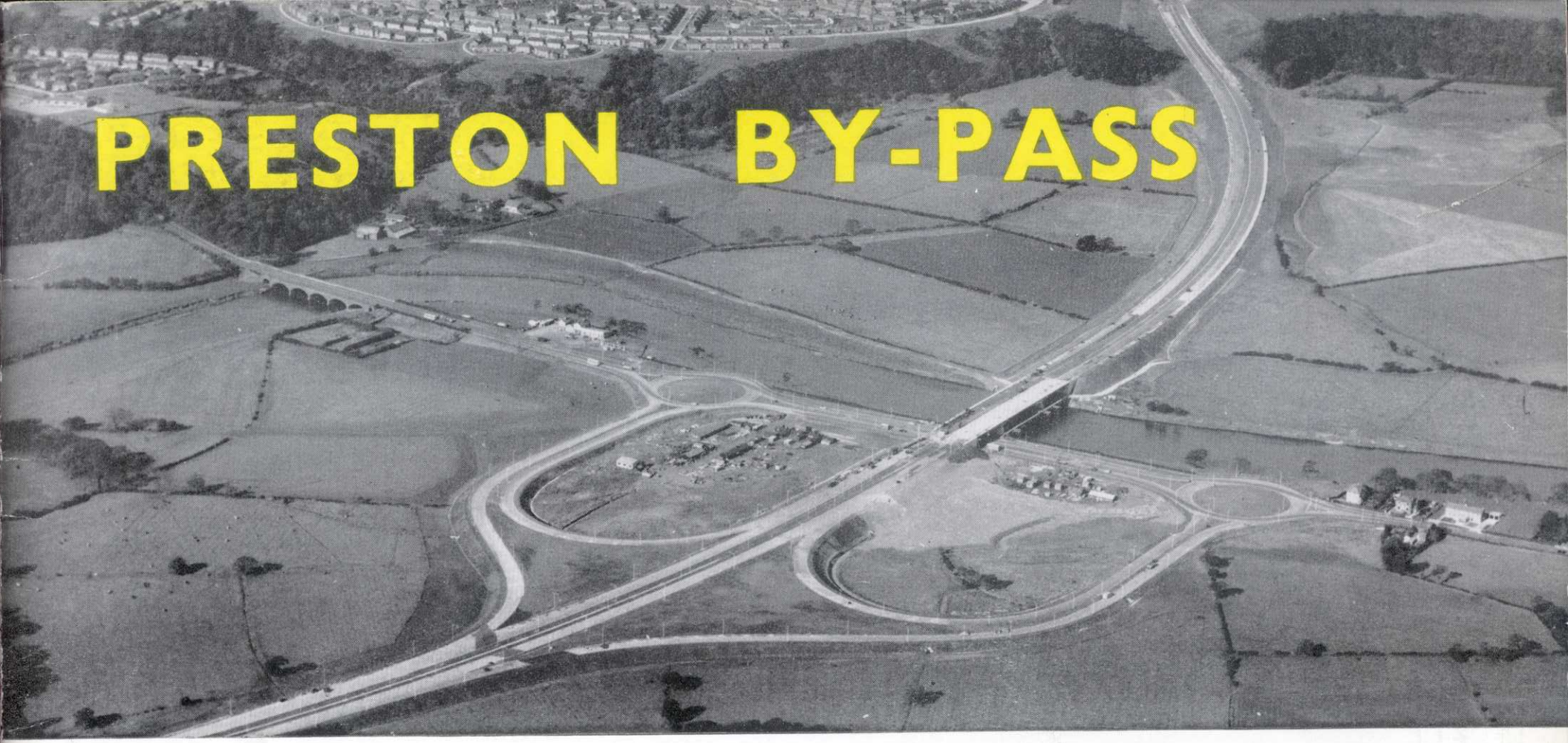

OFFICIAL OPENING

BY THE

PRIME MINISTER

THE Rt. Hon. HAROLD MACMILLAN, M.P.

5th DECEMBER 1958

MINISTRY OF TRANSPORT AND CIVIL AVIATION
AGENT AUTHORITY—LANCASHIRE COUNTY COUNCIL

THE PRIME MINISTER
THE RT. HON. HAROLD MacMILLAN, M.P.

THE RT. HON. HAROLD A. WATKINSON, M.P.
Minister of Transport and Civil Aviation

LANCASHIRE COUNTY COUNCIL

HIGHWAYS AND BRIDGES COMMITTEE

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(Chairman of the County Council)

County Alderman Sir Alfred Bates, M.C., D.L.
(Vice-Chairman of the County Council)

County Councillor J. Selwyn Jones, J.P.
(Chairman of the Finance Committee)

CHAIRMAN: County Alderman C. W. Doodson

VICE-CHAIRMAN:
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J. Riley
T. Roocroft, J.P.
J. G. Smith
H. Stott
W. Turner
E. Valentine
A. F. Williamson

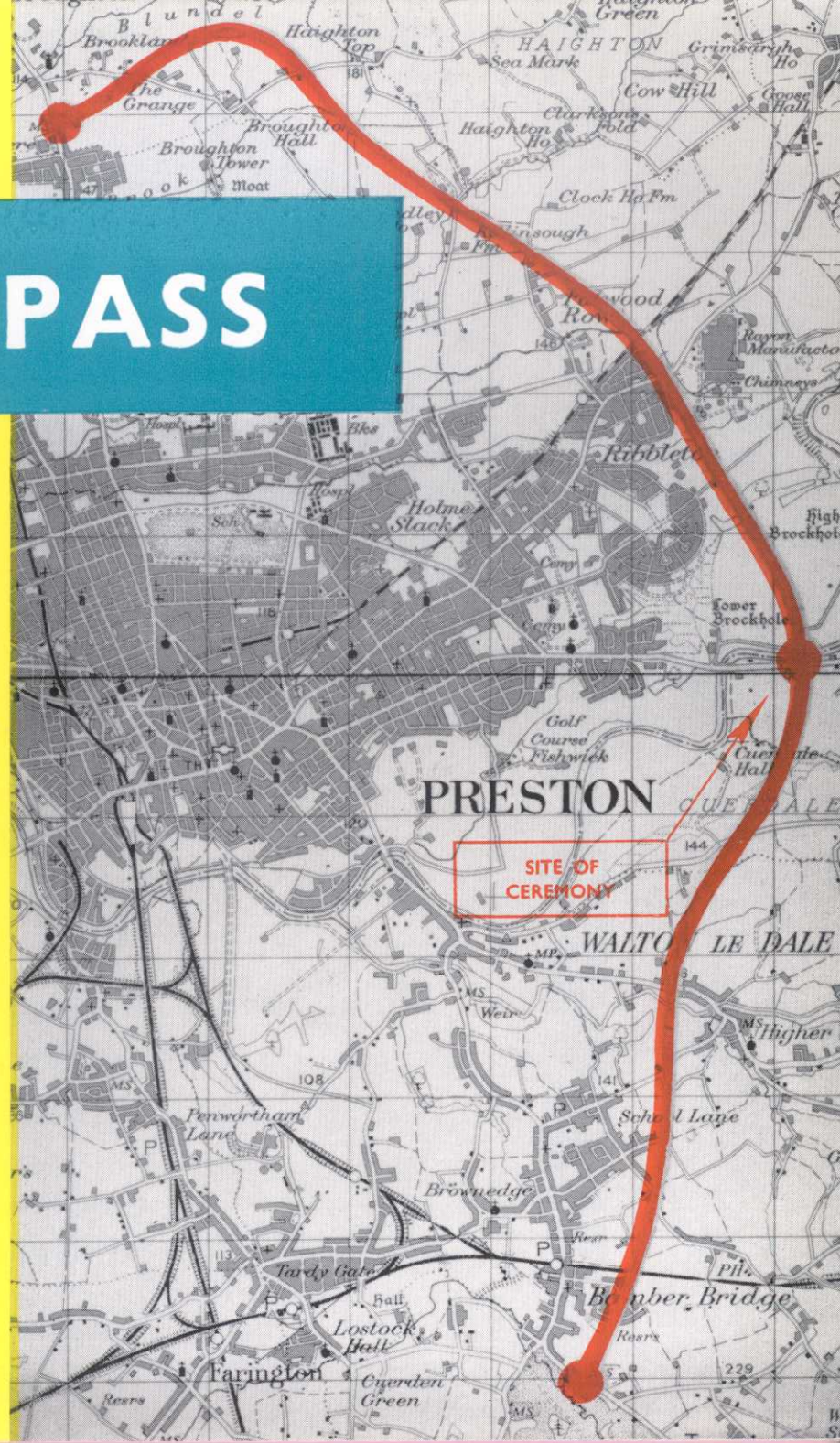
OFFICERS:

SIR ROBERT ADCOCK, C.B.E., D.L.,
Clerk of the Couny Council

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

PRESTON BY-PASS

The By-pass has a long history of investigation and preparation dating back to 1937 when the County Council recommended to the Minister of Transport that the North–South Route through Lancashire should be an entirely new road restricted to the use of motor traffic only, but it was not until 1949 that the Special Roads Act made available the legal powers necessary for the construction of a motorway. In May, 1953, the Minister of Transport intimated his intention to make a Scheme under the Act for the Preston By-pass, *i.e.*, the part of the North–South Motorway from Bamber Bridge to Broughton and in December of that year the Minister outlined in Parliament his expanded road programme which provided for the Preston By-pass to be commenced in 1956–57.



There followed in the ensuing period the Statutory procedure which provides for the public advertisement of the Scheme in order to give interested parties the opportunity to make objections if they so wish and in June, 1955, the Lancashire County Council, as Agents for the Minister of Transport and Civil Aviation, were invited by the Minister to prepare the contract for the road and bridgeworks. In February, 1956, tenders were invited for the construction of the Motorway and on the 24th April the tenders were opened and the acceptance of the lowest tenders was later approved by the Ministry of Transport and Civil Aviation and the County Highways and Bridges Committee.

The successful tenderers were :—

(1) For Samlesbury Bridge—

Cleveland Bridge & Engineering Co., Ltd., Darlington . . . . . Tender : £334,431.

(2) For Higher Walton Bridge—

Dorman Long (Bridge & Engineering), Limited, Luton . . . . . Tender : £193,690.

(3) For the Motorway including nineteen other bridges—

Tarmac Limited, Wolverhampton . . . . . Tender : £2,432,360.

Sub-Contractors for the bridgeworks—

Leonard Fairclough, Ltd., Adlington.

PLATE I. LANE END FARM OCCUPATION BRIDGE.

Subsequently the tender of Leonard Fairclough, Limited, Adlington, was accepted by the British Transport Commission for the construction of the bridge to carry the Preston–Longridge Railway over the By-pass.

On the 12th June, 1956, the works were inaugurated by the Right Hon. Hugh Molson, M.P., Joint Parliamentary Secretary of the Ministry of Transport and Civil Aviation.

THE NEW ROAD

The opening of the Preston By-pass marks the beginning of a new era of motoring in Britain. It is the first link in the network of motorways, which, progressively completed, will contribute to an increasing extent to the health of the community and to the national economy.

The national motorways in general and the Preston By-pass in particular are designed to enable traffic to travel safely at high speeds, and to minimise the chance of accidents arising from bad driving.

These objectives are achieved principally by :—

(*a*) The prohibition of pedestrians, cyclists and animals.

(*b*) The prohibition of access from adjacent land and the elimination of all cross traffic by the bridging of all roads and footpaths, etc., encountered on the route.

(*c*) Dual carriageways separated by a central reservation.

(*d*) The provision at junctions of acceleration and deceleration lanes which enable traffic to enter or leave the stream of traffic on the Motorway in safety.

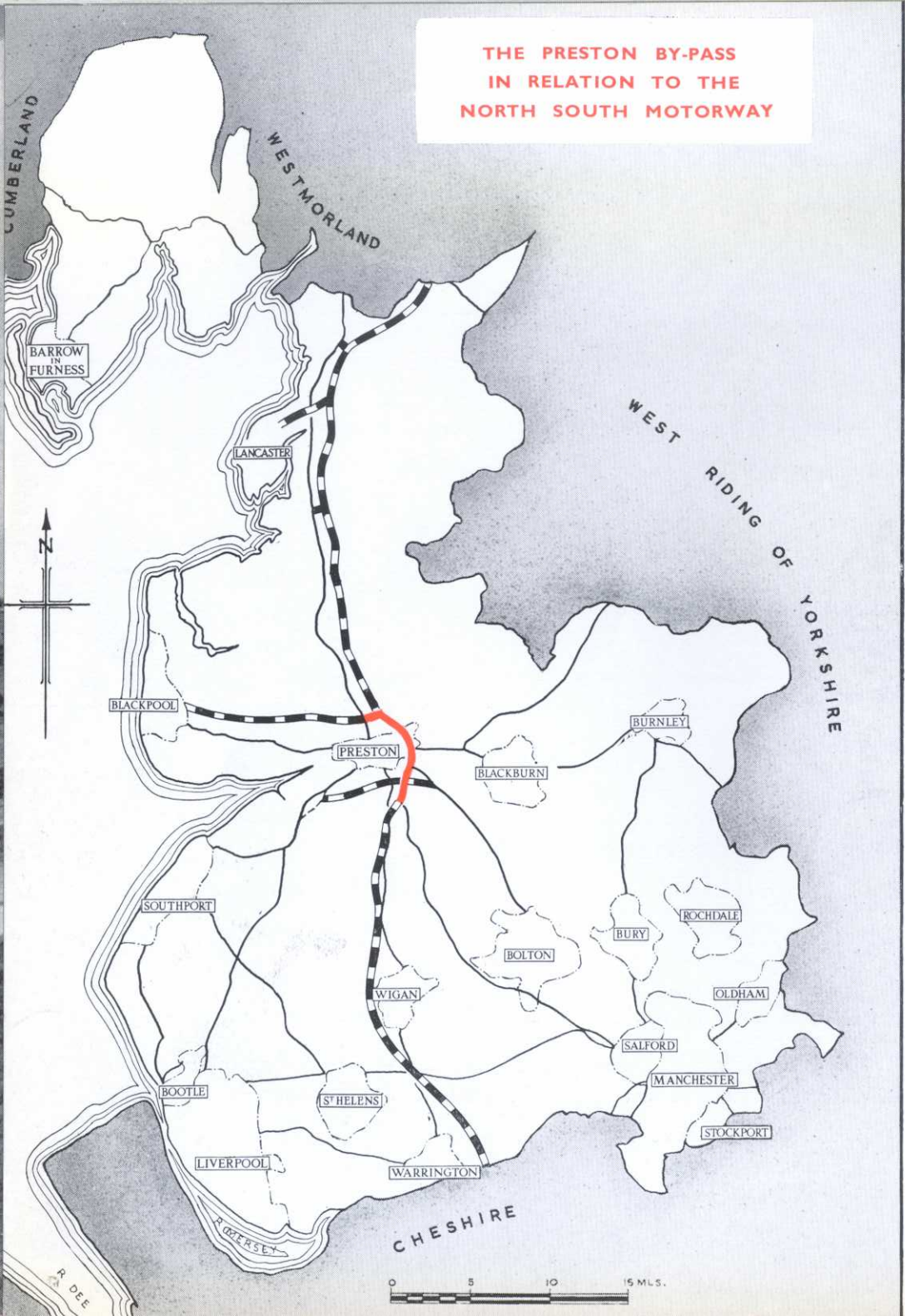
(*e*) The adoption of easy gradients and very large radius curves.

(*f*) The absence of raised kerbs and the provision of hard shoulders on the nearside of the carriageway for use in emergency halts.

(*g*) Sign posts of a size which can be read both by day and by night without the need for a driver to slow down.

(*h*) The provision of road surfaces with the highest possible resistance to skidding.

PLATE 2. HIGHER WALTON BRIDGE.



The line of the By-pass has been sited so as to fulfil its primary function as part of the North–South Motorway, other lengths of which in Lancashire are either under construction or shortly to commence. Fortunately, in addition, its location is such that, with the construction of the projected three motorway links from the By-pass to the Longton By-pass, to the Belmont–Bolton Road and to Blackpool, all through traffic which now approaches Preston on any of the seven main radial roads will be able to avoid the town, thereby materially contributing to the safety of the citizens of Preston, Walton-le-Dale and Fulwood. There will be immediate benefit to all motor traffic moving from south to north of Preston and in either of these directions from the Blackburn–Clitheroe areas.

The road commences in Walton-le-Dale at a roundabout on the Manchester–Preston Trunk Road A6 a short distance south of the junction of that road with the Wigan–Preston Trunk Road A49. It runs thence to the east of Bamber Bridge, is carried by a viaduct over the River Darwen and the Preston–Belmont Road A675 and then ascends over the watershed between the Rivers Darwen and Ribble.

After passing under Cuerdale Road (Plate 3) the view of the Ribble Valley opens out revealing the long embankment which carries the road across the valley to enter a deep cutting in the north escarpment of the Ribble.

The junction with the Preston–Blackburn Trunk Road A59 at Samlesbury forms the principal feature of the By-pass. Here the Trunk Road runs parallel with and adjacent to the River Ribble, and this difficulty has been overcome by the adoption of a " double-U " type of junction comprising twin roundabouts on the Trunk Road connected by dual carriageway motorway loop roads to the main Motorway, which is carried on a three-span bridge, the two northerly spans accommodating the river and the southerly span the Trunk Road. (Plate 4).

PLATE 3. CUERDALE ROAD BRIDGE.

After leaving the north escarpment the road passes under the Preston–Longridge Road (Plate 7) and the Preston–Longridge railway and continues in a northerly direction through a pleasantly rural and undulating countryside to a point just north of D'Urton Lane, whence it curves to the west to terminate at a surface roundabout on the Preston–Lancaster Trunk Road A6 a short distance south of Broughton Village.

This last mile of the Motorway from north of D'Urton Lane to the A6 road at Broughton will, when the main line of the North–South route is continued northwards to connect with the Lancaster By-pass, fulfil a dual purpose as (*a*) the first portion of the Motorway link to Blackpool and (*b*) the connection to Preston from the north.

These further works will necessitate the provision of flyover junctions at the Broughton roundabout and north of D'Urton Lane and land has been reserved for these purposes.

The line and layout of the road have also been determined to accommodate later (*a*) the building of a two-level roundabout junction at Prospect Hill, in Walton-le-Dale, for the proposed motorway links to the Longton By-pass (for Liverpool and Southport) and to the Belmont Road (for the Bolton area), and (*b*) the building of under-bridges at the Bamber Bridge roundabout for the continuation of the Motorway southwards to Birmingham.

Although the By-pass fringes and, in places, passes through industrial areas, it has been found possible to minimise property demolition to an extent that, over the whole length, only one farmhouse and three dwellings have required demolition.

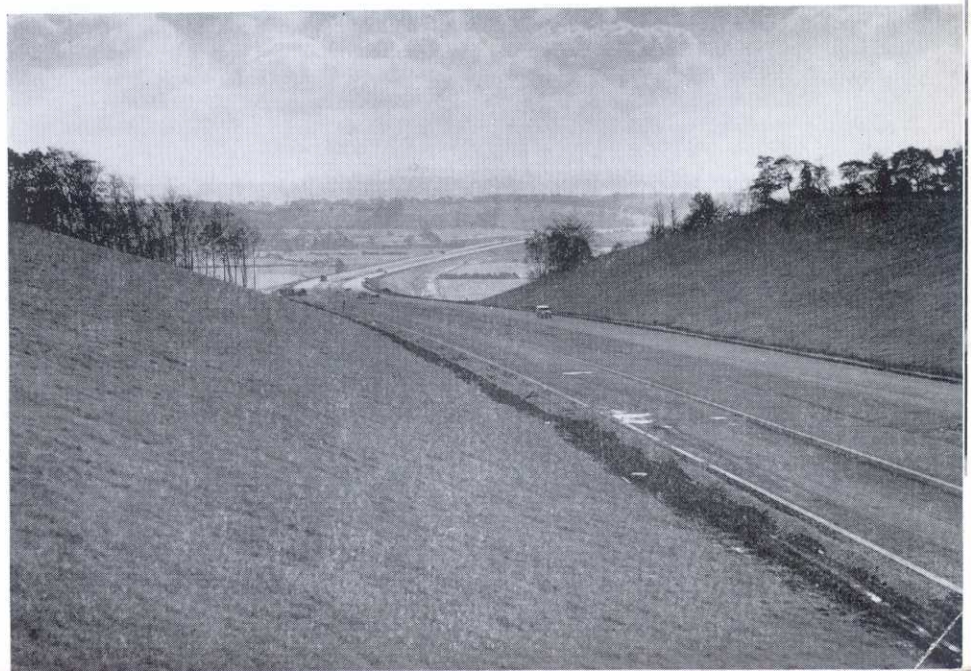
Much thought has been given to the question of amenity and a scheme of landscape treatment and tree planting for the whole length of the By-pass has been prepared recently in detail by the Minister of Transport and Civil Aviation's Advisory Committee on Landscape Treatment of Trunk and Special Roads.

It is hoped that the absence of long lengths of straight road and the variety and treatment of the bridges will prevent the boredom which is sometimes reported as occurring on foreign motorways.

PLATE 4. SAMLESBURY BRIDGE.

PLATE 5. NORTH ESCARPMENT TO RIBBLE VALLEY UNDER CONSTRUCTION.

PLATE 6. NORTH ESCARPMENT TO RIBBLE VALLEY NEARING COMPLETION.



PRINCIPAL DESIGN FEATURES

Length :

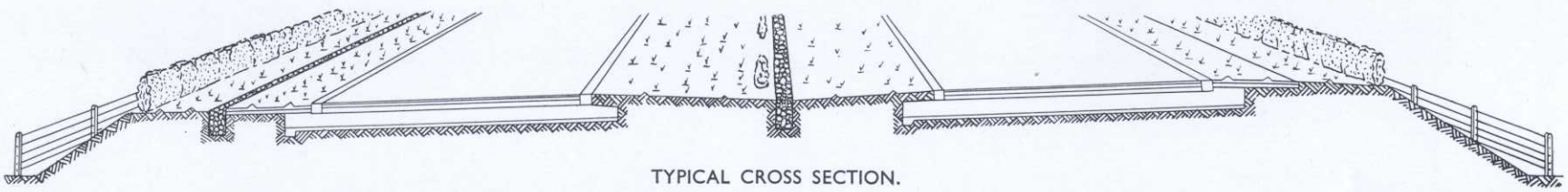
In the County Borough of Preston . . .	*1.65 miles*
In the Urban District of Walton-le-Dale	*2.54 miles*
In the Urban District of Fulwood . .	*1.77 miles*
In the Rural District of Preston . . .	*2.30 miles*
Total	*8.26 miles*

Overall Width	*112 feet*
Width of Carriageway	*24 feet*
Width of Verges	*14 feet*
Width of Central Reserve	*32 feet*
Minimum Radius	*3,015 feet*
Maximum Gradient	*1 in 25*

ROADWORKS :

The two principal aspects of design relate to (*a*) alignment and layout and (*b*) constructional details.

(*a*) THE ALIGNMENT AND LAYOUT have been determined to comply with the most modern requirements of a motorway as set out on page 9, and the general details are given opposite and below. One principal feature of the layout of the Motorway as distinct from almost any all-purpose road built in this country to date is the provision (except at bridges) on the nearside of each carriageway of a specially hardened verge or " hard shoulder " designed to Ministry of Transport specification and of sufficient width to enable vehicles to draw off the carriageway in case of breakdown or to enable a driver to travel on the verge in an emergency without loss of control. The hard shoulder is separated from the carriageway by a 12 inch wide flush marginal strip of a colour which contrasts with that of the carriageway. On the Preston By-pass the marginal strips are concrete (*i.e.*, grey-white) and the carriageway



TYPICAL CROSS SECTION.

surfacing is " blacktop." Rain water runs off the carriageways over the marginal strips on to the side verges or central reserve whence it is collected into french drains, discharging later into the nearest available watercourse. The marginal strips are continuous over and under bridges but there, in addition, a raised kerb is provided for safety purposes. A further safety measure is the provision of continuous steel fenders outside the hard shoulders on all embankments of a height greater than 20 feet on the straight and 10 feet on right-hand curves. Each of the dual carriageways is of two-lane width but, between Bamber Bridge and north of D'Urton Lane, *i.e.*, on the main line of the North–South Motorway the central reserve is wide enough to permit of later widening to three-lane carriageways when the growth of traffic demands.

(*b*) CONSTRUCTIONAL DETAILS : The carriageways are designed and built to carry the heavy loading specified by the Minister of Transport. The sub-soil of the area is generally of weak clay which has called for the use of an imported sub-base material placed to a depth which has varied between 12 inches and 36 inches depending on ascertained strength after excavation of the sub-soil. The material used is a local waste product—burnt colliery shale. The shale, after consolidation, is followed by a 9 inch thickness of " wet-mix," *i.e.*, scientifically graded, premixed and mechanically laid waterbound macadam which has been developed for road construction by the County Council.

This is followed by a 2½-inch tarmacadam base course on which is laid a coat of ¾-inch cold asphalt in which are embedded precoated granite chippings. At a later date, after any settlement has taken place, a rolled asphalt wearing course will be laid.

In all twenty-two bridges are built over or under the Motorway, of which—

Two carry the Motorway over both a river and a road.
Six carry the Motorway over roads and streams.
Six carry roads over the Motorway.
One carries the Motorway over a railway.
One carries a railway over the Motorway.
Six carry occupation roads and footpaths over the Motorway.

BRIDGES

For all the twenty-two bridges the choice of type of bridge and of materials of construction has been determined by the engineering problems of the individual sites and by the need for their appearance to be in harmony with their surroundings.

The two principal bridges are (*a*) at Samlesbury, over the River Ribble and Trunk Road A 59—a three-span continuous steel girder bridge of spans 120 feet, 180 feet and 120 feet, giving a total length of 420 feet between abutments which, together with the piers, are stone faced, and (*b*) at Higher Walton over the River Darwen and County Road A675, a multi-span continuous steel girder bridge carried on concrete trestles with four main spans of 97 feet 6 inches each and two end spans of 42 feet 9 inches, an overall length of 474 feet.

The remaining bridges are of single, three and four spans, twelve of them having prestressed concrete decks and three decks of steel girder construction. Five, comprising two footbridges and three large culverts, are of reinforced concrete. In five instances ground conditions necessitated the provision of piled foundations.

The parapets are of the open railing type, except in the case of the bridge over the railway at Bamber Bridge. Facework to abutments, piers and wing walls varies and includes brickwork, plain and treated concrete surfaces and precast blockwork.

WORKS OF CONSTRUCTION

From the date on which they were notified of the acceptance of their tenders the Contractors planned the works in a manner which would normally have permitted them to complete within the Contract period of two years.

Unfortunately, however, their programmes, which were based on the presumption that the weather would approximate to that of average summers and winters in Lancashire were destined to be thrown completely out of gear by the rains which have continued almost uninterruptedly right from the commencement.

PLATE 7. LONGRIDGE ROAD BRIDGE.

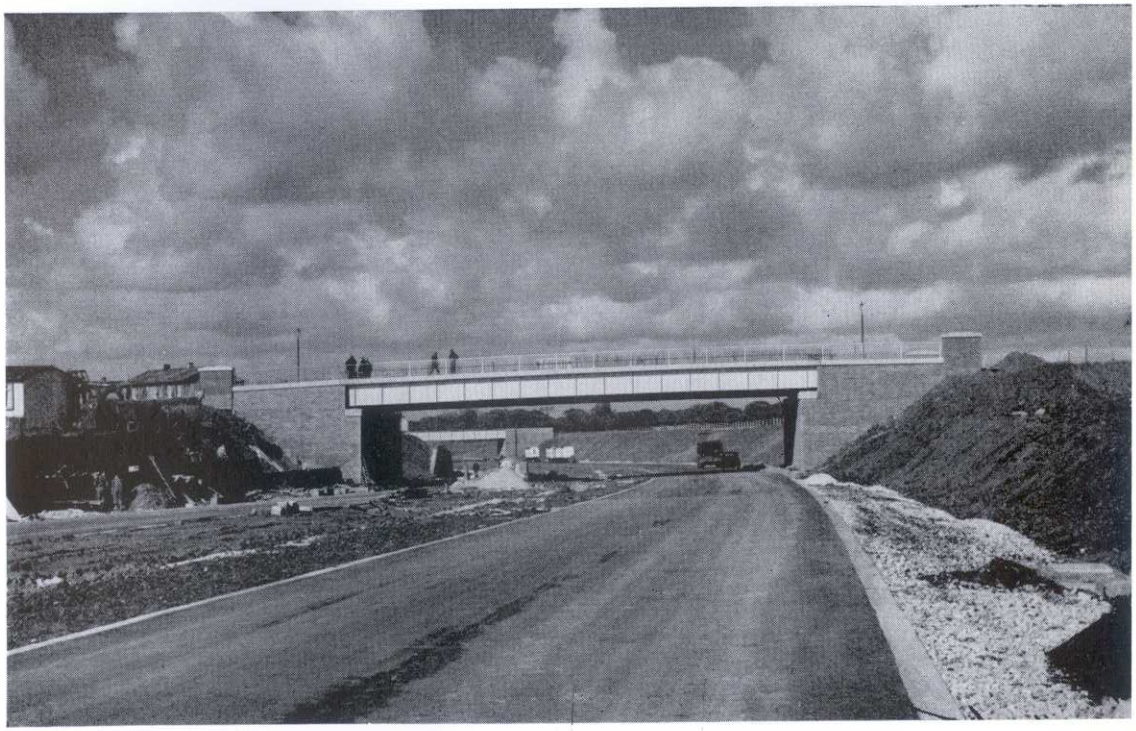


PLATE 8. HINDLEY HOUSE FOOTBRIDGE.

In order to deal with the heavy earth moving programme, the Contractors assembled at the start, in June, a fleet of heavy plant which included tractors, scrapers, large capacity excavators, rear dump trucks, etc., but the heavy rains of the autumn of 1956 made it virtually impossible to work the sandy clay sub-soil and so the heavy earth moving was postponed until the following spring (1957) and the Contractors were granted a five-months' extension of contract.

On reassembling the heavy plant there was a welcome respite from the rains and over the ensuing fine period of some twelve weeks intensive work enabled about 50 per cent. of the excavations to be completed. Then the previous year's experience repeated itself and, until a brief fine spell in the spring of 1958, ground conditions made it possible for earth moving to proceed only at a fraction of the desired rate.

Nevertheless the Contractors used every means available to overcome the physical difficulties with the result that the works have been completed within the revised contract period of 2 years 5 months.

In order, however, for this to be accomplished it was found necessary to authorise the running to tip of large quantities of excavation of which, had weather conditions permitted, much could have been used for embankment construction and this tipped material had to be replaced by imported material. The problems arising from the incessant rains were many and varied, one instance being the deep cutting through the south escarpment of the Ribble where it was found necessary to re-design a portion of the eastern slope.

Earth excavated	*3,400,000 tons*
Imported filling material	*668,000 tons*
Ashes	*176,000 tons*
Red shale underbed	*288,000 tons*
Premixed waterbound macadam	*120,000 tons*
Tarmacadam base coat	*31,000 tons*
Cold asphalt surfacing	*12,000 tons*
Drains and sewers	*55,000 yards*
Concrete	*35,000 cu. yds.*
Reinforcement steel	*950 tons*
Structural steel	*2,900 tons*
High tensile prestressing wire	*220 miles*
Piling to bridge foundations	*21,000 lin. ft.*

PLATE 9. BROUGHTON HALL BRIDGE.

The bridgeworks' programmes as a whole were not affected by the rains to the same extent as the earth moving programme. Nevertheless, the difficulties normally associated with bridge building were, in many cases, much accentuated ; for instance, on several sites it was found necessary, due to the water-logged condition of the ground, to drive heavy section sheet piling to ensure the safety of the public highways. Some idea of the magnitude of the works involved can be gained from the above figures.

The Minister of Transport and Civil Aviation has quite recently described the By-pass as a guinea pig—in other words as an experiment for all other British motorways. That it has been regarded as such throughout its construction is evinced by the very large number of visits of inpsection which have been made by Engineering Institutions and Associations ; in fact these visits became so numerous that the County Council appointed a panel of retired engineers to act as guides.

STAFF

The whole of the design work and the supervision of the construction of the works—with the exception of the Preston–Longridge Railway Bridge 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 and Civil Aviation.

The County Surveyor would like to place on record his appreciation of the constant encouragement afforded to him by all these officers of the Ministry, both during the preparation of the scheme and the progress of the works, and to thank the engineer responsible for the design and supervision of the Preston–Longridge Railway Bridge, Mr. J. Taylor Thompson, M.I.C.E., the Chief Civil Engineer, London Midland Region of the British Transport Commission.

CONCLUSION

Acknowledgment should also be made to all those whose efforts resulted in the works being carried through to a successful conclusion. Amongst these the County Surveyor and Bridgemaster would particularly like to express his thanks to :—

1. The Chairman, County Alderman C. W. Doodson, the Vice-Chairman, County Alderman T. Hargreaves, J.P., and members of the County Highways and Bridges Committee who have given him full support throughout the whole period of the contract.

2. The chief officers and staffs of other County Council Departments and particularly the Clerk of the County Council—Sir Robert Adcock, C.B.E., D.L., the County Treasurer—Mr. N. Doodson, F.I.M.T.A., F.S.A.A., and the Chief Constable—Colonel T. E. St. Johnston, C.B.E., M.A.

3. His Deputy, Mr. J. H. Dean, B.ENG., A.M.I.C.E., M.I.H.E., and the many members of his own staff, both technical and administrative, who have worked regardless of office hours, and particularly to Mr. F. A. L. Wellard, M.A., M.I.C.E., the Chief Assistant County Surveyor (Bridges), Mr. M. Edwards, B.ENG., A.R.I.C.S., M.I.MUN.E., Assistant County Surveyor (Motorways North) and his Resident Engineer, Mr. R. S. Kevill, A.M.I.C.E.

4. The Contractors (who are as mentioned on page 6) responsible for carrying out the works, their Agents, their staffs and their workmen, who persisted throughout the almost incessant adverse weather conditions.

5. The District Valuer, Mr. S. Rawson, A.R.I.C.S., and his staff, who have had a tremendous amount of extra work in negotiating settlements regarding land.

6. The owners and tenants of land affected by the By-pass.

7. The Parliamentary Committee of the Lancashire Branch of the National Farmers' Union.

8. The Engineers and Surveyors of the Preston County Borough, Mr. E. H. Stazicker, B.SC., M.I.C.E., M.I.MUN.E., F.R.S.H., the Fulwood Urban District Council, Mr. A. C. Dickinson, M.I.MUN.E., M.INST.H.E., the Walton-le-Dale Urban District Council, Mr. S. Race, A.M.I.C.E., M.I.MUN.E., A.M.I.W.E., M.INST.H.E., and the Preston Rural District Council, Mr. H. Collier, A.M.I.S.E., A.R.SAN.I., and their staffs.

9. The General Manager of the North Western Gas Board, West Lancashire Group, Mr. A. K. Collinge, M.INST.GAS.E., and the Manager of the North Western Electricity Board, No. 4 Sub-Area, Mr. G. A. Robertson, M.SC.(TECH.), M.I.E.E., M.I.MECH.E., and their staffs.

10. The Waterworks Engineer and Manager of Preston Corporation, Mr. J. F. Bailey, A.M.INST.C.E., M.INST.W.E., and the Waterworks Engineers of the Fulwood Urban District Council, Mr. N. Holmes, A.M.INST.C.E., A.M.I.MUN.E., and their staffs.

11. The Manager, Post Office Telephones, Preston Area, Mr. B. Lloyd, and his staff.

12. The Chief Engineer of the Lancashire River Board, Mr. G. Dalkins, A.M.I.C.E., A.M.I.MECH.E., A.M.I.W.E., and his staff.

PLATE 10. D'URTON LANE BRIDGE.

ACKNOWLEDGMENTS

Photographs : Frontispiece.—Aero Films, Ltd.

Plate 5 by courtesy of "Lancashire Evening Post."

Plate 4 by courtesy of Mr. J. Cuerden.

The Map on Page 5 is reproduced from the Ordnance Survey Map with the sanction of the Controller of H.M. Stationery Office.