

STIRLING COUNTY COUNCIL
ROADS AND BRIDGES DEPARTMENT
EDINBURGH TO STIRLING MOTORWAY (M9)
(STAGE 1)
POLMONT AND FALKIRK BYPASS

OFFICIAL OPENING CEREMONY PERFORMED BY LORD HUGHES PARLIAMENTARY UNDER SECRETARY OF STATE FOR SCOTLAND.

THURSDAY 29th. AUGUST 1968 AT 11.30 A.M.



HIGHWAY AUTHORITY:—
SCOTTISH DEVELOPMENT DEPARTMENT.

AGENT AUTHORITY:—ROAD AND BRIDGE WORKS.
COUNTY COUNCIL OF THE COUNTY OF STIRLING.

CONTRACTOR:—
DUNCAN LOGAN (CONSTRUCTION) LTD.

CHIEF ROAD ENGINEER. J. S. McNEIL B.Sc.(Civ Eng).M.I.C.E.
M.I. MUN.E. M. INST. H.E.
CHARTERED CIVIL ENGINEER.

ENGINEER FOR PROJECT. J. F. KEITH. B.Sc. A.M.I.C.E. A.M.I. Mun.E.
CHARTERED CIVIL ENGINEER.
COUNTY ROAD SURVEYOR.

OFFICIAL OPENING CEREMONY - THURSDAY, 29th AUGUST, 1968.

FOREWORD - by the Convener of the Roads Committee of the County Council of Stirling.

The opening, of this, the first Section of Motorway in Stirlingshire by Lord Hughes, Parliamentary Under Secretary of State for Scotland, reminds us that the provision of major traffic roads in the County is proceeding satisfactorily. In June 1964, the Denny Bypass (4¾ miles in length) was opened and in October, 1965, the Bonnybridge and Larbert Diversion (3¾ miles) was opened to traffic.

Work on the design of the New Road Network for the 1970's proceeds. This ultimate triangular network will provide a system of roads, of motorway or to motorway standards, in Stirlingshire, second to none, and are designed to cater for the anticipated industrial growth of this expanding Area.

On behalf of the Roads Committee of the County Council of Stirling, I should like to thank all those whose endeavours have made the success and speedy completion of the Polmont and Falkirk Bypass, possible.

G. W. LYNCH.

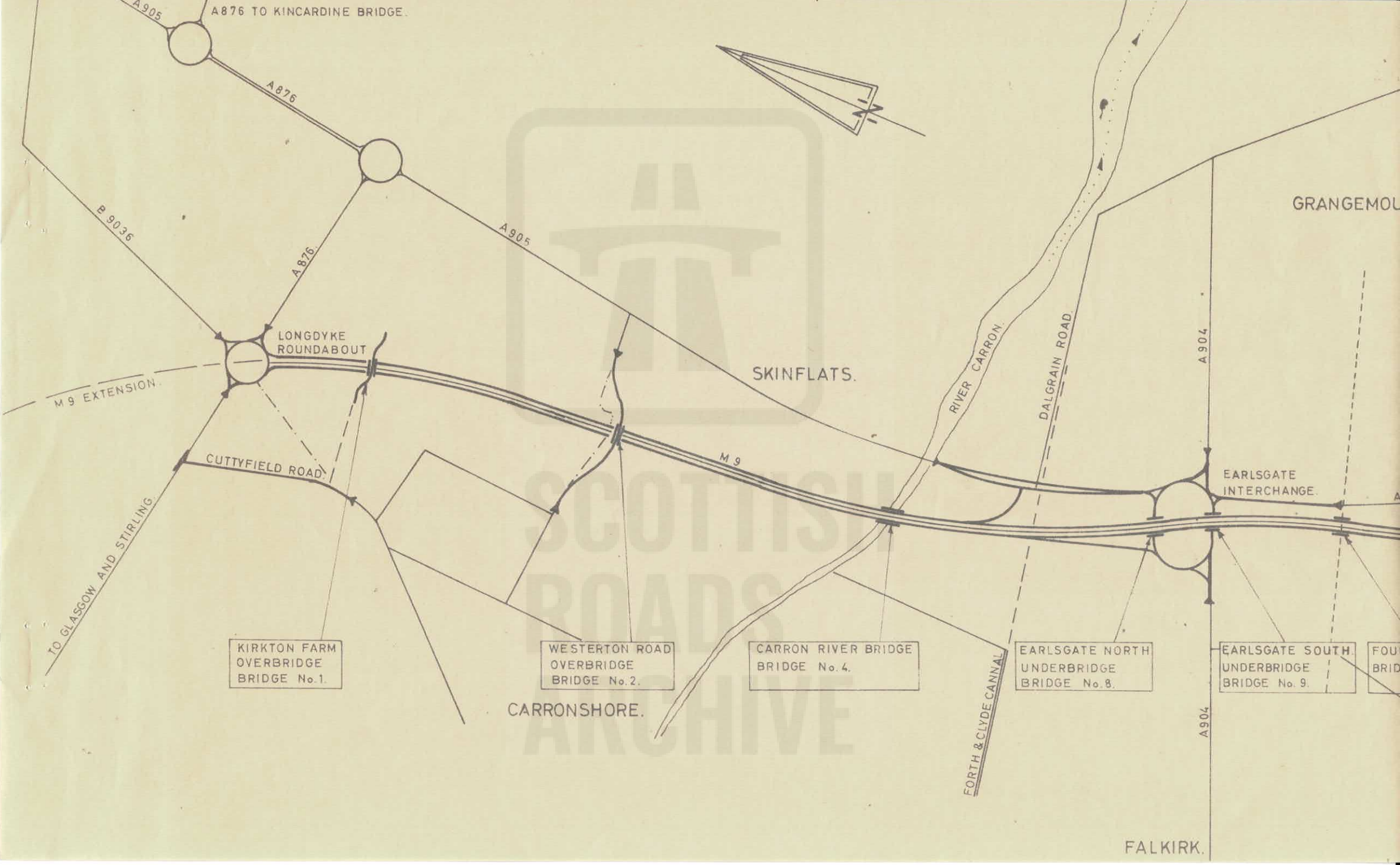
PROGRAMME.

- 11.30 Hrs. Assemble on the South bound carriageway of the Motorway at Longdyke.
The Convener of the County Council, Mr. A. K. Davidson, C.B.E., will invite Lord Hughes, Parliamentary Under Secretary of State for Scotland, to perform the opening ceremony.
- 11.55 Hrs. Official Motorcade proceeds along South bound carriageway to Lathallan Interchange, returning immediately to the North bound carriageway to Cadger's Brae Interchange thence
to
- 12.15 Hrs. the Reception at the Inchyra Grange Hotel.
- 12.45 Hrs. Luncheon.
- 13.45 Hrs. Address by MR. A. K. DAVIDSON, C.B.E.,
The Convener of the County Council.
- Reply by LORD HUGHES,
Parliamentary Under Secretary of State for Scotland.
- Reply by MR. M. R. E. HILL,
Managing Director,
Duncan Logan (Construction) Ltd.
- Vote of Thanks MR. G. W. LYNCH,
Convener of Roads Committee.

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CONTRACT DETAILS

Motorway Authority.	The Secretary of State for Scotland. Chief Road Engineer, J.S. McNeil, B.Sc. (C.Eng.), M.I.C.E., M.I.Mun.E., M.Inst.H.E., Scottish Development Department.	Length of Motorway.	5 $\frac{1}{3}$ Miles, constituting the first section of a total length of 18 Miles of the Motorway in Stirlingshire.
Agent Authority for Roads and Bridgeworks.	Stirling County Council. County Road Surveyor, J.F. Keith, B.Sc., A.M.I.C.E., A.M.I.Mun.E., Chartered Civil Engineer. Assistant County Road Surveyor, (Motorways and Major Contracts) G. I. McCrindle, A.M.I.C.E., M. Inst.H.E., Chartered Civil Engineer. Resident Engineer, W. B. Jarvie, A.M.I.C.E., Chartered Civil Engineer. Testing Consultants, Messrs. Sandberg, Messrs. Solus Schall.	Length of Other Roads.	5 $\frac{1}{2}$ Miles.
Starting Date.	14th February, 1966. (P.F. Ash Embankment commenced by County Roads Department on 1st January, 1965.)	Roadworks Details.	Dual Carriageway - 24 Feet Wide. Flexible Construction - 1 $\frac{1}{2}$ " Hot Rolled Asphalt with Pitch Bitumen Binder Wearing Course. 2 $\frac{1}{2}$ " Hot Rolled Asphalt Basecourse. 7" Hot Rolled Asphalt Base. 7" Upper Sub-Base - Frost Resistant. (Stabilised Shale). Lower Sub-Base - As Required. 6" Minimum Spent Oil Shale.
Duration of Contract.	30 Months.	Hardshoulders	- 10 Feet Wide.
Tender Sum.	£3,197,639 1s 7d.	Central Reserve	- 13 Feet Wide with two 1 Foot Wide Margins. (8" Wide Calcined Flint + 4" Amber Reflecting Studs).
Contractors.	Duncan Logan (Construction) Limited.	Minimum Radii	- 5729.6 Feet (1°00' Curve)
Sub-Contractors.	George Wimpey and Company Limited. Johnson Construction Limited. Strangs of Polmont. P. & W. McLellan Limited.	Maximum Gradient	- 1.56% (1 in 64)
P.F. Ash Supplied by	Stephenson Clarke (P.F.A. Dev.) Limited. for the South of Scotland Electricity Board.	Normal Crossfall	- 1 in 40.
Design Traffic 1985	M.9 - 31,700 Passenger Car Units (16 Hour day). A.9 - 20,600 Passenger Car Units (16 Hour day). A.905 - 20,400 Passenger Car Units (16 Hour day).	Excavation Suitable Material As Fill	- 690,000 Cubic Yards.
		Unsuitable Material To Tip	- 410,000 Cubic Yards.
		Imported Fill (Shale)	- 240,000 Cubic Yards.
		Pulverised Fuel Ash	- Precontract by Direct Labour 160,000 tons. Contract 410,000 tons.
		Area Surfaced including Side Roads.	- 394,000 Square Yards. (220,000 tons).
		Bridgeworks Details.	Overbridges - 5 No. Underbridges - 5 No. Pedestrian Underpasses - 1 No. Box Culverts - 5 No. Piped Culverts - 1 No. Concrete - 31,400 Tons (17,400 Cubic Yards). Steel Beams - 696 Tons. Reinforcement - 1,396 Tons. Precast Piles - Loading 60 Tons - No. 104. Loading 120 Tons - No. 430. (Total Length - 5.59 miles).
		P.F. Ash to Bridge Abutments	- 72,000 Tons.



A876 TO KINCARDINE BRIDGE.

A876

B9036

A876

A905

LONGDYKE
ROUNDBOUT

M9 EXTENSION.

SKINFLATS.

CUTTYFIELD ROAD

M9

RIVER CARRON.

DALGRAIN ROAD

A904

EARLSGATE
INTERCHANGE.

TO GLASGOW AND STIRLING

KIRKTON FARM
OVERBRIDGE
BRIDGE No.1.

WESTERTON ROAD
OVERBRIDGE
BRIDGE No.2.

CARRON RIVER BRIDGE
BRIDGE No.4.

EARLSGATE NORTH
UNDERBRIDGE
BRIDGE No.8.

EARLSGATE SOUTH
UNDERBRIDGE
BRIDGE No.9.

FOUR
BRIDGE

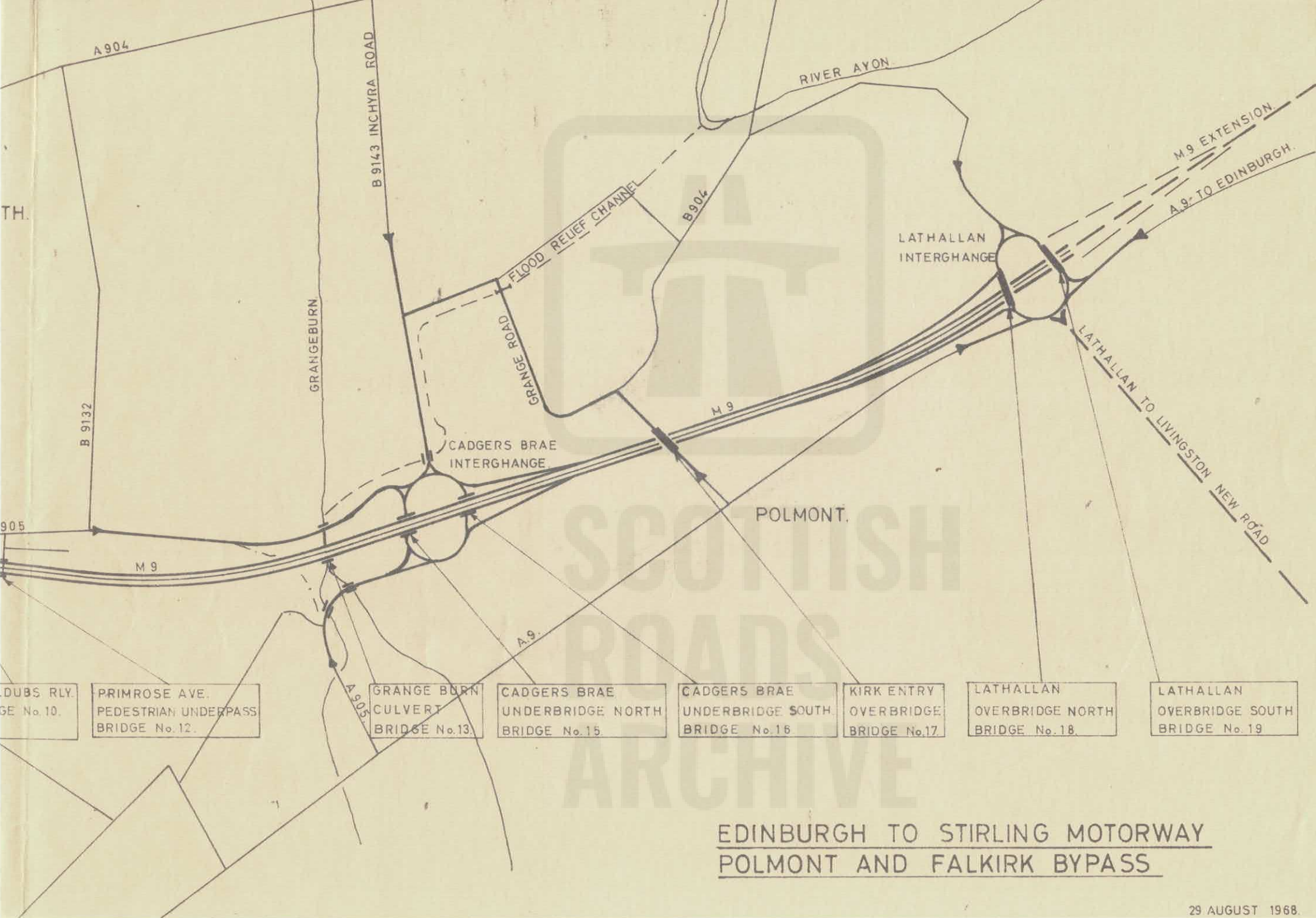
CARRONSHORE.

FORTH & CLYDE CANNAL

A904

FALKIRK.

GRANGEMOL



EDINBURGH TO STIRLING MOTORWAY
POLMONT AND FALKIRK BYPASS

THE EDINBURGH TO STIRLING MOTORWAY (M.9) : POLMONT AND FALKIRK BYPASS

The Polmont and Falkirk Bypass Motorway (within the Growth Area) is the first section of the eighteen miles of Motorway to be constructed in Stirlingshire and will form the Third Section of the ultimate thirty-two miles of major road network in the County. The Motorway will provide a much needed national artery for the life blood of the industrial Falkirk and Grangemouth Area, free from the congestion of Polmont, Laurieston, Larbert and the surrounding built-up areas.

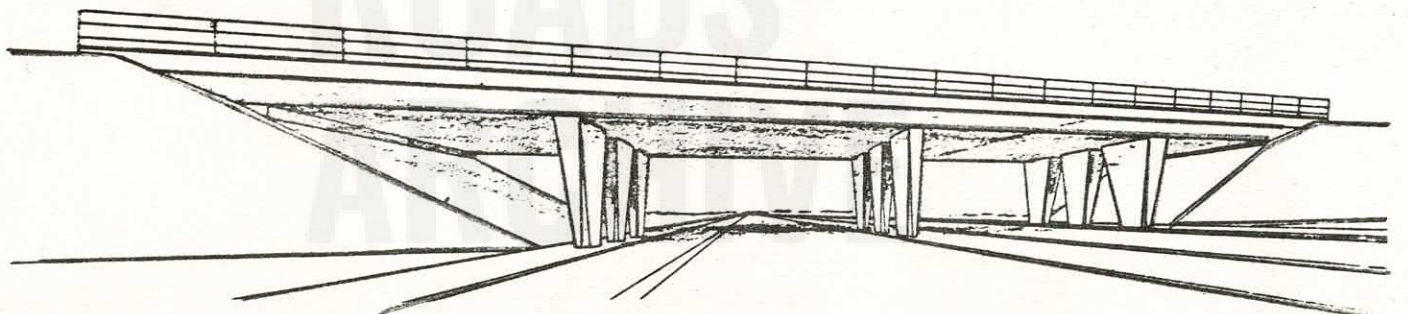
The Bypass is an entirely new road restricted to the use of motor traffic by means of legal powers made available under the Special Roads Act, 1949. This enables the Bypass to be designed to allow traffic to travel safely at high speeds and to minimise the chance of accidents by the elimination of:-

- (i) Presence of pedestrians, cyclists and animals.
- (ii) Access from adjacent land.
- (iii) All crossing traffic, by the bridging of roads and footpaths, etc., encountered en route and the provision of Interchanges of the grade separated directional type.
- (iv) Opposing traffic, by means of a central reservation (dual carriageway).
- (v) Nose to tail collisions at junctions, by the provision of acceleration and deceleration lanes separate from the main traffic flow.
- (vi) Speed variations, by the provision of easy gradients and very large radius curves.
- (vii) Vehicles standing on the carriageway by the provision of hard shoulders for use in emergency.
- (viii) The need for the driver to slow down by providing large signs illuminated or reflecting.

The Polmont and Falkirk Bypass is $5\frac{1}{3}$ miles long, involving the construction of eleven bridges, six major culverts and three interchanges of the grade separated directional type.

The Bypass commences at its Northern end with a temporary roundabout at Longdyke on the Bellsdyke Road (A.876), which in the meantime will afford a connection, via the Bonnybridge and Larbert Diversion to Glasgow, to Stirling, and over the Kincardine Bridge to Clackmannan, Kinross and Fife. It then runs Southwards, passing under the Kirkton Overbridge, Bridge No. 1, and the Western Overbridge, Bridge No. 2, on a long embankment which carries the Bypass over the Carse of the River Forth.

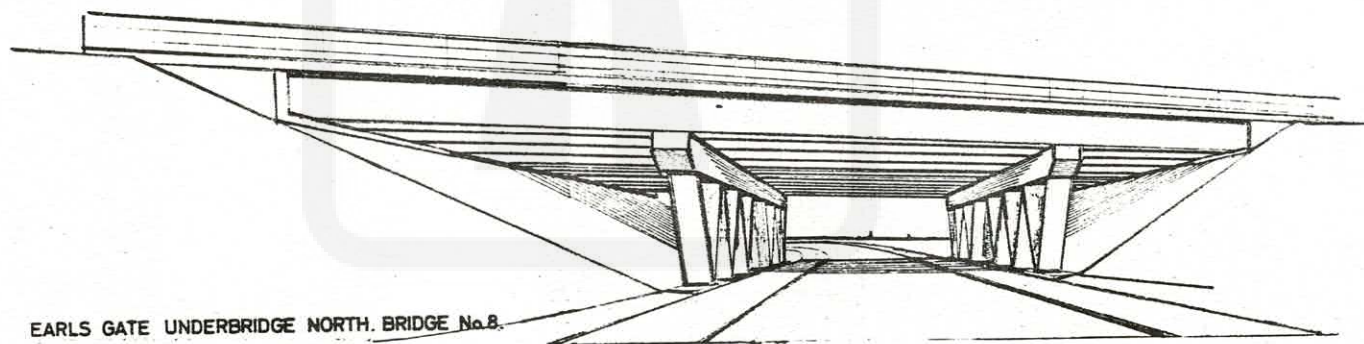
See Illustrations Nos. 1 and 2.



WESTERTON ROAD OVERBRIDGE. BRIDGE No.2. (See Illustration No. 3)

The route of the Bypass lies along the Carse of the River Forth for four-fifths of its length. The Soil Survey carried out in 1963 showed that the sub-grade conditions were amongst the worst experienced in Scottish Roadworks and unable to support normal embankments, which have to be twenty-seven feet high in order to pass over the railway at Fouldubs and the Earls Gate Interchange Roundel. These high spots coincide with a depth of 120 feet of soft brown plastic clay. The weight of the embankments were reduced by using lightweight Pulverised Fuel Ash from Kincardine and other Power Stations. The supply of this material is limited, giving the maximum time possible for settlement to take place. Stirling County Council Roads Department commenced the construction of the embankments by direct labour in January, 1965, and placed 160,000 tons up to the time when the work is being taken over by the Contractor (February 1966). The maximum settlement recorded is 24 inches.

See Illustrations Nos. 4 and 5.

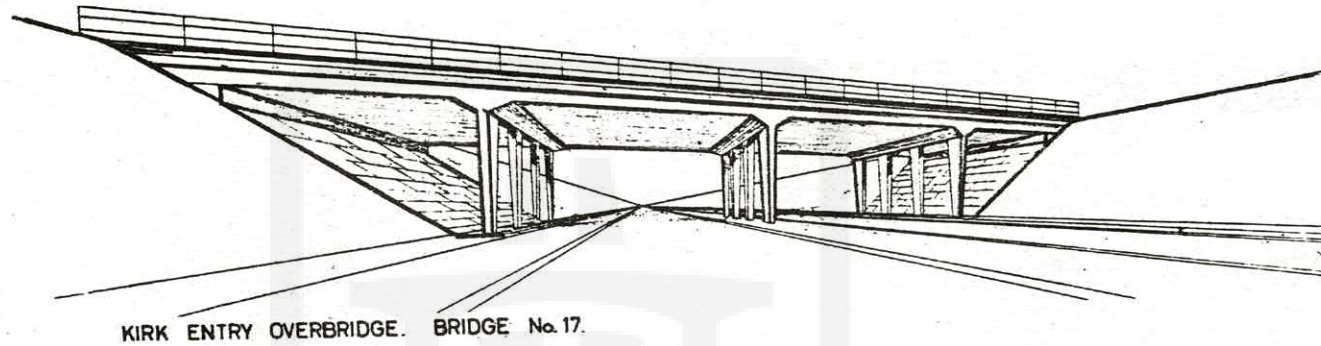


EARLS GATE UNDERBRIDGE NORTH. BRIDGE No. 8.
(See Illustration No. 6)

The remaining one-fifth of the Bypass is in cutting through the raised beach of the Polmont and Lathallan area, continuing Southwards through undulating countryside to the Lathallan Interchange which provides a connection to the Edinburgh-Stirling Trunk Road (A.9), and to the Lathallan to Livingstone New Road which it is hoped will commence this financial year. It is from this cutting that all the material (other than P.F.A. and Spent Oil Shale) for forming the embankments is obtained.

See Illustrations Nos. 7 and 8.

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KIRK ENTRY OVERBRIDGE. BRIDGE No. 17.

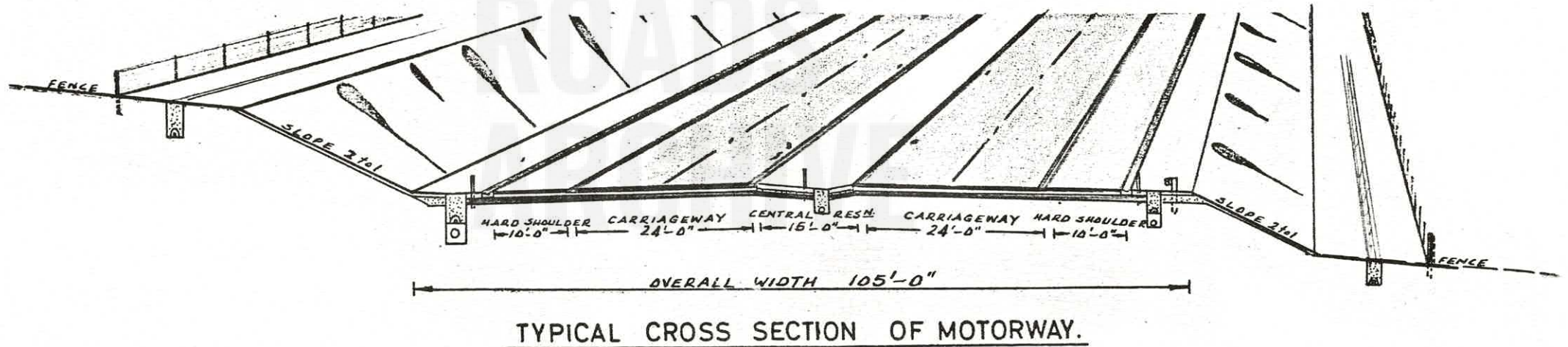
See Illustration No. 9

Although the Bypass cuts between the Industrial Areas of Grangemouth and Falkirk, it has been possible to minimise property demolition to an extent that over the whole length only two derelict buildings, a brick built store, and part of a Timber Yard have been demolished.

The Road and Bridge works have been designed, and the work carried out, under the direction of the County Road Surveyor of Stirling County Council as Agent Authority for the Scottish Development Department.

Carriageways and Bridges have been designed and built to withstand the heavy loading anticipated by the standards imposed by the Scottish Development Department.

The carriageways are completely flexible in construction providing a good riding surface, should differential settlement occur. The minimum depth of construction is eighteen inches consisting of a Sub-Base of cement stabilised spent oil shale, a Base of seven inches Hot Rolled Asphalt, with a surface consisting of a Basecourse of two and a half inches Hot Rolled Asphalt, and Wearing Course of one and a half inches Hot Rolled Asphalt with Pitch-Bitumen Binder.



BRIDGES.

The design criteria and type of construction adopted have been determined by the engineering problems of each individual site and the need for the appearance of the bridge to be in harmony with its surroundings.

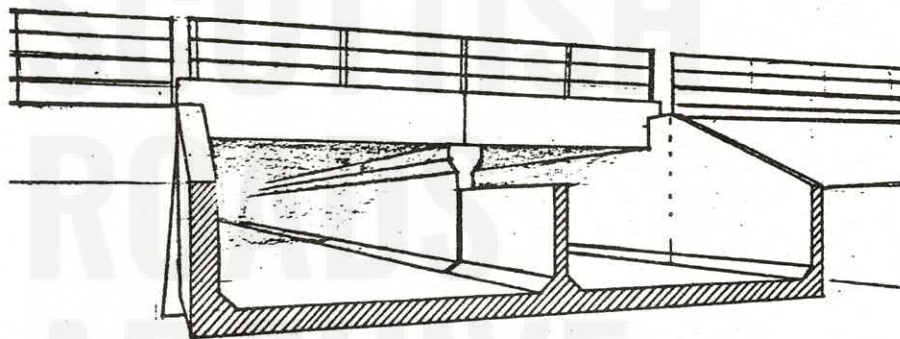
Bridges carrying roads over the Bypass are of four spans, consisting of the Kirkton Farm Road Bridge No. 1, the Westerton Road Bridge No. 2, Kirk Entry Road Bridge No. 17, and the Lathallan Interchange Bridges Nos. 18 and 19. All the overbridges are of reinforced concrete construction, designed either as simply supported or as continuous beam structures.

The bridges carrying the Motorway over roads are either three spans as at Earls Gate Interchange, Bridges Nos. 8 and 9, and Fouldubs Railway Bridge No. 10, or single span as at Cadgers Brae Interchange, Bridges Nos. 15 and 16. The decks are of composite construction in which the concrete slab is anchored to steel beams to produce economic designs. In Bridge No. 10 transverse stiffening of the deck was incorporated to provide a better distribution of the loading.

The Pedestrian Underpass at Primrose Avenue, Bridge No. 12, has been designed to withstand the effects of ground settlement expected in this area. The internal surface of this underpass has been coloured yellow to brighten the interior.

Several culverts of spans of fifteen feet and over have been designed for the Grange Burn and the Flood Relief Channel of the Grange Burn (Bridges Nos. 13, 13A, 13B, 14, 14A and 14B).

The Bridge over the River Carron, Bridge No. 4 is a separate Contract prepared by W. A. Fairhurst and Partners, Consulting Engineers, Contractor for the Bridge - Whatlings.



GRANGEBURN A905.CULVERT. BRIDGE No.14.

CONTROL TESTING.

A well equipped laboratory has been established on the site and regular testing has been carried out on Earthworks and all construction materials by the Testing Consultants employed by Stirling County Council, Messrs. Sandbergs. The testing of bridgework steel was undertaken by Messrs. Solus Schall.

Density Tests were carried out during construction of the Embankments to check the standard of compaction together with tests on the suitability of the materials excavated.

Sieve Analyses of aggregates and checks on the workability of the concrete were carried out during concreting. In the contract period over 3,000 cubes have been made and crushed.

Control of the bituminous materials is by analysis of the samples taken from the delivered material and over 1,100 samples have been analysed.

PILING.

The poor sub-grade conditions made it necessary to use piles at Bridges Nos. 1, 2, 8, 9, 10, 14A, 14B, 15 and 16.

The length of piles at individual bridge sites vary, the longest individual piles being at Fouldubs Railway Bridge No. 10 where the length was 136 feet maximum.

The total length of piling required, if laid end to end, would extend to 5.59 miles, which is greater than the length of the Bypass.

PUBLIC UTILITY UNDERTAKERS SERVICES.

A considerable diversion of existing services of Public Utility Undertakers was required, including Water Mains from $\frac{3}{4}$ " to 36" dia., Gas Mains, Sewers, G.P.O. Apparatus, Electricity Supplies and sections of the Finnart to Grangemouth Oil Pipelines.

COST.

The amount of the Tender is £3,197,649. Work to the value of £182,000 has been carried out by the County Council Roads Department and the cost of P.F.A. supplied to the Contractor will be £300,000.

The total cost of the scheme, excluding land, will be about £4,000,000.

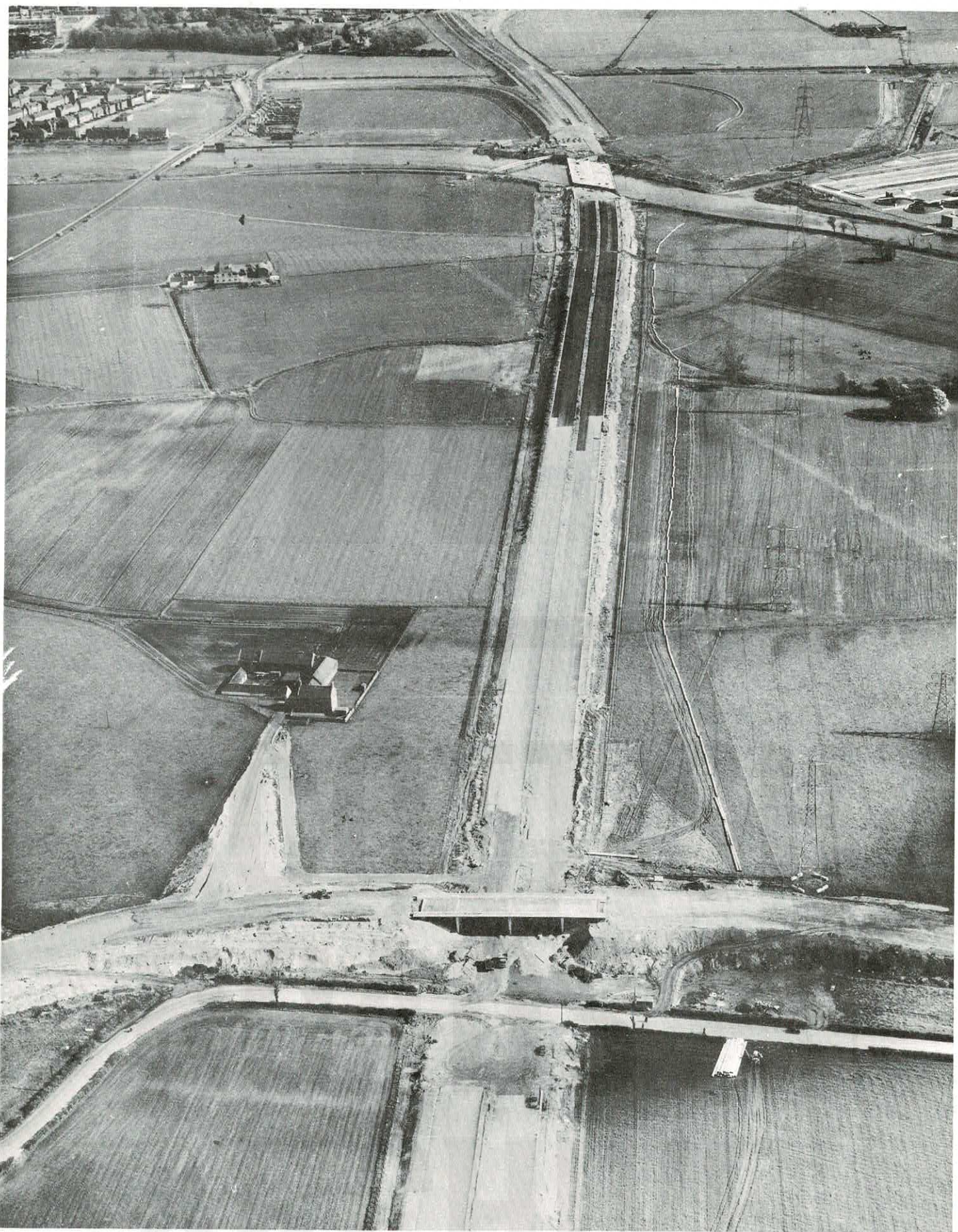


ILLUSTRATION NO. 1. AERIAL VIEW OF THE NORTHERN END OF THE MOTORWAY LOOKING SOUTH WESTERTON BRIDGE (BRIDGE NO. 2) TO THE RIVER CARRON.

PHOTOGRAPH:- AIRVIEWS LTD., MANCHESTER AIRPORT.

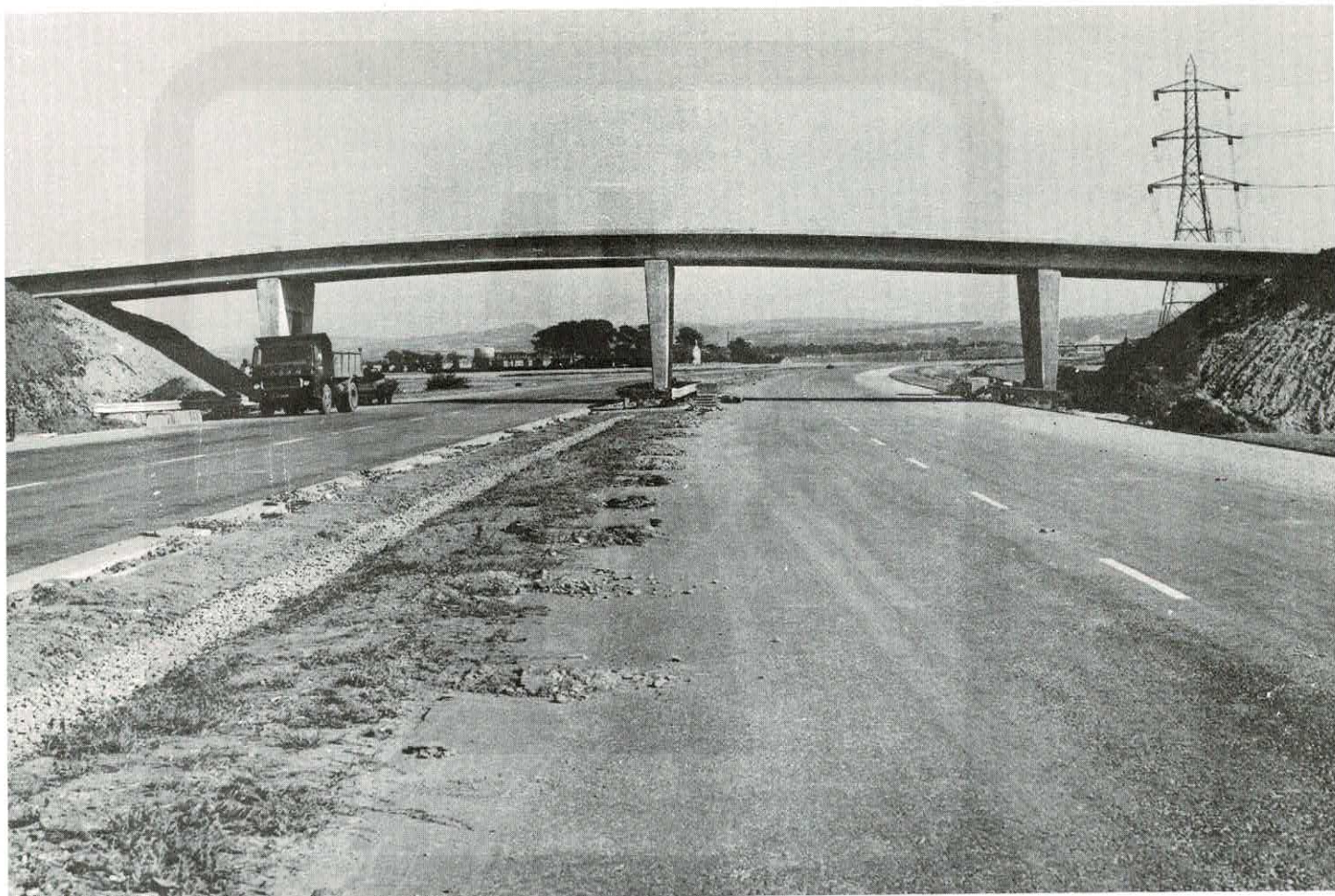


ILLUSTRATION NO. 2. KIRKTON FARM OVERBRIDGE (BRIDGE NO. 1).



ILLUSTRATION NO. 3 WESTERTON ROAD OVERBRIDGE (BRIDGE NO. 2).

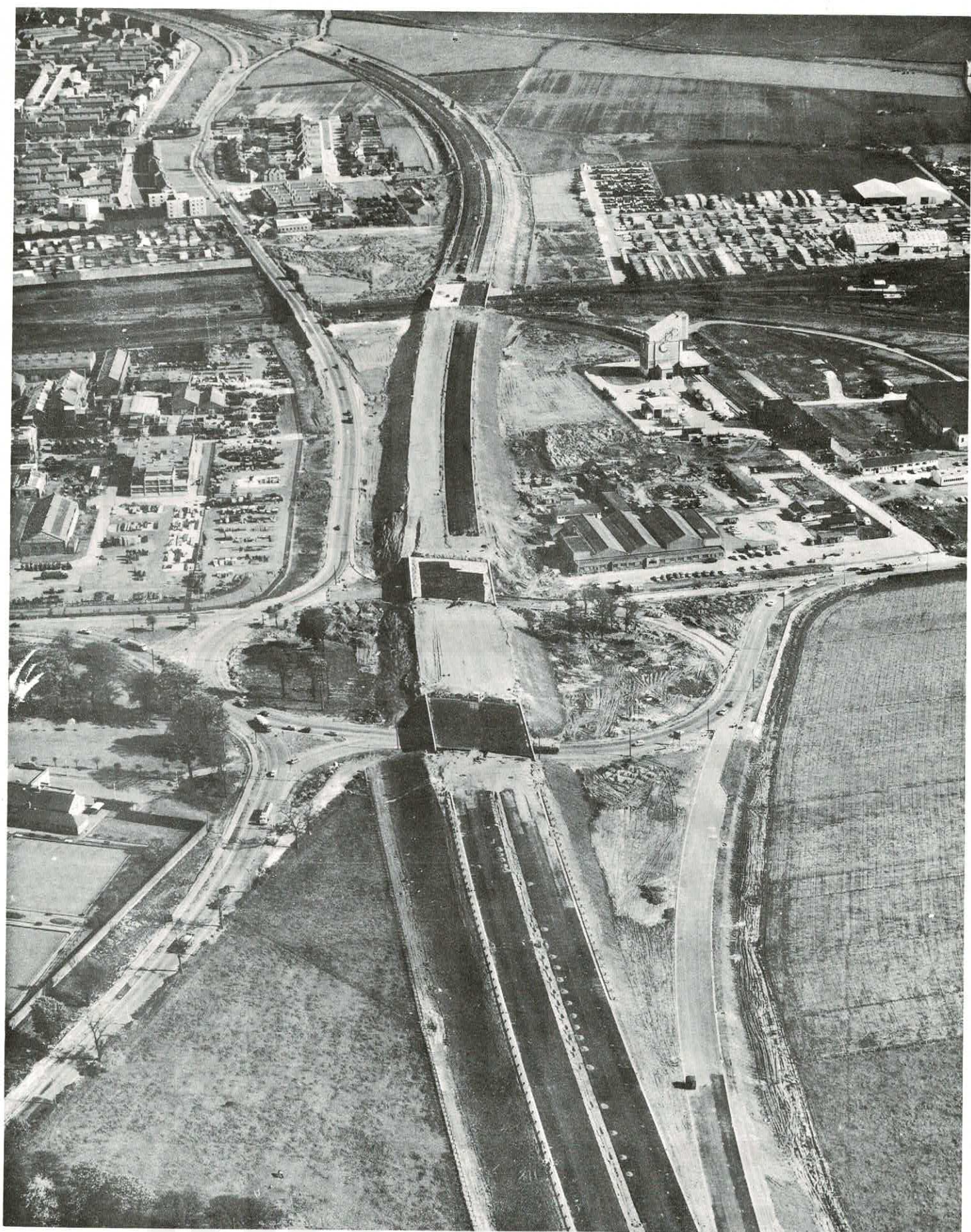


ILLUSTRATION NO. 4 AERIAL VIEW OF THE EARL'S GATE SECTION OF THE MOTORWAY
LOOKING SOUTH, SHOWING THE INTERCHANGE WITH THE
FALKIRK-GRANGEMOUTH ROAD (A.904).

PHOTOGRAPH:- AIRVIEWS LTD., MANCHESTER AIRPORT.

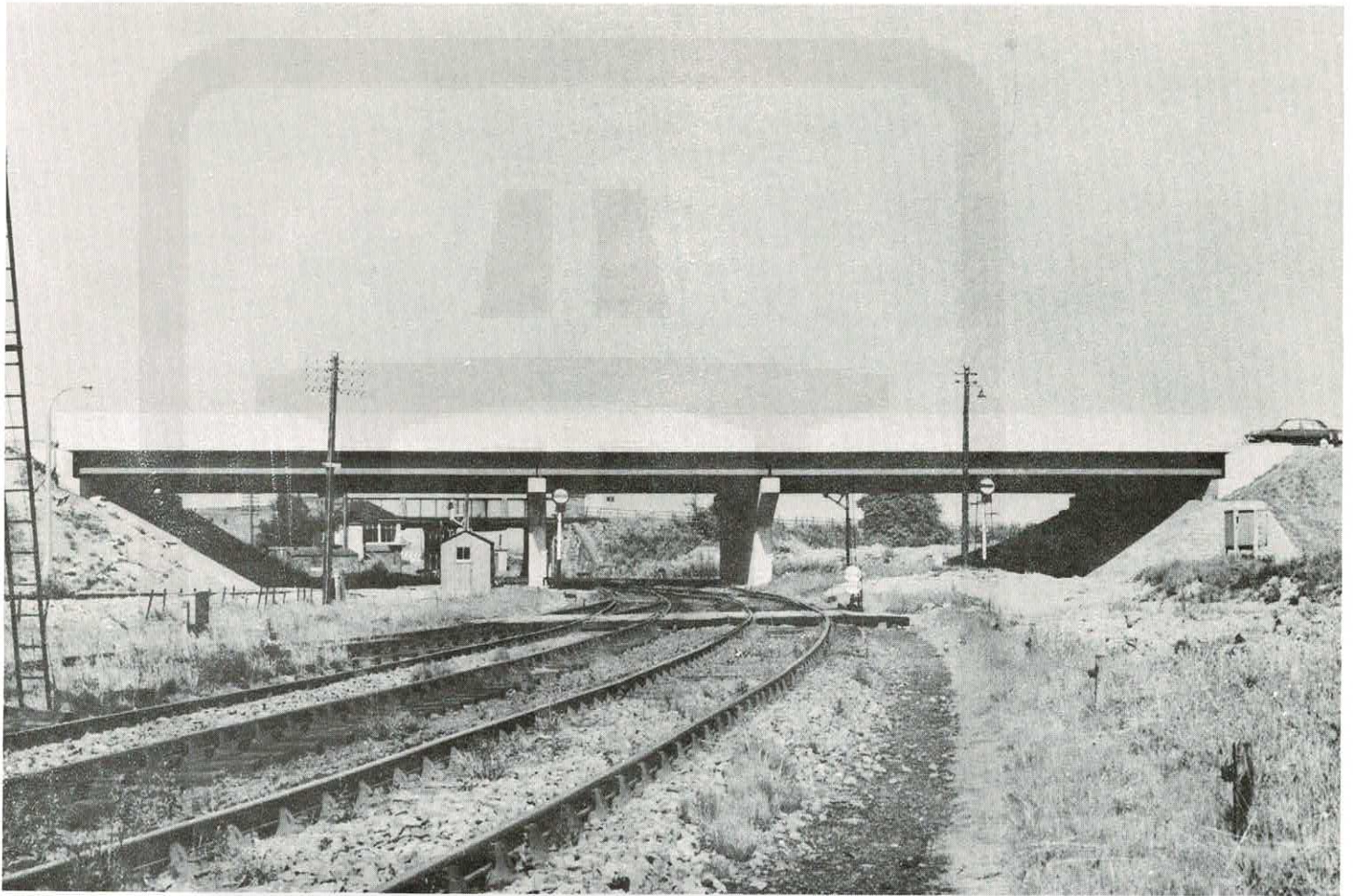


ILLUSTRATION NO. 5 FOULDUBS RAILWAY UNDERBRIDGE (BRIDGE NO. 10).

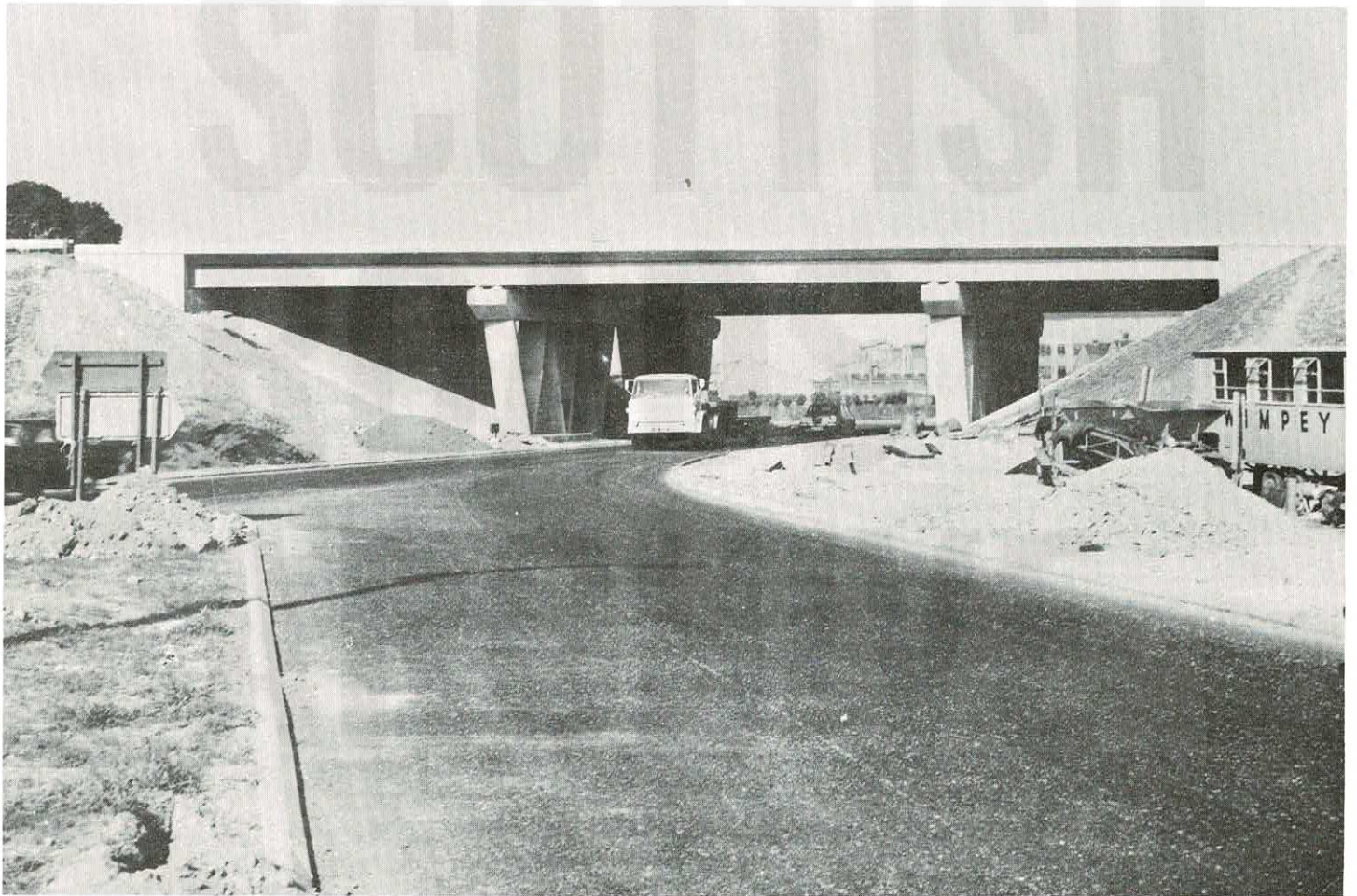


ILLUSTRATION NO. 6 EARL'S GATE INTERCHANGE UNDERBRIDGE (BRIDGES NOS. 8 AND 9).

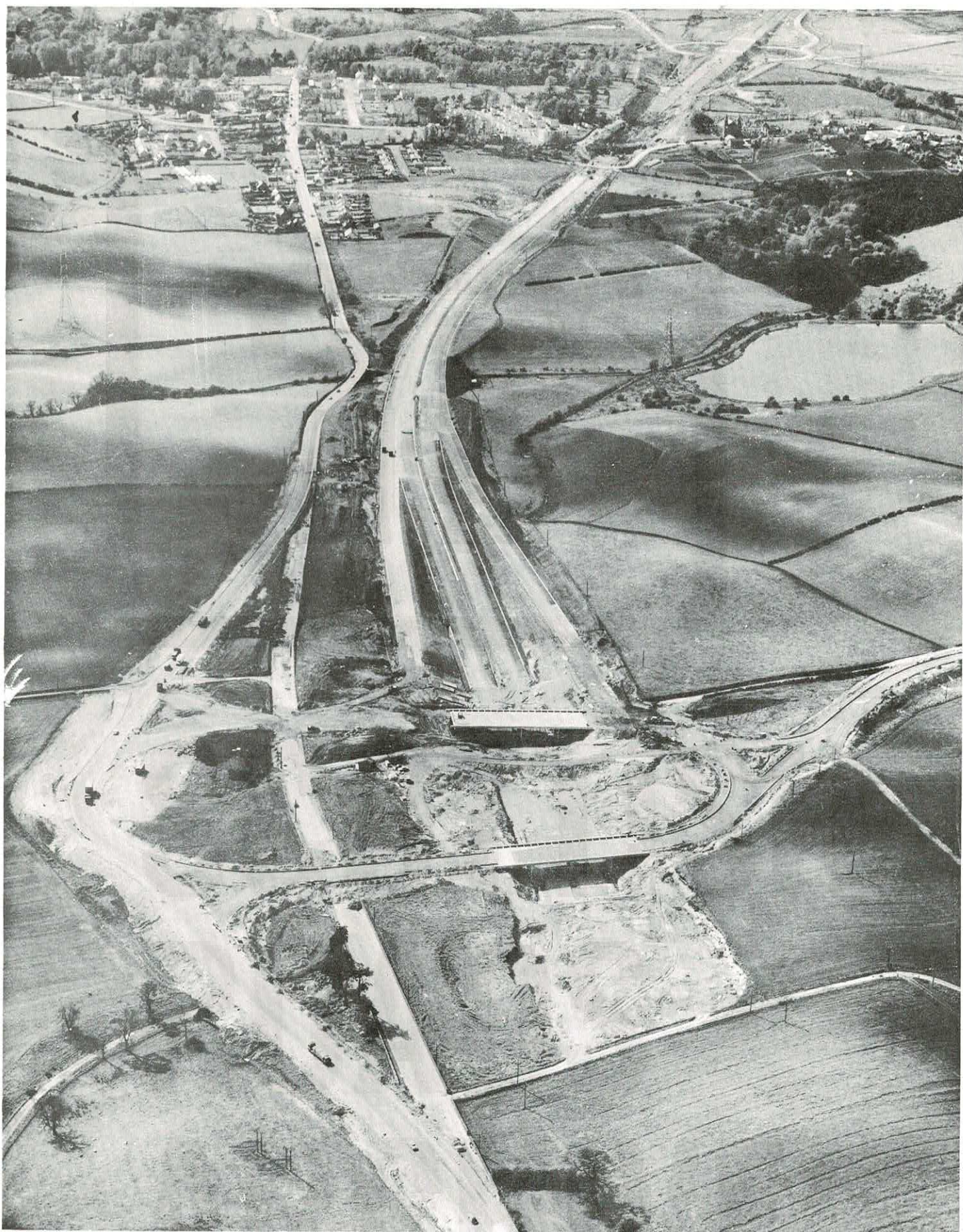


ILLUSTRATION NO. 8 AERIAL VIEW OF LATHALLAN INTERCHANGE AND THE MOTORWAY
LOOKING NORTHWARDS, SHOWING THE DIVERSION OF THE EDINBURGH
ROAD (A.9).

PHOTOGRAPH:- AIRVIEWS LTD., MANCHESTER AIRPORT.

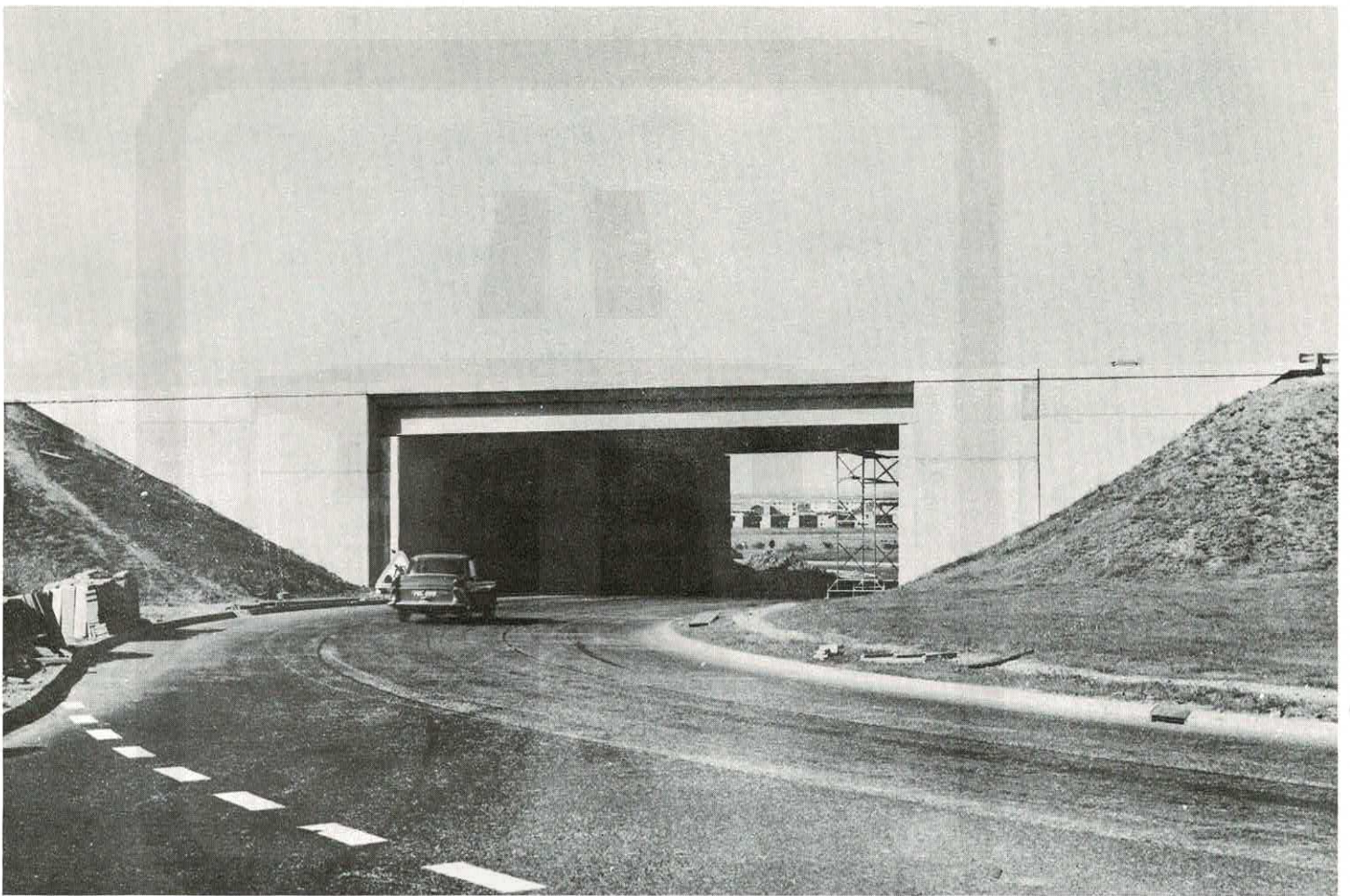


ILLUSTRATION NO. 7 CADGER'S BRAE INTERCHANGE UNDERBRIDGE (BRIDGE NOS. 15 AND 16)

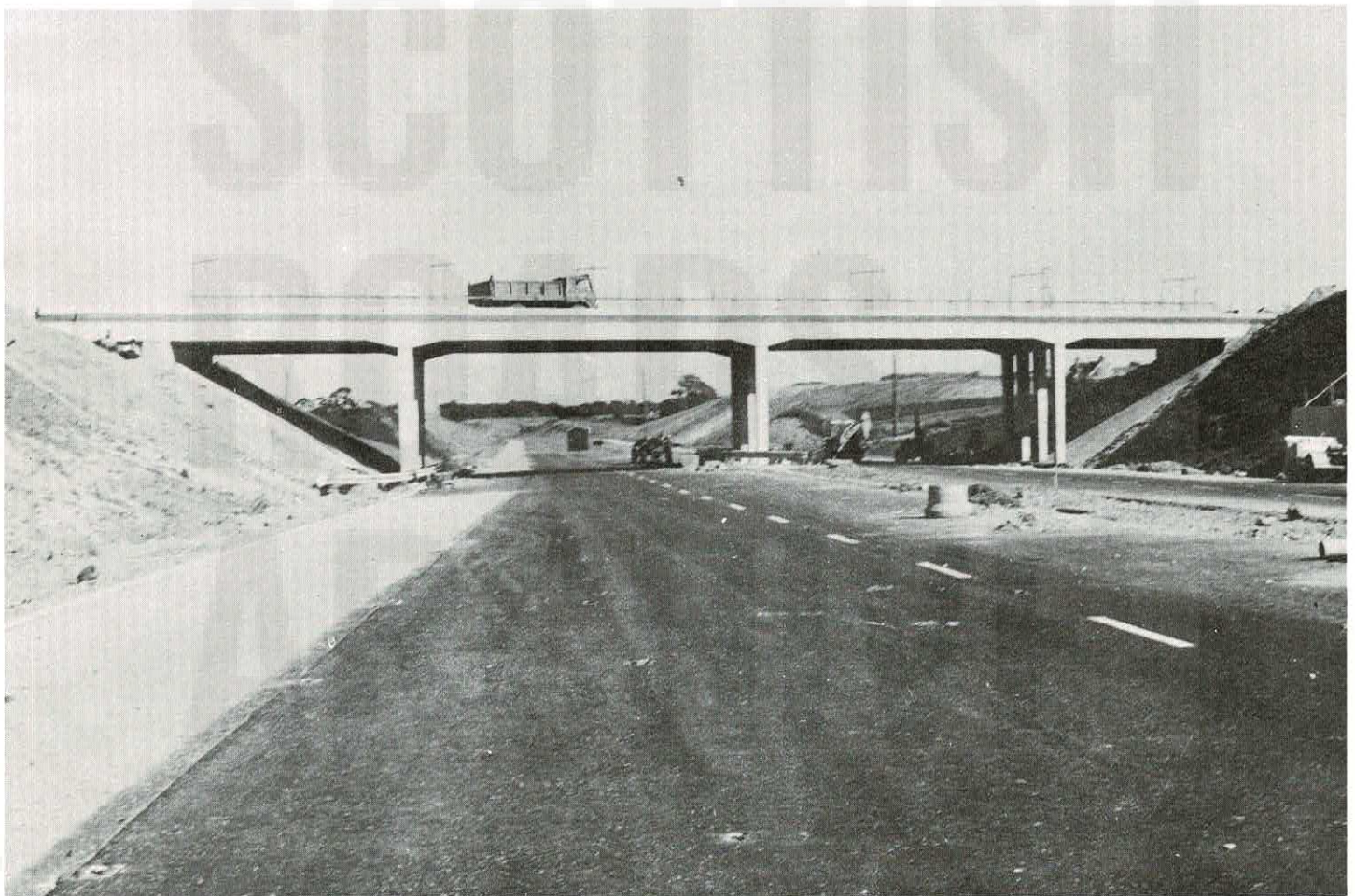
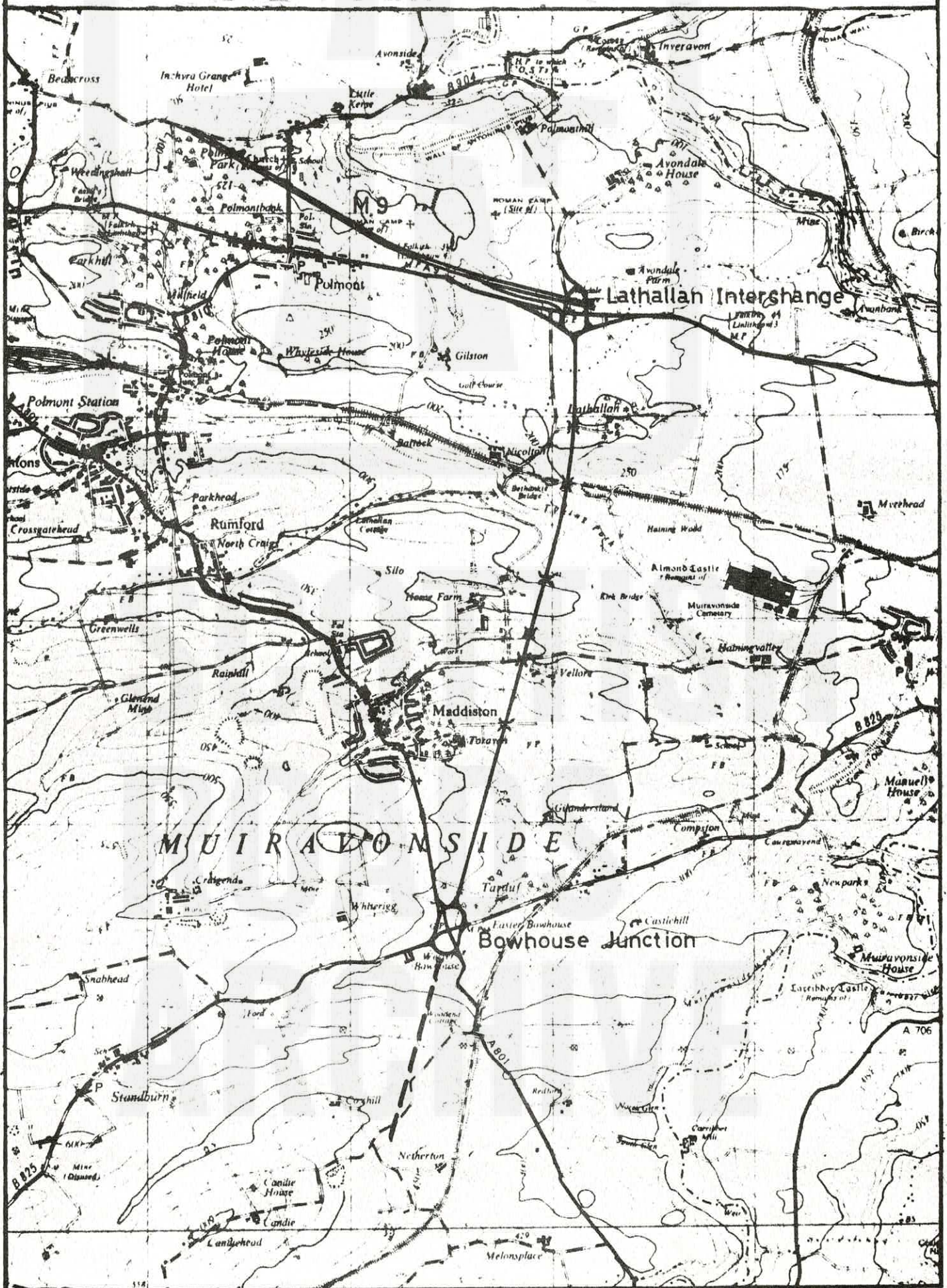


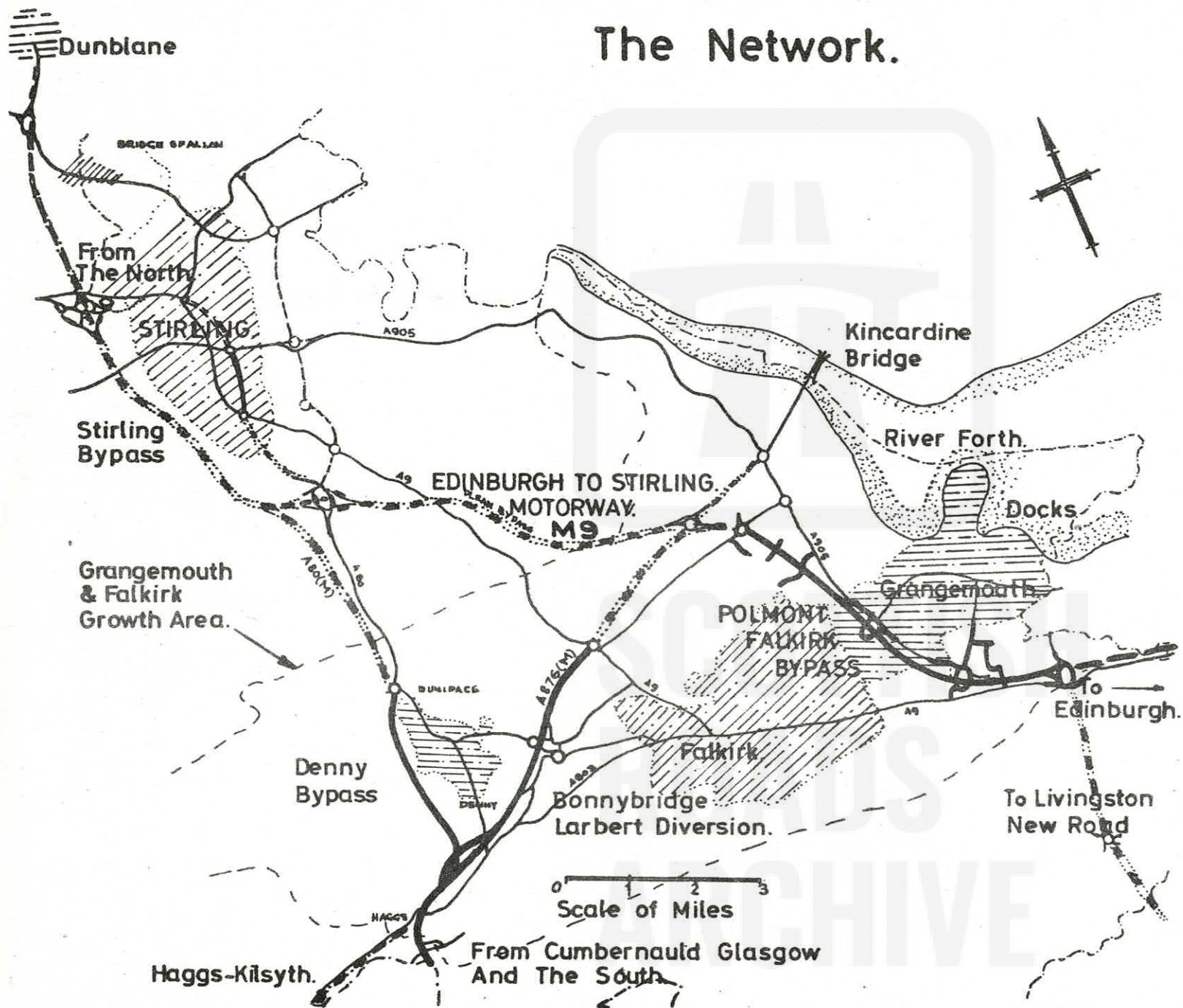
ILLUSTRATION NO. 9 KIRK ENTRY ROAD OVERBRIDGE (BRIDGE NO. 17).

LATHALLAN - LIVINGSTON ROAD

THE NEXT TASK in this vicinity is the construction of the first stage of the North - South link between the M.9 and A.9 Roads at Lathallan and the M.8 and A.8 Roads near Whitburn. This first stage which is to be constructed as a single twenty-four feet carriageway runs from Lathallan Interchange to Bowhouse Cross Roads on the A.801 Road a distance of approximately two miles. The road is being designed so that an additional carriageway can be added in the future to cope with the expected traffic build up from the Livingstone-Bathgate Development Area and the Falkirk-Grangemouth Growth Area. Economically the construction of a dual carriageway would be justified on the basis of the natural growth of traffic by the year 1972.



The Network.



The White Paper entitled "Central Scotland - A Programme for Development and Growth" was issued in November, 1963, and established the Falkirk-Grangemouth Growth Area. Since then the Denny Bypass and the Bonnybridge and Larbert Diversion, and now the Polmont and Falkirk Bypass have been constructed in accordance with the programme which indicated the work contemplated until 1970 as shown on the plan.

Within the County of Stirling it is estimated that work to cost approximately £14,000,000 will have been completed by mid 1971 including -

- Denny Bypass A80(M) (1964)
- Bonnybridge and Larbert Diversion A876(M) (1965)
- Polmont and Falkirk Bypass M9 (1968)
- Stirling Western Bypass M9 (1969-70)
- Lathallan - Bowhouse New Road (1968)
- Ingliston Pinnhall Diversion A80(M) (1970)
- Bellsdyke Diversion A876(M) (1971)
- Plean Bypass M9 (1972)
- Haggs - Kilsyth Improvement (1968)

The dates in brackets are approximate completion dates depending upon progress of administrative procedure and financial allocation.

The ultimate triangular network will afford a system of roads, of motorway or to motorway standards, in Stirlingshire, second to none, and adequate to cater for the considerable anticipated industrial growth of the area.

