

North Dorset Guide to Shopfront Design



1. Introduction

- 1.1 Shops make a significant contribution to the distinguishing character of our town and village centres and they represent an important link with the social and cultural history of a place. The primary purpose of a shopfront is to attract the attention of shoppers. Appropriate signage, paint finishes, inviting entrances and attractive window displays all influence the potential customer. Conserving the historic features of our town and village centres enhances shopping areas no matter how small and may, in turn, bring economic benefits to that area by increased footfall. In contrast, shops and signage of poor appearance and quality detract from an area, can discourage shoppers and may contribute to an overall loss of townscape character. Like any property, it is important to carry out a regular maintenance regime for a shop. A building is a valuable asset and a planned maintenance approach will ensure that it retains its value as well as potentially encouraging retail trade. Effective maintenance can minimise the need for more costly works in the long term. This guide provides information to help you understand your shop and signage and aims to ensure that informed decisions are made regarding alterations to shop fronts within the district.



Milton Abbas Post Office and Shop

- 1.2 This Design Guide has been produced by North Dorset District Council in partnership with Blandford Forum Town Council. It is intended to help retailers, commercial operators and their agents to improve the standard of design when needing to alter or replace shopfronts and associated signage within the District. By following the guidelines and advice contained within the guide applicants should be able to achieve shopfront solutions which pay respect and have regard to the host building and its

surroundings. Its purpose is not to suggest precise ways of designing alterations or to discourage imaginative new design, but to provide guidance for the alteration, replacement and restoration of shopfronts. The Council and its partners attach considerable importance to suitably-designed shopfronts, not only for the preservation of the character of buildings and areas, but also for the attractive overall appearance of streets within the towns and villages which will in turn contribute to their commercial success and viability.



Iwerne Minster

- 1.3 North Dorset District Council recognises and accepts that the retail industry requires adaptability and flexibility in shopfront design in order to respond to the rapidly changing market and consumer pressures. However, North Dorset contains towns and village centres of the very highest quality and the architectural integrity of individual and groups of buildings within the district can be harmed by insensitive shopfront and signage design. For example an over large plastic fascia may be inappropriate in terms of size and material and may cover traditional architectural features. Also, standardised 'house designs' (i.e. standard shopfronts of multiple or 'chain' shops) present a particular problem when they are applied insensitively to existing buildings. Furthermore, whilst the desire for corporate image is appreciated, in some cases standard designs will need to be modified in order to fit sympathetically with the

period and architectural style of the building. It is important therefore that alterations, restoration and replacement are sympathetically carried out, especially in conservation areas and on listed buildings in order to protect their special character and appearance. Size, scale, elaborate or simple design and detailing, the use of correct materials and colour schemes are all important in making shopfronts acceptable parts of existing buildings and areas.

2. Legislation

Planning Permission

- 2.1 The alteration and replacement of shopfronts generally requires planning permission. Advertisements may require a separate application for advertisement consent. However, routine maintenance works, such as redecoration or straightforward repairs do not normally require permission.

Listed Buildings

- 2.2 Any alterations to shopfronts that are a part of a listed building will need to be consistent with the age or style of the building and will normally require listed building consent. In the case of listed buildings, even seemingly minor alterations, which might otherwise be permitted development (such as alterations to the detailing of stucco or woodwork, removal of small features or specially treated glass), would normally require consent.

Conservation Areas

- 2.3 The Local Authority is empowered to designate areas of special architectural or historic interest as conservation areas in order to safeguard their character or appearance. In such areas, special attention is paid to the desirability of preserving or enhancing historic shopfronts. Planning permission will be required for the demolition or removal of an existing shopfront.

3. Policy

NPPF

- 3.1 The National Planning Policy Framework sets out the Government's planning policies for England and how these are expected to be applied. At paragraph 56 it states:

The Government attaches great importance to the design of the built environment. Good design is a key aspect of sustainable development, is

indivisible from good planning, and should contribute positively to making places better for people

3.2 Furthermore, paragraph 60 makes clear that:

.... planning policies and decisions should not attempt to impose architectural styles or particular tastes and they should not stifle innovation, originality or initiative through unsubstantiated requirements to conform to certain development forms or styles. It is, however, proper to seek to promote or reinforce local distinctiveness.

3.3 With regard to advertisements it states:

67. Poorly placed advertisements can have a negative impact on the appearance of the built and natural environment. Control over outdoor advertisements should be efficient, effective and simple in concept and operation. Only those advertisements which will clearly have an appreciable impact on a building or on their surroundings should be subject to the local planning authority's detailed assessment. Advertisements should be subject to control only in the interests of amenity and public safety, taking account of cumulative impacts.

The Local Plan

3.4 The Draft North Dorset Local Plan makes clear that the Council's approach to design is to ensure that all developments improve the character and quality of the area within which they are located. Policy 24 of the plan describes the design approach the Council will adopt when determining applications. It is necessary for the Council, developers and local residents to understand the design rationale behind any development proposals to enable informed judgements about what may be acceptable in design terms. To achieve this, developers will be required to submit detailed design information setting out how the local context, the design principles, standards and other aspects of development have been addressed.

3.5 In historic areas or proposals affecting designated or non-designated heritage assets, attention is drawn to Section 4 of the draft plan and in particular Policy 5 and the supporting information relating to the historic environment.

4. Architectural elements of a shopfront

4.1 This section sets out some fundamental principles. It lists and describes the elements of the architectural framework and the shopfront. It sets out

the general design principles for each. It develops those principles in relation to each of the specific elements and in relation to the Disability Discrimination Act and Building Regulation requirements. These principles apply to existing buildings where shopfronts may be replaced or altered and to new developments containing ground floor commercial units. Certain principles apply specifically to historic buildings, and their setting, which are defined as statutorily listed buildings and buildings in conservation areas, or affecting the setting of the conservation area.

4.2 In the design of all shopfronts, whether early, traditional or modern/non-traditional, the following general considerations should be taken into account:

i. The streetscene: it is important to consider the effect of the design on the rest of the street and the immediate area. Proportions, materials and details should maintain the variation and hierarchy of the buildings and should not seek attention or dominate them unnecessarily.

ii. The building as a whole: it is important to consider the effect of the design on the whole building, and on the adjoining shopfronts. Sensitive design should enhance the individuality and character of the building. The structural integrity of the traditional frontage should be maintained.

ii. The details: details in the design are equally important. Original ornaments and other details provide visual interest. Carefully selected colours may enhance the building as well as the whole street. Special care in the design of the entrance, windows and signs will help shoppers and make shopping an easier task, especially for people with a particular disability or mobility problem.

4.3 A traditional shopfront is made up of a number of elements, which form a frame for the shop entrance and shop window. Each element has its own practical and visual function. The main components are as follows:

Fascia: The fascia provides the space within which the name and business of the shop can be displayed.

Pilasters: separate each shop from its neighbours and define the width of the shopfront.

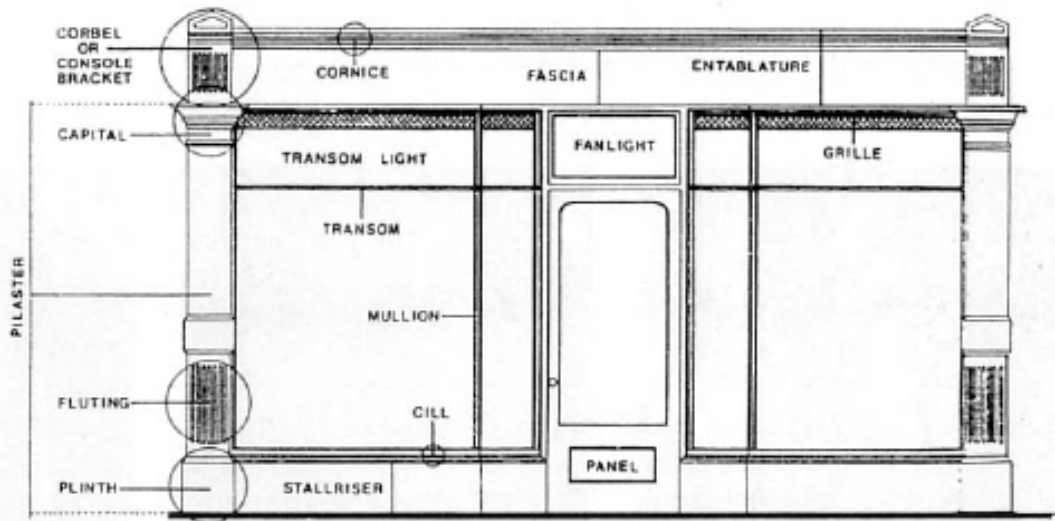
Stallriser: The stallriser provides protection at ground level and provides a solid base to the shopfront.

Architrave: Normally the moulded, slightly projecting timber beneath the fascia but also used to describe moulded timber surrounding a door or window.

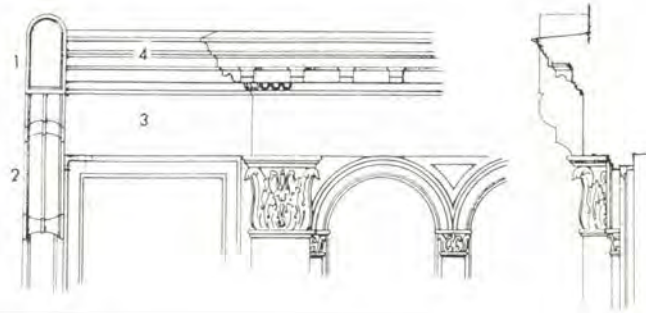
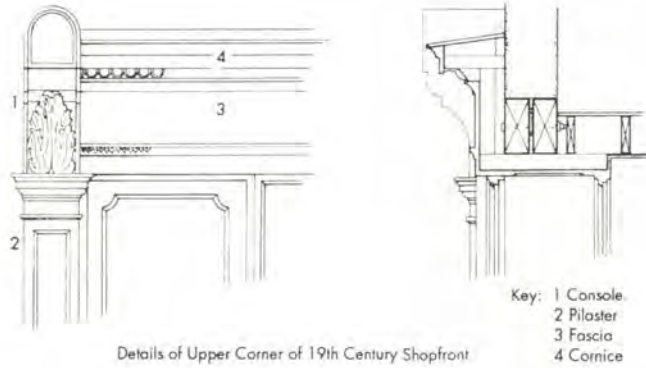
Corbel: Pilaster heads often project to form a bracket or corbel. These can either be a decorative feature or a means to allow the fascia to be fixed at an angle looking down to the pavement.

Cornice: The cornice defines the top of the shopfront and gives protection from the weather.

Mullion: a vertical post or upright dividing a window or opening into two or more lights.



- 4.4 The architectural framework establishes the basic design principles for the ground floor of a shopping street (vertical, horizontal rhythms, scale and proportions). It normally comprises pilasters, with architectural details such as capital and plinth, a corbel or a console bracket, and an entablature with a frieze or fascia, and is terminated by a cornice (as previously described). In new build developments an architectural framework should be developed to establish the ground floor rhythm and proportions.
- 4.5 The shopfront is the screen or panel that fills the space defined by the architectural framework. The term refers to the door, window and stallriser as well as any glazing bars (transoms, mullions) that might be present. They provide the greatest opportunity for interpretation and adaptation.
- 4.6 It is a fundamental principle for historic buildings that original or traditional architectural frameworks, shopfronts, or elements should be repaired or re-established, where photographic evidence or nearby original fabric exists. The removal of good quality original or early fabric will be resisted.



The architectural framework should:

- i Relate to the building or group of buildings on which it is fitted;
- ii Frame the shopfront and give visual support to the upper floors;
- iii Separate shop units visually within the streetscene, creating a strong vertical rhythm;
- iv Respect the proportions of adjacent units and upper floors;

Fascias

4.7 The fascia was traditionally an angled or flat board containing the trade name sited between the corbels at the top of the pilasters. The fascia provides the opportunity to create a distinctive and individual style by applying the following principles:

- (i) Cornices should be retained or reinstated as the terminating element of the fascia; they should be weatherproofed using lead flashing or a similar material.
- (ii) The width of the fascia should be restricted within the pilasters and corbels, or line up with the window frame below where the corbels are missing.

(iii) The depth of the fascia should be restricted to the depth of the console. If consoles do not exist the general rule is that the fascia depth should not exceed one-fifth of the distance between the cornice and pavement or the fascias of adjacent properties should be used as a guide for alignment but not necessarily as a standard.

(iv) Fascias which are overdeep should be reduced when a new fascia sign is produced or shopfront replaced.

(v) The fascia (and other signage) should contain the name and/or trade of the premises together with the street number of the premises and a telephone number if necessary. The lettering should be well spaced and cover a maximum of 3/4 the depth of the fascia. The colour scheme should complement the shop window frames. The lettering style should be simple and bold.

(vi) Intermittent, flashing or moving displays will normally be unacceptable, either on the shopfront or within the window.

(vii) Due to the historic nature of the towns and villages within the district, illuminated signs will be generally resisted. In exceptional circumstances, where it is felt appropriate to introduce a form of sensitive lighting, i.e. to support evening trade, internally illuminated or wholly backlit fascias will not be acceptable. If illumination of the fascia is required this should be done by external means e.g. concealed top light tubes or carefully positioned spot or backlights concealing the light source. Large spots or swan necks will normally be unacceptable.

(viii) Shiny, glossy, highly reflective and luminous colours and materials will not be acceptable.

(ix) On historic buildings and within conservation areas in particular, effective and acceptable forms of signage include signwriting on the fascia board or the installation of individual letters in metal or wood. Silver, gold or light-coloured lettering on a dark background reflects light at night and used with interior lighting of window displays is successful. This provides the required colour contrast to assist people who are visually impaired.



A good traditionally painted fascia sign in Blandford Forum

Lettering

- 4.8 Lettering upon the fascia should preferably be traditionally signwritten. In some circumstances applied lettering will be considered, for example, gilded lettering with a half-round section is particularly suitable for pubs and hotels. Flat applied lettering on minimal pins will sometimes be acceptable. Lettering should normally be easily contained within the fascia - a ratio of 60% fascia height for lettering, with 20% spacing above and below is a guide. Generally, the length of wording should not be greater than 75% of the fascia length.

Stallrisers

- 4.9 Stallrisers are the solid panels below the shop window they can introduce a horizontal unity in the streetscene. They can also provide a visual base to the shopfront, bring displays of goods closer to the shopper and to protect the glazing from damage. The materials for stallrisers and upstands should respect the main building and shopfront. Acceptable materials include:- timber, stonework, brickwork to match the upper facades, painted smooth render, slate, or when appropriate e.g. butchers or fishmongers, ceramics.

- 4.10 In historic buildings traditional stallrisers will normally required in all shop premises. The base of the pilasters or existing traditional stallrisers in adjacent units should determine the height. The general design and details of mouldings and cills should respect the architectural period of the property. At the very minimum a solid upstand of at least 150mm will be required.

Pilasters

- 4.11 Pilasters contribute to the vertical emphasis of a building and providing support for the shop and upper floors. The pilaster projects only slightly from the wall, and has a base, a shaft, and a capital. Pilasters should:
- Be modelled and project beyond the plane of the shopfront and the upper floors.
 - Not be clad or treated separately on each side of the party line, or cluttered with fixtures such as signs, alarm boxes or blind fittings.
 - On historic buildings, be treated in a manner sympathetic to the architectural style and age of the building.
 - Include decorative mouldings on historic buildings which can be should be copied from an original nearby shop or a historical pattern book.

Window frame and doors including architraves

- 4.12 Windows and doors, through the use of colour, interesting shapes and proportions, quality materials and lively window displays can add visual interest to the streetscene and produce a distinctive individual shop unit. It should be noted that the Disability Discrimination Act (2005) requires that all buildings containing shops or providing public services are accessible to disabled people. Easy access to and circulation within shops is important to everyone, including people who use wheelchairs; those who cannot walk easily, people who are deaf, people who are blind or visually impaired and to the elderly, children, and people with pushchairs, prams or trolleys. Inclusive design enables this to be achieved to the greatest effect and should be employed in the installation of new doors and access arrangements in shop units.
- 4.13 At all times, the detailed design of the size, shape and profile of window frames, glazing bars and doors should respect the architectural style and period of the premises. The plane of shop windows should be slightly recessed from the pilasters to provide depth and shadow and a variation in the plane, by recessing doors or curving windows, can also add to

visual interest. Deeply recessed windows or completely open frontages are unacceptable in visual and functional terms.



A good traditional 19th century timber shopfront in Blandford Forum

- 4.14 Where the historic or underlying character of the area permits, concertina or folding shopfronts need a strong architectural framework to provide support for the upper storeys when 'open' and to ensure integration of the shopfront within the streetscene. In order to achieve this, elements such as an upstand to each door should be incorporated as these provide a visual base to the shopfront, and helps to integrate it with surrounding shopfronts when 'closed'.
- 4.15 In historic buildings a traditional height stallriser should be part of the design with windows opening above this height only.
- 4.16 Large areas of glazing should incorporate visual "stops", (alerting people who are visually impaired to the presence of the glass) at least 150mm high, across the width of the glazed area, at two heights: 850-1000mm

and 1400-1600mm above ground level, to ensure visibility against the background seen through the glass.



A good Art Deco (first half of the 20th century) shopfront in Shaftesbury with sensitive use of lettering and image on the fascia

- 4.17 Glazing should always be transparent, even in non-retail units. Opaque, frosted, reflective, mirrored or tinted glass is normally unacceptable, unless it has a functional use in small, selective areas. Shatterproof safety glass (laminated glass) should be used to ensure public safety and as a security measure.
- 4.18 Mechanised ventilation units create clutter and should be sensitively accommodated to the rear of the property. Alternative acceptable methods of ventilation include opening fanlights above the door or transom bar and decorative grilles in the stallriser or clerestory.
- 4.19 In general, a shop window display should be maintained at all times in order to maintain the continuity and interest of the shopping frontage. The

- internal illumination of window displays at night is encouraged, to increase safety and security and reduce the need for illuminated advertisements.
- 4.20 Solid or partly infilled frontages will always be unacceptable even on non-retail uses such as restaurants, banks and office uses. An internal screen should be provided in the form of a permanent display behind the glass, curtains or blinds. However, autoteller machines may be acceptable where they can be satisfactorily integrated into the shopfront as a whole and incorporate a substantial litter bin/receipt collector.
 - 4.21 New doors to shopfronts are not permitted to open outwards over the public highway.
 - 4.22 In historic buildings the materials for window frames, glazing bars and doors should be selected with the architectural style and period of the premises and area in mind. Painted timber is the recognised quality material for a shopfront, as it can be easily modelled, adapted, and repaired; correctly sourced timber is also a sustainable material. Basic milled silver aluminium produces an unsatisfactory appearance, which is not acceptable in any circumstance.
 - 4.23 Entrance doors should provide a minimum clear opening width of 830mm for wheelchair access on a flat fronted shop. There may, however, be circumstances that would allow a narrower opening of not less than 800mm but advice should be sought from the Council's Conservation and Building Control Officers prior to any work taking place on site. A 900mm door is the optimum width for providing adequate clear opening. Where doors are recessed or frontages splayed the pavement entrance should be a minimum of 1200mm wide.
 - 4.24 In the case of manually operated double entrance doors, the minimum clear width provided by one leaf of the entrance doors should be 800mm. This may necessitate the use of a door and a half arrangement, where one, larger leaf measures provides least 800mm clear opening width and the smaller, narrower leaf is shut unless the full width is needed for transporting large loads.
 - 4.25 Ramps outside the premises on the forecourt or footway will be resisted. Any ramp on the highway will require a license under the Highways Act 1980.
 - 4.26 Thresholds at entrances should be level. Changes in level should be accommodated within the shop unit by ramps no steeper than 1: 14 and a minimum of 1200mm wide. Thresholds should have non-slip surfaces, with flush weathermatting. Coir matting should never be used.

- 4.27 Entrance doors should include a kicking plate; door handles should be easy to operate, positioned 1000mm above ground level and be of a lever or tubular design (not continuous pole types or knobs), and clearly signed if necessary (ie "automatic", "push"). If automatic doors are not incorporated door closers should be of a minimum opening pressure (not spring closers) allowing the door/doors to open easily and remain open to facilitate convenient access for wheelchairs, prams and pushchairs. In this scenario a ring for assistance sign should also be displayed.

Colour

- 4.28 The colour palette should reflect the context of the area and the character and appearance of the host building. Where shopfronts and signs are within a historic street, a 'traditional' colour palette and finish should be used. Rich, dark colours with a matt finish often look very good, leaving window displays and lettering to provide accents. Whatever the context, colour schemes adopted should be subtle and blend harmoniously with the environment. Corporate organisations should not assume that their corporate colour scheme will be acceptable and variations may be required.

(Listed building consent may be required for the repainting of shopfronts on a listed building, where a colour change would affect its character (please check with the Conservation Officer).

Materials

- 4.29 Materials used in shopfront construction should be of good quality, durable and in keeping with a building's existing character. In general, the number and type of materials and colours used should be kept to a minimum. Materials traditionally used in North Dorset are wood, glass, brick, stone, brass and painted iron. Good quality modern materials for lettering will sometimes be permitted where appropriate, but fascias made of acrylic sheeting, Perspex, aluminium or plastic will not generally be permitted. Timber is the most versatile of materials and was the standard shopfront material of previous centuries. Painted timber is preferred to stained hardwood and tropical hardwoods are discouraged, as their use is environmentally questionable.

(Sustainability, especially the prudent use of natural resources, should be addressed in all shopfront designs and refurbishments. Materials should be carefully chosen with energy efficiency, durability, security and maintenance requirements in mind. Natural materials like timber products are usually a more sustainable option than uPVC and aluminium, which need a lot of energy to be produced and harm the environment when disposed of. Sustainably forested timber products can be sourced through

the Forest Stewardship Council (www.fsc-uk.org). When undertaking refurbishment works opportunities to reuse and recycle materials should be taken to reduce construction costs.

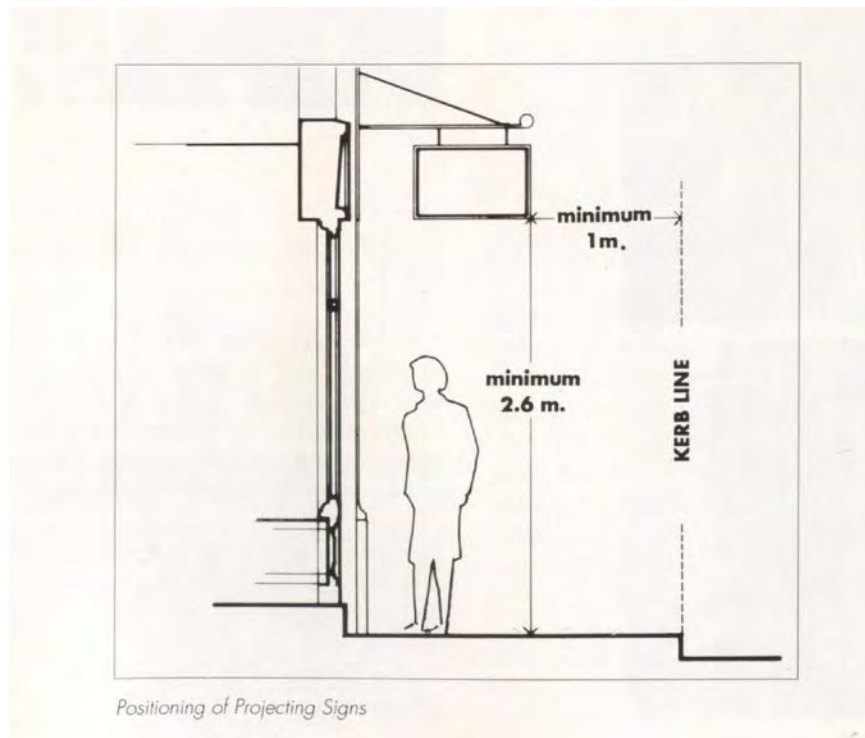
Projecting Signs

- 4.30 Projecting signs can provide a useful form of advertising where identity is necessary from a longer distance, and if illuminated on premises that are open after dark. However, the proliferation of such signage can create visual clutter in the townscape thus undermining their advertising purpose.
- 4.31 Only one projecting sign for each shop unit or structural bay will be permitted. Where a unit is located on a corner site the projecting signs should be located at that end of the fascia, which is farthest from the corner. This enables the trader to maximise presence while minimising the visual clutter. Also, projecting signs should normally be installed at fascia level, at either end of the fascia panel. Signs should not be fixed to the pilasters or decorative capitals.



A traditional non-illuminated projecting sign in Shaftesbury

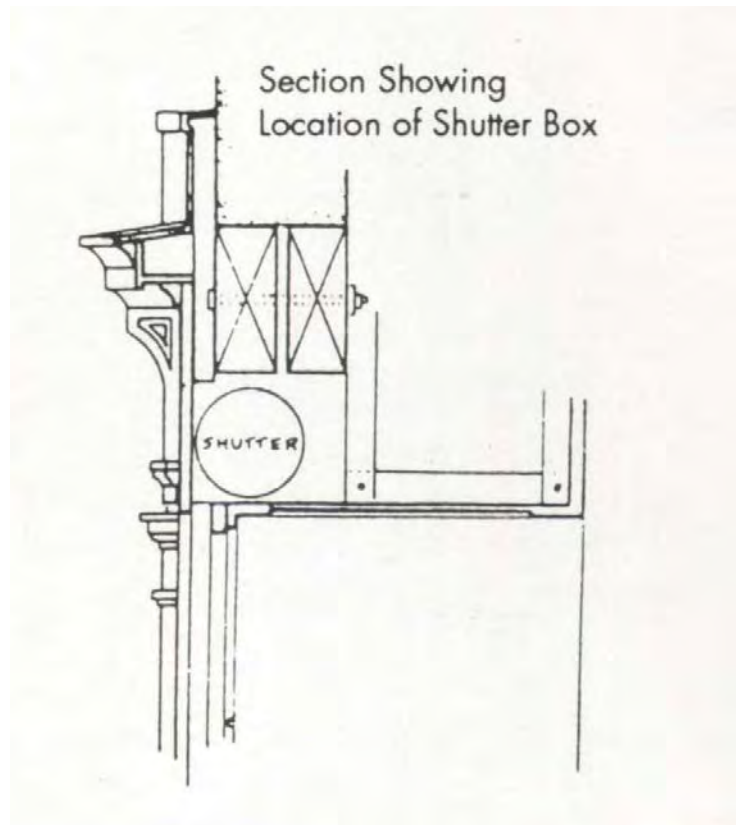
- 4.32 The size of a projecting sign and any frame or support should be modest. As a guide, typically maximum dimensions of 600x600x100mm will be appropriate.
- 4.33 The content of all signs should generally be restricted to the shop name or service and not relate to specific commercial products or services.
- 4.34 A sign projecting over the Public Highway will need a minimum vertical clearance of 2.6 meters to the underside of the sign, and a minimum horizontal clearance between the sign and the carriageway of 1 metre.
- 4.35 The Council will resist illuminated projecting signs due to the historic nature of the town and village centres. When a degree of illumination is necessary and the principle accepted this should be achieved through the use of external lighting e.g. concealed top light tubes, or well designed spot lights. Where a degree of illumination is appropriate, large spots or swan necks will not normally be acceptable.
- 4.36 On historic buildings or in conservation areas projecting signs should generally be non-illuminated and of a traditional hanging or bracketed design. A slim signwritten panel will avoid visual clutter and ensure visual separation from the main fascia and building. In addition, on historic buildings brackets for hanging signs should be reused and designed so that the panel can be replaced.



- 4.37 Hanging signs at first floor level are acceptable on pubs and where they replace an existing sign at that level.

Blinds and canopies

- 4.38 There is a good historical precedent for the installation of blinds or canopies on shop units. However, the style, colour, material, location, and number of blinds or canopies installed can affect the character of a streetscene.
- 4.39 Existing original or traditional canvas blinds and blind boxes should be retained and refurbished. The mechanism for the blind should ideally be located at the base of the fascia, behind a blind lath. If the shopfront is not being altered, it may be appropriate to position the blind mechanism above the cornice.



Typical section showing location of shutter box relative to the fascia

- 4.40 A canopy or blind projecting over the Public Highway will need a maximum vertical clearance, measured from the surface of the Highway to the underside of the canopy of 2.6 metres. A folding canopy or blind will require a minimum vertical clearance of 2.1 metres. A minimum horizontal

clearance of 0.9 metres will be required from the edge of the carriageway to the canopy.

- 4.41 On historic buildings the design of any blind installed should relate to the architectural character of the building or area generally. The historical precedent for Victorian and Edwardian buildings constructed between 1830 and 1911 is for a blind of a straight roller or apron type.



A traditional roller blind

- 4.42 Modern buildings in conservation areas should use a blind of a design comparable with the historic and architectural character of the area, normally a straight roller blind.
- 4.43 The design and method of installation of all blinds should relate satisfactorily to the features of a building and the general streetscene in both the open and retracted state. 'Dutch' or fixed canopies obscure parts of the shopfront in both states and introduce discordant forms into the streetscene and are therefore unacceptable.
- 4.44 Blinds should be made of canvas or a similar non-reflective material.
- 4.45 The display of advertising material should be avoided unless other opportunities for advertisement are limited.

Additional signage

- 4.46 When business premises have a forecourt there is consent to display additional signage, indicating any commercial services, goods for sale or other services available at the premises. Typically these notices take the form of A board signs. The notices must be at ground floor; not exceed 4.5 square meters on each forecourt; not be illuminated and consider issues relevant to the Disability and Discrimination Act. The front of a premise which forms part of the highway is not a forecourt.
- 4.47 Where there is a desire to provide additional signage for a business an application must be made under highway legislation. These applications will be considered on the grounds of safety and access. The council will normally resist them on these grounds.

Wall mounted signs

- 4.48 Notices or signs may be displayed on any premises to advertise the fact that a person, partnership or company is carrying on a profession, business or trade at those premises. These should not be over .3 of a square metre in area. Signs need to be mounted so they are in colour contrast with their background wall. The colours of the sign background and of the lettering on the sign need to contrast with one another.

Security shutters

- 4.49 External solid or perforated metal shutters result in an unattractive environment out of shopping hours, attract graffiti and reduce safety and security for the public. They deaden the streetscene and discourage pedestrians from using streets out of shopping hours. Night lighting of the interior of shop window displays encourages pedestrian use of the street out of hours providing passive surveillance that deters vandals and thieves. As such the use of external metal roller shutters is unacceptable.
- 4.50 Any security device should have a minimum effect on the architectural features and appearance of a building or the character of the streetscene. Acceptable security options are:
- Laminated or toughened glass, which is shatterproof, and unobtrusively positioned burglar alarms.
 - Lattice shutters placed inside the shop window providing they do not affect the external appearance of the property.

- 4.51 The mechanism for the shutter should ideally be located, and concealed behind the fascia. On historic buildings external metal shutters of any design will normally be unacceptable.

Suspended ceilings

- 4.52 Modern retailing methods often result in the installation of a false or suspended ceiling within a shop. This can result in unbalanced proportions to the shopfront and a loss of the horizontal lines in the streetscene. As such the installation of suspended ceilings should not result in an extension of the fascia or any other detrimental effect on the frontage. One of the design solutions illustrated below should be used.

Burglar and Fire Alarms

- 4.53 These items are often necessary, but their insensitive siting can be visually detrimental to a building. Sometimes it is preferable to install alarms either near ground level or on upper storeys, where they are less visually intrusive. Ideally they should be incorporated into the design of a shopfront, which is often easy on modern shops. For traditional shops it may be possible to modify a small part of the shopfront, such as one panel of the stallriser, to accommodate such a fitting.

Floodlighting

- 4.54 Floodlighting does not normally require planning permission; however the installation of the necessary light fittings does. Where a listed building is involved consent is required for the light fittings as well as the actual floodlighting. It is often preferable for light fittings to be located at basement level out of view. Consideration must be given to the effect on traffic when positioning light fittings, as the light can sometimes cause confusion to drivers.