



# LANCASTER BY-PASS

## OFFICIAL OPENING

ON THE 11th APRIL, 1960

BY

Dr. Rt. Hon. CHARLES HILL, M.P.  
CHANCELLOR OF THE DUCHY OF LANCASTER

LANCASHIRE COUNTY COUNCIL  
HIGHWAYS AND BRIDGES COMMITTEE

---

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COUNTY ALDERMAN SIR ALFRED BATES, M.C., D.L. (*Vice-Chairman of the County Council*)  
COUNTY ALDERMAN J. SELWYN JONES, J.P. (*Chairman of the Finance Committee*)

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COUNTY ALDERMAN C. W. DOODSON

**Vice-Chairman :**

COUNTY ALDERMAN SIR THOMAS HARGREAVES, J.P., M.I.H.E.

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**Officers :**

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*Clerk of the County Council.*

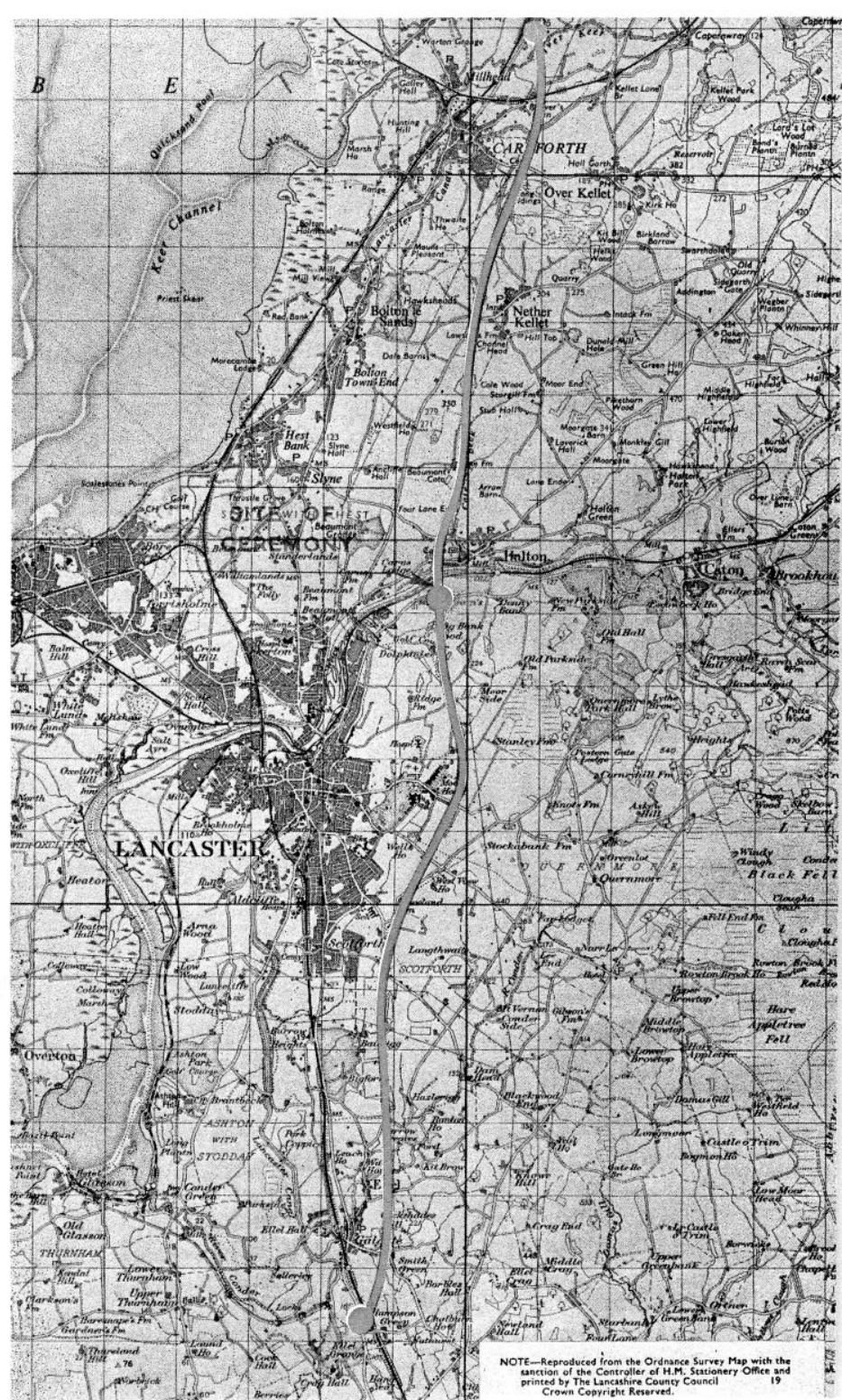
JAMES DRAKE, B.SC., M.I.C.E., M.I.MUN.E., F.I.H.E.,  
*County Surveyor and Bridgmaster.*

HAMPSON GREEN.—NORTH OF CARNFORTH SPECIAL ROAD

## Lancaster By-pass

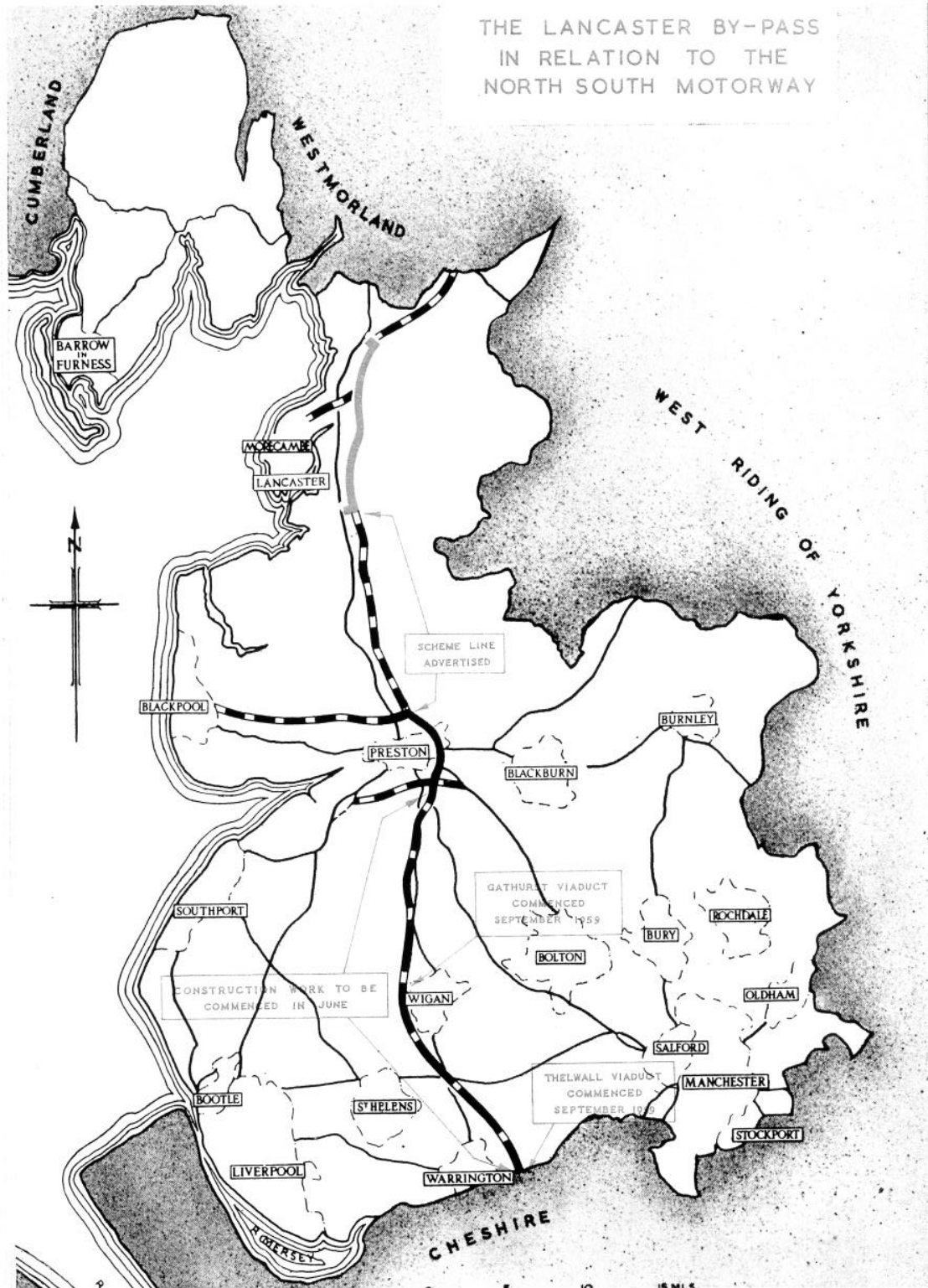
The plan for the construction of a North-South Motorway through Lancashire was accepted in principle by the County Council in 1937. It was not until 1949 however that the Special Roads Act provided the powers necessary for the construction of Motorways. The first section of the route to be completed was the Preston By-pass, opened by the Prime Minister, the Rt. Hon. Harold Macmillan, M.P., on the 5th of December, 1958.

The Lancaster By-pass is the second section of the route to be completed in Lancashire. It is 11.62 miles long of which 1.57 miles are in the City of Lancaster, 0.83 miles in the Urban District of Carnforth, 3.35 miles in the Rural District of Lancaster and 5.87 miles in the Rural District of Lunesdale.



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THE LANCASTER BY-PASS  
IN RELATION TO THE  
NORTH SOUTH MOTORWAY



The Minister of Transport in May, 1953, intimated his intention of making a "Scheme" under the Special Roads Act, 1949, for the Lancaster By-pass and the expanded road programme announced by the Minister in February, 1955, provided for the construction to commence in 1957-58. The County Council in October, 1955, were invited, as Agents for the Minister of Transport, to prepare the necessary contract documents for the road and bridge works.

Tenders were invited in March, 1957, and subsequently the acceptance of the lowest tender, viz., that of Sir Lindsay Parkinson & Company, Limited, amounting to £3,186,388, was approved by the Minister of Transport and the County Highways and Bridges Committee.

The inauguration ceremony was performed on the 5th July, 1957, by County Alderman Thomas Hargreaves, now Sir Thomas Hargreaves, who was Chairman of the County Highways and Bridges Committee at that time. The ceremony was to have been performed by the then Minister of Transport and Civil Aviation, the Rt. Hon. Harold A. Watkinson, M.P., who unfortunately was prevented from attending due to engine trouble developing in his aircraft.

The opening of the By-pass will afford much needed relief to the existing heavily trafficked and congested Trunk Road A6 and will represent a valuable contribution to the Motorway system for Lancashire.

PLAN OF MOTORWAYS IN LANCASTIRE



The Lancaster By-pass commences in the south at a new roundabout at Hampson Green. Shortly after leaving this roundabout the route is carried over the main West Coast Railway Line and curves sharply towards the north. The carriageways on this curve have a temporary surface: when the Motorway is continued southwards from Hampson Green to Broughton, linking the Lancaster and Preston By-passes, the carriageways on this section will be incorporated in the two level junction to be constructed to retain connection with A6.

On rounding the sharp curve a fine view opens out with pleasantly undulating countryside in the foreground and the Pennines in the background.

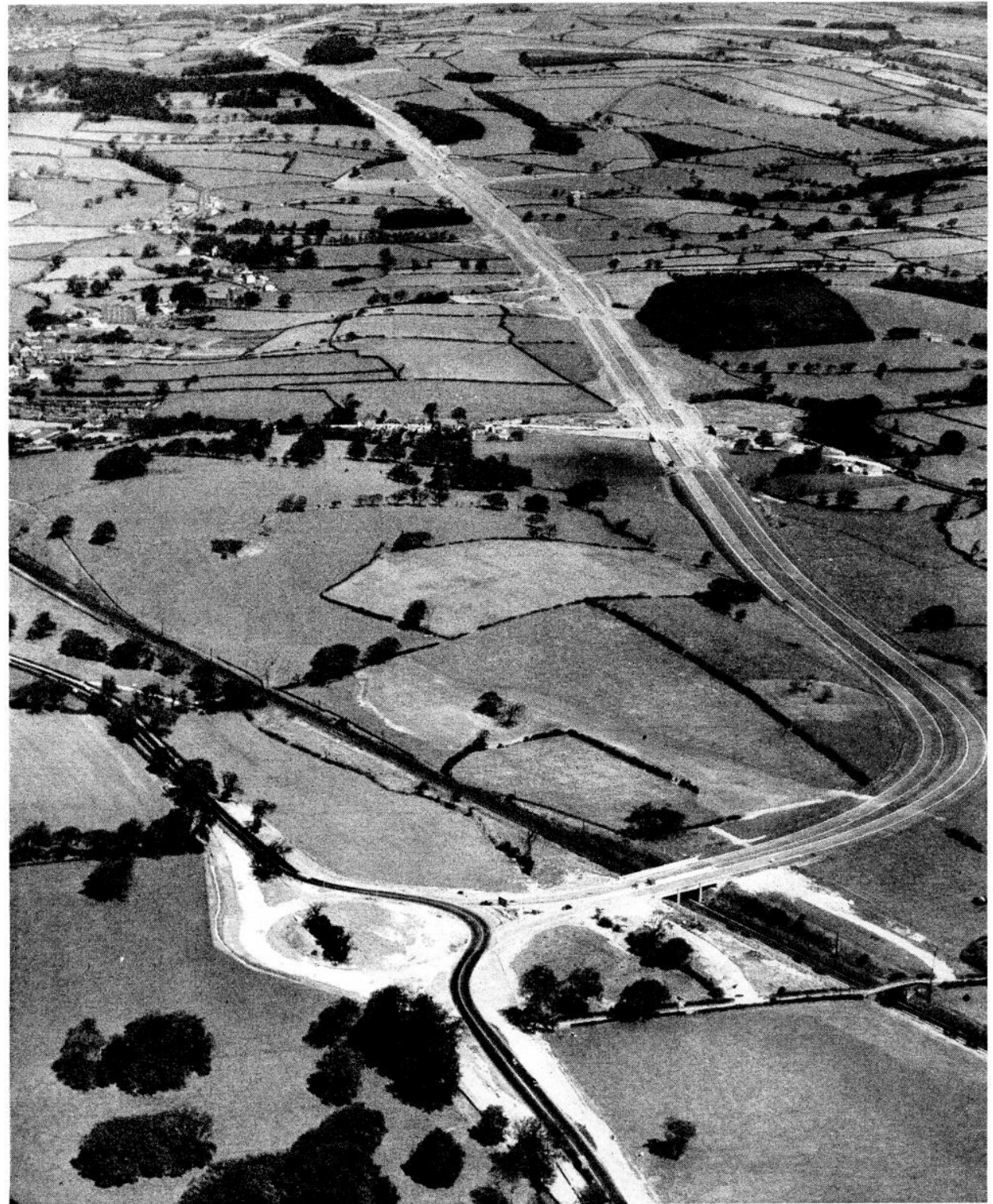


PLATE I.  
AERIAL VIEW OF HAMPSON GREEN SHOWING  
ROUNDBOUT AND SOUTHERN END OF THE  
BY-PASS.

(Photograph by Airviews (M/c), Limited by courtesy of Sir Lindsay  
Parkinson & Company, Limited.)

The road now passes over Stoney Lane Bridge, under Cockshades Footbridge, over Langshaw Bridge and Sill House Bridge. Sill House Bridge forms an interesting feature on this part of the route where a double decked bridge has been constructed (Plate 2). The lower deck carries a farm access road and public right of way over the River Conder and the upper deck carries the Motorway.

Proceeding northwards the road crosses Barrow Greaves Bridge and continues through Bailrigg Wood Cutting which forms a very pleasant setting. On emerging from the confines of the wood Bailrigg Ravine is crossed beyond which a very fine view is obtained of Morecambe Bay and the Lakeland Hills.

The road then swings gently to the north-east passing under Bowerham Lane Bridge and Hala Carr Occupation Bridge rising to the highest point on the By-pass, 340 ft. above sea level, south of the road leading to the Trough of Bowland. The City of Lancaster and the Ashton Memorial lies to the west.

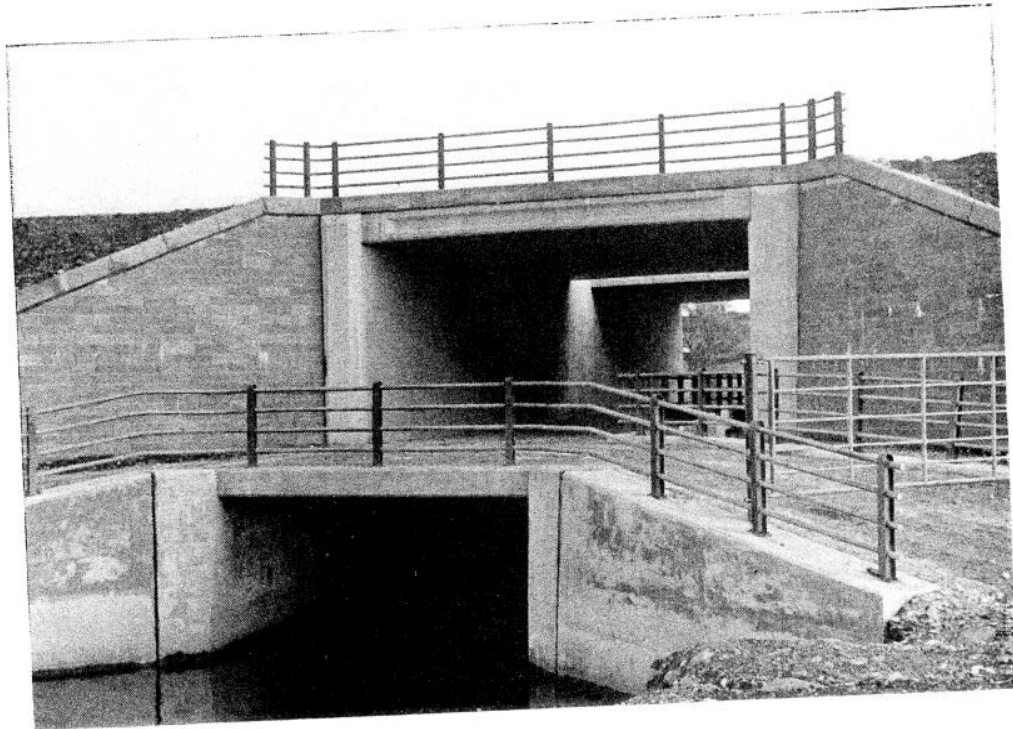
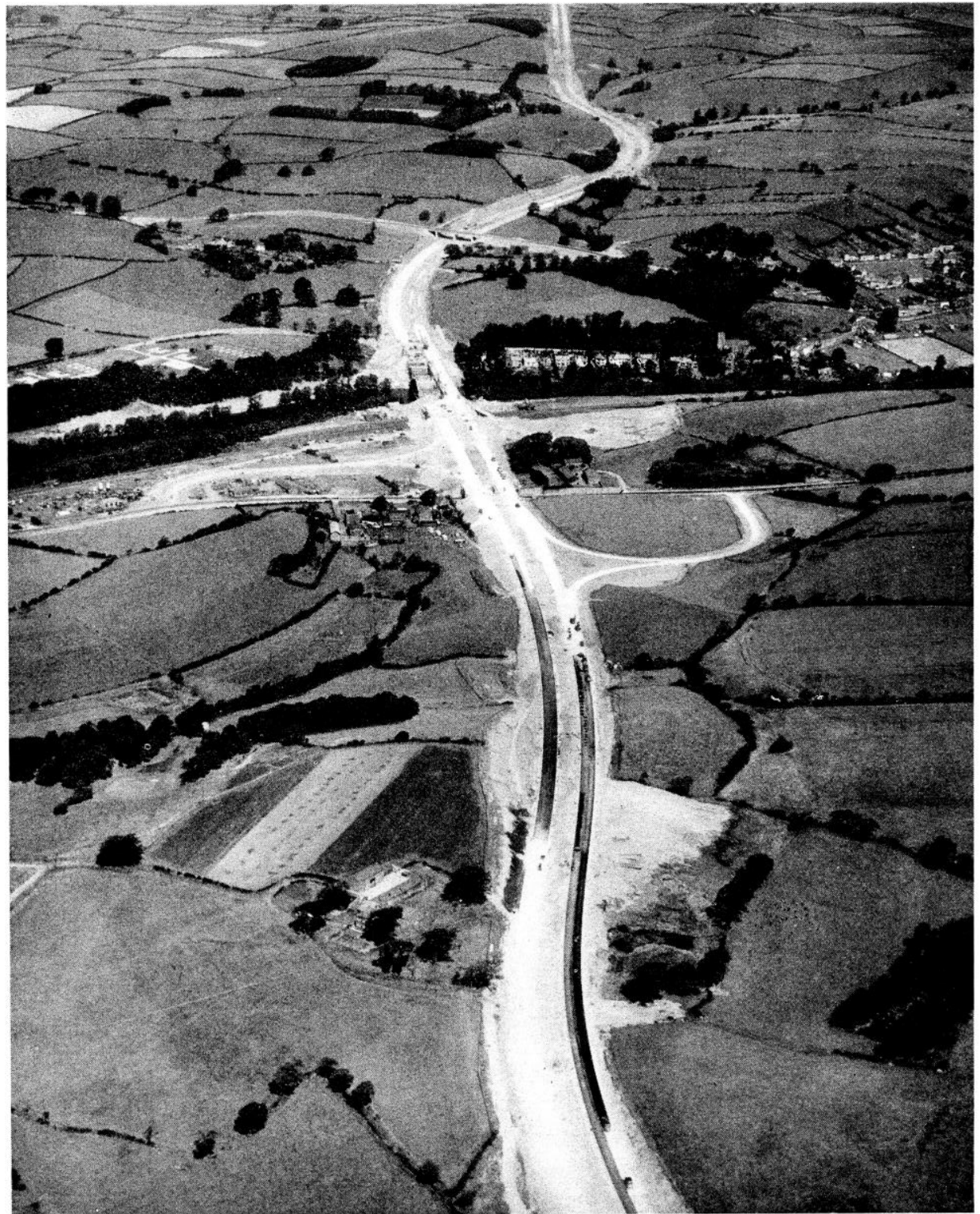


PLATE 2. SILL HOUSE BRIDGE.  
(*Photograph by courtesy of "Evening Gazette," Blackpool.*)

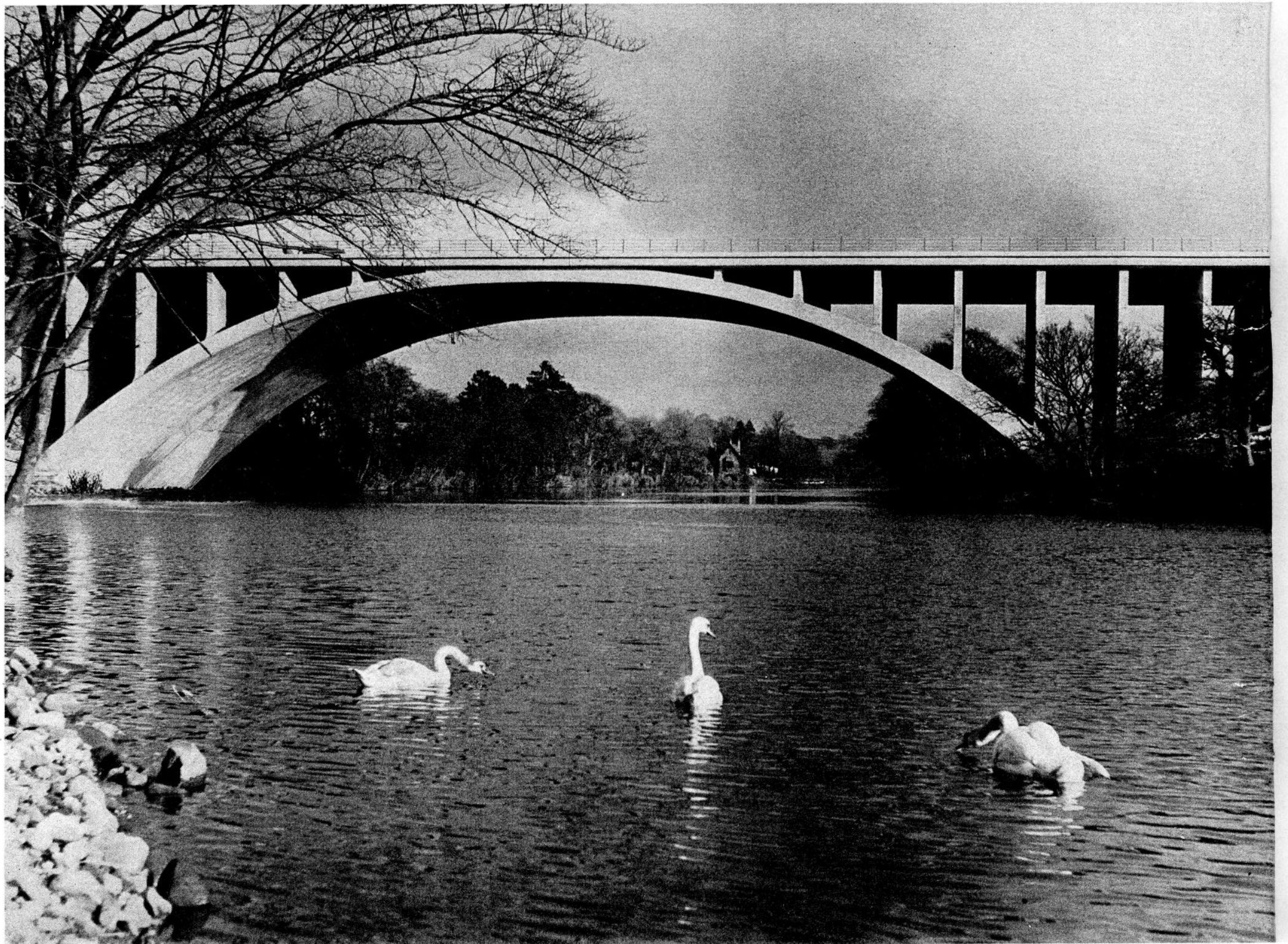
It then descends and curves towards the north-west passing under Quernmore Road Bridge and Grimeshaw Lane Bridge where it passes through a sandstone rock cutting. Upon leaving this cutting a charming view of the Lune Valley is revealed. The road descends into the valley and it is here at the Lancaster-Kirkby Lonsdale Road A683 that the only intermediate connection is made to the existing highway system. This consists of a two-level junction of the double "U" type (Plate 3) which forms an important feature of the route and provides a connection for traffic travelling to and from Lancaster, Morecambe and Yorkshire.

PLATE 3.  
AERIAL VIEW OF LUNE VALLEY JUNCTION  
SHOWING ROAD AND BRIDGES UNDER CONSTRUCTION.

*(Photograph by Airviews (M/c), Limited by courtesy of Sir Lindsay Parkinson & Company, Limited.)*









## THE RIVER LUNE BRIDGE.

The crossing of the Lune Valley has entailed the construction of four bridges in close proximity, over the Lancaster-Kirkby Lonsdale Road A683, the Settle Junction and Morecambe Railway, the River Lune and Halton Road. The River Lune Bridge (Plate 4) is by far the largest on the By-pass. It is a reinforced concrete open spandril arch with a clear span of 230 feet, a rise of 44 feet, an overall length of 400 feet and a width between parapets of 97 feet. The parapets of the bridge are of the open railing type which are continued to the north and south to provide an unbroken line over and adjoining the bridge. A small model of the bridge and its environs was made in the first instance to ensure that it would merge pleasingly into the landscape. At that stage it was considered that the face of the arch ring should be emphasised by the use of white concrete. Once a larger scale profile had been constructed however it became apparent that by giving too much prominence to the arch ring this would detract from the rest of the structure. It was finally decided after considering all the aspects that a bush hammered finish should be employed and it is felt that this has produced the desired effect.

The design of this bridge, together with many other bridges on the By-pass has been approved by the Royal Fine Art Commission and it is interesting to record their comment when plans were submitted to them of the Lune Bridge was they liked the design.

PLATE 5. AERIAL VIEW OF RIVER LUNE BRIDGE UNDER CONSTRUCTION.

*(Photograph by Airviews (M/c), Limited, by courtesy of Sir Lindsay Parkinson & Company, Limited.)*



PLATE 4.  
RIVER LUNE BRIDGE.

*(Photograph by courtesy of Tillotsons  
Newspapers, Limited.)*

The road now climbs gently out of the Lune Valley and on crossing Halton Road Bridge the site of the future two-level junction for the Morecambe Link is reached. Swinging slightly towards the north-east it passes under Foundry Lane Bridge, thence through pleasantly wooded surroundings, along the Valley of the Cote Beck swinging to the north-west, skirting Cole Wood where a combined occupation and footbridge spans the Motorway. On leaving Cole Wood cutting an excellent view is unfolded of Warton Crag, the Lakeland Hills, Shap Fells and the Pennines. The village of Nether Kellet is seen to the east of the road which then descends to pass under Kellet Lane Bridge maintaining a general north easterly direction passing under Lane Ends Occupation Bridge, Long Riddings Bridge and Kellet Road Bridge (Plate 9) with Carnforth lying to the west.

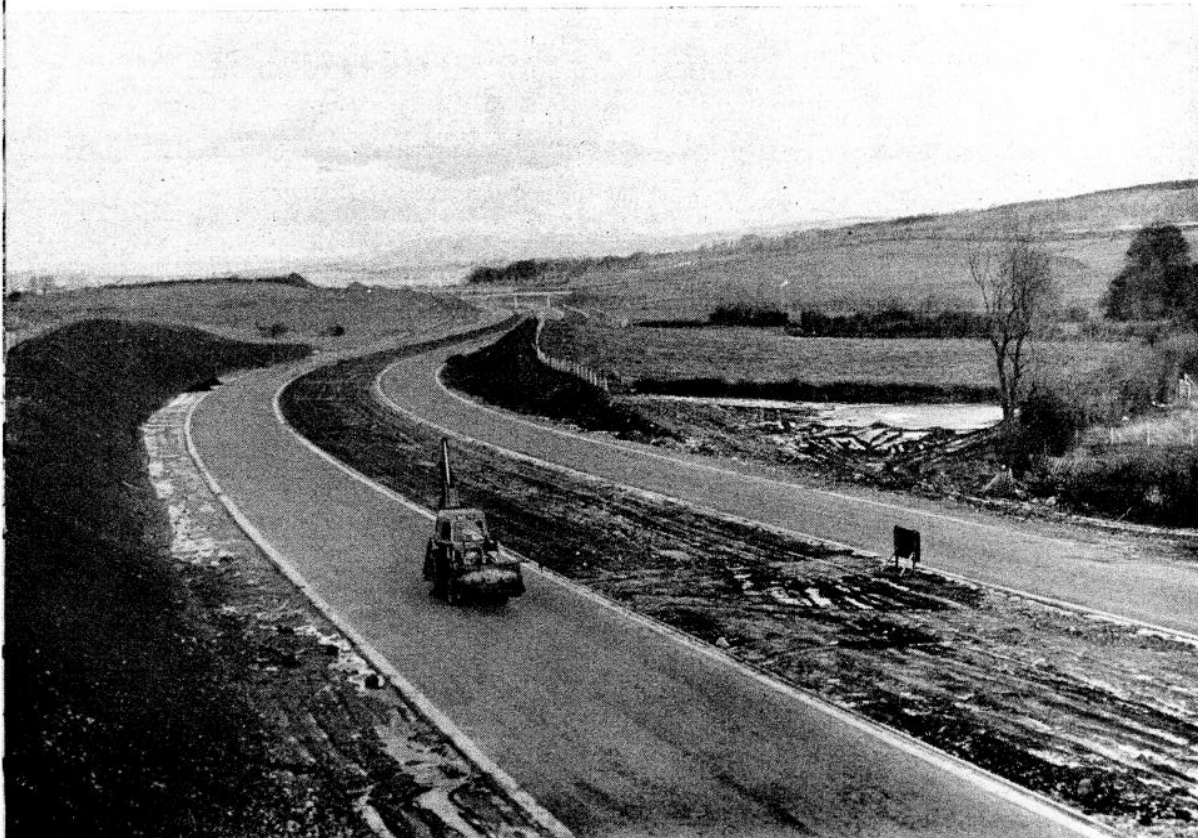


PLATE 6.  
VIEW OF MOTORWAY LOOKING NORTH FROM KELLET LANE  
BRIDGE WITH LANE END OCCUPATION BRIDGE AND LONG  
RIDDINGS BRIDGE IN THE MIDDLE DISTANCE.

(*Photograph by courtesy of "Evening Gazette," Blackpool.*)

Curving gently back towards the north the road passes under Brewers Barn Footbridge and immediately to the north of this foot-bridge a relatively sharp curve to the north-west is encountered which will form part of the two-level junction when the Motorway is continued towards Penrith. Beyond this point the present route will act as a link only to A6. The road is carried over the Lancaster and Kendal Canal by Brewers Barn Bridge ; it then passes under the Carnforth-Wennington Branch Railway and Higher North Road Bridge and finally over the River Keer at Elpha Bridge, rejoining A6 at the roundabout at Keer Level (Plate 7).

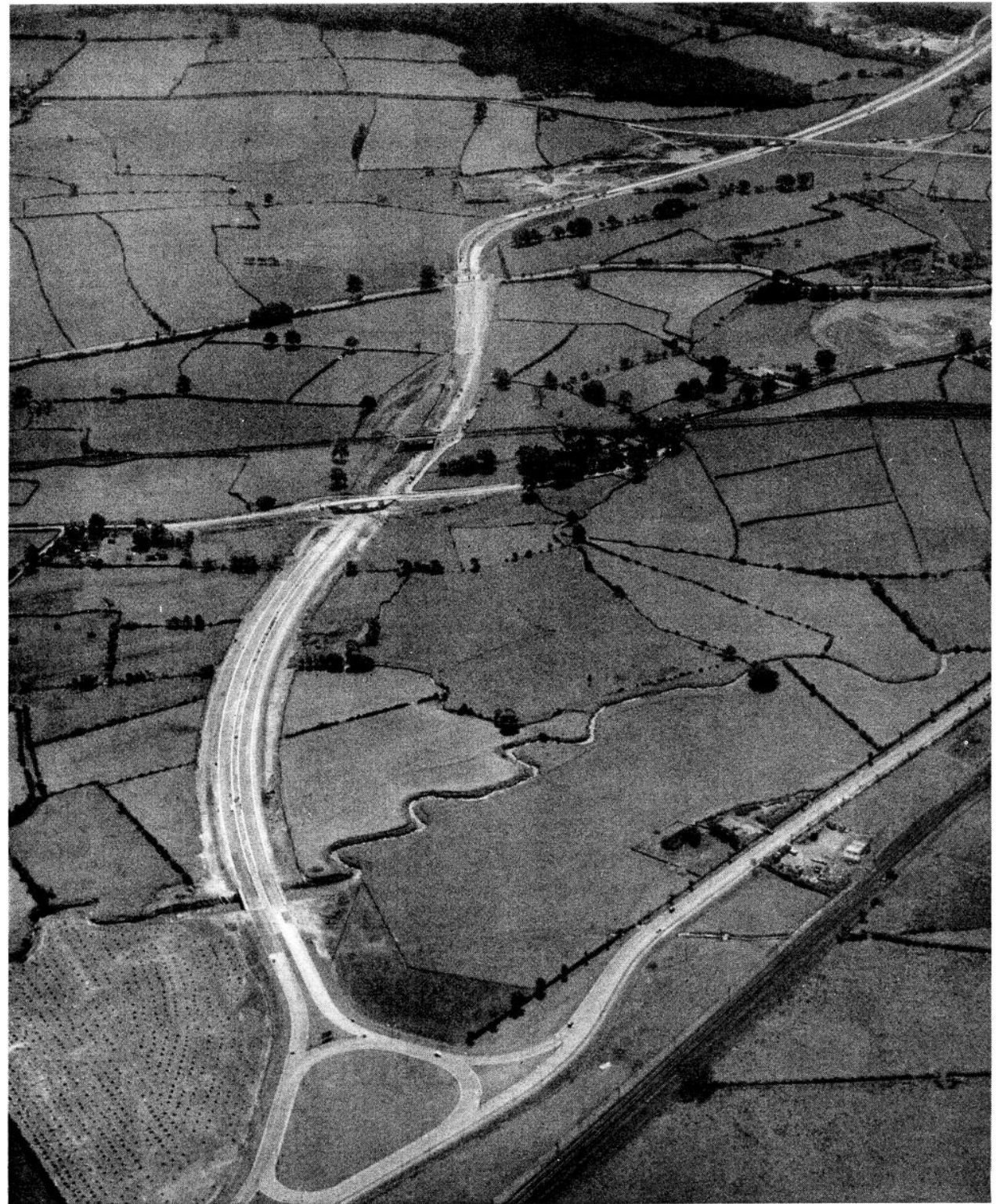


PLATE 7. AERIAL VIEW OF ROUNDABOUT AT KEER LEVEL SHOWING NORTH END OF BY-PASS.

*(Photograph by Airviews (M/c), Limited by courtesy of Sir Lindsay Parkinson & Company, Limited.)*



## PRINCIPAL DESIGN FEATURES

<i>Design Speed</i> . . . . .	70 m.p.h.
<i>Minimum Overall Width</i> . . . . .	112 feet
<i>Width of Carriageways</i> . . . . .	24 feet
<i>Minimum Width of Verges</i> . . . . .	12 feet 6 inches*
<i>Width of central reservation</i> . . . . .	39 feet*
<i>Minimum Radius (except on temporary bends)</i> . . .	2,865 feet
<i>Maximum Gradient</i> . . . . .	1 in 30
<i>Maximum Depth of Cutting</i> . . . . .	45 feet
<i>Maximum Height of Embankment</i> . . . . .	50 feet

\* Includes marginal strips.

## ROADWORKS

### (a) LAYOUT AND ALIGNMENT

The layout and alignment have been chosen to meet Motorway requirements whilst at the same time care has been taken to preserve the amenities of the very attractive countryside through which the route passes. A landscaping scheme is being prepared by the Ministry of Transport with the expert advice of the Advisory Committee on Landscape Treatment of Trunk Roads and this will be carried out as soon as practicable.

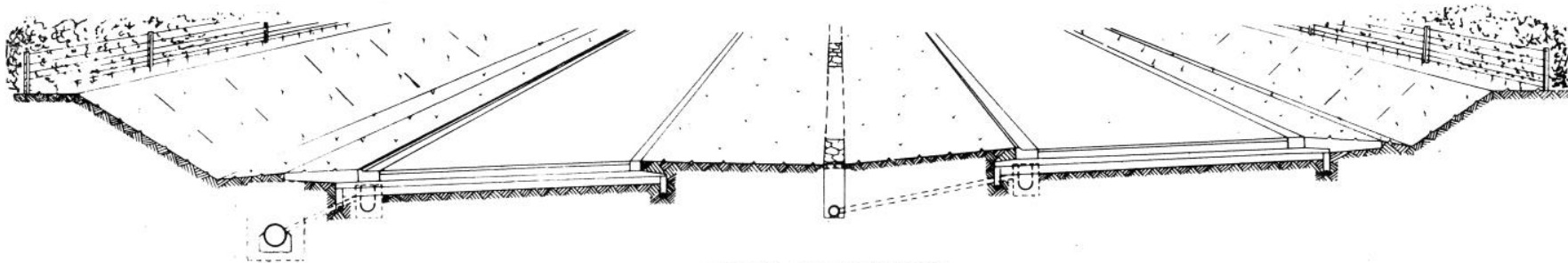
The dual carriageways are separated by a central reservation 39 feet wide which will permit the future widening of the carriageways to 36 feet with an ultimate reservation width of 15 feet. Hard shoulders are provided to enable vehicles to draw off the carriageway in case of an emergency.

Crossings are provided on the central reservation at approximately two mile intervals with the exception of the Lune Valley area where the existence of the junction and bridges has necessitated the provision of three crossings, one north of the River Lune and two to the south. These crossings will be used for maintenance purposes and also in the case of emergencies involving the switching of traffic from one carriageway to another.

Steel fenders are provided as a safety measure at the top of the higher embankments, on certain bridge approaches and on the sharp curve near the north end of the By-pass where the width of central reservation reduces to 13 feet.

Marker posts with red and white bands indicate the mileage measured from Hampson Green whilst marker posts with blue and white bands are sited at quarter furlong intervals along the road. Reflective strips are fixed to the top 12 inches of all marker posts, which are erected at a distance of approximately 10 feet from the nearside of the carriageways, and this will render them easily visible during the hours of darkness.

No service areas are planned on the Lancaster By-pass but when the Motorway is extended southward it is intended to establish a service area a short distance to the south of Hampson Green.



TYPICAL CROSS SECTION.

(b) CONSTRUCTIONAL DETAILS

The carriageways are designed to carry the heavy loading specified by the Minister of Transport. Sub-soil conditions vary considerably throughout the length of the By-pass ranging from peat and clays of varying qualities to rock. Construction depths vary from 12 inches in the rock areas to 36 inches according to design requirements. The sub-base is partly of gravel and partly of crusher run limestone. The base of the carriageway consists of 8 inches of premixed waterbound limestone macadam with cement added in the proportion of 1 part to 60 by weight. The surfacing consists of two course Hot Rolled Asphalt  $4\frac{1}{2}$  inches thick, comprising a base course, 3 inches thick and a wearing course  $1\frac{1}{2}$  inches thick with precoated granite chippings applied to the surface to provide a high resistance to skidding. The only temporary surface is on the sharp curve near Hampson Green where Fine Cold Asphalt has been laid.

Surface water discharging from the carriageway is carried into gullies located in the combined concrete marginal strip and drainage channel which has an overall width of 24 inches. This feature has not been introduced previously in Motorway construction, its object being to ensure maximum efficiency of discharge into the piped drainage system and preventing discharge on to the hard shoulders and verges. Flush concrete marginal strips are provided on the high side of the carriageways, 20 inches wide where they are in their permanent position and 12 inches wide where they have to be removed when the carriageways are widened. The marginal strips can be seen on Plate No. 8 opposite.

The hard shoulders have in general been soiled and seeded but those recently constructed have not been so treated and in the coming summer will be surface dressed.

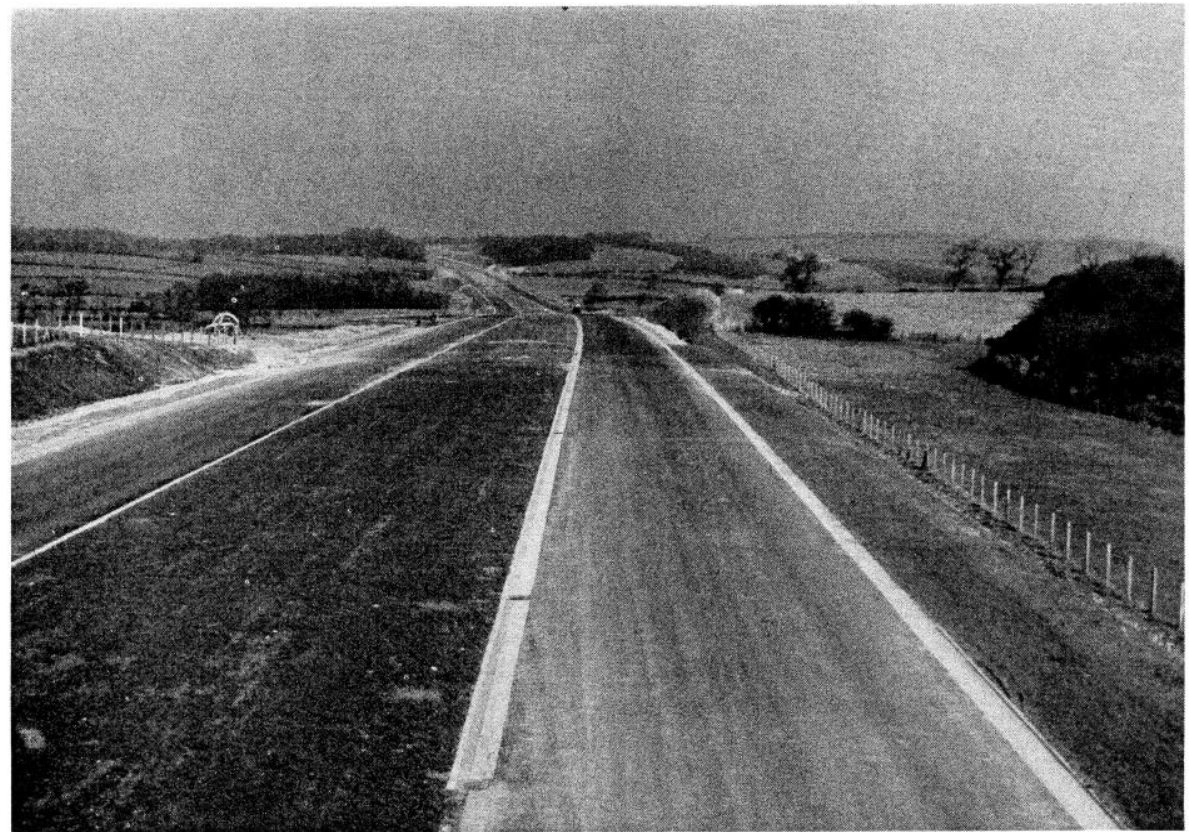


PLATE 8. VIEW OF MOTORWAY, LOOKING NORTH FROM COCKSHADES FOOTBRIDGE TOWARDS BAILRIGG.

## BRIDGES

The Motorway has entailed the construction of 27 bridges of which :—

Seven carry the Motorway over public roads.

One carries the Motorway over a canal.

Two carry the Motorway over railways.

Three carry the Motorway over Rivers.

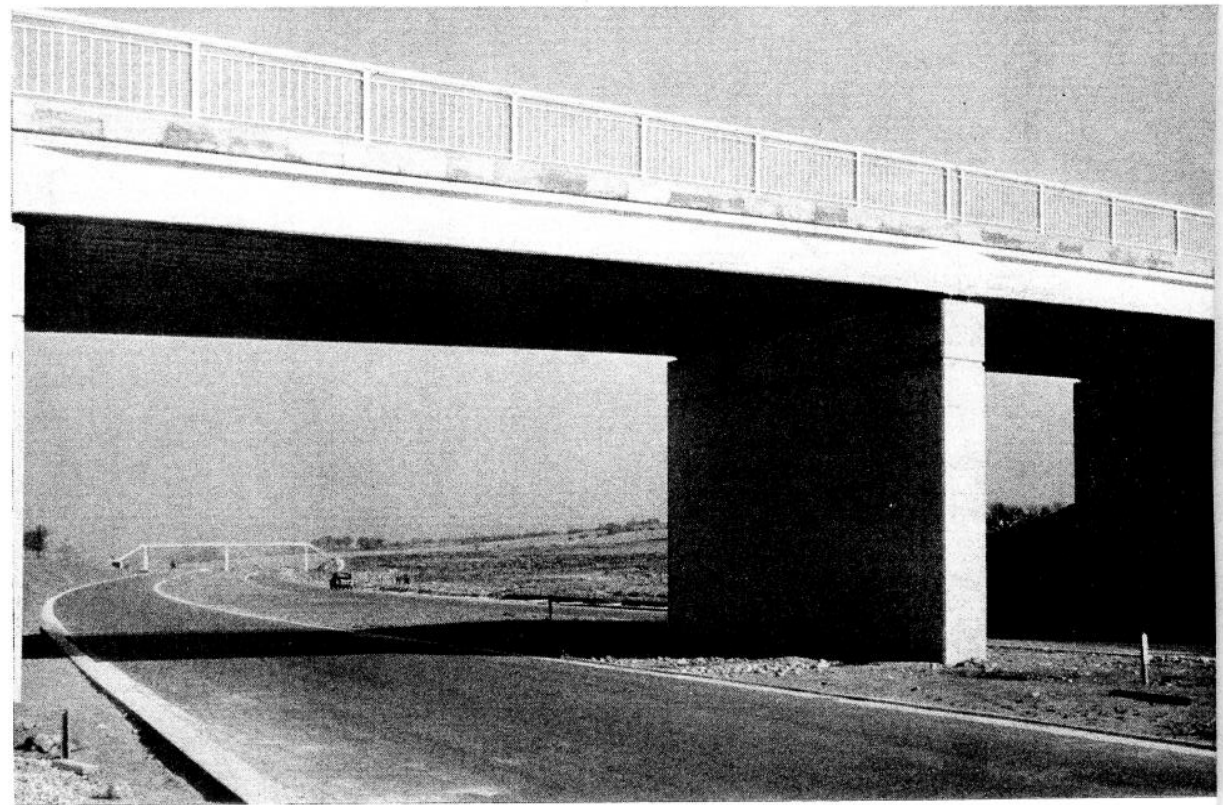
Eight carry public roads over the Motorway.

Four carry occupation roads and footpaths over the Motorway.

One carries a railway over the Motorway.

One carries an occupation road over a railway.

PLATE 9.  
KELLET ROAD BRIDGE WITH  
BREWERS BARN FOOTBRIDGE  
BEYOND.



The choice of types of bridges and materials for construction has been determined by the engineering problems of the individual sites at the same time bearing in mind the desirability of selecting structures which blend with their surroundings so far as possible.

All road bridges have been designed to carry the Ministry of Transport standard loading and the bridges carrying the Motorway were checked for the Abnormal Heavy Loading. Occupation Bridges are designed for half of the Ministry of Transport Standard Loading.

The headroom provided at all bridges carrying roads over or under the Motorway is 17 feet, *i.e.*, the standard minimum clearance plus six inches to allow for resurfacing in the future.

The design of the principal bridge, *viz.*, over the River Lune has already been referred to and of the remaining bridges ten have single spans, three have three spans and thirteen have four spans. Twenty-three bridges have prestressed concrete decks, two have steel decks and one a reinforced concrete deck.

The bridges generally have open railing tube parapets with the exception of the railway bridges where solid parapets have had to be provided to meet railway requirements.

Facework to abutments, piers and wing walls varies and includes brickwork, plain and treated concrete surfaces and artificial stonework. Foundations have, when site conditions demanded, been provided with piled supports.



## THE CONSTRUCTION OF THE BY-PASS

Work commenced on 5th July, 1957, and was scheduled to be completed in 28 months, *i.e.*, in November, 1959. Adverse weather conditions during 1957 and 1958 made earthmoving operations slow and difficult but bridge construction was not unduly interrupted. In view of the delay in the earthmoving programme, however, the Contractors asked for an extension of time and a five month extension to May, 1960, was granted. The summer of 1959 made it possible to expedite the works generally but adverse conditions during the past winter again retarded progress. Nevertheless the work was completed one month in advance of the extended completion date.

### LIST OF CONTRACTORS AND PRINCIPAL SUB-CONTRACTORS

MAIN CONTRACTORS **SIR LINDSAY PARKINSON & CO., LTD.**

SUB-CONTRACTORS

- RAYNOR CONTRACTING Co., LTD.
- GEORGE SHEPPARD, LTD.
- DICK HAMPTON
- HARBOUR & GENERAL WORKS, LTD.
- H. FAIRCLOUGH, LTD.
- LANE BROS. (BUILDERS), LTD.
- ANGLICAN BUILDING PRODUCTS, LTD.
- ROBERT WATSON & Co., CONSTRUCTIONAL ENGINEERS, LTD.
- JOHN BOOTH & SONS (BOLTON), LTD.
- SHEEPBRIDGE COMPANY, LTD.
- TRINIDAD LAKE ASPHALT Co., LTD.
- DURAFENCING (NORTHERN), LTD.
- WEBSTER BROS. (HORSFORTH), LTD.
- T. GRAVESON, LTD.

SIGN CONTRACTORS GOWSHALL, LTD.

### QUANTITIES OF MATERIALS

The major items on the By-pass are :—

<i>Excavation . . . . .</i>	<i>3,100,000 tons</i>
<i>Imported filling . . . . .</i>	<i>800,000 tons</i>
<i>Gravel and Crusher Sub-base . .</i>	<i>360,000 tons</i>
<i>Premixed waterbound macadam . .</i>	<i>140,000 tons</i>
<i>Hot Rolled Asphalt . . . . .</i>	<i>70,000 tons</i>
<i>Sewers and Culverts . . . . .</i>	<i>62,000 lin. yds.</i>
<i>Concrete . . . . .</i>	<i>70,000 cub. yds.</i>
<i>Reinforcement Steel . . . . .</i>	<i>1,500 tons</i>
<i>Structural Steel . . . . .</i>	<i>130 tons</i>
<i>High Tensile Prestressing-wire . .</i>	<i>620 miles</i>
<i>Prestressed Concrete Bridge Beams .</i>	<i>65,656 lin. ft.</i>

## TRAFFIC SIGNS

Signs on the Lancaster By-pass and approaches conform to the system devised by the Ministry of Transport Advisory Committee on Traffic Signs. Their findings were based on trials carried out on the Preston By-pass. The principal signs on the Motorway are designed to be legible from a distance of at least 600 feet. They consist of white letters on a blue background and at intersections all the signs are provided with external illumination : other signs have the letters and symbols carried out in scotchlite.

On the Motorway the signs provide guidance to traffic approaching the junctions and occur in four stages—one miles,  $\frac{2}{3}$  mile or  $\frac{1}{2}$  mile, at the commencement of the deceleration lane and at the point where the slip road leaves the main carriageway. All except the first sign contain details of the destinations. Other signs on the Motorway consist of route and destination confirmatory signs, exit distance markers and warning signs for the End of the Motorway.

On the Link Road to the Motorway signs are provided giving information regarding Motorway usage, Motorway Regulations, End of Motorway and No Entry signs. In addition, the emergency sign giving warning of Ice on the road is permanently mounted in position with a device for opening it up and illuminating it when required.

On the all purpose roads adjacent to the Motorway the signs also conform to the requirements of the above-mentioned Committee and are specially designed for Motorway use, again consisting of white letters and symbols on a blue background with external illumination.

## COMPARISON BETWEEN THE NEW BY-PASS AND THE EXISTING ROUTE

	<i>North-South Motorway (Lancaster By-pass)</i>	<i>Existing Route</i>
Minimum Width . . . . .	112 feet . . . . .	22 feet
Minimum radius . . . . .	2,865 feet (exception, temporary bends) . . . . .	50 feet
Maximum gradient . . . . .	1 : 30 . . . . .	1 : 14.6
30 m.p.h. speed limit . . . . .	Nil . . . . .	6.2 miles
Length . . . . .	11.62 miles . . . . .	12.22 miles
Access points . . . . .	3 . . . . .	1,597
Estimated car travelling time . . . . .	12 to 15 minutes . . . . .	25 to 120 minutes
Accident rate per million vehicle miles . . . . .	0.50 (estimate) . . . . .	4.6 (actual)

## STAFF

The whole of the design work and the supervision of the construction of the works—with the exception of the Railway Bridge near Carnforth—has been carried out by the staff of the County Surveyor and Bridgemaster, Mr. James Drake, B.SC., M.I.C.E., M.I.MUN.E., F.I.H.E., in close co-operation with the staffs of the Chief Engineer, Mr. J. F. A. Baker, M.I.C.E., M.I.MUN.E., A.M.INST.T., and the Divisional Road Engineer (North Western), Mr. V. H. Haynes, A.M.I.C.E., M.I.H.E., of the Ministry of Transport.

The County Surveyor would like to record his appreciation of the assistance which he has had from all the officials of the Ministry throughout the various stages of the scheme and to thank the engineer responsible for the design and supervision of the Carnforth Railway Bridge, Mr. A. N. Butland, M.I.C.E., the Chief Civil Engineer, London Midland Region of the British Transport Commission.

The District Valuer, Mr. T. A. Collins, A.R.I.C.S., was responsible for carrying through the land negotiations and obtained right of entry to all the land without recourse to compulsory powers.

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