investors. This is evidenced by an increasing volume of transactional activity. Weight of money, limited supply and improving occupational dynamics have combined to create yield compression; and the prime yield for a well-let city centre office would be in the order of 5.5% at the present time.

Further investor activity is expected in Edinburgh and Glasgow in the run up to the end of 2015. Several major buildings are up for grabs including Meridian Court and The Grosvenor Building in Glasgow and Atria in Edinburgh.

Based upon the IPD Quarterly Index the Total Return for the sample of Scottish office properties to June 2015 was 11.8%, which is marginally down from the previous year. Rental value growth has increased for the fourth year running with yield impact moving in the opposite direction.

Office property investment deals include:

Address	Property	Purchaser
1, 2 & 3 Atlantic Quay, Glasgow	26,079 sq.m. multi-let office buildings, let to Lloyds, Bank, BAE Systems and AXA Insurance	Moorfield for £60.7 million (c.8.54%)
163 West George Street, Glasgow	3,061 sq.m. multi-let office building, let to tenants including Savills, KPMG and Pertemps	Private investor for £8.7 million (6.51%)
180 West George Street, Glasgow	4,840 sq.m. multi-let Grade A office building, let to Standard Life and Michael Page	Picton Capital for £14.25 million (7.8%)
Westport 102, Edinburgh	9,001 sq.m. multi-let predominantly office building, occupiers include Scottish Ministers, Audit Scotland and Senergy	Britannia Invest A/S c/o Cording for £32.2 million (c.6.17%)
Citypoint, Haymarket Terrace, Edinburgh	3,927 sq.m. multi-let office, occupiers include BDO and Harper Macleod	CBRE Global Investors for £14.5 million (c.5.7%)
Tanfield, Edinburgh	17,730 sq.m. multi-let office, occupiers include Avaloq, FNZ and Alstom	Rockspring for £56 million (c.6.55%)
Annan House, Palmerston Road, Aberdeen	11,300 sq.m. single let office building, sale and leaseback for 20 years	Rockspring for £45.1 million (6.5%)
Peregrine House, Peregrine Road, Westhill, Aberdeen	2,945 sq.m. single let office building, with a new 15-year lease	Capital Trust Group for £10.2 million (6.24%)
6 Queen's Road/31-33 Union Grove, Aberdeen	Two prime office buildings totalling 2,165 sq.m. WAULT of 14 years	Beauchamp Investments for £10.875 million (5.88%)

Industrial

Sentiment drives the market, and in addition to the residual caution towards Scotland following recent political events in the UK, more generally recent pronouncements regarding growth globally and China in particular have also perhaps given investors pause for thought, narrowing the focus on stock selection. Consequently, the chase for absolute prime industrial assets has become increasingly hard run across the UK.

In Scotland, the fundamentals of good occupational demand and contracting supply have reinforced investor activity. However, this is a two-tier market where prime assets enjoy high demand, particularly from UK institutions, and there is less depth to the market for more secondary or older stock.

The recent trading of prime industrial stock has left few opportunities across Scotland. With the best secondary stock difficult to acquire, further compression in industrial yields is anticipated, driven largely by specialist buyers in the sector. Institutional buyers will remain active in the prime part of the market but are increasingly finding stiff competition from the weight of money chasing good secondary stock.

Funding for speculative industrial development remains absent from the Scottish market at present. However, as has been argued for the past two Reviews and demonstrated once again in the occupational market commentaries in this report, it remains an excellent opportunity, particularly for funds to secure stock in a competitive market, while ensuring the required return and desired value of money placed in the market.

Pricing remains strong for multi-let industrial estates. Yields continue to reflect 6.75-7.25%, albeit with little trading in the past six months or so, it is conceivable that there has been some further compression in those levels. Single let assets continue to perform well with buyers for most lot sizes and pricing again remains in the low 6%s for well-let stock.

The annual performance for Scottish industrials to end June 2015 saw a total return of 17.9%, broadly in line with the overall 2014 result and up from the 15.5% for the year ending June 2014. While Scotland still lags the UK as a whole (20.3% to year end June 2015), the gap is narrowing and will continue to do so as investors seek better value outwith the London and south east markets.

Industrial property investment deals include:

Address	Property	Purchaser
Ibrox Business Park, Glasgow	6,499 sq.m. modern multi-let estate of 18 units. Tenants include SIG, Edmundson Electrical and Stevenswood	Buccleuch Property for £4.711 million (c.7.75%)
Units 1, 2 & 10, James Street, Righead Industrial Estate, Bellshill	1,889 sq.m. modern multi-let trade counter units. Tenants include SIG and Edmundson Electrical	Threadneedle Investments for £1.75 million (7.24%)
Glencairn Industrial Estate, Kilmarnock	11,705 sq.m. multi-let estate of 58 units let to a mix of high quality covenant and local occupiers. 10 vacant units	IO Group for £7.075 million (c.7.7%)
Bonnington Trade Centre, Bonnington Road, Edinburgh	Multi-let estate comprising 7 units and total area of 2,982 sq.m. Tenants include ATS Euromaster Ltd and Johnstone's Paints. WAULT of approx. 16 years to expiries and 13 years to breaks	Esson Properties for c.£3.35 million (6.3%)
7 Bankhead Medway, Sighthill, Edinburgh	Data centre investment let to Onyx Group Ltd extending to 2,887 sq.m. with c.5 years unexpired	Private investor for c.£2.2 million (c.8.67%)
Imex Industrial Estate, Bilston Glen, Loanhead	Multi-let estate comprising 39 units and extending to 4,347 sq.m.	Industrials UK LLP for £3.55 million (c.8.07%)
9 Oakbank Park Way, Livingston	2,966 sq.m. modern single let industrial unit fitted out as a disaster recovery centre, leased to THUS Group Holdings Ltd, sub-let to Sungard Availability Services (UK) Ltd. 4 years unexpired	Squarestone Growth Fund LLP £1.63 million (9.5%)
Gateway Drive, Aberdeen Gateway, Aberdeen	2,183 sq.m. single let industrial and office building with a new 15-year lease	MRC Pension Trust Ltd for £5.855 million (6.29%)
Main Road, Blackburn, Near Aberdeen	6,634 sq.m. single let industrial and office building with unexpired term of 18.5 years	Capital Trust Group for £16.97 million (6.25%)
Viking House, 1 Claymore Drive, Bridge of Don	1,645 sq.m. single let industrial and office building, sale and leaseback for 15 years	DS Properties for £1.735 million (8.5%)

Retail

The retail investment sector improved over the Review period. The breadth of demand for retail property has spread outwith specific sub-sectors, although there does continue to be a concentration on prime and very good secondary stock. This focus may be changing and as investors seek income return, more secondary assets may come into view.

Yields have continued to harden (ie. reduce, driving up prices) for prime retail product as institutions and overseas investors have set their sights on this sub-sector.

Although many institutional investors have reservations about increasing their weightings to Scotland during this Post-Referendum period, demand for prime Edinburgh and Glasgow retail continues to be strong and the pool of buyers deep.

Interest from investors in High Streets outwith Edinburgh and Glasgow is weaker and as a consequence, the income return available is significantly higher. Enhanced returns are generating demand from well-funded private investors and property company investors.

Retail property investment deals include:

Address	Property	Purchaser
116-120 Buchanan Street, Glasgow	Prime retail unit let to Diesel on FRI terms expiring October 2022 at a passing rent of £303,000 per annum (£252 per sq.ft. Zone A)	Kames Capital for £6.45 million (4.43%)
92-96 Argyle Street, Glasgow	1,022 sq.m. retail unit let to Officers Club on FRI terms expiring April 2024 with tenant break option April 2019. Passing rent of £300,000 pa (£135 per sq.ft. Zone A)	Aberdeen Asset Management for £4.3 million (6.6%)
14 Royal Exchange Square, Glasgow	84 sq.m. retail unit let to Sweaty Betty on FRI terms expiring August 2024, tenant break option August 2019 at a passing rent of £52,500 pa (£107 per sq.ft. Zone A)	Private investor for £875,000 (5.7%)
Greenlaw Village, Newton Mearns	1,863 sq.m. modern retail units let on FRI terms to Home Bargains and Pets at Home. Total passing rent of £276,832 per annum. Average unexpired income of c.13 years	Private investor for £4.1 million (6.37%)
Forge Retail Park, Glasgow	32,516 sq.m. retail park with 18 tenants including Marks & Spencer and Next	Pradera & Tristan Capital Partners for £83.6 million (6.95%)
124/125 Princes Street, Edinburgh	3,567 sq.m. mixed use (retail & offices) multi-let building. Tenants include Urban Outfitters (56% of income), RICS and Chartered Institute of Housing. WAULT of approx. 8.81 years	Hines for £18.05 million (5.37%)
71-77 Princes Street, Edinburgh	2,467 sq.m. multi-let retail investment. Tenants include Costa, Fraser Hart, 02, Three and Dr Martens. WAULT of approx. 8.4 years to expiries (7.4 years to breaks)	Savills Investment Management for £24.075 million (5.11%)
89 George Street, Edinburgh	Flagship retail unit let to White Stuff providing total area of c.1,421 sq.m. with c.10 years unexpired	Aviva Investors for £6.6 million (4.48%)
21-25 Frederick Street, Edinburgh	Mixed-use building extending to 687 sq.m. Occupiers include J Barbour & Sons, Laing The Jeweller and John Dickson & Son Ltd	Tonstate Group for £3.9 million (6.32%)
B&Q, Tennent Street, Coatbridge	9,546 sq.m. retail warehouse let to B&Q plc with c.8 years unexpired. DIY consent	Client of Ediston Property Investment Company for £16.8 million (7.46%)
B&Q, Crieff Road, Perth	5,702 sq.m. retail warehouse let to B&Q plc with c.11 years unexpired. Open non-food consent	Friends First Life Assurance Company for £11.75 million (6.84%)
Jamie's Italian, 38 Union Street, Aberdeen	701 sq.m. restaurant let for 22 years	Private overseas investor for £2.2 million (5.58%)

With shopping centre investment activity on the upturn, the retail warehouse sector within Scotland continues to be the least favoured sector of the retail property investment market. At this point in time there appears to be limited interest in bulky goods single and multi-let assets. Those investors active in this sub-sector are securing well-let product at attractive yields in the range of 7% to 8%.

Based upon the IPD Annual Index, the performance of all Scottish retail property to June 2015 has slipped from the previous year and recorded a total return of 8.7% (to June 2014: 10.3%). Although rental value growth was better, yield improvement slowed over the period.

Outlook

As investors monitor the wider political developments, it looks likely that the cautious sentiment will continue for the near future or at least until other issues, such as the potential UK Brexit scenario, take precedence. Prime investments will always attract strong demand but the definition of what constitutes 'prime' will remain narrow and the fall off in demand and pricing for secondary assets will continue to be more severe than usual.

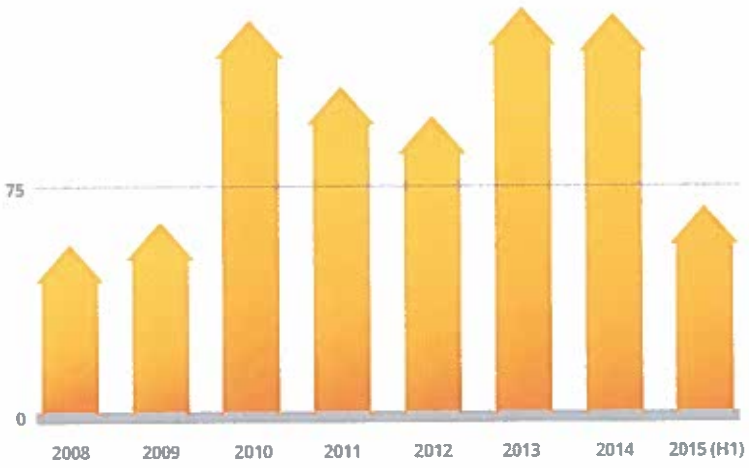
The absence of speculative development in the office and industrial sectors throughout the Central Belt, and the reduction in prime supply will inevitably lead to improved rental and letting prospects for existing and refurbished stock. There is an added bonus for those investors in the market that these opportunities are available at attractive yields/capital values, both historically and in comparison to similar regional centres south of the border.

Pricing on secondary assets remains quite volatile and the convergence of short income pricing and alternative use values for student accommodation, residential and private rental sector (PRS) should continue to stimulate change of use in a number of these situations.

Now, more so than ever, the Scottish market offers strong performance opportunities for those investors with the benefit of a clear head and a good understanding of the market, able to look beyond the immediate uncertainties.

Investment tracker:

Number of transactions over £1 million in Scotland



Edinburgh
7 Exchange Crescent
Conference Square EH3 8AN
Tel: 0131 225 6612

Glasgow
130 St Vincent Street G2 5HF
Tel: 0141 204 3838

Aberdeen
25 Albyn Place AB10 1YL
Tel: 01224 588866

Leeds
3rd Floor Carlton Tower
34 St Paul's Street LS1 2QB
Tel: 0113 243 6777

Dundee
Unit 20 City Quay
Camperdown Street DD1 3JA
Tel: 01382 227900

Contacts

Bill Duguid, Managing Partner
bill.duguid@ryden.co.uk

Dr Mark Robertson, Partner
mark.robertson@ryden.co.uk

Karen Forsyth, Research Manager
karen.forsyth@ryden.co.uk

www.ryden.co.uk

We are grateful for the assistance of CoStar and Investment Property Databank (IPD).

Ryden

Appendix 8

CARNLEA DEVELOPMENTS

DESIGN BRIEF: MAINS OF CAIRNROBIN

Business, Industrial and Leisure Development (Class 4, 5, 6 and 11)

December 2011

Ryden LLP
25 Albyn Place
Aberdeen
AB10 1YL
Tel; 01224 588866
Fax; 01224 589669

Contents

Background

1.1 An outline planning application (reference APP/2002/0026) was approved for Land at Mains of Cairnrobin, north of Portlethen, for Business, Industrial and Leisure development on the 18th of November 2008. Condition 12 of this consent explains that the Transport Assessment has been audited on the basis that the development will comprise of 39280 sqm of office development; a rail freight terminal (3 hectares/ 12,000 sqm warehousing equivalent); 21090 sqm of warehousing and 6 hectares of Yard Space. Within this 2 hectares are allowed for Class 11 assembly and leisure. Any increase to the above will require the production of a further Transport Assessment to assess any additional mitigation required.

1.2 A condition pertaining to the Outline Planning Permission requires the submission of a comprehensive Masterplan and Design Brief for approval of the council. Condition 4 requires the Design Brief to have regard to:

- Site layout, road and footpath circulation points;
- The proposed phasing of the development;
- Proposals for the integration of the development with the proposed development at Moss side;
- Proposals for the rail freight transfer depot;
- Proposals for strategic landscaped areas around the site;
- Building heights and general design principles;
- Integration of the development on the landscape as demonstrated by an appropriate landscape appraisal and related mitigation measures; AND
- Safeguarding an appropriate means of access to the remaining Employment Land to the immediate south of the site, to the satisfaction of the planning authority in consultation with the roads authority.

1.3 This Design Brief also covers land to the west of the site which was granted outline planning permission (reference APP/2006/1932) on the 3rd July 2007 for the formation of an access road and business park (class 4, 5, 6, 7, 8, 10 and 11 use). It is proposed that development of this land will coincide with the first phase of development of Mains of Cairnrobin (reference APP/2002/0026). Phasing is discussed in section 4 of this Design Brief.

2.0 SITE ANALYSIS

Location and Site Description

2.1 Mains of Cairnrobin is located to the south of Aberdeen (please see figure 1), approximately 1km south of the suburb of Cove and approximately 800m to the east of the A90 and 1.5 km north of Portlethen. Access to the site is taken from the A90 via the grade separated Findon Junction, and along the former A90.

Figure 1: Location

2.2 The site contains agricultural fields, an operational hard rock quarry, a recycling centre and pipe storage yards. The Aberdeen/ Edinburgh/ Glasgow railway line runs to the south of the site close to the southern boundary. To the north of the site lies Apex Tubulars Pipe Storage Yard, EIS Waste Services and a hydro station. To the south west of the site lies a redundant pipe storage yard which is visually separated from the site by earth bunds. Immediately north of the site's south western access lies the Marywell Caravan Park. A number of residential dwellings are present in the area and Barratt East Scotland have recently secured full planning permission for the erection of 115 residential units (application reference APP/2009/2401) on land to the north of the Caravan Park.

2.3 The site is relatively flat, but slopes steeply at its boundary with the railway line (please refer to figure 2 below). As discussed above an operational quarry exists to the south of the site. Access to the quarry is via a steep track.

Photo 1: Views into the site from the east

Photo 2: View of the sites southern boundary

Photo 3: Views into the site from the south

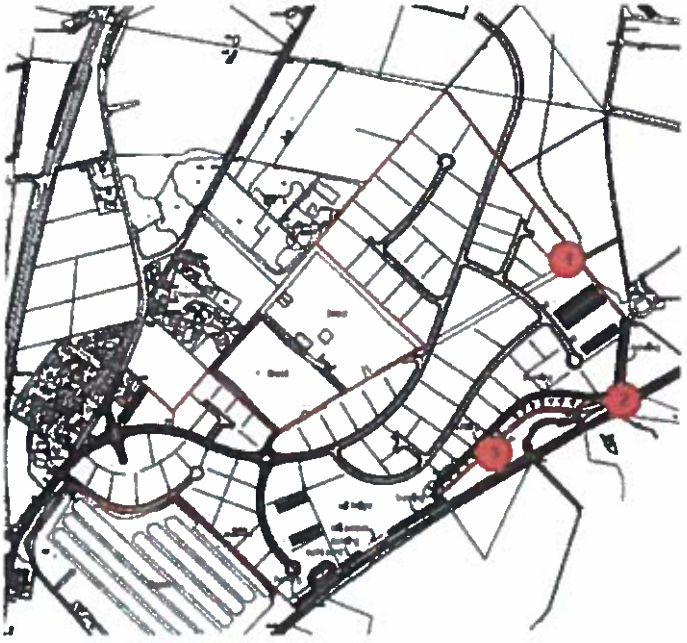


Figure 2: Photos of the site

2.4 As noted the site is located on the east coast and enjoys good views to the south east over arable farm land and out to the north sea.

2.5 There are few direct views into the site. There is no single point where the entire site can be seen. The main view into the site is from the coastal road which runs north to south and lies to its east boundary. It is only at the north of this road where the site is visible. To the north of the site, from the former A90, it is well screened due to the presence of dwellings, a commercial garage and the Aberdeen Gateway Businesses Park. On the western approach to the site, the presently redundant pipe storage yard, in addition to the topography of the land, screens the site from view. The site is not visible from the A90.

2.6 The site can be viewed from the railway line, however the views are transient with passengers only obtaining glimpses of the site. Bunding proposed on the southern boundary will help screen the site from passing trains.

Local Climatic Characteristics

2.7 Enjoying an east coast location the site is exposed to the elements and therefore no trees or major shrub groups exist. The land is predominantly in grass with areas of broom and gorse bushes existing by the central and eastern ditches.

Local Historic/ Townscape Characteristics

2.8 The area within which Mains of Cairnrobin is located is predominantly industrial and has historically been the location of several pipe storage yards. To the north east of the site lies the Aberdeen Gateway Business Park, to the south west lies a redundant pipe storage yard. To the north lies waste services and oil storage yards. Outwith the immediate area which surrounds the site, land uses are predominantly agricultural. Residential dwellings exist to the north of the site and there are also individual dwellings within the vicinity of the site.

Constraints on development in this area

2.9 A hard rock quarry exists to the south of the site. This will require partial infill to enable development.

2.10 Due to the previous and present uses of the site there was concern that there may be potential contamination. Ground investigations were undertaken by Geotechnics in January 2007 and concluded that the levels of contaminants reported in soils collected from the site are not considered to pose a significant risk and that no remedial works are required to allow for development of the Access Road.

2.11 A phase 1 Environmental Desk Top Study was undertaken in June 2011 by Halcrow which identified some potential pollutant linkages due to the proximity of nearby landfills. The report recommended that a hazardous ground assessment should be undertaken to assess risk associated with off site sources of contamination. The report recommends ground water and gas monitoring due to potential low to moderate risk of contamination.

2.12 As recommended by the phase 1 Environmental Desk Top Study, developers are expected to undertake further investigations. Remedial actions may be required prior to the commencement of development.

Accessibility of development in this area

2.13 Current access to the site and the neighbouring industrial area is via an un-surfaced track. Access to this track is from the former A90 Old Wellington Road which leads from the A90 at the grade separated Findon junction. Being located in proximity to the A90, the site is well placed to take advantages of the links north and south.

2.14 The site also lies in proximity to the Charleston Interchange which will be upgraded as the southern end of the Aberdeen Western Peripheral Route. As part of the development of the Aberdeen Gateway Business Park, a new roundabout has been formed linking it to Old Wellington Road. The distributor road, which will be constructed as part of the business park will ultimately connect to Old Wellington Road via the Aberdeen Gateway Business Park thereby increasing the accessibility of the site by car.

2.15 At present the No. 21 First Bus service serves the Aberdeen Gateway Business Park at peak times only. Once the Aberdeen Gateway Business Park is established with sufficient numbers of employees, the frequency of this service will be increased.

2.16 In addition to the First No. 21 service, Stagecoach No. 7 service stops adjacent to the site at Marywell Caravan Park. This provides a frequent service to both Aberdeen and Stonehaven. Additional bus stops will be delivered following development of the land to the north of Marywell Caravan Park for residential use (reference APP/2009). It is also likely that the service will be increased.

2.17 Due to the proximity of the site to public transport services at the Aberdeen Gateway Business Park and Marywell Caravan Park, the site is considered to be well served by public transport. However, developers will be expected to engage in dialogue with service providers, prior to development to secure an increase in service to the site, as required by condition 16 of APP/2002/0026.

Other relevant issues

2.18 Conditions 4 (i) and 15 of planning consent APP/2002/0026 seek to safeguard access to the employment land to the south. The masterplan prepared for the site ensures that access to this land is safeguarded. Please refer to appendix 1 and sections 3.0 and 10.1 of this Design Brief for further information.

Implications of analysis for the masterplan/ development brief.

2.19 The presence of the quarry on the site impacts on the design of the masterplan. The quarry will need to be partly infilled to enable development. This will also facilitate scope for the provision of rail freight sidings if required.

3.0 SITE REQUIREMENTS

Site Layout

3.1 The site lies to the south of Aberdeen City Centre (6km) and to the east of the A90 trunk road (800m). The former A90 Old Wellington Road provides access from the grade separated Findon junction on the existing A90 to the industrial area at Mains of Cairnrobin. To the south of the site lies the east coast railway line; the Brief safeguards land for a rail freight terminal (figure 4) adjacent to the railway line. Until it is demonstrated that this parcel of land is or is not required for rail use, it could be used for short term uses such as open storage; which could easily be dismantled to make way for a rail freight terminal, further details are provided in section 7.

3.2 As discussed in paragraph 1.1 the Transport Assessment has been audited on the basis that the site (APP/2002/0026), once complete, will comprise 39280sqm of office space; 3 hectares for a rail freight (12,000sqm warehousing equivalent); 21,090sqm of warehousing; 6 hectares of yard space and 2 hectares for assembly and leisure. Any increase to the above will require the production of a further Transport Assessment to assess any additional mitigation required.

3.3 Three phases of development are proposed. The likely phasing of the development is discussed in section 4 but will be dictated by market demand. The layout of the site should be designed to ensure the higher density areas are located adjacent to the distributor road allowing for ease of access. Class 5 and 6 uses should be located in proximity to the land reserved for a rail freight terminal to the south east of the site adjacent to the railway line and bunds. Class 11 Assembly and Leisure use should be located centrally to ensure easy access for the employees of the business park.

Drainage proposals

3.4 Surface water drainage proposals for the site have been investigated and based on current guidance the site will require to be drained via an appropriate Sustainable Urban Drainage System (SUD's). As such, a SUD's pond is proposed to the south east of the site adjacent to the land reserved for the rail freight terminal. An indicative SUD's layout is provided at appendix 3.

3.5 Developers will be expected to submit a detailed scheme of SUD's which is to be designed in accordance with the agreed Drainage Impact Assessment/ SUD's strategy. This should be approved by the Planning Authority and must be implemented prior to the occupation of the site. The SUD's pond should be designed to provide a habitat for flora and fauna.

3.6 Surface water drainage from roads will be drained via swales located on the main distributor road which provides access through the site. Swales of 2 metres wide by 1 metre deep are proposed.

Bunding

3.7 A number of bunds are proposed on the south eastern boundary adjacent to the railway line. It is proposed that the bunding will be a long and linear mound which will offer screening to passing railway travellers; will reduce noise disturbance experienced by business park users and will partially screen the development from the railway.

Road Connections

3.8 A grade separated junction with the trunk road at Marywell/ Roadside of Findon was completed as part of the Stewart Milne Homes development at Lethan Fields to accommodate development in the Portlethen area. To accommodate traffic generated by the development the initial access road into the development will be formed directly across from Marywell Caravan Park. A four arm roundabout is proposed which would provide access east and west of the former A90 Old Wellington Road and also into the site. Please see figure 3 below.

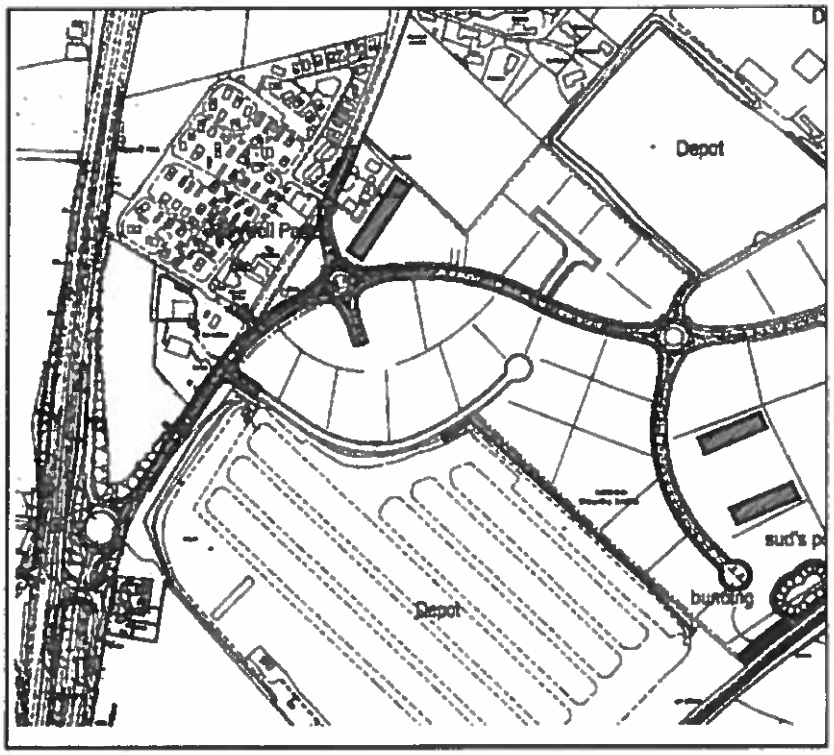


Figure 3: Access into the site

3.9 Access to the employment land to the south will be taken from the existing access road into the site which is located approximately 227 metres from the grade separated Findon Junction.

3.10 As noted above the roundabout will provide access into the site and will form the start of the distributor road and will link with Wellington Road to the north east. Please see figure 4 below.

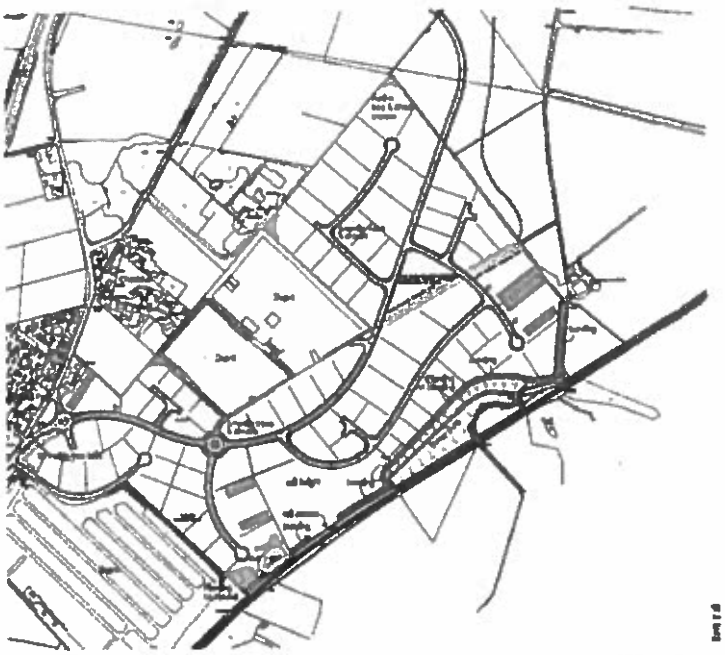


Figure 4: Distributor Road

Footpath connections

3.11 The existing footpath connections and cycle paths will be retained. These lie to the north of the site and are predominantly along Wellington Road and the unclassified road. New footpaths and cycle paths should be provided along the distributor road and access roads throughout the site (see figure 5 below). On the distributor road footpaths should be 2 metres wide with a 3 metre wide cycle path on the southern section of the road. Developers are expected to provide pathways between key destinations. As such, pathways should be provided to connect the site with the Aberdeen Gateway Business Park which is located to the north of the site and also the redundant pipe storage yard which lies to the south west. Core Path Plan NCN1 (see figure 6) lies to the east of the site which provides on road links to Portlethen. Existing footpath connections to NCN1 will be retained to promote connectivity.

3.12 In addition to the footpath links highlighted below in figure 5 developers are also expected to create additional links between key buildings. This will ensure connectivity not only through the site but to developments to the north and south.

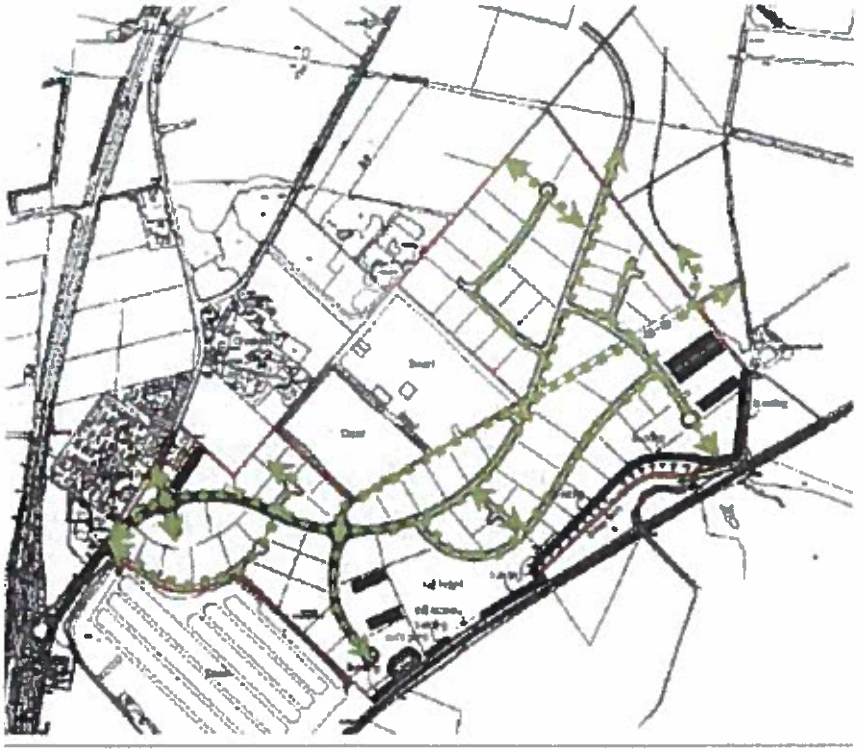


Figure 5: Footpath connections

3.13 Whilst it is expected that cyclists will predominantly use the road network, it is anticipated that there may be occasions where the use shared of footpath and cycleways may be appropriate. Where this is likely footpath links should be developed at a width which will allow users on foot and cycle to use the facilities harmoniously.

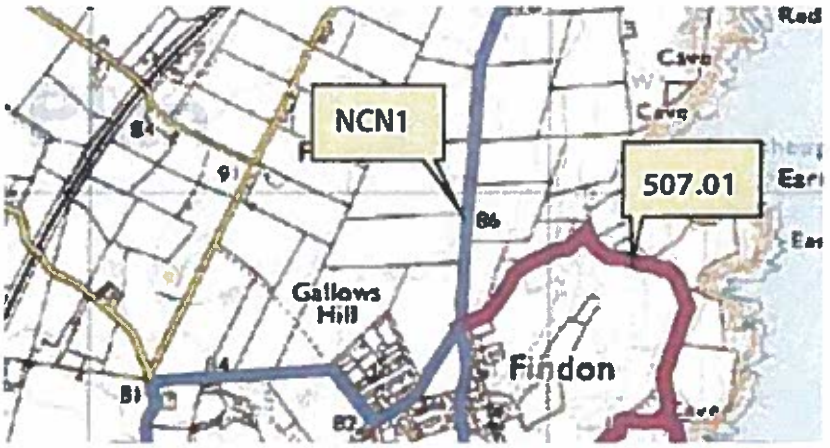


Figure 5: Core Paths

4.0 PHASING OF THE DEVELOPMENT

4.1 Condition 12 of APP/2002/0026 advises that the Transport Assessment has been audited on the basis that the development once completed will comprise:

- 39280sqm of office development;

- 3 hectares of rail freight terminal;
- 21090sqm of warehousing;
- 6 hectares of yard space; and
- 2 hectares of assembly and leisure.

4.2 Any increase to the floor space proposed, will require the Transport Assessment to be updated and agreed with Aberdeenshire Council and Transport Scotland Trunk Road Network Management Authority. Any mitigation highlighted as necessary to accommodate development will require to be implemented.

4.3 No part of the development shall be occupied until a Travel Plan has been submitted to and approved in writing by Aberdeenshire Council.

4.4 Prior to the commencement of development on site, developers are expected to provide details of new or extended bus services. Specifically submission of this information will be required to provide details of operating hours, frequency of service, route and time scale for introduction together with evidence of an agreement with a public transport operator to provide this service.

4.5 The development of the land covered by APP/2002/0026 should be delivered in 3 phases, an indicative phasing layout is shown below in figure 7. Delivery of the first phase of development is restricted by condition 13, of the planning consent (APP/2002/0026). This condition states that development in the first phase will be restricted to 4340sqm of Class 4 Office Space; 10651sqm of Class 5 General Industrial Space; 31842sqm Class 6 Distribution and Warehousing Space. The first phase of development as stipulated by condition 13 of APP/2002/0026, will begin to the south of the site.

4.6 Development of the area of land covered by APP/2006/1932 should be developed to coincide with the delivery of the first phase of development at Mains of Cairnrobin. Due to the size of this area its development does not require phasing.

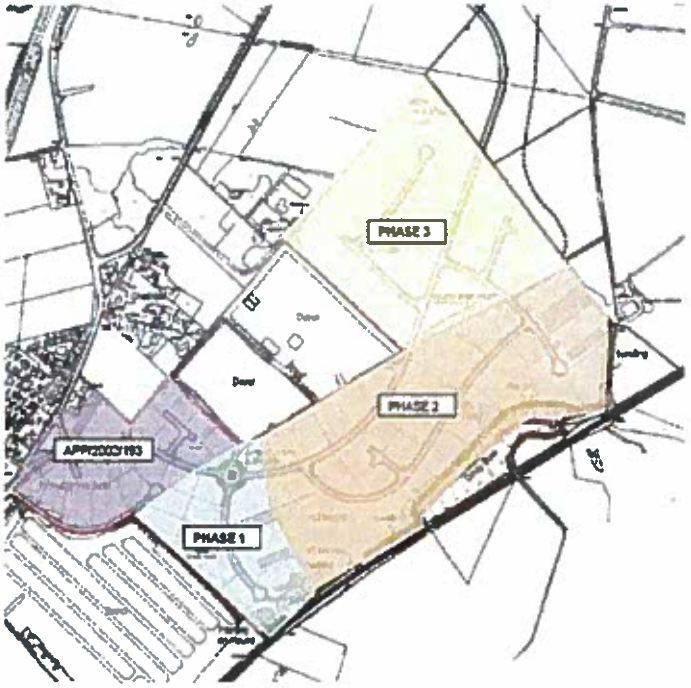


Figure 7: Indicative phasing

4.7 No further phases of development beyond that stipulated by condition 13 shall be occupied until the works for the construction of the internal distributor road linking the development with the interchange at Wellington Road have been constructed and completed as required by condition 14 of APP/2002/0026.

4.8 Bunds to screen the site and prevent noise disturbance should be delivered during both phases 1 and 2. Bunds will be developed to the south of the site adjacent to the railway line. Please refer to appendix 1 Masterplan for further details.

4.9 Phase 2 will include the development of 17470sqm of Class 4, 5219sqm of Class 5, 14079sqm of Class 6 and 2 hectares of Class 11 use. Land will require to be retained for a rail freight terminal pending the outcome of the 'StratMos Project'. It could however, be utilised in the interim period for temporary uses. Warehousing may be acceptable provided it did not prejudice or restrict future rail access and loading and unloading areas.

4.10 The third and final phase of development will deliver 17470sqm of Class 4, 5220sqm of Class 5 and 14079sqm of Class 6 use. If the 'StratMos project' identifies that there is no demand at Mains of Cairnrobin for a rail freight depot, the land currently safeguarded should be retained for 12,000sqm warehousing use.

5.0 INTEGRATION WITH ABERDEEN GATEWAY BUSINESS PARK

5.1 It is important that the development links with the Aberdeen Gateway Business Park to the north. To achieve this it is paramount that building styles are complimentary to those buildings which currently exist in the Aberdeen Gateway Business Park. In addition to this, the distributor road will ultimately pass through

the Aberdeen Gateway Business Park providing access between the two business parks and a north- south connection between the Findon grade separated junction and the A952 Wellington Road. To enhance connectivity between the two business parks a number of footpath links should also be created.

5.2 The travel plan to be prepared for the site will require to ensure, that there is the opportunity for an extension to public transport services which currently serve the Aberdeen Gateway Business Park, and will serve the business park which is the subject of this Design Brief. Discussions will require to be undertaken with both First Bus and Stagecoach, during the preparation of the Green Travel Plan to ensure an extension in both service and frequency of service.

6.0 STRATEGIC LANDSCAPING

6.1 The site is considered to fit well with the landscape setting and as such, screening of the whole site is not considered necessary. However, structure planting will improve and soften the appearance of the area and break up the urbanisation/ industrialisation of the area.

6.2 It is proposed that a 10 metre wide strip of land is reserved for tree planting at the entrance of the site, to the south adjacent to the railway line and to the north east and west boundary corners. Clumps of native shrubs will be planted at all the road intersections. This will soften the appearance of the business park and ensure that it fits in well to the landscape.

6.3 As discussed in paragraph 3.4 a SUD's pond is proposed to the south of the site. At the base of the SUD's pond it is proposed that marsh loving native seeds of flowers and grasses should be sown. This will ensure that when there are times of no permanent water there is something attractive and of interest to please the eye. In addition to this it will create an attractive environment for wildlife.

6.4 As discussed above in paragraph 4.7 areas of bunding are proposed to the south of the site to provide screening from the Aberdeen/ Edinburgh railway line. The bund will be approximately 600 metres in length and approximately 15 metres in width and shaped into a rolling matter. Please refer to the landscape strategy for further details. Tree planting on the bund will include Alder and Shrubbery Willows. A gap will need to be provided in the bunding to enable access to the rail freight depot should it be required. Further details of the strategic planting are discussed in the Landscape Statement (appendix 2).

7.0 PROPOSALS FOR RAIL FREIGHT TERMINAL

7.1 Condition 4 (d) of planning consent reference APP/2008/0026 safeguards land to the south of the site for a rail freight terminal. Historically this area was identified in

the former Structure Plan, North East Scotland Together (December 2001) for the development of a rail freight terminal (please see figure 6). This allocation was not carried forward into the more recent Aberdeen City and Shire Structure Plan (August 2009).

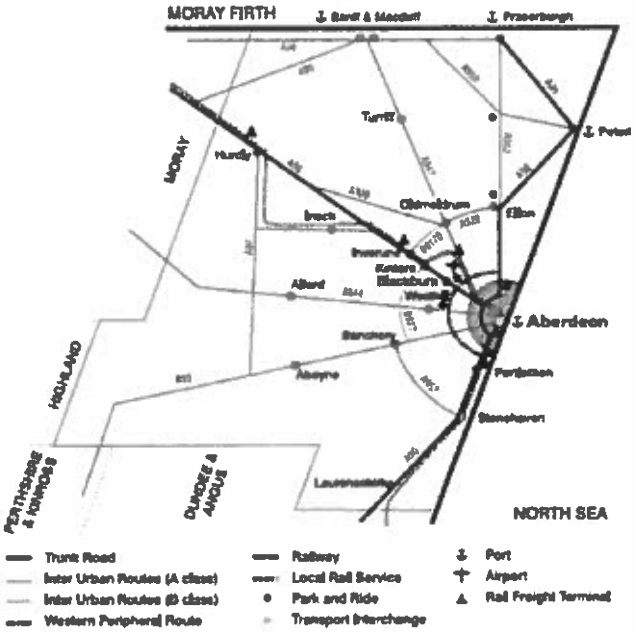


Figure 6: Extract from North East Scotland Together

7.2 Since the identification of the site for a rail freight terminal within the 2001 Structure Plan circumstances have changed. The extant 2009 Structure Plan does not specify such a requirement in this location as there are now two rail freight terminals in Aberdeen; at Raiths Farm, Dyce and at Tullos. These depots are presently underutilised and as such there would appear to be little demand for an additional rail freight terminal. Aberdeenshire Council are presently undertaking the 'StratMoS project' to investigate the demand for rail freight in the North East, and consideration is being given to this site. The results of the 'StratMoS project' will determine if there is demand for a rail freight terminal at Mains of Cairnrobin. Until this is determined the Brief safeguards the land to the south for such a use. In the interim the safeguarded land can be used for short term storage uses. Alternatively warehousing may be permitted provided it does not restrict future rail access and loading and unloading areas.

8.0 BUILDING HEIGHTS AND DESIGN PRINCIPLES

Building heights

8.1 A topographical survey of the entire site has been carried out and a contour plan of the site and surrounding area is attached at Appendix 4. This has been examined to assess those areas of the site which could accommodate higher buildings. The contour map highlights that the site, whilst generally level to the north at 92-95m AOD, falls gently from the distributor road to the south to 85m AOD – 72m AOD.

8.2 Heights of buildings within the vicinity of the site have also been examined. The lowest building height is at Marywell Caravan Park. Buildings here are designed in scale and range from one to one and a half storeys in height. The Aberdeen Gateway Business Park lies adjacent to the northern boundary of the site. Office and industrial buildings here range from two to three stories in height. Buildings proposed and in existence at the Park's boundary with Mains of Cairnrobin are two storeys in height. Industrial units proposed are six to eight metres floor to ridge in height.

8.3 Having reviewed the differences in level throughout the site and also having examined building heights in the immediate vicinity it is considered that the site can accommodate a variety of building heights ranging from one to three or four storeys in height. This variation will create an interesting and varied streetscape. Variation in building heights can also be achieved through roof design which will help to create variation in areas where the building heights are more restrictive.

8.4 To ensure that building heights at the entrance of the site are sympathetic to the neighbouring buildings, building heights should be no more then 2 storeys in height. Outwith this area there is the opportunity to provide higher buildings. As discussed above the southern part of the site lies at 70m AOD. Buildings lying within this area, to the south of the distributor road could be up to three or four storeys in height. These buildings will require to be set back from access roads and at a suitable distance from neighbouring buildings to ensure that there is no overshadowing.

8.5 Outwith the above areas building heights of up to two storeys in height are considered acceptable. Industrial buildings should range between six to eight metres in height floor to ridge within these areas.

8.6 These principles whilst general should be used when designing individual plots. Developers are expected to design buildings to be of a height that not only fits in well with the landscape features, but is sympathetic to the buildings setting.

Design Principles

8.7 The entrance to Mains of Cairnrobin lies opposite Marywell Caravan Park. The key design objective at this location is to ensure that an attractive entrance to a

distinctive business park is created. It is vital that buildings designed not only respect, but are sympathetic, to the buildings in the locale. Buildings therefore as discussed above in paragraph 8.4 should be no more then two storeys in height and should be designed to be creative and of the highest quality.

8.8 As noted, the Aberdeen Gateway Business Park lies to the north of the site and it is important that the style of building delivered complements and fits well with buildings on the Park. This will ensure that an attractive environment and a sense of place is created. At this location the key design objective is to develop buildings that are distinctive and are well integrated with the Aberdeen Gateway Business Park. To achieve this buildings should not only be designed to have a relationship with the buildings present in the Business Park but should be designed to ensure that they do not have their backs or leave blank facades to existing buildings in the Aberdeen Gateway Business Park.

8.9 As noted above the south of the site is considered the most appropriate area to accommodate higher buildings. The key objectives here are to design buildings which not only have good relationships with other buildings in the business park but respect the railway line which lies to the southern boundary and the development proposals for the redundant pipe storage yard to the south west.

8.10 Throughout the site the key design principle is to develop a business park that is distinctive, respectful of neighbouring buildings, of the highest quality and creates a sense of place. Opportunities exist to develop a high quality business and industrial park; to achieve this variety of architectural styles should be developed.

Car Parking

8.11 Developers are expected to design plots to ensure that buildings have public frontages onto the main roads, providing for car parking within central areas which are screened from the main roads. Disabled car parking must be in close proximity to the entrances of buildings.

8.12 Developers are expected to break down areas of car parking with landscaping and give due consideration to the arrival experience of the buildings.

8.13 Developers should have regard to both Aberdeenshire Council Car Parking Standards November 2001[1] and Scottish Planning Policy[2] (SPP) for the design and level of car parking spaces provided. Aberdeenshire Council Car Parking Standards advises that maximum car parking standards for the site would be:

- Class 4 Business, 3 spaces per 100sqm;
- Class 5 General Industry, 3 spaces per 100sqm; and
- Class 6 Storage or Distribution, 1.4 space per 100sqm.

[1] http://www.aberdeenshire.gov.uk/roads/parking/cpr.pdf
[2] http://www.scotland.gov.uk/Resource/Doc/300760/0093908.pdf

8.14 Published in 2009 Scottish Planning Policy (SPP) provides more updated guidance in terms of maximum car parking standards for Class 4 Business use and advises that 1 space should be provided per 30sqm of office space. This figure should be used to determine the level of car parking required for such development.

Landscaping

8.15 A sizable area of open space (circa 1.4ha) is provided along the central ditch to the east of the site. This will not only provide amenity space for people working within the business park, but will create an attractive wildlife habitat.

8.16 Further opportunities for landscaping exist through the development of individual plots. As discussed above in paragraph 8.7 car parking areas are expected to be broken down with areas of soft landscaping. This will enhance the attractiveness of these areas. In addition to this developers are expected to design individual plots to contain a series of both soft and hard landscaping. This will not only enhance the attractiveness of the building but will add to the arrival experience of the building itself and assist in creating a high design quality development.

Sustainability

8.17 Paragraph 41 of Scottish Planning Policy stresses the need to tackle climate change and reduce emissions of greenhouse gasses that contribute to it. It explains that the Climate Change (Scotland) Act 2009 sets a target of an 80% reduction in emissions by 2050, with an interim target of 42% reduction by 2020. It is therefore important that new development is designed to reduce greenhouse gas emissions.

8.18 The site is south facing and this resource should be utilised in relation to energy savings and light. Building plots should be orientated to maximise opportunities offered by passive solar gain. Glazing should be utilised to maximise solar gain and day lighting. This will reduce dependence on artificial lighting. Externally, lighting which automatically switches off during daylight hours should be selected.

8.19 Buildings should be designed to maximise their own thermal efficiency. Buildings should be designed to maximise air tightness and should utilise opportunities offered by natural ventilation such as windows.

8.20 In designing buildings developers should have regard to the use of initiatives including the location of photovoltaic panels for hot water, wind energy initiatives, grey water recycling and ground source heat pumps, if feasible. Developers are also expected to design buildings so that they can maximise opportunities offered by solar technologies; both now and in the future.

8.21 Developers are expected to use energy efficient design and management in order to deliver buildings which are sustainable. Buildings should, as a minimum be designed to the latest carbon emission targets and the requirement of current Building Standards. Developers should aspire to create buildings which receive the

minimum BREEAM rating of 'good'. Developers are expected to design buildings which minimise construction waste and re use materials where possible and maximise the use of locally sourced sustainable materials.

8.22 Developers are also expected to prepare and submit a Green Travel Plan to Aberdeenshire Council for approval. This document will list the alternatives to car use and will minimise traffic generation and movement throughout the site. As discussed in paragraphs 2.15 and 2.16 the site is well served by public transport, the frequency of which will increase upon development of the site and completion of the Aberdeen Gateway Business Park. This, with the addition of a network of footpath links throughout the site will encourage sustainable means of travel to and from the site and also through the site itself.

High Quality Palette of Materials

8.23 As discussed above in paragraph 2.7, the site enjoying a coastal location is exposed to the elements. It is therefore important that developers choose a palette of materials which is not only suitable to the location and climatic factors but has a low environmental impact over the life cycle of the building. Where possible recycled materials should be used. High quality, robust, long lasting materials should be selected.

8.24 It is noted that buildings within the Aberdeen Gateway Business Park have used a palette of silver flat panel cladding, high performance aluminium curtain walling, polished granite grey facing block, aluminium and standing seam roofs in the design of their buildings see figure 4 below.

Figure 7: Palette of materials at Aberdeen Gateway Business Park

8.25 To ensure that buildings are designed with due consideration for their context developers are encouraged to use a similar palette of both materials and colours. A constant approach to the use of palletes should be taken. Bright and contrasting colours and materials will not be considered appropriate.

A Sense of Place

8.26 To ensure a sense of place and that the business park fits with the Aberdeen Gateway Business Park it will be important that buildings are designed with a consistent approach to detailing, use of materials, landscape and recognition of the

masterplan. Elevational treatments should be of a high quality, containing elements to make them visually interesting. Buildings can be different in scale and built form but should include elements which connect them to other buildings in the business park and ensure that they are visually attractive creating an attractive place for people to work.

Boundary Treatments

8.27 Bunding and planting is proposed on the sites southern boundary. This is to screen the site from the railway line. To the northern boundaries areas of planting are proposed on the sites corners. Please refer to the Landscape Strategy. Planting is proposed to the north western boundary where access into the site is taken.

8.28 Developers are expected to submit details of boundary treatments and planting to Aberdeenshire Council prior to the development of individual plots.

9.0 INTEGRATION OF THE DEVELOPMENT INTO THE LANDSCAPE

9.1 The location of the site, in proximity to the A90 and the Aberdeen Gateway Business Park as well as the current industrial use of parts of the site lends itself well to the development. The layout of the distributor road ensures connectivity with the Aberdeen Gateway Business Park. The design of the offices and industrial units should be in keeping with buildings present in the Aberdeen Gateway Business Park to ensure that the development fits within the context of the area. Structure planting at the entrance to the development and on the southern boundary will soften the development in landscaping terms. Planting at the intersections throughout the site will create an attractive environment.

9.2 A landscape strategy has been completed by The Ross Partnership which provides further detailed information on structure planting and mitigation measures (appendix 2).

10.0 ACCESS TO EMPLOYMENT LAND TO THE IMMEDIATE SOUTH

10.1 A condition pertaining to Outline Planning Permission reference APP/2002/0026 requires that access to the employment land to the south of the site is secured. Figure 3 of this Design Brief provides details of the access arrangements to this area. As discussed in paragraph 3.9 access to the redundant pipe storage yard will be taken from the existing access road into the site which lies approximately 227 metres from the grade separated Findon Junction. There is also scope for a direct vehicular connection between the two sites.

10.2 To ensure that there is the opportunity for the redundant pipe storage yard to be connected to the completed development at Mains of Cairnrobin footpath links should be developed between the two sites. Figure 5 highlights the opportunity to

create footpath links between the site and the redundant pipe storage yard. In addition to this developers should provide opportunities for further footpath links between key buildings on both sites.

10.3 It is understood that an application is currently pending for the development of the redundant pipe storage yard (reference APP/2007/2350). Developers of this land to the south are expected to adopt similar design principles in the design of their buildings to ensure that they too respect and complement buildings at Mains of Cairnrobin. This is important to ensure that the two areas are not only physically linked but are also visually linked.

11.0 FURTHER WORKS REQUIRED

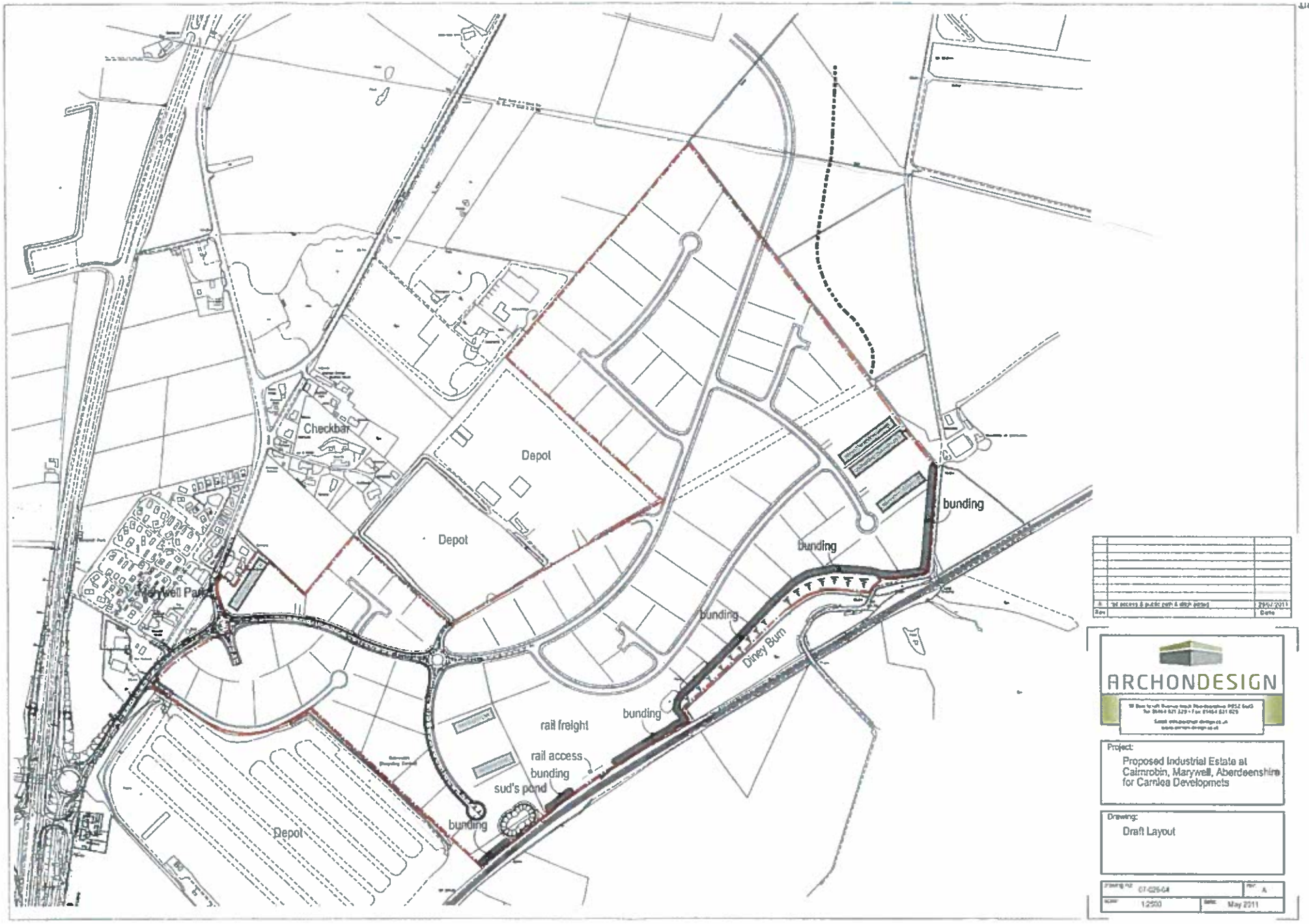
11.1 Developers are expected to submit details to Aberdeenshire Council explaining how proposals for development comply with the provisions of the Masterplan Supplementary Guidance. In addition to this developers will be expected to submit individual design statements.

11.2 Developers are expected to submit a detailed scheme of SUD's which is to be designed in accordance with the agreed Drainage Impact Assessment/ SUD's strategy.

11.3 The Stage 1 Environmental Report prepared by Halcrow identified that gas and water monitoring was recommended. Developers are expected to undertake further investigations.

11.4 To ensure that the site is well served by public transport, developers are expected, as part of the Green Travel Plan, to engage in discussions with public transport service providers. This will ensure that the site is served by a frequent bus service.

Appendix 1: Master Plan



Rev		Date
A	1st access & public path & ditch added	29/07/2011

ARCHONDESIGN

Project:
Proposed Industrial Estate at Cairnrobin, Marywell, Aberdeenshire for Carnlea Developmets

Drawing:
Draft Layout

Drawing no.	07-026-04	Rev.	A
Scale	1:2500	Date	May 2011

Appendix 2: Landscape Statement

Landscape Statement
for
Proposed Development
at
Mains of Cairnrobin, Marywell, Aberdeen

for
Bruce Plant Ltd.

26 July 2011

the Ross Partnership Landscape and Forestry Consultancy www.ross-partnership.co.uk

Bearfold Ordie Dinnet Aboyne AB34 5LS Tel: 013398 81651 E-mail: info@ross-partnership.co.uk
Veronica Ross BA DipLD MLI Irvine Ross BSc(For) FICFor

Table of Contents

Refer to the Ross Partnership Drwg. no. 1114C Landscape Strategy

1. Introduction

The site for the proposed development is a combination of agricultural fields and a working granite quarry south of Aberdeen and east of the A90 and Marywell. The land is owned by Bruce Plant Ltd. The Aberdeen/Edinburgh railway line runs close to the south eastern site boundary. Along the north boundary is the existing Apex Tubular pipe depot, EIS Waste and a hydro station. Directly to the west is the former Seaforth pipe storage site. To the east are the 3 Council owned fields.

2. Features

2.1 There are no trees or major shrub groups anywhere on this site. See all views.

2.2 The main landscape features of the site are the 2 ditches (Views 10.1 & 10.2). One is at the far eastern boundary of the site and the other runs along the centre of the site towards the eastern ditch which flows to the sea. Growing alongside this eastern ditch there are sporadic groups of broom and gorse bushes, but nothing grows beside the central ditch.

2.3 The granite quarry is a large man-made feature on the site (View 10.5). It will cease being worked when the proposed business park is developed.

3. Proposals

The proposals are for a business park on the former Mains of Cairnrobin farm to the south of Aberdeen situated between the A90 dual carriageway and the Aberdeen/Dundee railway line. Access to the park is proposed from a new roundabout on the minor Marywell road just south of Wellington Road. It is also proposed to form a rail freight yard to the south east of the site, adjacent to the railway, for the benefit of future establishments in the park.

4. Views into the Site

4.1 The site is well suited to business development because there are few direct views into the site from the surrounding countryside, from the roads or from Marywell. From no one point can the entire site be seen. The main view of the site is from the north/ south unclassified road between Cove and Findon, which has the one residence of Blackhills of Cairnrobin that will looks onto the site. Once the road crosses the railway line travelling south, the site cannot be seen from vehicles. It is only from the northern section of this road when it passes the Council fields that the site can be seen. The proposed development is situated behind the 3 Council-owned fields that are adjacent to the road. Here the views that are in the middle distance, will be more clear because the ground becomes reasonably level – see Views 10.1 & 10.2.

the Ross Partnership Bearfold Ordie Dinnet Aboyne AB34 5LS t: 013398 81651 e:veronica@ross-partnership.co.uk

4.2 There will be views when travelling north in a vehicle over the railway bridge (View 9.4), and from the trains when travelling north or south.

4.3 The site cannot be seen from any road to the north, and from the west is not easily seen because of the Seaforth yard to the west of the site.

4.4 There will be some views of the larger buildings/offices that are likely to be built in a business park, from the residential properties to the north of the site at Marywell, and this fact suggests that there should be tree and shrub belts between the site and these houses. The existing business developments to the north will also look onto the site.

5. Landscape Strategy

5.1 New developments do not necessarily require screening, and within the landscape surrounding Carinrobin there are currently no woodlands or hedgerows of any type. Close to the North Sea, the landscape is mostly open fields. However, areas of planting at the road intersections will visually break up the built environment for those working within the development. Currently the agricultural fields offer little to wildlife. Retaining the 2 ditches as planted open space for the business park could offer a valuable habitat to wetland wildlife.

5.2 At this stage in the planning process the landscape strategy will focus on screening of the development for the Marywell residents and for the railway passengers, planting alongside the 2 ditches, and the planting of shrubs and Feathered tree beds at the major roundabout and at the road intersections. It is not considered necessary to add large amounts of woodland or tree belts to a landscape, close to the North Sea that has few existing areas of woodland. Landscape proposals will be submitted for each individual plot as they are developed.

6. Structure Planting

6.1 The tree belts at the entrance to the site, to screen it from the Marywell road will be of whip/transplant size (40/60cm & 60/90cm), with groups of feathered trees (size 1.8-2.4m) in certain places to offer slightly more immediate impact. These belts should be a minimum of 10m in width and contain a scattering of large trees such as ash, underplanted with native shrubs.

6.2 The site is 0.5 – 1.0 kilometre from the North Sea cost, therefore, it is important to select species that will grow as quickly as possible, and be tolerant of the salt-laden winds from the North Sea. The following species have been selected::

6.3

Tree Belt Species		
20%	Pinus contorta	Lodgepole pine
10%	Picea abies	Norway Spruce
10%	Acer campestre	field maple
20%	Fraxinus excelsior	ash
20%	Crataegus monogyna	hawthorn
10%	Sambucus nigra	elder
10%	Sorbus aucuparia	rowan

6.4 Transplants of 40-60cm size and whips of 60-90cm will be planted, as they will establish more quickly than anything larger. The planting will be in belts 10 -15m wide, curving round any corners,

the Ross Partnership Bearfold Ordie Dinnet Aboyne AB34 5LS t: 013398 81651 e:veronica@ross-partnership.co.uk

and the spacing will be at 1.5m in staggered rows, to improve the conditions for effective maintenance. It will be important to protect the planting from rabbit predation with rabbit fencing. Regular inspection of this fencing must be written into the management schedules.

7. Ditch Planting

7.1 The existing ditch running north/south at the eastern edge of the site, and the west/east ditch through centre, can become beneficial habitats for both humans and wildlife. It is suggested that a 10-15m strip of land on either side of the central ditch is reserved for open space use. Footpaths can be constructed on either side of the ditch linking to and from the public road pavements. Occasional seating can be installed, interspersed with clumps of native wetland trees and shrubs of whip (60/90cm) and feathered tree size (1.8-2.4m)

7.2 These clumps of trees and shrubs will be interspersed with areas of meadow seed grass, which is maintained close to the footpath and seating areas, but left to grow naturally elsewhere. The trees and shrubs will be as follows:

Open Space Ditch Species	
Botanical Name	**Common Name**
Alnus glutinosa	alder
Corylus avellana	hazel
Crataegus monogyna	hawthorn
Populus tremula	aspen
Prunus padus	bird cherry
Salix caprea	goat willow
Salix cinerea.	grey willow

8. Roadsides

8.1 The main access road through the site has a 2m wide public footpath on its north side and a 3m public cycleway on its south side. Between the footpath and the road there will be a 2m wide, 1m deep, grass covered swale. There can be no tree planting in the swales. There can be clumps of native trees and shrubs planted at all the road intersections, with careful siting and species choice for the road visibility splays.

9. SUDS Detention Basins.

9.1 It is proposed to plant native trees and shrubs suitable for damp ground, around the detention basins: willows and alder. At the base of each basin it is proposed to sow marsh-loving native seeds of flowers and grasses that can live either in water or damp ground. This will offer interest to these depressions at times when there is no permanent water.

10. Bunding

10.1 It is proposed to establish a long, linear mound along the southern site boundary, to offer screening for passing railway travellers. For the development of the rail freight yard is to proposed to form a gap in this bunding, for the rail line.

10.2 Although the mound will appear as a man-made feature, it will be shaped in a smooth rolling manner, and will grade gently into the surrounding levels. It will not rise to a sharp pyramidal peak. The height will vary in different sections, depending on the adjacent land.

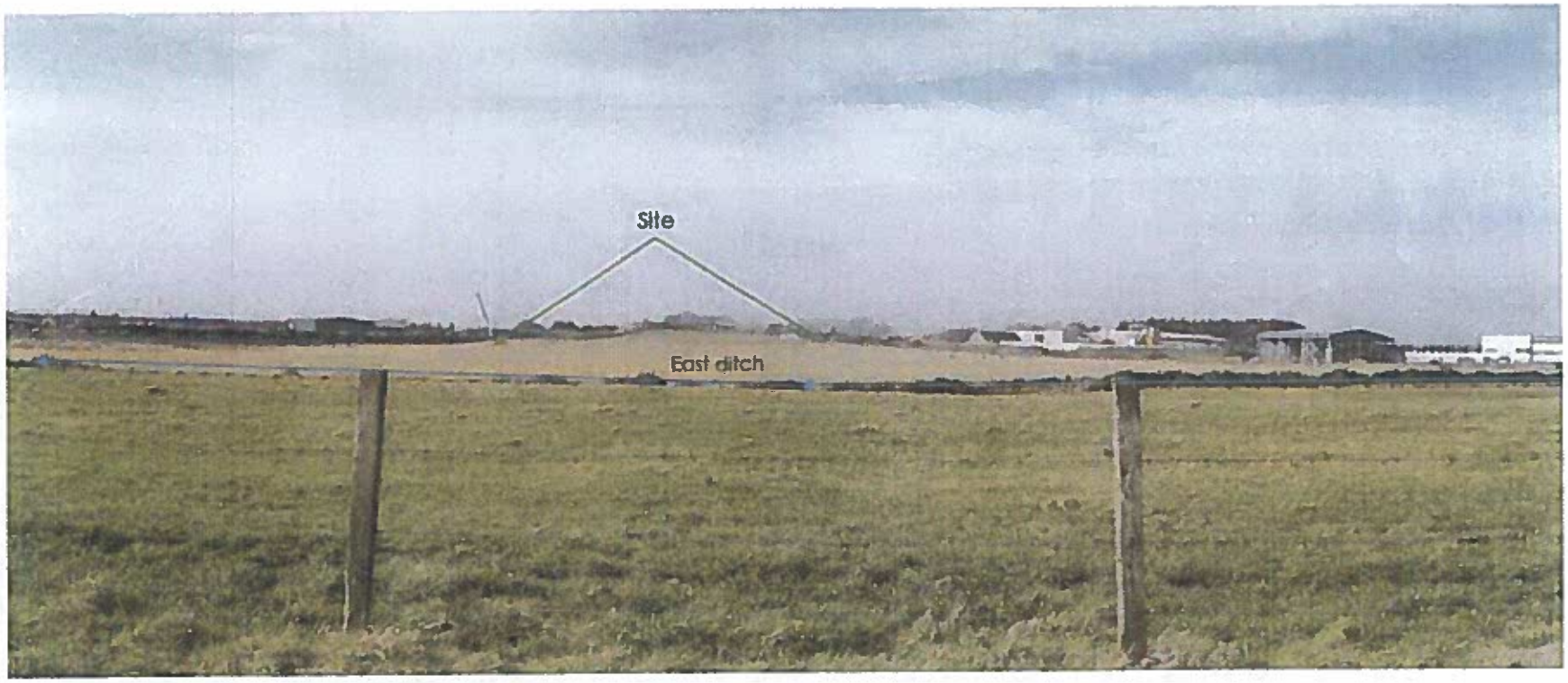
10.3 The bund will be over 600m in length, which is a large extent of land and therefore, it should be quite a wide bund to fit in with the

the Ross Partnership Bearfold Ordie Dinnet Aboyne AB34 5LS t: 013398 81651 e:veronica@ross-partnership.co.uk

scale of the surrounding landscape. It should be a minimum 15m in width. Because the materials it is made with may not be of a perfect quality, tough tree species such as alder and shrubby willows should primarily be used for planting of the bund.

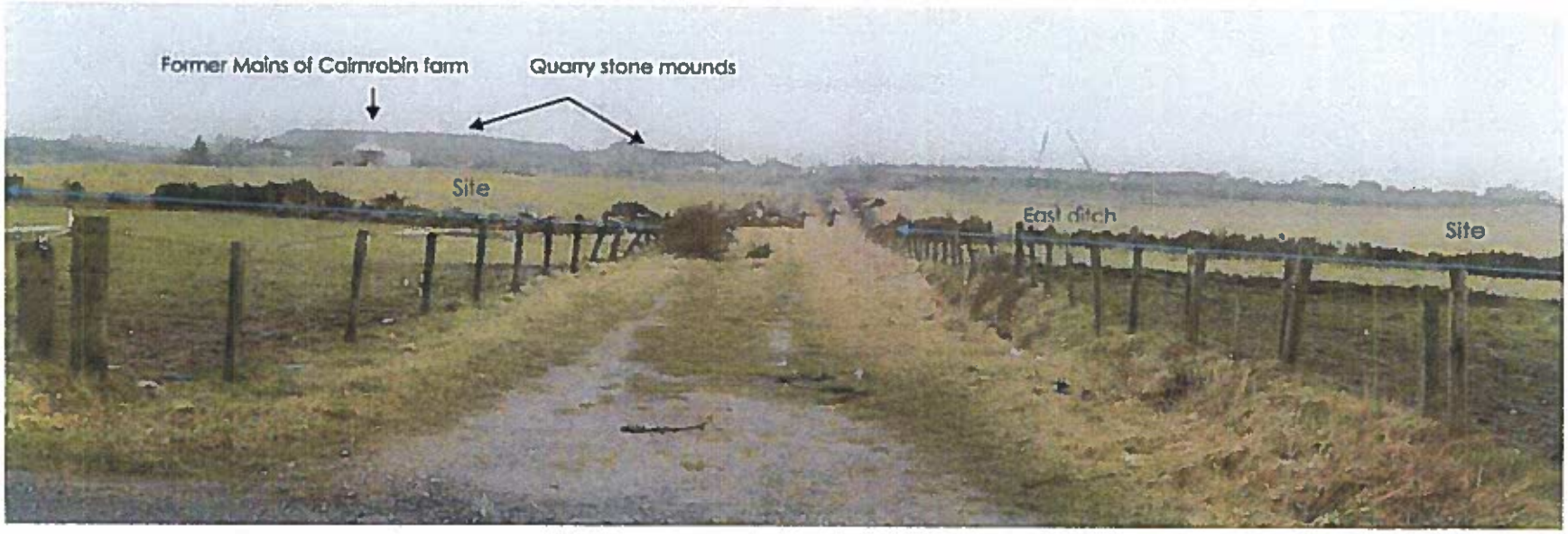
The Ross Partnership Bearfold Ordie Dinnet Aboyne AB34 5LS t: 01339 881651 e:veronica@ross-partnership.co.uk

11. Public Views of Site



11.1 From N/S minor road across Council field into north of site

the Ross Partnership Bearfold Ordie Dinnet Aboyne AB34 5LS t: 013398 81651 e:veronica@ross-partnership.co.uk



11.2 West along old farm track from unscheduled N/S road to east of site

the Ross Partnership Bearfold Ordie Dinnet Aboyne AB34 5LS t: 013398 81651 e:veronica@ross-partnership.co.uk

11.3 E to railway bridge & site

the Ross Partnership Bearfold Ordie Dinnet Aboyne AB34 5LS t: 013398 81651 e:veronica@ross-partnership.co.uk

11.4 NW into site from railway bridge

the Ross Partnership Bearfold Ordie Dinnet Aboyne AB34 5LS t: 013398 81651 e:veronica@ross-partnership.co.uk

11.5 NW into quarry from railway bridge

11.6 North into quarry from Findon Road

the Ross Partnership Bearfold Ordie Dinnet Aboyne AB34 5LS t: 013398 81651 e:veronica@ross-partnership.co.uk

12. Soft Landscape Maintenance Schedule

12.1 SHRUBS

	March - April	May - October	October - November	November - April
Annually	All species – cut back any winter-damaged growth.	Monthly - extract any weeds growing thro' bark or apply herbicide to shrub bed	* Deadhead all shrubs as necessary * Do NOT remove hips from roses * Damaged shrubs to be pruned as necessary	Replace any dead or dying shrubs as necessary during first two years
Annually	* Apply rose fertiliser to all roses. * Apply general fertiliser to all other shrubs	/	/	*Rosa spp:* Only if too rampant, cut back to preferred space
Bark mulch	Bark to be topped up if necessary after 3 years.	/	/	/
Pests & diseases	To be given specialist treatment as they occur.	/	/	/
Water - for first 3 yrs.	If rainfall less than 10mm per week, use sprinkler system – weekly	If rain less than 10mm per week or if shrubs demonstrate stress, use sprinkler system – weekly	/	/

- Shrubs to be replaced (due to disease, age etc.) as judged necessary by the grounds supervisor
- The grounds supervisor will monitor rain fall/drought conditions & will instruct the landscape contractor to water all plants within the site when necessary.

the Ross Partnership Bearfold Ordie Dinnet Aboyne AB34 5LS t: 013398 81651 e:veronica@ross-partnership.co.uk

12.2 STAKED TREES – FEATHERED/STANDARD/SELECTED STANDARD

	Spring	Summer	Autumn	Winter
Year 1	Check stakes & ties. Prune as necessary	Apply approved contact, systemic herbicide to ground vegetation @ base of trees – 1m dia.	* Check stakes & ties. * Prune any damage as necessary.	Replace any dead or dying trees as necessary
Year 2	Check stakes & ties. Prune as necessary	Apply approved contact, systemic herbicide to ground vegetation @ base of trees – 1m dia.	* Prune any damage as necessary	Replace any dead or dying trees as necessary
Year 3 – 5	Yr.3 – apply approved fertiliser	Apply contact, systemic herbicide to ground vegetation @ base of trees – 1m dia..	REMOVE TREE STAKES (unless tree obviously still unstable) * Prune any damage as necessary	/

12.3 MANAGED GRASS

	Spring	Summer	Autumn	Winter
Annually	April. Apply a spring lawn fertiliser & broadleaf weedkiller.	Amenity space grass to be cut once a fortnight during growing season.	Sept. – Apply autumn feed & weedkiller mixture	/
Grass under daffodils	/	Do not 1st cut grass with daffodils until JUNE each year	/	/

The Ross Partnership Bearfold Ordie Dinnet Aboyne AB34 5LS t: 013398 81651 e:veronica@ross-partnership.co.uk

12.4 MEADOW GRASS/WILD FLOWER GRASS

	Spring	Summer	Autumn	Winter
Year 1 Aim to reduce competition from weeds	April/May. Cut grass to 5cm ht. Remove all cut material.	- 2nd cut late Sept./early Oct - cut to 5cm ht. after flowering & seeding Remove all cut material. - If persistent weeds a problem, spot treat with Glyphosate	/	/
Future Years	April/May 1st cut to 7.5cm - remove all cuttings	- late Dept./Oct 2nd cut to 7.5cm -remove all cuttings	/	/

12.5 OPEN SPACE: SELF -SEEDED GRASS UNDER TREE GROUPS & WHIPS

	Spring	Summer	Autumn	Winter
Year 1 - 3	1st cut as per item 4 . May. Apply a directed application of a foliar-acting herbicide to veg. around whips. Keep off trees.	2nd cut as per item 4 If nec. apply 2nd. dose of foliar-acting herbicide to persistent weeds. Keep off trees.	/	/
Year 3 +	/	To be left uncut to form wild grass habitat.	/	/

the Ross Partnership Bearfold Ordie Dinnet Aboyne AB34 5LS t: 013398 81651 e:veronica@ross-partnership.co.uk

12.6 SWALES & BASINS

	Spring	Summer	Autumn	Winter
Annually	1st cut - late May remove cuttings	2nd cut - late September, remove cuttings	/	/
Annually	Inspect vegetation & remove any unwanted species eg. seedling sycamore or escaped amenity flowers	Inspect vegetation & remove any unwanted species eg. seedling sycamore or escaped amenity flowers	Inspect vegetation & remove any unwanted species eg. seedling sycamore or escaped garden amenity flowers	/
Annually	Clear & remove any litter	Clear & remove any litter	Clear & remove any litter	Clear & remove any litter

12.7 SUDS BASINS

	Spring	Summer	Autumn	Winter
Annually	1st cut - late May remove cuttings	2nd cut - late September, remove cuttings	/	/
Annually	Inspect vegetation & remove any unwanted species eg. seedling sycamore or garden flowers	Inspect vegetation & remove any unwanted species eg. seedling sycamore or garden flowers	Inspect vegetation & remove any unwanted species eg. seedling sycamore or garden flowers	/
Annually	Clear & remove any litter	Clear & remove any litter	Clear & remove any litter	Clear & remove any litter
Yr. 7-10	Remove any sediment accumulations from basin	/	/	/

the Ross Partnership Bearfold Ordie Dinnet Aboyne AB34 5LS t: 013398 81651 e:veronica@ross-partnership.co.uk

12.8 NATIVE HEDGEROWS

	Spring	Summer	Autumn	Winter
Immediately after planting	Trim leader of each plant by 1/3 to encourage bushy base growth (whichever time of year hedge is planted)	/	/	/
Year 1	Control weed growth at foot of hedge manually or with approved herbicide	* Control weed growth at foot of hedge manually or with approved herbicide * Clip hedge late Sept-Mar.	Trim as necessary	/
Year 2	Control weed growth at foot of hedge manually or with approved herbicide	* Control weed growth at foot of hedge manually or with approved herbicide * Clip hedge late Sept-Mar.	Trim as necessary	/
Year 3 – 5	Control weed growth at foot of hedge manually or with approved herbicide	* Control weed growth at foot of hedge manually or with approved herbicide * Clip hedge late Sept-Mar.	Trim as necessary	/
Year 5 +	/	/	/	Trim once every 3 years, allowing an incremental growth in those years. ie. do not trim to same height each year.
Pests & diseases	To be given specialist treatment as they occur.	/	/	/
Annually	Ensure rabbit netting on fencing/protective tubes is/are still secure. Repair if necessary. Remove after 5 years	/	/	/

Note 1:
Please note that when more mature, no trimming of hedgerow must take place during nesting season: April - August

the Ross Partnership Bearfold Ordie Dinnet Aboyne AB34 5LS t: 013398 81651 e:veronica@ross-partnership.co.uk

12.9 WHIPS/TRANSPLANTS

	Spring	Summer	Autumn	Winter
Year 1	1. Inspect rabbit fencing/protective tubes – mend/re-stake if nec. 2. May. Apply a directed application of an approved foliar-acting herbicide to veg. around whips. Keep off trees.	Aug/ Sept.- If necessary apply 2nd. dose of foliar-acting herbicide to all grass/weeds. Keep off trees.	/	Replace any dead or dying plants as necessary
Year 2	3. Inspect rabbit fencing/protective tubes – mend/re-stake if nec. 4. May. Apply a directed application of an approved foliar-acting herbicide to veg. around whips. Keep off trees.	Aug/ Sept.- If necessary apply 2nd. dose of foliar-acting herbicide to all grass/weeds. Keep off trees.	/	Replace any dead or dying plants as necessary
Year 3	1. Inspect rabbit fencing/protective tubes – mend/re-stake if nec. 2. May. Apply an approved residual soil-acting herbicide to veg. around whips Keep off trees.		/	/
Year 10 - 15	Thin & remove 1/3 of whips. Select the poorest plants for removal.	/	/	/

Notes

- It is necessary for the establishment of the whips/transplants to maintain a weed/grass-free zone for at least 3 years after planting
- All herbicide spraying must take place on calm days and each whip must be protected during spraying

Long Term Maintenance

- Remove (off site) 33% of whips when trees reach10m in height (Approx. year 10-15). Select the poorest trees. Thin shrubs at same time.
- Continue to thin selectively to maintain balanced crowns. Work to be carried out by trained and approved arboriculturalists.

the Ross Partnership Bearfold Ordie Dinnet Aboyne AB34 5LS t: 013398 81651 e:veronica@ross-partnership.co.uk

12.10 WATER

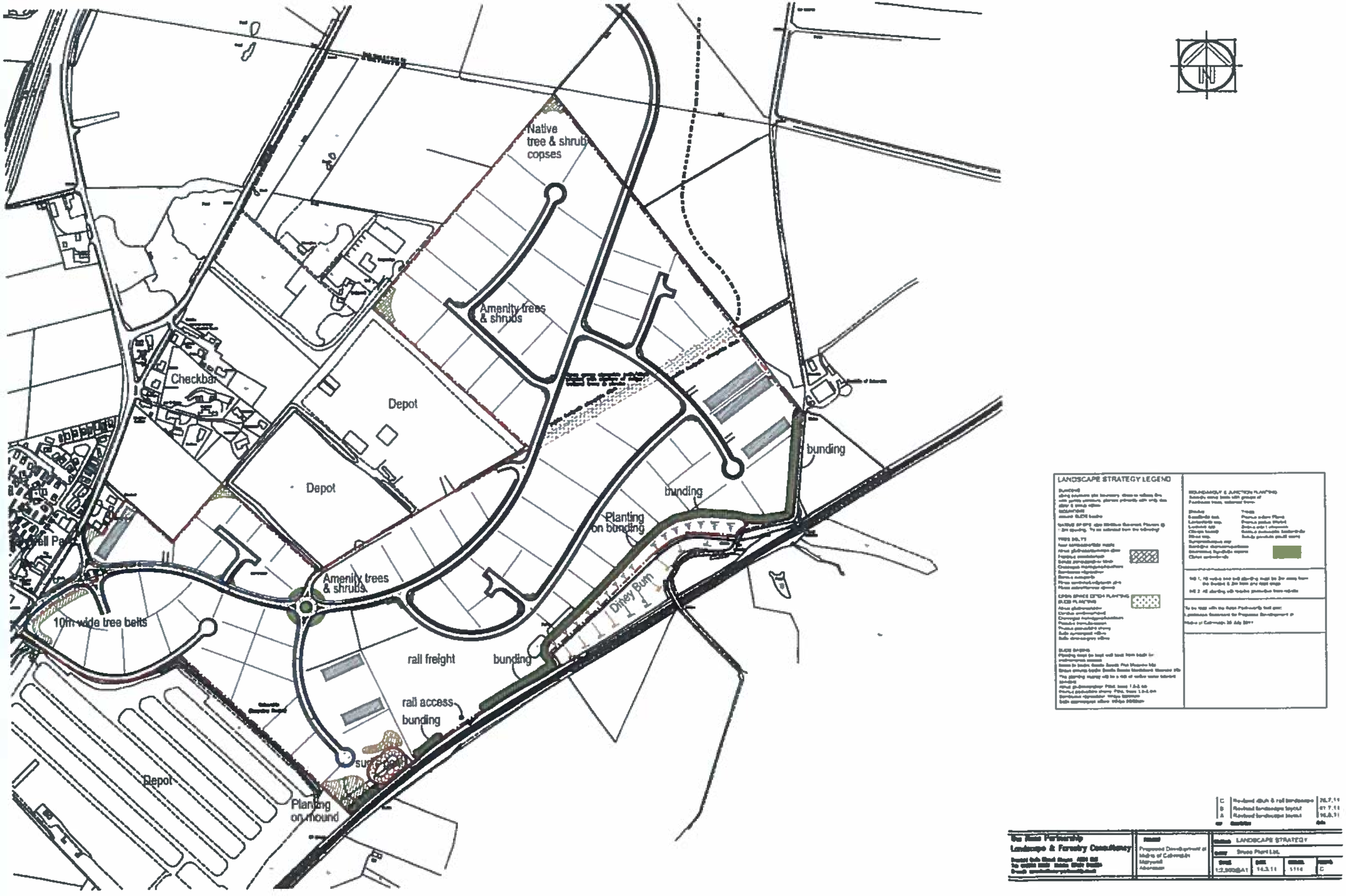
- After 10 days of hot, drying winds or drought conditions, hand watering shall be carried out if a piped system has not been installed. Approximately 15 lts. is to be applied to the root zone of all staked trees & 10 lts. to shrubs, conifers and whips/transplants. The ground is to be forked over & left tidy after watering.
- In drought conditions, newly seeded grass or turf shall be watered. The ground will be watered to a depth of 15mm using a sprinkler.

12.11 ANNUAL INSPECTION

- A qualified arboriculturalist will carry out an annual inspection of all the planting stock for 5 years after planting and prepare a report for the developer.
- A copy of the report will be sent to the Planning Service within 3 weeks of the inspection.
- Any necessary replacement plants will be planted before the end of the planting season of that year.

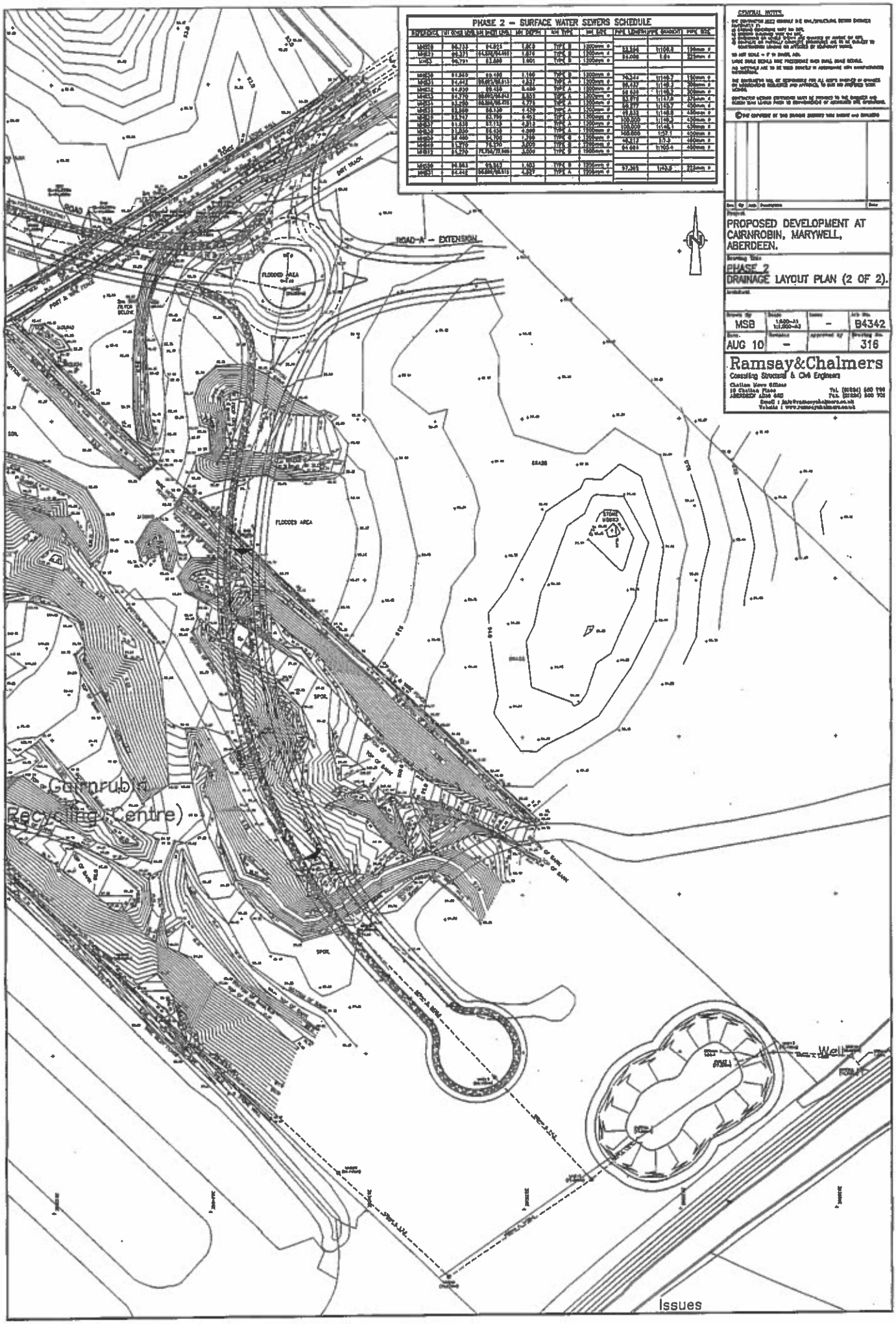
The Ross Partnership Bearfold Ordie Dinnet Aboyne AB34 5LS t: 013398 81651 e:veronica@ross-partnership.co.uk

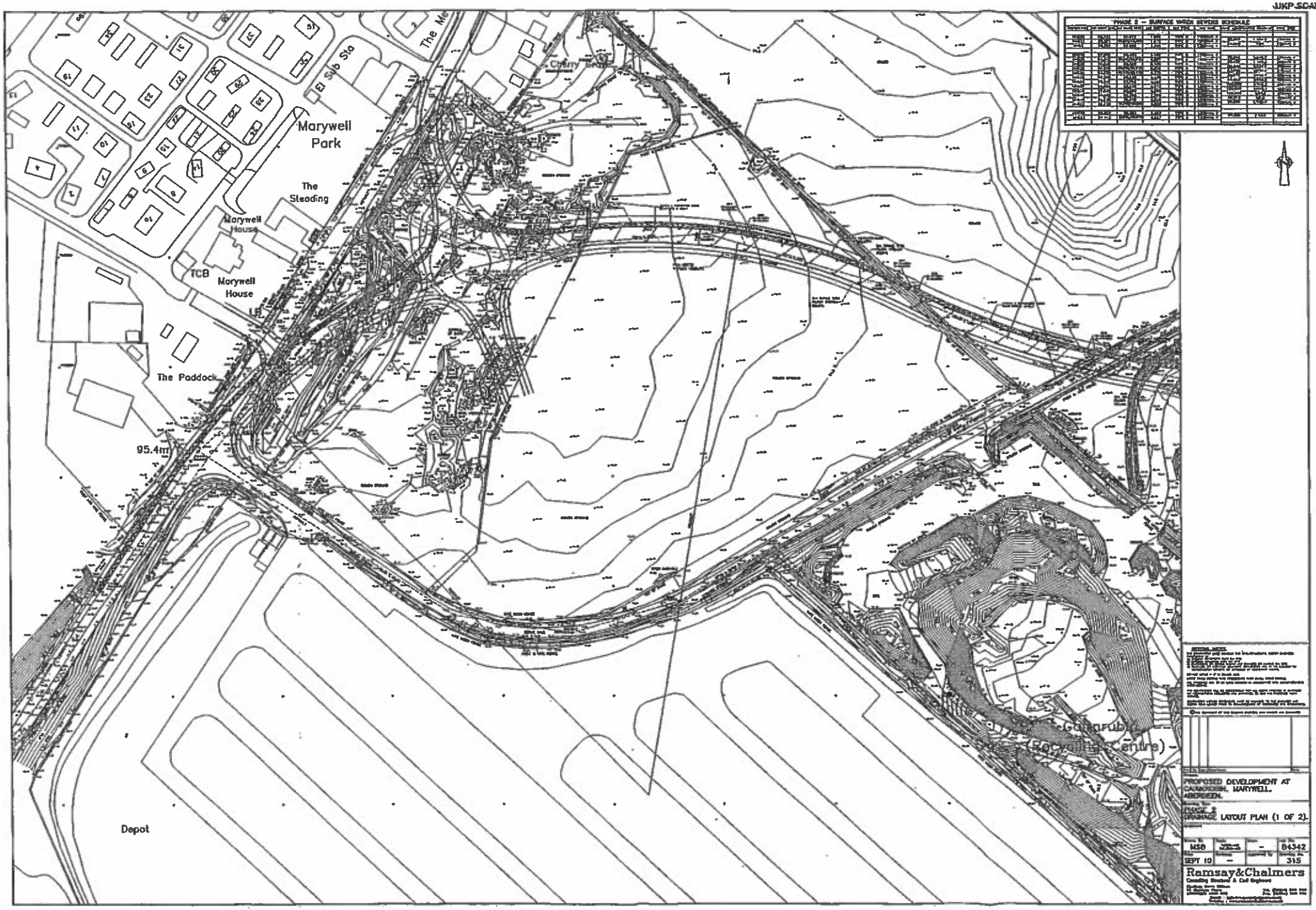
JKP SCANNED



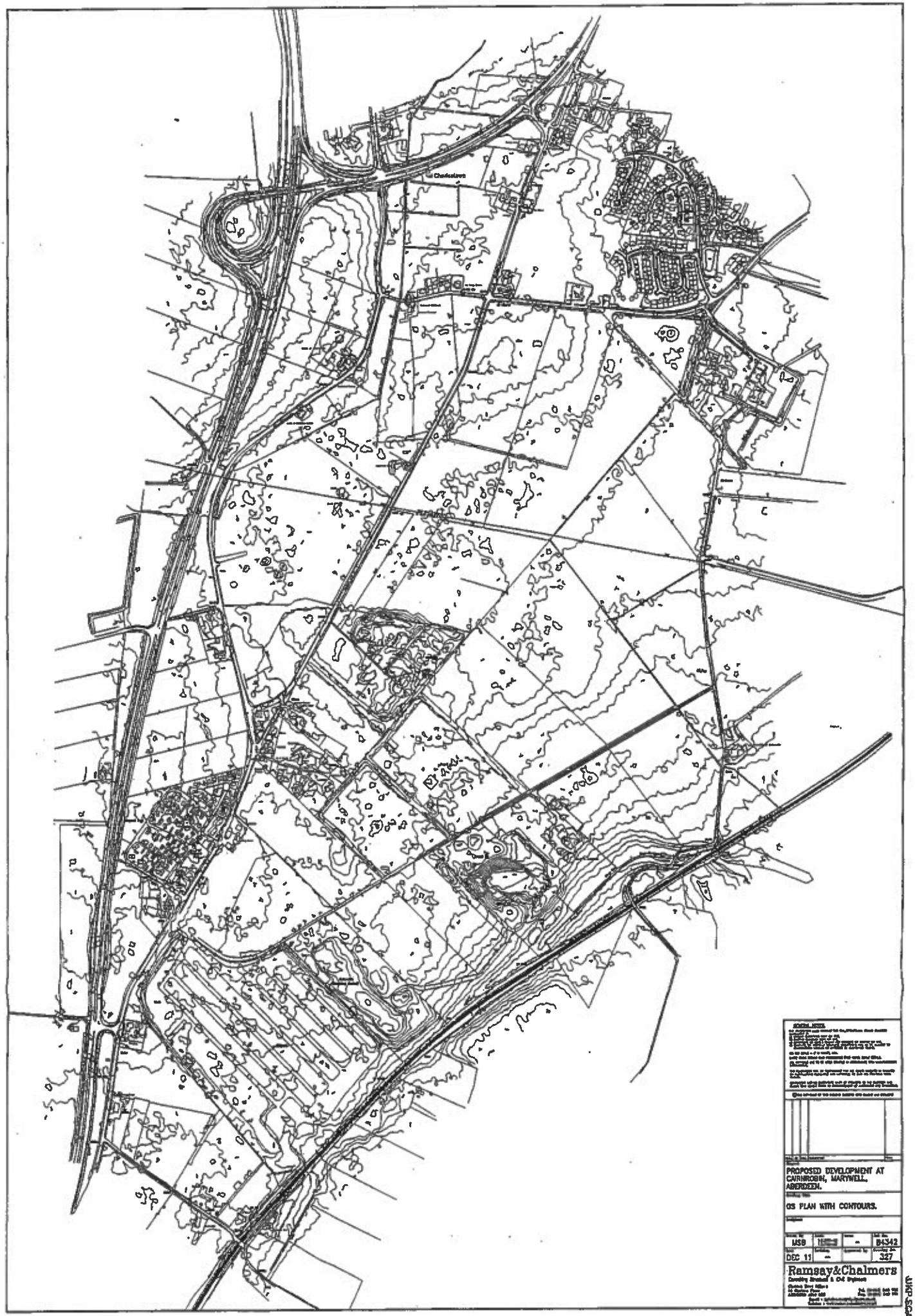
Native tree & shrub copses
Amenity trees & shrubs
Depot
Depot
Checkbar
Amenity trees & shrubs
10m wide tree belts
rail freight
bunding
rail access
bunding
Planting on bunding
bunding
Dipey Burn
Planting on mound
Depot
bunding
LANDSCAPE STRATEGY LEGEND
LANDSCAPE STRATEGY

Appendix 3: Drainage Layout


PHASE 2 – SURFACE WATER SEWERS SCHEDULE
ROAD A – EXTENSION
DIRT TRACK
FLOODED AREA
FLOODED AREA
Gairnrubin
Recycling Centre)
Well
Issues
PROPOSED DEVELOPMENT AT CAIRNROBIN, MARYWELL, ABERDEEN.
PHASE 2
DRAINAGE LAYOUT PLAN (2 OF 2).
MSB
AUG 10
B4342
316
Ramsay&Chalmers
Consulting Structural & Civil Engineers


Marywell Park
The Steading
Marywell House
TCB
Marywell House
LB
The Paddock
95.4m
Depot
Cherry Lodge
El Sub Sta
The Me
(Recycling Centre)
PROPOSED DEVELOPMENT AT CAIRNROBIN, MARYWELL, ABERDEEN.
DRAINAGE LAYOUT PLAN (1 OF 2).
MSB
SEPT 10
84342
315
Ramsay&Chalmers

Appendix 4: Contour Plan


Charlestown
PROPOSED DEVELOPMENT AT CAIRNROBIN, MARYWELL, ABERDEEN.
OS PLAN WITH CONTOURS.
MSB
DEC 11
Ramsay&Chalmers

Edinburgh
46 Castle Street EH2 3BN
Tel: 0131 225 6612
Fax: 0131 225 5766

Glasgow
130 St Vincent Street G2 5HF
Tel: 0141 204 3838
Fax: 0141 204 3554

Aberdeen
25 Albyn Place AB10 1YL
Tel: 01224 588866
Fax: 01224 589669

Leeds
Park House
Park Square West LS1 2PW
Tel: 0113 243 6777
Fax: 0113 243 9323

Dundee
Unit 20 City Quay
Camperdown Street DD1 3JA
Tel: 01382 227900
Fax: 01382 229071

Inverness
Moray House
16-18 Bank Street IV1 1QY
Tel: 01463 717202
Fax: 01463 717204

ABERDEEN GATEWAY

ABERDEEN'S NEW BUSINESS QUARTER

Application For
Planning Permission in Principle
To Extend
Aberdeen Gateway Business Park

Appendix 9

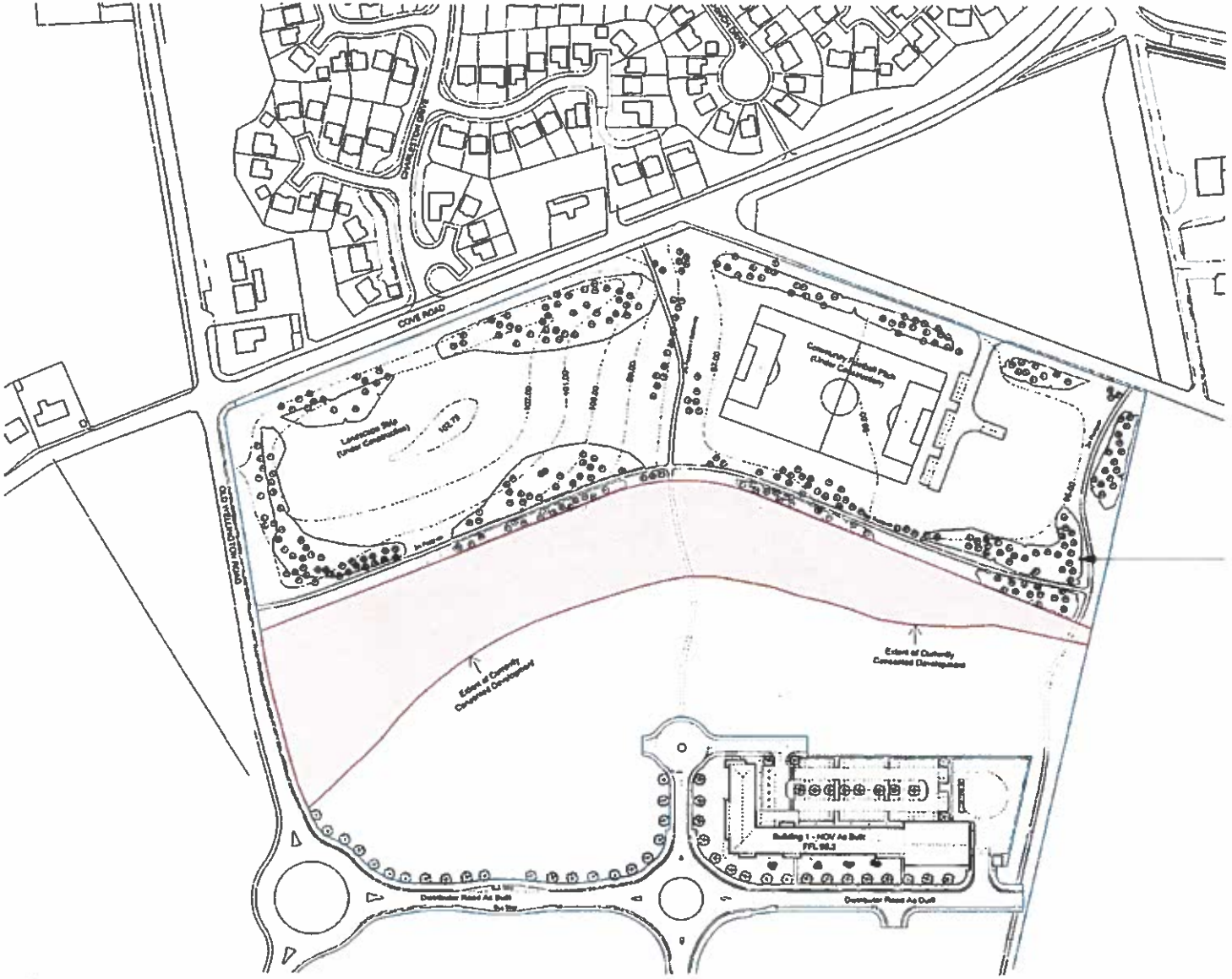
RGP Architects Design & Access Statement 8911 / 110408

Aerial view of Aberdeen Gateway showing extent of proposed Northern Extension

Application for Planning Permission in Principle

Architect's Design and Access Statement

List of Contents



Site Location Plan
Red line indicates Application Site.
Blue line indicates other land controlled by applicant

Introduction

Aberdeen Gateway is being developed by Stockland Muir into a high quality business park to the south of the city.

The site sits close to the main arterial route from the south, the A90, adjacent to the junction with the A956 to Aberdeen Harbour.

Over the last four years, Stockland Muir have constructed the infrastructure of the park, including roads, drainage and bringing services to the site. A number of varying building types have been developed on the park, and Stockland Muir are currently constructing a large landscaped zone to the north of the site, including a community football pitch. Stockland Muir have also contributed financially to the upgrading of the local roads infrastructure.

This Design and Access Statement has been produced to support an application for Planning Permission in Principle to extend the development boundary to the north of the site, to allow for the creation of further high quality Class 4 offices.

As well as outlining the design concept for the site and including an indicative masterplan showing how the site might be developed, this document includes a Landscape and Visual Impact Assesment, analysing the visibility of the proposed development from agreed points to the west, north and east of the site.

Development Team

Developer	Stockland Muir
Planning Consultant	Knight Frank
Architect	RGP Architects
Landscape Architect	Chris Palmer Associates
Infrastructure Engineer	Fairhurst
Development Engineer	Odin
M&E Engineer	Ramboll
Cost Consultant	Gardiner & Theobald

Masterplan in originally consented format showing location of proposed Northern Extension in red

Planning History

Aberdeen Gateway Business Park originally gained an outline planning consent to establish it's use under application A1/0514.

A later reserved meters application A7/1107 defined a more detailed indicative masterplan for the park (illustrated opposite).

As well as securing consent for a major class 4 HQ building on Site A of the masterplan, this latter consent allowed the construction of the infrastructure to serve the site (landscaping, roads, drainage, services etc). Much of this infrastructure is now complete, with the Northern Landscape Zone, including landscaping, cycleways, pathways and a community football pitch, currently under construction.

Over the last 4 years, a number of bespoke buildings for specific end-users have been successfully delivered -

1. A Driving Standards Agency (DSA) Test Centre completed in 2008. (Aberdeenshire Council KM/APP/2007/4517)

2. A major new office and warehouse facility for National Oilwell Varco completed in December 2009. (Aberdeen Council A8/1625)

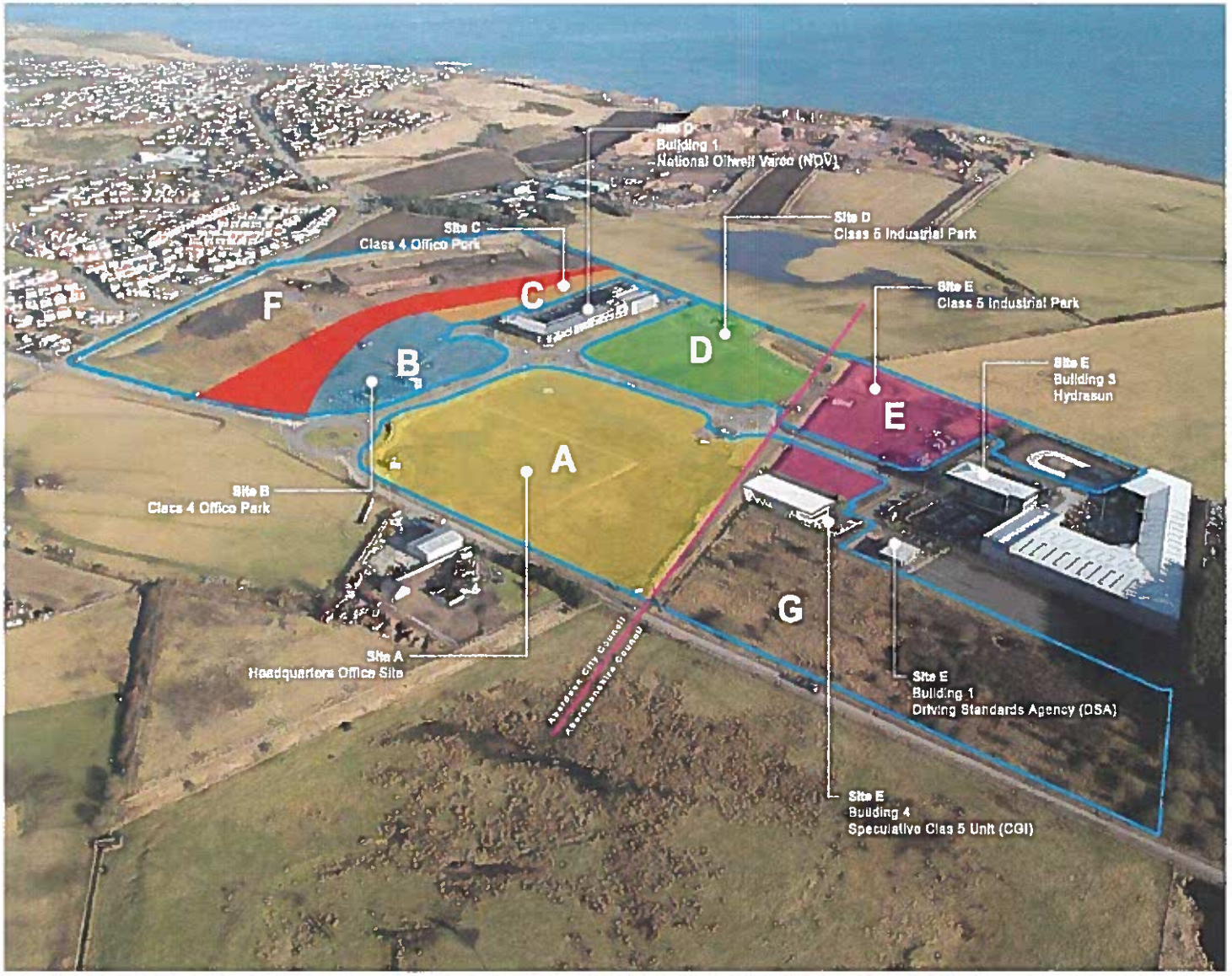
3. A substantial manufacturing and office facility for Hydrasun, completed in December 2010. (Aberdeenshire Council KM/APP/2009/2470)

Following on from these successful projects, Stockland Muir have recently made an application to Aberdeenshire Council for -

4. A speculative Class 5 industrial building, due to start on site in May 2011. (Aberdeenshire Council KM/APP/2011/0709)

The actual site planning inevitably differs from the original masterplan in terms of building sizes and orientation, although the basic concept of Class 4 (Office) development to the north of the site and Class 5 and 6 (Industrial and Storage) development to the south remains intact.

The current status of the site is illustrated overleaf.



Aerial view of Aberdeen Gateway showing buildings currently constructed and current masterplan intent (with CGI of Speculative Class 5 Unit added).

Proposed Northern Extension shown in red

National Oilwell Varco Office Building

DSA Test Centre

Hydrasun Production Warehouse

Indicative Masterplan of Site - 'For Illustrative Purposes Only'

Indicative Masterplan

The original masterplan concept (refer page 2) created two courtyards of two storey Class 4 office developments, Site A and Site B.

However, due to the then constraints of the northern site boundary, Site B's courtyard was truncated, with a 'missing building', leaving open views into the central car park.

Subsequent to the original masterplan, the National Oilwell Varco office building has been developed. It is a substantially larger footprint than the office pavilions originally conceived for the site, but the building was sited with careful consideration of the original masterplan.

The proposed revised site boundary impacts most greatly on the western and northern parts of the site, which allows a more symmetrical arrangement to be created of two courtyards of office buildings, separated by a wide swathe of landscaping. Through this central green corridor runs a pedestrian / cycle path, linking the site to the Northern Landscape Zone and the wider pedestrian and cycle infrastructure in the area.

Car parking is generally contained within the centre of the courtyards. This allows the clean, high quality contemporary facades of the office buildings to address the surrounding green spaces, whilst containing the majority of noise and light pollution from the car parking.

Where the original masterplan envisaged shared central car parking, the new proposals are for each office building to have it's own dedicated car park, delineated from it's surroundings by substantial landscape strips. This is not only preferable to potential end-users but allows phased development to take place in a more controlled manner. Car parking is provided at the maximum car parking standard of one space per thirty square meters of office floor space and disabled spaces at one per twenty spaces.

As part of the original masterplan, already constructed as part of the infrastructure works, bus stops have been created on the distributor road immediately to the south of these proposals.

The office pavilions are intended to remain as two-storey in height. The northern landscape zone profile and landscaping scheme has been previously agreed with Aberdeen Council and is currently under construction. The Landscape and Visual Impact Assessment included in this document illustrates that these two storey buildings will be substantially hidden from view from the closest housing on the other side of Cove Road. As you progress east along Cove Road, the land flattens out and affords visibility of the proposed development behind the community football pitches, although the housing is further away from the proposed development by this point.

CGI of proposals from south

Design Principles

Boulevard Planting
The original masterplan was conceived as a series of high quality buildings in a parkland setting, with boulevard planting on the main roads throughout the park. This theme will be continued by these latest proposals.

Landscaped Courtyard Parking
All car parking is contained in the centre of the two courtyards. This means that the 'public' frontages, to the main roads, green spaces and housing are the high quality facades of the office buildings. The light and sound pollution and general 'clutter' of the car parking is contained in the central areas.

Northern Landscape Zone
The Northern Landscaping Zone, including a natural remodeling of the ground profiles, significant planting, new and repaired drystone walls and a community football pitch, is already under construction. Meandering through this are cycle and pedestrian pathways which link to the wider infrastructure already existing and planned in the area.

Central Landscaped Corridor
A wide green corridor bisects the scheme, allowing breathing space for the people working in the business park, and linking through to the Northern Landscape Zone and beyond.

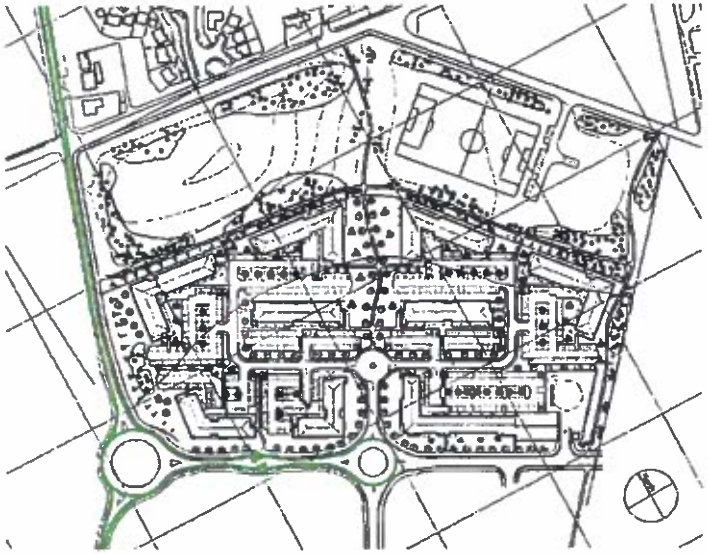
Wider Pedestrian / Cycle Infrastructure
The proposals acknowledge and enhance the strategic requirements of the wider area, including the desirability of a green link through the Loirston area, along the north of the Aberdeen Gateway site and onwards to the east, towards the sea front.

Public Transport Links
Currently a good bus service runs down Old Wellington Road. When a sufficient critical mass of people working on the business park is achieved, bus operators will route into the site. Bus stops, immediately to the south of these proposals, were constructed as part of the original infrastructure works and will provide easy and convenient public transport links to the site.

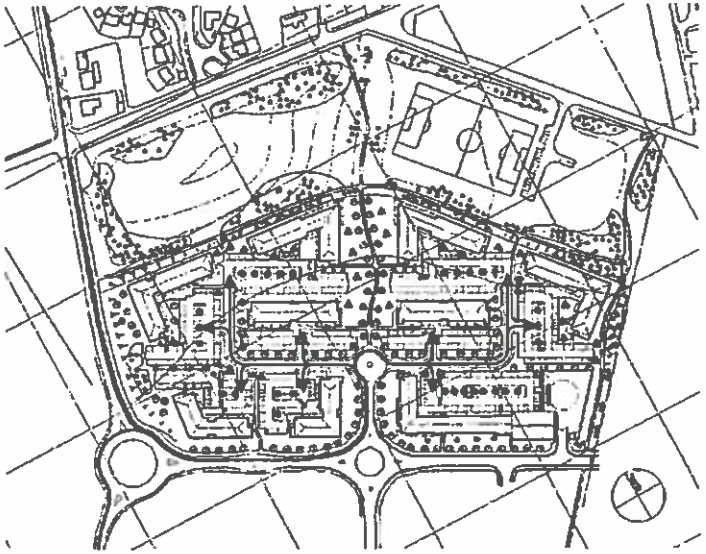
Sustainability
All buildings are designed to the latest carbon emission targets and the requirements of the current Building Standards. Stockland Muir are keen to promote sustainability and will work with potential tenants to investigate more advanced performance, such as enhanced BREEAM ratings. The site incorporates SUDS, and Green Travel Plans for each building will be developed at the appropriate time.

High Quality Palette Of Materials
The park as a whole will be designed with quality, long lasting materials appropriate to it's location. To date we have used silver flat panel cladding, high performance aluminium curtain walling, polished granite grey facing block, aluminium standing seam roofs and high quality hard and soft landscaping. This theme will be continued.

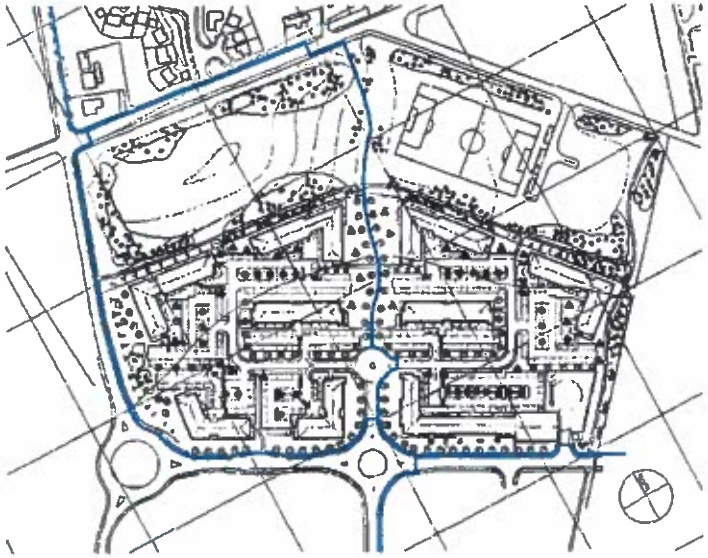
A Sense of Place
The three buildings developed to date (and the fourth currently proposed) are all significantly different in terms of scale, use and built form. However, all are conceived with a consistent approach to detailing, use of materials, landscape and recognition of the original masterplan. The continuation of this design ethos will create a business park with an identity, rather than a loose conglomeration of buildings. The aim is to create a pleasant and appealing environment for people to work in, businesses to locate to and visitors to enjoy.



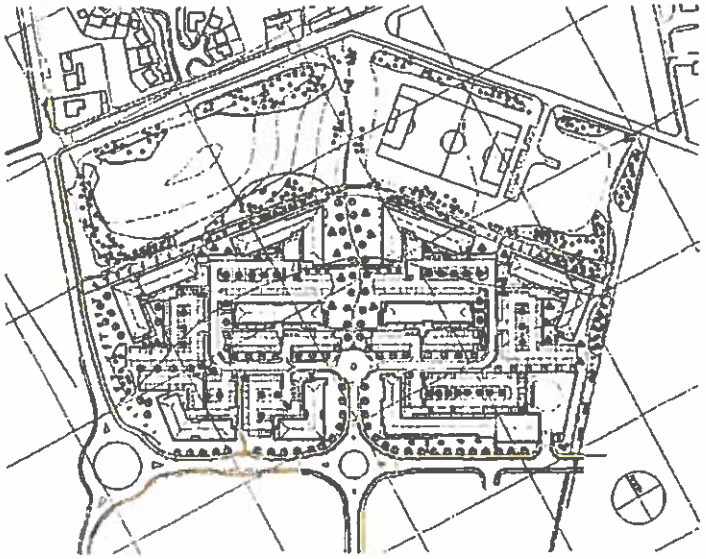
Access by public transport (bus)



Access by car



Access by bicycle (cycle paths)



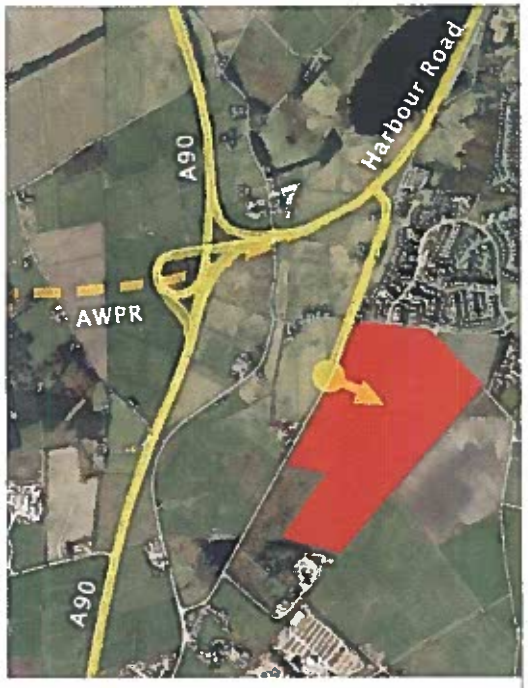
Pedestrian access

Access to the Site

As previously noted, Aberdeen Gateway Business Park is situated in close proximity to the Harbour Road junction off the A90, the main route south from Aberdeen. This junction is due to be upgraded in the future when it becomes the southern end of the Aberdeen Western Peripheral Route (AWPR). The site is therefore readily accessible by car.

A good bus service runs down Old Wellington Road and will divert into the site when sufficient numbers are employed at the site to make this viable for the operator. The site is therefore well served by public transport.

A comprehensive cycle and pedestrian network, through green spaces, is planned for the wider area. This runs through the proposed Loirston Development to the north, down Old Wellington Road and across the north of the Aberdeen Gateway Business Park, before heading off east to the sea. The site contributes to this network and is therefore well linked by pedestrian and cycle routes.



Site proximity to National Road Network

Indicative Landscape Proposals

Indicative Landscape Proposals

The original masterplan was conceived as a series of high quality buildings, set in a parkland setting. The proposals for the Northern Extension continue this theme and will integrate more fully with the Northern Landscape Zone, through the wide green corridor which bisects the scheme. Individually landscaped car parking courtyards and boulevard planting to the circulation roads, along with structure planting to the perimeter of the site, will further contribute to the quality of the built environment

Key to Proposals

- EXISTING EXTRA HEAVY STANDARD AVENUE TREES AT 10M CENTRES
- EXISTING CONIFERS ON MOUNDS AND SITE PERIMETER
- EXISTING FEATHERED TREES ON MOUNDS AND SITE PERIMETER
- EXISTING WHIP & TRANSPLANT NATIVE STRUCTURE PLANTING ON MOUNDS AND SITE PERIMETER
- PROPOSED WHIP & TRANSPLANT NATIVE STRUCTURE , FEATHERED TREE & CONIFER PLANTING
- PROPOSED EXTRA HEAVY STANDARD TREES
- PROPOSED MULTI STEM TREES
- EXISTING HIGH MAINTENANCE GRASS AREAS TO MAIN SITE ROAD VERGES, & WELLINGTON ROAD FRONTAGE
- HIGH MAINTENANCE GRASS TO SPORTS PITCH
- LOW MAINTENANCE AMENITY GRASS SEED AREAS
- LOW MAINTENANCE GRASS/ WILD FLORA
- LOW MAINTENANCE CLOVER BENEATH STRUCTURE PLANTING
- LOW MAINTENANCE WILD FLORA AREAS, SEEDED WITH BSH A4 MIX WITH ENHANCEMENT PLANTING OF WILD FLOWER PLUGS OVER 25% OF AREA
- PROPOSED HIGH MAINTENANCE GRASS AREAS TO ROAD & CAR PARK VERGES

Consented Northern Landscape works, currently under construction

Northern Landscape Zone

Consented as part of the original masterplan, the Northern Landscape Zone is currently well progressed on site, with work expected to be finished in the near future. Works include new and re-built dry stane dykes to the perimeter, a new community football pitch, natural land forming to shield the park from the nearby housing and significant new planting. The zone is criss-crossed by new pedestrian and cycle paths, which increases access to the landscape and links the business park to the wider network of pedestrian and cycle paths planned for the area.

Cove Road - rebuilt drystone wall and levels being formed

Old Wellington Road - new drystone wall and new planting

Community football pitch under construction

Indicative Landscape Proposals, showing viewpoint positions

Landscape and Visual Impact Assessment

As part of the original masterplanning exercise, a Landscape and Visual Impact Assessment (LVIA) was undertaken, considering the impact of the proposals from various strategic viewpoints around the site.

These proposals envisage an extension of the original site boundary to the north, in closer proximity to the housing of Cove, particularly the Charleston Drive housing scheme. As such a further LVIA is considered neccessary.

Eight viewpoints were identified as being important and the LVIA considers the impact of the proposed development from those viewpoints.

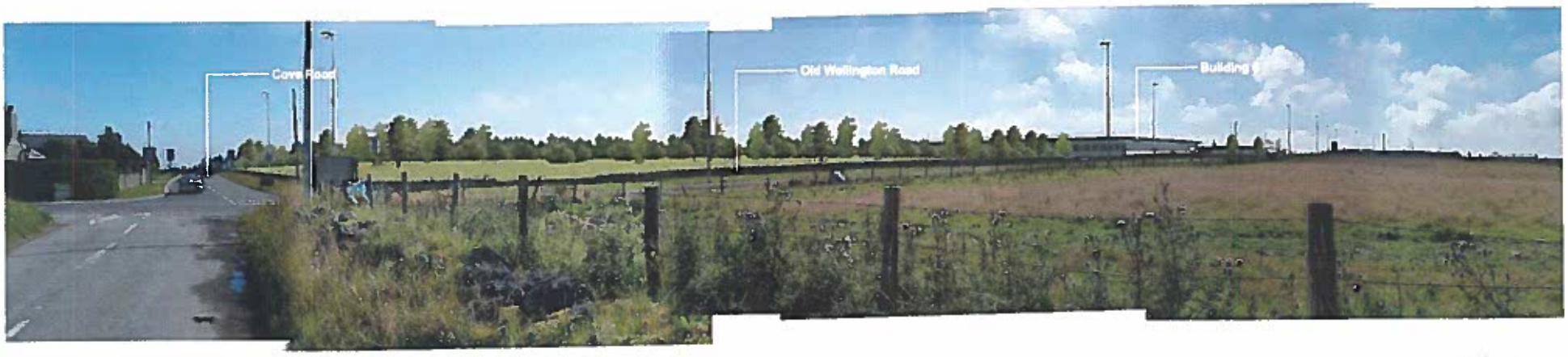
The LVIA demonstrates what the views will look like in around eight years after the first planting season, which should take us to around 2019. The buildings are shown as typical two storey office pavilions, in the style of the NOV office building recently completed on the site.

A fully contoured computer model was made, based upon the contours on the Chris Palmer Associates consented Northern Landscaping proposals, and the floor levels shown on RGP Architects' Indicative Masterplan. Initial Computer Generated Images (CGIs) were produced from the eight viewpoints. These were then overlaid by Chris Palmer Associates to anticipate the approximate height of trees, shrubs etc after the defined time period.

Accurate tree, shrub etc positions were then input into the computer model and 'grown' to the anticipated size.

The resultant CGI's were then photomontaged into panoramic photgraphic montages taken from the eight viewpoints to produce the images on the following pages.

Existing View



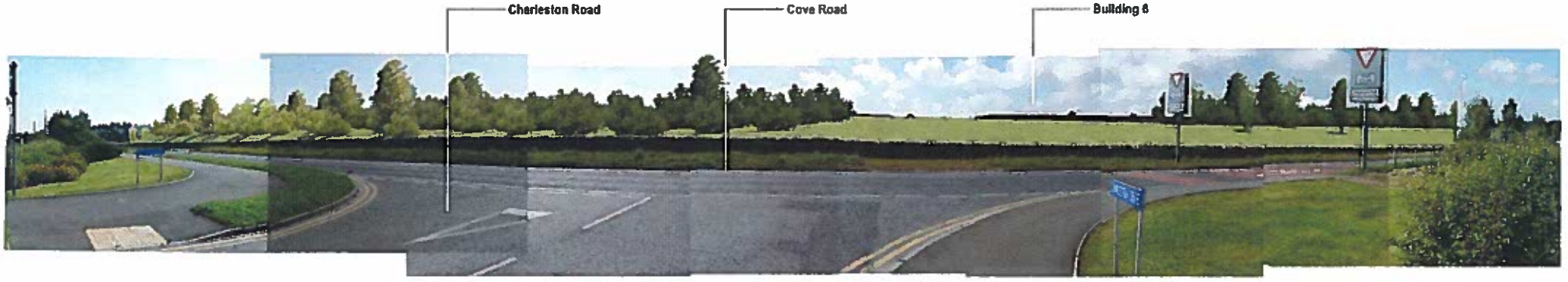
Proposed View

Aberdeen Gateway Business Park - Northern Extension

Viewpoint 1

RGP architects

Existing View

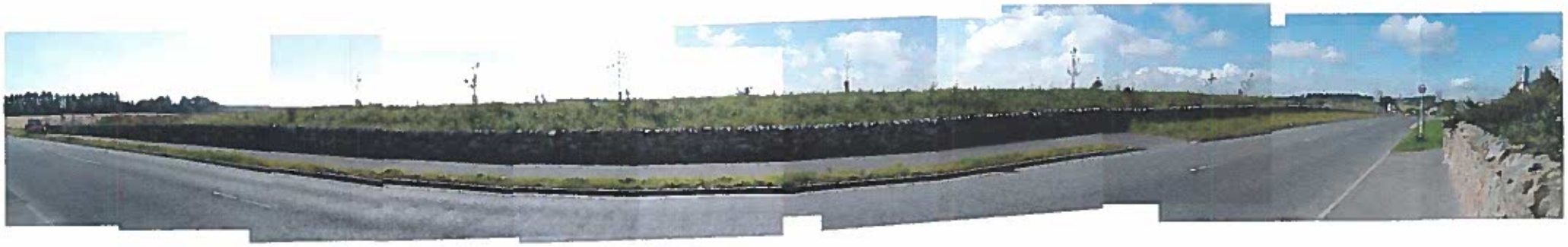


Proposed View

Aberdeen Gateway Business Park - Northern Extension

Viewpoint 2

RGP architects



Existing View

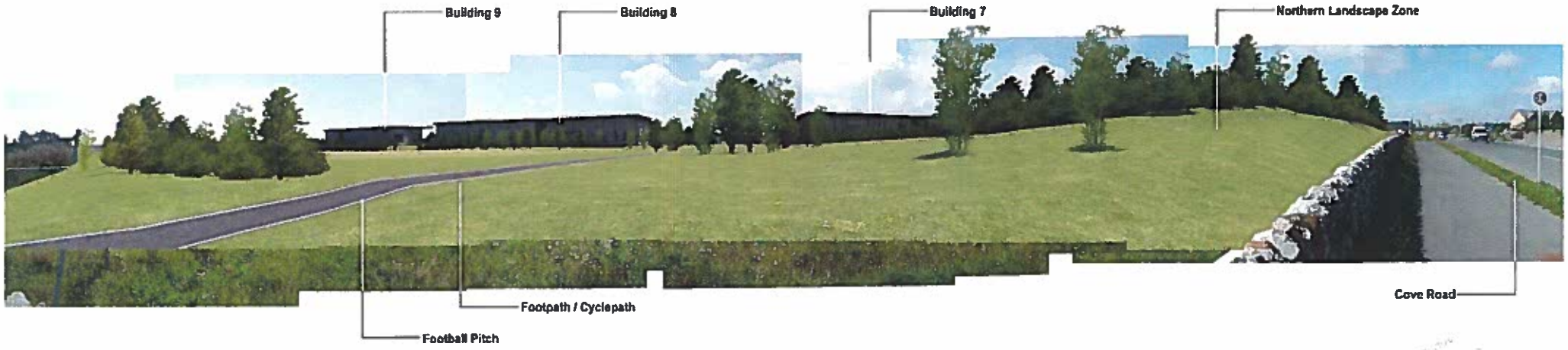
Proposed View

Aberdeen Gateway Business Park - Northern Extension

Viewpoint 3

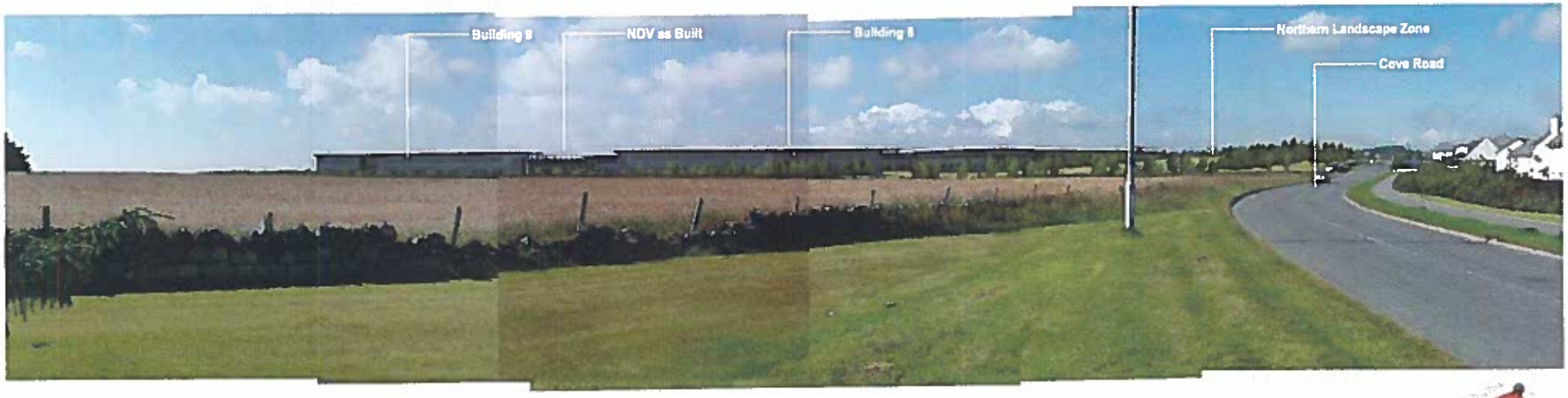
RGU architects

Existing View



Proposed View

Existing View



Proposed View

Existing View

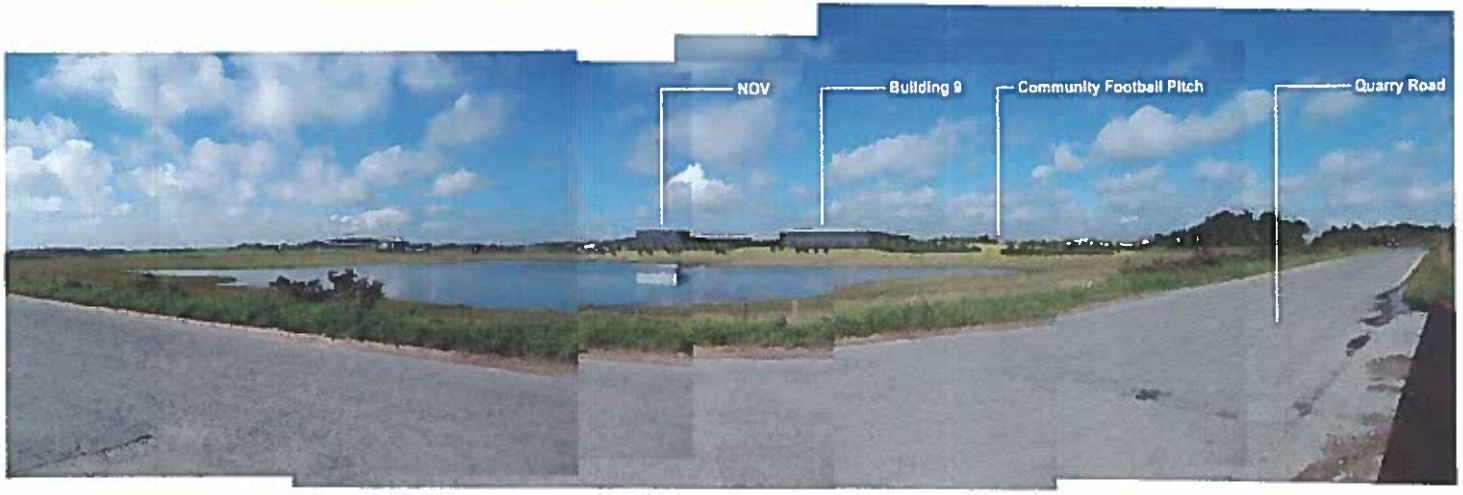
Proposed View

Aberdeen Gateway Business Park – Northern Extension

Viewpoint 6

architects

Existing View

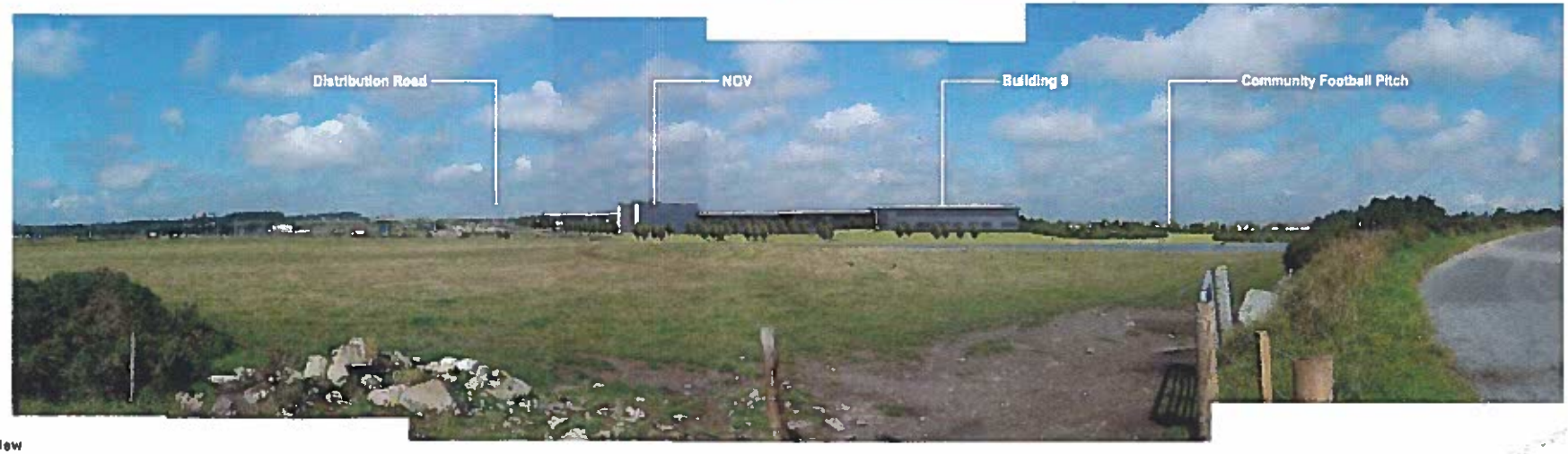


Proposed View

Aberdeen Gateway Business Park - Northern Extension

Viewpoint 7

Existing View



Proposed View

CGI of proposals from north east

Conclusion

Stockland Muir continue to develop Aberdeen Gateway Business Park into the premier business location to the south of Aberdeen. Despite the ongoing unfavourable economic climate, three significant end-users have been attracted to the park already. This success, along with significant investment in infrastructure and environmental improvement works, puts Aberdeen Gateway Business Park in an extremely strong position for the future.

The Northern Exension of the park provides an opportunity to create a well designed, pleasant to use and popular office development, seperated from the housing at Cove by the already largely complete Northern Landscape Zone.

By careful masterplanning, future adherance to that masterplan, and the design principles enshrined within it, Stockland Muir aim to fulfill their aim of creating a high class business park in a parkland setting, which will be an economic success, create employment in the local and wider Aberdeen / Aberdeenshire area and be a pleasant and appealing environment to work in and visit

The Indicative Masterplan and Landscape & Visual Impact Assessment included in this document demonstrate clearly that the proposlas are carefully sited and do not adversely impact upon the amenity of the local residents of Cove.

The Northern Landscape Zone, nearing completion, not only creates a green break between the park and the settlement of Cove, but will create a pleasant and useful amenity space for both the local residents to the north and those working to the south, as well as adhering to the aspiration of creating a green link from the Loirston development to the north, through to the sea to the east.

In conclusion, we believe the proposals outlined in this document are well considered, appropriate and an opportunity to continue the success to date of Aberdeen Gateway Business Park.

RGP Architects 08.04.11

WWW.ABERDEENGATEWAY.COM

A DEVELOPMENT BY:

Stockland

Muir