

General Certificate of Secondary Education

GEOGRAPHY SPECIFICATION C (1988) 2401/RB

RESOURCE BOOKLET FOR DECISION MAKING EXERCISE

12 JUNE 2006

Monday

Afternoon

This Resource Booklet should be available to candidates for up to three working weeks prior to this date.

THE ISSUE WHY DO WE STILL BUILD ON FLOOD PLAINS?

INSTRUCTIONS TO CANDIDATES

This Resource Booklet must be handed in to your teacher at the end of each lesson. You must not write on the booklet.

INFORMATION FOR CANDIDATES

The following abbreviations may be used:

MEDC – More Economically Developed Country

LEDC - Less Economically Developed Country

EU – European Union which includes the United Kingdom

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Fig. 1 – Population estimates for England and Wales





Fig. 3 – Households by household type in Britain, 1979 and 2002



What are the plans for new housing?

Thousands of new homes for South-East

Peter Hetherington, Regional Affairs Editor Tuesday July 16, 2002 The Guardian

South-East England was the principal gainer in a housing package which will see tens of thousands of new homes built in the region over the next few years. This will be helped by a fast-track planning regime and the expansion of four key areas. At the same time, a big expansion of affordable housing in London was signalled.

House builders and environmental groups reacted cautiously to a twin-track announcement which tries to balance measures to tackle a shortage of homes in the south, with the growing crisis of collapsing neighbourhoods and negative equity in the north.

Housing specialists, hoping for a big boost for affordable homes, complained last night that the increase in overall housing funding for England from $\pounds4.6m$ this year to $\pounds5.9m$ by 2005-06 fell well below their expectations – and would fail to tackle a shortage in social housing caused by the sale of more than a million council homes over the past 20 years.



Who needs houses?

Number of households in England in temporary accommodation; 1995 – 46000 2003 – 93000

The problems of building on flood plains

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Around 5 million people, in 2 million properties, live in flood risk areas in England and Wales. The Environment Agency has an important role to play in warning people about the risk of flooding and in reducing the likelihood of flooding from rivers and the sea.



Currently, there is no legal obligation on a council to accept the advice of the EA about flooding risks. However, it is the homeowners who suffer most.



Flood defences are meant to protect housing and keep excess water on the Washland



Flooding in Barlby, November 2003

Fears for new homes planned for green belt flood plains

The Environment Agency has predicted that some 340,000 new homes could be built on flood plains in England and Wales over the next two decades. In the same period, winter rains will increase by 30% and summer deluges will become more frequent.

Despite the Agency's advice that local authorities should not allow home building because of flood risks, a fifth of projects it objects to still get approved. Figures in a recent report reveal that in 2003 the EA objected to 2,426 planning applications because of flood risk. Yet local authorities approved 512 of these against the Agency's advice.

Flooding in Sussex in 2000

Lifeboats join flood rescue

Lifeboat crews from across the South of England joined a major rescue operation after floods caused millions of pounds of damage to new homes and businesses. RNLI volunteers from Poole, Shoreham, Brighton, Eastbourne and Hastings helped flood victims in Uckfield, the worst hit town in the South East, which was also threatened by an incoming tide.

Five inflatable lifeboats and more than 20 members of the RNLI carried people from their flooded homes and shops to rest centres throughout the town, which was devastated when a river burst its banks.

A shopkeeper was swept away by the fast flowing floods. A search was launched at 7.20 a.m. and 20 minutes later he was spotted in the river clinging on for his life. Cold and shivering, he was rescued by coastguard helicopter. He had only moved into his new shop a few weeks before.

<u>The floods that turned a</u> <u>town centre into a lake</u>

Uckfield, Sussex, 2000

A group of 20 men, women and children were trapped in a supermarket by flood waters and were rescued by lifeboat.





Traders start mopping up in Bell Walk, Uckfield

The Thames Gateway

Most of these houses will be in London and Essex, with the potential of Kent in the longer term. Experts believe that the area is ideal because it is close to Central London and has a high proportion of brownfield sites. However, in choosing the Thames Gateway, planners are asking people to set up home It is estimated that eventually the Thames Gateway might provide over 110,000 new houses in the South-East, with 70,000 new houses built by 2006. in some places at risk from flooding.



pefore starting to build."

river will have tiered flood defences that allow it to rise along steps."

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Some alternative flood control methods



Water-Inflated Property Protector deployed in actual flood conditions

The WIPP[™] flood protection system and flood control products provide effective flood protection and prevent costly flood damage. Simply use any available water source – even the flood water – to rapidly inflate the WIPP.



WIPP flood protection systems are reusable, safe and affordable, and provide an excellent alternative to the expense of sandbags.

The 90 cm high \times 30 m long WIPP system pictured above weighs **120 kg** prior to inflation. A comparable size 90 cm \times 30 m wall of sandbags consists of 3,450 22.5 kg bags weighing a total of **77,625 kg** (77.625 tonnes).



Financial costs of living in flood plain locations

Storm clouds gathering; British householders count the cost of climate change

- Cover against flooding has been a standard feature of household insurance policies since the 1960s.
 Floods are becoming more widespread and more costly. Climate changes, including heavier rain, are a cause.
- Other causes include an increase in the building of new homes on flood plains and poor maintenance of flood defences.
- Autumn 2000 was the wettest in the UK in over 270 years. Unprecedented rainfall led to flooding in around 700 locations in England and Wales. Approximately 10,000 properties were damaged. The insurance bill was over £1bn.
- Of the 21 million properties in England and Wales, around 1.8 million are at risk from flooding.
- Average annual building and contents premiums cost £159 and £132 respectively. (Source: ABI)



Rising damp: a 17th century home up for sale in Bewdley

Value of riverside homes about to slide

PROPERTY owners in once desirable riverside locations are seeing tens of thousands of pounds knocked off the value of their homes by the floods.

Families whose homes have been swamped while up for sale are counting the cost of buyers being scared off by the prospect of soaring insurance premiums and difficulty obtaining a mortgage, as well as the clean-up.

Estate agents warned that anyone whose property had flooded more than once this year would be best advised to take it off the market.

(Source: Western Daily Press)

Good news for flood victims

Thousands of householders living in flood risk areas received a major boost after insurance firms pledged to provide cover beyond the end of the year. The Association of British Insurers (ABI) announced that its members would continue to provide a competitive market for the vast majority of homeowners and small businesses.

However, it emerged that some families could still lose out after the ABI added that it could not guarantee cover would be offered for all properties, and premiums would reflect the risks involved.

About 2 million UK homes and businesses are on flood plains, but 75% are protected to the Government's minimum standard and would still be insured as long as flood defences were in place by 2007.

When improvements in flood defences were planned, the ABI would use its best efforts to continue to provide cover. Insurers will work with policyholders on steps to make properties insurable such as flood control methods including sandbags and sealing off houses.

The ABI said that the new principles for offering flood cover would be reviewed annually. The practice of offering cover to all policyholders in flood risk areas was no longer considered viable.

(Source: Western Daily Press)

A possible idea for the future

Sink or swim

In times of flood, these houses rise to the occasion.



Holland is Europe's most densely occupied country and 67% of the Dutch live below sea level. If there are to be more houses, more land will have to be created for them or they will have to be built near water. There are minor floods every two or three years and a combination of dykes, canals and windmills driving pumps, have kept the land safe. However, according to the UN, rainfall will increase by 25% and sea level will rise 8 cm. during this century.

Dr. Chris Zevenbergen, of the construction company Dura Vermeer, believes the solution is to build amphibious houses on flood plains. "Floating houses could make up 40% of the shortfall in land suitable for development in Holland over the next 50 years."

Boats can be moored alongside. The houses are bright, breezy and split-level, modern and popular with residents. Views from the bedroom and living room balconies across the River Maas are a delight. The 80 sq. metre houses have sold for £175,000, a little pricey for Holland, but the cost of building the flood-proof bases is cheaper than building foundations on dry land.

Increasingly, Britain is experiencing floods on a major scale, but future residents of the Thames Gateway are unlikely to live in amphibious homes. In Britain we are suspicious of such nonsense as floating homes. We will brave out future floods with sandbags and wellies, just as we have done in the past. Britain likes cheap, bland housing aimed at meeting government construction targets and satisfying the market economy. Floods, however, do not care about the market economy. (*Source: Independent on Sunday*)

Flooding in York 2000

ENVIRONMENT AGENCY

Objectives of Floodplain policy

- development should not take place which has an unacceptable risk of flooding, leading to danger to life, damage to property and wasteful expenditure on remedial works;
- development should not create or exacerbate flooding elsewhere;
- development should not take place which prejudices possible works to reduce flood risk;
- development should not cause unacceptable detriment to the environment;
- natural floodplain areas are retained and where practicable restored in order to fulfil their natural functions.

wo rivers run through the centre of York; the River Ouse and the River Foss. The Ouse has a dense drainage network and a large drainage basin, so water from a large catchment area flows through York (Fig. 1).

The city is built on an area of low-lying land, but the tributaries of the Ouse rise in the Pennines, a highland area fed by relief rainfall. The flow of the river in these upland areas is fast and a lot of sediment is transported, but when the river reaches the flat Vale of York it slows down and deposition occurs. This makes the river channel shallower, so less water is needed in order for the level in the river to rise.

The water table is generally high in York due to the clay soil. In addition, like many cities, York has experienced a lot of new building

Fig. 1 The catchment of the River Ouse, Yorkshire



in recent years, including residential developments next to the river. The increasing amount of land covered by buildings and roads, together with the clay soil, means there is

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little infiltration. This in turn leads to increased surface runoff, so rainwater reaches the river more quickly, and the river rises fast.



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Fig. 2 Map of York showing the location of flood defences



Flood protection

York has many ways of protecting itself from flooding, including natural floodplains and built defences (see Fig. 2)

- **Clifton Ings** is a natural floodplain that can store up to 2.3 million cubic metres of water. In 1982 sluice gates were installed to allow greater control of the water and the floodbanks were raised at a cost of £1.25 million.
- In 1983 the **Bootham area** was protected by a 650 metre earth floodbank and a 280 metre reinforced concrete flood wall. In this area there are many houses and small B&Bs backing onto the river. They have metal gates at the

bottom of the gardens which can be used to prevent floodwater reaching the houses.

In the nearby North Street area floodgates and walls have been built. A main trunk sewer here can also be isolated and pumped out. The pumping station was built in a secluded corner of the Museum Gardens, to minimise its visual impact.



- The Leeman Road area flooded badly during the 1982 flood as high winds created waves over Clifton Ings, and the water overtopped the defences. In response the floodbank was raised. Had this not been done then hundreds more houses would have been flooded in November 2000.
- The largest flood defence in York is the Foss Barrier, built at a cost of £3.4 million in 1987. Eight 2401/RB Jun06

pumps lift water from the River Foss into the Ouse to avoid the water 'backing up' at the confluence of the two rivers and flooding the houses in North York. The Foss Barrier is vital for the city of York in times of flood. When flooding was at its peak in November 2000, it cost £11,000 to power the pumps for a week.

Flooding in York 2000 (continued)



Why did York flood?

York is prone to flooding and records of flood heights go back to the thirteenth century. At the end of October and early November 2000 more than 125 mm of rain fell in 8 days. Because this followed a longer period of wet weather much of the catchment area was already saturated and flooding was inevitable. The River Ouse rose rapidly and peaked on 4 November at 5.38 metres above normal level — the highest for 375 years. The city's defences had been built to hold up to 5.43 metres above normal.

Huge sums of money had been spent on protecting the city, including a total of ± 8 million on flood defences in the years leading up to November 2000. In fact the flood defences in York held, but the exceptionally high water level inevitably resulted in some flooding. More than 350 houses were flooded and 3,000 people were put on evacuation alert.

The effects of the floods

There were both long-term and short-term effects of the flooding. During the week of the flood only two out of ten roads into the city centre remained open. Other major transport routes were disrupted when 1,000 tonnes of earth slid onto the A59. The northbound carriageway of the A1 was closed and trains were cancelled because the railway station and tracks lie adjacent to the river were waterlogged.

A special control room was set up to monitor the river — council staff abandoned their normal work to help with the floods. More than 5,000 sandbags were used to prevent homes from being flooded.

The failure of two of the Foss Barrier pumps led to flooding in the north of York.

Businesses closed during the floods, but effects were felt long after the waters had subsided. The economic effects were huge, because many buildings had to be gutted due to water and structural damage. Some residents who live near the river now find that they cannot get home insurance because of the risk of their property flooding. Even those who were not flooded suffered as fewer people visited York in the months following the floods. This had serious consequences for a city in which tourism is a major source of income.

In rural areas crops were destroyed as fields lay under water for days, if not months. The water table remained high for the entire winter and even small amounts of rain led to standing water in the fields because the ground was saturated. In the months following the floods 1,600 bridges across North Yorkshire had to be checked for structural damage.

After the floods

It is acknowledged that the flood in 2000 was a one in 400-year event. Although the effect on some people was great, the majority of the city was saved from the water. In October 2001 the government granted an extra £1.5 million towards flood defences in the region. Most of this money will be spent in the Malton area, close to the River Derwent, rather than in York itself. York held a flood forum in October 2002 and the Environment Agency commended the city by saying that it was not the victim of flooding but an example of good flood defences, helping to protect thousands of homes from flooding.