

earthworks environmental design

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FAO: Andrew Mitchell

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320120127P

19 November 2011

Job Ref: B1061

Dear Andrew

Protected Species Survey (Bats and barn owls) Dewhurst Farm, Longsight Road, Langho, BB6 8AD

Introduction

You have requested a protected species survey (on behalf of your clients Mr J Turner) as a condition of a planning application to Ribble Valley Borough Council for a proposed development requiring demolition of the existing buildings shown in figures 1 to 7 of this report.

The Local Planning Authority must take account of the impact of a development on protected species in accordance with PPS9. Ribble Valley Borough Council requires an appraisal of the likely impact of the proposed building alterations on protected species in addition to any mitigation measures that are required.

A scoping survey and daylight inspection was undertaken on Tuesday 4 October between 12.45 and 14.00. The weather at the time of the inspection was mild, dry and bright (max temperature: 14°C; cloud cover: 95%, wind: blustery and fresh south-west) providing satisfactory conditions for a site assessment.

Survey methodology

The aim of the scoping survey is to make a daylight assessment of the potential value of the site for European Protected Species (EPS) and to establish whether bats have ever been active within any part of the property that will be affected by the building demolition.

The survey methodology follows the recommended monitoring guidelines published by the Bat Conservation Trust (*BCT – Bat Surveys, Good Practice Guidelines, 2007*), Natural England (*Survey Objectives, Methods and Standards as outlined in the Bat Mitigation Guidelines, 2004*) and Survey and Monitoring Methods, (*Bat Worker's Manual, JNCC, 2004*).

Non-intrusive survey methods were used to assess the use of the property by bats. The search was made using a high-powered lamp (Clu-lite CB2 - 1,000,000 candle power), close-focussing binoculars (Leica Trinovid), a digital camera (Kodak MD41) and 900mm endoscope (ProVision 300) to view all likely areas of the building for the presence of bats, ie. droppings and urine and grease staining, feeding remains such as discarded moth and butterfly wings and other insects fragments typically found in a feeding and resting area.

Recommended survey methods (Natural England / Barn Owl Trust) were used to assess the use of the building by barn owls and other nesting birds; normal search procedures include inspecting a site for evidence such as droppings, pellets, discarded prey items, feathers and nest debris. Barn owl guidelines are those recommended by Natural England, *Barn Owls on Site – A guide for developers and planners, March 2002*.

A published records search (data trawl) has been undertaken to identify existing records of protected species within the district, including designated wildlife and conservation sites nearby or significant landscape features such as riparian woodlands, plantations, water courses and other areas of open water within the locality.

Reference is also made to a previous survey carried at Dewhurst Farm on 14 April 2010 (EED reference: B743).

The survey was carried out by David Fisher (Earthworks Environmental Design) - an experienced ecological consultant with more than 25 years experience of bat ecology and field survey work and a Natural England licence holder since 1989; current NE licence No: 20113901, (Conservation, Science and Education).

Constraints (limitations of the survey)

The inspection was carried out using 'non-intrusive' survey techniques to determine bat activity within the buildings. (reference: *Bat Surveys*, BCT, 2007, p23).

The scoping survey is outwith the optimal survey period for carrying out bat emergence survey or dawn re-entry survey (1 May to 31 August).

The survey methodology is designed to determine the likely presence of bats within the building and does not necessarily prove absence.

National Biodiversity Network (NBN Gateway) database records, whilst indicative of the bat species that are likely to occur within a 10km square, do not confirm presence or absence of a species or habitat.

Absence of records does not imply that a particular bat species is not present within the recording area.

Evidence of bat roosting activity such as bat droppings on external walls and surfaces is frequently removed by the action of wind and rain and therefore lack of evidence of bat activity is always evaluated with caution.

Bats are highly mobile animals and frequently change roost sites; crevice-roosting species are able to hide within small cavities inside walls or under roofing materials and cannot be located by visual inspection alone.

Data search (SD63)

A targeted desk study was undertaken to identify the presence of protected species (bats and barn owls) including any notable species records for the area.

NBN (10km square SD63) uses mammal datasets (*Terrestrial mammals – Chiroptera*) provided by the Bat Conservation Trust (*National Bat Monitoring Programme – Colony Counts Survey and Daubenton's Bat Waterway Survey*), Natural England's Bat Sites Inventory for England, Mammal Records for Britain (Mammal Atlas 1993 with additions), and some local and regional biological record centres and data providers including North Lancashire Bat Group and East Lancashire Bat Group.

A data search (NBN website) has identified five species of bats within the 10km square as follows: brown long-eared bat (*Plecotus auritus*), common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*P. pygmaeus*), whiskered bat (*M. mystacinus*) and *Myotis* sp. These species are regularly recorded within the district and throughout the region where feeding, foraging and roosting habitat exists.

The following bat species are likely to be present within the wider district:

- | | |
|--------------------------------|---|
| • Natterer's bat | (<i>Myotis nattereri</i>) |
| • Whiskered bat / Brandt's bat | (<i>M. mystacinus</i> / <i>M. brandtii</i>) |
| • Whiskered bat | (<i>M. mystacinus</i>) |
| • Brandt's bat | (<i>M. brandtii</i>) |
| • Daubenton's bat | (<i>M. daubentonii</i>) |
| • Common long-eared bat | (<i>Plecotus auritus</i>)* |
| • Pipistrelle species | (<i>Pipistrellus</i> sp.) |
| • Common pipistrelle | (<i>Pipistrellus pipistrellus</i>) |
| • Soprano pipistrelle | (<i>P. pygmaeus</i>)* |
| • Noctule bat | (<i>Nyctalus noctula</i> *) |

*UK BAP priority species

There are no published records of bat roosting activity (prior to the bat survey carried out on 14.04.10).

A previous protected species survey was carried at Dewhurst Farm on 14 April 2010 (ref. EED survey B743). The scoping survey found clear evidence of bat (pipistrelle) roosting and flight activity within the main stone barn. NB The survey did not include either of the two buildings included within the scope of this report.

Barn owl activity was not recorded at the site during the previous site inspection.

Existing property (images)



Figure 1: showing buildings A and 'B



Figure 2:

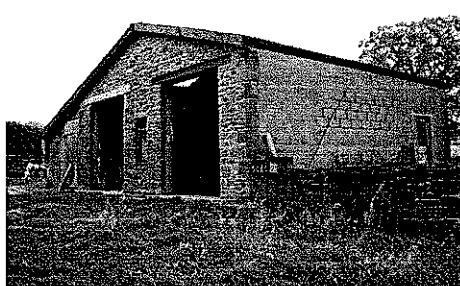


Figure 3:



Figure 4:



Figure 5:



Figure 6:



Figure 7:

Description of the buildings

Two buildings are included within the scope of this survey as follow:

Building 'A' – this structure has a block-work construction and the front elevation is faced with natural stone (figures 1 to 5); the duo-pitch roof is clad with cement and asbestos sheeting with 4 clear laminate panels; the roof extends across a lean-to side workshop; the lean-to has a concrete floor and a glazed window at the rear of the building (figure 4); the side wall is timbered with hard-board panels and is damaged by ingress of water

The barn has two open portals at the front and is used for storage of machinery; the structure is dry, light and well-ventilated.

Building 'B' – this is a single storey structure with stone and block construction (construction not complete). Although there are timber ceiling joists in situ, the building is without an upper floor or roof and is fully open to weather; the building is effectively derelict and unused.

Site location and habitat description

Dewhurst Farm comprises a detached residential property and several large agricultural buildings including a large stone barn with out-buildings; the farm is located south of the A59 Longsight Road, close to Langho at NGR: SD 688340 at an elevation of approximately 95m asl.

The site is surrounded by open countryside with grazing land, hedgerows and traditional field boundaries.

There are no extensive broadleaved woodlands or conifer plantations within 2.5km of the site and connectivity to high-value feeding and foraging habitat is relatively low.

The site is not adjacent to any pond, lake or river channel and the nearest extensive areas of open water are at Dean Clough and Parsonage Reservoirs 2km to the south of the farm on much higher ground.

The location of Dewhurst Farm provides sub-optimal feeding, foraging and commuting habitat for bats and there is very little high-value feeding habitat for bats within 1.5km of the property. There are a number of prominent linear features including mature hedgerows and several wooded cloughs throughout the district; these are likely to provide commuting routes and localised feeding / foraging habitat for bats.

Proposed development

Demolition of the existing buildings 'A' and 'B' (as shown figure 1)

(Reference: Andrew Mitchell, Gary Hoerty Associates).

Survey results

There is evidence of bat feeding and foraging activity within Building 'A'.

A small number of bat droppings were found scattered throughout the building indicating flight within the barn.

Additionally there was a small accumulation of discarded moth wings at the rear of the building indicating likely perching and feeding activity by a solitary bat. A sample of 20 insect wings contained single wings of noctuidae and geometridae moth species, including typical prey items such as herald moth, scalloped oak, dark arches and yellow under wing moth (ie. late summer / autumn flying species frequently taken by long-eared bats, typically found at this time of year).

There were no significant accumulations of dropping or discarded insect prey within any part of the building or the side workshop. There is no evidence of bat feeding, foraging or perching activity within Building 'B' and roosting within this building is very unlikely.

There is no evidence of barn owl activity or nesting wild birds at the site.

Evaluation of results

A small number of fresh bat droppings were found scattered inside the barn; these are indicative of occasional or sporadic flight by bats entering the barn through the open portals. The most likely species are pipistrelle bat and long-eared bat; the former species is known to roost within the nearby stone barn.

Additionally, a small accumulation of discarded insect wings at the rear of the barn indicates an occasional feeding perch, probably used by a (solitary) long-eared bat rather than several bats. Both common pipistrelles and long-eared bats frequently enter barns at night to perch, feed and rest during the night.

There is no evidence of regular or significant flight or foraging activity within the building and regular day roosting activity by either species is unlikely. Similarly, there is no evidence of a maternity roost, transitory roost or hibernaculum at the site; activity is likely to be low frequency and largely opportunistic and sporadic.

Summary:

- The scale of impact of the development at site level on local bat populations is likely to be low¹.
- There is no evidence of a maternity roost, hibernation roost or transitory / mating roost within the buildings.
- The overall conservation significance of the structures in terms of roosting bats is currently low.²
- The site is not adjacent to high-value feeding and foraging habitat and there are no significant woodland areas or watercourses within 2000m.
- The overall value of adjacent habitat features within 1000m of the site for feeding, foraging and commuting activity by bats is relatively low³ and connectivity to woodland, water and riparian woodland habitat is poor.
- Using current good practice guidelines to assess the level of survey effort that is required at the property, it is recommended that further survey work is not required and demolition / building works should proceed with reasonable caution and vigilance for the unexpected presence of isolated roosting or resting bats* (refer to: mitigation notes below).

¹ The scale of main impacts at site level on bat populations – Table 6.1. p37 - (BMG, 2004)

² Guidelines for proportionate Mitigation, (Bat Mitigation Guidelines, 2004).

³ Guidance for assessing the value of habitat features – (BCT 2007, Bat Surveys, Good Practice Guidelines, p21)

* Flow chart depicting the process for deciding what level of survey is necessary, (BCT, Bat Surveys, 2007, p24)

Conclusion and recommendations

The scale of impact of the development at site level on local bat populations is likely to be low. The risk of disturbing roosting bats at this property during the proposed demolition is low*

*(refer to the categories of risk shown in Appendix A)

The proposed demolition of these buildings is **unlikely to cause significant disturbance to bats** or result in the loss of a bat roost or cause injury or death of a European Protected Species – (Bats) or result in any significant impact on a local bat population.

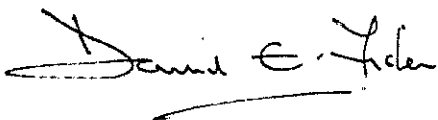
Be aware that bats are highly mobile animals and will regularly / frequently change roosts or adopt temporary roosts or resting places; solitary roosting bats (eg. pipistrelles and long-eared bats) are occasionally found within wall cavities or under roofing materials and beneath fascia soffits throughout the year regardless of season.

There is no evidence of roosting or nesting barn owls or other wild birds within any part of the buildings.

Further survey effort at this site is not recommended.

Please note: I do not provide a copy of this report to the local planning authority, therefore it is your responsibility to forward the report to RVBC.

Yours sincerely



David Fisher

Mitigation refers to the practices adopted to reduce or remove the risk of disturbance, injury or death of a protected species or damage to a roost. The Bat Mitigation Guidelines define mitigation as “...measures to protect the bat population from damaging activities and reduce or remove the impact of development”.

ACTION:	METHOD:
1. Timing constraints	No specific timing restrictions are required at this site
2. Risk of disturbance	Although it is unlikely that roosting bats will be disturbed during the proposed development, there remains a low risk of exposing solitary bats during demolition operations. The risk of exposing solitary roosting bats cannot be entirely eliminated by visual inspection alone. Crevice-roosting species such as pipistrelles and long-eared bats can hide within very small cavities and gaps inside wall cavities or beneath roofing materials. You are advised to be aware of the risk when carrying out the demolition and contractors should be aware that bats are occasionally active at this property. If bats are exposed or vulnerable to harm, stop work in that particular location and seek further advice immediately.
3. Removal of roofing materials	There is a low risk of accidentally exposing roosting bats at this property; be aware that isolated bats are occasionally found roosting beneath roofing materials and fascia soffits.
4. Accidental exposure of bats	Stop work immediately if bats are exposed and are likely to be disturbed; eg. if you find live or dead bats or expose obvious accumulations of bat droppings under roofing materials. In the unlikely event of bats being exposed or vulnerable to harm at this property, all work in that area must stop immediately. Cover the exposed bats to reduce further risk of harm and seek further advice by calling the Bat Conservation Trust (BCT) helpline on 0845 1300 228.
5. Avoid handling bats	Contractors should avoid handling bats but where there is no alternative, use gloves or a small container to move them to a dark and quiet area, preferably without causing them to fly in daylight.
6. Legal protection	All contractors and project managers should be made aware of the legal protection afforded all species of bat in the UK and procedures should be in place to mitigate for the potential impact on bats before any building or demolition work is undertaken. The onus lies with the applicant to satisfy herself that no offence will be committed if the development goes ahead, regardless of whether planning permission has been granted.
7. Further advice	If you require further advice on bats during the proposed building operations or if you find an injured or resting bat, call BCT immediately; they will normally contact a qualified bat worker in the local area who will visit the site and provide further advice free of charge.
8. Additional survey effort	Not required.

Wildlife legislation – Bats and the law

All bat species in the UK receive full protection under the Wildlife and Countryside Act 1981 (amended by the Environment Protection Act 1990). The Countryside and Rights of Way Act 2000 amends the Wildlife and Countryside Act to also make it an offence to intentionally or recklessly damage, destroy or obstruct a place that bats use for shelter or protection. All species of bats are listed on Schedule 5 of the 1981 Act, which makes it an offence to:

- *intentionally kill, injure or take any wild bat*
- *intentionally or recklessly damage, destroy or obstruct access to any place that a wild bat uses for shelter or protection. This is taken to mean all bat roosts whether bats are present or not.*
- *intentionally or recklessly disturb any wild bat while it is occupying a structure or place which it uses for shelter or protection*

The protected status afforded to bats means planning authorities may require extra information (in the form of surveys, impact assessments and mitigation proposals) before determining planning applications for sites used by bats. Planning authorities may refuse planning permission solely on grounds of the predicted impact on protected species such as bats. Recent case law has underlined the importance of obtaining survey information prior to the determination of planning consent¹.

*"It is essential that the presence or otherwise of protected species, and the extent that they may be affected by a development proposal, is established before the planning permission is granted, otherwise all relevant material considerations may not have been addressed in making the decision."*²

All British bat species are included in Schedule 2 of the Conservation (Natural Habitats, &c.) (Amendment) Regulations 2007, (also known as Habitats Regulations) which defines 'European Protected Species' (EPS)

¹ Bat Mitigation Guidelines AJ Mitchell Jones, Joint Nature Conservation Committee, (2004) ISBN 1 86107 558 8

² Planning Policy Statement (PPS9) (2005) . Biodiversity and Geological Conservation. ODPM

Protected species (Bats) and the planning process¹

For development proposals requiring planning permission, the presence of bats, and therefore the need for a bat survey, is an important 'material planning consideration'. Adequate surveys are therefore required to establish the presence or absence of bats, to enable a prediction of the likely impact of the proposed development on them and their breeding sites or resting places and, if necessary, to design mitigation and compensation. Similarly, adequate survey information must accompany an application for a Habitats Regulations licence (also known as a Mitigation Licence) required to ensure that a proposed development is able to proceed lawfully.

The term 'development' [used in these guidelines] includes all activities requiring consent under relevant planning legislation and / or demolition operations requiring building control approval under the Building Act 1984.

Natural England (Formerly English Nature) states that development in relation to bats "covers a wide range of operations that have the potential to impact negatively on bats and bat populations. Typical examples would be the construction, modification, restoration or conversion of buildings and structures, as well as infrastructure, landfill or mineral extraction projects and demolition operations"

(Mitchell-Jones, 2004)

¹ 2.2.3 - Planning for development, p10, Bat Surveys, Good Practice Guidelines BCT (2007)

Other references:

Bats, development and planning in England, (Specialist support series) - Bat Conservation Trust, 5th Floor, Quadrant house, 250 Kennington Lane, London, SE11 5RD, 0845 1300 228

Clarification of the legal duty of Local planning Authorities' to European Protected species: High Court Judgment June 2009: (Wooley v Cheshire east Borough Council) - Bat Conservation Trust

Defra Circular 01/2005 (to accompany PPS 9) - Department for Environment, Food and Rural Affairs www.defra.gov.uk

Natural England 1 East Parade. Sheffield, S1 2ET, Enquiry Service: 0845 600 3078 enquiries@naturalengland.org.uk

Natural England Cheshire to Lancashire Team Electra Way, Crewe, Cheshire, CW1 6GJ Tel: 01270 754227

APPENDIX A

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Categories of risk*

Negligible risk: it is highly unlikely any bat species have been present at this site.

Low risk: there is only low risk of disturbance to solitary bats or small numbers of common and widespread bat species.

Low / moderate risk: caution required; activity of common / rarer species is possible, including the presence of occasional / regular night perching and feeding activity or the presence of small numbers of rarer species (but not a maternity or hibernation site).

Moderate risk: caution required; there is moderate risk of disturbance to common bat species; activity may include the presence of regular / significant feeding perches and signs of feeding, a regularly used day / night roost or a maternity site of a common and widespread species or the likely presence of low numbers of rarer species ('rarer' as defined within the local context).

Moderate / high risk: considerable caution is required; this category may include a maternity site of rarer species.

High risk: considerable / extreme caution is required; there is a significant risk of causing disturbance to roosting bats at this site including large numbers of common species, a maternity site of locally rare or rarest UK species or a significant hibernation site for rare or rarest species; this is likely to be a site meeting the SSSI guidelines.

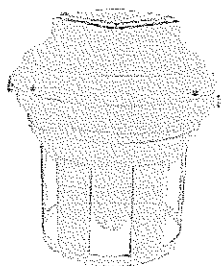
*based on the Guidelines for proportionate mitigation - figure 4, page 39 - Bat Mitigation Guidelines, (2004)

APPENDIX B

The following websites and datasets were consulted during the preparation of this report:

1. National Biodiversity Network (NBN) database, (terrestrial mammals - chiroptera)
2. Joint Nature Conservation Committee (JNCC)
3. Department for Environment Food and Rural Affairs (Defra)
4. Bat Conservation Trust (BCT)
5. North Lancashire Bat Group
6. East Lancashire Bat Group
7. Lancashire Biodiversity Partnership
8. Biological Heritage Sites Partnership (LCC, NE and LWT)
9. EED dataset (Lancashire bat records 2000 - 2011)
10. Magicmap interactive map
11. Natureonthemap (Natural England)
12. Multimap
13. Google Maps
14. MARIO - Maps and related information online (Lancashire County Council).
15. Bat Surveys, Good practice Guidelines, BCT, 2007
16. Bat Mitigation Guidelines, Natural England, 2004

ASP range



the conder **ASP range** of package sewage treatment plants

clereflo™ ASP 6-25

320120127P



demand special treatment

Designed and tested in accordance with BSEN12566-3:2005 and with the British Water Code of Practice for Flows and Loads, the Clereflo ASP will serve a population range from 6-20 persons and is suitable for residential and commercial projects where mains drainage is not available. Typical applications include single dwellings, small communities or developments, refurbishments and rural barn conversions.

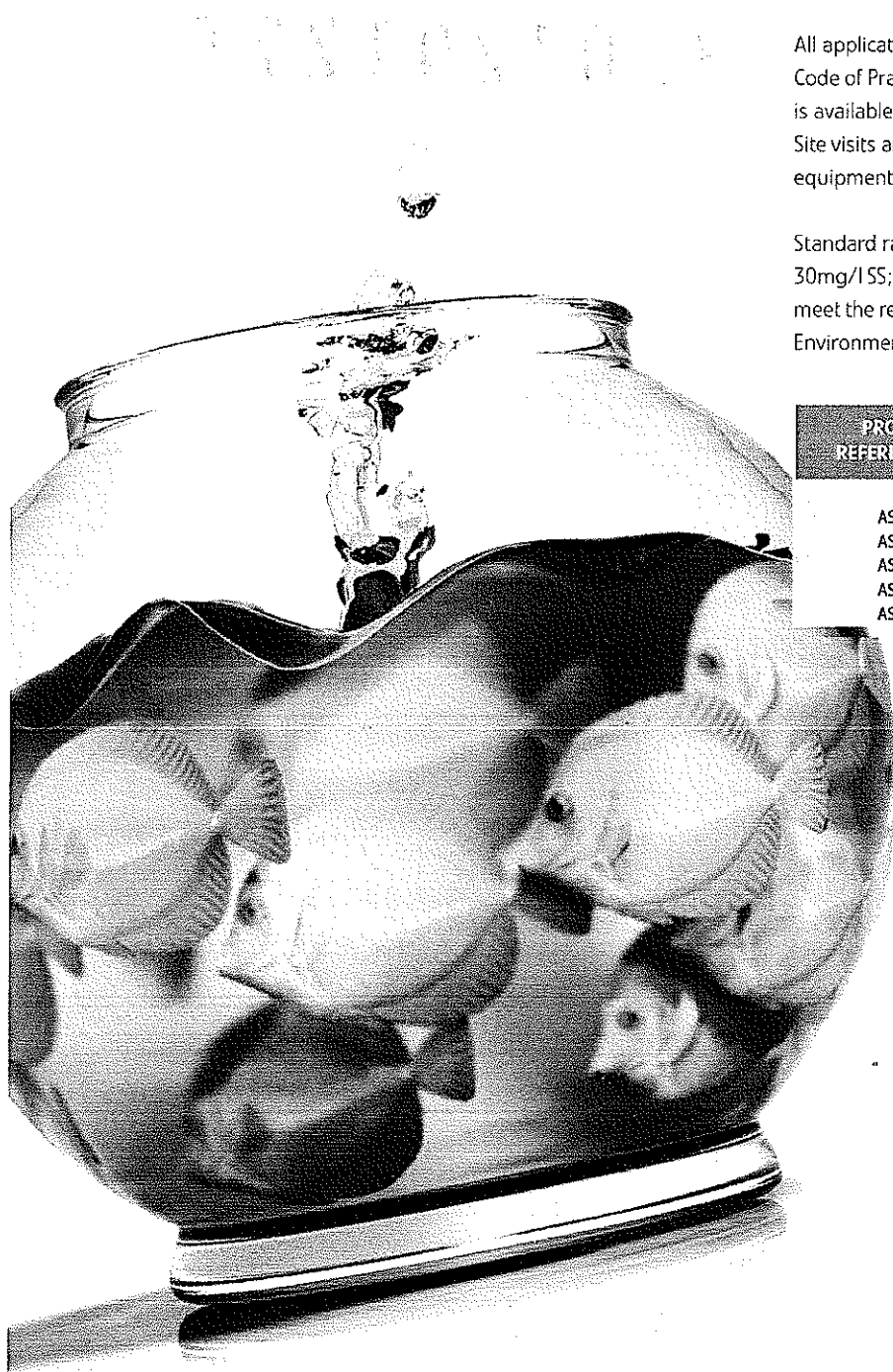
For homeowners and self-builders the key features of the new Clereflo ASP are its discreet below ground installation, its quiet odourless operation and the low ongoing maintenance and running costs. For builders and developers, as well as being price competitive, the Clereflo ASP's compact design offers a low-cost, easy installation process.

FEATURES AND BENEFITS

- Independently Tested to BSEN12566-3:2005
- Value for money
- Completely below-ground installation
- Easy to install – reduced costs
- Proven technology with reliable performance
- Quiet, odourless operation
- Compact design with no moving parts
- Typically 1 to 3-year desludging period
- Deeper inverts available with a standard extension kit
- Option for pumped influent or effluent
- Effluent Standard: 20mg/l BOD; 30mg/l SS; 20mg/l NH₃
- Suitable for discharge to ground or watercourse (subject to Environment Agency consent)

All applications should be specified to comply with the British Water Code of Practice for Flows and Loads. Further advice and assistance is available from our experienced internal and external sales teams. Site visits and assessments are recommended to ensure the correct equipment is proposed for each application.

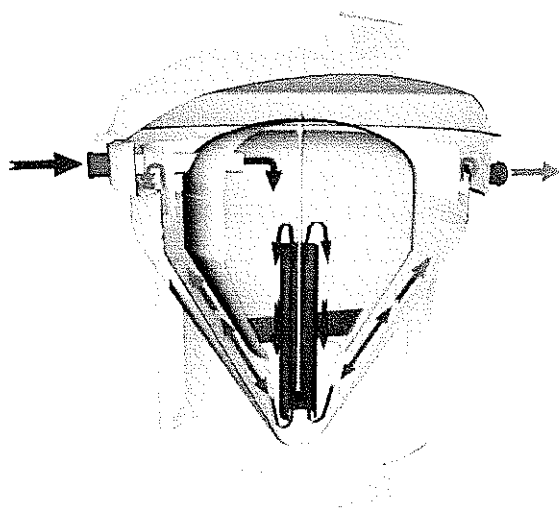
Standard range plants produce an effluent quality of 20mg/l BOD; 30mg/l SS; 20mg/l NH₃. The correct plant should be selected to meet the requirements of the discharge consent granted by the Environment Agency, SEPA or EHS.



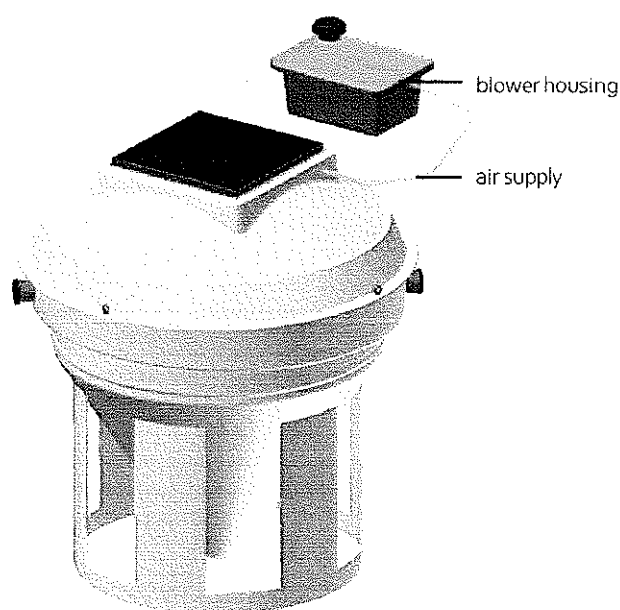
PRODUCT REFERENCE (pe)	MAX FLOW PER DAY (M ³)	MAX LOAD PER DAY	
		BOD g	NH ₃ g
ASP06	1.2	360	48
ASP12	2.4	720	96
ASP16	3.2	960	128
ASP20	4	1200	160
ASP25	5	1500	200

process and plant description

The Clereflo ASP treatment plant comprises a single tank. Within the tank there is an inner central bio-zone chamber and an outer settlement zone. The plant accepts and treats the incoming sewage, using the extended aeration principle in the central bio-zone chamber. A simple coarse bubble diffuser, housed in a draft tube, introduces the air that provides the oxygen to the bacteria which then treats the sewage. The bio-zone retains the mixture of sewage and bacteria until the level of treatment has been achieved.



The treated effluent then enters the settlement zone where settlement takes place. The settled solids are drawn back towards the draft tube with the diffuser in it and are returned via the airlift principle to the bio-zone for further treatment. The treated (final) effluent subsequently leaves the plant over a weir, at the outlet level that extends around the circumference of the tank. The movement of fluid through the whole system is by gravity displacement. There are no moving parts in the treatment plant.



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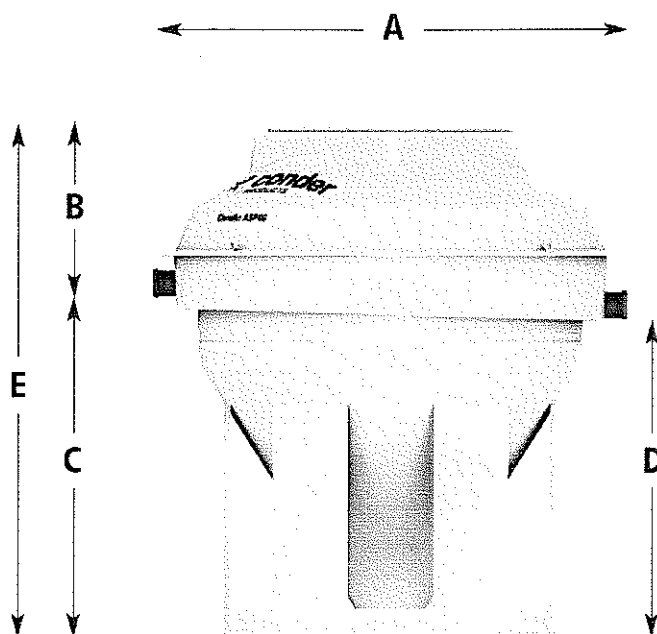
installation

Conder Products advises the use of a suitably experienced and qualified installation company to install any of its products. For suggested installers in your area, please contact our sales team on: 08702 640004. Care should be taken to fully assess the site ground conditions prior to commencement of installation. The ASP range requires a relatively low cost installation, typically using only a 200mm deep concrete base followed by pea shingle or self-compacting backfill.

Detailed installation guidelines are provided for each product. All electrical work should be carried out in accordance with current regulations (for example NIC EIC/Building Regulations).



specification



CLEREFLO UNIT	ASP06	ASP12	ASP16	ASP20	ASP25
Population Equivalent	6	12	16	20	25
Hydraulic Load (l/day)	1200	2400	3200	4000	5000
Organic Load (g BOD5/per day)	360	720	960	1200	1500
NH3 (g per day)	48	96	128	160	200
O/A Diameter (mm)	A 2080	2080	2080	2080	2080
Standard Inlet Invert (mm)	B* 780	780	780	780	780
Inlet Invert to Base (mm)	C 1500	1800	1900	2000	2370
Outlet Invert to Base (mm)	D 1400	1700	1800	1900	2270
O/A Depth (mm)	E* 2280	2580	2680	2780	3150
Pipework Fitting (mm)	110	110	110	110	110
Max Rated Power (Watts)	135	225	225	300	230
Estimated Power Consumption at working pressure (Watts)	100	170	165	220	190
Cover Size	750 SQ	750 SQ	750 SQ	750 SQ	750 SQ
Plant Weight	230kg	260kg	300kg	360kg	440kg

* Deeper inverts can be accommodated with extension shafts

OPTIONAL EXTRAS

Extension kit

Deeper inverts can be accommodated by means of an access extension kit which is available in 1.0m and 2.0m lengths. These are designed to be cut to suit on site and can also be retrofitted again on site taking away the worries of installing at incorrect levels.

Package Pump Stations

Inlet sewage and final effluent pump chambers are available in single or dual units at varying inverts designed to suit the customer's on site requirements. Again these can be retrofitted if problems occur during installation.

Sample Chamber

A Sample Chamber is required in order for the regulatory authority to take representative samples of the final effluent for testing.

SERVICE

Package sewage treatment plants are installed to treat wastewater and to protect the environment. They must be cared for and maintained so that they can continue to operate effectively. Failure to do this will undoubtedly lead to pollution of the water environment, which is an offence and may result in prosecution.

For the Clereflo ASP, Conder Products recommends that a maintenance agreement is taken out to service the plant as indicated in the Environment Agency Guideline PPG4. A plant de-sludge should be carried out between 1 and 3 years (depending on the plant loading).

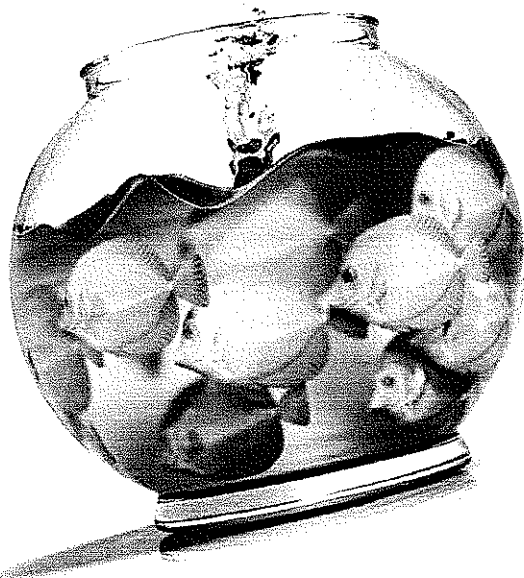
Through a nationwide network of British Water accredited service engineers, Conder's partners offer a comprehensive range of services including commissioning and ongoing service contracts.



about conder environmental solutions

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Protecting the water environment has been the mission of Conder Environmental Solutions, since it was established in the early 1970s. The business is organised into specialist divisions: Conder Products, Conder Technical Solutions, Conder Pumping Solutions. Our full capability extends beyond our successful range of 'sealed-design' commodity products to providing expert consultancy and design for hi-specification bespoke solutions across all areas of wastewater pollution control. Conder works closely with engineers, architects, specifiers, developers and self-builders. Providing support from detailed site surveys, plant selection, full technical proposals and liaison with regulatory bodies where necessary, we will ensure that our client achieves the most environmentally sound and cost-effective solution.



CONDER PRODUCTS

Our specialist commodity division offers a portfolio of products ranging from oil separators and small sewage treatment plant to pumping stations and attenuation or storm water balancing tanks. Our Clereflo range of small-scale domestic sewage treatment plants serve 6-50 population equivalents, utilising either Activated Sludge Plant (ASP) or Submerged Aerated Filter (SAF) technology. Highly price-competitive with minimal running costs, the Clereflo range is the low energy solution for applications where access to mains drainage is not available.

CONDER TECHNICAL SOLUTIONS

The capability of Conder's Technical Solutions division illustrates the breadth of the company's expertise and has established Conder as the authority in hi-specification projects. As a solutions provider, our expertise extends across a product range that includes SAF technology unitank and modular sewage treatment systems up to 1800pe, Membrane BioReactor sewage treatment systems up to 5000pe, attenuation, engineered vessels and other specialist tanks.



CONDER PUMPING SOLUTIONS

We offer a range of water and wastewater pumping solutions for domestic, commercial and industrial applications from off the shelf packages through to custom-built pumping solutions.

SERVICE

Products installed to protect the environment must be maintained and serviced regularly to ensure that they continue to operate efficiently and effectively. Failure to do this will undoubtedly lead to pollution of the water environment, which is an offence and may result in prosecution. Through a nationwide network of British Water accredited engineers, Conder's service partners offer a full service and technical package which can include product support, commissioning, waste management and ongoing service and maintenance programmes.

let us make your environment
a better place to be...
demand special treatment



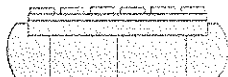
ASP 6-20pc Package Sewage
Treatment Plant



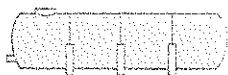
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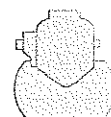
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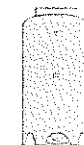
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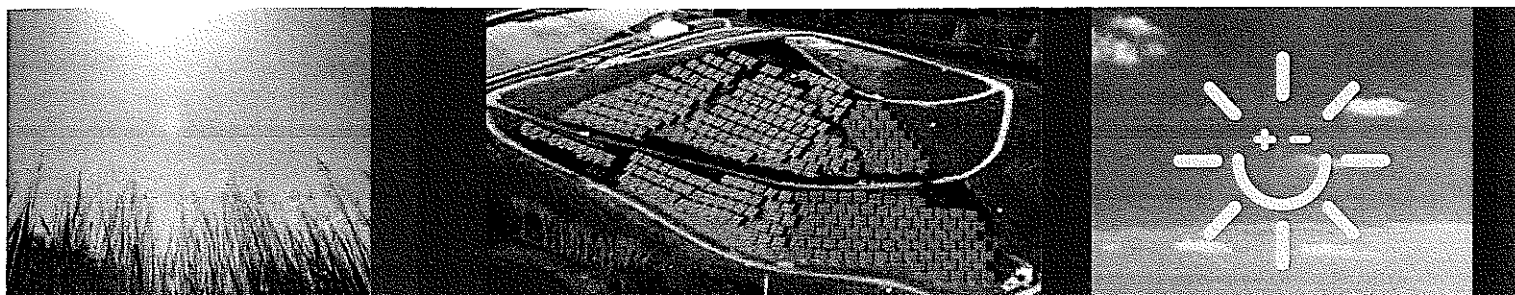
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SHARP

ND Series (60 cells)
220 W | 210 W | 200 W

Polycrystalline silicon photovoltaic modules



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Because it protects the climate.

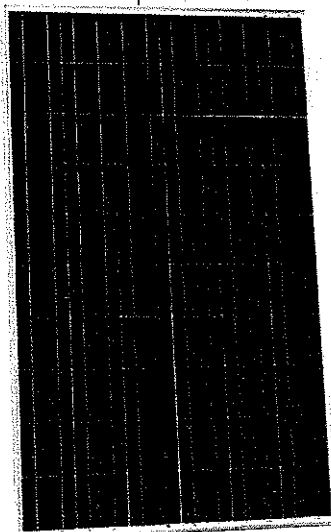
320120127P

Innovations from a photovoltaic pioneer

As a solar specialist with 50 years' experience in photovoltaics (PV), Sharp makes significant contributions to ground-breaking progress in solar technology

Sharp photovoltaic modules in the ND series are designed for applications with high power requirements. These quality polycrystalline modules produce a continuous, reliable yield, even under demanding operational conditions

All Sharp ND series modules offer system integration which is optimal both technically and economically, and are suitable for installations in on and off-grid PV systems



Product features

- High-performance photovoltaic modules made of polycrystalline (156.5 mm)² silicon solar cells with module efficiencies of up to 13.4 %
- Bypass diodes which minimise the loss in output when shading occurs
- Textured cell surface for particularly high electricity yields.
- BSF structure (Back Surface Field) to optimise cell efficiency
- Use of tempered white glass, EVA plastic, and weather protection film, as well as an anodised aluminium frame with drainage holes for long-term use
- Output: connection cable with waterproof plug connector

Quality from Sharp

Benchmarks are set by the quality standards of Sharp Solar. Continual checks guarantee a consistently high level of quality. Every module undergoes visual, mechanical, and electrical inspection. This is recognisable by means of the original Sharp label, the serial number, and the Sharp guarantee:

- 2 year product guarantee
- 10 year performance guarantee for a power output of 90 %
- 25 year performance guarantee for a power output of 80 %

The detailed guarantee conditions and additional information can be found at www.sharp.eu

Brief details for the installer

- 156.5 mm x 156.5 mm polycrystalline solar cells
- 60 cells in series
- 2 400 N/m² mechanical load-bearing capacity (245 kg/m²)
- 1,000 V DC maximum system voltage
- IEC/EN 61215 IEC/EN 61730, Class II (VDE: 40021391)

Mechanical data

Cell	Polycrystalline (156.5 mm) ² Sharp silicon solar cells
Quantity and wiring of cells	60 in series
Dimensions	1 652 x 994 x 46 mm (1.64 m ²)
Weight	21 kg
Connection type	Cable with plug connector (MC-3)

Limit values

Operating temperature (cell)	- 40 to + 90	°C
Storage temperature	- 40 to + 90	°C
Maximum system voltage	1 000	V DC
Maximum mechanical load	2 400	N / m ²
Over-current Protection	15	A

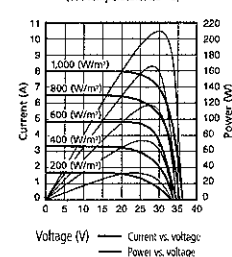
Electrical data

Made in EU						
Made in Japan		ND-F220 (A1)*	ND-F210 (A1)*	ND-210 (E1F)	ND-200 (E1F)	
Maximum power	P _{max}	220 W _p	210 W _p	210 W _p	200 W _p	200 W _p
Open-circuit voltage	V _{oc}	36.8	36.6	36.4	36.4	36.0
Short-circuit current	I _{sc}	7.96	7.68	8.03	7.40	7.90
Voltage at point of maximum power	V _{mpp}	30.2	30.1	28.8	30.0	28.4
Current at point of maximum power	I _{mpp}	7.29	6.98	7.3	6.67	7.05
Module efficiency	η _m	13.4	12.8	12.8	12.2	12.2
NOCT		47.5	47.5	47.5	47.5	47.5
Temperature coefficient – open-circuit voltage	αV _{oc}	- 130	- 130	- 130	- 130	- 130
Temperature coefficient – short-circuit voltage	αI _{sc}	+ 0.053	+ 0.053	+ 0.053	+ 0.053	+ 0.053
Temperature coefficient – power	αP _{max}	- 0.485	- 0.485	- 0.485	- 0.485	- 0.485

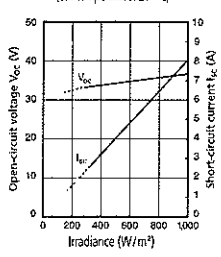
The electrical data applies under standard test conditions (STCs): irradiation 1,000 W/m² with light spectrum AM 1.5 and a cell temperature of 25 °C. The rated electrical characteristics are subject to a manufacturing tolerance of - 5 % / + 10 %. NOCT conditions: irradiation of 800 W/m², ambient temperature of 20 °C and wind speed of 1 m/sec. *This module has three cell connectors and is otherwise identical in construction to the modules shown here.

Characteristic curves ND-210 (E1F)

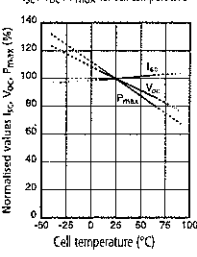
Characteristic curves: current / power vs. voltage (cell temperature: 25 °C)



Characteristic curves: open-circuit voltage / short-circuit current vs. irradiance (cell temperature: 25 °C)



Characteristic curves: normalised values I_{sc} / V_{oc} / P_{max} vs. cell temperature

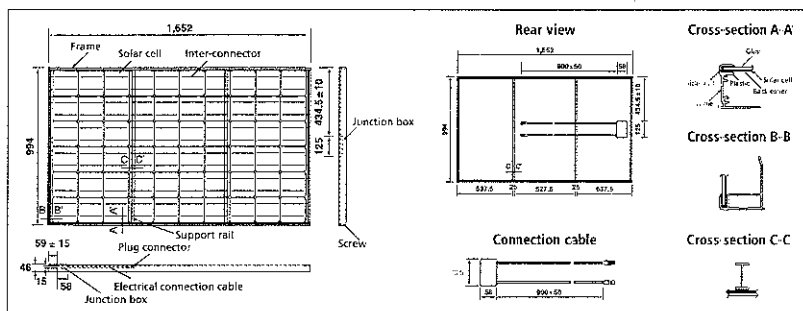


Applications

- On-grid PV systems
- Off-grid PV systems
- On-roof PV systems
- Ground-mounted PV systems

Please read our detailed installation manual carefully before installing the photovoltaic modules.

Exterior dimensions



Note

Technical data is subject to change without prior notice. Before using Sharp products, please request the latest data sheets from Sharp. Sharp accepts no responsibility for damage to devices which have been equipped with Sharp products on the basis of unverified information.

The specifications may deviate slightly and are not guaranteed. Installation and operating instructions are to be found in the corresponding handbooks, or can be downloaded from www.sharp.eu

This module should not be directly connected to a load.

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