

THE CLIMATIC EXPOSURE OF URBAN EDGES AND THE PROSPECTS FOR  
INITIATIVES THROUGH DEVELOPMENT CONTROL

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1.0 Introduction

It is generally agreed that the microclimatic effects of shelter are exceedingly complex, reflecting the interaction of topography, wind conditions, humidity, soil moisture and temperature, air temperature, radiation balance, and diurnal and seasonal climatic changes. However, the new suburban housing estates which often constitute the urban edge are subjected to higher wind levels and wind chill factors than are encountered further in, and would clearly benefit if additional shelter were provided. This shelter could take the form of extensive tree planting between the houses, the use of shelter belts and an increase in the 'roughness' of the landscape beyond the residential development.<sup>1</sup> There is sufficient empirical evidence to suggest that shelter belts can also lead to energy savings in the region of 5 to 10%.<sup>2</sup> The relationships between urban form, microclimatic factors and subsequent and operational and heating costs,<sup>3</sup> and between urban structure, density and climate<sup>4</sup> are also receiving further attention.

2.0 Urban Edge Definition and Characteristics

The green belt boundaries defined in local plans have played an important role in defining the general character of the urban edge, and hence the number of buildings that are likely to front (or back) onto open country. This in turn will determine the scope which exists to secure energy savings and increased levels of outside comfort through landscape planning. Generally speaking, residential development is the dominant land use at the urban edge, regardless of the size of the settlement. It is possible to identify a number of 'typical' residential urban edge typologies:

- \* a clearly defined urban edge with no major breaks;
- \* a clearly defined urban edge penetrated by large wedges of open space;
- \* an indeterminate edge; and
- \* an urban edge which combines elements of the three categories identified above.

The ratio of residential building frontage to open space varies from 1:1 where the urban edge is indeterminate to 3:1 where blocks of terraced housing predominate. In the case of commercial, industrial and institutional uses (such as schools, hospitals, colleges), where the intensity of site coverage is much lower, the ratio is frequently less than 0.5:1. A photographic survey has been undertaken of the landscape elements which are adjacent to the urban edge of Cambridge, Chelsfield and Enfield Chase/Hadley Wood. This survey has demonstrated both the extent and varied character of the actual landscape elements. For present purposes it suffices to note the broad categories of landscape elements which have been identified:



- \* recent landscape planting;
- \* sporadic hedgerows and individual trees;
- \* continuous mature hedgerows and groups of trees;
- \* sporadic lines and/or groups of trees;
- \* mature woodland; and
- \* low cut hedgerows and individual trees.

There is also considerable variation in the amount of landscape 'roughness' that occurs in the open land which adjoins the urban edge.

### 3.0 The Prospective Role of Development Plans and Development Control

#### 3.1 National Policy Framework

The present review of UK agricultural policy has raised important questions about the long term future of 'surplus' agricultural land. Farmers have been advised to consider alternative crops, less intensive methods of food production and a more diversified pattern of land use.<sup>5</sup> This prevailing uncertainty has generated interest in forestry as a farm crop which would generate additional income, create employment, enhance the landscape, provide additional recreational opportunities, and facilitate wildlife conservation. There are also calls for the adoption of a more relaxed attitude to housebuilding in the countryside. Developers are preparing outline plans for new towns at Stone Bassett (Oxfordshire), Foxley Wood (Hampshire), Wilburton (Cambridgeshire) and Fradley Hythe (Staffordshire), notwithstanding the fact that the Tillingham Hall proposal in Essex was refused planning permission in February 1987 following a local public inquiry.<sup>6</sup> There is already a massive demand for commercial and industrial floorspace in the Thames Valley, and developers are now looking for out-of-town shopping centre sites within 15 minutes driving time of the M25 motorway.<sup>7</sup> These alternative land use scenarios highlight the scope which now exists to secure the construction of 'climatically sensitive' site layouts which offer protection from adverse weather conditions and yet still derive maximum benefit from fine weather. They also highlight the need for a comprehensive planning and management framework, and for the establishment of effective partnership arrangements between local authorities, farmers, amenity groups and conservationists.

#### 3.2 The Statutory Planning System

Since its inception in 1947 the system of development plans and development control has responded to the changing needs and priority accorded to agriculture, forestry and conservation, as set out in statements of government policy. It has also responded positively to new issues and problems such as inner city regeneration, oil and natural gas exploration, toxic and hazardous industrial installations, and environmental pollution. There is every reason to believe that the planning system will also respond positively if priority is accorded to the various measures which are advocated in the six studies which have been commissioned by the PSA Landscape Architecture Group in connection with the BRE research programme entitled "Microclimate and the Thermal Performance of Buildings".



### 3.3 Development Plans

The development plan constitutes the means whereby national and regional policies are interpreted in terms of their economic, social, physical and environmental outcomes. It also constitutes the means whereby local issues and problems are brought to the attention of central and local government, other public bodies, private agencies and the general public with a view to influencing both public policy and private sector investment decisions. The development plan provides a land use framework for the day-to-day exercise of development control powers. At present, the development plan for a given area usually consists of the combined provisions of the approved structure plans and an adopted (or approved) local plan. It suffices here to note that the policies in structure and local plans currently make provision (*inter alia*) for the designation of green belts, the protection of agricultural land, the enhancement of landscape (especially on the fringe of urban areas), and wildlife conservation. A recent survey has confirmed that some 25 county planning authorities have also attempted to integrate energy considerations into the structure planning process.<sup>8</sup> There is already considerable support for the view that the energy implications of building design, layout, density and orientation should be addressed in local plans and/or supplementary guidance. In this context it is interesting to note that one structure plan argues that building design, layout and siting should also "take proper account of climate".<sup>9</sup>

### 3.4 Supplementary Planning Guidance

DoE Circular 22/84 advised that there is a continuing role for planning guidance which supplements the policies and proposals in structure and local plans. This guidance may include, for example, practice notes for development control requirements, development briefs, and detailed or sketch layouts for housing and open space. The BRE has already produced a Draft Digest which examines the relationships between geography, topography and local climate of a site and its surroundings. It also provides advice in respect of site layouts which will achieve a 'favourable' microclimate in terms of solar access and wind shelter.<sup>10</sup> The forthcoming PSA Landscape Design Guide will provide detailed advice about the shelter afforded by trees, shrubs, walls and fences.

### 3.5 Development Control

The exercise of control and influence over the location, layout, form and appearance of development is a key feature of the statutory planning system. It is a process which often comes closer to the individual than long term development plans because it seeks, on a site by site basis, to strike a balance between the pressures of technological, economic and social change, and the need to protect the natural and built environment. Section 29(i) of the 1971 Planning Act requires that the local planning authority responsible for determining the planning application must have regard to the provisions of the development plan and to any other material considerations. This highlights the need for appropriate policies to be set out in development plans, and for supplementary planning guidance, to secure the full range of potential benefits which can accrue to planted shelter.

#### 4.0 Urban Edge Planning, Control and Management

4.1 It is considered that the present development plan system, which is soon to be replaced by unitary development plans in the Greater London Boroughs and Metropolitan Districts, constitutes an appropriate mechanism for the formulation, promulgation and implementation of policies for energy conservation in general and shelter belts in particular. These policies could take the form of exhortatory statements which relate either to designated areas or to individual projects as appropriate. Local plans are especially important because they will define the areas to which specified development control policies, including detailed design guidance, can be applied. The adoption of policies which seek to promote wind shelter and/or safeguard solar access, in order to reduce the climatic loadings that partly ignore energy consumption, would appear to be consistent with three of the local plan functions listed in DoE Circular 22/84 (viz provision of a detailed basis for development control, co-ordination and direction of development, and bringing local planning issues before the public). As the green belt local plans prepared by county and district planning authorities already make specific provision for tree planting, landscape enhancement and wildlife conservation, they can easily be amended to include policies in respect of wind shelter and solar access. In view of the progress that has been made on the preparation of design guidance on solar access and the shelter afforded by fences, hedges, shrubs and trees, this is an opportune time to sanction the incorporation of energy-saving policies in the unitary development plans which will shortly be prepared for the 33 London Boroughs and the 36 Metropolitan Districts. Development control powers can then be used to secure the incorporation of energy saving measures, including shelter belts and solar access protection, when determining planning applications.

4.2 Local planning authorities already recognise the important role that landscape features can play in defining the boundary of new development. For example, the Shenley Hospital project, which is set in 72 hectares (180 acres) of green belt close to Elstree, includes an 18 hectares (45 acre) park with a green border to control further development. The area management approach which has been pioneered by the Countryside Commission also constitutes an appropriate operational mechanism for securing the planting, and maintenance, of shelter belts which clearly define the urban edge, create a favourable local climate for development in exposed locations, and constitute a protective buffer zone for urban fringe farming activities. The urban fringe management schemes have already demonstrated that small-scale projects can have a considerable success in improving the urban fringe environment, alleviating conflicts between user groups, and mobilising the resources of volunteers effectively.



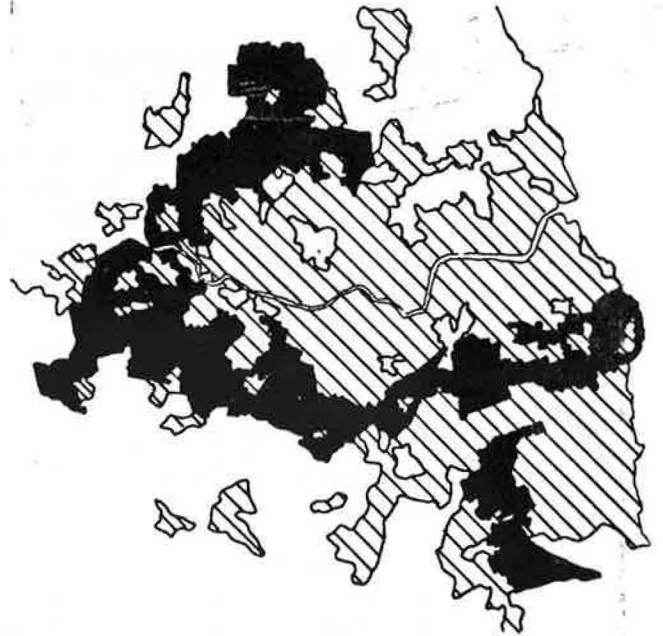
## References

1. U.K. Gerry, Microclimatic Effects of Shelter : With Special Reference to Prediction and to Urban Shelter, 19th July 1987
2. G.F. Mattingley & E.F. Peters, Wind and Trees: Air Infiltration Effects on Energy and Housing, Journal of Industrial Aerodynamics 1977, pp. 1-9. Energy Conservation in Exposed Houses, Oakpark Research Centre in Ireland, Building 19th Feb. 1988 p. 68
3. Pertti Tamminers, The Consideration of Local Climatic Variations in Urban Planning Economics (Part II); Paper presented at the 1987 Building Climatology Symposium, Moscow.
4. Jan O. Matsson, Sven Lindqvist & Lars Barring, Urban Structure, Infill and Climate, Report No. R78, 1986, Swedish Council for Building Research
5. Countryside Commission, New Opportunities for the Countryside: The Report of the Countryside Policy Review Panel, March 1987. SERPLAN, Developing S.E. Regional Strategic Guidance: Report of the Rural Issues Group RPC 923 November 1987
6. The Planner, January 1988 p. 7
7. The Planner, February 1988 p. 71
8. Sue Owens, Strategic Planning and Energy Conservation, Town Planning Review 57, No. 1, 1986 pp. 69-86
9. Powys County Council, Structure Plan Written Statement, 1979 p. 78
10. BRE, Local Climate and Site Development, Draft Digest, September 1985

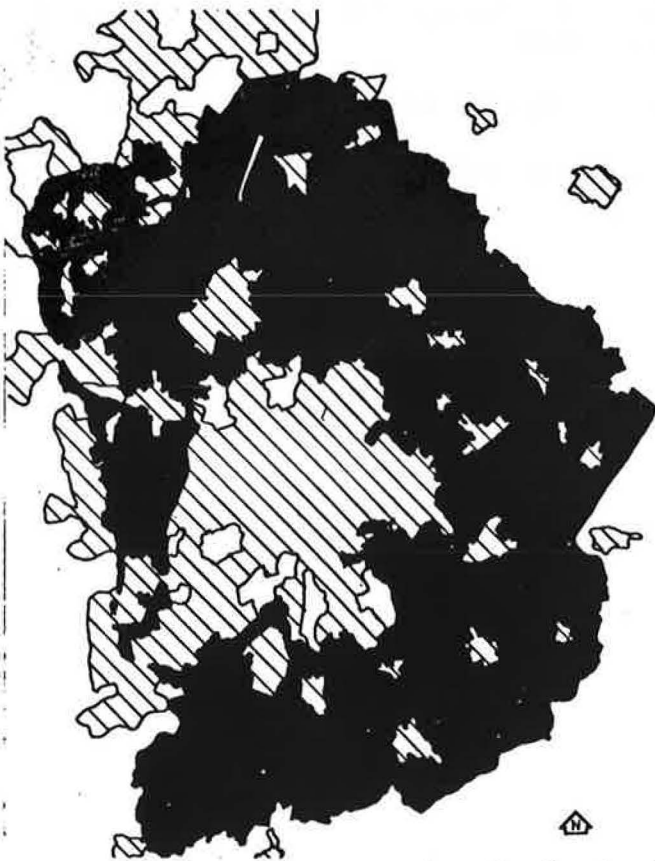
Greater London: Urban Fringe



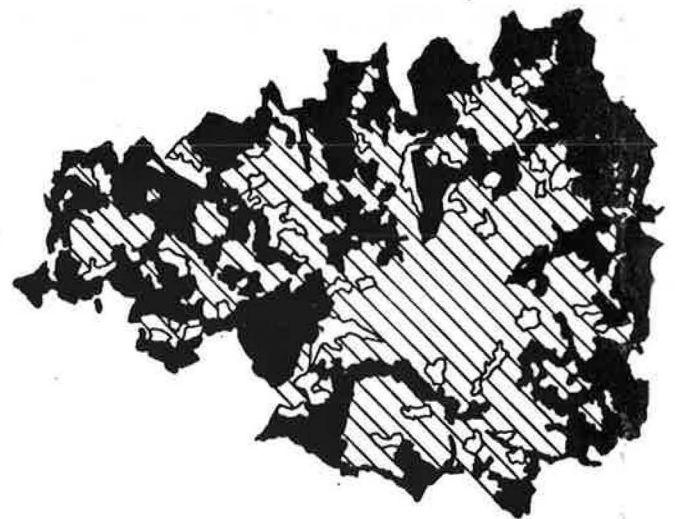
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Nottingham: Urban Fringe



Greater Manchester: Urban Fringe



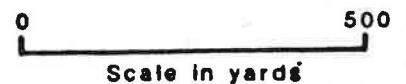
KEY

- Built up Area 
- Green Belt 

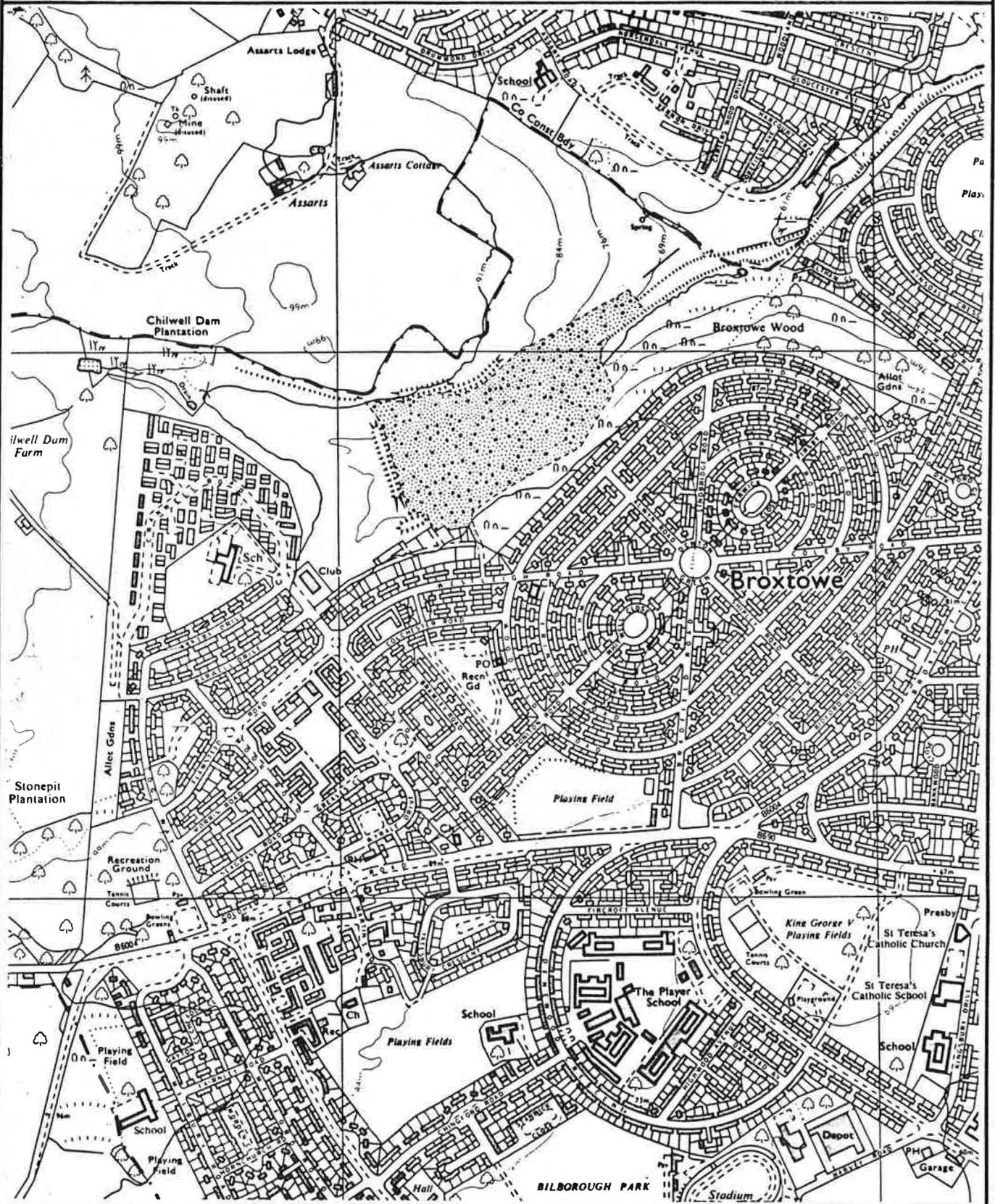
# WEST CAMBRIDGE : URBAN FRINGE



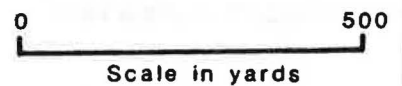
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# WEST NOTTINGHAM : URBAN FRINGE

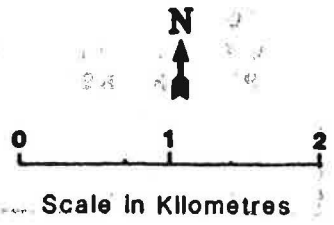
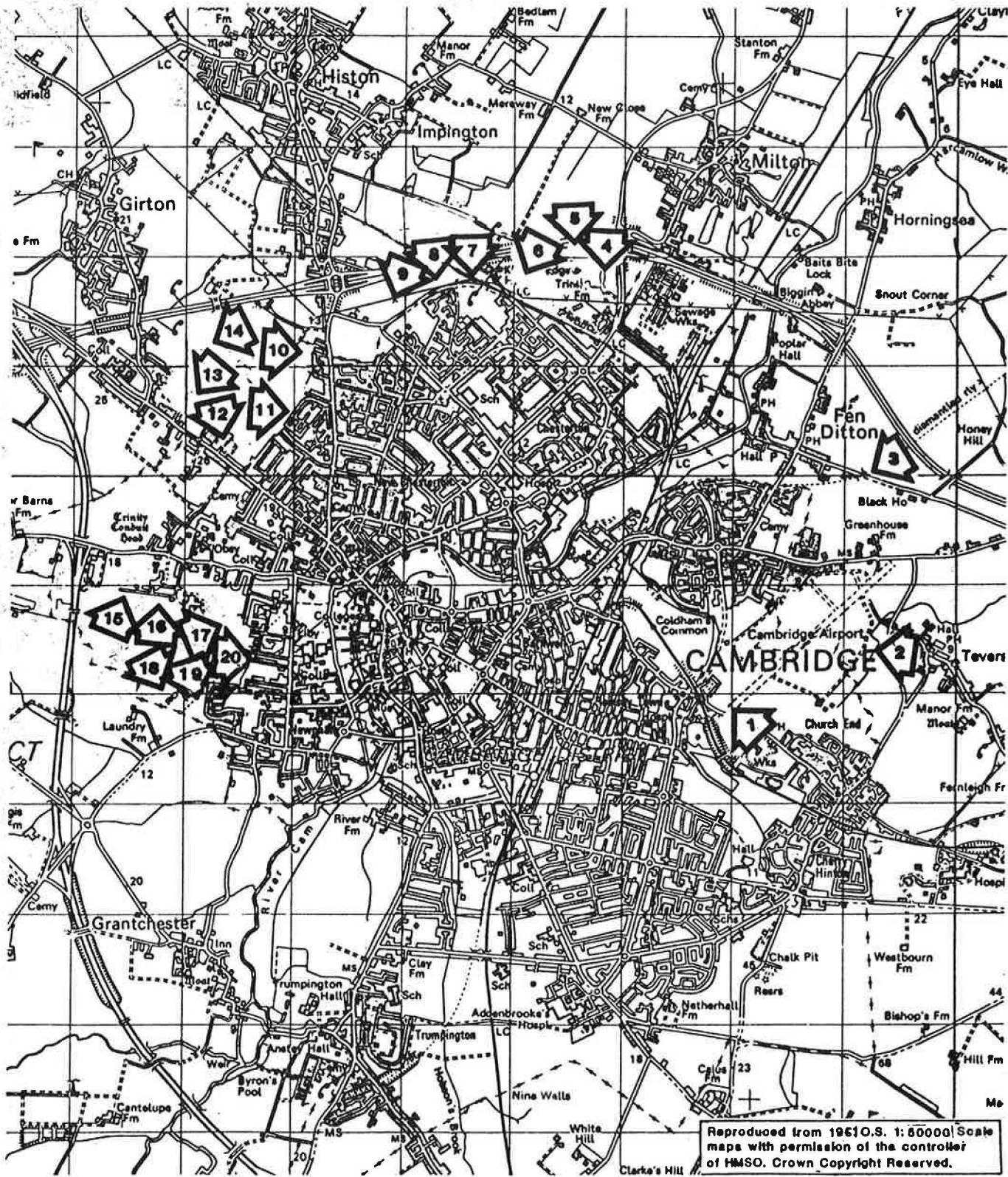


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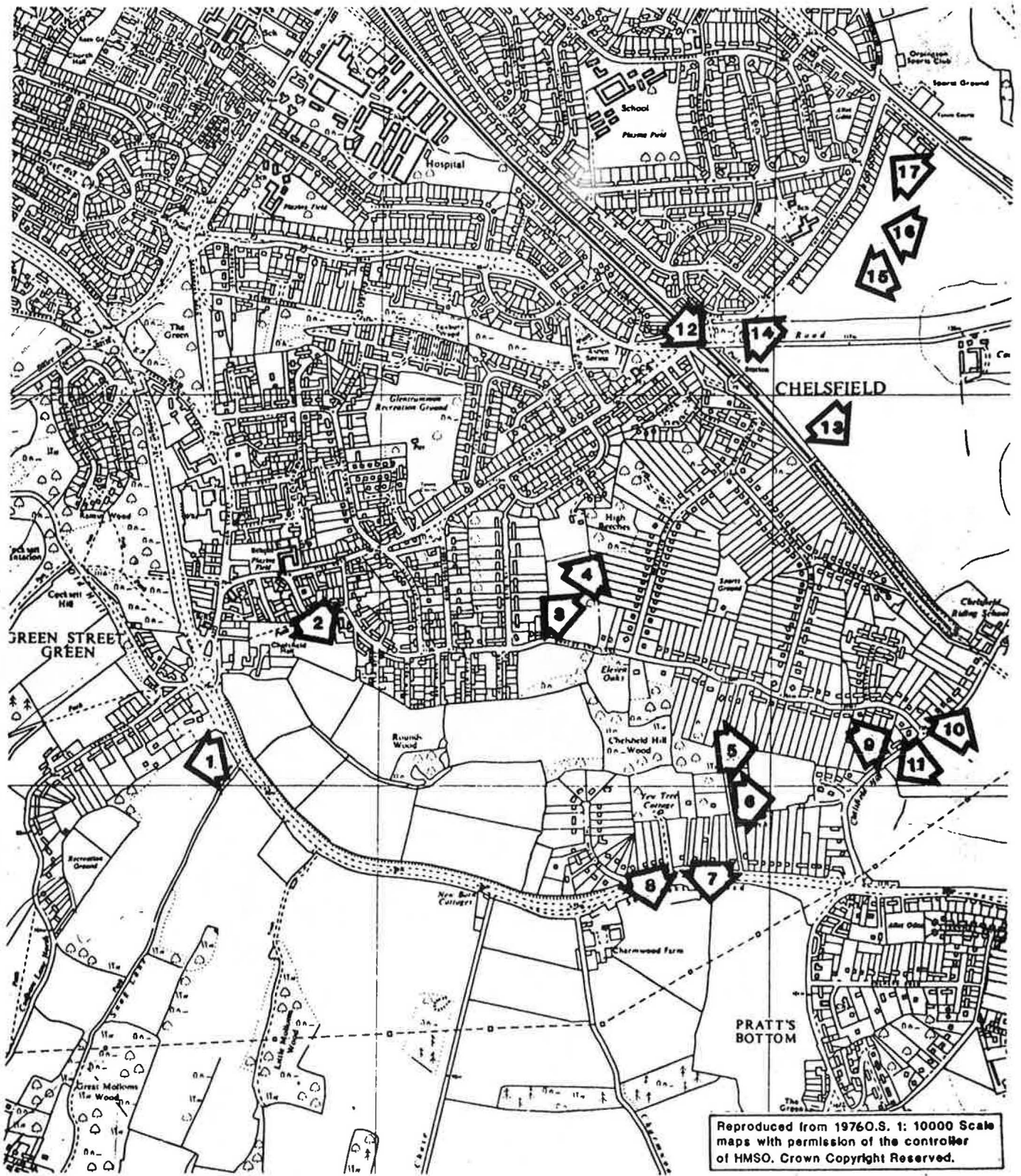




### CAMBRIDGE CITY COUNCIL : Location of Urban Edge Photographs

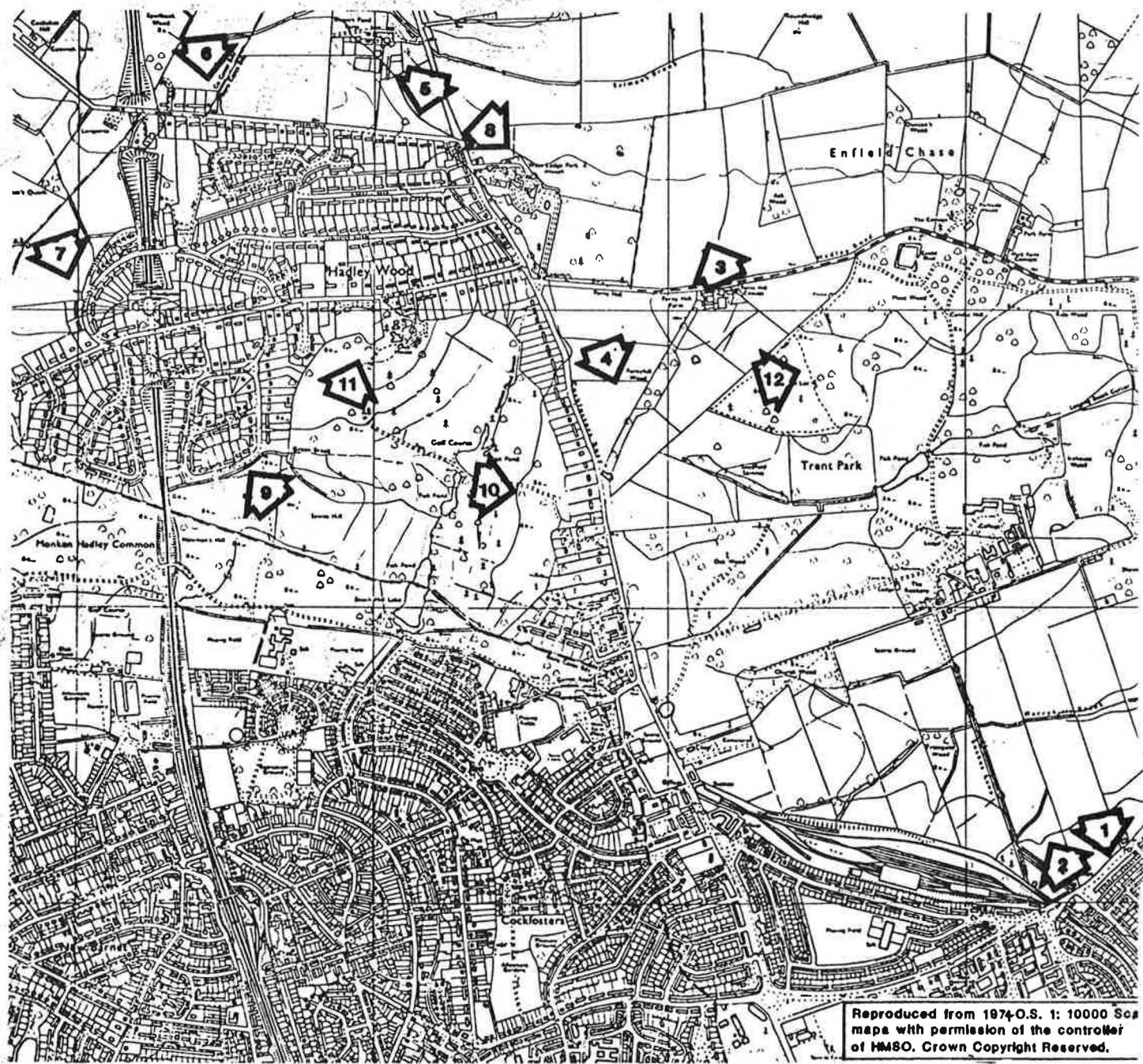


# LONDON BOROUGH OF BROMLEY : Location of Urban Edge Photographs





# LONDON BOROUGH OF ENFIELD : Location of Urban Edge Photographs





View 3

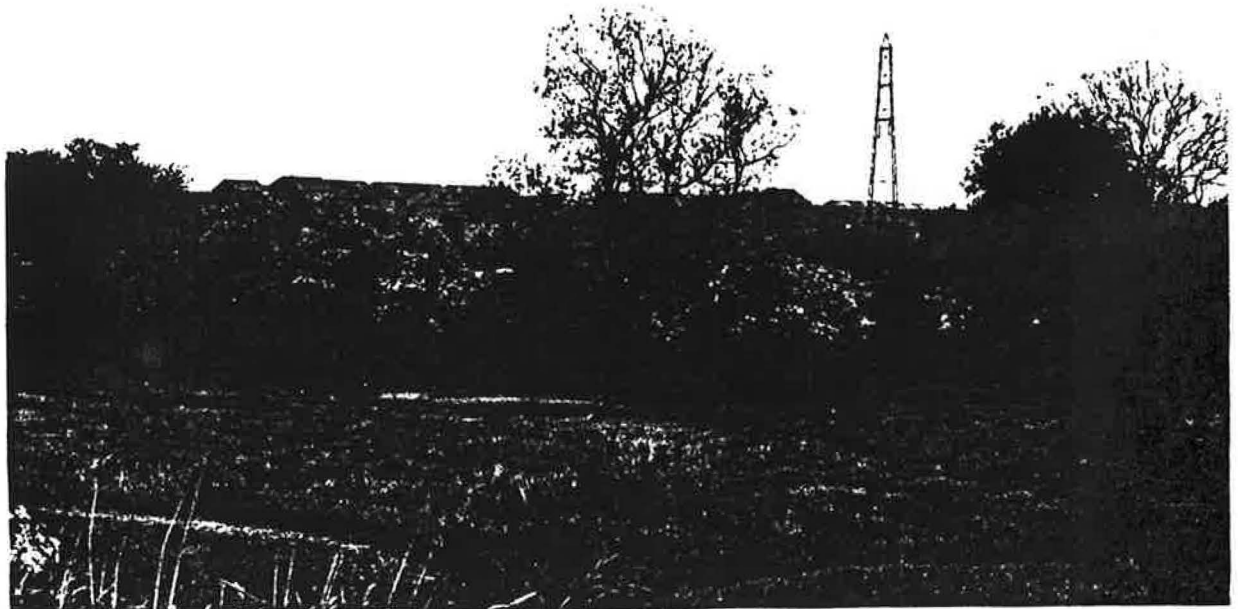


View 4





View 7



View 8



View 9



View 10



View 3



View 4



View 15



View 16