

NRA - South West 395



*National Rivers Authority
South West Region*

GROUND INVESTIGATION

IDLESS DAM

TRURO

OCTOBER 1990

**GORDON BIELBY BSc
Regional General Manager**

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Engineering Manager**

RIVER ALLEN FLOOD ALLEVIATION SCHEME, TRURO

IDLESS DAM

GROUND INVESTIGATION

OCTOBER 1990

ENVIRONMENT AGENCY



125199

NATIONAL RIVERS AUTHORITY SOUTH WEST REGION

RIVER ALLEN FLOOD ALLEVIATION SCHEME, TRURO

GROUND INVESTIGATION CONTRACT

CONTRACT NR: W29 0001 5450

LOCATION: Truro NGR SW 822 472

DESCRIPTION
OF WORKS:

The drilling of 9 nr rotary cored holes and excavation
of 21 nr trial pits including insitu testing.

CONTACT
PERSON:

For further information please contact the Principal
Engineer, Mr J Iffla or Project Engineer, Mr J James
(telephone nr Exeter 444000 extension 2445 or 2447)

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Form of Tender

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Declaration relating to Collusive Tendering

INSTRUCTIONS TO TENDERERS

1. The Tenderer must price and extend every item in the Bill of Quantities, complete and sign the Form of Tender for the whole of the Investigation as specified, entirely clear of any extra requirements or alteration or condition on acceptance. The rates and extensions are to be inserted in black ink and calculated up to a maximum of two places of decimals.

The Tenderer may submit explanatory information relevant to his offer but this must not in any way be at variance with the requirements of the Tender Documents.

The Tenderer should examine all documents as soon as possible and immediately inform the Engineer in writing of any apparent ambiguity or discrepancy in the Tender Documents.

If the Tenderer should also wish to submit for consideration alternative offers, or to place certain conditions on acceptance or introduce proposals outside of the content of the Tender Documents, he may set out his proposals together with such detailed prices and alternative tender sums as would apply in the form of a completely separate Tender, enclosed in a separate envelope to his main Tender. The Documents and envelope shall be clearly marked "Alternative Tender". Alternative Tenders will only be considered where the Tenderer has also submitted a clear Tender in accordance with the first paragraph hereof.

2. Every Tender shall be made on the form supplied by the National Rivers Authority South West Region (hereinafter called "the Employer") without any alteration therein except such as may be necessary by reason of the Tender being made by a Firm or Limited Company. There shall be attached to every Tender a complete and unaltered copy of:-
 - (a) These Instructions
 - (b) The Conditions of Contract
 - (c) The Specification
 - (d) The Bill of Quantities

such Bill of Quantities having the appropriate columns filled in by the person or persons, Firm or Company, taking the Tender hereinafter referred to as "the Tenderer") with the rates upon which the Tender is made. Tenders must in all cases be for the execution of the Investigation in accordance with the Instructions to Tenderers, Conditions of Contract, Specification, Bill of Quantities and the Drawings which have been prepared by the Engineer and which the Tenderer shall be deemed to have examined.

3. No representation by way of explanation or otherwise to persons or Corporations tendering or desirous of tendering as to the meaning of the Instructions to Tenderers, Conditions of Contract, Specification, Bill of Quantities, Drawing or other Contract Document or as to any other matter or thing to be done under the proposed Contract shall bind the Employer or the Engineer unless such representation is in writing under the hand of the Solicitor to the Authority or the Engineer.

4. All of the Tenders submitted will be arithmetically checked and, if necessary, corrected. The summation of all figures will be taken as the Tender Figure.

Any quantity items in the Bill of Quantities which are required to be extended but which are left unpriced shall be deemed to be included in the price for the other items of the work relative thereto.

No reference will be made to the Tenderer other than notification of the revised tender figure in the case of an arithmetical alteration having to be made.

Where examination of Tenders reveals errors or discrepancies in the rates which would affect the Tender Figure in an otherwise successful Tender, the Tenderer is to be given details of such error and discrepancies and afforded an opportunity of confirming his rates or withdrawing his Tender.

5. No Tender will be considered unless contained in the endorsed envelope supplied (or in a plain packet endorsed with the label supplied) which shall be securely sealed, but shall not bear any distinguishing matter or mark intended to indicate the identity of the Tenderer.

The submission of any communication revealing the Tender price other than the Tender itself will disqualify the Tenderer.

6. The Employer does not bind itself to accept the lowest or any Tender and will not pay any expense in connection therewith.

7. The Tenderer is required to complete the following pages which are at the rear of the document printed on green papers:

- (a) Grand Summary
- (b) Form of Tender
- (c) Form of Tender (Appendix)
- (d) Declaration relating to collusive tendering.

8. The date for commencement will be given within 28 days of acceptance of tender.

9. The Tender will remain open for acceptance for 90 days after the closing date for receipt of Tenders.

10. All rates are to be net exclusive of any Value Added Tax. The value of the tax will be reimbursed to the Contractor against Tax Invoices supplied by him.

11. The Contractor when submitting to the Engineer a statement in accordance with I.C.E. Conditions Clause 60(1), shall produce a Monthly Statement Summary Sheet in the form as shown on the page following these Instructions.

12. The Bill of Quantities and Form of Tender are to be completed on the basis that the Contract Price Fluctuations Clause is not applicable and the Price Fluctuations Clause will not apply.

13. The Tenderer shall on the acceptance of his Tender forthwith provide the Employer with a Surety Bond from an Indemnity Company or a Banker's Guarantee to the satisfaction of the Employer for the due and punctual fulfilment and completion of all his obligations under the Contract Documents and no extension of time or any variation of the Contract nor the determination of the Contract by the Employer shall in any way impair or diminish or terminate any liability to the Employer under and by virtue of such Surety Bond.
14. The Tenderer shall submit CV's of the nominated persons with respect to the following:
 - (1) ICE Conditions of Contract for Ground Investigation Clause 15(2).
 - (2) "Department of Transport Specification and method of Measurement for Ground Investigation (HMSO 1987)" Schedule G.
15. The Contractor is requested to give a breakdown of the following costs which have been included in this Tender:
 - (1) Performance Bond
 - (2) Insurance of Works
 - (3) Insurance of ground investigation plant
 - (4) Insurance against damage to persons and property
 - (5) Reinstatement of accesses and working areas
 - (6) Compliance with Clause 2.21
 - (7) Method Related Charges which have been included for complying with the Conditions of Contract and Specification.

The Conditions of Contract are Clauses 1 to 71 inclusive of the "Conditions of Contract and Forms of Tender, Agreement and Bond for use in connection with Ground Investigation (First Edition - October 1983)" approved by the Institution of Civil Engineers, the Association of Consulting Engineers and the Federation of Civil Engineering Contractors and commonly known as "the I.C.E. Conditions of Contract for Ground Investigation" together with the following Amendments and Special Conditions:-

AMENDMENTS TO CONDITIONS OF CONTRACT AND SUPPLEMENTARY CLAUSES

Clause numbers relate to the Clause Numbers in the Conditions of Contract.

DEFINITIONS 1. Sub-clause (1)(a). Complete this sub-clause as follows:

"Employer" means the National Rivers Authority, South West Region.

Sub-clause (1)(c) complete this sub-clause as follows:

"Engineer" means Chief Engineer for the time being of National Rivers Authority, South West Region.

SUB-LETTING 4. Line 1 - after "Investigation" insert "There shall be no sub-letting of the boring or drilling part of the Investigation."

DAMAGE TO PERSONS AND PROPERTY 22. Sub-clause (1) line 3. After "person" insert:

"(including members and employees of the Employer)".

Sub-clause (1) Line 3. After "property" insert:

"(including the property of the Employer)".

Add new sub-clause (3) as follows:

Extension of Indemnity

(3) For the purpose of this Contract the provisos (a) and (b) (v) of sub-clause (1) of this Clause shall not include any injury or damage to persons or property arising out of any accident involving a vehicle supplied by the Contractor for use by the Engineer and occurring when such vehicle is being driven by or is in the charge of the Engineer or any person authorised by him.

INSURANCE AGAINST
DAMAGE TO PERSONS
ON PROPERTY

23. Sub-clause (1) line 3. After "property"
insert:

"(including the property of the Employer)".

Sub-clause (1) line 3. After "person" insert:

"(including members and employees of the
Employer)".

CONTRACTOR TO
CONFORM WITH
STATUTES, ETC

26. Add new sub-clause (3) as follows:

(3) Without prejudice to the duties of the Contractor under this Clause insofar as the Employer is authorised by any Statute or Byelaws made thereunder and in particular by the Public Health Act 1936, the Water Acts 1945-81, the Rivers (Prevention of Pollution) Acts 1951 to 1961, the Water Resources Act 1963, the Nature Conservancy Council Act 1973, the Control of Pollution Act 1974, the Salmon and Fresh Water Fisheries Act 1975, the Land Drainage Act 1976, the Wildlife and Countryside Act 1981, to give a consent to the carrying out of any operations, no consents shall be deemed to have been given by the Employer in its capacity as the National Rivers Authority incorporated under the Water Act 1989 in relation to such operations and the Contractor must satisfy himself that he has the necessary consent of the National Rivers Authority before carrying out such operations unless they are the unavoidable result of complying with the drawings, specifications or instructions of the Engineer.

TRANSPORT OF
MATERIALS

30. Sub-clause (3) line 9. After "such claim"
insert:

"or any such claims made against the Employer".

RATES OF WAGES/
HOUR AND CONDITIONS
OF LABOUR

34. Delete whole Clause.

USE OF SITE

- 42.(2) Delete whole sub-clause and insert new sub-clause (2) as follows:

"The Contractor shall not negotiate directly on any matter arising out of the contract or relating to the Investigation with the owners or occupiers of land required for access or for the purposes of the Investigation. In the event of the Contractor requiring further land or special access to the site he should contact the Engineer's Representative with his requirement and the Engineer will decide if it is necessary for the carrying out of the Investigation. If it is deemed necessary the Employer shall negotiate directly with the owner or occupier concerned for the additional land. Where it is not deemed necessary but is allowable and the Contractor undertakes to pay all claims or compensation whatsoever which may arise from the obtaining of the additional land and the Employer will negotiate for such additional land".

42. Add new sub-clause (3) as follows:

"(3) The Contractor shall not use the site for any purpose other than that of carrying out the Investigation in accordance with the Contract".

FINAL ACCOUNT

- 60(3) Add (a) after 60 (3) and insert new sub-clause (b) as follows:-

"(b) The Employer will carry out a financial audit of the final account before the issue of the final certificate in accordance with sub-clause 3(a) hereof and the Contractor shall co-operate fully with this requirement".

INTEREST
ON OVERDUE
PAYMENTS

- 60(6) Line 4 - delete "Average" and "Barclays National Westminster and Midland".
- change "Banks" to "Bank PLC"
Line 6 - delete "Average".

SPECIAL
CONDITIONS

72. The following special conditions form part of the Conditions of Contract.

CONTRACT
PRICE
FLUCTUATIONS

73. This Contract has been prepared and issued for the invitation of Tenders on a fixed price basis and the Contract Price Fluctuations Clause is not included in the Conditions of Contract.

REINSTATEMENT

74(1) The Contractor if called upon to do so by the Engineer and in accordance with his instructions as to the time and manner in which it shall be carried out, carry out any works necessary for the reinstatement of any property howsoever damaged and if the damage to the property is such that the Contractor would not be liable to pay compensation or damages or indemnify the Employer by virtue of Clause 22 (1)(b) then such works shall be valued and paid in accordance with Clause 52.

(2) If the Contractor is liable under Clause 22(1) of the Conditions to indemnify the Employer and reinstatement in part or in whole is not required by the Engineer in accordance with (1) above the Contractor shall allow any claim by any person to be assessed by the Employer without reference to the Contractor whether or not that claim is received by the Employer direct or forwarded to the Employer by the Contractor (and the Contractor is under duty to so forward). The Contractor will be notified of the assessment of such claims, together with the reasonable professional charges for valuation incurred by the claimant and the Employer which shall be payable by the Contractor to the Employer and which the Employer may deduct from any payment due to the Contractor under the terms of the Contract. If the Contractor disputes the assessment then such dispute shall fall to be settled in accordance with Clause 66.

RECOVERY
OF SUM DUE FROM
THE CONTRACTOR

75. Whenever under the Contract any sum of money shall be recoverable from or payable by the Contractor such sum may be deducted from or reduced by the amount of any sum or sums then due or which at any time thereafter may become due to the Contractor under the Contract or any other contract with the Employer.

GIFTS, INDUCEMENTS
AND REWARDS

76. The Employer shall be entitled to cancel the Contract and to recover from the Contractor the amount of any loss resulting from such cancellation, if the Contractor shall have corruptly offered or given or agreed to give to any person any gift or consideration of any kind as an inducement or reward for doing or forbearing to do or for having done or forborne to do any action in relation to the obtaining or execution of the Contract or any other Contract with the Employer, or for showing or forbearing to show favour or disfavour to any person in relation to the Contract or any other Contract with the Employer, or if the like acts shall have been done by any person employed by him or

acting on his behalf (whether with or without the knowledge of the Contractor), or if in relation to any Contract with the Employer the Contractor or any person employed by him or acting on his behalf shall have committed any offence under the Prevention of Corruption Acts 1889 to 1916, or any amendment of them or shall have given any fee or reward the receipt of which is an offence under sub-section (2) of Section 117 of the Local Government Act, 1972.

MINISTRY OF
AGRICULTURE
FISHERIES AND
FOOD

77. "The Ministry of Agriculture, Fisheries and Food is paying grant towards the costs of the Investigation and the Ministry's representative shall at all times have access to the Site and the Contractor shall afford every facility and every assistance in or in obtaining the right to such access."

ADVERTISING

78. The Contractor or any person supplying plant, material or equipment for the Investigation shall not publish any information about the works nor shall the site be used for any demonstration of plant, equipment or material to third parties unless such publication or demonstration shall have been approved by the Engineer. All notice boards erected on the site and designed to attract public attention to the works shall be approved by the Engineer.

S P E C I F I C A T I O N

SPECIFICATION

PREAMBLE

1. The Specification referred to in the Tender shall be the 1987 edition of the "Department of Transport Specification and Method of Measurement for Ground Investigation" published by Her Majesty's Stationery Office modified and extended by any Substitute Clause or Additional or Cancelled Clause or Table listed in Schedule A below.
2. A Substitute Clause, as indicated by the suffix "S" is a modification originating from the Department of Transport. A Substitute Clause suffixed "SR" is a Regional or scheme specific modification. Both types of Substitute Clauses are major text modifications of the Clause in the Specification and supersede the whole of that Clause.
3. An Additional Clause supplementing the Specification with the suffix "A" originates from the Department of Transport. A Clause "AR" is a Regional or scheme specific addition. Both types of Additional Clauses have a number subsequent to the last Clause of its Series in the Specification.
4. A Cancelled Clause is indicated by the suffix "C" or "CR" and is a Clause entirely deleted from the Specification either by the Department of Transport or a Regional or scheme specific cancellation respectively.
5. Insofar as any of the numbered Appendices, Substitute, Additional or Amended Clauses may conflict or be inconsistent with any provision of the Specification for Ground Investigations then the numbered Appendices, Substitute, Additional or Amended Clauses shall always prevail.
6. Any reference in the Contract to a Clause number or Appendix shall be deemed to refer to any Substitute Clause or Appendix of that number or to any amended version of that Clause or Appendix as listed in Schedule A.
7. Reference to Clauses shall apply equally to Tables. Where a Clause is amended or substituted any Tables referred to in the original Clause shall apply unless the Table is also amended. When a Table is amended any reference in a Clause to the original Tables shall apply to the amended Table.
8. Any Clauses or Appendices in the Specification which relate to work or materials not required for the Investigation shall be deemed not to apply.
9. Any Schedules referred to in the Specification which are not used shall be deemed not to apply.

SCHEDULE A
LIST OF SUBSTITUTE, ADDITIONAL
OR CANCELLED CLAUSES AND TABLES

SECTION 1

INFORMATION

1.6SR The following is provided in Schedule G:-

1. The level of the Contractor's professional attendance in accordance with Clause 2.12, 4.10 and 10.3.

SECTION 2

GENERAL REQUIREMENTS

2.14SR Location and Ground Elevation of Exploratory Holes

The Engineer will provide the Contractor with ground markers at the location of each exploratory hole. The Contractor shall confirm the position of each exploratory hole with the Engineer prior to commencing any site operations at that location.

2.15SR Exploratory Work

The location and depth of each exploratory hole shall be as described in the Contract. The Engineer may, after consultation with the Contractor, vary the location and depth of any exploratory hole and the sequence or quantity of insitu testing depending on the actual ground conditions encountered. When the position of an exploratory hole has been varied, the Contractor shall take all necessary measurements required to locate the exploratory hole.

The Contractor shall obtain the Engineer's prior approval before commencing any exploratory hole and before moving his equipment from each location and backfilling each exploratory hole.

SECTION 4

ROTARY DRILLING

4.6SR Drilling Fluid

The drilling fluid shall normally be clean water and/or air. The Engineer may require drilling muds, additives or foam to be used. The precise type of mud, additive or foam shall first be approved by the Engineer.

The Contractor shall make all necessary arrangements for providing at the site of each hole an adequate supply of water for the operations.

Flush return fluids shall be pumped to locations agreed by the Engineer to allow percolation and settlement of suspended solids and so prevent river pollution.

4.8SR Removal of Cores

Core barrels shall be held horizontally whilst the core is extruded, in the same direction as it entered the barrel, by applying a constant pressure, without vibration and in a manner to prevent disturbance to the cores and shall be extruded directly into the core box or into a correctly sized detachable channel which forms part of the core box. After extrusion all cores shall immediately be sealed with transparent flexible sheeting or other approved sealant to prevent drying out and damage. They shall be resealed immediately following examination, logging and photography. Alternatively, and where approved by the Engineer, the Contractor may use low friction transparent plastic liner tubes, as described in BS 5930.

4.11SR Core Photographs

The Contractor shall photograph all the rock cores in a fresh condition prior to logging. A single gloss enprint in colour shall be submitted of each photograph for the approval of the Engineer and for his retention, within 3 weeks of the completion of each borehole. If the photograph quality is not accepted by the Engineer, the Contractor shall photograph the cores at his own expense and within 2 weeks shall present an enprint for the approval of the Engineer. On acceptance of the enprint quality by the Engineer two 175 x 125mm copies of each colour photograph shall be prepared of each core box. Two complete sets of all 175 x 125mm photographs shall be mounted and submitted inbound volumes together with one set of photograph negatives, with the Final Factual Report. The following items shall be included in each photograph:-

- (a) A standard colour chart and monochrome step wedge.
- (b) A graduated scale in millimeters.
- (c) The labels and markers specified in Clause 4.9 which shall be clearly legible in the photograph.

In addition the Contractor shall ensure that the following criteria are fulfilled:-

- (d) The core boxes are evenly lit.
- (e) The core box in each photograph fills the frame.
- (f) The focal plane of the camera and the plane of the core box are parallel.
- (g) The camera is placed in the same position with respect to the core box in every photograph.

SECTION 5

INSPECTION PITS AND TRIAL PITS

5.4SR Support to Pit Sides and Safety

Unless otherwise stated in the Contract the Contractor shall adequately support the sides of pits and trenches at all times to protect anyone entering and working in the hole. The supports shall be placed so as to minimise interference with the taking of samples or inspection of the faces. The Contractor shall take all necessary

safety checks, including checking for noxious or toxic gases or materials, or radioactive materials.

Unsupported trial pits shall be excavated by machine to depths as stated in the Contract. The purpose of these pits is for visual examination from ground level only, and access below 1.2m depth is not required.

5.6SR Photographs

Where required the Contractor shall provide colour photographs of pits and trenches with their support in place and their arisings. Photographs will generally be required at the rate of three for every pit or as directed by the Engineer. A single gloss enprint in colour shall be submitted of each photograph for the approval of the Engineer and for his retention, within 3 weeks of the completion of each pit or trench. If the photograph quality is not accepted by the Engineer, the Contractor shall photograph the pit or trench at his own expense and within 2 weeks of the refusal, shall present an enprint for the approval of the Engineer. On acceptance of the enprint quality by the Engineer, two 175 x 125mm copies of each colour photograph shall be prepared for each pit or trench. Two complete sets of all 175 x 125mm photographs shall be mounted and submitted in bound volumes together with one set of photograph negatives, with the Factual Report. The following items shall be included in each photograph.

- (a) A standard colour chart and monochrome step wedge.
- (b) A graduated scale in millimeters.
- (c) The pit or trench shall be as far as practicable evenly lit, so that no detail of the ground conditions is obscured in the photograph as a result of excessive light or shade.

SECTION 7

GROUND WATER, STANDPIPES AND PIEZOMETERS

7.1SR Ground Water Measurement Records

Ground water when encountered in exploratory holes shall be measured in the following way:-

1. When water is first encountered the depth from ground level of the point of entry shall be recorded and exploratory hole operations stopped and the depth from ground level to water level recorded at 5 minute intervals until no further rise is observed. However, if at the end of the period of 20 minutes the water level is still rising, unless otherwise instructed by the Engineer, this shall be recorded together with the depth of water below ground level and the exploratory hole shall then be continued. If casing is used and this forms a seal against the entry of ground water, the Contractor shall record the depth at which no further

entry or only insignificant infiltration of water occurred. Where applicable every effort shall be made to seal off each water strike. The Time and the Equipment is standing shall be agreed with the Engineer.

2. When further changes in water levels occur such as when lower water tables are found after upper water tables have been sealed off by the casing, they shall be recorded as in Clause 7.1.1.
3. Water levels shall be recorded at the beginning and end of each shift.
4. On each occasion when ground water is recorded the depth of the exploratory hole, the length of each size of casing inserted in the exploratory hole, and the time shall also be recorded.
5. The Engineer may require exploratory holes to be left open for 24 hours after completion and the water level recorded at the end of this time.

7.2SR Piezometers and Standpipes

Piezometers and Standpipes for recording seepages, ground water and changes in ground water levels shall be installed in exploratory holes where indicated in the Schedule of Exploratory Holes or where instructed by the Engineer. They shall be as described in Clauses 7.3 to 7.6 inclusive and Specification Appendix No. 1. Readings of water levels in each piezometer shall be made by the Contractor during the Contract Period as directed by the Engineer with an approved sounding instrument or read-out unit supplied by the Contractor as detailed in Schedule B.

SECTION 8

INSITU AND ON-SITE TESTING AND PROBING

8.3SR Testing - General

The following information shall be submitted for each test record to be included in the factual report:-

1. Date of test.
2. Project name, exploratory hole number and location.
3. Depth and location of test or depths covered by test as appropriate together with reduced levels.
4. Information on water levels in exploratory hole during testing.
5. Original ground level at test site.

6. Soil type and description as identified from samples required in Section 8.4 and BS 5930.

All results shall be reported in SI units.

8.4 Testing - Procedures

8.4.1SR Penetration Resistance Test

Equipment and Procedure:-

1. The test equipment and procedure shall be as described in BS 1377 Test 19, and the drive hammer shall be of the type incorporating an automatic trip mechanism to ensure free fall.
2. The maximum intervals between tests measured centre to centre shall be 1.5m or as directed by the Engineer.
3. When tests are performed in soils containing gravel the driving shoe of the split barrel sampler shall be replaced by a solid 60 degree cone, or the split barrel sampler with solid cone may be replaced by an identically dimensioned solid test rod.
4. Where blows for each 75mm are in excess of 20, the penetration for each 20 blows shall be recorded in mm for a total of 100 blows.
5. Where a solid cone is used or where no soil is recovered in the split hammer sampler, a small disturbed sample shall be obtained from the position of the test.

Information to be submitted:-

1. The number of blows for the first 150mm penetration.
2. The number of blows for each successive 75mm penetration or penetration produced by 5 sets of 20 blows.
3. The penetration resistance ("N" value).
4. Boring method, size and depth of casing.
5. Information on added water.

SCHEDULE B

INFORMATION

1. **Scope of Contract**
2. **Object of Contract**
3. **Description of the Scheme**
4. **Schedule of Drawings**
5. **Contract Requirements**
6. **Geology**
7. **Engineers Office**
 - 7.1 **Accommodation**
 - 7.2 **Furnishings**
 - 7.3 **Services**
 - 7.4 **Equipment**
8. **Landowners/Occupiers**

SCHEDULE B

1. Scope of Contract

The Contractor is required to drill rotary cored boreholes and excavate trial pits. In-situ testing, laboratory testing and a subsequent Factual Report will be required.

2. Object of Contract

The object of the Contract is a main ground investigation in order to obtain sufficient design information regarding the ground conditions at the proposed site for dam design.

3. Description of the Scheme

Construction of a gravity dam together with release culvert, stilling basin and other associated works.

4. Schedule of Drawings

Drawing No.	Description	Scale
TR/2/1	Contour Plan Borehole & Trial Pit locations Access & Working Areas Approximate Service locations	1:1250
TR/2/2	Site location plan	1:10560

Drawings of the location of underground services may be used for guidance purposes only. The Contractor shall make his own enquiries as to the precise location of any services.

5. Contract Requirements

1. The Contractor shall at all reasonable times afford access to any authorised Officer of the British Geological Survey or any Independent Engineering Geologist or Geotechnical Engineer appointed by the Engineer. They shall be allowed to inspect the Investigation, the materials taken from the exploratory holes and the daily journals. Check logging of soil and rock samples from certain exploratory holes may be made by the independent geologist or geotechnical engineer.
2. The Contractor shall confine his working to the hours between 0700 and 1900 on Mondays to Fridays and between 0700 and 1400 on Saturdays. Work on Sundays, other than emergency work, shall not be permitted.
3. Water levels in piezometers to be taken at daily intervals during the Site Operations.

6. Geology

The site is underlain by sediments of the Porthtowan Formation comprising grey mudstone (slate) with sporadic beds and pockets of greywacke sandstone and siltstone.

BHS regional surveys in the area indicate that the cleavage dip is between 16-22° to the south/south-east. Considerable local variations in trend exist.

The rock formation in the valley at Idless is covered by deposits of river alluvium with local head deposits on the sides of the valleys. A preliminary ground investigation comprising of trial pits was carried out in September 1990. The ground investigation logs have been included in Appendix B1.

South Garras Mine (abandoned) is located to the west of the site. The mine, which produced lead, silver and iron was said to have been active in Elizabethan times. The mine was worked to the '80fm' level with the lode reported to have been '6ft' wide. It is of note that several small workings were spawned locally between 1855-1861 on the success of South Garras mine although none recorded any output.

7. Engineers Office and Equipment

7.1 Accommodation

The office shall be of 15 sq.m minimum floor area, with at least 7 sq.m of window area. The walls shall be properly lined and insulated to maintain the required working temperature. The door to the office shall be fitted with a letterbox and with a mortice lock with 5 keys.

The Contractor shall provide a suitable site for the office.

The Contractor shall also provide heating and lighting to at least the minimum requirements of the Offices Shops and Railway Premises Act 1963 and sanitary conveniences to at least the minimum requirements of the Sanitary Regulations (SI 1964 No. 966).

7.2 Furnishings

The office shall be equipped with the items noted below which shall be provided by the Contractor for the sole use of the Engineer and his staff, and shall be maintained in good order by the Contractor:-

- 1 no. Kneehole office desk 1400 x 700mm with locking drawers;
- 1 no. Office chair;
- 1 no. Waste paper bin;
- 3 no. Safety helmets;
- 4 no. Ranging rods;

7.3 Services

The Contractor shall make available a cellphone for the use of the Engineer when required.

7.4 Equipment

The Contractor shall provide one 30 metre standpipe piezometer sounding apparatus with an attached measuring tape capable of measuring depths to an accuracy of $\pm 5\text{mm}$.

8. Landowners/Occupiers

The following is a list of landowners/occupiers. Those crossed, entered or affected by the Investigation are noted in Schedule C. This list should be used in conjunction with the plans supplied.

Plot No.	Owner	Occupier	Remarks
2155) 2648)	Mrs Hocking Woodpark Farm Idless		
1642) 2330) 3037)	Mr and Mrs G Tyson Lamerton Manor Idless		
1831	Dr and Mrs Thould The Mill House Idless		
3230) 4546)	Mr C Ellis Little Idless		
WOODED AREA) ADJACENT) ACCESS TRACK)	Information to follow in due course		

APPENDIX B1
SUMMARY AND LOGS OF EXPLORATORY HOLES CARRIED
OUT DURING SEPTEMBER 1990

SUMMARY OF TRIAL PIT RESULTS

Four trial pits were excavated within the valley bottom at Idless dam site to approximately 3.0m depth. The locations of the pits are shown on the location plan (figure 1) and details of the strata encountered are given on the enclosed trial pit logs.

Trial pit Nos 1-3 comprised Alluvial deposits to a depth of between 1.6m - 2.3m overlying bedrock. Trial pit No. 4 encountered 'Head' deposits up to 1.6m in depth overlying a thin layer of Alluvium which rests on bedrock at approximately 2.1m depth.

The Alluvium varied considerably in composition ranging from predominantly coarse-grained granular deposits to fine-grained silty clays. The transition from alluvium to bedrock was often gradual with the rockhead surface completely weathered for a short depth. The strength of the bedrock, a poorly cleaved silty slate/shale was generally very weak enabling the excavator to penetrate the strata relatively easily.

Groundwater was encountered in all the trial pits at depths of between 1.2m - 2.0m issuing from the alluvium. The flows were minimal generally and did not substantially influence excavation and logging of the material. Entry into the pits was however limited due to the danger of the sides collapsing and consequently many descriptions of the material were made from examination of disturbed samples.

Babtie Geotechnical	Location Idless Dam - Truro	Trial Pit No. 1
Excavation method & support JCB - none	Carried out for: National Rivers Authority	Sheet 1 of 1
		Ground level Co-ordinates

Depth m	Description	Legend	Sample / Test		
			Depth	Type	No.
0.4	Organic peaty rooty Topsoil				
0.7	Very soft light grey clayey sandy silt (Alluvium) containing some gravel sized quartz and small fragments of siltstone.		0.7	D	
1.0	Medium dense light grey and cream silty gravelly med-coarse sand comprising sub-rounded fragments of Quartz and sandstone (with some peat and large roots)		1.0	D	
1.4	Soft mottled orange and light bluey grey sandy silty clay (.Presumed Alluvium) with some very small very weak slate fragments		1.5	D	
2.0					
2.3	Firm light bluey grey completely weathered slate with some weak very small tabular slate fragments				
2.6	Light bluey grey fresh slatey siltstone, very weak, thinly laminated with patches displaying occasional slickensides and a mild lustre		2.6	D	
3.0					
3.1					
4.0					

REMARKS 2m x 1m base area Groundwater ingress minimal to marked, only from upper levels of Alluvium at between 1.1 - 1.4m depth	PLAN (Not to scale)	Date 18.9.90
		Logged by F.S.
		Scale 1:25
		Fig.

Sample and Test Key	
⊕ Disturbed Sample	Y Vane Test
⊕ Bulk Sample	U Undisturbed Sample
W Water Sample	All depths and reduced levels in metres

Babtie Geotechnical	Location Idless Dam - Truro	Trial Pit No. 2A Sheet 1 of 1
Excavation method & support JCB - none	Carried out for: National Rivers Authority	Ground level Co-ordinates

Depth m	Description	Legend	Sample / Test		
			Depth	Type	№
0.3	Light brown rooty silty topsoil				
0.9	Medium dense to dense brown silty sandy gravel (Alluvium) comprising subrounded Quartz and sandstone with some cobbles.				
1.0	Medium dense to dense light grey mottled orange clayey silty sandy gravel (Alluvium) with some cobbles of Quartz and sandstone, becoming bouldery at 1.3m (Quartz - subrounded, sandstone subrounded to tabular Colour changing to brown at 1.45m				
2.0					
2.2	Light grey slightly cemented/dense silty mudstone (poorly cleaved slate or shale), very weak.				
3.0					
3.1					
4.0					

REMARKS 2m x 1m base area Minimal groundwater issue at 1.30m Minor instability of pit sides	PLAN (Not to scale)	Date 18.9.90
		Logged by F.S.
Sample and Test Key D Disturbed Sample V Vane Test B Bulk Sample U Undisturbed Sample W Water Sample All depths and reduced levels in metres		Scale 1:25
		Fig.

Babtie Geotechnical	Location Idless Dam - Truro	Trial Pit No. 3 Sheet 1 of 1
Excavation method & support JCB - none	Carried out for: National Rivers Authority	Ground level Co-ordinates

Depth m	Description	Legend	Sample / Test		
			Depth	Type	No.
0.4	Brown clayey topsoil				
1.0	Medium dense light grey clayey silty Gravel (Alluvium) with some cobble-sized particles of Quartz and sandstone.				
1.1	Medium dense to dense light grey mottled orange clayey silty gravel (Alluvium) with occasional cobbles - subrounded Quartz & sandstone.				
1.6	Buff slightly weathered silty slate, very weak with poorly developed cleavage; pronounced dark purple stained joints (closely spaced, rough, irregular). Incipient joints (1-2mm) healed with quartz		2.0	D	
1.9					
2.0					
2.8					
3.0					
4.0					

REMARKS 2m x 1m base area Minimal groundwater issue at 1.90m Minor instability of pit sides	PLAN (Not to scale)	Date 18.9.90
		Logged by F.S.
Sample and Test Key ⊕ Disturbed Sample V Vane Test ⊕ Bulk Sample U Undisturbed Sample ⊕ Water Sample All depths and reduced levels in metres		Scale 1:25
		Fig.

Babtie Geotechnical	Location Idless Dam - Truro	Trial Pit No. 4 Sheet 1 of 1
Excavation method & support JCB - none	Carried out for National Rivers Authority	Ground level Co-ordinates

Depth m	Description	Legend	Sample / Test		
			Depth	Type	№
	Brown sandy topsoil				
0.3	Stiff light brown sandy silt (Head) with many angular fragments of quartz and sandstone.				
0.6					
1.0	Stiff light brown mottled buff sandy gravelly silt (Head) with angular quartz and sandstone.				
1.6					
2.0	Dense light brown mottled buff silty sandy gravel (Alluvium) comprising quartz and sandstone.				
(2.2)	Buff slightly weathered light brown silty Slate/Shale laminated/poorly cleaved, generally weak but occasional fragments - mod. weak to mod. strong (strength increasing with depth).		2.5	D	
2.7					
3.0					
4.0					

<u>REMARKS</u> 2m x 1m base area Groundwater encountered at 2.0m depth Pit sides stable	<u>PLAN</u> (Not to scale)	Date 18.9.90
		Logged by F.S.
<u>Sample and Test Key</u> *D Disturbed Sample V Vane Test *B Bulk Sample U Undisturbed Sample *W Water Sample All depths and reduced levels in metres		Scale 1:25
		Fig.

JOB NATIONAL RIVERS AUTHORITY.

JOB No.

REF. No.

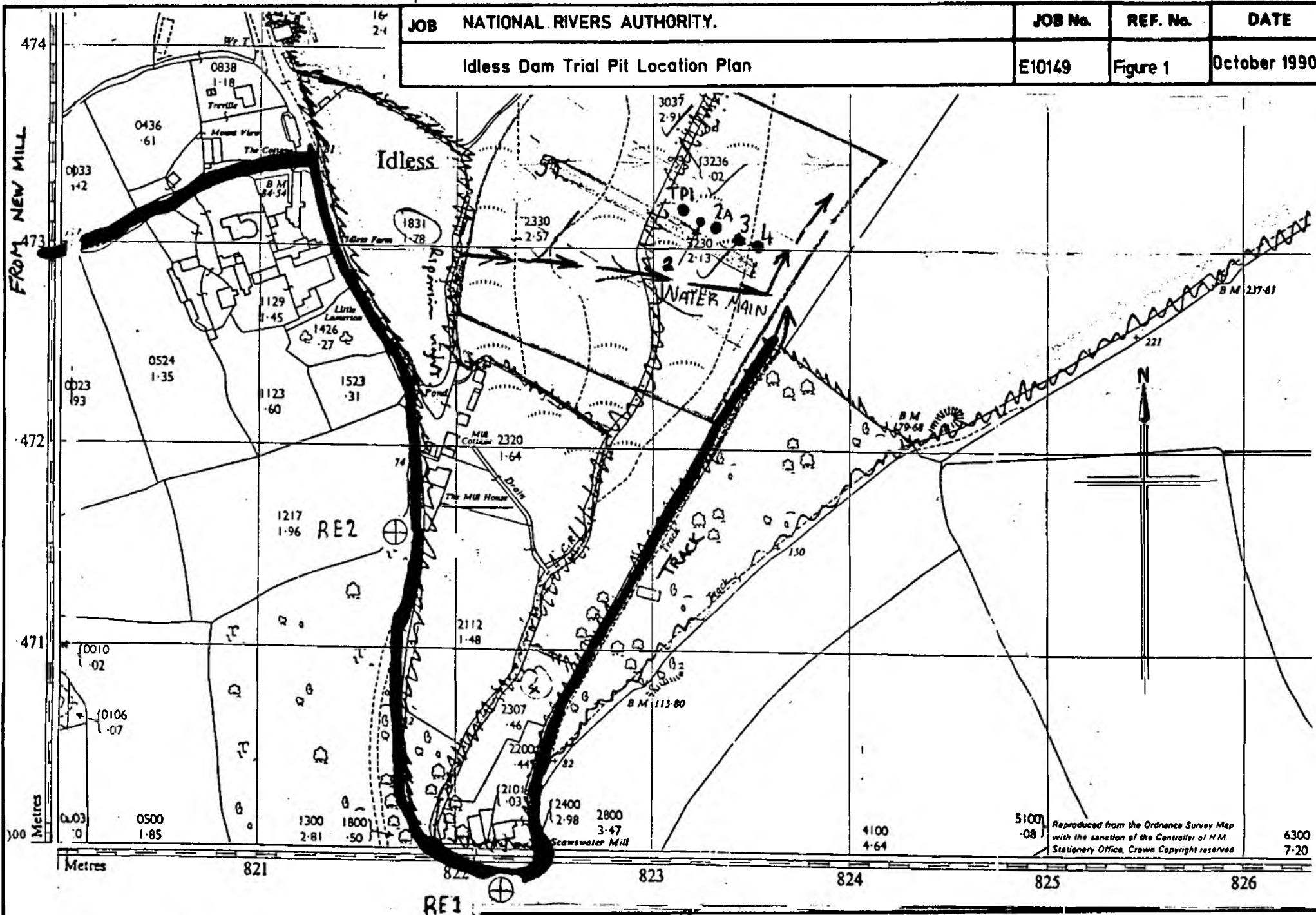
DATE

Idless Dam Trial Pit Location Plan

E10149

Figure 1

October 1990



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RENSLADE HOUSE, BONHAY ROAD, EXETER EX4 3AY

5100
08
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SCHEDULE C
SCHEDULE OF EXPLORATORY HOLES

SCHEDULE C

SCHEDULE OF EXPLORATORY HOLES

EXPLORATORY HOLE NO/ NOTES	PROBABLE DEPTH (m)	PLOT NO.
BH A R **	20	3230
BH B R	15	2330
BH C R *	15	2330
BH D R *	10	1831
BH E R **	20	3037
BH F R	10	WOODED AREA ADJACENT ACCESS TRACK
BH G R	15	3230
BH H R **	15	3037
BH I R	10	2330

Rotary exploratory holes minimum 92mm diameter.

* 1 piezometer to be installed in exploratory hole

** 2 piezometers to be installed in exploratory hole

KEY

Suffix R exploratory hole formed by rotary drilling

SCHEDULE C

SCHEDULE OF EXPLORATORY HOLES

EXPLORATORY HOLE NO/ NOTES	PROBABLE DEPTH (m)	PLOT NO.
TP 1	4	WOODED AREA ADJACENT ACCESS TRACK
TP 2	4	3037
TP 3	4	2330
TP 4	4	1831
TP 5	4	3037
TP 6	4	2330
TP 7	4	4546
TP 8	4	2330
TP 9	4	1831
TP 10	3	4546
TP 11	3	3230
TP 12	3	4546
TP 13	3	4546
TP 14	3	4546
TP 15	3	4546
TP 16	3	4546
TP 17	3	2330
TP 18	3	2648
TP 19	3	1642
TP 20	3	2648
TP 21	3	2155

SCHEDULE D
ANCILLARY WORK

SCHEDULE D
ANCILLARY WORK

1. Piezometers to be installed in accordance with Appendix 1 of the Specification in the following exploratory holes:

Exploratory Hole No.	No. of Piezometers
BH A	2
BH C	1
BH D	1
BH E	2
BH H	2

SCHEDULE E
IN SITU AND LABORATORY TESTING

SCHEDULE E

The Engineer will decide the laboratory tests required and will provide the Contractor with one or more schedules of Laboratory Tests. It may be necessary to specify additional testing after the results of the original testing are available. Testing schedules will not be prepared until the Engineer has received the relevant preliminary records as detailed in Clause 10.2. The Contractor shall inform the Engineer within 7 calendar days from the receipt of the testing schedule if the sample is not adequate for all the tests specified.

In Situ and Laboratory Testing.

The following In Situ and laboratory tests may be required during the investigation:-

In Situ Testing

Penetration resistance test (during rotary coring)

Permeability Test - Packer

Laboratory Soil Testing

Moisture Content

Liquid Limit, Plastic Limit, Plasticity Index

Specific Gravity

Particle Size Distribution

Organic Matter Content

Total Sulphate Content of Soil

Sulphate Content of Ground Water and Aqueous Soil Extracts

pH Value

Dry Density/Moisture Content Relationship

Dry Density (Laboratory and Site Measurement)

One-dimensional Consolidation

Undrained Triaxial Compression without the Measurement of Pore Water Pressure (Single Stage)

Undrained Triaxial Compression without the Measurement of Pore Water Pressure (Multi-Stage)

Undrained Shear Strength for Remoulded Cohesive Soil

Consolidated Undrained Triaxial Compression with the Measurement of Pore Water Pressure (Multi Stage).

Consolidated Undrained Triaxial Compression without the Measurement of Pore Water Pressure.

Permeability in Triaxial Apparatus

Standard Shearbox Test

Drained Strength and Residual Strength Shearbox Tests.

Laboratory Vane Test

Laboratory Rock Testing

Natural Water Content

Dry Density/Porosity

Point Load

Direct Shear Strength

Soundness by Magnesium Sulphate

Uniaxial Compressive Strength

SCHEDULE F
FACTUAL REPORT REQUIREMENTS

SCHEDULE F

The Factual Reports which shall be bound into loose leafed hard backed multiple ring binders are not more than 50mm thickness of content in each, or as otherwise directed by the Engineer shall include the following content:-

- 1) A factual description of the Investigation stating the aim of the Investigation, the numbers and types of exploratory holes, time of year and weather conditions encountered, a description of the Site Operations, list of laboratory tests and a summary of general geology and revealed strata.
- ii) Exploratory hole records to include all information set out in Clause 10.2 such as information having been modified as necessary in the light of Laboratory Testing and the further examination of samples in Clause 9.2 Where appropriate insitu test results shall be given in the exploratory hole records or otherwise presented in tabular or graphical form.
- iii) All in situ test records and results, including summaries.
- iv) Standpipe and piezometer records, including permeability test reading and plots, any other relevant groundwater records.
- v) All laboratory test records and results.
- vi) Summaries of Laboratory test results, which shall be produced in tabular form suitable for aggregation for statistical purposes, for each exploratory hole and for each geological stratum.
- vii) Site plans showing locations of all exploratory holes and areas covered by the Investigation, including the Scale and North sign. These will be supplied by the Engineer.
- viii) Geological cross sections shall be submitted as necessary to illustrate variations of strata parallel and normal to the centre line of the dam.
- ix) The Engineer will provide suitable negatives of site plans if so required.
- x) The Engineer will provide the Contractor with the National Grid Co-ordinates and the ground elevation related to Ordnance Datum of each exploratory hole on completion of the Site Operations.

SCHEDULE G
CONTRACTORS PROFESSIONAL ATTENDANCE

SCHEDULE G

1. For the purpose of Specification Clause 2.12 the Contractor shall provide a Geotechnical Engineer or Engineering Geologist with a minimum of 3 years experience of ground investigation site works. The Geotechnical Engineer or Engineering Geologist shall be fully conversant with all investigation techniques required in the Contract.
2. For the purposes of Specification Clause 4.10 the Contractor shall provide a Geologist or Engineering Geologist with a minimum of 2 years experience of rock core logging. The Geologist or Engineering Geologist shall be fully conversant with the logging technique of BS5930.
3. For the purposes of Specification Clause 10.3 the Contractor shall provide a Geotechnical Engineer with a minimum of 3 years experience of laboratory testing.
4. The Contractor's Agent shall be required to attend an inaugural meeting with the Engineer prior to the Date of Commencement.

PREAMBLE TO BILL OF QUANTITIES
AMENDED FROM THE
SPECIFICATION AND METHOD OF MEASUREMENT FOR
GROUND INVESTIGATION PUBLISHED BY
HMSO 1987

PREAMBLE TO BILL OF QUANTITIES

1. General Directions

In this Bill of Quantities the sub headings and item descriptions identify the work covered by the respective items and should be read in conjunction with the matters listed against the relevant marginal headings "Item coverage" in Part IV of the Specification and Method of Measurement for Ground Investigation Contracts published by HMSO 1987. The nature and extent of the work is to be ascertained by reference to the Drawings, Specification Schedules and Conditions of Contract.

The rates and prices entered in the Bill of Quantities shall be deemed to be the full inclusive value of the work covered by the several items including the following, unless expressly stated otherwise:

- (i) Labour and costs in connection therewith
- (ii) The supply of materials, goods, storage and costs in connection therewith including delivery to Site. Taking delivery of materials and goods supplied by others, unloading, storage and costs in connection therewith.
- (iii) Fixing, erecting and installing or placing of materials and goods in position, including Ancillary Works.
- (iv) Equipment and costs in connection therewith.
- (v) General obligations, liabilities and risks involved in the execution of the Works set forth or reasonably implied in the documents on which the tender is based.
- (vi) Establishment charges, overheads and profit.
- (vii) Waste.

2. Measurement

The measurement of work shall be computed net from the agreed records unless stated otherwise in the Method of Measurement.

3. Pricing of Items

Each individual item shall have a rate or price entered against it. Rates and prices shall be expressed to two decimal places.

4. Privately and Publicly Owned Services or Supplies

The Contractor shall include in his rates and prices for taking measures for the support and full protection of pipes, cables and other apparatus during the progress of the Site Operations and for keeping the Engineer informed of all arrangements he makes with the owners of privately owned services Statutory Undertakers and Public Authorities as appropriate.

5. Labours

Labours in connection with nominated Sub-Contractors shall include:

- (a) in the case of work or services executed, for affording the use of existing working space, access, temporary roads, erected scaffolding, working shelters, staging, ladders, hoists, storage, latrines, messing, welfare and other facilities existing on Site and the provision of protection, water, electricity for lighting and clearing away rubbish and debris arising from the work:
- (b) in the case of goods, materials or services supplied, for taking delivery, unloading, storing, protecting and returning crates, cartons and packing materials.

6. Work Within and Below Non-Tidal Open Water or Tidal Water

The Contractor shall allow in his rates and prices for taking measures required to execute the work separately measured as being within and below non-tidal open water or tidal water. For the measurement of work affected by non-tidal open water or tidal water the datum stated in the Contract shall be used irrespective of the actual level encountered in the Site Operations.

7. Dealing with Flows

The Contractor shall allow in his rates and prices for taking measures to deal with the existing flow of water, sewage and the like.

8. Schedule of Rates for Professional and Technical Staff

The Schedule of Rates for Professional and Technical Staff shall be priced at the rates for the various grades of staff who will be employed in the preparation of the interpretative and advisory section of the report, or employed for advisory work for the Engineer on site on the conduct of the Investigation, as required by the Engineer. This excludes the superintendence and technical direction required under Clause 15 of the Conditions of Contract which must be included in the rates and prices entered in the Bill of Quantities.

9. Reimbursement by the Employer of Fees, Rates, Taxes and Engineer's Telephone Calls

The Employer will reimburse the Contractor the actual price paid by the Contractor in respect of:

- (i) fees, rates and taxes - the sums certified by the Engineer as properly payable and repayable to the Contractor in accordance with Clause 26 of the Conditions of Contract.
- (ii) Engineer's telephone calls - the telephone calls charged to the number or numbers allocated to the Engineer except that such charges shall be those within the telephone system organisation.

Any other cost, charge or expense in respect of these items shall be allowed for in the rates and prices for temporary accommodation.

10. **Amendments to the Method of Measurement**

For the purpose of the Contract the Method of Measurement referred to in Preamble 1 General Direction is amended in accordance with the pages immediately following.

The format of amendments is in accordance with the pattern set out in the Preambles to the specification as detailed below.

2. A substitute Clause, as indicated by the suffix "S" is a modification originating from the Department of Transport. A substitute Clause suffixed "SR" is a Regional or scheme specific modification. Both types of Substitute Clauses are major text modifications of a Clause in the Method Measurement and supersede the whole of that Clause.

3. An Additional Clause supplementing the Method of Measurement with a suffix "A" originates from the Department of Transport. A Clause "AR" is a Regional or scheme specific addition. Both types of Additional Clauses have a number subsequent to the last Clause of its Series in the Method of Measurement.

4. A Cancelled Clause is indicated by the suffix "C" or "CR" and is a Clause entirely deleted from the Method of Measurement either by the Department of Transport or a Regional or scheme specific cancellation respectively.

5. Insofar as any of the numbered, Substitute, Additional or Amended Clauses may conflict or be inconsistent with any provision of the Method of Measurement then the numbered, Substitute, Additional or Amended Clauses shall always prevail.

6. Any reference in the Contract to a Clause number shall be deemed to refer to any Substitute Clause of that number or to any amended version of that Clause as listed in Schedule A of the Specification.

7. Reference to Clauses shall apply equally to Tables to the Method of Measurement following the Amendments. Where a Clause is amended or substituted any Tables referred to in the original Clause shall apply unless the Table is also amended. When a Table is amended any reference in a Clause to the original Tables shall apply to the amended Table.

8. Any Clauses in the Method of Measurement which relate to work or materials not required for the Investigation shall be deemed not to apply.

AMENDMENTS TO METHOD OF MEASUREMENT

**Section 2 Site Operations
Inspection Pits, Trial Pits and Trenches**

Itemisation

35SR Separate items shall be provided for inspection and trial pits in accordance with Part II paragraphs 3 and 4 and the following:

Group	Feature
I	1. Excavation of topsoil
	2. Excavation of soil
	3. Excavation in rock
	4. Backfilling
	5. Leaving open of exploratory holes
II	1. Inspection Pit
	2. Trial Pit
	3. Trench
	4. Unsupported Trial Pit
III	1. Between existing ground level to not exceeding 1.2 metres depth
	2. Between 1.2 metres to not exceeding 3 metres depth
	3. Between 3 metres to not exceeding 4.5 metres depth.
IV	1. Excavated material
	2. Imported material
	3. Concrete
	4. Sand

Note Topsoil shall not be separately identified by any Group III feature.

Standpipes, Standpipe Piezometers and Pneumatic Piezometers

Filling Holes

71SR. The items for filling holes shall in accordance with the Preambles to the Bill of Quantities General Directions include for:

Item Coverage

- (a) backfilling and compaction
- (b) mixing and placing grout
- (c) sand/gravel filter including allowing time for settlement
- (d) recording required data
- (e) disposal of surplus material.

BILL OF QUANTITIES

SECTION 1 - PRELIMINARIES

Number	Item Description	Unit	Quantity	Rate	Amount	
					£	p
	<u>Temporary Accommodation</u>					
1.1	Erection, Servicing and Dismantling Offices for the Engineer		Item			
1.2	Erection, Servicing and Dismantling offices and stores for the Contractor		Item			
	<u>Equipment</u>					
1.3	Establishment on site of all Equipment		Item			
	<u>Photographs</u>					
1.4	Photographs	60	No.			
1.5	Bound Photograph Volumes	2	No.			
	<u>Provisional Sums</u>					
1.6	Allow for the Engineer's telephone calls		Provisional sum		150	
PAGE TOTAL - Carried to Part Summary :						

SECTION 2 - SITE OPERATIONS

Number	Item Description	Unit	Quantity	Rate	Amount	
					£	p
	<u>Moving of Equipment</u>					
2.1	Moving of Drilling Equipment to the site of each exploratory hole	9	No.			
2.2	Moving of Trial Pitting and Trenching Equipment to the site of each exploratory hole	21	No.			
	<u>Rotary Drilling</u>					
2.3	Open hole rotary drilling 150mm diameter Vertical Between existing ground level to not exceeding 10 metres depth	18	m			
2.4	Open hole rotary drilling 150mm diameter Raking Between existing ground level to not exceeding 10 metres depth	Rate Only	m			
2.5	Rotary drilling to produce continuous cores 92.0mm diameter Vertical Between existing ground level to not exceeding 10 metres depth	72	m			
2.6	Rotary drilling to produce continuous cores 92.0mm diameter Vertical between 10 metres to not exceeding 20 metres depth	40	m			
2.7	Rotary drilling to produce continuous cores 92.0mm diameter Raking Between existing ground level to not exceeding 10 metres depth	Rate Only	m			
2.8	Rotary drilling to produce continuous cores 92.0mm diameter Raking Between 10 metres and to not exceeding 20 metres depth	Rate Only	m			
2.9	Backfilling 150mm diameter Vertical Between existing ground level to not exceeding 10 metres depth with Cement/Bentonite grout	18	m			
2.10	Backfilling 150mm diameter Raking Between existing ground level to not exceeding 10 metres depth with Cement/Bentonite grout	Rate Only	m			
PAGE TOTAL - Carried to Part Summary :						

SECTION 2 - SITE OPERATIONS

Number	Item Description	Unit	Quantity	Rate	Amount	
					£	p
2.11	Backfilling 92.0mm diameter Vertical Between existing ground level to not exceeding 10 metres depth with Cement/Bentonite grout	72	m			
2.12	Backfilling 92.0mm diameter Vertical Between 10 metres to not exceeding 20 metres depth with Cement/Bentonite grout	40	m			
2.13	Backfilling 92.0mm diameter Raking Between existing ground level to not exceeding 10 metres depth with Cement/Bentonite grout	Rate Only	m			
2.14	Backfilling 92.0mm diameter Raking Between 10 metres to not exceeding 20 metres depth with Cement/Bentonite grout	Rate Only	m			
<u>Inspection Pits, Trial Pits and Trenches</u>						
2.15	Excavation of topsoil Unsupported Trial Pit Between existing ground level to not exceeding 1.2 metres depth	16	m ³			
2.16	Excavation of soil Unsupported Trial Pit Between existing ground level to not exceeding 1.2 metres depth	43	m ³			
2.17	Excavation of soil Unsupported Trial Pit Between 1.2 metres to not exceeding 3metres depth	88	m ³			
2.18	Excavation of rock Unsupported Trial Pit Between existing ground level to not exceeding 1.2 metres depth	5	m ³			
2.19	Excavation of rock Unsupported Trial Pit Between 1.2 metres to not exceeding 3 metres depth	9	m ³			
2.20	Excavation of topsoil Trial Pit Between existing ground level to not exceeding 1.2 metres depth	12	m ³			
2.21	Excavation of soil Trial Pit Between existing ground level to not exceeding 1.2 metres depth	33	m ³			
PAGE TOTAL - Carried to Part Summary :						

SECTION 2 - SITE OPERATIONS

Number	Item Description	Unit	Quantity	Rate	Amount	
					£	p
2.22	Excavation of soil Trial Pit Between 1.2 metres to not exceeding 3 metres depth	66	m ³			
2.23	Excavation of soil Trial Pit Between 3 metres to not exceeding. 4.5 metres depth	10	m ³			
2.24	Excavation in rock Trial Pit Between existing ground level to not exceeding 1.2 metres depth	4	m ³			
2.25	Excavation in rock Trial Pit Between 1.2 metres to not exceeding 3 metres depth	7	m ³			
2.26	Excavation in rock Trial Pit Between 3 metres to not exceeding 4.5 metres depth	30	m ³			
2.27	Backfilling All Trial Pits Between existing ground level to not exceeding 1.2 metres depth with Excavated material	113	m ³			
2.28	Backfilling All Trial pits Between 1.2 metres to not exceeding 3 metres depth with Excavated material	170	m ³			
2.29	Backfilling All Trial Pits Between 3 metres to not exceeding 4.5 metres depth with Excavated material	40	m ³			
2.30	Leave open Trial Pit	27	m ³ /day			
	<u>Standing Time</u>					
2.31	Standing time of Drilling Equipment	6	hr			
2.32	Standing time of Trial Pitting and Trenching equipment	4	hr			
	<u>Sampling</u>					
2.33	Small Disturbed Samples Weighing not less than 1.0kg	50	no.			
2.34	Bulk Disturbed samples weighing not less than 25kg	100	no.			
PAGE TOTAL - Carried to Part Summary :						

SECTION 2 - SITE OPERATIONS

Number	Item Description	Unit	Quantity	Rate	Amount	
					£	p
2.35	Bulk Disturbed samples weighing not less than 50kg	20	no.			
2.36	Groundwater samples not less than 500ml	10	no.			
	<u>Standpipes and Piezometers</u>					
2.37	Standpipe piezometer 92.0mm diameter holes	84	lin.m			
2.38	Filling holes 92.0mm diameter Cement/Bentonite grout below piezometer tip	36	lin.m			
2.39	Filling holes 92.0mm diameter holes Sandfilling around piezometer tip	9	lin.m			
2.40	Filling holes 92.0mm diameter Bentonite Pellets above and below piezometer tip	14	lin.m			
2.41	Filling holes 92.0mm diameter holes Cement/Bentonite grout above piezometer	25	lin.m			
2.42	Piezometer porous element	9	no.			
2.43	Protective covers (steel water barrel type)	6	no.			
2.44	Groundwater readings	50	no.			
	<u>In-Situ Testing</u>					
2.45	Penetration resistance Test (during rotary coring)	54	no.			
2.46	Permeability Test - Packer	12	no.			
PAGE TOTAL - Carried to Part Summary :						

SECTION 3 - LABORATORY
AND REPORTS

Number	Item Description	Unit	Quantity	Rate	Amount	
					£	p
<u>Laboratory Soil Tests</u>						
3.1	Moisture content test	60	no.			
3.2	Liquid limit, plastic limit, plasticity index test	15	no.			
3.3	Specific gravity test	5	no.			
3.4	Particle size distribution test	15	no.			
3.5	Organic matter content test	5	no.			
3.6	Total sulphate content of soil test	6	no.			
3.7	Sulphate content of groundwater and aqueous soil extracts test	6	no.			
3.8	pH value test	6	no.			
3.9	Dry density/moisture content relationship test	12	no.			
3.10	One dimensional consolidation properties test	4	no.			
3.11	Undrained Triaxial Compression on Set of 3 x 38mm diameter remoulded specimens without the Measurement of Pore Water Pressure (Single Stage) test	30	no.			
3.12	Undrained Triaxial Compression on single 102mm dia. remoulded specimen without the Measurement of Pore Water Pressure (Multi-Stage) test	6	no.			
3.13	Consolidated Undrained Triaxial Compression Test on 102mm diameter remoulded specimen with the Measurement of Pore Water Pressure (Single-Stage) of duration not exceeding 4 days	9	no.			
PAGE TOTAL - Carried to Part Summary :						

SECTION 3 - LABORATORY
AND RESULTS

Number	Item Description	Unit	Quantity	Rate	Amount	
					£	p
3.14	Consolidated Undrained Triaxial Compression Test on 102mm diameter remoulded specimen with the Measurement of Pore Water Pressure (Single-Stage) of duration exceeding 4 days but not exceeding 7 days	Rate Only	no.			
3.15	Consolidated Undrained Triaxial Compression Test on 102mm diameter remoulded specimen with the Measurement of Pore Water Pressure (Multi-Stage) of duration not exceeding 4 days	Rate Only	no.			
3.16	Consolidated Undrained Triaxial Compression Test on 102mm diameter remoulded specimen with the Measurement of Pore Water Pressure (Multi-Stage) of duration exceeding 4 days but not exceeding 7 days	Rate Only	no.			
3.17	Consolidated Undrained Triaxial Compression Test on 102mm diameter remoulded specimen without the Measurement of Pore Water Pressure (Single-Stage) of duration not exceeding 4 days	Rate Only	no.			
3.18	Consolidated Undrained Triaxial Compression Test on 102mm diameter remoulded specimen without the Measurement of Pore Water Pressure (Single Stage) of duration exceeding 4 days but not exceeding 7 days	Rate Only	no.			
3.19	Permeability in Triaxial Apparatus	3	no.			
3.20	Standard shearbox test	6	no.			
3.21	Drained Strength and Residual Strength Shearbox Test	Rate Only	no.			
3.22	Laboratory Vane test	Rate Only	no.			
	<u>Rock Laboratory Tests</u>					
3.23	Natural Water Content	12	no.			
3.24	Dry Density/Porosity	2	no.			
PAGE TOTAL - Carried to Part Summary :						

SECTION 3 - LABORATORY
AND RESULTS

Number	Item Description	Unit	Quantity	Rate	Amount	
					£	p
3.25	Point Load	65	no.			
3.26	Direct Shear Strength	Rate Only	no.			
3.27	Soundness by Magnesium Sulphate	Rate Only	no.			
3.28	Uniaxial Compressive Strength	15	no.			
3.29	Examination and description of Small disturbed soil specimens in the laboratory	20	no.			
3.30	Examination and description of Bulk disturbed soil specimens in the laboratory	30	no.			
3.31	Examination and description of rock core specimens in the laboratory	12	no.			
3.32	4 Copies of the Factual Report		Item			
3.33	Extra over 3.32 for each additional Factual Report	Rate Only	no.			
PAGE TOTAL - Carried to Part Summary :						

SUMMARY OF
BILL OF QUANTITIES

SECTION 1 - PRELIMINARIES
SECTION 2 - SITE OPERATIONS
SECTION 3 - LABORATORY AND REPORTS

General Contingencies Allowance

1000-00

TOTAL TENDER

Signature

Address

.....

.....

Date

All Site Operations, in connection with:

RIVER ALLEN FLOOD ALLEVIATION SCHEME, TRURO - IDLESS DAM
GROUND INVESTIGATION
FORM OF TENDER

(Note: The Appendix forms part of the Tender)

To: The Chairman and Members of the South West Regional Advisory Board of the
National Rivers Authority

Lady and Gentlemen,

Having examined the Drawings, Conditions of Contract, Specification and Bill of Quantities for the above-mentioned Works (and the matters set out in the Appendix hereto), we offer to execute and complete the whole of the said Investigation and maintain the Permanent Works in conformity with the said Drawings, Conditions of Contracts, Specification and Bill of Quantities for such sum as may be ascertained in accordance with the said Conditions of Contract.

We undertake to complete the whole of the Investigation comprised in the Contract within the time stated in the Appendix hereto.

If our tender is accepted we will, when required, obtain the guarantee of a Bank or Insurance Company (to be approved in either case by you) to be jointly and severally bound with us in a sum equal to the percentage of the tender total as defined in the said Conditions of Contract for the due performance of the Contract under the terms of a Bond in the form annexed to the Conditions of Contract.

Unless and until a formal Agreement is prepared and executed this Tender, together with your written acceptance thereof, shall constitute a binding Contract between us.

We understand that you are not bound to accept the lowest or any tender you may receive.

We have noted that the Contract will be let on a fixed price basis.

We are, Lady and Gentlemen,

Yours faithfully,

Signature: _____

Company Name: _____

Address: _____

Date: _____

FORM OF TENDER

Appendix

NOTE: Relevant Clause numbers are shown in brackets following the description

Amount of Bond (if any)	(10)	..... 10	% of Tender Total
Period for Approvals	(14(5))		
Testing Schedule	..... 1		weeks
Draft Report	..... 2		weeks
Final Report	..... 2		weeks
Minimum Amount of Insurance	(23(2))	£ 1,000,000	.....
Time for Completion	(43)	Liquidated Damages for Delay	(47)
		Column 1	
		(see Clause 47(1))	
<i>For the Whole of the Investigation</i>			
	<u>14</u> (a) weeks	£ 600 (b)	per Day/Week (c)
		Column 2	Column 3
		(see Clause 47(2))	
<i>For the following Sections (of the Investigation)</i>			
i)	Section (d)	£ NIL	£ 150
	SITE OPERATIONS..... <u>3</u> Weeks	per Day/Week (c)	per Day/Week (c)
ii)	Section (d) (i) ABOVE AND	£ 50	£ 300
	LABORATORY TESTING <u>8</u> Weeks	Per Day/Week (c)	per Day/Week (c)
iii)	Section (d) (ii) ABOVE AND	£ 100	£ 450
	DRAFT REPORT..... <u>12</u> Weeks	Per Day/Week (c)	per Day/Week (c)
<i>For the whole of the Site Operations</i>			
	<u>3</u> (a) weeks	£ (b)	per Day/Week (c)
<i>For the following Sections (of the Site Operations)</i>			
	Section (d)	£	£
	..... Weeks	per Day/Week (c)	per Day/Week (c)
	Section (d)	£	£
	..... Weeks	per Day/Week (c)	per Day/Week (c)
	Section (d)	£	£
	..... Weeks	per Day/Week (c)	per Day/Week (c)
Period of Maintenance	(49(1))	..... 26	Weeks
Standard Method of Measurement adopted in preparation of Bills of Quantities	(57)(e)	.....
THE DEPARTMENT OF TRANSPORT SPECIFICATION AND METHOD OF		.....
MEASUREMENT FOR GROUND INVESTIGATION (HMSO 1987)		.....
Percentage for adjustment of P.C. Sums	(59A (2)(b) and (5)(c))	.....	%
Percentage of the Value of Goods and Materials to be included in Interim Certificates	(60(2)(b))	..... 80	%
Minimum Amount of Interim Certificates	(60(2))	£ 15000	.....

Retention in accordance with Clause 60(4) is/is not (g) to be deducted.

- (a) To be completed in every case (by Contractor if not already stipulated).
- (b) To be completed by Engineer in every case
- (c) Delete which not required.
- (d) To be completed by the Engineer as required, with brief description.
The division of the Investigation into Sections (see Clause 1(1)(o)) may be based on sub-division of the Site Operations or on separation of the Site Operations from the Laboratory Testing and Report or otherwise.
- (e) Insert here any amendment or modification adopted if different from that stated in Clause 57.
- (g) Delete as appropriate

DECLARATION RELATING TO COLLUSIVE TENDERING

We declare that this is a bona fide tender, intended to be competitive, and that we have not fixed or adjusted the amount of the tender by or under or in accordance with any agreement or arrangement with any other person. We also declare that we have not done and we undertake that we will not do at any time before the hour and date specified for the return of this tender any of the following acts:-

- (a) Communicate to a person other than the person calling for those tenders the amount or approximate amount of the proposed tender, except where the disclosure, in confidence, of the approximate amount of the tender was necessary to obtain insurance premium quotations required for the preparation of the tender.
- (b) Enter into any agreement or arrangement with any other person that he shall refrain from tendering or as to the amount of any tender to be submitted.
- (c) Offer or pay or give or agree to pay any sum or valuable consideration directly or indirectly to any person for doing or having done or causing or having caused to be done in relation to any other tender or proposed tender for the said work any act or thing of the sort described above.

In this certificate the word "person" includes any persons or any body or association, corporate or noncorporate, and "any agreement or arrangement" includes such transaction, formal or informal and whether legally binding or not.

Signature

Firm or Company:

DECLARATION RELATING TO COLLUSIVE TENDERING

[EN.DE.CONTRACTS]JJ_IDLESS_GROUND_INVESTIGATION_OCT90