

SCOTTISH DEVELOPMENT DEPARTMENT
ROADS DIRECTORATE
TECHNICAL MEMORANDUM SH4/89

GEOTECHNICAL CERTIFICATION PROCEDURES:
TRUNK ROAD GROUND INVESTIGATIONS.

SUMMARY

This Technical Memorandum sets out revised procedures for the Geotechnical Certification of ground investigations and related contract documentation for trunk road schemes.

SCOTTISH DEVELOPMENT DEPARTMENT

ROADS DIRECTORATE

TECHNICAL MEMORANDUM SH 4/89
AMENDMENT NO 1

1. INTRODUCTION

1.1 Appendices B, C, D and E of the above Technical Memorandum have been revised and new certificates 1, 2, 3 and 4 are enclosed for your information and future use.

1.2 Where the Agent Authority/Consulting Engineer introduces, with the prior approval of the Roads Directorate, departures from the various standards referred to, these should be detailed on the certificates as exceptions.

1.3 Where, after detailed discussions between the respective parties, the geotechnical checking consultant holds opinions which differ from those adopted by the originator, these should be detailed on the certificate by the checking consultant under the appropriate heading.

2. IMPLEMENTATION

2.1 The revised certificates should be used for all certificates to be issued after 2 April 1990.

3. ENQUIRIES

3.1 Any technical enquiries about this amendment should be made in writing to the Roads Directorate.



J INNES
Deputy Chief Engineer
Scottish Development Department
New St Andrews House
Edinburgh
EH1 3SZ
30 March 1990

TABLE OF CONTENTS

| | |
|------------------------------------|---|
| 1. INTRODUCTION | 1 |
| 2. SCOPE | 1 |
| 3. STATEMENT OF INTENT | 1 |
| 4. SCHEME CATEGORIES | 1 |
| 5. CERTIFICATION PROCEDURE | 2 |
| 6. INDEPENDENT CHECKING CONSULTANT | 3 |
| 7. ENQUIRIES | 3 |
| APPENDIX A | 5 |
| APPENDIX B | 6 |
| APPENDIX C | 7 |
| APPENDIX D | 8 |
| APPENDIX E | 9 |

GEOTECHNICAL CERTIFICATION PROCEDURES: TRUNK ROAD GROUND INVESTIGATIONS.

1. INTRODUCTION

1.1 Shortcomings in ground investigations and their interpretation continue to lead to errors in earthworks design and specification, the billing of earthworks quantities and the design of structures, with consequential increases in final costs over tender prices.

1.2 Accordingly it has been decided to introduce revised procedures for the geotechnical certification of ground investigations and related parts of the contract documents in order to ensure greater compliance with the Department's requirements.

1.3 This Memorandum supersedes Technical Memorandum SH 6/80.

2. SCOPE

2.1 The requirements in this Memorandum apply to all trunk road improvement schemes including structures, where the nature and extent of the works depend to any degree upon the properties of the ground.

3. STATEMENT OF INTENT

3.1 As soon as possible after the start of the feasibility study or preliminary design work for the scheme, the Director of Roads or Consulting Engineer shall prepare and submit to the Roads Directorate for approval a Statement of Intent in the form shown at Appendix A.

3.2 The Roads Directorate, having approved the Statement of Intent, will decide into which category the scheme falls and advise the Director of Roads or Consulting Engineer accordingly.

4. SCHEME CATEGORIES

4.1 Small and straightforward schemes with the following features will not require certification:-

- earthworks estimated to cost less than £100,000;
- no structures requiring Approval in Principle in accordance with Technical Memorandum SB1/82; and
- no anticipated geotechnical problems.

4.2 All other schemes will require certification, as follows:-

4.2.1 Category A: Straightforward schemes with the following features:-

- no grade separation or high embankments;
- earthworks estimated to cost between £100,000 and £400,000;

- any structures which require Approval in Principle and are deemed to be Category I in accordance with Technical Memorandum SB1/82; and
- no anticipated geotechnical problems.

4.2.2 Category B: All other schemes, with any of the following features:-

- earthworks estimated to cost over £400,000;
- structures deemed to be Category II or III in accordance with Technical Memorandum SB1/82; and
- as Category A but where geotechnical problems will require particular design measures or construction techniques.

4.3 These earthworks costs are only a guide, and it is possible that a scheme of comparatively small financial value may be put into Category B because of difficult ground conditions.

4.4 The sort of features which could lead to a scheme being placed in Category B are:-

- Possibility of landslips affecting the stability of the works.
- Presence of large quantities of marginally suitable, moisture sensitive, or difficult to classify material which could lead to claims if its behaviour was not as predicted.
- Existence of peat or other soft ground conditions.
- Presence of underground workings.
- Rock mechanics problems in cuttings or sidelong ground.
- Anticipated need for dewatering methods, chemical treatment, Dynamic Compaction, Vibro-flotation, long term surcharging or other special methods to render the subsoil stable.
- Artesian water conditions.
- Any other features which would in the opinion of the Roads Directorate create uncertainty in the earthworks design or quantities, or the design of structural foundations, retaining walls, etc.

5. CERTIFICATION PROCEDURE

5.1 Directors of Roads or Consulting Engineers shall submit Certificates in the form given in Appendices B, C, D or E as follows:

5.1.1 Category A schemes: Certificate No 1, which covers the desk study, preliminary and main ground investigation, interpretation and incorporation of the results into the design of the scheme. Schemes shall not go out to tender until the certificate has been accepted by the Roads Directorate. No independent check will normally be made on schemes in this category.

5.1.2 Category B schemes:

a. Certificate No 2, which covers the desk study, the preliminary ground investigation and the contract documentation for the main ground investigation (stage 1). Main ground investigation contracts shall not go out to tender until the certificate has been accepted by the Roads Directorate.

b. Certificate No 3, which covers the main ground investigation and interpretive report (stage 2). Earthworks or structural design shall not start until the certificate has been accepted by the Roads Directorate.

c. Certificate No 4, which covers the design of the earthworks and the translation of this design into drawings, specifications and bill of quantity items (stage 3). Schemes shall not go out to tender until the certificate has been accepted by the Roads Directorate. The certification of the design of structures will continue to be in accordance with Technical Memorandum SB 1/82.

These 3 stages will be subject to an independent check, and Directors of Roads or Consulting Engineers shall obtain the signature of the Independent Checking Consultant before submitting the certificates.

5.1.3 Acceptance of a certificate is denoted by its return duly signed on behalf of the Roads Directorate.

6. INDEPENDENT CHECKING CONSULTANT

6.1 The Roads Directorate will from time to time appoint a firm of geotechnical engineers to act as Independent Checking Consultant.

6.2 The Independent Checking Consultant shall be given such access to the relevant documents, contractors laboratories and sites as will enable him to ascertain whether the Department's requirements are being met.

6.3 It is intended that the independent checking process should extend throughout all stages of the ground investigation and earthworks design. It is important therefore that Directors of Roads or Consulting Engineers should keep the Independent Checking Consultant fully informed of progress so that he is in a position to observe site and laboratory works and discuss the project with the personnel involved.

7. ENQUIRIES

7.1 All enquiries or comments regarding this memorandum should be made in writing to the Roads Directorate.



J INNES
Deputy Chief Engineer
Scottish Development Department
New St Andrew's House
Edinburgh
EH1 3SZ
31 October 1989

Statement of Intent

1. Studies proposed, their purpose and limits listing existing sources of information and fieldwork envisaged.
2. Details of any specialist consultation proposed.
3. Any features of design alternatives affecting investigations.
4. Outline of topography, geology, geomorphological process and hydrology expected to be encountered.
5. Are any man made features (quarries, underground workings etc) expected.
6. Proposed form of report(s).
7. Estimated programme and cost of work.

**GEOTECHNICAL CERTIFICATE NO 1
CATEGORY A SCHEMES**

1. Route No and Scheme
2. The ground investigation for this scheme was designed and supervised by
3. The contractor for the ground investigation was

4. I certify that the desk study, ground investigation together with factual and interpretive reports, and incorporation of the results into the design of this scheme have been carried out in accordance with Technical memorandum SH 2/88 and in recognition of the requirements of the Specification for Highway Works, with the undernoted exceptions, and that reasonable professional skill and care have been used at all stages.

Signed Name
DIRECTOR OF ROADS/
*CONSULTING ENGINEER Firm/
Authority
Date

5. This certificate is accepted by the Roads Directorate.

Signed Name
for Roads Directorate Position
Date

6. Exceptions to SH2/88 and Specification for Highway Works.

*Delete as appropriate

GEOTECHNICAL CERTIFICATE NO 2
CATEGORY B SCHEMES

Certificate for Stage 1

1. Route No and Scheme

2. I certify that a) the desk study and preliminary ground investigation have been carried out in accordance with Technical Memorandum SH 2/88 and b) the main ground investigation contract documents have been prepared in accordance with the current Model Contract Document for Ground Investigation Contracts with the undernoted exceptions.

Signed Name

DIRECTOR OF ROADS/
CONSULTING ENGINEER*

Firm/
Authority

Date

3. I certify that the site and the documents referred to above have been examined and I am satisfied that reasonable professional skill and care have been used in the desk study, preliminary ground investigation and preparation of the main ground investigation contract documents and that the scale and nature of the contract is appropriate to the ground conditions expected and the works to be carried out.

*However, I note below any comments on matters in respect of which there remains a difference of opinion from that adopted by the originator.

Signed Name
INDEPENDENT CHECKING CONSULTANT

Firm

Date

4. This certificate is accepted by the Roads Directorate.

Signed Name
for Roads Directorate

Position

Date

5. Exceptions to MCD and Technical Memorandum SH2/88.
*None/As attached

6. Comments by Independent Checking Consultant
*None/As attached

*Delete as appropriate

GEOTECHNICAL CERTIFICATE NO 3 CATEGORY B SCHEMES

Certificate for Stage 2

1. Route No and Scheme
2. The contractor for the ground investigation was

3. I certify that the ground investigation and resulting factual and interpretive reports have been carried out in accordance with Technical Memorandum SH 2/88 and in recognition of the requirements of the Specification for Highway Works and the Notes for Guidance thereto with the undernoted exceptions.

Signed Name

DIRECTOR OF ROADS/
*CONSULTING ENGINEER

Firm/
Authority

Date

4. I certify that the site and the contractors laboratory have been visited during the ground investigation contract, the factual and interpretive reports have been studied together with any calculations relating thereto and I am satisfied that reasonable professional skill and care have been used in the execution and supervision of the contract and the preparation of the reports, and that these satisfactorily explain the nature of the subsoil and how it should be dealt with.

*However, I note below any comments on matters in respect of which there remains a difference of opinion from that adopted by the originator.

Signed Name

INDEPENDENT CHECKING CONSULTANT

Firm

Date

5. This certificate is accepted by the Roads Directorate

Signed Name
for Roads Directorate

Position

Date

6. Exceptions to SH2/88, Specification for Highway Works and Notes for Guidance

*None/As attached

*7. Comments by Independent Checking Consultant.

*None/As attached

*Delete as appropriate

GEOTECHNICAL CERTIFICATE NO 4 CATEGORY B SCHEMES

Certificate for Stage 3

1. Route No and Scheme

2. I certify that the design calculations, drawings, specification and bills of quantities for earthworks for the above scheme have been prepared on the basis of the interpretive report referred to in Geotechnical Certificate No 3 with the undernoted exceptions.

Signed Name

DIRECTOR OF ROADS/
CONSULTING ENGINEER*

Firm/
Authority

Date

3. I certify that the design calculations, drawings, specification and bills of quantities for the above scheme have been examined and I am satisfied that reasonable professional skill and care have been used in applying the conclusions in the interpretive report to the design and contractual presentation of the earthworks.

However, I note below any comments on matters in respect of which there remains a difference of opinion from that adopted by the originator.

Signed Name

INDEPENDENT CHECKING CONSULTANT

Firm

Date

4. This certificate is accepted by the Roads Directorate

Signed Name

for Roads Directorate

Position

Date

5. Exceptions to the interpretive report.

*None/As attached

6. Comments by Independent Checking Consultant

*None/As attached

*Delete as appropriate