YORKSHIRE DALES
National Park Authority

Yorkshire Dales National Park Authority

Farm Buildings Design Guide

(May 2007)

Please note: Illustrations will be added to this guide during 2007

CONTENTS

1. Introduction

i. Aims of the Design Guide

The Yorkshire Dales National Park Farm Buildings Design Guide is intended to reconcile the needs of farmers with the functions of the Yorkshire Dales National Park Authority, which are to protect the natural and built landscape of the National Park, and the enjoyment of that landscape by the public, both of which can be spoiled by the erection of large buildings.

It is intended to stimulate good design, which minimises adverse visual impact, yet produces buildings whose form adequately serves their function.

The Design Guide has the following specific aims:

- to maximise efficiency in the planning application process for applicants, by indicating the design standards which need to be met, and the reasons for them.

- to identify the other principal constraints facing applicants and farm building designers.

and thereby:

- to bring more consistency and effectiveness to negotiations between applicants and planning officers.

ii. The Yorkshire Dales National Park

The Yorkshire Dales gained national park status in 1954 because of the area's range of wildlife, habitats, beautiful scenery and local history. The National Park covers 1,762 square kilometres of England's finest countryside, with over 20,000 people living and working here.

The statutory purposes of the National Park Authority are:

- to conserve and enhance the natural beauty, wildlife and cultural heritage of the area.

- to promote opportunities for the understanding and enjoyment of the special qualities of the parks by the public.

In pursuing these purposes, it also has a duty to seek to foster the economic and social well-being of local communities within the National Park.

iii. New farm buildings

The construction of new buildings offers farmers the opportunity to make a lasting contribution to the Dales landscape. Careful design and the sensitive selection of locations and materials can result in buildings that enhance the landscape. They also require very high levels of investment, however, and must therefore contribute effectively to the efficient functioning of the holdings they serve. They have to work.

As farm buildings increase in size, particularly as a result of imposed animal welfare standards and the requirements of health and safety legislation, their impact on the landscape becomes more pronounced. The problem is how to accommodate these large structures without adversely affecting the landscape, whilst still meeting the farmer's requirements.

The development of the present landscape of the Yorkshire Dales owes a great deal to the prevailing agricultural system involving, primarily, small family farms. However, economic factors related to national and international circumstances, and the changing aspirations of the young rural population, are putting this system under ever increasing strain. The traditional farming system of the Dales, already threatened by these trends, has also suffered severely from the recent effects of the foot and mouth outbreak in 2001. The National Park Authority therefore understands its responsibility in setting standards for new agricultural development, to have regard to the possible impact on the viability of the enterprises concerned, and not to impose those standards unnecessarily. In its drive to maximise visual assimilation of new farm buildings, the Authority will always take account of how costly any particular method of achieving this will be to the farmer, and will be prepared to consider less burdensome alternatives if they can be found.

It is also recognised that farming systems and methods inevitably evolve, and that new systems require new infrastructure, including buildings. The National Park Authority does not seek to try to control change by denying the development of such infrastructure where it is needed, but will always try to direct it in such a way as to be as compatible as possible with the existing Dales landscape.

It should also be recognised, however, that farm buildings, because of their size and construction, form prominent elements in the modern landscape and have the ability to significantly alter the character and appearance of the surrounding area. This is why very special care is needed in their siting and design.

iv. The integration of modern farm buildings in the Yorkshire Dales

Historically, farm buildings in the Yorkshire Dales were constructed from local materials, namely limestone, sandstone and gritstone, often with sandstone flags or slates for roofing materials.

These materials, being naturally extracted, merge well with the landscape particularly as they weather. Not only are they easily accepted into the landscape, but they often enhance it.

These traditional materials are generally more expensive to use today and, in the absence of grants to encourage their use, it has been more economical to use a small range of mass-produced building types and components. Opportunities for

variation are increasing, however, as new materials emerge as affordable alternatives. These new materials are discussed in detail in Chapter 4.

Modern farm buildings usually consist of a portal frame clad with fibre cement sheeting, steel sheets or timber boarding. They are usually permitted as exceptions to the national presumption against new development in the countryside on the basis that they are needed to meet the essential needs of agriculture. For this reason, applications for planning permission for new farm buildings have to show that there is an essential need for them.

This has allowed modern buildings to be much larger than traditional buildings with less opportunity for them being closely knitted into existing groups.

Careful integration of traditional materials into a portal framed structure reduces the impact of the building and enhances its appearance. For example, cladding of the lower walls can be with stone, and the additional costs may be justified when the building is particularly prominent in public views or seen in association with existing stone buildings or walls. Because of the expense, the National Park Authority is careful to suggest adding stone cladding to a proposed building only where it produces real public benefit.

The surface treatment of cladding materials is also important in that it can substantially modify their appearance (for example, colouring of timber, concrete block and rendered surfaces).

Modern farm buildings not only need to meet the requirements of BS 5502 and codes of practice relating to pollution listed at Chapter 13, but they invariably need to comply with the various quality assurance schemes which today regulate the industry.

v. Planning in the National Park

The Yorkshire Dales National Park Authority is the statutory planning authority for the National Park and deals with all applications for planning permission as well as 'notices of intention' to carry out agricultural development within its boundaries. The fees which exist for both applications for planning permission and notices of intention apply nationally, and unfortunately cannot be negotiated.

The planning system administered by the National Park Authority is intended to ensure that any development of buildings or land adheres to the policy objectives set out in the Yorkshire Dales Local Plan.

The farming objectives set out in the Yorkshire Dales Local Plan are:

i) to support the growth and diversification of the farming economy where this is in accordance with the special qualities of the National Park.

ii) to ensure the sensitive siting and design of new farm and forestry buildings and associated structures.

iii) to prevent the loss of important agricultural land.

The policy in the Yorkshire Dales Local Plan of most relevance to agricultural development is Policy F1. This states that:

Agricultural and forestry buildings and structures will be permitted if all the following criteria are met:

i) it is necessary in that location and its proposed function cannot be achieved by the appropriate and economically viable adaptation of an existing traditional building.

ii) in terms of siting and external appearance, it will not detract significantly from the surrounding landscape, including any wildlife, archaeological or building conservation interest.

iii) it meets the requirements of Policy EP1 (Protecting the environment), NE1 (The open upland) and B1 (Historic landscapes).

iv) It will not adversely affect residential amenity or the use of any public right of way.

v) It will not create significant traffic problems on access or approach roads.

Where necessary in the granting of approval, an agreed landscape enhancement scheme will be required meeting the requirements of GP4 (Landscape enhancement schemes).

Buildings and structures granted planning permission under this policy will be required to be dismantled and removed from the site when no longer in agricultural or forestry use, unless permission is given for change of use."

In the supporting text to the policy it is stated that:

> Where proposed buildings and structures are considered inappropriate modifications to their design or alternative siting will be sought. The National Park Authority will encourage opportunities for adaptation of existing buildings to be more fully explored and, where necessary, will impose planting and landscaping conditions when approving new development. Where appropriate, the use of traditional materials will be required if it is considered that this would assimilate a new building into its landscape setting.
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> Many new agricultural buildings have only been allowed as exceptions to the general presumption against new development in the countryside because they were necessary to meet agricultural needs. In such cases it is desirable that modern buildings be dismantled when no longer required. Policy E5 (Re-use of modern buildings) allows for the opportunity to change the use of redundant, modern buildings to provide low cost employment premises. Such proposals will be assessed according to the location, design and condition of the building and the nature of the proposed new use.

The question of whether a proposed development requires a planning application or a notice of intention is best discussed between the applicant and the planning officer

at an early stage. At the same time, advice can be given to ensure that adequate documentation is submitted to allow the application or notice to be validated without delay.

a) Planning permission

An application for planning permission **must** be submitted for proposals to erect farm buildings which would be:

i) in excess of 465 square metres in area taken on their own or with other nearby buildings constructed within the previous two years

ii) over 12 metres in height

iii) within 25 metres of an A, B or C classified road

iv) a livestock building within 400 metres of a non-agricultural dwelling or other protected building*.

The National Park Authority encourages early negotiations between applicants and planning officers to assess whether siting, design and materials might need to be tailored in order to achieve better integration into the landscape. Conditions covering these matters will normally be attached to the planning permission.

* A protected building is defined in the Town and Country Planning General Permitted Development Order 1995 as one “which is normally occupied by people, or would be so occupied, if it were in use for purposes for which it is apt; but does not include (i) a building within the agricultural unit (ii) a dwelling or another building on another agricultural unit which is used for or in connection with agriculture”.

b) General permitted development order notification

The Town and Country Planning (General permitted development order) 1995 grants rights to carry out certain minor forms of development without planning consent. These are grouped into thirty three different parts, one of which, Part 6, relates to agricultural development. This includes buildings which, because of their size and position, are generally considered by the Government to be less likely to be harmful.

For those farm buildings in National Parks which are covered by Part 6, however, it is still required that a Notice of intention be served on the National Park Authority, at least 28 days before it is intended to commence the development. This notice is also required for extensions and significant alterations to existing structures, farm access roads and other works such as silage clamps and slurry compounds. Following the serving of a Notice of intention, the National Park Authority can require modifications to site, design and construction materials.

If a development requiring a Notice of intention is started without prior submission of the notice, a full retrospective planning application is required, and enforcement action can result if this is not submitted.

Early negotiation can save the applicant a lot of time and money by quickly establishing the proper procedure as well as a design which fulfils the needs of the applicant and meets the criteria laid down by the National Park Authority.

vi. The contents of the Design Guide

This guide falls into two parts.

i) Guidance on designing an attractive farm building which blends in well with its surroundings (Chapters 2-7).

ii) Supporting technical information that is required to ensure that a proposed farm building can fulfil the role for which it is designed (Chapter 8).

2. Siting

SUMMARY
- Minimise visual impact
- Relate new buildings to existing groups wherever possible
- Avoid sites of historical or archaeological interest
- Put access points where they will utilise existing features where possible
- Take future use or expansion into account
- Consider neighbouring properties
- Avoid sites of major conservation importance
- Avoid sites crossed by or close to public rights of way
- Improve existing building groups where possible
- Replace obsolete buildings

A well designed building that is carefully sited will maximise the efficiency and profitability of the enterprise that it serves and will blend into the landscape in which it is built.

There is often little flexibility when planning to site a new building within an existing farmstead; however there will frequently be opportunities to contain it within a local landform or existing group of buildings or trees. These all help to reduce the impact on the landscape of a new building. On sloping ground it is usually better to 'cut' into the slope, rather than to 'fill' beneath the building.

The following factors should be taken into account when choosing a site for a new building:

- Avoid skyline locations – do not site a structure where it will stand out against the sky from principal public viewpoints.

- Use the natural contours of the ground to minimise the impact of a building.

- Consider the impact of any new building from a number of viewpoints and distances:

    - Would it be visible from any public roads, footpaths or bridleways?
    - Is the proposed location more exposed to public view than possible alternative sites?
    - Would re-siting make the building less intrusive without making it any less useful?

- If possible, use existing landscape features to break up the outlines of the buildings.

    - Take account of trees, walls, hedges, streams and so on in the vicinity.

    - Inspect the area in which you wish to build from a number of viewpoints and select a site that allows the proposed building to harmonise with local features and which uses them to reduce its impact on the landscape.

- A sloping site may not only reduce the visual impact of the building, but make use of less productive land and also provide shelter. Building into a slope will provide a backdrop for the building, and the visual benefits can justify the greater expense of earth movement. Ventilation requirements must, however, be met. When building into a slope, take account of the need to restore the area immediately around the building to avoid any unnecessary scarring of the slope.

- Where a sloping site is used, it may be visually beneficial to have two levels, using separate access points. Although the problems that this may create in the use of the building, particularly for internal stock and vehicle movements, have to be considered, there may be opportunities for dividing the floor space between separate uses or discrete elements of the same use.

- Buildings usually create least visual impact when grouped with others of their scale and type rather than standing in isolation, and usually this is also beneficial to the efficient functioning of the farm holding. Again, ventilation requirements must be met, and these may preclude very tight juxtaposition of new buildings with existing ones.

- The siting of a building of substantially greater scale than any existing building in the vicinity presents special problems. If the scale cannot be reduced in ways suggested elsewhere in this guide, it may be that a hitherto undeveloped site would be the least visually damaging option, if there are natural features which can be used to help it fit in.

- Large new buildings should not necessarily be erected in close association with unspoilt groups of traditional buildings, especially if these include buildings which are listed where there must be a strong presumption in favour of conserving the character of their setting.

- Avoid any known historical or archaeological features when choosing a site. This issue is best resolved in early discussions with planning officers, given that archaeological features may not be apparent, or their value may not be known to the applicant. Placename evidence suggests that some farmsteads may be sites of much older settlements, which may be archaeologically very interesting.

- It is therefore important that applicants discuss their proposals at as early a stage as possible with the planning officers so that expert guidance can be obtained on where to site a new building with least likelihood of disturbing important evidence, or at least to allow that evidence to be investigated before it is lost. Also, archaeological guidance can be given in respect of the siting of underground service provision away from the site of the building itself. The National Park Authority employs archaeologically trained staff who are always willing to help.

- Where a new access track is required, it is best if it follows a hedge, boundary wall or some other existing feature. If there is no option but to take an access across open country, try to follow an existing hollow and, as far as possible,

follow the contours of hillsides, rising obliquely rather than directly across them.

- The surfacing of access points is also important both in terms of visual impact and practicality of use. Generally unconsolidated materials are better visually as they look less engineered and allow the growth of grasses etc to soften the edges and those parts of the track less heavily ridden over. They may not, however, be appropriate for the regular use by heavy vehicles which most new buildings require, especially where the access is across rising ground, and where access tracks meet public highways. There may also be sites at which a well designed road can unify uncoordinated buildings. Access must be considered in the context of what it is needed for, and allowance must be given for the dimensions and turning circles required by the sorts of vehicles and trailers which will use it.

- Consider the future of your proposed building:

    - Is there room at the existing site to extend or expand it if the need arises?
    - Can it be designed in such a way to be put to an alternative agricultural use if its current proposed use ceases?
    - Would a higher than normal standard of design overcome the need for the standard planning condition requiring removal when no longer required for agriculture?

- Ensure all required services (for example, electricity, water, drainage and so on) are available at the proposed site or can be obtained at an economic cost and without excessive visual intrusion.

- Consider the need for clean and dirty water drainage and ensure that the selected site can accommodate such requirements.

- Take advice from the Environment Agency as to whether the proposed development would be likely to contribute to increased flood risk, and what measures can be taken to reduce it.

- Consider neighbouring properties – blocking light, noise, smells, visual offence, environmental health issues.

- Avoid any sites which have been designated of nature conservation importance, including sites of special scientific interest, nature reserves and hay meadows which are known to contain a profusion of interesting plant species. If in doubt check at the outset with the National Park Authority's specialist staff.

- Avoid any site crossed by, or in the immediate vicinity of, public rights of way. Applications for permanent or temporary closure or diversion of public rights of way can be very time consuming and expensive, and may not be successful. To find the precise line of a public right of way, or for an explanation of the procedures involved in closure or diversion, contact the National Park Authority's specialist access staff or your local Area Ranger.

- Avoid sites within areas designated as open upland in Policy NE1 of the Yorkshire Dales Local Plan. These are indicated on the proposals map forming part of the Local Plan and are protected against all development except that which is essential for the management or enhancement of the special qualities of the open upland.

3. Design and Colour Choice

SUMMARY

- Generally use simple designs and a limited number of materials, but consider alternatives to large box-like structures.
- Respect and replicate external features and finishes of existing buildings if this is possible. Otherwise, try to identify the salient features (for example angle of roof pitch) and incorporate in the new building.
- Give special attention to the roof, which is likely to be the dominant feature.
- Consider how each external feature contributes to the overall appearance.
- Avoid large expanses of colours which are lighter than the general tone of the landscape in which the building would be situated (lighter in limestone areas than where the underlying geology is sandstone or gritstone)
- Take opportunities to encourage wildlife, especially endangered or rare species of birds and bats, or those for which farm buildings have been a traditional habitat element.
- Investigate ways of utilising renewable sources of energy.

- Increased knowledge of animal welfare requirements, ease and cost of construction, and adaptability have all resulted in a trend towards larger, better ventilated and better lit buildings. Whilst it would unrealistic to expect applicants to ignore these considerations, there are often ways in which a proposed building's external appearance can be improved without significant impact on its performance.

i. Shape, size, position and external features

- New buildings should relate well to existing ones of similar type and construction, providing these are in a condition which suggests that they will be retained for the foreseeable future. Ensure that new buildings are of complementary colours and textures. Avoid using a wide variety of materials and building designs within a farmstead, but where this is unavoidable, choose colours or shapes which are the least discordant. Often buildings of different sizes can look good together as long as their various proportions are similar, for example, height to length, eaves height to ridge height, width to length, and lower walls to upper walls.

- Divide large structures into smaller units wherever this is possible without losing all the advantages, in terms of internal manoeuvrability and cost, of a clear span structure without internal fabrication points and foundation runs. A large single span structure will usually have the biggest impact on a landscape. If this can be visually or physically split in to a number of smaller elements without significantly affecting its ability to function, the apparent bulk of the building can be reduced. The advantages of particular types and sizes of buildings are not the same for all types of agricultural activity and in all areas, but there is nevertheless a tendency for national and international trends to be followed everywhere. In particular, the comparative benefits of large single span buildings are less obvious for sheep farms which still predominate in the Yorkshire Dales. There may, therefore, be more scope

for using smaller buildings, which are more in scale with traditional styles here, than in the countryside generally.

- Consider siting smaller units in front of larger ones in important public views to reduce the apparent scale of new development.

- Stepped floors and roofs will add variety and interest to a building, helping to reduce the apparent scale and can aid ventilation in some circumstances. Stepped roofs are easier to incorporate, but even stepped floors may not necessarily restrict efficient usage, where different parts of the building can be devoted to specific discreet activities, and where unrestricted access by stock and vehicles is not a necessity. They can allow a sloping site close to a farmstead to be developed as an alternative to a functionally ideal site some distance away in a more visually prominent location. Avoiding disturbance of a productive field might also justify the added cost of construction and inconvenience. Consideration must, however, be given to the fact that upland farms are run with very low levels of manpower, and are often one man operations, requiring considerable mechanical handling of feed and manure. This reduces the scope for stepped floors.

- Where very large floor areas are needed, consideration should be given to alternatives to the traditional simple rectangular box shape whose height is determined by its floor area. Sometimes more complex shaped structures can be equally suitable internally, but much less visually dominating externally. The visual benefits of such composite buildings need to be weighed against the additional costs and, sometimes, less easy responses to such environmental factors as the prevailing wind.

- Some variation in the materials and colour of the roof and wall cladding provides visual interest and gives scope for individuality of design. Such variation should only be introduced vertically and never horizontally, so that the main vertically separate elements – the roof, upper walls and lower walls – are consistent in their material and colour throughout the building. Subject to considerations relating to the overall tone of the surrounding landscape, often determined from its geology, buildings generally benefit from a variation in darkness, with the roof as the darkest element and the lower walls as the lightest. Particular care needs to be given to the height of the dividing line between the upper and lower wall surfaces. This should be determined by the heights of the horizontal features in the immediate vicinity and the general proportions of the building. For example, if there are existing stone walls, the lower walls of the building should be similar in height, subject to the need to ensure there is sufficient ventilation to satisfy animal welfare consideration.

- ‘Yorkshire boarding’ has become the most widely used material for the upper walls of modern buildings. It is functional, providing essential ventilation, and is generally more aesthetically pleasing than alternatives. The best treatment for timber boarding varies from site to site depending on the characteristics of the landscape setting and of adjoining buildings. In some locations the boards may be best left untreated, but in others they would benefit from staining (see below). This should be discussed with the planning officer.

- The roof is usually the most dominant feature of a building when seen as a feature of the wider landscape, and should generally be darker in colour than the walls. If roofs are designed to overhang slightly at eaves level, they not only protect the cladding by reducing rain penetration, but create a shadow line, making a building appear less conspicuous. Roof overlaps are not traditional features of Dales buildings, with definitions of eaves in modern buildings usually created by gutters, but, given that most modern farm building forms are themselves unlike traditional Dales buildings, this is not considered a reason in itself to exclude them altogether.

- Consider the potential to break up very large roof planes by stepping or splitting large spans.

- Although translucent roof panels (roof lights) provide a natural source of light within a building, their different tone to the surrounding roofing material, as well as the fact that they allow internal light to escape, can have a detrimental affect on visual impact. They can be positioned to bring light to the centre of buildings, and they can help to reduce energy consumption and accidents, and improve animal welfare, but overprovision and multi-rowed patterns in prominent roof slopes should be avoided if possible. Side openings and spaced timber boards to upper walls provide a useful alternative source of natural light. The use of light ridges should be considered as these can reduce the need for a large number of roof lights, and can appear to break up the ridge line.

- The roof pitches of the other buildings within the farmstead and in the locality should be taken into account, as well as the fact that steeper pitches are generally better suited to hilly terrain, and shallower pitches are more appropriate on flatter ground. In the Yorkshire Dales, roof slopes for traditional buildings are usually in the range of 28 to 32 degrees. Whilst this would be excessive for large steel framed buildings, for which 15 to 22½ degrees is the normal range, the visual benefits of avoiding excessively shallow roof pitches should be recognised and addressed. Conversely, it should also be borne in mind that the shallower the roof pitch, the lower the ridge height, and sometimes this can be a more important visual consideration.

- Environmental factors such as wind strength and direction, and snow accumulation, also need to be taken into account. If a building includes additional side elements next to the main span, its appearance can often be made less bland by slight variations in the roof pitches of the different elements. However, regard must be given to ventilation requirements – if the primary use is for livestock, there may be a need for a greater pitch to aid exhaust air movements from eaves to ridge, but an efficient exhaust ridge can also provide a solution.

- Plan for what else may be required as a direct result of the new building being erected and used. For example, silage clamps, feed bins, fuel tanks, access roads and outside storage areas (including those for bales) may all be needed. Anticipation of these needs, and of the possible additional tree planting required to assimilate ancillary development, can help to ensure that the appearance of an otherwise attractive new building is not spoilt by

external clutter. In particular, it is important to plan for mucking out, with sufficient hard surfaced areas and storage tanks.

- Consider how the building and surrounding area will need to be lit externally, and how this can be achieved with minimal light pollution, interference for residential properties in the vicinity, or dazzle for road users.

- Site spoil may be used for remoulding the land surface around the building, as well as to provide a tree planting medium. If a building can be dug in, this can be doubly beneficial as the spoil quantity is increased. (Chapter 5).

- Consider novel approaches to farm building design, including those being explored abroad.

- Generally, avoid roof structures which are angled asymmetrically, or are monopitched unless this assists incorporating a building within a group, or takes advantage of an existing feature such as a high wall against which the building can rest.

ii. <u>Colour</u>

a) <u>General points about colour</u>

External colour and the ways in which this can be varied on different surfaces are amongst the most important considerations when designing a new farm building. If all the walls as well as the roof are one colour it tends to emphasise the size of a building and can make it less visually acceptable.

- Dark colours make an object seem smaller and are almost always more acceptable than light colours except where the general tone of the landscape is particularly light, for instance in limestone areas. Black and other very dark colours should, however, be avoided as they may be as difficult to absorb in the landscape as light colours. Very dark colours also increase heat absorption which can be bad for animal welfare, and can reduce the life of the material.

- Roofs should nearly always be darker than the walls; however, it is important to assess each individual situation as surrounding buildings may have lighter roofs which need to be taken into account when planning a new building.

- Avoid using greens, especially lighter ones, as they tend to clash with natural greens.

- In most locations the best colours for roofs are either dark grey (BS 18-B-25), or dark brown (BS 08-B-29), depending on the type of landscape and the colours of existing roofs in the vicinity.

- As a general rule, the colours of external walls should be ‘earth’ colours such as browns, ochres and greys, similar to those of the soil of the surrounding land. In the Yorkshire Dales, these are generally in the dark brown to dark

grey range but where there is exposed limestone, lighter colours may be more appropriate.

- The chosen colours should blend well together.

- All rainwater goods should be coloured to best fit in with that part of the building against which they are seen. Black and dark brown tend to be better than grey or orange.

- Most manufacturers supply fibre cement sheeting with a factory applied finish. Try to choose a finish that allows the texture of the fibre cement to show through, as this will reduce the reflectivity and have a natural, weathered appearance. Some readily available products have been developed with this specific purpose.

b) Roof colour

In deciding on the colour of a building's roof, the principal consideration should be the general tone of the natural and human landscape features in the area (particularly rock outcrops and older buildings) and the colour of existing farm building roofs in the immediate vicinity. Various shades of grey or dark brown may be appropriate close to BS 18-B-25 and BS 08-B-29 respectively. Generally there is a preference for grey in the limestone parts of the National Park and where true slate is the predominant roofing material on non-agricultural buildings, and dark brown elsewhere. Different manufacturers use their own names for these colours and also have their own ranges of colours suitable for farm buildings. Guidance should be sought from the National Park Authority.

Roofing sheets should always be of the types that are pre-coloured at the factory. There is much less certainty of colours lasting for the lifetime of the building when they are applied to the roof once erected.

Fibre cement sheets are preferable to plastic coated steel sheets as they are generally much less reflective, visually less striking, cheaper and create less condensation when housing stock.

With fibre cement sheets, the more the uneven texture of the material remains apparent, the better the roof will be in terms of reduced reflectivity.

Galvanised steel sheets should always be pre-treated with either a plastisol or polyester coating applied in the factory. Uncoated galvanised metal sheets are not easily painted effectively, and require periodic repainting.

c) External wall finishes

i) Timber

Timber stains are available in a wide range of colours and in some circumstances can even be mixed to produce a finish not generally available. The stain can be applied either in situ or in the factory and the various tints can do much to make the building fit into its surroundings. As regular recoating of large areas of timber

cladding is not a very realistic option, however, consideration should be given to how the appearance of a surface treated with a particular product will change over time.

The preservative treatments for timber can also provide an element of colour which may reduce the need for further staining. The types of treatment available are discussed in the sub-section on surface treatments in Chapter 4.

ii) Concrete

Where appearance is important, and where a more immediate effect is needed than can be obtained through weathering and lichen or moss growth, it is possible to apply different finishes to concrete block work or panels, both of which can look alien, especially when seen in association with natural stonework.

Other than by burying it, the best way of concealing block work permanently is to render it, with painting as a less satisfactory alternative because of its need for maintenance. Finishes can be purely decorative or can improve durability of the concrete. Untreated block work is also more difficult to clean to meet hygiene requirements. Weathering of rendered surfaces can be an important issue, however, as the benefits of concealing blockwork can be negated by ugly staining. The vulnerability of a rendered wall to this long term effect can be reduced by maximising the roughness of the surface of the render, and also by taking measures to reduce rainwater concentration by maximising the difference in the vertical plane, for example, between the rendered wall and any boarding above that is, by setting it back as far as possible relative to the boards.

There is a wide range of colours available in masonry paints and render can either be applied and then painted afterwards or have colour mixed in from the start.

One of the most undesirable qualities of smooth surfaced concrete panels is their susceptibility to drip-staining from weathering. Applying a coloured rough render or paint can conceal this, although these finishes will eventually suffer from weathering themselves unless regularly maintained.

The rendering of concrete is referred to again in the ‘surface treatments’ sub section of Chapter 4.

iii. Breeding birds and bats

Traditional farm buildings provide important nesting sites for a number of bird species. Perhaps the most well known species associated with farm buildings is the swallow, a summer migrant that builds a nest out of mud and straw on beams inside the barn. A number of other species, notably starlings, stock doves and house sparrows will also nest inside field barns and in suitable holes in external stone walls.

Some barns originally had ventilation holes in the gables, and these were often used by owls of various species to nest in hay lofts, presumably attracted by the presence of rodents. Tawny and little owls, as well as kestrels, often still make use of barns for nesting sites, particularly where there is access into the barn through forking holes, Barn owls, which are a nationally endangered species are also present in certain locations within the Dales, but in very small numbers.

Bats may regularly be seen feeding around field barns, attracted by the large number of flying insects associated with stock and hay storage. It is likely that some barns will be suitable for roosting or maternity sites but further work is required to determine the importance of the Dales barns for bat colonies.

Loft space for storing hay is not a feature that is required in many modern farm buildings and the more open nature of the barns often mean that sites for nesting birds can be limited. Although it may be impractical to incorporate owl holes and/or nesting space into modern structures, the provision of nest boxes on, or nearby to new farm buildings will be beneficial to breeding birds.

Even in modern farm buildings, there should be enough suitable nest sites for swallows. All they require is a small area such as one open window or gap above a door to get in and out of the building throughout the breeding season.

A variety of nest boxes could be put up for other species such as owls, kestrels and starlings on the outside of a new building or other nearby buildings or trees.

For more general information, please contact the Yorkshire Dales National Park Authority's Wildlife Conservation Team.

For information on construction or purchase of nest boxes please contact:

The Royal Society for the Protection of Birds at www.rspb.org.uk

The Hawk and Owl Trust at www.hawkandowl.org

iv. Use of renewable energy sources

- The design of modern agricultural buildings can lend itself to renewable energy installations, including photo-voltaic roofing panels, solar panels and micro wind turbines. These may not assist the visual assimilation of the building, but the important contribution to reducing carbon emissions is recognised, and proposals to include these are considered sympathetically. Indeed, the National Park Authority encourage an innovative approach towards energy conservation measures and accept, in particular, that the roofs of modern farm buildings may offer greater scope for radical adaptation than those of traditional stone buildings.

  Further advice on the use of renewable energy installations generally in the National Park will be published separately.

- A useful source of advice to farmers is the Farm Energy Centre (www.farmenergy.com). Its main functions are:

  - Online advisory service – helping farmers with general energy efficiency advice, specification and design of energy technology for farmers

- Utility services – working with energy utilities to deliver their marketing and service commitment to their customers in areas of energy efficiency, safety and utilisation advice.

- Research and development – providing research expertise to the agricultural industry's research bodies.

- Trade membership – providing technical and marketing services for manufacturers and suppliers of energy equipment.

- Training – offering courses to bridge the knowledge gap between the agricultural and energy businesses.

- Technical publications – producing a wealth of information covering energy technologies for farmers.

4. Materials

SUMMARY
- Integrate, don't camouflage.
- Avoid excessive reflectivity, for example, by using matt finishes.

i. Traditional materials

Local materials such as limestone, sandstone and grit stone help to provide a distinct individuality to the buildings of the Yorkshire Dales. Their use in the cosmetic treatment of new farm buildings can help to reduce the impact of new development. availability of these materials has not generally been a problem in the past, given the relatively small quantities needed for wall facing. However, it could become so now that many farms are in grant schemes under which they are obliged to retain existing stone walls and structures. In such cases it is important that planning officers are made aware of supply problems so that other alternatives can be considered. Stone cladding should not be seen as camouflage, but as a way of making a visual link between the building and existing features in the landscape. It is generally most appropriate where existing stone buildings or walls are in immediate proximity.

The use of stone as the principal building material is not readily compatible with modern welfare requirements, and is not economically available in sufficient quantities. Its use as a cladding material for selected wall surfaces is, however, generally very beneficial and can turn an otherwise bland and ordinary building into one of distinction. It also affords an opportunity for farm building designers to use their flair to incorporate it in new structures.

If a new building is proposed in a particularly sensitive area, the National Park Authority may insist that it is partially clad with stone, despite the added cost which it is know this will incur for the applicant.

ii. Modern cladding materials

There is currently a wider range of modern wall cladding materials available to the construction industry than are currently used for farm buildings. Given the important contribution to visual impact of the choice of external materials, and the importance of their colour and comparative reflectivity, the National Park Authority encourages their investigation as alternatives to the very limited range of materials hitherto available.

There is now also a wide variety of roofing materials which seek to replicate traditional materials, including artificial slates and tiles, which may not previously have been considered, as well as others which offer alternatives to metal and cement based panels. These are designed to cover large areas at relatively low costs and, again, investigation of their potential is encouraged, subject to the understanding that a roofing material which is suitable for a domestic scale roof may not be so for a large farm building, and that obvious artificiality may not be desirable.

The National Park Authority would be pleased to see structures designed incorporating materials not typically seen in farm buildings provided that they accord with the principles of this Design Guide.

In general terms:

- Avoid using materials which would produce a significantly different colour or tone to other buildings in the area.

- Materials used in roofs should have as little reflectivity as possible. The pitch of the roof causes more light to be reflected, giving a lighter appearance than the actual colour would suggest. Ways of reducing roof reflectivity include choice of material, choice of orientation and choice of site relative to shade-casting features such as trees and tall buildings. These should be weighed against other factors affecting orientation such as the direction of the prevailing wind and ventilation.

- Farm buildings are long-term structures; the weathering and ageing properties of the materials in which they are constructed are therefore very important.

- Avoid using any materials, of whatever colour, which have a gloss finish, as the resulting reflectivity can be much worse than if materials with a matt finish are used, and this considerably increases their prominence especially in conditions of low angled sunlight.

a) <u>Timber</u>

- Spaced vertical boarding ('Yorkshire boarding') is functional, sustainable, and usually more attractive than steel or concrete. It provides a good source of natural ventilation and light, and can be stained to meet the requirements of any particular site.

- Timber used as closed vertical cladding can also be very effective on new buildings. Except on buildings with very low side walls, however, timber cladding usually looks best when its use is restricted to upper walls, above lower walls of different construction. If the depth of the timber cladding at the upper level is about the same as the stone or block work cladding of the lower walls, the contrast between the two materials reduces the apparent height of the building. Alternatively, it can be very effective if taken down to just below the top level of adjacent free-standing stone walls.

- A recent visually successful innovation has been the use of timber-framed buildings with short timber side walls constructed of horizontally-laid heavy boards.

- Timber used for cladding doors should match that used for the external timber walls of the building. The use of plywood cladding for this purpose should be avoided as it tends to look bland and weathers badly. Vertically timber boarded doors generally look better than metal ones, but if metal is used for reasons of durability and hygiene it should be painted a similar colour to that of the surrounding walls. The paintwork needs to be maintained, otherwise the surface can very soon begin to develop bare, rusted and discoloured patches.

- Timber is readily available, relatively cheap, robust, easy to handle, easy to replace, easy to fix, and with the proper treatment (see below), can be virtually maintenance free. It is also readily recyclable.

b) Concrete panels

- Concrete will age and weather differently from naturally derived materials such as stone and timber. It tends to fade in patches.

- The other main visual problem with concrete panels as a material for vertical surfaces is their blandness and lack of visual harmony with stone. For these reasons they should only be used for external walls which are concealed from view.

- Pre-cast concrete panels are quick to install, flexible, strong and hygienic and they are a good, but more expensive, alternative to concrete block walls.

- There may be more scope for their use in some locations, particularly in limestone areas, if installed to rigorous standards to minimise rainwater concentration. Their potential for use should be discussed as early as possible with a planning officer.

c) Concrete blocks

- Concrete blocks provide a strong and hygienic surface, but should only be left visible at low level. They may be concealed by earth mounding or burial.

- Concrete blocks can be painted, rendered, or clad with timber, or profiled sheets. Cladding with natural stone is particularly effective but expensive.

iii. Roofing materials

a) Established modern roofing materials

The following table compares the two currently most common types of roofing material in terms of their visual and functional attributes:

	Fibre cement sheeting	Plastic, pvc or polyester coated steel
Sheet size range	Various	Various
Range of profiles	Wide range of profiles	Wide range of profiles

Colour range	Wide range of colours	Wide range of colours
Functional benefits	1) Some products can hold condensation. 2) Virtually maintenance free 3) Factory painted	1)Durable 2)Easy to handle 3)Require little maintenance
Functional problems	1) Difficult to paint on site 2) Fragile	1) May degrade in sunlight 2) May cause condensation in livestock housing 3) Robust
Visual benefits	1)Texture shows through coloured sheets creating a more natural appearance 2) Weathers down with the aid of lichens to reduce reflectivity	1)Large range of factory finishes and colours
Visual problems	1) Can be conspicuous in the early years especially in strong sunlight.	1) Will not age as naturally derived products age. 2)Often high reflectivity
Comparative costs	Tends to be more economical in the short term than metal, although with products now having 30 year guarantees and have quoted life expectancies of 50 years, they may be more economical over the long term as well.	Possibly more economical in the long term

The fibre cement sheets referred to in the table above include both 'factory painted' sheets (which are naturally coloured but with an applied paint finish) and integral coloured sheets (which are coloured as part of the basic manufacturing process, and have an applied surface sealer). Integral coloured sheets are generally preferable visually as they are less reflective. Costs are similar.

b) <u>New innovations in roofing products</u>

Over the last decade or so, new products have been introduced in to the market as roofing materials.

Although mostly more appropriate for domestic scale structures and not commonplace in agricultural buildings, the following are some of the materials and techniques which are becoming affordable alternatives to more usual materials. The National Park Authority will give advice on the appropriateness of such materials in specific situations.

i) <u>Timber shingles</u> – a sustainable roofing material generally available in cedar or oak. Timber is a renewable energy resource whose use creates little or no pollution and is very lightweight and easy to handle. Life expectancy is thought to be up to 50 years, although some maintenance works would probably be required throughout the lifetime, and could be a definite problem in a wet climate such as that of most of the Yorkshire Dales. The life expectancy of the timber depends on the quality of the wood and the fitting of the shingles.

There are some concerns over the fire risk and it may be necessary to coat with a fire retardant which will increase the costs.

There is no post-medieval precedent in the Yorkshire Dales for a product of this type, but any proposal to use shingles would be received with interest. The low reflectivity of the material would weigh positively against the unusualness of its appearance.

ii) Replica slates

These provide additional choice for architects and builders where the use of natural slate is financially unviable. These are available in profiled sheets which have the ridged appearance of natural slates, or as slate-sized tiles.

It is vital to inspect the quality of the profiles before committing to the use of a particular product as there are numerous manufacturers and suppliers, each with products of a different quality. These may be made of fibre cement, resin bonded slate or reconstructed stone, and the degree to which their artificiality is apparent varies. The National Park Authority will give advice on the suitability of such products for a particular site.

As some of the alternative materials are lighter than natural ones, they are more vulnerable to being lifted by wind.

iii) 'Green' roofs

This is the name given to eco-friendly roofing systems which may have potential for agricultural buildings in some circumstances where conventional roofs would be particularly incongruous, such as in locations where there are no existing buildings or where rain water run-off would be a problem.

The roofs are generally built of metal sheeting or concrete which is then covered with soil and low growing, self-regenerating plants which will produce a natural carpet effect. This finish is only suitable on flat or very low pitched roofs, but can significantly reduce rainwater run-off; but supporting structures would need to be of sufficient strength to cope with the increased weight from water and snow accumulation within and upon the soil covering.

This is a very new development in roofing materials and expert advice must be sought from the outset.

iv) Corrugated sheets of copper rich 'weathering steel'. This material weathers quickly to give an appearance of being long established on the building, but then remains inert without substantial further degradation for a long period. It is visually very effective and suitable for wide spans, but expensive and of limited availability.

iv. Surface treatments

a) Timber

The use of creosote is no longer permissible for health and safety reasons, but alternative products are available and applied either through:

- steam or other treatment in the factory or,

- remedial treatment in situ, which is usually done by spraying or brush application.

The most common treatment for fences and other outdoor timber is CCA (active ingredients of copper, chrome and arsenic) which tanalises timber.

The active ingredients in the tanalising process mean that the treatment has quite a high level of toxicity and is not appropriate in all situations.

An alternative to CCA treatment which is growing in popularity is the use of boron-based products which protect timber right through to the heart. These have a lower level of toxicity than the more common CCA treatments.

b) Concrete

External concrete can be rendered to improve its appearance.

Render is basically mortar (a material composed of sand and cement and often other additives) which produces an attractive, water resistant and virtually maintenance free wall finish.

Render or masonry paint will help to protect the concrete from the weather and will produce a uniform coloured finish which can be either textured or smooth and coloured to fit in with the surroundings of the building.

5. Planting and Landscape Considerations

SUMMARY
- Use any existing features
- Planting of groups of trees and shrubs may be appropriate
- Plan new planting carefully
- Use locally occurring trees and shrubs
- Manage planted areas after establishment

- Existing trees and other natural features such as walls and hedges can be retained to break up the mass of buildings in important views. They can reduce the extent to which a building might otherwise look out of place within its setting. They can help to reduce the visual dominance of the horizontal lines characteristic of modern farm buildings.

- Spoil from site excavations can be used for ground shaping and earth mounding around the building, provided that slopes are kept shallow to avoid abrupt changes in angle which can tend to make the mounding look like an artificial bund which can be as incongruous as the building itself. Care should be taken to avoid substantial earth mounding within the crown spread (rooting zone) of existing trees. Where trees are to be planted on mounded areas, it is important that the mounded material is suitable, that is, it should contain a good proportion of topsoil including adequate organic material, not just sub soil.

- Planting around the building is often the wrong solution. Well designed buildings do not need hiding, but trees can break up their outline in the landscape. Consider planting groups of trees in the line of sight between roads, footpaths, bridleways and new buildings. Strengthening existing groups of trees and hedgerows to assist with visual integration can be the best option.

- Groups of new trees and shrubs can provide good screening for buildings as well as shelter for farm stock. New planting should reflect local patterns of woodland cover, and be in keeping with the character and scale of the local landscape. Large-scale planting will not always be appropriate.

- Where there is good reason to hide a new building from public view by thick screening of new trees (for instance next to a particularly sensitive group of traditional buildings in an area where trees are already a landscape feature) it is important to plant a good proportion of species which will provide dense low growth. Otherwise, the benefits of planting will only be short-term as the crowns of planted trees rise with age.

- Poorly designed planting may limit future development, have an adverse effect on ventilation and cause other problems such as leaf filled gutters or drains. Leaving a distance of 10 metres between a building and new tree planting will generally ensure that ventilation is not adversely affected.

- The choice of species, their size and means of protection and ground preparation are all important considerations and should be discussed with experts. The National Park Authority provides such advice free of charge. Generally, indigenous species which are locally abundant should be used and although ‘standards’ and ‘half standards’ (1.5 – 2 metres) specimens may have immediate effect, it is usually better in the long run to plant smaller ‘whips’ (600 millimetres – 900 millimetres). Protection and ground preparation depend on the circumstances at the site.

- In particular soil and drainage conditions, some species of trees can cause structural damage and clogging of drainage pipes and channels where inadequate precautions have been taken in the construction process. Provisional advice should be sought and alternative species planted if there is thought to be a risk.

- The planting of trees and shrubs needs to be followed up with regular maintenance, including weeding, for at least three years and often longer, and replacement planting may be necessary.

- Mounded soil should be seeded with a low maintenance grass mix or native shrubs to prevent weed growth.

- Planting trees in evenly spaced straight lines can look very formal and is not recommended. Grouping together a number of trees at different intervals, and including groups of shrubby species, will give a more natural appearance.

6. Slurry Stores, Silage Clamps and Sheep Dipping Facilities

SUMMARY

- Obtain Environment Agency approval
- Slurry stores:
  - Draw up a farm waste management plan
    - Size correctly
    - Site carefully
    - Use dark, matt colours
- Silage clamps:
  - Design to resist corrosion and allow inspection
    - Site carefully
- Sheep dipping and drenching facilities
  - Ensure that siting and design address the need for safe drainage, with adequate coverage to avoid mixture of rainwater with the dipping fluid.
- Avoid sites of historical or archaeological interest (see Chapter 2).

The Environment Agency will normally be consulted by the National Park Authority as part of the planning process for any structure which may impose a potential pollution risk.

It is essential to negotiate with the Environment Agency when designing silage clamps, slurry stores and sheep dipping facilities.

Surry stores and silage clamps are governed by The Control of Pollution (Silage, Slurry and Agricultural Fuel Oil) Regulations 1991 (as amended) and minimum standards are set for the construction of relevant stores. Take professional advice when siting and designing such structures.

Uncontrolled discharge of sheep dips can be responsible for devastating pollution of water courses, and it is therefore extremely important that dipping facilities are sited and designed to minimise the risk of this happening.

i. Manure and slurry stores:

- Consult with the Environment Agency and draw up a farm waste management plan.

- Establish the correct size of the structure.

Consider:

- Current stocking
- Possible expansion
- Duration of storage required

- Rainfall
- Area of ‘dirty’ concrete and run-off to be contained.

- Avoid positioning on land with a high water table.

- Undertake soil investigations to confirm suitability of a site.

- Slurry stores must be in reasonable proximity to livestock buildings but must also be 10 metres from any watercourse or field drain, and it is advisable that they are located 50 metres from any borehole or spring which supplies water for human consumption.

- Use the lie of the land to screen the structure.

- Where possible a slurry store should be excavated into a slope or partially buried, providing this still allows gravity feed which is beneficial in reducing power consumption. Waste material from excavation should be used as additional screening and mounded as appropriate.

- Wherever possible site slurry stores against a backdrop of other buildings, sloping ground, or a plantation.

- Use dark matt colours to minimise the impact of these structures on the landscape.

- Amounts of contaminated dirty water should be minimised by careful design of yard areas and possibly roofing of manure stores. Storage tanks for dirty water are expensive to construct.

ii. <u>Silage clamps and bagged silage storage areas</u>

- Use local landforms to bed the structure or bag pile into the landscape.

- Where possible silage clamps and bag pile areas should be excavated into a slope. Waste material from excavation should be used to assimilate it into the landform and to reduce its impact. This can be enhanced with tree planting, but this needs to be carried out carefully, usually with the aim of breaking up the overall form of the clamp or bag storage area, rather than to screen it. Unnaturally sharp changes of angle in the slope of the mounded material should be avoided, to avoid it standing out itself as a bund.

- Silage must be stored more than 10 metres from any watercourse or field drain, and over 50 metres from any borehole or spring which supplies water for human consumption.

- Effluent from silage is a concentrated and harmful pollutant. Any part of the structure that comes into contact with silage effluent must be regularly checked and well maintained.

- Owing to the nature of their construction, silage clamps are often the ugliest of farm buildings and are rarely assimilated successfully. Therefore, their siting

is particularly important so as to minimise their visual impact – ideally they should be between buildings. If prominence cannot be avoided, however, walls constructed of re-used timbers (sleepers and so on) are generally less intrusive than concrete panels, especially when these are light in colour. The colour of the metal stanchions of the framework is also important and should be as close to that of the walls themselves as possible.

- Consider whether there is scope for a new stock building to be enlarged sufficiently to accommodate silage storage without the need for a separate development. The National Park Authority may agree that this is a reasonable option.

iii. Sheep dipping and drenching facilities

- The advice of the Environment Agency and Yorkshire Water should be sought at an early stage of planning the installation of sheep dipping facilities. They have been involved in developing modern facilities as part of the Upper Wharfe Best Practice Project.

- Address the need for the separation of rainwater and dipping fluid to avoid overflow. The facilities may be provided entirely within a building, or may simply include the erection of an open sided canopy. In either case, the advice on the design of roofs given elsewhere in this document is applicable.

7. Other Structures

SUMMARY	
• Towers, silos and hoppers	Consider the impact on existing tall structures Integrate with existing buildings Treat sheets with dark, matt colours
• Fuel tanks	Relate to existing buildings Use dark, matt colours Bund to 110% of capacity
• Handling pens	Use traditional materials where possible Relate to existing features on site Remove mobile systems promptly Avoid the use of untreated sheet material

i. Towers, silos and hoppers

- Structures which exceed the height of adjacent buildings are rarely acceptable in the National Park.

- Wherever possible integrate structures such as grain and feed bins with other buildings and site away from prominent viewpoints.

- A tower silo or other such tall structure can be helped in its assimilation into the landscape by retaining existing trees. Existing landforms should be used to fit the new structure into the local landscape. New tree planting may also be appropriate to help to assimilate the new structure.

- These structures may be constructed from galvanised steel, which is highly reflective and very conspicuous, especially when first erected. Such materials should only be used when painted in a dark, matt colour. An appropriate primer should be applied first to avoid peeling. An alternative material which is growing in popularity is fibreglass. This has the advantage of being pre-coloured in the factory and has very good weathering characteristics. The additional cost is increasingly being seen as a worthwhile investment, for practical as well as visual reasons.

- Any lettering on structures such as tower silos and feed bins should be as inconspicuous as possible, given the need for safety instructions to be seen.

ii. Fuel Tanks

- Should be sited within existing building complexes with good access and out of view wherever possible. Avoid elevated siting where this would be visible.

- Tanks should be painted in dark matt colours without lettering.

- Surround by a bund to contain 110% of the capacity of the tank.

- Fuel tanks should be secure to minimise the risk of theft or vandalism. Hoses and nozzles should be locked away within the bund when not in use.

iii. Sheep and cattle handling systems

- Wherever possible the use of traditional materials is desirable. If sheep handling pens can be extended from existing stone walls, they will blend well into the landscape.

- Where this is not practical, handling systems should be incorporated within the farmstead shielded from view by existing buildings.

- Mobile sheep handling pens tend to be of aluminium construction and are highly reflective especially when first erected. Their use is desirable but they must be removed promptly after use.

- Avoid the use of tin or steel sheets or Armco, unless painted.

8. Regulations Covering Design of New Agricultural Buildings and Structures and Technical Guidance

i. Current regulations

Regulations relevant to the construction of new farm buildings are complex and subject to change. The following is a list of the principal regulations and legislation current in May 2007, but it is not intended to be comprehensive. Anyone considering the erection of a new farm building is advised either to research thoroughly the technical and statutory requirements correct at the time, or to employ appropriate consultants with the necessary experience and knowledge.

- British Standard 5502
- The Welfare of Farmed Animals (England) Regulations 2000 (Statutory Instrument 2000 No.1870)
- Code of Good Agricultural Practice for the Protection of Water 1998
- The Control of Pollution (Silage, Slurry and Agricultural Fuel Oil) Regulations 1991
- Health and Safety when constructing – Construction (Design and Management) Regulations 1994.
- Hazardous Waste Regulations 2004
- Work and Height Regulations 2005
- Construction (Health, Safety and Welfare) Regulations 1996
- Health and Safety at Work Act 1974

(Note: All to be checked immediately prior to publication and augmented as necessary)

For further information contact:

Defra – Rural Development Service (RDS), Government Buildings, Otley Road, Lawnswood, Leeds, LS16 5QT
Tel: 01132 303750 Defra helpline 0845 9 335577

British Standards Institution (BSI) – Tel: 020 89969001

Environment Agency – Tel: 0870 8 506506

Yorkshire Dales National Park Authority - Tel: 0870 1 666333

ii. Technical guidance

a) Siting

- If a sloping site is aligned parallel to the contours of the slope, 'cut and fill' techniques should be used to achieve a level platform.

- Always assess the potential for utilising the existing local landforms to assist assimilation, (for example, using hollows to sit buildings within, and rising ground as backdrops to reduce scale).

- Always consider the potential for expansion in the future especially where the site is in close relation to existing buildings.

- Take care not to create or exacerbate wind tunnels which could make certain activities within the farmstead difficult.

- Security is a growing concern to farmers and landowners. Ideally new buildings should be located within sight and sound of a dwelling and away from public access. Where this is not possible, ensure that public access routes are not obstructed in any way.

- Good access for machinery and animals is vital for any new building. If the proposed initial use is for storage, do not prejudice any future changes in use by, for example, restricting access for livestock.

- Consider access for service vehicles such as milk tankers and feed wagons.

- Consider the adequacy of existing services and the costs of bringing new mains supplies to the site.

- Surface drainage will be affected as a result of a new building. Ensure that adequate provisions are made for rainwater from roofs and run off from hardened areas.

- If the building is to accommodate livestock, ensure that 'clean' and 'dirty' water drainage is managed separately. 'Dirty' water collection, storage and disposal systems must conform to the Control of Pollution (Silage, Slurry and Agricultural Fuel Oil) Regulations 1991.

- Take care when siting new buildings, to ensure that accidental spillage or seepage will not enter a watercourse, either directly or through a drainage system.

- Consider locations for ancillary functions when planning a site, (for example, bale storage and mucking out areas). Try to minimise uncovered areas of 'dirty' yard that will increase the volumes of effluent that will have to be stored.

b) Design

BS 5502 specifies the following standards for various types of farm building:

CLASS 1: Unrestricted as to purpose, siting, and human occupancy. Design life of 50 years

CLASS 2: Maximum of six hours human occupancy per day not exceeding two persons per 50 square metres. Must be minimum distance from a classified highway or human habitation in different ownership. Design life minimum of 20 years.

CLASS 3: Maximum of two hours human occupancy per day not exceeding one person per 50 square metres. Must be minimum 20 metres distance from a classified highway or human habitation in different ownership. Design life minimum of ten years.

CLASS 4: Maximum of one hour human occupancy per day not exceeding one person per 50 square metres. Must be 30 metres minimum distance from a classified highway or human habitation in different ownership. Design life minimum of two years.

All buildings should carry a sign giving the date of erection and classification.

BS 5502 also sets standards for General Design (parts 20-39), Livestock (parts 40-59), Crops (parts 60-79) and Ancillary Buildings (parts 80-99).

It is advisable to obtain a copy of any relevant parts of BS 5502 before planning any building works, or to take professional advice.

“Materials used for the construction of livestock accommodation, and in particular for the construction of pens, cages, stalls and equipment with which the animals may come into contact, shall not be harmful to them and shall be capable of being thoroughly cleaned and disinfected.”

Source: The Welfare of Farmed Animals (England) Regulations 2000
(Statutory Instrument 2000 No. 1870)

- BS 5502 gives specific minimum dimensions for eaves height and width for new agricultural building. It is worth considering, however, that a medium sized tractor will have a height of approximately 2.7 metres and machinery
- such as combines can be as high as 4.7 metres.

- Natural ventilation is a proven and successful method of ventilating the majority of livestock buildings. Adjustable ventilation products such as curtains are worth considering, as they allow for day to day flexibility, according to weather conditions and stocking density.

- Two natural forces operate to provide ventilation in buildings: wind effect and stack effect. In practice ventilation problems will occur when there are calm conditions, and hence the wind effect can not be relied upon.

- The stack effect is where the warm air inside the building rises and is replaced by colder, denser air from outside.

- A pitched roof building with an open ridge (outlet) and Yorkshire/space boarding below the eaves (inlet) usually provides satisfactory ventilation. The depth of the timber boarding can be varied along with the width of the boards and the gaps between the boards, depending on livestock requirements, prevailing wind and other climatic considerations. This can involve quite complex calculations to take into account building size, roof pitch, stocking density, size of open ridge and so on.

- The inlet and outlet spaces need to be carefully calculated in accordance with stock numbers and type to ensure adequate ventilation for livestock.

- Multi-span and mono pitch roof structures will require a further source of ventilation. This could be achieved by having open or partially open stretches along the side or ends of buildings.

- Badly arranged ventilation can cause draughts or lead to diseases such as pneumonia particularly in cattle.

- Spoil from any excavations necessary to site the building can be used as banks to screen the building if it is in a prominent position within the landscape.

- Any openings to the building, including doors, should be located on the south elevation of the building wherever the site allows.

c) <u>Slurry</u>

i) <u>Above ground circular stores</u>

- Not suitable for slurry containing a lot of straw bedding or waste feed materials.

- A typical system has a reception pit large enough for a two day supply of slurry with the contents then pumped into the main store.

- Generally constructed from steel panels, specially treated to enable them to withstand the corrosive contents of the store.

- Timber cladding can be used to limit the obtrusiveness of such a structure if the nature of the area is particularly sensitive. However careful siting and colouring will usually be satisfactory.

ii) <u>Weeping wall slurry stores</u>

- Suitable for slurry with a lot of straw bedding in it.

- Built above ground level on a concrete base. Any excess liquid drains through the walls and be collected before being spread onto the land.

iii) Earth banked slurry stores

- Suitable for slurry with little straw bedding in it.
- In many locations these structures are not viable as soil types are unsuitable.
- Take expert advice on siting and design. Consult the Environment Agency at an early stage.
- Be aware of health and safety issues: 'Mixing or re-circulating slurry can give off dangerous gases that are lethal to both humans and livestock. Never put silage effluent into under-floor slurry stores.'

Source: The Code of Good Agricultural Practice for the Protection of Water 1998.

d) Silage

- Access will be required with tractors and trailers, and handling machinery and for cleaning and maintenance purposes. When siting leave wide clear
- vehicular access.
- Floors should have a one in 75 slope from back to front, with a collection drain at the front, and a one in 50 slope from the centre of the clamp to collection drains at the sides.
- The base of the silo must be impermeable, with channels around it to collect any effluent. If it has walls around it as a clamp, then the base should extend
- beyond the walls and have collection channels.
- The collection channels must lead to an acid-resistant tank. The tank must have the capacity to store 20 litres of effluent for each tonne of silage stored if the silo has a capacity of less than 1500m^3. Silos that are larger than this must have a tank with a capacity of 30m^3 plus 6.7 litres per each cubic metre of silo capacity above 1500m^3
- If the base of the tank is below ground level, the tank must be acid-resistant for 20 years without needing any maintenance.
- Putting a roof on the silage clamp will help to minimise the amount of effluent, as rain falling upon a silage clamp is 'dirty' water and must be contained. If rain falls on a roof it is 'clean'. However adding a roof will make the building appreciably higher and therefore increase its visual impact, necessitating re-assessment of siting and so on.

Discuss proposals with the Environment Agency and Yorkshire Dales National Park Authority at an early stage.

Making and storing silage in field heaps or in large bags without an impermeable base or wall is allowed provided the site is suitable. Discuss your proposals with the Environment Agency well in advance of silage making.

"In considering site suitability, the Agency will take into account slope, soil permeability, soil compaction, degree of soil cracking and fissuring, and the risk of causing pollution of underground and surface water. Other factors will include the nearness of roads and farm tracks which may increase the risk of run off reaching surface waters or sensitive sites such as sites of special scientific interest (SSSIs)."

Source: The Code of Good Agricultural Practice for the Protection of Water 1998.

- Material which is to be baled should be wilted until it contains at least 25% dry matter wherever possible.

- Wrapped or sealed silage bales again must be stored more than 10 metres away from water courses or field drains.

- The plastic silage wrap is highly reflective, so choice of storage site, even though it may only be temporary, needs careful consideration. For this reason, as well as to facilitate collection in winter weather and ground conditions, use the lie of the land wherever possible to screen the bales from view across a valley or from any viewpoints.

e) Other structures - sheep and cattle pens

- When considering where to site sheep handling pens, wherever possible integrate into the existing farm stead, bearing in mind that sheep:

    - will follow one another,
    - run better around gentle corners than in a straight line,
    - run better away from a building,
    - run better uphill,
    - run away.

- Cattle handling pens will require higher and stronger materials. Use dark stained timber wherever possible.

- Handling pens should be constructed of materials that are already present in the vicinity.

f) Livestock Building Requirements

The following information relates to minimum space allocations under the Welfare Code. Larger spaces may be required to qualify under accreditation schemes such as 'Freedom Foods'; the Soil Association's 'Organic Standards'; 'FFSIS – FABBL'; or 'Organic Farmers and Growers'.

i) Sheep Housing

The Welfare of Farmed Animals (England) Regulations 2000 is relevant and further information can be obtained from the Code of Recommendations for the Welfare of Livestock produced by Defra.

Good natural ventilation is generally sufficient for sheep housing.

Space allowances for housing sheep

Sheep	Trough space		
	Area on straw (m^2)	Concentrates (mm)	Ad lib hay or silage (mm)
Large ewe 60-90 kg in lamb	1.2-1.4	450-500	200-225
Large ewe 60-90 kg plus lamb	1.4-1.8	450-500	200-225
Small ewe 45-60 kg in lamb	1.0-1.3	400-450	175-200
Small ewe 45-60 kg plus lamb	1.3-1.7	400-450	175-200
Hoggs 32-45 kg	0.7-0.9	350-400	150-175
Hoggs 23-32 kg	0.6-0.9	300-350	125-150

Source: Extracted from BS 5502

ii) Cattle housing

Pen spacing for calves

Pen type	Age	Minimum space required per calf
Individual	Up to 4 weeks Up to 8 weeks	1.1 m^2 (1.5 x 0.75 m) 1.8 m^2 (1.8 x 1.0 m)
Groups	Up to 8 weeks Up to 12 weeks	1.1 m^2 1.5 m^2

Source: Extracted from BS 5502 part 40

Space allowance for calves

Weight (kg)	Bedded area including loaf/feed area (m^2)	Slatted area (m^2)	Trough length (mm)	Calf creep/ gate Width (mm)	Height (mm)
Up to 250	2.5	1.3	400	)) 450-) 500)	900- 1100
Up to 400	3.8	1.8	550		

Source: Extracted from BS 5502 part 40

Space Allowances for Suckler Cows

Weight (kg)	HOUSING SYSTEM					Trough length (mm)	Slurry passage width between cubicle rows (m)	Depth feed area behind manger (m)
	Cubicles		Bedded yards		Slatted Yards (m^2)			
	Length (m)	Width (m)	Lying (m^2)	Feeding (m^2)				
Up to 500	2.1	1.2	3.75	1.25	2.5	650	2.3	3.0
500 to 600	2.2	1.2	4.05	1.45	2.75	675	2.3	3.0
Over 600	2.3	1.2	4.35	1.65	3.00	700	2.3	3.0

Source: Extracted from BS 5502 part 40

Space allowances for beef cattle

	Area per head (excluding troughs and tractor passage)		
Weight (kg)	Solid floors (m^2)	Slatted floors (m^2)	Width of feed face (restricted feeding) (mm)
200	3.0	1.1	350
300	3.4	1.5	400
400	3.8	1.8	450
500	4.2	2.1	500
600	4.6	2.3	575
700	5.0	2.5	625

g) Slurry stores

Waste production

The characteristics and volume of neat slurry or excreta produced by a particular animal depends on a number of factors:

- Size
- Age and breed
- Diet and type of feed
- Amount of roughage
- Availability of drinking water

The following table contains standard output figures only and should be adapted to suit individual circumstances.

Amount of excreta produced by livestock

Type of livestock	Body weight (kg)	Moisture content (%)	Typical volume (litres / day)
One dairy cow	450-650	90	57.0
One beef bullock	200-450	90	27.0
One fattening lamb	45	89	2.2
One mature sheep	60-80	89	4.0

Source: Extracted from BS5502

Slurry tank size should be based on:

- Total daily estimate of slurry and dirty water production in conjunction with the desired storage period.

- In addition, stores open to rainfall, an allowance should be made for incidental rainfall directly onto store during storage period.

Slurry Volumes

Wet straw 1.95 m^3 / tonne
Farmyard manure 1.25 m^3 / tonne
Slurry (faeces and urine) 0.9 m^3 / tonne
Straw when mixed with slurry has volume of 1.9 m^3 / tonne
Rainwater
10mm of rain falling on 1 m = 10 litres (0.01 $m^{3)}$

Sources

The Agricultural Budgeting and Costing Book
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The Code of Good Agricultural Practice for the Protection of Water 1998

The Control of Pollution (Silage, Slurry and Agricultural Fuel Oil) Regulations 1991 (as amended)

The Welfare of Farmed Animals (England) Regulations 2000

The Yorkshire Dales National Park Authority Design Guide 2002