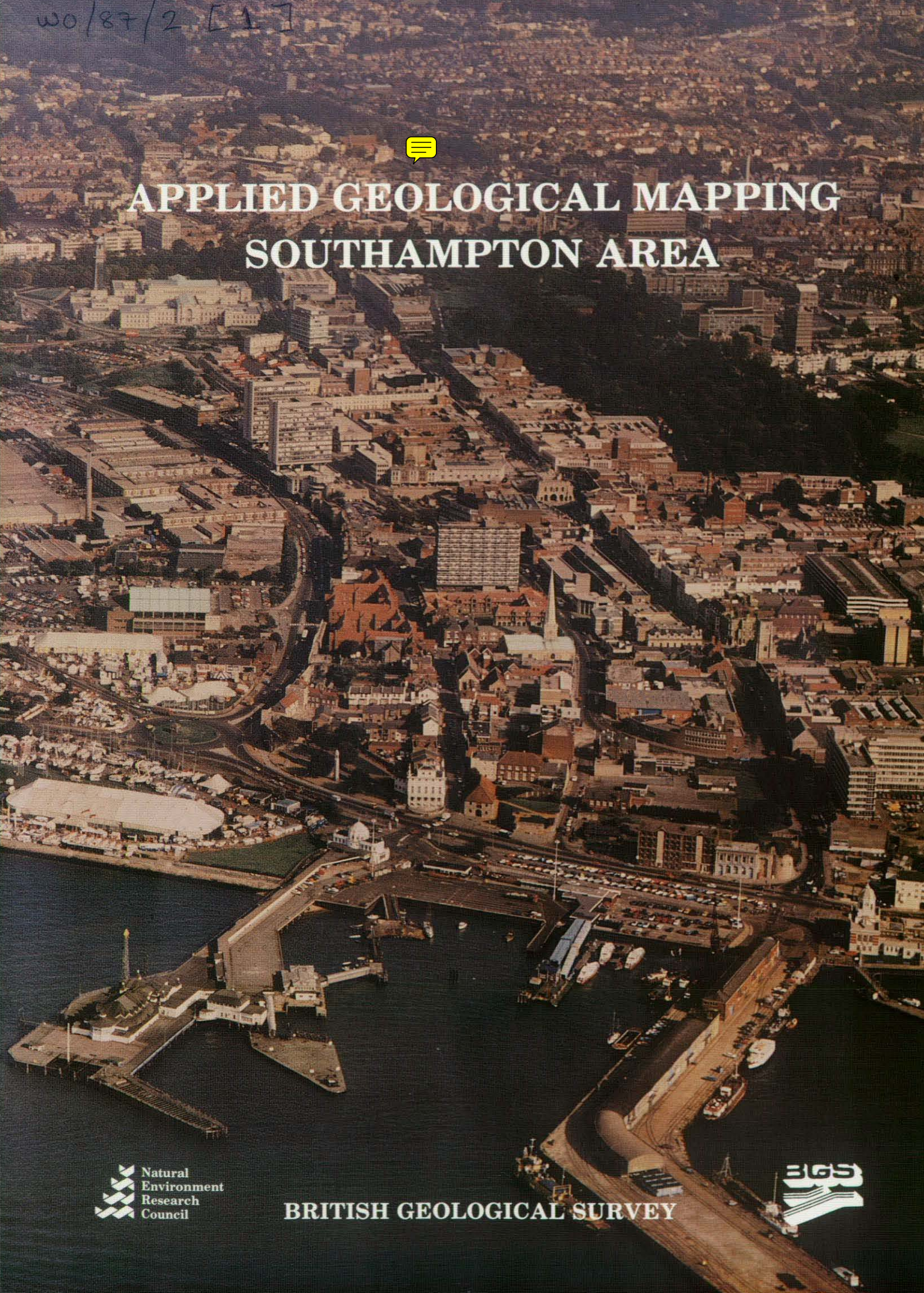


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# APPLIED GEOLOGICAL MAPPING SOUTHAMPTON AREA



BRITISH GEOLOGICAL SURVEY



**Cover photograph**

We see Southampton city centre from the air, looking northwards over the Royal Pier and Mayflower Park (where a Boat show is taking place) in the foreground. The low-lying area in the left centre, occupied mainly by industrial buildings, is formed of reclaimed land over Estuarine Alluvium deposits. Most of the rest of the city is built on River Terrace Deposits overlying formations of the Bracklesham Group.

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**MAPS OF  
MADE GROUND  
(M1-M6)**

**VOLUME 10**

**BGS Research Report ICSO/87/2**

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Natural Environment Research Council  
BRITISH GEOLOGICAL SURVEY

**APPLIED GEOLOGICAL MAPPING  
SOUTHAMPTON AREA**

Area covered by  
1:50 000 Geological sheet No. 315 (Southampton)  
Parts of OS 1:10 000 sheets SU20, SU21, SU22, SU30, SU31,  
SU32, SU40, SU41, SU42, SU50, SU51 and SU52

**VOLUME 10: MAPS OF MADE GROUND**

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*Production of this report was supported by  
the Department of the Environment but the views  
expressed in it are not necessarily those of  
the Department*

*Bibliographic reference*

EDWARDS, R.A., SCRIVENER, R.C. and FORSTER, A. 1987.  
Applied geological mapping: Southampton area.  
*Research Report of the British Geological Survey, No ICSO/87/2, vol 10.*

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## **DESCRIPTION OF THE APPLIED GEOLOGY MAPS**

### **LANDFILL AND WASTE DISPOSAL**

#### **Distribution of Made Ground (Maps M1-M6)**

The identification of Made Ground, particularly infilled land, is an extremely important aspect of land use planning. Apart from presenting problems in foundation conditions for prospective building developments, there are implications in the fields of agriculture and forestry.

Major problems associated with deposits of domestic and industrial waste stem from their low strength and inhomogeneous nature. Large structures built on such deposits may require special foundation designs to overcome possible settlement and differential compaction. Such problems may be particularly important at the boundary of infilled land where structures straddle an area with contrasting ground conditions.

Land that is returned to agriculture after infilling may not be in the same condition as the surrounding natural ground. Differences in drainage characteristics and the nature of the restored upper soil layer may variously affect the type and yield of crops. Attempts to afforest areas of landfill may be affected by the penetration of deep root systems into layers of buried domestic or industrial waste.

The disposal of toxic substances in landfill sites can present special problems affecting the environment. Such waste can be considered in two categories: firstly material which is inherently toxic and secondly, materials which may react to generate toxic or hazardous substances. Examples of the former are a wide range of industrial chemical waste such as mineral acids, cyanide residues and phenols. Some materials rich in cellulose, such as domestic refuse, can break down by the action of bacteria to form methane or undergo combustion to form gases rich in carbon monoxide and these examples would fall in the second category. The potential pollution of aquifers by leachate from waste disposal sites should be considered as a factor in the licensing of sites. The disposition of aquifers is dealt with in the section describing map H.

It is essential that site investigation programmes are designed to take account of the problems outlined above and probe the thickness, lateral extent and composition of Made Ground deposits. This is particularly important where waste

disposal has been effected prior to the licensing regulations of 1976.

The maps of Made Ground at the 1:25 000 scale are based on the 1:10 000 Geological Survey of 1973-80 with updated information from local government and other sources. For the purposes of this study three categories of Made Ground have been shown on the face of the map, namely:-

1. Areas of landfill, in this district most commonly on the sites of former mineral workings. In many instances the type of fill is not known, but in the case of licensed sites (post-1976) or at sites where specific investigation is available an indication of the main fill components is given. The types of fill recognised are hardcore (HC), domestic waste (DW) and industrial waste (IW).
2. Areas of Made Ground raised above the natural surface level and constructed to provide engineering foundations. Examples include embankments for roads and railways, reclamation works for docks and wharves, and the foundations of large building or industrial complexes. In this category there is a general requirement for the fill to possess uniformity and strength and domestic and industrial wastes are generally excluded. For roads, railways and building foundations the fill is usually hardcore derived from cut-and-fill operations or specially imported materials such as chalk rubble. In areas adjoining the rivers, ground has been built up behind retaining structures using dredged mud and silt. These sites are identified where information exists.
3. Some former mineral workings have been partially backfilled with quarry waste and covered with topsoil, and are then left with a lowered surface level. In many cases, a proportion of domestic or industrial waste has been included with the backfill, though the nature and extent of this is seldom known. These partially backfilled sites are placed in a separate category.

The thickness of Made Ground is generally less than 5m, although locally much thicker deposits are present. Owing to the great variability in thickness and the data distribution, it has not been possible to give an indication of thickness on the maps. In particular over much of the urban area of Southampton patches of Made Ground of very variable thickness are present, especially in districts damaged by enemy bombing operations

## Notes to the user

There is considerable variation in the quality and reliability of the source data used to compile this report and the accompanying set of applied geology maps, as well as a great disparity in the density of site investigation data within the study area. Therefore, the accuracy and reliability of the interpreted information reflects that of the source data. However, emphasis has been placed throughout on the most reliable data, particularly those derived from authoritative sources such as geotechnical engineers and geologists.

Thus the report and maps are to be regarded as the *best interpretation of the information available at the time of compilation. They should be used for preliminary studies only and are not intended as a substitute for on-site investigations or detailed local searches.* The responsibility for assuring that geological, geotechnical and mineral and water resource data for any given site are as indicated in the maps and in the figures and text of this report must remain solely that of the user.

The possible occurrence of undetected anomalous site conditions should always be anticipated. The indicated occurrences of mineral deposits do not necessarily imply an economic resource. The possible presence of unmapped variable thicknesses of superficial deposits and Made Ground, particularly within the urban area of Southampton, should also be taken into account in any planning procedures.

There is no substitute for the knowledge provided by a detailed site investigation that takes into consideration the extent, nature and location of a proposed development. Therefore the report and maps are intended a) to give guidance on when to seek specialist advice and b) to aid developers in formulating effective investigations.

No information made available after the end of 1986 has been taken into account in this report.

All National Grid references in the report lie within the 100km square SU. Grid references are given to either eight figures (accurate to within 10m), or six figures for more extensive locations.

Data used in preparing this report and associated maps is lodged at the Exeter office of the British Geological Survey. Any enquiries concerning these documents should be directed to that office. Enquiries concerning the computer techniques or methodology should be directed to the Edinburgh or Keyworth office of the Survey. Enquiries about purchase of the report or maps should be

directed to the National Geosciences Data Centre, British Geological Survey, Keyworth, Nottingham NG12 5GG.



## 2 *Applied geological mapping Southampton area*

in the Second World War.

While the maps show all the data collected in the course of the recent geological survey together with later amendments, they must not be considered an exhaustive or accurate representation of Made Ground in the study area. Old landfill sites, particularly in areas now covered by urban development, are difficult to identify and may be completely obscured. In areas of intensive former mineral working, such as the brick-clay pits of the Swanwick area, the extent of landfill within the worked area is difficult to establish. Careful attention to site investigation must be given when areas of Made Ground are included within the boundaries of any proposed developments.

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