ADDRESS

Cooling towers, SHEFFIELD

Parish SHEFFIELD
District SHEFFIELD
County SOUTH YORKSHIRE

Case UID: 160559

Date First Listed:

Formerly Listed As:

RECOMMENDATION

Adviser: Mr E Branse-Instone

Outcome: No, do not list Recommended Grade: NL 16-FEB-2006

Advice Text: After examining all the papers on this file and other relevant information and having carefully considered the architectural and historic interest of this case, the criteria for listing are not fulfilled.

CONTEXT

The cooling towers are the principal surviving features of the former Blackburn Meadows electricity generating station. They were not demolished with the rest of the plant in the 1970s because of their close proximity to the Tinsley Viaduct carrying the M1 motorway. Strengthening work on the viaduct has recently finished and the owners of the site now believe that they can safely demolish the towers. The owners are currently in discussion with the Highways Agency and Sheffield City Council. They hope to demolish the towers this year, perhaps as early as April.

The towers were assessed during the national survey of the electricity industry for the Monuments Protection Programme in 1995. They were initially recommended for consideration for Listing and then (following the public consultation of the survey report) for designation via Scheduling. To date, along with most recommendations made by this survey, the recommendations for Blackburn Meadows have not been followed up. Instead this assessment has been prompted by two independent requests.

DESCRIPTION

The two cooling towers are both reinforced concrete structures of typical hyperbolic form, about 70m tall and 50m in diameter at the base narrowing to just over 20m at the throat before widening slightly to the top. They are smaller than examples typically still in use, but are not as plain in appearance. They have a projecting band encircling their throats with regular perforations above and are capped with a coping course. The perforations of the northern tower consist of a single band of diamonds, with those of the southern tower being two offset bands of vertical slits. Externally around the base of the shell there is a large concrete water channel which also does not appear to be a feature of more modern designs. Internally there is very little surviving evidence of the original complex structure that would have filled the lower 5m or so of the towers. This would have included a complex network of water pipes with spray nozzles, staging and screens constructed from timber or asbestos, as well as maintenance access-ways.

The two towers show clear evidence of deterioration including spalling concrete exposing rusting reinforcing rods and both cracks and bulges in the shell. Both towers also have missing supporting legs that are thought to have been removed to allow the stripping of their interiors. According to the owners, the shell thickness (which for most of their height is less than 12cm) is thinner than

considered safe today. The northern tower had an additional spray coat of concrete to increase its weight and stability following the collapse of three towers at Ferrybridge in 1964.

HISTORY
Blackburn Meadows electricity generating station was built by the Sheffield Corporation in 1921, mainly to support the steel industry in the Lower Don Valley. The station was expanded in the 1930s, requiring the construction of Cooling Towers 6 and 7 in 1937-8 to supplement earlier square cooling towers to the north east. These new hyperbolic shaped towers were designed by LG Mouchell and Partners. This was the same partnership responsible for the first hyperbolic cooling towers in the country (built in Liverpool in 1925) and some 150 towers subsequently built across the United Kingdom. Blackburn Meadows was one of those power stations nationalised to form part of the National Grid after the Second World War. It was decommissioned and mainly demolished in the 1970s.

ASSESSMENT
The Blackburn Meadows cooling towers are nationally rare surviving remains of pre-nationalisation large scale electricity generation. They are thought to be the only pre-1950 hyperbolic cooling towers surviving nationally, with nearly all the other 500 or so towers in the country dating to 1960 or later. In addition to their early date, the association with LG Mouchell, the design features such as the banding and the thinness of the shell all give the towers interest. The addition of the spray coating of concrete following the 1964 disaster at Ferrybridge adds further interest by showing a development in the industry. Even without the clouds of steam that signify operational examples, the cooling towers are also very prominent landmark features, providing a visual indication of the former scale and importance of the Sheffield steel industry in the Lower Don Valley.

However the two hyperbolic cooling towers are just one component of an extensive complex that formerly existed. The plant at Blackburn Meadows generated electricity by using steam turbines to turn electric generators, with the steam produced using coal fired boilers, the coal supplied by rail. The railway system, coal handling plant, boiler complex, turbine and generating halls, as well as the switchgear for connecting the plant to the electricity grid and the earlier square cooling towers have all been lost. Water used by the steam turbines would have been maintained within a closed system, the steam leaving the turbine then passing through a condenser to change it back to hot water before being reboiled to produce steam to turn the turbine. The cooling towers were used to cool water circulating in a separate system that was used to cool the condensers other equipment. With the demolition of the rest of the generating station, the surviving cooling towers have lost their context so it is difficult to see how they functioned as an integrated part of a much wider plant.

Functionally, cooling towers still in use consist of far more than just the shell of the tower that survives at Blackburn Meadows. In operation, water is piped into the lower portion of the cooling tower into a complex network of pipes or troughs ending with sprinklers. A fine mist of water is then sprayed on to a timber or asbestos lattice of staging and screens filling the lower 4-5m of the tower, with the water being cooled via natural evaporation aided by air being drawn upwards by the tower above. Any water droplets carried by this updraft are intercepted by a layer of louvers positioned above the sprinklers. In addition, operational cooling towers have a network of maintenance access ways. All bar one pipe in one of the towers has been stripped out from the cooling towers at Blackburn Meadows, leaving very little indication of how the towers actually functioned.

The Blackburn Meadows cooling towers are thus not only a very partial survival of an electricity generating station, they are also only a very partial survival of a pair of cooling towers. Even given

the national context of the highly fragmentary survival of the pre-nationalisation power generation industry, designation of the Blackburn Meadows cooling towers cannot be justified. The rest of the generating station has been lost, depriving the towers of their functional context and the loss of pipe work, staging, screens and access ways means that a highly significant part of the interest of the towers as cooling towers has also been lost.

CONCLUSION
Although of some interest as the earliest surviving hyperbolic cooling towers, and of clear local prominence, the Blackburn Meadows towers are too poorly preserved to merit designation via scheduling or listing.

Conclusion:

Reasons For Designation Decision:

Built in the late 1930s, the Blackburn Meadows cooling towers are the earliest known surviving cooling towers of hyperbolic form and a nationally rare surviving fragment of large scale electricity generation pre-dating nationalisation. Unfortunately the near complete loss of internal features (the key to understanding the operation of the towers) as well as the clearance of the rest of the power station, means that they do not merit designation either by listing or scheduling. Being a fragment of a larger complex and surviving as little more than the outer shell of formerly complex operational structures, the two cooling towers do not meet the criteria for national designation.

VISITS

15-FEB-2006 Full inspection

COUNTERSIGNING

First Countersigning Adviser: Mr R Hawkins

Comments: Agreed. The cooling towers are the highly prominent but fragmentary remains of a power generation plant built to serve the needs of Sheffield's C20 steel industry, particularly electric arc melting. All of the other component elements, including the generators have been demolished, and the towers themselves have been stripped of their internal equipment by means of which the towers functioned. They remain as the visible reminders of power generation in the vicinity, but are not in themselves of sufficient special interest to justify designation.

10-March-2006

Second Countersigning Adviser: Dr R Bowdler

Comments: Agreed also. This case has been discussed with the Heritage Protection Director also. Although early examples of their type, these towers have undergone considerable alteration and their undoubted visual presence does not in itself offset the loss of fabric and context. They are not, therefore, suitable for designation. 10.04.06

HP Director:

Comments: