Homes England

The Housing and Regeneration Agency

Date: 16 June 2025
Our Ref: RFI4956
Tel: 0300 1234 500
Email: infogov@homesengland.gov.uk

[redacted]
By Email Only

Dear [redacted]

RE: Request for Information – RFI4956

Thank you for your request for information which was processed under the Environmental Information Regulations 2004 (EIR).

You requested the following information:

I'm in the process of purchasing a house within 25m of contaminated land. I have been searching to find out what the land was used for and all the routes I have gone down have been shut down since 2022 and the last search from the Gov site brought me to here. Is there any way you may be able to help me find out what was the use and any other details on the land?

The area I'm searching for is Castleford, West Yorkshire WF10[redacted]

Response

We can confirm that we do hold some of the requested information. Please see attached the following documents regarding the land you specified in your request:

Annex A	HEALDFIELD ROAD QUARRY GAS CONTROL WORKS
Annex B	HEALDFIELD ROAD QUARRY INVESTIGATION WORKS
Annex C	Castleford scanned images

Regulation 13 – Personal Data

We have redacted certain information from the disclosed material in accordance with Regulation 13 of the Environmental Information Regulations 2004. This regulation applies where the information constitutes the personal data of a third party, and its disclosure would contravene one or more of the data protection

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principles set out in the UK General Data Protection Regulation (UK GDPR) and the Data Protection Act 2018.

Personal data in this context includes, but is not limited to, names and contact details. Disclosure of such information could lead to the identification of individuals and would therefore breach their rights under data protection law.

Regulation 13 is an absolute exception. This means that once it is established that the information is personal data and its release would breach data protection principles, there is no requirement to consider the public interest in disclosure.

For further reference the full text of Regulation 13 can be found online via this link:

https://www.legislation.gov.uk/uksi/2004/3391/regulation/13

Right to make Representations

If you are not happy with the information that has been provided or the way in which your request has been handled, you may request a reconsideration of our response (Internal Review). You can make this representation by writing to Homes England via the details below, quoting the reference number at the top of this letter.

Email: infogov@homesengland.gov.uk

The Information Governance Team
Homes England
2nd Floor
The Lumen
St James Boulevard
Newcastle Helix
Newcastle upon Tyne
NE4 5BZ

Your request for reconsideration must be made in writing, explain why you wish to appeal, and be received within 40 working days of the date of this response (Reg 11(2)). Failure to meet this criteria may lead to your request being refused.

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Upon receipt, your request for reconsideration will be passed to an independent party not involved in your original request. We aim to issue a response within 20 working days.

You may also complain to the Information Commissioner's Office (ICO) however, the Information Commissioner does usually expect the internal review procedure to be exhausted in the first instance.

The Information Commissioner's details can be found via the following link https://ico.org.uk/

Please note that the contents of your request and this response are also subject to the Freedom of Information Act 2000. Homes England may be required to disclose your request and our response accordingly.

Yours sincerely,

The Information Governance Team
For Homes England

CITY OF WAKEFIELD METROPOLITAN DISTRICT COUNCIL

ENVIRONMENTAL SERVICES DEPARTMENT

ENVIRONMENT DIVISION

INSTRUCTIONS TO TENDERERS

CONDITIONS OF CONTRACT

SPECIFICATION OF WORKS

BILL OF QUANTITIES

FOR

HEALDFIELD ROAD QUARRY RECLAMATION SCHEME

GAS CONTROL WORKS

[redacted]

Environmental Services Department
King Charles II House
Pontefract
WF8 1BQ

Tel : Wakefield 290900

Ref : R/21.103

Date : APRIL 1993

environment
DIVISION

CONTENTS

INSTRUCTIONS FOR TENDERING

TENDERS MUST BE SUBMITTED IN ACCORDANCE WITH THE FOLLOWING INSTRUCTIONS.

TENDERS NOT COMPLYING WITH THESE INSTRUCTIONS MAY BE REJECTED BY THE EMPLOYER WHOSE DECISION IN THE MATTER SHALL BE FINAL.

1. The tender document must be treated as private and confidential. Tenderers should not disclose the fact that they have been invited to tender or release details of the tender document other than on an In Confidence basis to those who have a legitimate need to know or whom they need to consult for the purpose of preparing the tender.

2. The tender should be made on the Form of Tender incorporated in the tender document. It should be signed by the Tenderer and submitted with the Bill of Quantities, which should be fully priced and totalled in ink, and accompanied by the Conditions of Contract and the Specification, to the address and not later than the date and time stated in paragraph 8 below.

3. No UNAUTHORISED alteration or addition should be made to the Form of Tender, to the Bill of Quantities or to any other component of the tender document.

4. Tenders must not be qualified and must not be accompanied by statements that could be construed as rendering the tender equivocal and/or placing it on a different footing from other tenders.

5. Any queries arising from the tender documents which may have a bearing on the offer to be made should be raised with the Engineer as early as possible in the tender period. The Engineer will be ready to consider properly reasoned requests for an extension of the tender period.

6. The attention of Tenderers is drawn to the Programme of Works Clause in the Specification in which certain conditions are detailed affecting the phasing of the Contractor's programme. Tenderers will be required to supply an Initial Programme for consideration with their tender.

7. Attention is directed to any Special Requirements in Relation to Statutory Bodies which may be included in the Conditions of Contract and to the fact that it will be necessary when effecting the insurance required by Clause 23 of the Conditions of Contract to let the Insurers know of these Special Requirements.

8. Tenders should be sent by registered post or recorded delivery service or delivered by hand, sealed in the pre-addressed envelope provided not bearing any indication of the Tenderer marked on the envelope or in the franking thereon, addressed to the Head of Administration, Wakefield Metropolitan District Council, Post Room, Room 43, County Hall, Wakefield and clearly marked "HEALDFIELD ROAD QUARRY - GAS CONTROL WORKS" so as to arrive not later than NOON on . Tenders delivered by hand **must be taken to Room 43 (Mail Registration) and a receipt obtained.**

9. Unit rates and prices must be quoted in pounds and decimal fractions of a pound. Such fractions need not be restricted to any specific number of decimal places but the product of multiplying the rate by the quantity must be expressed in pounds and whole new pence (i.e. to two decimal places).

10. Tenders should be submitted exclusive of Value Added Tax (V.A.T.).

11. Any tender received after the date and time for receipt stated above will be opened to identify the sender and returned to that person or firm.

12. Tenderers should note that the Contract will not include a Contract Price Flunctuations Clause.

13. The Employer does not bind himself to accept the lowest or any tender. Tenderers should note that they may be expected to enter negotiations with a view to reducing their submitted tender. Every effort will be made to reach a decision on award of the contract within 60 days of the closing date for submission of tenders. Tenders should therefore remain open for acceptance for a minimum of 60 days.

14. Tenderers should note that it is expected that a period of 'two weeks' will elapse between the date of the Contract and the date for Commencement of the Works notified in writing by the Engineer.

15. Tenderers are required to submit with their tender a comprehensive method statement outlining the planned operations for carrying out the works.

16. Prior to submission of tenders, Tenderers are required to visit the site, satisfy themselves on all points affecting the tender and in particular to take note of and allow for the conditions on site.

BRIEF DESCRIPTION OF THE WORKS

(For information for tendering purposes only and NOT forming part of the contract documents)

The site is a former quarry which has been filled with putrescible waste, upto 18m depth. The landfilling took place from 1948 to 1985, table 1 shows the types of waste deposited. There have been problems with landfill gas since 1986 and various measures have been taken to reduce the amount of gas migrating from the site, to the adjacent properties.

In June 1990 a series of gas wells and a pumping extraction/flaring unit were installed. These measures have been successful at intercepting gas migrating towards the houses and the monitoring boreholes are now only showing very low levels of methane gas.

This tender is the installation of the gas pumping and monitoring system to cover the whole site.

LIST OF PROPOSED SUB-CONTRACTORS

It is the wish of the Wakefield Metropolitan District Council that local firms should be used whenever the need arises to employ sub-contractors.

Tenderers are therefore required, wherever practicable, to include with their tender(s) a list in the form below of the names and addresses of the sub-contractors which they would propose to employ on the Contract.

Acceptance of a tender shall NOT be deemed to constitute approval of any sub-contractor so listed for the purposes of Clause 4 of the Conditions of Contract.

Type of Work	Sub-Contractor	Address of Sub-Contractor

City of Wakefield Metropolitan District Council	environment DIVISION
R.W.MATTHEWS CHIEF OFFICER	PROJECT. **Healdfield Road Quarry**
ENVIRONMENTAL SERVICES DEPT. KING CHARLES II HOUSE, PONTEFRACT	DRAWING TITLE. **Site location**
	SCALE. **1:25,000**
	DATE. **Mar 1992**
	GRID REF. **SE:4440:4260**
	DRAWN. **PD**

All Permanent and Temporary Works in connection with:-

HEALDFIELD ROAD QUARRY, RECLAMATION SCHEME
GAS CONTROL WORKS

FORM OF TENDER

INCORPORATING COLLUSIVE TENDERING CERTIFICATE

(NOTE: The Appendix forms part of the Tender)

To the Council of the City of Wakefield.

GENTLEMEN,

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

We undertake to complete and deliver the whole of the Permanent Works comprised in the Contract within the time(s) stated in the Appendix hereto.

If our tender is accepted we will, when required, provide good and sufficient sureties or obtain the guarantee of a Bank or Insurance Company (to be approved in either case by you) to be held and firmly bound to you 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 hereto.

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 certify that this is a bona fide tender, 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 certify 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. *communicating to a person other than the person calling for these tenders the amount or the 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. *entering 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. offering or paying or giving or agreeing to pay or give any sum of money 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 and any body or association, corporate or unincorporate; and "any agreement or arrangements" includes any such transaction, formal or informal, and whether legally binding or not.

Signature: .....

Firm: .....

Address: .....

.....

Tel. No: ..... *Date:* .....

APPENDIX TO THE FORM OF TENDER

(Note: Relevant Clause numbers are shown after the description)

Name of the Employer	*1(1)(a)*	*THE COUNCIL OF THE CITY OF WAKEFIELD TOWN HALL, WOOD ST., WAKEFIELD, WEST YORKSHIRE, WF1 2QW.*
Name of the Engineer	*1(1)(c)*	*DR. C.P. McDONALD, HEAD OF ENVIRONMENT, ENVIRONMENTAL SERVICES DEPARTMENT. KING CHARLES II HOUSE, HEADLANDS ROAD, PONTEFRACT, WEST YORKSHIRE, WF8 1BQ.*
Defects Correction Period	*1(1)(s)*	*52 Weeks*
Number and type of copies of Drawings to be provided	*6(1)(b)*	*2 paper prints*
Contract Agreement	*9*	*Not required*
Performance Bond	*10(1)*	*Required*
Amount of Bond	*10(1)*	*10% of Tender Total*
Minimum Amount of Third Party Insurance (Persons & Property)	*23(3)*	*£1,000,000 each and every occurrence*
Time for Completion	*43*	*20Weeks*
Liquidated Damages for Delay	*47*	*£250 per day*
Vesting of materials not on site	*54(1)*	*N/A*
Method of Measurement adopted	*57*	*CESMM 3 see Preamble to Bill of Quantities*
Percentage of Value of Goods and Materials to be included in Interim Certificates	*60(2)(b)*	*97 %*
Minimum Interim Certificate	*60(3)*	*£10,000*
Rate of Retention	*60(5)*	*5%*
Limit of Retention (% of Tender Total)	*60(5)*	*3% Payments made under any Contract Price Fluctuations Clause shall not be subject to a retention.*
Bank whose Base Lending Rate is to be used	*60(7)*	*Co-operative Bank PLC*

CONDITIONS OF CONTRACT

The Conditions of Contract referred to in the Tender shall be the Conditions of Contract, Sixth Edition (January 1991), approved by the Institution of Civil Engineers jointly with the Association of Consulting Engineers and the Federation of Civil Engineering Contractors and commonly known as the ICE Conditions of Contract, modified and added to as follows:-

CLAUSE 2

Delete sub-Clause (2) and substitute the following:-

> *The Chartered Engineer who will act on behalf of the Engineer and assume the full responsibilities under the Contract shall be Mr. B. Redfearn, Environment Manager of Environmental Services Department, or other named Chartered Engineer notified to the Contractor by the Engineer.*

The following paragraph shall be added to sub-Clause (4):-

(d) The Engineer's Representative shall, in addition to acting generally on behalf of the Engineer, on site, issue site instructions covering additional work at tendered rates or work under provisional items in the Bill of Quantities. In specific cases, the Engineer's Representative will be empowered to issue site instructions for additional or amended work at new rates or daywork rates but in these cases, the site instructions will be confirmed by a formal Variation Order signed by the Engineer. The Engineer's Representative will be empowered to agree interim and final measurements except in the case of serious contentious matters or claims in the final measure.

CLAUSE 4

Delete sub-Clause (1) and substitute the following:-

(1) The Contractor shall neither sub-contract the whole of the Works nor the major element of it.

CLAUSE 22

Sub-Clause (2)(e) line 1 - before "death" the following is inserted:-
"except as provided by sub-Clause (5) of this Clause;"

The following sub-clause is added:-

Extension of Indemnity

(5) For the purpose of this Contract proviso (a) to sub-Clause (4) and proviso (e) to sub-Clause (2) 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 and in relation to this sub-clause proviso (a) to the said sub-Clause (4) shall have effect with the insertion (for the removal of doubt) of the expression "Engineer or the" before the second occurrence in that provision of the word "Employer".

CLAUSE 29

The following sub-Clause is added:-

Pollution

(5) Subject and without prejudice to any other provisions of the Contract the Contractor shall take all reasonable precautions,

(a) in connection with any rivers, streams, waterways, drains, watercourses, lakes and the like to prevent:-
- *(i) silting,*
- *(ii) erosion of their beds or banks,*
- *(iii) pollution of the water so as to affect adversely the quality or appearance thereof or cause injury or death to animal and plant life;*

(b) in connection with underground water resources (including percolating water) to prevent:-
- *(i) any interference with the supply to or abstraction from such sources,*
- *(ii) pollution of the water so as to affect adversely the quality thereof.*

CLAUSE 32

This Clause is deleted in its entirety and substituted by the following:-

"Unless otherwise provided for in the Specification and/or Bill of Quantities all the old building materials on or in the Site at the time the Contractor received possession thereof shall remain the property of the Employer and shall not be removed by the Contractor from the site until instruction for such removal has been given by the Engineer.

All other materials or items of any description whatsoever including any articles of antiquarian value or interest and all timber, growing crops and the like found or being upon or excavated from the Site shall remain the property of the Employer and shall be dealt with by the Contractor as the Engineer may direct."

SPECIAL CONDITIONS

Special Conditions

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

Corrupt Gifts and Payments of Commission

72. (1) The Contractor or anyone employed by him or acting on his behalf shall not:-

(a) offer to give or agree to the giving, to any person in the service of the Employer, any gift or consideration of any kind as an inducement or reward for doing or forebearing to do, or for having done or foreborne to do, any act in relation to the obtaining or execution of his or any other Contract with the Employer, or for showing or foreboding to show favour or disfavour to any person in relation to this or any other Contract with the Employer; or

(b) enter into this or any other contract with the Employer in connection with which commission has been paid or agreed to be paid by him or on his behalf or to his knowledge, unless before the Contract is made particulars of any such commission and of the terms and conditions of any agreement for the payment thereof have been disclosed in writing to the Employer.

(2) Any breach of the above prohibitions or the commission of any offence under the Prevention of Corruption Acts 1889 to 1916, or the giving of any fee, or reward the receipt of which is an offence under sub-section (2) of Section 117 of the Local Government Act, 1972 by the Contractor or anyone employed by him or acting on his behalf (whether such breach or offence is with or without the knowledge of the Contractor) in relation to this or any other Contract with the Employer shall entitle the Employer to enter upon the Site under Clause 63 and expel the Contractor therefrom and, thereupon the provisions of Clause 63 shall have effect as if such breach or offence as aforesaid were expressed in Clause 63(1) as a ground therefor. In that case the Contractor shall not be entitled to payments on the Contract or Contracts beyond those (if any) provided for by Clause 63. In addition to the costs and expenses recoverable by the Employer as provided for in Clause 63(4) the Employer shall also be entitled to recover from the Contractor any other costs or losses incurred by the Employer consequent upon such entry and expulsion under this Clause and to receive from the Contractor such sum as in the opinion of the Employer represents the amount or value of any gift consideration or commission paid or agreed to be paid in breach of this Clause.

(3) *In every sub-contract for any part of the Works the Contractor shall incorporate such provisions as will impose on the Sub-Contractor liabilities similar to those imposed on the Contractor by this Clause and such provisions as will entitle the Contractor to determine the sub-contract on terms equivalent to those contained in Clause 63. In the event of any breach by the Sub-Contractor of any such provision, the Contractor shall without prejudice to any of his obligations under this Contract take action in accordance with the terms of the sub-contract to exercise his rights against the Sub-Contractor. Failure by the Contractor to take such action shall be grounds for the exercise by the Employer of his right under sub-Clause (2) of this Clause to enter the Site and expel the Contractor. When the Contractor exercises his rights against a Sub-Contractor in accordance with this Clause he shall make no claim nor agree to any claim being made on his behalf against the Employer in respect of any consequential delays and extra costs arising from the Contract.*

(4) *Any dispute as to the amount recoverable by the Employer from the Contractor under this Clause shall be settled in the manner provided for in Clause 66.*

Contractor's Insurance

73. (1) *The Contractor's public liability insurance policies for the Contract must contain an endorsement in the following terms:-*

"It is hereby declared and agreed that the Council of the City of Wakefield is indemnified by this Policy jointly with the Insured in respect of a Contract made between the Council of the City of Wakefield as Employer and the Insured as Contractor relating to a Contract for HEALDFIELD ROAD QUARRY,RECLAMATION SCHEME - GAS CONTROL WORKS. *It is further declared and agreed that notwithstanding the Council of the City of Wakefield is indemnified by this Policy as extended by this endorsement the Insured Contractor is indemnified against liability for loss of or damage to property owned by or for which the Council of the City of Wakefield is responsible."*

(2) *The Contractor will be required to supply certificates from his Insurers confirming that insurance cover to meet the requirements of the Contract is in force, and that his public liability policies will be endorsed in accordance with sub-Clause (1) of this Clause.*

(3) *The Contractor shall immediately notify the Employer and the Insurers of any happening or event which may give rise to any claim, demand, proceeding, damage, cost or charge whatsoever arising out of the particular work, and the Contractor shall indemnify the Employer against any loss whatsoever which may be occasioned to the Employer by the Contractor's failure to give such notification.*

Recovery of Sums Due from Contractor

74. 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.

Special Requirements in Relation to Statutory Bodies, etc.

75. The Contractor shall comply with the Special Requirements in relation to Statutory Bodies, etc., which may be included in the pages immediately following these Conditions of Contract. Compliance with such Special Requirements shall not relieve the Contractor of any of his other obligations and liabilities under the Contract and fulfilment of such other obligations and liabilities shall not relieve him of his responsibilities to comply with the said Special Requirements.

Special Requirements in Relation to:

NATIONAL GRID and YORKSHIRE ELECTRICITY

1. In these Special Requirements the following expressions shall have the meanings assigned to them:

   (a) "Board" means Yorkshire Electricity and/or National Grid.

   (b) "Board's Engineer" means the District Manager of Yorkshire Electricity and/or National Grid or his nominated representative.

   (c) "Plant or equipment" means any plant, equipment, gear machinery, apparatus or appliance or any part thereof as defined in the Construction (General Provisions) Regulations 1961 and the Construction (Lifting Operations) Regulations 1961.

2. The Work should be carried out to conform with the Requirements of the Health and Safety Executive Guidance Note No. G.S.6 "Avoidance of Danger from Overhead Electric Cables" and the National Joint Utilities Group document "Recommendations on Avoidance of Danger from Underground Electricity Cables".

3. (a) Except under such restrictions as the Board's Engineer may impose for the safety of persons and the protection of property, a distance of 15 metres shall be maintained at all times between any part of any plant or equipment or anything connected to such plant and equipment (e.g. the jib of a crane hoist rope load etc.), and any part of the Board's electric lines where these lines are carried on steel towers or a distance of 9 metres where the lines are carried on wood poles. Excavation spoil must not be dumped or accumulated so as to cause infringement of these distances. The permission of the Board's Engineer must be obtained in writing before plant or equipment is operated or work of any kind is carried out within the above distances.

   (b) The Contractor shall give at least fourteen days notice to the Board's Engineer of the dates upon which it is intended to operate plant or equipment or carry out any work for which permission has been given by the Board's Engineer under paragraph 3(a). Such operations or work, shall only be carried out in the presence of the Board's Engineer unless notice shall have been obtained in writing from the Board's Engineer that he does not require to be present.

   (c) In the event of the Board requiring work to be executed on the overhead electric lines or supports during the period of the Contract, the Contractor shall afford all facilities to the Board or its contractors and the Contractor shall amend his programme of working to suit any and all requirements of the Board during such period of working.

(d) The Contractor shall consult the Board's Engineer as early as possible and such consultation shall not be less than fourteen days before it is proposed to commence work to ascertain whether any underground electricity cables or apparatus will be affected by the proposed work in which event the Contractor shall make all necessary arrangements with the Board's Engineer to safeguard the cables or apparatus.

(e) Work should not be carried out in the immediate vicinity of the overhead lines during periods of poor visibility. If this is not reasonably practicable additional precautions must be taken to ensure maintenance of the appropriate safety clearance.

4. The above requirements will not relieve the Contractor of any responsibility for taking every precaution to avoid risk to persons or damage to property including compliance with Regulation 44(2) of the Construction (General Provisions) Regulations 1961.

5. In order to comply with the above requirements the Contractor should contact the following addresses:-

National Grid
Hookstone Park,
P.O. Box 110,
Harrogate HG2 7UR. Telephone: Harrogate (0423) 882000

Yorkshire Electricity
West Yorkshire Area,
PO Box 161
161 Gelderd Road
Leeds LS1 1QZ Telephone: Leeds 415255

Special Requirements in Relation to:

BRITISH TELECOMMUNICATIONS

1. Before commencing any work or moving heavy plant or equipment over any portion of the Site, the Contractor shall confirm details of British Telecommunications underground plant within the Site with the appropriate General Manager. (Dial 100 and ask for FREEPHONE 111).

2. Where such details show that the Contractor's works or the movement of plant or equipment may endanger British Telecommunications plant, the Contractor must give the General Manager at least one week's notice of the date on which it is intended to commence such work, or movement of plant, and equipment in order that the presence of buried plant can be indicated by markers to be supplied by British Telecommunications and placed by the Contractor under the supervision of a British Telecommunications representative. The Contractor shall ensure that British Telecommunications plant is protected from danger.

3. In the event of a British Telecommunications marker being disturbed for any reason, it shall not be replaced other than in the exact position and to its former depth unless the repositioning is carried out at the direction and under the supervision of a British Telecommunications representative.

4. The above requirements do not relieve the Contractor of any of his obligations under the Contract

Special Requirements in Relation to:

BRITISH GAS - North Eastern (NEGAS)

1. The position of mains and services are only approximate. Detailed plans of the mains in question may be inspected at the NEGAS Area Office and the Contractor is advised to verify positions by means of trial holes. The information supplied to the Employer has been taken from existing records, the accuracy of which cannot be guaranteed and, whilst every care has been taken in the provision of this information, NEGAS will not legally accept liability for any discrepancy, omission or deviation, whether arising from inadvertance or negligence or from any other cause whatsoever on the part of NEGAS or any officer, servant or agent of NEGAS.

2. Before commencing work or moving heavy plant or equipment over any portion of the Site, the Contractor must contact the NEGAS Excavation Superintendent (see paragraph 6 below).

3. In the interest of public safety and for the security of gas supplies, the Contractor shall comply with the following requirement:-

   (a) Heavy construction traffic, plant and machinery should only cross NEGAS mains where advised by NEGAS. It may be necessary to restrict certain traffic or machines to specially strengthened areas.

   (b) Before excavating within 3 metres of any NEGAS apparatus, the Contractor shall first establish the exact position of buried equipment by means of hand-excavated trial holes. Excavation within 1 metre of the established position of any NEGAS apparatus shall be carried out by hand in the presence of a designated NEGAS employee. Special care must be taken in the vicinity of indicated High Pressure apparatus.

   (c) No structures, temporary or permanent, shall be erected within 2 metres of the established position of any NEGAS apparatus.

   (d) No mains, cables, ducts, sewer pipes or other equipment shall be laid directly above or directly below, and in line with, NEGAS apparatus or in such a position as to make access to gas equipment difficult.

   (e) A minimum gap of 150mm shall be maintained where 'Undertaker's Works' cross NEGAS apparatus with minimum clearance of 300mm where such works are adjacent to NEGAS apparatus.

   (f) Where it is necessary to excavate below a main, the main shall be supported to the satisfaction of the NEGAS Engineer during all stages of the operation. On completion, permanent supports will, if necessary, be constructed to avoid further settlement.

(g) NEGAS shall be given 48 hours' notice of intention to backfill over or adjacent to a main. A NEGAS representative will be in attendance during the operation and advise on the suitability and consolidation of backfill material over the main.

(h) Approval in writing from NEGAS shall be obtained before:-

(i) piling is carried out within 14 metres of NEGAS mains and services,

(ii) welding or other hot work involving a naked flame is carried out within 14 metres of NEGAS apparatus,

(iii) explosives are used within 400 metres of NEGAS mains.

4. If a main or service is damaged, or a leak is suspected, the following precautions shall be observed immediately:-

(a) Evacuate all personnel from the vicinity.
(b) Notify NEGAS - Telephone (day):
(night):
(c) Remove all sources of ignition from the vicinity.
(d) Keep pedestrians and vehicles away from the damaged section.
(e) Do not interfere with leak.

5. The above requirements do not relieve the Contractor of any responsibility for taking every precaution to avoid risk to persons or damage to property.

6. The Assistant Engineer for this NEGAS Area is: Vicarage Street North, Wakefield. Telephone Wakefield 379511.

The Excavation Superintendent for the Area is:
Telephone:

Special Requirements in Relation to:

YORKSHIRE WATER (Sewerage)

1. The information in the Contract regarding the location of public sewers has been taken from the existing records of Yorkshire Water. Whilst every care has been taken in the provision of this information, its accuracy cannot be guaranteed and many sewers, culverts and pre-1936 connections are not recorded at all. The Contractor must therefore use his best endeavours to ascertain the location of all public sewers likely to be affected by the Works and shall take all precautions necessary to avoid damage to them.

2. The Contractor shall give sufficient notice to the Sewerage Controller to enable him to agree with the Contractor any protection or support works which the Sewerage Controller considers should be carried out by the Contractor prior to the commencement of any work which may affect any public sewer. Any such protection and support works shall be completed to the satisfaction of the Sewerage Controller.

3. No temporary hutments, spoil heaps or material stores shall be erected or deposited over any public sewer without the written permission of the Sewerage Controller and the Controller shall so conduct his work that he does not obstruct access to any public sewer. Any extra costs incurred by Yorkshire Water by reason of any delay or extra work involved in obtaining access to any public sewer resulting from the Contractor's activities will be recharged to the Contractor.

4. The Contractor shall not make any connections into a public sewer except as provided for in the Contract without the prior approval of the Sewerage Controller. Before making any connection into a public sewer the Contractor shall give Yorkshire Water at least two clear working days notice. (Saturdays, Sundays and Public Holidays shall not be regarded as working days). No work on a public sewer shall be covered up until it has been inspected by the Sewerage Controller.

5. The Contractor shall not dispose of any water arising from the Works into a public sewer, including discharging into a street gully, without the permission of the Sewerage Controller and shall take all necessary precautions to prevent any blockage, obstruction or surcharge of the drainage system, including passing such water through silt tanks prior to being discharged into the public sewer. If Yorkshire Water is called upon to clear a blockage which in the opinion of the Sewerage Controller results from negligence by the Contractor any costs and/or claims attributable to such a blockage will be recharged to the Contractor.

6. In order to comply with the above the Contractor should contact:-

Sewerage Controller, Yorkshire Water,
Central Division,
Wakefield Area Main Drainage Unit,
Brindley Way, Wakefield 41,
Wakefield, WF1 2NJ.

Telephone: Wakefield 822552

Special Requirements in Relation to:

YORKSHIRE WATER (Water Supply)

1. The information in the Contract regarding the location of public water mains has been taken from the existing records of Yorkshire Water. Whilst every care has been taken in the provision of this information, its accuracy cannot be guaranteed and no record is kept of communication pipes. There may also be privately owned supply pipes present which are unrecorded. The Contractor must therefore use his best endeavours to ascertain the location of all water mains and service pipes likely to be affected by the Works (including verifying positions by means of trial holes), and shall take all precautions necessary to avoid damage to this apparatus.

2. The Contractor shall give sufficient notice to the Distribution Engineer to enable him to agree with the Contractor any protection or support works which the Distribution Engineer considers should be carried out by the Contractor prior to the commencement of any work which may affect any public water main, associated fittings or service pipes. Any such protection and support works shall be completed to the satisfaction of the Distribution Engineer.

3. No temporary hutments, spoil heaps or material stores shall be erected or deposited over any public water main and the Contractor shall so conduct his work that he does not obstruct access to any public water main. Any extra costs incurred by Yorkshire Water by reason of any delay or extra work involved in obtaining access to any public water main resulting from the Contractor's activities will be recharged to the Contractor.

4. The Contractor shall not make any connection to a public water main and shall pay all charges for any connections carried out by Yorkshire Water where applicable. Fire hydrants or wash-out hydrants shall only be used following receipt of specific approval from the Distribution Engineer and the Contractor shall use only stand-pipes provided by Yorkshire Water. Any costs associated with such hire and use of stand-pipes shall be paid by the Contractor.

5. In order to comply with the above the Contractor should contact:-

Distribution Engineer
Yorkshire Water
Central Division
Area Office
38 Southgate
Wakefield
WF1 1TF

Telephone: Wakefield 372101

Special Requirements in Relation to:

BRITISH COAL CORPORATION

1. In the following Special Requirements the expression "the Board" means the British Coal Corporation and the expression "the Board's Engineer" means the Area Civil Engineer of the appropriate Area of the British Coal Corporation.

2. In carrying out the Works, the Contractor shall conform to all the requests or requirements the Board or their representative may consider necessary for the safe carrying out of the Works, and notwithstanding any compliance with such requests, or requirements or any supervision exercised by the Board shall indemnify the Employer in respect of all claims made by the Board for any losses, charges, costs, damages and expenses of every description arising from any cause whatsoever in connection with the said Works, including any obstruction or interference with traffic on the Board's railways, and also which may arise in consequence of working in the vicinity of colliery workings and/or entering colliery workings during the execution of the Works and the period of maintenance.

3. The Contractor will be held responsible for, and shall indemnify, and keep indemnified the Employer in all respects against any damage caused to the Board's property, or to any other adjoining property, buildings or works whether belonging to the Board or the Employer or otherwise, and against any accident damage, injury, loss of life or delay to any person using or employed on the railway, or to the servants rolling stock plant or property of the Board, and the Employer or person using or employed on the railway or public using the roads or footways affected or interfered with by the Works if such accident, damage, injury, loss of life or delay shall be in any way consequent upon the Contractor's operations or owing to any omission or neglect of the Contractor or that of any person or persons in their employ either directly or indirectly while the Works are in progress or during the period of maintenance, including all costs and expenses which the Board or the Employer may be put to in defending negotiating or settling such claims.

4. (a) The Board's Engineer or his representative shall at all times have free access to the site where work is being carried out in the vicinity of colliery workings, or where shallow colliery workings are encountered in the Works.

   (b) The Contractor shall notify the Employer and the Board as and when such workings are opened and entered.

   (c) The Contractor shall be responsible for the safe protection of workings to prevent accidents and to restrain the general public from gaining access thereto.

   (d) The Contractor shall not discharge any water or other liquid matter or tip any condemned or surplus material into any workings or disused pit shafts without first obtaining permission of the Board's Engineer.

(e) On completion of the Works the Contractor shall leave any shallow colliery workings and disused pit shafts in a safe condition and in such a condition that access is not possible to any person.

(f) The sale of coal extracted is prohibited.

(g) Where coal is encountered in substantial quantities the Contractor will notify the Board and may be required to load the coal extracted into transport provided by the Board, the coal so extracted being the property of the Board.

Special Requirements in Relation to:

BRITISH RAILWAYS BOARD

1. DEFINITIONS

(a) The "Board" means the British Railways Board.

(b) The "Board's Engineer" means the Chief Civil Engineer of the Eastern Region or other the Engineer appointed for the time being to act on his behalf.

(c) The "Works" means for the purpose of these Special Requirements that part of the work to be executed and constructed over upon or under the Board's land (or other land used by the Board) or in such close proximity that it may affect such land or the Board's traffic.

(d) "Handsignalman" means for the purpose of these Special Requirements handsignalmen and traffic supervisors.

2. RESTRICTIONS OCCUPATIONS AND ISOLATION

Demolition, excavating, piling and temporary or permanent works or any other works in the vicinity of the track, which in the opinion of the Board's Engineer require speed restrictions track occupations or electrical isolations shall be carried out on dates and times agreed in writing by the Board's Engineer. The restrictions occupations and isolations are strictly limited on most routes to minimise delays to the Board's railway traffic. They should be avoided wherever practicable. Occupations and isolations are likely to be available only at weekends or for short periods at night.

3. USE OF THE BOARD'S LAND

The Contractor shall from time to time be allowed to take possession of so much of the Board's land as has been agreed for the carrying out of the Works. Where access to the working site is required by way of the Board's land the route of such access shall be agreed with the Board's Engineer. Any other land belonging to the Board which is required for temporary use outside that which is essential for the actual carrying out of the Works shall be the subject of separate negotiations with the Board's Estate Surveyor. The Contractor shall be responsible for ensuring that any persons employed on their behalf do not trespass beyond the agreed limits of the working area or access route and shall if required to do so provide and maintain to the satisfaction of the Board's Engineer temporary fencing of an approved type to prevent trespass on the railway.

4. PREVENTION OF ACCIDENTS

Before entry is made on to the Board's land, the Contractor shall obtain in the interests of personal safety copies of the Board's current Track Safety Handbook. A copy shall be given to each person employed on behalf of the Contractor who may work on, or about the track including persons recruited during the progress of the Works. The Contractor shall ensure that such persons are fully conversant with the requirements of the Handbook and that these requirements are strictly observed.

A poster (obtainable from the Board) which draws attention to the Handbook and the need for care on the track shall be erected and maintained in a prominent position at the place of work preferably in the messroom.

5. HIGH VISIBILITY OF CLOTHING

The Contractor shall ensure that sufficient high visibility clothing of a pattern and a shade of orange colour approved by the Board's Engineer is supplied to all persons employed on their behalf who may work on, or about the track and shall ensure that such persons wear this clothing.

6. ACCESS AND ACCOMMODATION FOR BOARD'S REPRESENTATIVES

The Board's Engineer or his representative shall at all reasonable times have free access to any premises where work is being carried out of materials prepared or manufactured for the Works.

7. METHOD OF CARRYING OUT THE WORKS AND USE OF PLANT

All operations on or affecting the Board's land shall be carried out in such a manner so as to avoid risk of danger to the Board's traffic facilities and passengers or persons entitled to be on the Board's property, and as to avoid (except to the extent previously agreed in writing) any interference to the free movement of the Board's traffic and any such passengers or persons other than the Board's employees.

All excavations shall be properly guarded and all walkways and routes used by the Board's employees shall be kept safe and free from debris.

The Contractor shall submit full details (including calculations and drawings when considered necessary by the Board's Engineer) of all proposed temporary works (including formwork) excavations, piling and demolition over, under or in the vicinity of the Board's railways or other property and of the methods proposed for the execution of the Works in sufficient time for full consideration to be given by the Board's Engineer and if necessary for revised proposals to be submitted and approved.

In particular the Board's Engineer may require the submission of drawings showing the proposed method of using and handling plant and materials in the vicinity of the tracks. Plant and materials shall not be used or handled in such a manner that even in the event of mishandling or failure such plant and materials could move or fall foul of rail traffic, i.e. within 2 metres of a vertical plane from the nearest rail on which traffic may run (subject to Requirement 12.1 when working near overhead electrified lines).

The use and handling of mechanical plant and materials in the vicinity of the track shall be carried out only under such restrictions as the Board's Engineer may impose for the protection of rail traffic. Unless foolproof guard rails, locking devices or other safety measures can be provided to the satisfaction of the Board's Engineer, such work shall only be carried out during occupations or if the Board's Engineer considers conditions are suitable between the passage of trains with work ceasing on receipt of instructions from the Board's handsignalman and not restarting until permitted by him to do so.

The Contractor shall ensure that the method of carrying out the Works and all safety arrangements required in connection therewith, are approved in writing by the Board's Engineer and shall ensure that any rules regulations or instructions imposed by the Board's Engineer for the protection of rail traffic are strictly observed.

Excavation near any railway line or structures shall not commence until the agreed measures required to maintain the stability of the track and/or structures have been carried out and have been inspected and approved by the Board's Engineer.

8. CONFIRMATION OF PROGRAMME OF WORK ON OR NEAR THE RAILWAY.

After the method of carrying out the Works has been agreed with the Board's Engineer (and taking into account any provisional arrangements which have been made) the Contractor shall in all cases submit written notice of programme of work and of any speed restriction occupation and isolation requirements to the Board's Engineer at least 10 weeks in advance of the proposed commencement of work on or near the railway tracks.

The Board reserve the right to cancel or alter the dates and times of the agreed speed restrictions, occupations or isolations at short notice if this proves necessary because of any emergency affecting the safe or uninterrupted running of rail traffic but in such an event alternative arrangements will be made as soon as the Board's programme permits.

9. HANDSIGNALMEN LOOKOUTMEN AND RAILWAY SUPERVISORS

Before commencing any work in the vicinity of the track the Contractor shall ascertain whether the Board's Engineer considers it necessary to appoint handsignalmen for the control of trains; lookoutmen for the protection of persons employed on their behalf at the site and/or railway; supervisors for inspecting the Works and ensuring the safety of the Board's traffic and property. The Contractor shall only proceed with the Works or allow such persons to approach and remain close to the tracks when such handsignalmen lookoutmen and/or railway supervisors have been provided and are in position and whilst they are acting as such. However, in the case of supervisors only, such supervisors may authorise specific work to proceed in their absence.

The Contractor shall ensure that wherever work is in progress in the vicinity of the railway the person at site in charge of the Works has ascertained from the Board's representative the best method of stopping trains in the event of a mishap that could affect the safety of trains, and in the case of an electrified line how to have the current switched off in the event of an emergency.

10. INTERFERENCE WITH DRAINS AND SERVICES

The Contractor shall not interfere with the Board's cables signals telegraph wires or any other apparatus affecting the working of the railway. The Contractor shall give sufficient notice to the Board's Engineer to enable him to arrange for any diversion protection or support works which the Board's Engineer considers should be carried out prior to the commencement by the Contractor of any work which may affect such apparatus.

The Contractor shall when necessary, and to the complete satisfaction of the Board's Engineer, locate, divert or support other pipes and services including public utilities.

Any springs watercourses or drains which may be interfered with or cut through shall be preserved and pipes and other means be provided so as not to stop or diminish their present usage, and should any drain or spring appear, adequate measures shall be provided to convey the water and soil therefrom to a suitable outlet and every reasonable precaution taken to protect the Board's works and property from injury in consequence of the Works. The Contractor shall not be allowed without the prior approval of the Board's Engineer to make temporary or permanent connections to the railway mains, drains, pipes or other services.

11. CROSSING THE TRACK

Persons engaged on the Works shall not be allowed to cross or convey material across the tracks except under such special conditions as the Board's Engineer may previously approve in writing. Only in exceptional circumstances will the provision of a temporary level crossing be permitted over any railway track.

If the Board are prepared to accept the provision of a level crossing, then for a level crossing required for construction, traffic over lines used by passenger trains (or which could be used by diverted passenger trains without any special arrangements being made) and all temporary public level crossings, time must be allowed to enable the approval of the Railway Inspectorate of the Department of the Environment to be obtained in addition to the period of notice required by the Board as described in Requirement 8.

12. ELECTRIFIED RAILWAYS

The Contractor's attention is drawn to the presence in some areas of electric traction equipment which may be either overhead or conductor rail. This equipment is lethal and the Contractor shall obtain from the Board's Engineer and shall post in prominent positions agreed with the Board's Engineer warning notices and shall be solely responsible for seeing that such warning notices and other instructions including those given in the Board's Track Safety Handbook are observed.

12.1 Overhead Electrical Equipment

Overhead electrical equipment is charged at high voltage and the Contractor shall observe the following precautions:-

(1) Work shall not be carried out, cranes or other plant erected, operated and dismantled, or materials stored within the prohibited space which is that space within 3 metres of the live overhead equipment together with anywhere vertically above this space.

(2) When persons are working the figure of 3 metres used in determining the prohibited space in paragraph (1) shall be increased by the length of any tool or material being handled. However, normal work on the permanent way, platforms, walkways and the like below the equipment is permitted without special precautions provided the tools or equipment are not at any time raised above head height.

(3) When scaffolding is being erected or dismantled the figure of 3 metres used in determining the prohibited space in paragraph (1) shall be increased by the length of the longest individual unit of the scaffolding (The Board's Engineer may require the scaffolding or similar apparatus to be earthed).

(4) If a crane or other equipment is used, crane stops, fencing warning notices etc. shall be provided by the Contractor to ensure that there can be no encroachment on the prohibited space defined in paragraph (1) by crane load or other equipment even if the crane load or equipment slips, fails or overturns.

(5) Portable ladders used in the vicinity of the live overhead equipment shall be of wood or other non-conducting material, and shall not be reinforced by metal attachments running along the stiles of the ladders. Even ladders without reinforcement can lead to serious electrical shocks if allowed to come close to live overhead equipment and therefore special precautions must be taken to ensure the ladder cannot slip and encroach on the prohibited space defined in paragraph (1).

(6) Any disturbance of or attachment to any equipment forming part of the electric system shall only be carried out by the Board's staff.

Where it is impracticable to comply with any of the above requirements the Contractor shall arrange with the Board's Engineer for special precautions to be taken which could take one of the following forms:-

(a) The issue by the Board's Engineer of a "Permit to Work" which assures the holder that the overhead equipment is isolated and earthed and will not be made live whilst the Permit is in the holder's possession.

It is the responsibility of the Contractor to whom a "Permit to Work" is issued to:-

(i) Confirm immediately to the Board's Engineer their understanding of the limits of isolation given therein.

(ii) Ensure that persons employed on their behalf fully understand the limits of the isolation.

(iii) Ensure that no work is commenced within the limits specified unless and until the "Permit to Work" is in his possession.

(b) The erection of approved protection platforms and/or screens.

The erection of these may need to be carried out under cover of a "Permit to Work" following which work may be carried out normally behind screens or on platforms without a further "Permit to Work".

12.2 **Conductor rail equipment**

Work in the vicinity of a conductor rail or associated electrical equipment may involve the provision of a temporary protection guards and/or protective boarding conductor rail alterations (any of which would normally be carried out by the Board) and/or the isolation by the Board of a length of conductor rail and such other electrical equipment as considered necessary by the Board's Engineer.

It is the responsibility of the Contractor to:-

(1) Ascertain from the Board's representative at site responsible for traction current arrangement the limits of isolation.

(2) Ensure that persons employed on their behalf fully understand the limits of isolation.

(3) Ensure that work is not carried out beyond the limits of isolation.

13. **USE OF EXPLOSIVES**

Explosives shall not be used in connection with the Works without the written consent of the Board's Engineer and then only under such conditions as he may impose.

14. **STACKING OF MATERIALS ETC.**

The Contractor shall stack and place all materials, plant and appliances in such a manner as to prevent their causing injury or damage to persons or property, and at a safe distance from railway tracks or platform edges normally not less than 2 metres but subject to Requirement 12.1. The Contractor shall also strictly observe any instructions given by the Board's Engineer as to the precautions to be taken and the distance from railway tracks and platform edges within which materials plant and appliances shall not be stacked or placed.

15. SCREENING OF LIGHTS

All lights provided by the Contractor shall be so placed or screened as not to interfere with any signal of the Board and any temporary works which may interfere with the sighting of the Board's signals shall not be erected without the consent of the Board's Engineer.

16. FIRE PREVENTION

The Contractor shall during the performance of the Works make adequate arrangements to the satisfaction of the Board's Engineer for the protection of the Works and any temporary works, and any adjacent property of the Board from fire and shall give effect to the requirements (if any) with regard to such protection that has been laid down by the Board. The Contractor shall give the Board's Fire Officers all facilities periodically to inspect the fire prevention arrangements on the Board's land, and within such distance from it as such officers may consider necessary and shall at the Contractor's own cost remove such surplus materials and take such steps to reduce the fire risk as the Board's Engineer may from time to time require.

17. NOTICE OF ACCIDENTS

In the case of any casualty or accident arising out of the Works and occurring on the Board's land, the Contractor shall comply with the requirements of the Notice of Accidents Act 1894 or any statutory modification or re-enactment thereof and shall supply the Board's Engineer within 24 hours with four copies of the Notice sent to the Railway Inspectorate of the Department of the Environment as required by that Act. This is in addition to any statutory requirement to notify the Factory Inspectorate under the Factories Act 1961, or any statutory modification or re-enactment thereof.

18. ADVERTISEMENTS

The Contractor shall not permit any advertisements to be displayed on or above the Board's premises without the permission of the Board's Engineer.

19. SANITARY ACCOMMODATION

Sanitary accommodation will only be allowed on the Board's property when specifically agreed and a site has been allocated by the Board's Engineer.

Unless agreed by the Board's Engineer the Contractor shall not use the waiting rooms mess rooms or sanitary facilities provided by the Board for its passengers or staff.

The Contractor shall ensure that such accommodation meets with the approval of the local public health officer and shall remove thoroughly disinfect and fill in all pits sumps etc. When no longer required all to the satisfaction of the Board's Engineer.

20. CLEARANCE OF THE BOARD'S LAND AND PROPERTY

The Contractor shall prevent mud or water falling or draining on to the Board's land and property and particularly on to the track ballast and walkways. The Contractor shall not leave rubbish on the Board's land and property and shall subject to the approval of the Board's Engineer clear away and remove all constructional plant surplus materials and temporary works as and when in the opinion of the Board's Engineer these cease to be required for the work being carried out on the Board's land and property. All damage to the Board's land and property shall be made good to the satisfaction of the Board's Engineer.

Special Requirements in Relation to:

WAYS ACROSS THE WORKS

The Contractor shall maintain to the satisfaction of the Engineer, ways across the works as listed in the following schedule and indicated on drawing no.

Name of Road	Description	Classification	Traffic Density in one direction (comm. vehicles/day)
Entrance road - used by owners of adjacent former allotment gardens for access to their land.			

INDEX TO SPECIFICATION

This index relates to the complete list of standard clauses and this may contain references to clauses which are not applicable to this contract.

SPECIFICATION

Note : Any clauses in this Specification which relate to work or materials not required by the Works, shall be deemed not to apply.

101 BRITISH STANDARDS

1. Where a current British Standard Specification is applicable, all materials, workmanship and tests contained in the standards shall be complied with unless specifically modified by this Specification. The editions of the British Standard referred to are those current at the date when the Tenders are invited.

102 ACCESS TO SITE

1. Access to the site shall be as shown on the contract drawings or as described in the contract document.

2. The Contractor may make his own arrangements for other access to the site at his own expense but only with the approval of the Engineer. The Contractor shall maintain the site access in good repair and make good, at his expense, any damage which, in the Engineer's opinion, occurs as a result of the Contractor's activities.

103 OFFICES, ETC.

1. The Contractor shall obtain prior approval from the Engineer for the siting of all huts, sheds, offices and other temporary buildings which are required either by the Contractor for his own use or by the Engineer.

2. The Contractor shall site his machine servicing and refuelling areas so that no pollution will occur and to minimise nuisance to adjacent property.

3. Where an item is included in the Bill of Quantities for providing, maintaining and removal on completion of temporary lock-up accommodation for the exclusive use of the Engineer's Representative, this shall be as detailed in the Contract. If the installation of a telephone is included this shall be a separate connection for the sole and private use of the Engineer.

104 WELFARE FACILITIES, SANITARY ACCOMMODATION

1. The Contractor shall provide welfare facilities as prescribed in the Working Rule Agreement published by the Civil Engineering Construction Conciliation Board for Great Britain. The sanitary accommodation and disposal arrangements shall comply with the requirements of the local Environmental Health Authority.

105 WATER SUPPLY

1. The Contractor shall provide and pay all charges in connection with adequate supplies of clean water which may be required for all purposes on the works. Local stream, pond or other surface or spring water may not be considered as suitable for use in the works and the Engineer's agreement to the Contractor's proposed source must be obtained.

106 DATUM FOR LEVELS AND SETTING OUT

1. The Contractor will be given a suitable ordnance or temporary bench mark on or near the site to which all levels shall be referred. As soon as the Contractor takes possession of the site, works bench marks must be established at a ratio of one per hectare of land area of the site.

   Levels will be agreed with the Engineer and a list supplied to him. Checks must be made on these bench marks every month and any adjustments agreed and recorded.

2. The Contractor shall, at his own expense, set out his working area where not otherwise defined, by means of stout posts atleast 1.2m high and set at 5.0m intervals. These posts shall be clearly marked in red and white stripes and maintained throughout the Contractor's operations on the site. The Engineer will only allow work to proceed when these posts are intact. The Engineer will require bunting to be provided and maintained at the Contractor's expense between the posts if any plant runs outside the boundary as marked above.

3. A datum or datum points may be provided before commencement of work on site. The Contractor shall afford these points such protection as deemed necessary by the Engineer and shall maintain such protection throughout the Contract period.

107 EXISTING GROUND LEVELS

1. The Contractor shall satisfy himself that the existing ground levels as indicated on the drawings or schedule of cross section levels are correct. Should the Contractor wish to dispute any levels, he shall submit to the Engineer, a schedule of the position of the levels considered to be in error and a set of revised levels. The existing ground relevant to the disputed levels shall not be disturbed before the Engineer's decision as to the correct levels is given.

108 PRIVATELY AND PUBLICLY OWNED SERVICES

1. If any privately owned service - for water, electricity, drainage, etc., passing through the site will be affected by the works, the Contractor shall provide a satisfactory alternative service in full working order to the satisfaction of the owner of the service and of the Engineer before cutting the existing service.

2. Drawings showing Statutory Undertakers' apparatus known to be affected by the works are included in the Contract. Drawings showing other apparatus within the Contract boundary are available for inspection This information is the latest available BUT IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE COMPLETENESS AND ACCURACY OF THE INFORMATION PRIOR TO THE COMMENCEMENT OF ANY WORKS.

3. Notwithstanding the fact that the information on affected services is not exhaustive, the final position of these services within the works has been discussed with the various bodies and to this extent the bodies are familiar with the final proposals. The intermediate stages of the works are unknown at the design stage, these being dictated by the Contractor's methods of working. Accordingly, the Contractor's programme must take into account the period of notice and duration of diversionary works on each body as contained in the Contract and the Contractor must also allow for any effect of these services and alterations upon the Works.

4. No clearance of, or alterations to, apparatus shall be carried out unless specifically ordered by the Engineer.

5. Any services affected by the Works must be temporarily supported by the Contractor who must also take all measures reasonably required by the various bodies to protect their services and property during the progress of the works.

6. The Contractor may be required to carry out certain works for, and on behalf of, the various bodies and he shall also provide with the prior approval of the Engineer, such assistance to the various bodies as may be authorised by the Engineer.

7. The Employer will not be held liable or responsible for any delay which may occur due to non-completion of or any damage occurring to such service in consequence of the Contractor's operations.

109 ADVERTISEMENTS AND PHOTOGRAPHS

1. No advertisements shall appear on any temporary or permanent part of the works without the written permission of the Engineer. All press representatives shall be referred to the Engineer. Photographs for publication shall not be made of any part of the works without the permission of the Engineer to whom enquiries regarding the approval of prints shall also be made.

110 DUST AND MUD

1. The Contractor shall employ the best practicable means to minimise the emission of dust from the site during the construction of the works. Sprinkling equipment in a serviceable condition must be kept ready for use on site at all times. Should this nuisance occur, sprinkling equipment shall be used to minimise its effect and the Contractor shall amend his method of working if necessary.

2. The Contractor shall make use of a cuttings box or other dust suppression devices during all drilling operations, to the satisfaction of the Engineer.

3. All existing highways used by the vehicles of the Contractor or any of his Sub-Contractors or suppliers of material or plant, and similarly any new roads which are part of the works and which are being used by traffic, shall be kept clean and clear of all dust and mud dropped by the said vehicles or their tyres. All dust and mud from the works spreading on these highways shall be immediately cleared by the Contractor as detailed in sub-Clause 3 of this Clause.

4. Clearance shall be effected immediately by manual sweeping and removal of debris or, if so directed by the Engineer, by mechanical sweeping and clearing equipment and all dust, mud and other debris shall be removed entirely from the road surface. Additionally, if so directed by the Engineer, the road surface shall be hosed or watered using suitable equipment.

5. Compliance with the foregoing will not relieve the Contractor of any responsibility for complying with the requirements of any Highway Authority in respect of keeping roads clean.

111 TEMPORARY DIVERSION OF VEHICULAR AND PEDESTRIAN TRAFFIC

1. The Contractor shall construct temporary diversion ways wherever the works will interfere with existing public or private road or other ways over which there is a public or private right of way for any traffic.

2. The standard construction and width of the diversion shall be as shown on the drawings for the class or classes of traffic using the existing way.

3. Diversion ways must be constructed in advance of any interference with the existing ways and shall be maintained in a condition satisfactory to the Engineer for as long as required.

112 TRAFFIC SAFETY AND CONTROL

1. The Contractor shall provide, erect and maintain such traffic signs, lamps, barriers and traffic control signals and such other measures as may be necessitated by the construction of the works in accordance with the recommendations contained in Chapter 8 of the Traffic Sign Manual published by Her Majesty's Stationery Office for the Department of the Environment and any amendments thereof. Compliance with this Clause shall not relieve the Contractor of any of his other obligations and liabilities under the Contract and under the relevant provisions of the Highways Acts and Road Traffic Act.

2. Wherever single file traffic is necessary on a highway by reason of the construction of the works, the Contractor shall provide and maintain a minimum carriageway width of 3m, wider where necessary at curves and junctions as agreed by the Engineer. When alternate one-way (shuttle) working of traffic is required, the Contractor shall provide and maintain electric traffic control light signals and such traffic signs as may be required by the Engineer. The traffic control light signals shall normally be vehicle actuated but fixed time or manual actuation may be accepted by the Engineer in suitable cases. Manually operated 'Stop-Go' signs will be permitted only if agreed by the Engineer.

3. All signs, lamps, barriers and traffic control signals shall be in accordance with the requirements of the Traffic Signs Regulations and General Directions, current at the date of execution of the work.

4. The Contractor shall phase the work in a manner acceptable to the Police and the Engineer for the operation of traffic and shall, before commencing work, produce an agreed phased programme.

5. Traffic signs shall comply with BS 873 and road danger lamps with BS 3143 except that the flashing rate for flashing lamps shall be within the rate 120 - 150 flashes per minute. The minimum luminous intensity of the lamps shall be 0.5 candela for steady lamps, 1.0 candela for ripple lamps at their peak and 1.5 candela for flashing lamps at their peak.

113 CONTROL OF VIBRATION AND NOISE

1. The Contractor shall comply with the general recommendations set out in BS 5228 Code of Practice for Noise Control on Construction and Open Sites, together with the specific requirements set out below.

   (a) The Contractor's attention is drawn to the current legislation and in particular to procedures contained in Part III of the Control of Pollution Act, 1974 relating to control of noise on construction and demolition sites. Attention is also drawn to the British Standard Code of Practice for Noise Control on Construction and Open Sites (BS 5228 Part 1 : 1984).

   (b) The Contractor shall employ the best practicable means to minimise noise and vibration from within the site and compound and shall pay particular attention to the selection of the most appropriate available plant in order to minimise the neighbourhood noise (as mentioned in BS 5228, Section 3). All plant and equipment shall be maintained so as to avoid unnecessary noise and the Contractor shall make full use of suppressors and other mechanical means of reducing noise where these are commercially available.

   (c) Any machinery which is in intermittent use shall be shut down during periods of non-use, but if this is not practicable, shall be throttled back to a minimum.

   (d) Where operations require the use of compressors and breakers, pumps or generators the following conditions shall apply:

      (i) Compressors shall be silenced by all effective means,

      (ii) Breakers shall be fitted with mufflers and, where commercially available, dampened tools and accessories shall be used,

      (iii) Pumps and generators, if operating outside normal working hours, shall be acoustically screened.

2. Immediately the Contract is awarded the Contractor shall shall submit details to the Chief Environmental Services Officer (Health Division - Environmental Control) of the District Council giving the following:-

   (a) The works, and the method by which they are to be carried out,

   (b) Details of plant and machinery to be employed on site.

   (c) Proposed hours of work.

   (d) The proposed arrangements to minimise noise and vibration resulting from the work.

(e) Commencement date, giving atleast 14 days prior notice.

(f) Duration of works.

(g) Details of any sub-contractors.

The Chief Environmental Services Officer may then require an application for normal consent under Section 61 of the Control of Pollution Act.

114 SUBMISSION OF SAMPLES AND TEST CERTIFICATES

1. As soon as possible after the Contract has been awarded, the Contractor shall submit to the Engineer a list of the suppliers from whom he proposes to purchase the materials necessary for the execution of the works. Each supplier must be willing to admit the Engineer, or his representative, to his premises during ordinary working hours for the purpose of obtaining samples of the materials in question. Alternatively, if required by the Engineer, the Contractor shall deliver the samples of the materials to the Engineer's office. Samples shall be taken in accordance with the relevant British Standard where applicable. Materials subsequently supplied shall conform within any specific tolerances to the quality of samples which have been approved by the Engineer.

2. The information regarding the names of the suppliers may be submitted at different times as may be convenient but the sources of supply shall not be changed without the Engineer's prior approval.

3. When any material or article is required to comply with a British Standard, such material or article or its container shall bear the stamp of the registered certification trade mark of the British Standards Institution. Alternatively, the Contractor shall submit to the Engineer, test certificates furnished by the supplier or manufacturer of the material or article indicating compliance with the relevant British Standard.

4. Materials or equipment specified in the Contract by means of a manufacturer or suppliers name or reference mark may be substituted by similar materials or equipment in the works subject to the prior approval of the Engineer.

5. It should be noted by the Contractor that MDPE or Polypropylene pipe for use in the gas wells should be slotted to achieve 8-10% slotted area before use in this contract.

6. During the Contract period the Contractor shall submit samples to the Engineer's site office when so instructed. Sample size shall be in accordance with Table 100/1.

Suitable containers shall be provided by the Contractor.

TABLE 100/1

Material	Frequency of Testing	Size of Samples
Ready mixed	3 No. cubes per wagon	150 mm cube concrete
Sand	2 No. samples per wagon	3kg
Cement	2 No. samples per wagon	10kg
Pipe bedding	2 No. samples per wagon	25kg
Sub-base	2 No. samples per wagon	50kg
Lime	2 No. samples per wagon	2kg
Coated Materials	2 No. samples per wagon	2kg

115 SAFETY

1. The Contractor shall be responsible for all safety precautions being implemented. Records of inspections, examinations and tests as required by the various regulations should be available for the Engineer's inspection. The Contractor's attention is also drawn to the various Codes of Practice, advisory notes and manuals issued for specific operations and these shall be complied with.

2. Because of the nature of the site, particular attention is drawn to substances which may be encountered during the works. These may include:-

   Asbestos

   Hot and Burning Materials

   Drums and other Containers

   Unidentified Liquids, Slurries and Sludges

   Spent Oxides

   Sealed (or burst) Bags of Chemicals

   Gases (see sub-Clause 3 of this Clause)

   Unusual Objects

   The Contractor shall inform the Engineer immediately upon discovering any such substances, cease work in the immediate vicinity and agree his method of working with the Engineer before restarting.

3. Safety precautions are required to be taken in and adjacent to sewers, culverts, drains, manholes, excavations and other confined spaces, etc., where, because of the nature of the site, toxic flammable or oxygen deficient atmospheres may be present. The minimum testing equipment that the Contractor shall have on site at all times shall be able to detect an oxygen deficient atmosphere, the presence of methane gas and the Contractor shall ensure that his personnel do not smoke in all areas where such risks exist.

4. The Contractor's attention is drawn to the need for the Engineer to have free access at all times to the works. For the purpose of making any necessary inspections, the Contractor shall provide all equipment and labour required by the Engineer's Representative and his assistants.

5. In carrying out work the contractor shall not allow any naked lights or flames to be used anywhere on the site. Safety lamps only shall be used to illuminate the works.

   Smoking shall not be permitted on the site.

6. The contractor will not be permitted to commence work until personnel trained in the usage and maintenance of all necessary safety equipment for working in conditions were potentially dangerous gases may be encountered, are present on site.

7. It remains the contractor's responsibility for choosing the method of working and ensuring that the works are carried out in a safe manner.

116 PROGRAMME OF WORKS

1. In accordance with Clause 14 of the General Conditions of Contract, the Contractor will be required to provide an initial Programme of Works as soon as practicable after acceptance of the tender.

2. The Contractor's attention is drawn to the need to phase the works to take into account the following:-

   (a) Working hours shall be as follows:-

Monday to Fridays	0800 to 1800
Saturdays	0800 to 1300
Sundays and Bank Holidays	Not At All

   (b) The need for an interim gas control system to be provided as soon as the contractor takes possession of the site.

   (c) The Contractor shall submit details of his proposed method of drilling to the Engineer for approval prior to commencement of the works.

   (d) No borehole backfilling (ducting or aggregate) shall be commenced until the borehole has been approved by the Engineer.

   (e) Excavation and backfilling of service trench for electricity cable - given one weeks notice to commence.

117 TEMPORARY DRAINAGE

1. The Contractor shall be responsible for the temporary drainage of the works. He shall carry out his operations so that water shall not stand on the site. Trenches and excavated pits shall be kept free of water and the Contractor shall arrange for the immediate disposal of water shed onto the earthworks or completed formation or any other intermediate stage of the permanent works. Where practicable, water shall, with the prior consent of the Engineer, be discharged into the outfall(s) for the permanent drainage system. Adequate means for trapping silts shall be provided in temporary systems discharging into permanent works and the Contractor shall not allow water on the site to become polluted by this method of working.

2. All temporary and permanent drainage works shall be kept free of silt and rubbish for the duration of the Contract period.

3. Immediately prior to completion of the works, the Contractor shall clean out all permanent ditches and silt traps and dispose of the arisings.

Clauses 118 and 119 not used.

120 SURVEYING EQUIPMENT FOR THE ENGINEER'S REPRESENTATIVE

(a) The following equipment shall be supplied for the sole use for the Resident Engineer for the duration of the contract.

1No.	automatic level, minimum magnification 25 x, erect image and horizontal circle reading to parts of degree.
1No.	5m levelling staff with levelling bubble
6No.	2m ranging rods
1No.	5lb lump hammer
1No.	7lb sledge hammer
1No.	claw hammer
1No.	1m spirit level
1No.	heavy duty shovel
1No.	'Navvy's' pick
1No.	hand lamp
1No.	Max. Min. thermometer
1No.	35 mm auto focus compact camera with built in data back and electronic flash (including all batteries)
12No.	35mm 400ASA slide films, 36 exposure, contractor to cover cost of processing
4No.	Safety helmets of a colour not worn by the Contractor's employees
1No.	Total Station: Geodimeter 510N with dual axis Compensator,Alpha keyboard & Internal datalogger - comprising UDS inc. 3-D Free Station, Edit and 1,000 point memory. Carrying case with harness, two internal batteries,one heavy duty power pack, lead & battery chargers. Heavy duty tripod, reflector unit complete with prism, target and telescopic detail rod (2.5m) with bubble. Downloading lead to Amstrad PC serial port.
1No.	0.3 m spirit level
1No.	30m linen tape
1No.	5m steel tape with lock

1No. electronic calculator with LCD display, triganometrical functions and memory

Road nails, road chalk, pegs (long and short), profile boards, nails etc., as required

(b) The following equipment shall be supplied from new by the Contractor for the sole use of the Resident Engineer and his staff during the contract, replaced when required and be retained afterwards by the engineer:-

GMI Portable Carbon Dioxide Monitor, charger, case/shoulder strap, accessories, sampler and calibration system.

These are items from the ARCO catalogue and the numbers are their references:

10No. SUP110 Rigger gloves (12136)
4No. Sentinel waistcoats sizes to suit (18525).
2No. Navy/Purple Fleece Jackets sizes to suit (10673)
2No. Royal Gore-Tex Professional Jacket sizes to suit (10701)
2No. Hood for above (10705)
2No. KII Coverall Navy sizes to suit (08106)
1No. Packet of Dust/Mist Respirator (01135)
1No. Jalscand Shoe sizes to suit (06331)
1No. Jalmars Chukka Boot sizes to suit (06329)
2No. Jalhermes SAS Rigger Boot sizes to suit (06327)
2No. Century Super Safety Boot sizes to suit (05575)
6No. green unlettered 'Champion' safety helmets or similar approved with comfort headband and ear defenders (colour of helmet not to be worn by the Contractor)
2No. Protective goggles

121 REGISTRATION OF CARRIERS

1. The offence provisions of the Control of Pollution (Amendment) Act 1989 - Registration of Waste Carriers, came into force on 1st April 1992.

2. Contractors must ensure that they and their sub- contractors are registered carriers if necessary to fulfil their obligations under this contract.

3. The engineer will require to have proof of registration prior to relevant operations being allowed to commence.

122 DUTY OF CARE

1. The requirements of Section 34 of the Environmental Protection Act 1990, (Duty of Care as to waste), came into force on 1st April 1992.

2. Contractors must ensure that they and their sub-contractors are aware of and comply with all the requirements of the Duty of Care.

3. The engineer may check the Contractors and sub- contractors compliance with the Duty of Care, and will require proof of carriers registration and controlled waste Transfer Note prior to relevant operations being allowed to commence.

Clauses 123 to 200 not used.

201 SITE CLEARANCE

1. Trees, stumps, bushes, shrubs and fencing shall be grubbed up and removed and long grass, weeds and scrub cut down, litter and other deleterious material shall be collected. The resulting material shall be disposed of by removal from site or as otherwise directed by the Engineer - consent must be received in writing for burning or burial.

202 TREES FOR RETENTION

1. The Contractor shall take all necessary measures, including the erection of temporary fencing if necessary, to avoid damage to trees which are to be retained.

203 PROVISION OF INTERIM GAS CONTROL SYSTEM

1. At present the owners of the southern part of the site, Biffa Waste Services Ltd are operating a gas pumping and flaring system. This system comprises 9 vertical extraction wells, forming a barrier towards Healdfield Road, and connected to a positive extraction and flaring unit. Wells 5 to 9 have individual gas collector lines running to a 5 way inlet manifold, which is housed in a below ground level manifold chamber. A main collector line transfers the gas from this manifold to an inlet on the flare/extraction unit manifold. Wells 1 to 4 have individual gas collector lines running to other inlets on the flare/extraction unit manifold. The flare/extraction unit has a capacity of $500m^3/hr$, is skid mounted and located in a compound together with a mobile generator and fuel tank.

2. Whilst the installed gas system is of a permanent nature the flare/extraction unit, its manifold, the mobile generator, fuel tank and compound are of a temporary nature and are hired from Biffa Environmental Technology. The contractor on taking possession of the site shall become responsible for the provision, installation, maintenance and running of a gas control system (similar to the existing), until a permanent one is installed for the whole site. This system must be approved by the Engineer and the contractor shall carry out weekly monitoring of it and the existing boreholes, to prove its effectiveness.

3. The Contractor shall be furthermore responsible for the provision of an adequate gas control system during the transition between temporary and permanent ones.

4. Once the permanent gas control system is installed the Contractor shall carry out all necessary setting/adjustment of the system to ensure its efficient working. The Contractor shall during the Defects Correction Period be responsible for the running and monitoring of the system, including any repairs or modifications that may be necessary. The Contractor shall carry out weekly monitoring of it and the existing boreholes, to prove its effectiveness (a report of these shall be supplied to the Client).

204 PROVISION OF PERMANENT GAS CONTROL SYSTEM

1. The permanent gas system shall include the complete installation of the detailed system to control gas from the site and the flaring of the collected gas. The system shall be set up and adjusted to give optimum levels of working. Monitoring shall be carried out, on a weekly basis, to check the efficient working of the system (a report of these shall be supplied to the Client).

2. The running and maintenance of the system shall include all cost associated, including electrical supply, routine repairs and breakdowns. Maintenance shall include all wells, pipework, valves, the control gear, pumps and flare equipment, a three monthly check shall be carried out on all equipment and a report supplied to the Client.

3. The works include the connection of existing gas wells, raising of the wells and existing monitoring wells, the new gas and monitoring wells, pipework and valves, the gas control gear, pumps and flare stack -within a building in a compound. Also the clearing and reinstatement of the interim gas control system and its compound.

205 RAISING OF EXISTING EQUIPMENT

Monitoring Wells	Raise by
G	0.5m
H	1.2m
I	0.5m
J	0.6m
K	0.7m
L	0.7m
M	0.7m
N	0.0m
O	0.0m
P	0.3m
Q	0.2m
R	0.3m
S	0.4m
T	0.9m
U	0.3m
V	0.0m
W	0.1m
Gas Wells	
1	1.0m
2	1.8m
3	1.9m
4	2.1m
5	2.1m
6	2.3m
7	2.3m
8	2.4m
9	2.5m
X	1.7m
Y	2.0m
Exist Manifold	2.35m
Exist Trap	2.35m
Compound Level	1.9m

Clauses 206 to 300 not used.

301 DEFINITION AND CLASSIFICATION OF EARTHWORKS MATERIAL

1. The following definitions of earthworks materials shall apply to this and other Clauses of the Specifications in which reference is made to the defined materials.

   (a) 'Top Soil' shall mean the top layer of naturally occurring material containing humus and fibre capable of supporting vegetation.

   (b) 'Subsoil' shall mean that material occurring naturally between topsoil and weathered parent material but may include well-weathered soft sandstone and mudstone.

   (c) 'Suitable Material' shall comprise all that which is acceptable in accordance with sub-Clause (2) of this Clause.

   (d) 'Unsuitable Materials' shall mean material not suitable for use in areas where compaction is specified and shall comprise:

      (i) material from swamps, marshes and bogs;

      (ii) peat, logs, stumps, and perishable materials;

      (iii) material susceptible to spontaneous combustion;

      (iv) material in a frozen condition;

      (v) clay if liquid limit exceeding 90 and/or plasticity index exceeding 65;

      (vi) materials having moisture content greater than the maximum permitted for such materials in the Contract, unless otherwise permitted by the Engineer.

   Materials of class (iv) if otherwise suitable shall be classified as suitable when unfrozen.

2. For the purpose of Clause 306, materials are grouped as follows:

   (a) 'Cohesive soil' includes clays and marls with up to 20% of gravel or rock and having a moisture content not less than the value of the plastic limit (determined in accordance with BS 1377 test No. 3) minus 4; also chalk having a saturation moisture content of 20% or greater.

   (b) 'Well graded granular and dry cohesive soils' include clays and marls containing more than 20% of gravel and rock and/or having a moisture content less than the value of the plastic limit (determined in accordance with BS 1377 test No. 3) minus 4, well-graded sands and gravels with a uniformity co-efficient exceeding 10, chalk having a saturation moisture content within the range of 15-20% and all shales and clinker-ash.

(c) 'Uniformly-graded material' includes sand and gravels with a uniformity co-efficient of 10 or less, and all silts and pulverised fuel ashes. Any soil containing 80% or more of material in the particle size range of 0.60-0.002 mm will be regarded as silt for this purpose.

3. Rock and fused material is as defined in the preamble.

303 EXCAVATION AND FILLING - GENERAL REQUIREMENTS

1. The Contractor shall carry out excavation in accordance with the drawings and shall adhere to the slopes and levels shown. If specified compaction is required, excavation shall proceed only where sufficient plant is operating at the point of filling to comply with Clause 306.

2. The Contractor shall take precautions to ensure that no material is allowed to roll outside the Contract boundary.

3. The Contractor shall employ only that plant which is suited to the materials to be handled, he shall not at any time use any plant which damages or reduces the natural strength of the material in its in-situ state or during handling and placing or in its final compacted state. He shall not permit suitable materials to become unsuitable by his method of working.

4. Where excavation reveals a combination of suitable and unsuitable materials, the Contractor shall excavate in a manner such that, where required, suitable materials are excavated separately.

5. The Contractor shall ensure that no vertical face is left at any time such that it might cause danger to any persons or property or to the stability of any temporary or permanent works.

6. Should the Contractor wish to use any excavated surface for the general movements of constructional plant, measures to protect the surface of the areas shall be agreed with the Engineer.

7. Attention is drawn to the variable nature of the material to be excavated and to the high moisture content of some of the material. Where drier material is encountered, a dust nuisance may arise, when this nuisance occurs, the Contractor shall provide sprinkling equipment to minimise its effect and shall amend his method of working if necessary. Material with a high moisture content shall be blended with selected drier material to form a stable base for the placing of subsequent layers of fill.

8. The formation surface for any permanent works shall be protected. If damaged, the Contractor shall remove unsuitable material from the excavation and replace excavated materials with suitable material at his own expense.

9. Unless permanent works are required or tolerances specified elsewhere in the Contract, the surface of slopes and levels as shown on the drawings shall be graded smooth to a tolerance of ±300mm from the true surface level with no local humps or depressions and such that the finished surface will not cause ponding. Where plane surfaces intersect locally, and at the boundary of earthworks operations, surfaces shall be joined by a smooth curve of uniform radius.

10. All excavated material shall be used in the works. In areas requiring specific compaction, material shall be restricted to suitable material placed in accordance with Clause 306. In all other areas and subsequently on the areas mentioned below, all fill material shall be placed in layers not exceeding 250mm loose depth and shall be built up evenly so that the specified slopes can be attained. Earthmoving plant shall be so routed that even compaction is obtained over the whole of the fill area.

11. The Contractor should note the variable nature and shape of surfaces to be filled over and should allow for selecting appropriate fill material. On areas which cannot be run over by earthmoving plant, the Contractor shall first place a layer of fill of sufficient thickness to support his plant.

12. Benching will be required where fill is to be placed against slopes steeper than 1 vertical to 1.5 horizontal. A bench shall be cut for each layer of fill to the thickness of fill specified.

306 FILLING AND COMPACTION TO SPECIFIED REQUIREMENTS

1. All materials shall be placed and compacted as soon as practicable after excavation in layers of the thickness and using compaction plant as detailed in table 300/1. Filling shall be carried out so that final levels are approached simultaneously over the whole of any section of the work. The Contractor shall control and direct construction traffic uniformly over the full extent of the fill area and damage to compacted areas shall be made good by the Contractor.

2. No material having any dimension greater than 150mm shall be allowed.

3. Where materials of widely divergent characteristics are used in filling they shall be spread in clearly defined areas, in such a manner as to comply with the requirements of table 300/1 for compaction, and where it is impracticable to define such areas, compaction plant shall be operated as if only the material requiring the greater compactive effort is being compacted.

4. Should the Contractor wish to use any filled area for the general movement of constructional plant, measures to protect the works shall be agreed with the Engineer.

5. Fill shall not be placed during conditions of frost or snow.

6. Definitions and Requirements Associated with Table 300/1

A The depth of compacted layer is the height by which the fill is raised by each successive compacted layer.

B The number of passes is the number of times that each point on the surface of the layer being compacted has been traversed by the item of compaction plant.

C The compactive effort of each compactor is a function of the mass of the machine and the compaction plant Table 300/1 is listed in terms of their masses. The mass per metre width of roll is the total mass of the roll divided by the total roll width. Where a smooth-wheeled roller has more than one axle, the machine shall be assessed on the basis of the axle giving the highest value of mass per metre width.

D A tamping roller, for the purposes of this Specification, is a machine with a roll or rolls from which 'feet' project. The projected end area of each 'foot' shall exceed $0.01m^2$ and the sum of the areas of the feet shall exceed 15% of the area of the cyclinder swept by the ends of the feet. The requirements for tamping rollers apply to machines that have 2 rolls in tandem. If only one tamping roll traverses each point on the surface of the layer on any one pass of the machine, the minimum number of passes shall be twice the number given in Table 300/1.

E (i) For pneumatic-tyred rollers mass per wheel is the total mass of the roller divided by the number of wheels.

(ii) In assessing the number of passes of pneumatic-tyred rollers the effective width shall be in the sum of the widths of the individual wheel tracks together with the sum of the spacing between the wheel tracks, provided that each spacing does not exceed 230mm. Where the spacings exceed 230mm, the effective width shall be the sum of the widths of the individual wheel tracks only.

F Vibrating rollers are self-propelled or towed smooth-wheeled rollers having means of applying mechanical vibration to one or more rolls.

(i) The requirements for vibrating rollers are based on the use of the lowest gear on a self propelled machine with mechanical transmission and a speed of 1.5-2.5 km/h for a towed machine, or a self-propelled machine with hydrostatic transmission. If higher gears or speeds are used, an increased number of passes shall be provided in proportion to the increase in speed of travel.

(ii) Where the mechanical vibration is applied to two rolls in tandem, the minimum number of passes shall be half the number given in Table 300/1 for the appropriate mass per metre width of on vibrating roll. If one roll differs in mass per metre width from the other, the number of passes shall be calculated as for the roll with the smallest value. Alternatively, the machine may be treated as having a single vibrating roll with a mass per metre width equal to that of the roll with the higher value.

(iii) Vibrating rollers operating without vibration will be classified as smooth-wheeled rollers.

(iv) Vibrating rollers shall be operated with their vibratory mechanism operating only at the frequency of vibration recommended or provided with a device automatically indicating the frequency at which the mechanism is operating.

G Vibrating-plate compactors are machines having a base-plate to which is attached a source of vibration consisting of one or two eccentrically weighed shafts.

(i) The mass per unit area of base-plate of a vibrating-plate compactor is calculated by dividing the total mass of the machine in its working condition by its area in contact with compacted soil.

(ii) Vibrating-plate compactors shall be operated at the frequency of vibration recommended by the manufacturers. They shall normally be operated at travelling speeds of less than 1km/h but if higher speeds are necessary, the number of passes shall be increased in proportion to the increase in speed of travel.

H Vibro-tampers are machines in which an engine-driven reciprocating mechanism acts on spring system through which oscillations are set up in a base-plate.

I Power rammers are machines which are actuated by explosions in an internal combustion cylinder, each explosion being controlled by the operator.

J In the case of power rammers, one pass will be considered as made when the compacting shoes have made one strike on the area in question.

K For items marked * the rollers shall be towed by track-laying tractors. Self propelled rollers are unsuitable.

L Where combinations of different types of categories or plant are used, the compaction requirements shall be:

(i) the depth of layer shall be that for the type of plant requiring the least depth of layer, and

(ii) the number of passes shall be that for the type of plant requiring the greatest number of passes.

However, where the Contractor uses a lighter type of plant to provide some preliminary compaction only to assist the use of heavier plant, this shall be disregarded in assessing the above requirements.

M Dropping weight compactors shall have their specification agreed with the Engineer before use.

307 PREPARATION OF EARTHWORKS SURFACES TO RECEIVE PERMANENT WORKS

1. Preparation of surfaces shall only be carried out after completion of sub-surface drainage works and unless specified otherwise by the Engineer, immediately prior to commencement of the permanent works.

2 All surfaces shall be clean from mud or slurry.

3. The sequence of operations shall be as follows:-

(a) Surfaces shall be compacted by a minimum of 4 passes of a smooth wheel vibrating roller of not less than 2500 kg per metre width of roll.

(b) The surface shall be regulated and trimmed to the requirements of Clause 601.

(c) The trimmed surface shall be rolled by one pass of a smooth wheeled vibrating roller of not less than 1200 kg per metre width of roll.

4. Any soft areas which may occur shall be cut and backfilled as directed by the Engineer.

5. Should any depressions appear in the sub-grade during compaction, they shall be filled with selected suitable material, levelled and re-compacted.

308 SUB-SOIL

Sub-soil shall be from approved sources, consisting of naturally occuring weathered materials and shal be free from large stones, bricks and other materials deleterious to plant growth - waterlogged materials will not be accepted.

Clauses 309 to 311 are not used.

312 FILLING AROUND CONCRETE AND BRICKWORK STRUCTURES

1. Filling around concrete and brickwork structures shall not take place until 7 days after the completion of the final concrete pour.

2. Unless specified otherwise, filling material shall comprise type 'C' fill in accordance with Clause 503(4). It shall be placed in layers not exceeding 150mm in thickness and compacted by means of power rammers or vibrating plate-compactors to the requirements of Table 300/1. Alternatively, and with the permission of the Engineer, the

Contractor may use grade 10 concrete as backfilling to within 300mm of finished levels.

Clauses 313 to 400 not used.

401 CONSTRUCTION OF FORMWORK

1. Formwork shall include all temporary or permanent forms required for forming concrete together with all temporary structures required for their support.

2. All formwork shall be so constructed that there shall be no loss of material from the concrete. After hardening the concrete shall be in the position and of the shape, dimension and surface finish described in the Contract.

3. In the event of formwork being displaced by the weight of the wet concrete, it shall not be wedged, jacked or forced back into line without the approval of the Engineer, but shall be dismantled and re-erected and that portion of the work re-cast with freshly mixed concrete.

4. Where internal metal ties are permitted, they or their removableparts shall be extracted without damage to the concrete and the remaining hole filled with mortar. No permanently embedded metal parts shall have less than 40mm cover to the finished concrete surface or the specified cover to reinforcement, whichever is the greater. All external arrises shall have a 25mm chamfer.

402 FORMED SURFACE - CLASS OF FINISH

1. The class of finish as described in the Contract shall be:-

   (a) Rough finish (Class F1) using rough formwork consisting of plain, butt jointed, sawn timber, sheet metal or any other suitable material approved by the Engineer.

   (b) Fair finish (Class F2) using wrought formwork consisting of Grade 1 quality, resin bonded plywood complying with the requirements of BS 1455. Alternatively, steel forms with liner may be used subject to the design and manufacture being approved by the Engineer.

   (c) Other finish (Class F3) as described in the Contract.

403 PREPARATION OF FORMWORK BEFORE CONCRETING

1. The inside surfaces of forms shall, except for permanent formwork, or unless otherwise agreed by the Engineer, be coated with an approved material to prevent adhesion of the concrete. Release agents shall be applied strictly in accordance with the manufacturer's instructions and shall not come into contact with the reinforcement. Different release agents shall not be used in formwork to concrete which will be visible in the finished works.

2. Immediately before concreting, all forms shall be thoroughly cleaned out.

3. Mould oil shall be insoluble in water, non-staining or injurious to concrete and shall be to the Engineer's approval. Mould oil shall be used in accordance with the manufacturer's instructions and shall not come in contact with the reinforcement.

404 REMOVAL OF FORMWORK

1. The Engineer shall be informed in advance when the Contractor intends to strike any formwork.

2. The time at which the formwork is struck shall be the Contractor's responsibility but the minimum period between concreting and the removal of the forms shall be as follows:-

Sides of beams, wall columns and piles	18 hours
Soffits of beams and slabs	7 days

3. The periods stated above are based on a constant surface temperature of the concrete of 16°C and the use of Ordinary Portland Cement. They shall be changed if the types of cement are used subject to the Engineer's agreement.

4. Formwork shall be constructed so that the side forms of members can be removed without disturbing the soffit forms and, if props are to be left in place when the soffit forms are removed, these props shall not be disturbed during the striking.

5. All formwork shall be removed without damage to the concrete.

6. Where it is intended that formwork is to be re-used, it shall be cleaned and made good to the satisfaction of the Engineer.

405 UNFORMED SURFACES - CLASSES OF FINISH

1. The class of finish as described in the contract shall be :-

   (a) Class U1 - The concrete shall be uniformly levelled and screeded to produce a plain or ridged surface as described in the Contract. No further work shall be applied to the surface unless it is used as the first stage for a Class U2 or Class U3 finish.

   (b) Class U2 - After the concrete has hardened sufficiently, the concrete Class U1 surface shall be floated by hand or machine sufficiently to produce a uniform surface, free from screed marks.

   (c) Class U3 - When the moisture film has disappeared and the concrete has hardened sufficiently to prevent laitance from being worked to the surface, Class U1 surface shall be steel-trowelled under firm pressure to produce a dense, smooth uniform surface free from trowel marks.

406 REMEDIAL TREATMENT OF SURFACE

1. Any remedial treatment to surface shall be agreed with the Engineer following inspection immediately after removing the formwork and shall be carried out without delay.

2. Any concrete, the surface of which has been treated before being inspected by the Engineer, shall be liable to rejection.

407 STEEL REINFORCEMENT - GENERAL

1. Steel reinforcement shall be stored in clean conditions. It shall be clean and free from loose rust and loose mill scale at the time of fixing in position and subsequent concreting.

2. Steel fabric reinforcement shall comply with the requirements of BS 4483 to the reference number stated in the Contract as defined in Table 1 of BS 4483.

3. Hot rolled steel bars shall comply with the requirements of BS 4449.

4. Cold worked steel bars shall comply with the requirements of BS 4461.

5. Hard drawn mild steel wire shall comply with the requirements of BS 4482.

6. Tying wire shall be either:-

   (a) 1.2mm diameter stainless steel wire for members having exposed soffits or,

   (b) 1.6mm diameter soft annealed iron wire elsewhere.

408 BENDING OF REINFORCEMENT

1. Reinforcement shall be bent to the dimensions given in the Bar Schedules.

2. All reinforcement shall be bent at temperatures in the range of 5°C and 100°C.

3. Cold worked bars and hot rolled high yield bars shall not be straightened or bent again once having been bent. Where it is necessary to bend mild steel reinforcement already cast in the concrete, the internal radius of bend shall be not less than twice the diameter of the bar.

409 PLACING OF REINFORCEMENT

1. Reinforcement shall be placed and maintained in the position shown in the Contract. Unless otherwise permitted by the Engineer, all intersecting bars shall be tied together and the ends of the tying wire shall be turned into the main body of the concrete.

2. No splices shall be made in the reinforcement except where described in the Contract or where approved by the Engineer.

410 COVER BLOCKS

1. Cover blocks required for ensuring that the reinforcement is correctly positioned, shall be as small as possible consistent with their purpose, of a shape acceptable to the Engineer, and designed so that they will not overturn when the concrete is placed. They shall be made of concrete with 10mm maximum aggregate size and the mix proportions shall comply with Clause 414 to produce the same strength as the adjacent concrete. 1.2mm diameter stainless steel tying wire shall be cast in the block for the purpose of tying it to the reinforcement.

411 CEMENT

1. Unless otherwise stated in the Contract, all cement used in the works shall be Sulphate Resisting Portland Cement to BS 4027.

2. Ordinary Portland Cement, where permitted, shall comply with BS 12.

3. Partial cement replacement using ground granulated slag or selected PFA may be permitted subject to the approval of the Engineer.

4. Cement shall be stored in dry weatherproof conditions and shall be delivered in quantities sufficient to ensure that there is no suspension or interruption of work. Each consignment shall be kept separate and distinct.

412. WATER FOR USE WITH CEMENT

1. In accordance with Clause 105, the Engineer's approval shall be obtained regarding the source of water and the manner of its use. All water used with cement and aggregates must be suitable for such use when tested in accordance with BS 3148.

413 AGGREGATES FOR USE IN CONCRETE

1. Aggregates shall consist of naturally occurring materials complying with the requirements of BS 882. Water absorption shall not exceed 2% when measured in accordance with BS 812. Sand shall be fine aggregate resulting from the natural disintegration of rock.

2. Coarse aggregates shall have a flakiness index not exceeding 35 when measured by the sieve method described in BS 812.

3. Aggregates for granolithic concrete shall comply with BS 1201. Coarse aggregate shall be graded to Table 1 of BS 1201 and have an aggregate abrasion value, as defined in BS 12, not exceeding 10.0. Fine aggregate shall be naturally occurring sand to Table 2 of BS 1201.

4. All aggregates shall be kept free from contact with deleterious matter and in the case of aggregates passing a 5mm sieve, they shall be deposited on the site of mixing for not less than 8 hours before use. Aggregates of different sizes or specification shall be stored in different hoppers or stockpiles and shall be kept separate from each other. Coarse aggregates, unless otherwise agreed by the Engineer, shall be stockpiled in two separate sizes.

414 PROVISION OF CONCRETE

1. Ordinary structural concrete shall be provided in accordance with CP 110 and to the prescribed mixes detailed in sub-Clauses 2 or 3 of this Clause, as required in the Contract.

2. Prescribed mixes for ordinary structural concrete shall be provided in accordance with Table 400/1 which gives the weights of cement and total dry aggregates in Kilogrammes to produce approximately one cubic metre of fully compacted concrete together with the percentages by weight of fine aggregates in total dry aggregates.

Table 400/1

	Nominal max size of Aggregate (mm)	20		10	
	Workability	MEDIUM	HIGH	MEDIUM	HIGH
Concrete Grade	Limits of Expected Slump (mm)	25-75	75-125	10-25	25-50
10	Cement (Kg)	240	260	-	-
	Total Aggregate(Kg)	850	1800	-	-
	Fine Aggregate(%)	35-50	35-50	-	-
20	Cement (Kg)	320	350	360	410
	Total Aggregate (Kg)	1800	1750	1750	1650
	Sand: Zone 1(%)	40	45	50	55
	Zone 2(%)	35	40	45	50
	Zone 3(%)	30	35	40	45
30	Cement (Kg)	400	430	460	510
	Total Aggregate (Kg)	1700	1650	1650	1550
	Sand: Zone 1(%)	40	45	50	55
	Zone 2(%)	35	40	45	50
	Zone 3(%)	30	35	40	45

3. Prescribed Mix for granolithic concrete shall be provided in accordance with table 400/2. The nominal maximum aggregate size shall be 10mm and the following weights of cement and dry aggregates will produce approximately one cubic metre of fully compacted medium workability (expected slump 10-25mm) grade 30 concrete.

Table 400/2

Total Weight Cement (Kg)		460
Total Weight Dry Agg. (Kg)		1650
Percentage by wt. of Sand:	Zone 1	50
	Zone 2	45
	Zone 3	40

4. Adjustments to mix proportions necessitated by variations in the physical characteristics of the constituents of the mix shall be agreed with the Engineer.

5. Admixtures may not be used in ordinary structural concrete.

6. Special structural concrete shall be provided in accordance with CP 110. The Contractor will be responsible for the production of a design mix, which must be approved by the Engineer, to obtain the strength detailed in the Contract and provide Class 4 protection as required by Table 49 of CP 110.

7. The quantity of water used in mixing any concrete shall not exceed that required to produce a concrete of the workability appropriate to the situation in which the concrete is used. The workability shall be such as to give slump values, determined in accordance with BS 1881, to be agreed in advance with the Engineer.

415. MIXING CONCRETE

1. Weighing and water-dispensing mechanisms shall be maintained in good order. Their accuracy shall be maintained within the tolerances described in BS 15 and checked against accurate weights and volumes when required by the Engineer.

2. Weights of cement and each size of aggregate as indicated by the mechanisms employed shall be within a tolerance of ±2% of the respective weights per batch agreed by the Engineer. The weight of the fine and coarse aggregates shall be adjusted to allow for the free water contained in them. The water to be added to the mix shall be reduced by the quantity of free water contained in the fine and coarse aggregates, which shall be determined by the Contractor by a method approved by the Engineer immediately before mixing begins, and further as the Engineer requires.

3. Unless otherwise agreed by the Engineer, concrete shall be mixed in a batch type mixer manufactured in accordance with BS 15 or in a batch type mixer, a specimen of which has been tested in accordance with BS 3963 and having a mixing performance within the limits of Table 6 of BS 15. Where appropriate, the batch capacity, method of loading, mixing time and drum speed shall conform to the details furnished in accordance with the requirements of BS 3963 for the mix which corresponds most closely to the mix proportions being used. The mixing blades of pan mixers shall be maintained within the tolerances specified by the manufacturers of the mixer and the blades shall be replaced when it is no longer possible to maintain the tolerance by adjustment.

4. Mixers which have been out of use for more than 30 minutes shall be thoroughly cleaned before any fresh concrete is mixed. Unless otherwise agreed by the Engineer, the first batch of concrete through the mixer after cleaning shall then contain only two thirds of the normal quantity of coarse aggregate. Mixing plant shall be thoroughly cleaned before changing from one type to another.

5. Concrete shall not be mixed when the air temperature in the shadeis below 3°C unless special precautions are taken which have been approved by the Engineer. No frozen material or materials containing ice shall be used and those which have been exposed to frost shall be completely thawed before use.

6. During hot weather, the Contractor shall ensure that the constituent materials of the concrete are sufficiently cool to prevent concrete from stiffening in the interval between its discharge from the mixer and compaction in its final position.

416 READY MIXED CONCRETE

1. Ready mixed concrete as defined in BS 5328 may be used only with the agreement of the Engineer. Mixes shall be as detailed in Clause 414 and water shall be added under supervision at the central batching plant. Under no circumstances is the water to be added in transit or at the site.

2. Concrete shall be carried in purpose-made agitators or truck mixers and the concrete shall be thoroughly re-mixed on receipt at the site. Unless otherwise agreed by the Engineer, truck mixers and their mixing and discharge performance shall comply with BS 4251. Re-mixing shall continue for a number and rate of revolutions not less than 7 revolutions per minute, for 10 minutes.

3. The concrete shall be compacted in its final position within 2 hours of the introduction of cement to the aggregates.

4. Each load shall be accompanied by a delivery note which shall contain the following information:-

   (a) Name or number of ready-mixed concrete depot
   (b) Serial number of ticket
   (c) Date
   (d) Truck number
   (e) Name of purchaser
   (f) Name and location of site
   (g) Grade of mix description of concrete
   (h) Specified workability
   (i) Type of cement
   (j) Nominal maximum size of aggregate
   (k) Quantity of concrete in cubic metres
   (l) Time of loading and introduction of cement
   (m) Details of admixtures

417 TRANSPORT AND PLACING OF CONCRETE

1. The method of transporting and placing concrete shall be subject to the approval of the Engineer. Concrete shall be so transported and placed that contamination, segregation or loss of the constituent materials does not occur.

2. All formwork and reinforcement contained in it shall be clean and free from standing water, snow or ice immediately before the placing of the concrete.

3. Concrete shall not be placed in any part of the structure until the Engineer's approval has been given. If placing of concrete is not started with 24 hours of approval being given, approval shall again be obtained from the Engineer. Placement of concrete shall then proceed continuously over the area between construction joints. Fresh concrete shall not be placed against insitu concrete which has been in position for more than 30 minutes unless a construction joint is formed in accordance with Clause 419. When insitu concrete has been in place for 4 hours (or less, as directed by the Engineer, depending upon the mix, type of cement and weather conditions), no further concrete shall be placed against it for a further 20 hours.

4. Concrete, when deposited, shall have a temperature of not less than 5°C and not more than 32°C. It shall be compacted in its final position within 30 minutes of discharge from the mixer unless carried in purpose-made agitators, operating continuously, when the time shall be within 2 hours of the introduction of cement to the mix and within 30 minutes of discharge from the agitator.

5. Except where otherwise agreed by the Engineer, concrete shall be deposited in horizontal layers to a compacted depth not exceeding 0.5m where internal vibrators are used, or 0.3m in all other cases.

6. Unless otherwise agreed by the Engineer, concrete shall not be dropped into place from a height exceeding 2.0m. When trunking or chutes are used, they shall be kept clean and used in such a way as to avoid segretation. Concrete shall not be pumped from aluminium conduits.

7. No concrete shall be placed in flowing water. Underwater concrete shall be placed in position by tremies, or by pipeline from the mixer. Full details of the method proposed shall be submitted in advance to the Engineer and his approval obtained before placing begins. Where the concrete is placed by a tremie, its size and method of operation shall be in accordance with Civil Engineering Code of Practice 'Foundations'. During and after placement of concrete under water, pumping or de-watering operations in the immediate vicinity shall be suspended until the Engineer permits them to be continued.

418 COMPACTION OF CONCRETE

1. All concrete shall be compacted to produce a dense homogenous mass. Unless otherwise agreed by the Engineer, it shall be compacted with the assistance of vibrators. Sufficient vibrators in serviceable condition shall be on site so that spare equipment is always available in the event of breakdowns.

2. Internal vibrators shall be capable of producing not less than 10,000 cycles per minute, and external vibrators not less than 3,000 cycles per minute.

3. Vibrations shall not be applied by way of reinforcement. Where vibrators of the immersion type are used, contact with reinforcement and all inserts, shall be avoided so far as is practicable.

4. Concrete shall not be subject to vibration between 4 and 24 hours after compaction.

419 CONSTRUCTION OF JOINTS IN CONCRETE

1. The position and detail of any construction joints not described in the contract shall be subject to the approval of the Engineer, and shall be so arranged as to minimise the possibility of the occurrence of shrinkage cracks.

2. The upper surface of lifts to concrete walls and columns shall be horizontal unless otherwise described in the Contract and if the formwork extends above the joint on the exposed face, it shall be cleaned of adhering concrete before the next lift is placed. The concrete placed immediately above a horizontal or inclined construction joint shall contain only two thirds the normal quantity of coarse aggregate, shall not be the first batch through the mixer and shall be thoroughly compacted and worked against the existing concrete.

3. Where a construction joint contains a formed surface, that surface shall be roughened to expose the aggregate, care being taken to avoid damaging the aggregate and the arrises to the joint. The roughened surface shall then be washed with clean water to remove loose particles.

4. Where sections of the works are carried out in lifts, the reinforcement projecting above the lift being cast shall be adequately supported so as to prevent movement of the bars during the placement and curing of the concrete.

5. Wherever possible, laitance and all loose material shall be removed while the concrete is still 'green' and no further roughening shall then be required. Where this is not possible, it shall be removed by mechanical means provided the concrete has been in position for more than 24 hours. The roughened surface shall then be washed with clean water.

420 CURING OF CONCRETE

1. Immediately after compaction, and for 7 days thereafter, concrete shall be protected against harmful effects of weather, including rain, rapid temperature changes, frost and from drying out. The methods of protection used shall be subject to the approval of the Engineer.

2. When elevated-temperatures curing is used, 4 hours must elapse from the completion of the concrete before its temperature is raised. The rise in temperature within any period of 30 minutes shall not exceed 10°C and the maximum temperature attained shall not exceed 70°C. The rate of subsequent cooling shall not exceed the rate of heating.

3. The method of curing used shall prevent loss of moisture from the concrete. On concrete surfaces which are to be waterproofed, curing membranes shall be of the non-disintegrating type. Details of all curing methods to be used shall be subject to the approval of the Engineer.

421 USE OF CEMENT IN COLD WEATHER

1. No concreting or any other work involving the use of cement shall be carried out during heavy rain or below a shade temperature of 2°C on a rising thermometer or 4°C on a falling thermometer. All concrete placed during cold weather or when frost is likely to occur, or occurs, shall be protected from freezing by approved means.

422 TESTING OF CONCRETE

1. Sampling shall be in accordance with the requirements given in BS 1881: Part 1. A simple batch sampling procedure shall be adopted and the number, frequency and location of batches to be sampled shall be decided by the Engineer.

2. 150mm cubes shall be made, cured and tested, all in accordance with BS 1881. All cubes made in compliance with this Clause shall be cast in the presence of the Engineer's Representative.

423 EARLY LOADING

1. Concrete shall at no time be subjected to loading, including its own mass, which will induce a compressive stress in it exceeding 0.33 of its compressive strength at the time of loading or of the specified 28 day strength.

424 CEMENT MORTAR

1. Mortar shall consist of two and a half parts of sand to one part cement, measure by volume of dry material.

2. Sand for use in cement mortar shall comply with Table II of BS 1200.

3. An impervious hard stage is to be provided for hand mixing of mortar. The sand and cement shall be thoroughly mixed in the dry state after which water may be added in such amounts as are necessary to make the mortar workable. The material must be turned over at least twice, following addition of water to ensure the correct consistency.

4. Machine mixing will be permitted.

5. Any plasticizer used shall be free from chlorides.

6. Mortar shall be used within one hour of mixing.

425 BRICKS

1. Unless specified otherwise in the Contract, bricks shall be Class B clay engineering bricks complying in all respects with BS 3921.

426 BRICKWORK

1. Unless specified otherwise, brickwork shall be in English bond using mortar to Clause 424. No vertical or horizontal joint shall be less than 7mm nor more than 10mm in thickness. All joints shall be solidly filled and struck off neatly as the work proceeds on all faces. Courses shall be horizontal and matching perpends shall be vertically aligned. Advance brickwork shall be raked back. Toothing of brickwork shall not be permitted.

2. Brickwork shall not be constructed during weather conditions as detailed in Clause 421.

427 PRECAST CONCRETE FLAGS

1. Precast concrete flags shall be hydraulically pressed concrete flags complying in all respects with BS 368. They shall be manufactured using Ordinary Portland Cement and provided to the sized specified. Where no dimensions are given, they shall be 63mm thick and generally 600mm wide, 900mm long.

428 WATERPROOFING WITH BITUMEN

1. Bitumen for waterproofing shall be cut-back bitumen complyingwith BS 3690 of a viscosity grade within the range 25-50 seconds (STV) at 40°C with a coverage of 1.8m^2/litre.

2. Surfaces for waterproofing shall be clean, dry, free from membrane curing compounds and projecting tying wire. Water-proofing shall be with two coats of bitumen in conditions where the ambient temperature is not below 4°C.

429 GALVANISING OF METAL COMPOUNDS

1. Items to be galvanised shall be fully assembled prior to treatment unless prior agreement has been obtained from the Engineer to large items being split into smaller sections.

2. Items shall be hot-dipped galvanised in accordance with BS 729.

430 BOLTS, NUTS AND WASHERS

1. Mild steel bolts and nuts shall comply with the requirements of BS 153: Part 1 and either BS 916 or BS 2708.

2. Structural quality high tensile steel bolts and nuts shall be manufactured from material as specified in BS 153: Part 1.

3. Special quality high tensile steel bolts and nuts shall comply with the requirements of BS 153: Part 1 and either BS 1769 or BS 1083.

4. High strength friction grip bolts, nuts and washers shall comply with the requirements of BS 3139.

5. Special quality high strength friction grip bolts, nuts and washers, comply generally with the requirements of BS 3139 for dimension and BS 1768 for material.

6. Plain and tapered washers, other than for high strength friction grip bolts, shall comply with the requirements of BS 153: Part 1 and BS 3410.

Clauses 431 to 500 not used.

501 EXCAVATION FOR PIPELINES

1. Unless shown otherwise in the Contract, trenches for pipes shall be excavated to a width (Bd) of 1.5d + 200mm (where d is the nominal bore of the pipe). Trench widths shall be maintained for the depths specified in the Contract. In areas of filling, trenches shall not be excavated until sufficient materials have been placed and compacted to enable the specified width and depth to be attained, and where no figure is specified, a minimum cover of 1.0m to the barrel of the pipe must be achieved prior to trench excavation. In all other cases, the trench width must be maintained to the original surface unless agreed with the Engineer.

2. Sufficient depth shall be excavated in the trench to accommodate the pipe and bedding as specified.

3. Top soil excavated from trenches shall be set on one side for reinstatement where specified or stockpiled in accordance with Clause 302 in a location to be agreed with the Engineer.

4. Suitable material excavated from trenches shall be retained for backfilling. The Contractor shall not permit suitable materials to become unsuitable by his method of working. All material surplus to backfilling or that which is unsuitable shall be disposed of.

5. Soft spots in the bottom of excavations shall be removed and the resulting void immediately backfilled in a manner to be agreed with the Engineer. Similarly, any over excavation at the bottom of a trench, or trench bottom which has been allowed to become soft and subsequently excavated, shall be backfilled as agreed with the Engineer.

502 BEDDING, LAYING AND BACKFILLING TO PIPES

1. Immediately following excavation of the trench, and approval thereof by the Engineer, the pipes shall be laid and jointed. Construction shall commence at the outfalls and proceed from downstream to upstream. Manholes, catchpits, etc, shall be constructed up to at least pipe soffit levels as and when pipe laying reaches each manhole. Alternatively, suitable fluming arrangements must be made at each manhole location. Unless the Contract dictates the need to depart from these principles, approval for an alternative sequence of construction must be obtained from the Engineer.

2. Pipes shall be laid so that each one is in contact with the bed throughout the length of its barrel and provision made to accommodate the collar. Brick or other hard material shall not be placed under the pipes to provide temporary support except as described in sub-Clause 3 of this Clause.

3. Where a concrete bed, haunch or surround is specified, concrete blinding shall be laid in the trench in advance of pipe laying and shall be in place for at least 24 hours, or longer if the Engineer decides, before further operations are carried out. The pipes shall be laid on pre-cast concrete blocks as detailed on the drawings. Between each block and the pipe, compressible packing pieces shall be inserted and the Contractor shall ensure that no lateral movement of the pipe can take place. The bedding concrete shall then be placed on one side of the pipe and vibrated until it appears on the other side of the barrel. The remainder of the concrete shall then be placed evenly on both sides of the pipe at the same time, vibrated and worked into position until thoroughly compacted - suitable precautions shall be taken against flotation of pipes. Flexible joints, as detailed on the drawings, shall be formed in the concrete at each pipe joint.

4. After jointing of the pipes, the bedding, or where none is specified, the backfill material, shall be brought up equally on both sides of the pipe to the level of the centre of the pipe line. Testing shall then be carried out except in the case of concrete haunches or surrounds placed in accordance with sub-Clause 3 of this Clause, when the placement of concrete shall be complete before testing is undertaken. No filling shall be commenced earlier than 24 hours after the placing of the concrete surround.

   The bedding, or backfilling material shall then be brought up equally on both sides of the pipe and shall be carefully compacted in layers not exceeding 150mm thickness for the full width of the trench with hand tools to a height of 300mm above the top of the pipe barrel. Remaining backfill material shall be placed in layers not exceeding 150mm in thickness and compacted using power rammers, vibrating plate compactors, trench rollers or other such compacting equipment as is agreed with the Engineer. Backfilling shall be brought to ground level unless reinstatement is specified in the Contract, in which case, backfilling shall be terminated at the appropriate level. Topsoil placed on one side in accordance with Clause 501(3) shall be re-used for reinstatement to grassland, gardens, sports fields or cultivated land.

503. MATERIALS FOR BEDDING AND BACKFILLING TO PIPELINE

1. Pipe bedding material shall have a grading within the following ranges:

BS 410 Test Sieve	Percentage by Mass Passing			
	1	2	3	4
	Pipes Exceeding 1350 mm nominal bore	Pipes 600-1350mm nominal bore and all temporary drains.	Pipes 300-525 nominal bore	Pipes less than 300mm nominal bore
63mm	100	-	-	-
37.5mm	85-100	100	-	-
20mm	0-25	85-100	100	-
14mm	-	-	85-100	100
10mm	0-5	0-25	0-50	85-100
5mm	-	0-5	0-10	0-25
2.36mm	-	-	-	0-5

2. Pipe bedding and surround material for the MDPE pipelines shall be soft sand from an approved source.

   Material used for backfilling over the sand bed and surround shall be the type 'C' fill.

3. Backfilling material to French Drains shall have a grading within column 1 of the table shown in sub-Clause (1) above.

4. All material for pipe bedding and for backfilling to French Drains shall meet the following requirements.

   (a) Water soluble sulphate content shall not exceed 2.5g/1when tested in accordance with BS 1377 Test 10.

   (b) The Magnesium Sulphate Soundness Value shall not exceed 12% when tested in accordance with Clause 515 of the specification.

   (c) The aggregate crushing value (ACV) of any 14mm to 10mm fraction of the material shall not exceed 35 when tested in accordance with Section 7, Paragraph 34 of BS 812 modified as follows:-

      (i) The prepared test sample shall be immersed in water at room temperature for 48 hours prior to test.

      (ii) The sample shall then be removed from the water, allowed to drain at room temperature for one minute and then tested in the crushing cylinder in the normal manner,

and

(iii) The crushed specimen shall be surface dried in accordance with paragraph 34(i) of BS 812 before being seived.

(d) Limestone shall not be used.

(e) The compaction fraction shall not exceed 0.2 when tested as below:-

The following apparatus shall be used:

(i) Open ended cylinder 250mm long and 145 to 160mm internal diameter.

(ii) Metal rammer with a striking face 40mm diameter and of total mass 1Kg.

Method

Stand the cylinder on a firm flat surface.

Using a sample of material having a moisture content equal to that of the material at the time of use, pour the sample of material into the cylinder without supplementary compaction and strike off the material level with the top of the cylinder. Lift the cylinder clear of its contents and place on a fresh area of flat surface. Replace about one quarter of the material in the cylinder and tamp vigorously until no further compaction is evident. Repeat this process quarter by quarter until the whole of the material is measured loose in the cylinder is compacted.

The final measurement from the top of the cylinder to the compacted surface divided by the height of the cylinder is the compaction fraction value.

5. **Type "C" Fill**

Type "C" fill shall be a uniform readily compactible material, free from lumps and stones greater than 25mm, tree roots, vegetable matter, building rubbish, frozen soil or any other deleterious matter.

6. Where no other material is to be used for backfilling, then suitable material, in accordance with Clause 301 shall be used.

7. Where material is to be used for backfilling to concrete pipes and/or surrounds the concentration of sulphate expressed as SO_3 in the material shall not exceed 0.2%.

504 TYPES OF PIPE, JOINTS AND JOINTING

1. Pipes shall comply with the following requirements unless specified otherwise:

(a) **Clay Pipes and Fittings**

Shall comply with BS 65 for 'Normal' pipes and be of the strength specified in the Contract.

(b) **Uplasticized PVC (uPVC) Pipes and Fittings**

Shall be to the class specified in the Contract and shall comply with requirements of BS 3505.

(c) **Steel Pipes and Fittings**

Shall be of any type and with any type of joint complying with BS 534.

(d) The collector pipes used in the works shall be Medium Density Polyethylene Pipe (black) manufactured with the BP type Polymer.

The Pipes shall have an SDR of 17.6 and where applicable be to specification BGC/PS/PL2, part 1. Fittings shall be to specification BGC/PS/PL2, part 2 for butt fusion and to BGC/PS/PL2, part 4 for electrofusion fittings where applicable.

The joints shall be made by butt fusion or electrofusion methods in accordance with British Gas Corporation specification and the whole pipeline will be tested.

2. Individual lengths of pipe shall be jointed strictly in accordance with the manufacturer's instructions using the approved joints to provide a pipeline which, other than where perforated pipes are specified, is of a wholly watertight construction. No change of pipe type will be permitted between manholes and no mixing of joints will be allowed. Unless the manufacturer's instructions state otherwise, socket and spigot joints shall have a space no greater than 13mm between the spigot and the inner end of the socket at any point on the circumference of the completed joint.

3. The Engineer's consent must be obtained for the cutting of any pipes. Special and short lengths must be manufactured as such. Cut ends shall not be used in joints less a proper joint can be made as specified for that particular type of pipe.

505 TESTING AND CLEANING OF PIPELINES

1. All pipelines shall be tested in lengths between manholes or chambers. The Contractor shall provide, fix and operate, all apparatus and equipment required for the testing.

2. All gravity pipelines, except when perforated pipes have been specified, will be tested using the air test as described in C.P. 2005. Prior to the test, the pipes and joints shall be cleared of debris, water, etc., all branches and openings closed with expanding disc stoppers or air bags. If any length of gravity pipeline should fail this test, then it shall be tested using the water test as described in C.P. 2005 before the Engineer decides to accept or reject the pipeline. Any section of pipelines found to be defective shall be relayed over the whole of the defective length, tested again, and so on until the test is satisfactory. No repairs to defective lengths will be permitted without the prior consent of the Engineer.

3. On completion of the test specified in sub-Clause 2 of this Clause, the pipeline, except where perforated pipes have been specified shall be flushed through from manhole to manhole with clean water.

4. On completion of the work, or earlier by agreement with the Engineer, each manhole to manhole length of pipeline of 600mm diameter or less shall be "pulled through" once using a purpose made wooden cylinder (25mm less in diameter than the nominal diameter of the pipeline under test, and one and a half times the diameter in length), being hauled through the pipeline from manhole to manhole. The cause of any obstructions will be investigated immediately.

5. On completion of the works, the drainage system shall be examined for infiltration. Except in perforated pipelines, no infiltration shall be permitted and the source of any leakage investigated in order that remedial measures can be agreed with the Engineer.

506 MATERIAL FOR SURROUNDS TO WELLS

1. Material shall have a grading within the following range:

BS 410 Test Sieve	PERCENTAGE BY MASS PASSING
14mm	85 - 100
10mm	25
5mm	0 - 5

3. Material shall meet the following requirements:

a) Water soluble sulphate content shall not exceed 2.5g/1 when tested in accordance with BS 1377 Test 10.

b) The Magnesium Sulphate Soundness Value shall not exceed 12% when tested in accordance with Clause 515 of the Specification.

c) The material shall have a 10% fines value of 50KN or more when tested in compliance with BS 812 except that samples shall be tested in a saturated and surface dried condition. Prior to testing the selected portion shall be soaked in water at room temperature for 24 hours without previously having been oven dried.

d) Limestone shall not be used.

507 DITCHES AND WATERCOURSES

1. All ditches shall be excavated true to line and level and to the cross sections shown on the drawings. The point at which the ditch side-slopes meet the ground surface shall be rounded off as shown on the typical sections. The sides and beds of ditches shall be finished to an even surface and this work shall be carried out by hand if in the opinion of the Engineer the finish by other means is not satisfactory.

508 CLEARING EXISTING DITCHES

1. Existing ditches shall, where shown on the drawings, be cleared by removing vegetable growths and deposits. The sides shall be trimmed throughout and the bottoms uniformly graded and the ditches kept clean and maintained for the period of the works. Material removed from existing ditches shall be disposed of.

509 PIPES AT HEADWALLS

1. Where pipes are built into headwalls, a length of plain pipe shall be used. The pipe shall be cut cleanly and set flush with the face of the wall. No collars shall occur in headwalls. Where possible, the Engineer may allow variation in headwall location to accommodate the requirements of Clause 514(7).

510 HEADINGS

1. The Contractor shall not carry out work in headings without the consent of the Engineer.

511 SADDLE CONNECTIONS

1. Saddle connections shall be made at 45° or thereabouts to the existing pipe such that no conflict of flows in the pipes exists. The connection shall be placed in the top section of the pipe such that the soffit levels of the two pipes are equal. The joint shall be surrounded in a minimum of 150mm thickness of grade 10 concrete.

512 CONNECTIONS INTO EXISTING SEWERS AND DRAINS

1. No connections to existing sewers and drains shall be made without the prior consent of the Engineer. Connections shall be made in accordance with the Contract. The Contractor must give a minimum of 48 hours notice of his intention to connect to any existing pipe or manhole.

2. Where a connection is to be made to a public sewer by the Drainage Authority, or by the Contractor in the presence of the Drainage Authority, the Contractor shall provide attendance as necessary and attention is drawn to Clause 108.

513 MAINTENANCE OF FLOWS

1. The Contractor shall be responsible for the maintenance of flow during temporary interference with existing sewers, drains or streams, whether for the purpose of diverting of lifting and relaying the same to altered levels, making connection, or building chambers on line thereof. The Contractor shall provide timber troughs and pipes or other channels, and if required, pumping appliances of sufficient capacity and power to cope with the volume of sewage and/or storm-water passing through the respective sewers, drains or streams interfered with, to the satisfaction of the Engineer, so as to maintain the uninterrupted conveyance of sewage and/or storm-water past the portions interfered with.

2. At all points where pumping may be carried out, the Contractor must provide for stand-by pumps of sufficient capacity and power to cope with the volume of sewage and/or storm-water passing through the respective sewers, drains or streams interfered with.

3. The Contractor shall indemnify the Council against any claims for damages occasioned by flooding as a result of his operations

4. Before the Contractor carries out work of this nature, he shall submit his proposals to the Engineer for approval.

514 MANHOLES, CATCHPITS AND INSPECTION CHAMBERS

1. The provisions of this Clause shall apply equally to manholes, catchpits, inspection chambers, headwalls and other related structures, unless specified otherwise. The word manhole is used throughout except where special requirements are specified for other items.

2. Manholes shall be constructed to the specified design group or as otherwise indicated on the drawings.

3. Excavations for manholes shall be in the locations indicated on the drawings and to the minimum dimensions required to accommodate construction. In all other aspects, the excavation work shall comply with Clause 501.

4. Foundations to manholes shall be as indicated on the drawings. Blinding concrete shall be in place for at least 24 hours, or longer if the Engineer decides, before further operations are carried out. Backfilling between completed manholes and the sides of excavations shall be carried out in accordance with Clause 502(4), unless specified otherwise; in existing carriageways, backfilling to the underside of the specified reinstatement shall be in grade 10 concrete.

5. Brickwork to manholes shall be in accordance with Clause 426, reducing slabs, cover slabs and landing slabs to brick manholes shall be all as detailed on the drawings. Shaft and chamber ring sections, reducing slabs, cover slabs and landing slabs to pre-cast concrete manholes shall be in accordance with BS 5911, unless specified otherwise. No tapered reducing sections will be permitted.

6. All joints in pre-cast concrete manholes, including those between rings and slabs have a mastic material compressed between the jointed surfaces. Tokstrip, or other approved material, shall be used for this purpose and shall be to the correct dimensions, used strictly in accordance with manufacturer's instructions. Surplus mastic material shall be trimmed off inside and out and the inside faces, and all lifting holes pointed flush with mortar.

7. Pipes shall be built into new or existing manholes, as indicated on the drawings and as follows:

   A flexible joint shall occur in the pipeline at a maximum of 450mm from the outermost face of the manhole. The next pipe after this joint shall be a half length pipe (maximum length 1250mm) - see Clause 504(3). Thereafter pipelaying may proceed as normal until the next manhole. Where a pipe is built into a brick manhole, a relieving arch shall be turned over the end of the pipe (for pipes up to 375mm bore, a single brick arch shall be provided, above this size a double brick arch). Unless shown othewise, pipes shall be finished flush with the inner faces of the manhole.

8. Benchings, where specified, shall be formed perfectly smooth with a rounded arris, as indicated on the drawings, in a 75mm thick granolithic concrete screed (Clause 414(3)). Laitance and loose material shall be removed in accordance with Clause 419(5) before applying the screed. Pre-formed channels shall be used unless indicated otherwise, or agreed with the Engineer.

9. Prior to backfilling, the outsides of all concrete surrounded manholes, and where specified, brick manholes shall be painted with two coats of bitumen to Clause 428.

10. Manhole covers and frames shall be of the dimensions and grading shown on the drawings and comply in all respects with BS 497. Where not shown otherwise, they shall be Grade A with a 600mm square clear opening. The frames shall be firmly bedded and haunched in mortar. The cover shall be cleaned and greased and the Contractor shall supply to the Engineer, for his retention, two sets of keys for each pattern of manhole cover used in the works.

11. No infiltration shall be permitted in completed manholes. The source of any leakage must be investigated in order that remedial measures can be agreed with the Engineer.

12. All chains, grilles, safety rails, toe boards, ladders, step irons or any other fittings shall be galvanised in accordance with Clause 429 and built into the manholes as indicated on the drawings or using fixings which must be agreed with the Engineer. No expanding type fitting will normally be permitted.

515 MAGNESIUM SULPHATE SOUNDNESS TEST

1. The Magnesium Sulphate Soundness Test is carried out on a 1Kg mass of the material which passes a 20mm BS sieve and is retained on a 14mm BS sieve. The test sample is washed and dried, and is then subjected to five cycles of 17 hours immersion in a saturated solution of crystalline Magnesium Sulphate, in such a manner that the solution covers the sample to a depth of at least 10mm.

2. For the immersion period, the sample is kept at a constant temperature within the range of 15°C to 20°C. After the immersion period the sample is removed from the solution, allowed to drain, and is then dried in a suitable oven at a temperature of 100°C for 5 hours. The sample is allowed to cool to room temperature before immersion for the second cycle.

3. After the completion of the final cycle the sample is washed and dried and sieved through a 10mm BS sieve.

4. The amount of material that passes this sieve, expressed as a percentage of the original dry mass of the sample, is reported as the Magnesium Sulphate Soundness Value.

516 METALWORK FOR DRAINAGE WORKS

1. **Step irons** shall be in accordance with BS 1247.

2. **Step Ladders and Safety Cages** shall be of the best quality mild steel to BS 4360, or stainless steel (grade 306) to BS 970, as specified and constructed as shown on the drawings. Mild steel parts shall be galvanised in accordance with Clause 429. For ease of handling, ladders may be split into smaller sections with the prior approval of the Engineer. In these cases, galvanising shall be carried out after splitting.

3. **Drainage Grilles** to headwalls, etc. shall be constructed of the best quality mild steel to BS 4360 as detailed on the drawings. They shall be galvanised in accordance with Clause 429.

4. **Safety Chains** (non-lifting chains) shall consist of 10mm mild steel chain, 2.25Kg/m, all as detailed on the drawings. They shall be slack to permit removal from the hook and galvanised in accordance with Clause 429.

517 DUCTS

1. Pipes for service ducts shall be excavated for, laid, jointed andbackfilled etc, all as detailed in the Contract and generally in accordance with Clauses 501, 502, 503 and 504 for pipelines.

2. Pipes for service ducts shall have a smooth internal bore without any sharp edges, and shall be constructed of any of the following:

   (a) Vitrified clay ducts with self-aligning flexible sleeve joints, manufactured in accordance with the tolerances, permeability and strength requirements of BS 65. The internal ends of the ducts shall be radiused to 3mm minimum.

   (b) Unplasticized polyvinylchloride (uPVC) pipes complying with class B or C of BS 3506 or with BS 4660.

   (c) Galvanised steel pipes with couplings and joints complying with BS 1387 class H.

   (d) Ductile cast iron pipes to BS 4772.

3. Pipes for ducts shall be joined so that no silt, grit, grout or concrete surround is able to enter the duct.

4. Each duct shall be fitted with a pigmented, stranded polypropylene draw rope of 5.3KN breaking load, the ends of which shall be made fast at the ends of each duct.

5. Immediately after laying, the position of ducts shall be marked and the ends sealed by removable stoppers. Permanent markers shall be provided, as described in the Contract.

519 BACKFILL TO RUBBLE DRAINS

1. Filling material shall be limestone graded as follows:

Sieve Size	% Passing Sieve
200mm	95-100
100mm	0-7

It shall be clean and free from fines and comply with the following requirements.

(a) Magnesium Sulphate soundness value shall not exceed 12% when tested in accordance with Clause 515.

(b) Aggregate crushing value of saturated material shall not exceed 35% when tested in accordance with Clause 503(3)(c).

Clauses 521 to 600 not used

601 HORIZONTAL ALIGNMENT, SURFACE LEVELS AND SURFACE REGULARITY OF PAVEMENT COURSES

1. Horizontal alignment shall be determined from one edge of the carriageway pavement surface as shown on the drawings. The edge of the carriageway as constructed with all other parallel alignments shall be correct within a tolerance of ±50mm here from.

2. **Surface Level of Pavement Courses**

The levels of pavement courses shall be determined from the true pavement surface which shall be the surface of the wearing course for flexible pavements or of the slab for concrete pavements calculated from the carriageway vertical profile and crossfalls as shown on the drawings. The vertical depth below the true pavement surface of any point on the constructed surface of the formation or pavement courses shall be within the appropriate tolerances stated below. The laid pavement surface shall have no greater depression than 6mm under a 3m straight edge in any direction, for wearing course or concrete slab only.

Where any tolerance is exceeded, the Contractor shall determine the full extent of the area which is out of tolerance and shall make good the surface of the formation in the following manner

If the surface is too high, it shall be re-trimmed and re-compacted. If the surface is too low, the deficiency shall be corrected by the addition of fresh suitable material of the same classification laid and compacted to Specification.

Tolerances in Surface Levels of Pavement Courses and The Formation

Road Surface	+10mm -10mm
Sub-base	+10mm -30mm
Formation	+20mm -30mm

3. Notwithstanding the above tolerances, no pavement course shall deviate from the thickness stated in the Contract by more than 10% or 10mm, whichever is the lower.

602 COLD WEATHER WORKING

1. No material in a frozen condition shall be incorporated in the works but shall instead be retained on the site for use if suitable when unfrozen.

2. Material for use in road pavements shall not be laid on any surface which is frozen or covered with ice.

3. Laying of materials containing bitumen binders, shall cease if the temperature of the surface to be covered is at or falls below 2°C. Where, however, the surface is dry, unfrozen and free from ice, laying may proceed at temperatures at or above 1°C on a rising thermometer.

4. Laying of roadworks materials containing cement shall cease when descending air temperature in the shade falls below 3°C and shall not be resumed until the ascending air temperature in the shade reaches 3°C.

5. If material used in the road pavement contains cement and frost occurs during the first 20 days after placing concrete slabs, or the first 7 days in the case of other cemented materials, one day shall be added to the period which would otherwise be required before running of traffic of any sort on it for each night on which the temperature of the surface of the layer in question falls to 0°C or below.

603 USE OF SURFACES BY CONSTRUCTIONAL PLANT

1. Constructional plant used on pavements under construction shall be suitable in relation to the material, condition and thickness of the courses it traverses so that damage is not caused to the sub-grade or the pavement courses already constructed.

2. The wheels or tracks of plant moving over the various pavement courses shall be kept free from deleterious materials.

3. No vehicular traffic having an axle loading greater than 2 tonnes shall run on the finished surface of a concrete pavement within a period of 20 days of its completion. No wheels or tracks of plant shall use any part of a newly constructed pavement within 10 days of laying. If the 7 day strength is below that specified, the above periods before traffic may run on the pavement shall be increased at the discretion of the Engineer.

4. The periods before running of any traffic on road pavements constructed of materials containing cement shall be extended in accordance with Clause 602 for each night on which the temperature of the surface layer in question falls to 0°C or below.

5. Bituminous material shall be kept clean and uncontaminated for so long as it remains uncovered by succeeding layers or surface treatment. The only traffic permitted access to bituminous material shall be that engaged in laying and compacting the next course or, where a basecourse is to be binded and/or surface dressed, that engaged on such surface treatment. Should the material become contaminated, the Contractor shall make good by cleaning it to the satisfaction of the Engineer and if this proves impracticable, by removing the layer and replacing it to Specification.

604. NUMBER OF LAYERS FOR BITUMINOUS COURSES

1. A bituminous pavement course shall be laid in one or more layers so that the compacted thickness of each layer shall not exceed those set out in Appendix B, table 59 of BS 4987.

605. TRANSPORTATION, LAYING AND COMPACTING OF ROAD PAVEMENT MATERIALS CONTAINING BITUMEN BINDER

1. Bituminous materials shall be transported in clean vehicles and shall be covered over when in transit or awaiting tipping. The use of dust, coated dust, oil or water on the interior of the vehicles to facilitate discharge of mixed materials is permissible but the amount shall be kept to a minimum, and any excess shall be removed by tipping or brushing.

2. The mixed materials shall, as soon as possible after arrival at the site, be supplied continuouisly to the paver and laid without delay. The rate of delivery of material to the paver shall be so regulated as to enable the paver to be operated continuously and it shall be so operated whenever practicable. Wherever practicable, road pavement materials having bitumen as the binder shall be spread, levelled and tamped by approved self-propelled pavers.

3. The rate of travel of the paver and its method of operation shall be adjusted to ensure an aven and uniform flow of material across the full laying width, freedom from dragging or tearing of the material and minimum segregation. Laying shall commence at the lowest point and work shall proceed uphill.

4. The material shall be laid generally in conformity with the recommendations for laying in the British Standard to which it has been made or, where there is not British Standard for the material, in accordance with the laying recommendations in BS 594, but in all cases subject also to the following additional over-riding requirements.

5. Hand laying of any bituminous material will be permitted only in the following circumstances:

   (a) for laying regulating courses of irregular shape and varying thicknesses;

   (b) in confined spaces where it is impracticable for a paver to operate;

   (c) for footways

6. Material shall be compacted as soon as rolling can be effected without causing undue displacement of th emixed material and while this has at least the minimum rolling temperature stated in the appropriate British Standard. The material shall be uniformly compacted by an 8-10 tonnes smooth-wheeled roller having a width of roll not less than 450mm or by a multi-wheeled pneumatic-tyred roller of equivalent mass except that wearing course and beasecourse material shall be surface finished with a smooth wheeled roller.

7. The material shall be rolled in a longitudinal direction from the sides to the centre of the carriageway, overlapping on successive passes by at least half the width of the rear roll or in the case of a pneumatic-tyred roller, at least the nominal width of one tyre.

8. Rollers shall not stand on newly laid material while there is a risk that it will be deformed thereby.

9. Hand-raking of wearing course material which has been laid by a paver and the addition of such material by hand-spreading to the paved area for adjustment of level will be permitted only in the following circumstances:

(a) at the edge of the layers of material and at gullies and manholes;

(b) where otherwise directed by the Engineer

10. Hand laid work shall conform to all the Specification requirements of this Clause except those relating to the manner of operating pavers.

11. Where joints between laying widths or transverse joints have to be made in wearing courses, the material shall be fully compacted and the joint made flush in one or other of the following ways, method (ii) always being used for transverse joints:

(a) by heating the joint with an approved joint heater at the time when the additional width is being laid but without cutting back or coating with binder. The heater shall raise the temperature of the full depth of the wearing courseto a figure within the rolling temperature range specified for the material and for a width not less than 75mm on each side of the joint. In this case, however, the Contractor shall have available for use in the event of breakdown, equipment necessary for operating method (c);

(b) by using two or more pavers operating in echelon where this is practicable and in sufficient proximity for adjacent widths to be fully compacted by continuous rolling; or by using a multiple-lane-width paver;

(c) by cutting back the exposed joints to a vertical face of not less than the specified thickness, discarding all loosened material and coating the vertical face completely with a grade of hot bitumen suitable for the purpose before the next width is laid.

12. All joints shall be off-set at least 300mm from parallel joints in the layer beneath.

13. For the resurfacing of existing roads, the Engineer may direct the application of a tack coat complying with BS 434 Part 1 to the surface on which laying is to take place.

14. Basecourse material shall not remain uncovered by either the wearing course or surface treatment, whichever is specified in the Contract, for more than three consecutive days after being laid. The Engineer may extend this period by the minimum amount of time necesssary if compliance therewith is impracticable because of weather conditions or for any other reasons such as awaiting the results of tests made.

606 MATERIALS FOR SUB-BASES AND ROADBASES

1. Sub-bases and roadbases shall be made and constructed using the materials complying with Clauses 608 to 611, or as described in the Contract. The Contractor may substitute for the specified material in the sub-base, any of the roadbase materials or in a roadbase course, any of the materials specified for the courses of pavement to be superimposed on it.

2. Where the Contractor proposes to use the sub-base for constructional plant he shall increase, where necessary, the thickness and/or strength of the sub-base to accommodate the method of construction and the type of plant and vehicles which he proposes to use to avoid damage to the sub-base or the sub-grade. Any permanent thickening shall be across the whole width of the pavements, unless otherwise agreed by the Engineer. Temporary thickening shall not impede drainage of the sub-base or the sub-grade.

3. Material used shall not be frost susceptible and shall comply with the requirements of Clause 609(4).

4. Slag shall comply with the stability and sulphur contents of BS 1047. The bulk density shall not be less than 1100kg/m^3. Other materials when placed within 500mm of concrete structures and pavements or cement bound materials shall not have a soluble sulphate content exceeding 2.5g of sulphate (expressed as SO_2) per litre when tested in accordance with Test 10 of BS 1377. Except for cohesive soils, materials to be mixed with cements other than sulphate-resisting cements shall not have a total sulphate content exceeding 1 per cent by mass of sulphate (as SO_3) per litre when tested in accordance with Test 10 of BS 1377. For cohesive soils to be mixed with any cement, the limit of total sulphate content shall not exceed 0.25%.

607 CONSTRUCTION REQUIREMENTS FOR MATERIALS TO CLAUSES 608 TO 611 INCLUSIVE

1. Materials complying with the above mentioned Clauses shall be constructed in the following manner:

2. **Transportation**

Transport vehicles carrying plant mixed material shall have a capacity suited to the output of the mixing plant and the site conditions and be capable of discharging cleanly. Material, when mixed, shall be removed at once from the mixer, transported directly to the point where it is to be laid and protected from the weather both during transit from the mixer to the laying site and whilst awaiting tipping.

3. Laying

All material shall be placed and spread evenly. Spreading shall be undertaken either concurrently with placing or without delay. Roadbase material shall be spread using a paving machine or a spreader box approved by the Engineer and operated with a mechanism which levels off the material to an even depth. Except where otherwise specified in individual clauses, the material shall be spread in one layer so that after compaction, the total thickness is as specified. The sub-base material under reinforced concrete pavements with warping joints shall, when laid and compacted provide a smooth, close textured surface. For cement-treated materials, the Contractor shall so organise the work that longitudinal joints against hardened material are avoided so far as possible. Unless the material is compacted against forms, the edge of cement-treated material which has been laid for more than one hour shall be cut back vertically to produce a face of the specified thickness of properly compacted material before additional material is laid alongside.

4. Compacting

Compaction shall be carried out by the method specified in Table 600/1.

Compaction shall be completed as soon as possible after the material has been spread.

Compacting equipment shall not bear directly on hardened or partially hardened cement-treated material previously laid, other than that necessary for achieving the specified compaction at the joint.

Special care shall be taken to obtain full compaction in the vicinity of both longitudinal and transverse joints.

The surface of any layer of material shall, on completion of compaction and immediately before overlaying, be well closed, free from movement under compaction plant and from compaction planes, ridges, cracks or loose materials. All loose, segregated or otherwise defective areas shall be removed to the full thickness of layer, relaid with new material and re-compacted.

The Contractor shall in his choice of permitted materials within any sub-base and roadbase group, have regard to the nature of those materials and of the sub-grade and the need to protect them from deterioration due to the ingress of water and the use of constructional plant. The Contractor shall programme the laying of the sub-base and the subsequent pavement courses and take such other steps as may be considered necessary, to afford protection to the roadbase, sub-base and sub-grade.

Definitions and Requirements Associated with Table 600/1

A. Number of passes is the number of times that each point on the surface of the layer being compacted has been transversed by the compaction plant (or struck, in the case of power rammers).

B. The number of passes required with each type of compactor is a function of the mass of the machine, and the compaction plant in Table 600/1 are listed in terms of their mass. The mass per metre width of roll is the total mass on the roll divided by the total roll width. Where a smooth-wheeled roller has more than one axle, the machine will be assessed on the basis of the axle giving the highest value of mass per metre width.

C. For pneumatic-tyred rollers, mass per wheel is the total mass of the roller divided by the number of wheels. In assessing the number of passes of pneumatic-tyred rollers, the effective width shall be the sum of the widths of the individual wheel tracks together with the sum of the spacing between the wheel tracks, provided that each spacing does not exceed 230mm. When the spacing exceeds 230mm the effective width shall be taken as the sum of the widths of the individual wheel tracks only.

D. Vibrating rollers are self-propelled or towed smooth-wheeled rollers having means of applying mechanical vibration to one or more rolls.

(i) The requirements for vibrating rollers are based on the use of the lowest gear on the self-propelled machine with mechanical transmission and a speed of 1.5-2.5km/h for a towed machine, or a self-propelled machine with hydrostatic transmission. If higher gears or speed are used, an increased number of passes shall be provided in proportion to the increase in speed of travel.

(ii) Where mechanical vibration is applied to two rolls in tandem, the minimum number of passes shall be half the number given in Table 600/2 for the appropriate mass per metre width of one vibrating roll. If one roll differs in mass per metre width from the other, the number of passes shall be calculated as for the roll with the smallest value.

(iii) Vibrating type rollers operating without vibration will be classified as smooth-wheeled rollers.

(iv) Vibrating rollers shall be operated with their vibratory mechanism operating only at the frequency of vibration recommended by the manufacturers. All such rollers shall be equipped with or provided with a device which shall indicate the frequency at which the mechanism is operating.

Table 600/1
Compaction Requirements for Granular and Soil-Cement Materials

Type of Compaction Plant	Category	Number of passes for layers not greater than 110mm	150mm	225mm
Smooth-wheeled	Mass per metre width of roll:			
	over 2700kg up to 5400kg	16	u/s	u/s
	over 5400kg	8	16	u/s
Pneumatic-tyred roller	Mass per wheel:			
	over 4000kg up to 6000kg	12	u/s	u/s
	over 6000kg up to 8000kg	12	u/s	u/s
	over 8000kg up to 12000kg	10	16	u/s
	over 12000kg	8	12	u/s
Vibrating roller	Mass per metre width of vibrating roll			
	over 700kg up to 1300kg	16	u/s	u/s
	over 1300kg up to 1800kg	6	16	u/s
	over 1800kg up to 2300kg	4	6	10
	over 2300kg up to 2900kg	3	5	9
	over 2900kg up to 3600kg	3	5	8
	over 3600kg up to 4300kg	2	4	7
	over 4300kg up to 5000kg	2	4	6
	over 5000kg	2	3	5

u/s = unsuitable

608 CRUSHER RUN STONE

1. Crusher run stone shall consist of rocks listed in BS 812 under the trade group 'Artificial' and Limestone shall be from an approved source and shall be regularly and cubically broken to the gauge required. They shall be clean, free from dust, false stone or any foreign matter and shall lie within the grading limits of Table 600/2.

Table 600/2 Crusher Run Stone (40mm nominal size)

BS Sieve Size		Percentage by Mass
Passing	Retained	
	50mm	0
50mm	37.5mm	0-10
37.5mm	20mm	20-40
20mm	2.36mm	33-53
2.36mm	75μm	12-32
75μm		3-7

2. When tested in accordance with BS 812, the material shall have a Flakiness Index on the nominal and oversize material not exceeding 35% for material of nominal size 28mm or less or 40% for material of nominal size larger than 28mm and the Aggregate Crushing Value shall not exceed 25 for limestone or 35 for Artificial Aggregates.

3. Blast Furnace and Steel Slag shall comply with the following:

   (a) Bulk density shall not be less than 1250 kg/m^3, when tested in accordance with Appendix B of BS 1047.

   (b) Water absorption of the aggregate shall not exceed 4% by weight when tested in accordance with method 16 of BS 812.

4. Blast Furnace Slag shall also comply with the following requirements:

   (a) The aggregate shall comply with stability requirements of Appendix C of BS 1047, for sulphur unsoundness, iron unsoundness and 'falling', 'dusting' or 'lime' unsoundness.

   (b) The total sulphur content shall not exceed 2.75% by weight when tested in accordance with Appendix D of BS 1047.

   (c) The proportion of honeycomb material shall not exceed 10% by weight of the total.

5. The material shall be laid in layers on exceeding 110mm thickness and compacted in accordance with Clause 607.

615 DENSE BITUMEN MACADAM WEARING COURSE

1. The material shall be made in accordance with the general requirements of BS 4897 subject to the following provisos. It shall comply with the appropriate tables and sections thereof for 14mm or 10mm nominal size dense wearing course macadam, as described in the Contract. The traffic category shall be classified as Category A. It shall be laid and compacted to Clause 605.

2. **Aggregate**

The aggregate shall consist of hard, clean, durable cursched rock, steel slag, electric furnace slag or blast furnace slag, with the minimum polished stone value of 50 and maximum aggregate abrasion value of 16. Limestone aggregate will not be permitted unless stated in the Contract.

616 BITUMINOUS SPRAYS

1. The preparation of a surface for a bituminous spray, the application of a spray and blinding when specified, shall be carried out in accordance with the current recommendations of the Transport and Road Research Laboratory Road Notes for Surface Dressing where appropriate to such work and in the case of bitumen emulsion sprays in accordance with BS 434 Part 2. The work shall also comply with the undermentioned general requirements and specific requirements described in the Contract.

2. Cut-back bitumen shall conform to the requirements of BS 3690 and bitumen emulsion to BS 434 Part 1. The binder shall be sprayed at the rate described in the Contract.

3. If described in the Contract, the binder shall contain at the time of application to the surface, the required percentage of:

(a) an approved adhesion agent

or

(b) an approved rubber additive, initially in the form of latex or powder

4. When required by the Engineers, the Contractor shall provide for the particular binder distributor to be used, a test certificate issued by an appropriate and established Testing Authority to show that the distributor has been tested since the previous surface dressing season and was found to comply with the requirements of BS 1707 for hot binder distributors or BS 3136 for cold applied emulsion distributors.

5. Before spraying is commenced, the surface shall be freed of all loose material. The surface as a whole shall be generally dry and any damp areas shall be completely free of standing water.

6. Blinding material, where required by the contract, shall consist of hard clean crushed rock or slag fine aggregate sand; it shall contain not more than 15% retained on a 6.3mm BS sieve. It shall be applied to the binder and left unrolled. The rate of application shall be 5.5-6.8kg/m^2.

7. Unless the Engineer permits otherwise, all loose material on the sprayed surface, including any blinding material, shall be removed before any further layer of the pavement is laid.

617 TESTING OF BITUMINOUS MIXTURES AND THEIR COMPONENT MATERIALS

1. Testing of road bitumen to be carried out as defined in BS 3690, BS 4385, BS 4689, BS 4690, BS 4691, BS 4692, BS 4693 and BS 4707 of unmixed aggregates as in BS 812 and of other unmixed materials as in the appropriate BS or, if there is no BS, as described in the Contract.

2. The bulk density of blast-furnace slag shall be determined by the Compact Bulk Density of BS 812, carried out on oven-dried aggregates passing the 14mm and retained on the 10mm BS sieves.

3. The sampling and analysis of bituminous mixtures shall be in accordance with BS 598 except that where the sieving extractor method to determine the tar or bitumen content is permitted, if this method is used, it shall be carried out as described in the current edition of Ministry of Transport Road Note 10 and also be used to determine the grading of the aggregate in the mixed material, applying the adjustments recommended in Appendix 3 to Road Note 10 where they are appropriate.

4. Sampling and testing shall be carried out as frequently as the Engineer may deem necessary to satisfy himself that the mixtures and materials comply with the appropriate specification.

623 PRECAST CONCRETE KERBS, CHANNELS AND EDGINGS

1. Precast concrete Kerbs, Channels and Edgings shall comply with the requirements of BS 340 and shall be laid and bedded on a 13mm thick mortar bed, on a concrete foundation, and backed with a concrete haunch as described in the Contract. Where the concrete foundations and haunch are to be laid consecutively, the mortar bed may be omitted and concrete substituted in its place.

2. Unless otherwise described in the Contract, precast concrete Kerbs, Channels and Edgings shall be hydraulically pressed.

3. Kerbs and Edgings are to be set vertical. Channels are to be set to the cross falls of the carriageways, and where a channel abuts to a kerb, the joint between them is to be pointed in mortar.

4. Where a channel abuts a kerb, the foundation to both the kerb and the channel is to be laid at the same time.

5. On horizontal radii of 12m or less, the following provisions shall apply:

   (a) Kerbs - for all radii of 12m or less, kerbs of the appropriate radius shall be used.

   (b) Channels - for radii exceeding 3m but not exceeding 12m, the appropriate radius shall be used. For radii less than 3m, straight channels 300mm long shall be used.

   (c) Edgings - for radii less than 12m, straight edging 300mm long shall be used.

6. Where a kerb or channel abuts Rolled Asphalt Wearing Course, it shall be painted with a tack coat of 200 pen bitumen.

7. Any unit of kerb, channel or edging deviating more than 3mm in 3m from line or level shall be made good by lifting and relaying.

Clauses 630 to 700 not used

701 FENCING - GENERAL

1. The Contractor shall erect fencing as specified in the Contract. He shall give the Engineer prior notification when adjustment is necessary to the existing ground in order to achieve a satisfactory alignment.

2. Unless specified otherwise, all fencing, fencing materials, and treatment shall comply with BS 1722. Where reference codes are stated, these comply with those given in BS 1722.

3. Fences required prior to completion shall be maintained in good order. Defects shall be made good immediately.

4. All new fencing shall be neatly and effectively joined to existing fencing, walls, etc.

5. Ditches and narrow watercourses shall be crossed at right angles. A straining post shall be provided on each bank.

6. Concrete for post footings shall be grade 20, to the requirements of Clauses 411 - 417.

702 TIMBER FOR FENCING

Species

1. Timber components shall be supplied to the dimensions specified in the Contract. Both ends of posts and rails shall be cross-cut at right angles to the length of the piece. Posts for driving shall be square pointed, and posts damaged or twisted during driving shall be replaced by the Contractor.

2. Timber for posts and rails shall be chosen by the Contractor from the following:

Table 700/1

HARDWOODS	SOFTWOODS
Ash, Beech, Birch, Sweet Chestnut Dahoma, Danta, Ekki, Guarea, Iroko, Kapur, Kempas, Lime, Mokore, Mansonia, Norway Maple, Oak, Okan, Opepe, Pterygota, Sycamore, Utile	Posts - All Species except Spruces and Hemlocks Rails - All Species

3. Moisture content immediately prior to preservation treatment shall comply with Table 700/2.

ADDITIONAL REQUIREMENTS FOR TIMBER FOR PERMANENT FENCING

Preservation - General

4. Except for rails fabricated from Dahoma, Ekki, Guarea, Iroko, Kapur, Kempas, Mokore, Mansonia, Oak, Okan, Opepe and Utile, free from sapwood, which may be used untreated, all timber, whether for posts or rails shall, prior to erection, receive preservative treatment by pressure impregnation with creosote or water-borne salt, as specified in sub-Clauses 9, 10, 11 and 12 of this Clause.

5. After seasoning and immediately prior to preservative treatment, the moisture content of timber shall be determined as specified in Clause 704. The moisture content shall not exceed the appropriate value in Table 700/2 and the values obtained by the tests shall be recorded on the charge sheets and Certificates.

6. Suitable planed timber shall be batched for impregnation with 'stickers' of 3mm minimum thickness between each layer of timber while receiving preservation treatment.

7. All cutting of timber to final dimensions, fabrication and machining shall normally be carried out before preservative treatment. Where treated pieces have to be cut on site, preservative shall be applied liberally by brush or spray to all the cut surfaces. Preservative treatment shall meet the requirements of this Clause using either creosote, complying with the requirements of BS 144 or alternatively 'copper/chrome/arsenic' waterborne preservative which complies with Clause 2 of BS 4072. When making up charge loads for preservation, each batch shall be provided with a securely fastened durable label having a permanently marked works number, the batches being maintained until delivered to Works Site. Each batch of timber, when delivered, shall be accompanied by a certificate provided by the Treatment Plant Manager showing the serial number, species of timber, moisture content, preservative treatment and cycle employed.

8. All pressures are referred to in Pascal (Pa) units, relative to atmospheric pressures (gauge reading).

Table 700/2

Note - When both sapwood and hardwood are present in one piece of timber the sapwood will be chosen for moisture content determination.

Type of Timber		Maximum moisture content in any sample (per cent)
(a)	The outside 25mm of sapwood of all species	28
(b)	The outside 5mm of the heartwood of Sweet Chestnut, Dahoma, Danta, Ekki, Guarea, Iroko, Kapur, Kempas, Makore, Mansonia, Oak, Okan, Opepe, Utile	
(c)	The outside 25mm of posts and 12mm of other components made of Ash, Beech, Lime, Maple, Ptergota, Sycamore	
(d)	The outside 25mm of posts and 12mm of other components made of all species of softwood	

Creosote Preservation

9. Impregnation with creosote of the timber specified in sub-Clauses 1, 2 and 3 of this Clause shall be carried out in accordance with BS 913 except that:

(a) The initial negative pressure shall be 84.7kPa (vacuum of 635mm Hg) which shall be held for a period of not less than half an hour.

(b) The net retention of creosote in the timber after impregnation shall not be less than 160kg/m^3 of timber. If the timber will not absorb 160kg/m^3, it shall be treated to refusal in accordance with requirements of BS 913.

(c) As far as practicable, loads of timber for treatment shall consist of one species only.

Preservation with Water-Borne Salts

10. Impregnation with water-borne salts of 'copper/chrome/arsenic'type as defined in BS 4072, Section 2, shall be effected by the appropriate vacuum and pressure method indicated below using the appropriate treatment cycle A or C at a minimum pressure of 1.24 MPa (12.65kgf/cm^2).

11. Treatment Cycle A or C shall be used for timbers in Section (c) of Table 700/2 and species of softwood Corsican pine, Scots pine or Redwood or any other softwood with heartwood listed as 'permeable' or 'moderately resistant' in Table 3 of the Department of the Environment, Building Research Establishment publication 'Resistance of Timbers to Impregnation with Creosote', published by Her Majesty's Stationary Office.

Treatment Cycle C shall be used for timbers listed in Section (b) of Table 700/2 and species of softwood Douglas fir, Hemlock, Larch Maritime pine, Spruce or Whitewood, or any other softwood with heartwood listed as 'resistant' or 'extremely resistant', or where any of those species is included in a charge load.

Treatment Cycle Requirements

12. (a) The initial negative pressure shall be 84.7kPa (vacuum of 635Hg) which shall be held for a period as specified in (f) or (g).

(b) While still holding the initial negative pressure the cylinder shall be flooded with the preservative solution and during this period the negative pressure shall not be permitted to fall below 56.3kPa (vacuum of 422mm Hg).

(c) Immediately after flooding, the pressure in the cylinder shall be raised and held at, or above, 1.24 MPa (12.65 kgf/cm^2) for a period as specified in (f) or (g) from the time when maximum pressure is reached.

(d) A final negative pressure of 84.7kPa (vacuum of 635mm Hg) shall be applied and immediately released. The maintenance of such pressure will not be permitted.

(e) The solution strength for copper/chrome/arsenic shall not be less than 30 grams of salts to 1 litre of water (3 per cent solution).

(f) Cycle A Requirements. Initial negative pressure to be held for not less than 0.5 hour and the second pressure period not less than 2.0 hours.

(g) Cycle C Requirements. Initial negative pressure to be held for not less than 1.0 hour and the second pressure period not less than 3.5 hours.

703 GATES AND GATE POSTS

1. Gates and posts shall be of timber, iron or steel complete with all necessary fittings for hanging and fastening all as described in the Contract.

2. Timber for gates and posts shall be as specified in Clauses 701 and 702 for permanent fencing.

3. Metal gates and posts shall be painted in accordance with Clause 705.

4. Gate posts and drop bolt holes, etc shall be bedded in Grade 20 concrete to the requirements of Clauses 411 - 417, and posts shall be securely fastened to the adjacent fencing or other boundary.

704 TESTING OF MOISTURE CONTENT OF TIMBER

1. A test certificate shall be provided by the Timber Suppliers confirming that before preservation was carried out the timber was in accordance with the moisture content requirements when tested, as described in this Clause.

2. The suitability of a charge of timber for preservation shall be determined by moisture meter readings made on not less than the number of components specified in Table 700/3. The components to be taken from random positions in the charge. These tests shall be confirmed by the 'oven drying method' on samples taken from the position of the first, each tenth, and the last of the meter readings and the values of the results shall be recorded on the appropriate preservation certificate.

3. Meter tests shall be made using a properly calibrated moisture meter of the electrical resistance type, fitted with insulated probes which can be hammered into timber to the depth required in Table 700/2.

4. Confirmatory tests shall be made using the 'oven drying method' as specified in Appendix A to BS 913 on samples selected, as described in Section A2 of that Appendix.

5. If any one of the specified number of the samples fail the test for moisture content, the whole charge shall be rejected as being unsuitable for treatment and shall be set aside. After a further period of drying, a further set of tests as described in sub-Clause 2 of this Clause shall be made.

6. The Engineer or his representative shall be permitted to take such extra tests as he may require, in accordance with the procedures of this Clause.

Table 700/3

Number of Components in Charge	Number of Meter Tests to be Made	Number of Confirmatory Tests to be Made
up to 100	7	2
101 - 250	11	3
251 - 500	15	3
501 - 1000	22	4
1001 - 2000	30	4
2001 - 5000	60	7

705 PAINTING

General

1. Painting shall be carried out in accordance with the methods recommended in British Standard Code of Practice BS 6150.

2. All iron or steel materials capable of being despatched in units for assembly at the site, shall, after thorough cleansing, de-scaling and de-greasing, be primed at the works. After erection, any damage to primed surfaces shall be made good by cleaning and priming on site.

3. Other materials may be supplied works primed if the Contractor so wishes but any damage to primed surfaces shall be made good immediately prior to painting.

Priming

4. Surfaces of wood shall be clean and dry before being primed with lead based primer to BS 5358.

5. Surfaces of iron or steel shall be rendered clean, dry and free from grease, rust or mill scale. The materials shall then be primed without delay with red lead primer to BS 2523 Type B or calcium plumbate primer to BS 3698 Type A.

6. Galvanised surfaces which have been exposed to atmospheric weathering for a period of 6 months or more shall be cleaned down nd primed with calcium plumbate to BS 3698 Type A or B. If a surface has not been weathered for 6 months it shall first be treated with an etching compound of the following composition:

Industrial methylated spirit	60%)	
Toluene	30%)	by volume
Carbon tetrachloride	5%)	
Commercial Hydrochloric acid	5%)	

After etching and before priming, the galvanised surface shall be thoroughly rinsed with clean water to remove chemical residue from the treatment and allowed to dry.

7. Aluminium surfaces shall be cleaned, thoroughly degreased with industrial methylated spirit prior to the application of a thin coat of proprietary etch primer applied in accordance with the manufacturer's instructions. The surface shall then be coated with a compatible zinc chromate primer containing not less than 20% by weight of zinc chromate and free from graphite and from oxide or hydroxide of lead.

8. **Undercoats and Finishing Coats**

All primed surfaces shall be painted with two coats of oil based undercoat to BS 2525 in a colour appropriate to the colour of the finishing coat, as soon as practicable after priming.

9. One finishing coat of colour to be agreed with the Engineer shall be applied as soon as practicable after undercoating using paint complying with BS 2526 to 32 as appropriate to the colour required.

Clauses 706 to 999 not used

1000 DRILLING

1. Each borehole shall be of the minimum outside diameter and depth specified.

2. The sides of each borehole shall be fully supported over the entire depth to maintain the specified diameter unless the Contractor wishes not to at his own risk. Where used this support shall be removed progressively as stone enters the borehole. No claim for extra payment will be considered where the Contractor does not support the hole resulting in collapse and the consequent need for additional works.

3. The top of the borehole annulus must be fitted with a cutting suppression hood and collection box during drilling operations. The drilling medium shall be compressed air.

4. The Contractor shall be responsible for disposing of all spoil water and other waste products on completion of each borehole, in a proper manner, to the satisfaction of the Engineer's Representative, and the requirements of any public bodies or third parties.

5. MDPE or Polypropylene purpose made borehole liner or similar approved slotted radially to give 8 to 10% voids shall be used. Joints shall be butt fusion or screwed flush type to ensure a smooth external surface.

6. The boreholes shall be backfilled with single size washed non-friable aggregate to Clause 506 (not limestone) to the commencing surface (underside of trench). The stone shall be 12mm nominal size for all boreholes.

7. The approval of the Engineer's representative must be obtained prior to the commencement of borehole backfilling.

8. The boreholes are to be connected by collector pipes as detailed on Drawing No. R/21/103/ . The pipes shall be in accordance with clause 504.

9. The contractor shall ensure that stone placed in any borehole or trench shall not become contaminated by this method of working. Excavation around the top of any completed borehole shall be by hand.

1001 DRILLING LOGS

1. Daily, during the work on site, the Contractor shall submit to the Engineer's Representative, records containing the following information:

   (a) site
   (b) borehole reference number
   (c) date
   (d) weather
   (e) visitors
   (f) method of drilling
   (g) length of hole for which temporary casing was used
   (h) total depth of hole
   (i) description of each stratum encountered
   (j) depth below ground of each change of stratum
   (k) depth where water first encountered and standing water levels at the beginning and end of each shift
   (l) the depths of any loss of flush returns

1002 TEMPORARY ACCESS ROADS

1. Access roads may be constructed to the standards required by the Contractor's chosen method of working.

1003 REINSTATEMENT

1. Temporary access roads and working areas shall be reinstated to their original grades and levels, including removal of hardcore and replacement of soils where necessary.

1004 UNACCEPTABLE BOREHOLES

1. In the event of the Contractor being instructed by the Engineer to abandon a borehole for any reason, it shall be filled with suitable material and capped with bentonite to prevent ingress of air or water.

2. A borehole will be deemed unacceptable if the medium density polyethylene pipe will not reach the depth achieved by the drilling rods; or if the aggregate backfill "arches" and the correct amount cannot be placed.

Clause 1004 is the last.

Preamble to Bill of Quantities

1. The Bill of Quantities is compiled in accordance with the Civil Engineering Standard Method of Measurement (CESMM) 3rd Edition (1991) and as modified and extended herein. The various clauses contained within this Preamble shall take precedence over the CESMM in the event of any dispute.

2. The prices and rates entered against the various items in the Bill of Quantities shall be deemed to cover all materials, labour, plant, profit and other charges in connection with the work identified in the item and for complying with all requirements of the Contract relevant thereto including Specified Requirements of any clause not separately itemised in the Bill of Quantities.

3. Items against which no price or rate is entered shall be deemed to be covered by the other prices and rates in the Bill of Quantities.

4. The Tenderer shall include in his prices and rates for the effect on the phasing of the Works of alterations or additions to existing services and mains to the extent that such work is set forth or reasonably implied in the documents on which the tender is based.

5. (i) Rock shall be defined as natural material comprising geological strata or deposits which, in the opinion of the Engineer will in its removal have a significantly adve require the use of blasting, approved pneumatic tools or other specialist equipment for its removal, but excluding individual masses less than $0.2m^3$.

   (ii) Artificial hard material shall be defined as any material other than rock which, in the opinion of the Engineer, will in its removal have a significantly adverse effect on the rate of production for any operation and/or require the use of blasting, approved pneumatic tools or other specialist equipment for its removal, but excluding individual masses less than $0.2m^3$.

   (iii) No additional payment will be made for the breaking down of rock and artificial hard material into pieces to permit incorporation in the works as specified.

6. For the purposes of Clause 60 of the Conditions of Contract interim additional or deductions on account of the amount, if any, of the Adjustment Item shall be made by instalments in interim certificates in the proportion that the amount referred to in Clause 60(2) bears to the total of the Bill of Quantities before the addition or deduction of the amount of the Adjustment Item.

7. Method-Related Charges, if any, shall be certified and paid pursuant to Clauses 60(1)(d) and 60(2) of the Conditions of Contract.

APPENDIX 1

LIST OF DRAWINGS

The drawings referred to in the Form of Tender are as follows:

Drawing Number	Title	Scale
R/21/103/10A	Existing and Proposed Contours	
R/21/103/15	General Details 1	
R/21/103/16	General Details 2	
R/21/103/19	Fencing	
R/21/103/20	Publicity Sign	
R/S/700/3A	Chain Link Gates	
R/S/700/4	Chain Link Fence PLC 180A	
R/S/700/9	Stockproof Fence	
R/S/700/14	Timber Field Gate Type 2	

LIST OF PRINCIPAL QUANTITIES

Running of Gas Control System		92 weeks
Provisional Sums		£3,000
Gas and Monitoring Wells		£20
Site Clearance		6.2 ha
Excavation		560m³
Preparation		100m³
Filling		516m³
Imported Sub-soil		225m³
Concrete		7.2m³
Gas Control Building		1 Nr.
Electrical Control Cabinet		1 Nr.
Pipework		550m
Manifold in Chamber		1 Nr.
Other Chambers		37 Nr.
Sub-base		100m²
Dense Bit Wearing Course		170m²
Fencing:	Palisade	36m
	Palisade Gate	1 Nr.
	Stockproof	150m
	Timber Gate	1 Nr.
	Chain Link	380m
	Chain Link Gates	3 Nr.
Gas Control Station, Fittings and Flare Stack		1 Nr.

DAYWORK SCHEDULE

When works are ordered to be carried out on a Daywork basis, payment for such works will be in accordance with the following:-

The plant rates are to include for fuel and consumable stores, repairs and maintenance, insurance of plant, head office charges and profit together with driver and attendants. This method of calculation to apply irrespective of whether the plant be directly owned, hired or in the ownership of a sub-contractor.

The Contractor is to list below the items, types of plant he intends to use to carry out the works.

(NB - Hire rates must include for driver)

ITEM OF PLANT	TYPE OR SIZE	HIRE RATE PER HOUR (including driver)

HEALDFIELD ROAD QUARRY RECLAMATION - GAS CONTROL SCHEME
PART 1 - PRELIMINARIES **PAGE B4**

Item No.	CESMM Code	Item Description	Unit	Quantity	Rate	Amount £ p
1.	A110	Performance Bond, cost of providing bond of surety - this item MUST be priced separately.	Sum			500.00
2.	A120	Cost of providing Insurance of the Works.	Sum			2000.00
3.	A130	Cost of providing Third Party Insurance.	Sum			2000.00
		Specified Requirements - Temporary Works				
4.	A270	Provision, installation and removal of interim gas control system as clause 201.	Sum			10000.00
5.	A270	Running and maintenance of interim gas control system prior to installation of permanent system, to include monitoring as clause 204.	Wk	20	1200.00	24000.00
6.	A270	Running and maintenance of interim gas control system during installation of permanent system, to include monitoring as clause 204.	Wk	20	1200.00	24000.00
7.	A270	Running and maintenance of permanent gas control system during the defects correction period, to include monitoring as clause 204.	Wk	52	500.00	26,000.00
8.	A270	Running and maintenance of permanent gas control system for a period of 5 years.	Wk	260	100.00	26,000
					Page total carried to part 1 summary	105,500.00

Item No.	CESMM Code	Item Description	Unit	Quantity	Rate	Amount £ p
		<u>Specified Requirements - Equipment for Use by the Engineer's Staff</u>				
9.	A233	Establishment and removal of equipment as clause 120.	Sum			2000.00
10	A233	Maintenance of equipment as clause 120.	Sum			500.00
11.	A242	Attendance upon Engineer's staff chainman.	Hr.	20	20.00	400.00
12.	A299	Provision, erection and maintenance of publicity sign as drg. no. R/21/103/20. To be retained after contract by the Engineer.	Sum			1000.00
		<u>Testing of Materials in Accordance with Clause 114</u>				
13.	A250	Provision of and testing of samples.	Sum			200.00
		<u>Provisional Sums to be Instructed by the Engineer</u>				
14.	A420	Trial holes to investigate existing service locations.	Sum			500.00
15.	A419	Dayworks.	Sum			2,500.00

Page total carried to part 1 summary 7,100.00

HEALDFIELD ROAD QUARRY RECLAMATION - GAS CONTROL SCHEME
PART 1 - PRELIMINARIES (contd)

Item No.	CESMM Code	Item Description	Unit	Quantity	Rate	Amount £ p
		OTHER PROVISIONAL SUMS Site Operators Daywork Schedule (MUST be completed by the Contractor). (These items will only be used to pay for standing time agreed by the Engineer).				
16.	A420	Standing time for drilling rig.	Hr	5	500	2500
17.	A420	Standing time for driller.	Hr	5	50	250
18.	A420	Standing time for labourer.	Hr	10	50	500
					Page total carried to Part 1 Summary	3250.00

HEALDFIELD ROAD QUARRY RECLAMATION - GAS CONTROL SCHEME
PART 1 - PRELIMINARIES (contd)

Item No.	CESMM Code	Item Description	Unit	Quantity	Rate	Amount £ p
		Method Related Charges Items for Method Related Charges, if any, shall be inserted by the Tenderer in accordance with Section 7 of CESMM. Supervision Set up site				5000.00 5000.00
		Total for this page. Total for any additional pages attached.				
					Page total carried to Part 1 Summary	10000.00

HEALDFIELD ROAD QUARRY RECLAMATION
GAS CONTROL SCHEME

PAGE NUMBER: B8

PART 1 - PRELIMINARIES

Page No.	PAGE TOTALS £ p
B4	105,500.00
B5	7,100.00
B6	3,250.00
B7	10,000.00
Total Part Summary carried to Grand Summary	125,850.00

HEALDFIELD ROAD QUARRY RECLAMATION - GAS CONTROL SCHEME
PART 2 - GROUND INVESTIGATION AND SITE CLEARANCE **PAGE B9**

Item No.	CESMM Code	Item Description	Unit	Quantity	Rate	Amount £ p
		CLASS B: GROUND INVESTIGATION BOREHOLES Rotary Drilled Gas Well 250mm minimum diameter See Specification Series 1000. For borehole details see Drawing No. R/21/103/15.				
1.	B310	Number (to be back-filled with stone and pipe).	Nr.	5	100	500.00
2.	B333	Without core recovery - depth 10-12m from existing ground level.	m	50.0	10	500.00
3.	B999	Backfill gas well with 12mm single size non-friable aggregate. (Not limestone).	m	45.0	10	450.00
4.	B999	125mm nominal diameter slotted gas well pipe.	m	45.0	10	450.00
5.	B999	180mm nominal diameter plain gas well pipe.	m	10.0	10	100.00
6.	B999	125mm blanking cap to base of gas well.	Nr.	5	10	50.00
7.	B999	Provision and installation of well head tees complete, including cap and sampling tube within combined valve Chamber.	Nr.	4	250	1000.00
					Page total carried to Part 2 Summary	2645.00

HEALDFIELD ROAD QUARRY RECLAMATION - GAS CONTROL SCHEME
PART 2 - GROUND INVESTIGATION AND SITE CLEARANCE (contd) **PAGE B10**

Item No.	CESMM Code	Item Description	Unit	Quantity	Rate	Amount £ p
8.	B999	Provision and installation of well head tees complete, including cap and sampling tube to well W3.	Nr.	1	250	250.00
9.	B999	Provision and installation of well head tees complete, including cap and sampling tube to wells WX and WY - to include raising by 1.5-2m.	Nr.	2	250	500.00
10.	B999	Bentonite slurry seal to well tops. <u>Rotary Drilled Monitoring Well 150mm minimum diameter</u>	m	5	10	50.00
11.	B310	Number (to be backfilled with stone and pipe).	Nr.	15	100	1500.00
12.	B333	Without core recovery - depth 10-20m from existing ground level.	m	300	10	3000.00
13.	B999	50mm nominal diameter slotted well pipe.	m	270	10	2700.00
14.	B999	50mm nominal diameter plain well pipe.	m	15	10	150.00
15.	B999	50mm blanking cap to base of well.	Nr.	15	10	150.00
16.	B999	Backfill well with 12mm single size non-friable aggregate (not limestone).	m	270	10	2700.00
17.	B999	Cap and cover to top of well.	Nr.	15	10	150.00
					Page total carried to Part 2 Summary	11,150.00

HEALDFIELD ROAD QUARRY RECLAMATION - GAS CONTROL SCHEME
PART 2 - GROUND INVESTIGATION AND SITE CLEARANCE (contd) **PAGE B11**

Item No.	CESMM Code	Item Description	Unit	Quantity	Rate	Amount £ p
18.	B999	Bentonite slurry seal to well tops. <u>Connection of Existing Gas Wells</u> (Earthworks included in Part 3)	m	15	10	150.00
19.	B999	180mm nominal diameter plain gas well pipe.	m	4	10	40.00
20.	B999	300mm MDPE pipe to contain bentonite slurry.	m	2	100	200.00
21.	B999	Bentonite slurry seal to well tops. <u>Site Clearance</u>	m	2	10	20.00
22.		Of the whole site as clause 201, material to be disposed of off site.	ha	6.2	100	620.00
23.		Removal of fencing as shown on drg. no. R/21/103/19, to include for the disposal off site.	Sum		500	500.00

Page total carried to Part 2 Summary 1,530.00

HEALDFIELD ROAD QUARRY RECLAMATION GAS CONTROL SCHEME

PART 2 - GROUND INVESTIGATIONS

Page No.	PAGE TOTALS £	p
B9	2,645.00	
B10	11,150.00	
B11	1,530.00	

Total Part Summary carried to Grand Summary

HEALDFIELD ROAD QUARRY RECLAMATION - GAS CONTROL SCHEME
PART 3 - EARTHWORKS

Item No.	CESMM Code	Item Description	Unit	Quantity	Rate	Amount £ p
		CLASS E : EXCAVATION FOR FOUNDATIONS Well Head and Valve Chambers, Existing Pipeline and Soakaway				
1.	E394	Excavate in suitable material and place along side for re-use. Depth; not exceeding 2.0m.	m^3	16.0	2	32.00
2.	E395	Excavate in refuse and dispose off site commencing surface underside of suitable material. Depth; not exceeding 4.5m. Excavation of Existing Wells	m^3	12.0	10	120.00
3.	E395	Excavate in refuse to expose existing wells and dispose off site. Depth; not exceeding 3.0m. Excavation for Gas Control Compound	m^3	8.0	10	80.00
4.	E393	Excavate in suitable material depth not exceeding 1m and dispose where directed on site within 20m.	m^3	14	2	28.00
5.	E393	Excavate in refuse depth not exceeding 1m and dispose off site.	m^3	20	10	200.00
					Page total carried to Part 3 Summary	460.00

HEALDFIELD ROAD QUARRY RECLAMATION - GAS CONTROL SCHEME
PART 3 - EARTHWORKS (contd) **PAGE B14**

Item No.	CESMM Code	Item Description	Unit	Quantity	Rate	Amount £ p
6.	E424	Excavation of material for capping layer from stockpiles adjacent to existing gas control equipment, max 2m depth.	m^3	500	1	500.00
7.	E923	Excavation of trench for electricity supply cable depth 1m.	m	210	2.50	525.00
		<u>Preparation for Foundations</u>				
8.	E522	Preparation of excavated surfaces to receive permanent works.	m^2	100	1	100.00
		<u>Filling</u>				
9.	E614	Backfill with suitable material to existing MDPE pipework and over soakaway medium.	m^3	8.0	1	8.00
10.	E614	Backfill around existing gas wells with suitable material on completion of connection.	m^3	8.0	1	8.00
11.	E633	Filling to complete capping layer, compacted to clause 306, around existing gas control equipment, once raised.	m^3	500	0.50	250.00
12.	E635	Filling with imported sub-soil around gas equipment. Surround 1m, 0.5m depth.	m^3	225	2.50	562.50
13.	E694	Filling of trench following electricity cable laying.	m	210	1	210.00
					Page total carried to Part 3 Summary	1863.50

HEALDFIELD ROAD QUARRY RECLAMATION
GAS CONTROL SCHEME

PAGE NUMBER: B15

PART 3 - EARTHWORKS

Page No.	PAGE TOTALS £	p
B13	460.00	
B14	2163.50	
Total Part Summary carried to Grand Summary	2623.50	

HEALDFIELD ROAD QUARRY RECLAMATION - GAS CONTROL SCHEME
PART 4 - STRUCTURES **PAGE B16**

Item No.	CESMM Code	Item Description	Unit	Quantity	Rate	Amount £ p
		CLASS F : INSITU CONCRETE Provision of Concrete - Prescribed mix for ordinary structural concrete. Maximum aggregate size 20mm. Sulphate resisting cement to BS 4027.				
1.	F167	Grade 30 concrete to Specification Clause 414. Placement of Concrete - Reinforced.	m^3	7.2	50	360.00
2.	F522	Grade 30 to Control Building and ancillary slabs 150 to 300mm thick.	m^3	7.2	60	432.00
		CLASS G : CONCRETE ANCILLARIES Formwork Rough finish F1.				
3.	G142	Plane vertical width 0.15.	m	6	2	12.00
4.	G143	Plane vertical width 0.25.	m	28	2	56.00
		Reinforcement				
5.	G563	High yield steel fabric to BS 4482 Ref. A252.	m^2	63.0	5	315.00
		Concrete Accessories				
6.	G811	Finishing to top surfaces - wood float finish Class U2.	m^2	64	1	64.00
					Page total carried to Part 4 Summary	1239.00

HEALDFIELD ROAD QUARRY RECLAMATION - GAS CONTROL SCHEME
PART 4 - STRUCTURES (contd)

Item No.	CESMM Code	Item Description	Unit	Quantity	Rate	Amount £ p
		Buildings				
7.	X999	Gas Control Building 5 x 3.5 x 2.2m high to British Gas Standard BGC/PS/E27 (Kingsley Plastics Governor Kiosk or similar approved) with simulated brick finish to engineers requirement on prepared foundation.	Nr.	1		20,000.00
8.	X999	Electrical Control Cabinet 1.8 x 0.9 x 1.8 high with full width double security doors - on prepared slab (to match finish and bolted to Gas Control Building).	Nr.	1		4,000.00
					Page total carried to Part 4 Summary	24,000.00

HEALDFIELD ROAD QUARRY RECLAMATION
GAS CONTROL SCHEME

PART 4 - STRUCTURES

Page No.	PAGE TOTALS £	p
B16	1239.00	
B17	24,000.00	
Total Part Summary carried to Grand Summary	25,239.00	

HEALDFIELD ROAD QUARRY RECLAMATION - GAS CONTROL SCHEME
PART 5 - DRAINAGE

Item No.	CE8MM Code	Item Description	Unit	Quantity	Rate	Amount £ p
		CLASS I : PIPEWORKS - PIPES MDPE Pipe (Black BP Polymer Type) SDR 17.6 Butt Fusion Welded				
1.	I112	100mm vitrified E.S. clay to soakaway depth not exceeding 1.5m.	m	14	20	280.00
2.	I612	Plastic pipe 125mm. Depth not exceeding 1.5m.	m	237	10	2370.00
3.	I612	Plastic pipe 180mm. Depth not exceeding 1.5m.	m	225	15	3375.00
4.	I622	Plastic pipe 250mm. Depth not exceeding 1.5m.	m	67	20	1340.00
		CLASS J : PIPEWORK - VALVES & FITTINGS MDPE Pipe (Black BP Polymer Type) SDR 17.6 Butt Fusion Jointed				
5.	J611	45° Elbow 125mm diameter.	Nr.	3	20	60.00
6.	J611	45° Elbow 180mm diameter.	Nr.	2	20	40.00
7.	J612	22½° Elbow 250mm diameter.	Nr.	1	20	20.00
8.	J621	Equal tee 125 - 125 - 125mm.	Nr.	1	20	20.00
9.	J621	Equal tee 180 - 180 - 180mm.	Nr.	3	20	60.00
					Page total carried to Part 5 Summary	7527.50

HEALDFIELD ROAD QUARRY RECLAMATION - GAS CONTROL SCHEME
PART 5 - DRAINAGE (contd) **PAGE B20**

Item No.	CESMM Code	Item Description	Unit	Quantity	Rate	Amount £ p
10.	J622	Equal tee 250 - 250 - 250mm.	Nr.	3	20	60.00
11.	J631	Reducer 180 to 125mm.	Nr.	4	20	80.00
12.	J632	Reducer 250 to 125mm.	Nr.	1	20	20.00
13.	J632	Reducer 250 to 180mm.	Nr.	2	20	40.00
14.	J652	Flanged adaptor 250mm within chamber DS1.	Nr.	1	50	50.00
15.	J699	Monitoring points inserted into pipework within chambers.	Nr.	7	50	350.00
16.	J840	125 butterfly valves to valve chambers.	Nr.	7	50	350.00
17.	J999	Fabrication, provision and installation of manifold including valves, junctions, monitoring points and all works in connecting to existing and proposed system as shown on drawing no. R/21/103/15 in chamber. (The existing above ground equipment is the property of BIFFA Waste Services Ltd.). <u>CLASS K : MANHOLES & PIPEWORK ANCILLARIES</u> <u>Chambers</u>	Nr.	1	3500	3500.00
18.	K211	Well head and value chamber as shown on drawing no. R/21/103/	Nr.	4	250	1000.00
19.	K211	Valve and sampling chamber as shown on drawing no. R/21/103/	Nr.	3	250	750.00
					Page total carried to Part 5 Summary	6,200.00

HEALDFIELD ROAD QUARRY RECLAMATION - GAS CONTROL SCHEME
PART 5 - DRAINAGE (contd)

Item No.	CESMM Code	Item Description	Unit	Quantity	Rate	Amount £ p
20.	K211	Chamber DS1 as shown on drawing no. R/21/103/16 including expamet cover for pedestrian loadings.	Nr.	1	250	250.00
21.	K410	Clean brick hardcore to soakaway.	m^3	6	10	60.00
22.	K999	Terram 1000 or similar to soakaway base, sides and top.	m^2	14	1	14.00
23.	K212	Condensate chambers and trap complete as detailed on drawing no. R/21/103/16 to 250mm pipe.	Nr.	1	500	500.00
24.	K212	Manifold chamber as shown on drawing no. R/21/103/15.	Nr.	1	2500	2500.00
25.	K212	Existing manifold chamber to be raised by 2-2.5m as drg. no. R/21/103/16.	Nr.	1	2500	2500.00
26.	K211	Well head without valve chamber as shown on drawing no. R/21/103/15 to include cover, pipework and fittings.	Nr.	3	250	750.00
27.	K211	Well head, on existing wells to be extended by 1m as detail on drawing no. R/21/103/15, to include cover, pipe-work and fittings.	Nr.	1	250	250.00

Page total carried to Part 2 Summary 6824.00

HEALDFIELD ROAD QUARRY RECLAMATION - GAS CONTROL SCHEME
PART 5 - DRAINAGE (contd)

Item No.	CESMM Code	Item Description	Unit	Quantity	Rate	Amount £ p
28.	K211	Well head, on existing wells to be extended by 1.5-2m as detail on drawing no. R/21/103/15, to include cover, pipe-work and fittings.	Nr.	2	300	600.00
29.	K211	Well head, on existing wells to be extended by 2-2.5m as detail on drawing no. R/21/103/15, to include cover, pipe-work and fittings.	Nr.	6	600	3600.00
30.	K211	Existing monitoring well to be extended as detail on drg. no. R/21/103/15 by 0.5m or less.	Nr.	8	100	800.00
31.	K211	Existing monitoring well to be extended as detail on drg. no. R/21/103/15 by 0.5-1.0m.	Nr.	5	100	500.00
32.	K211	Existing monitoring well to be extended as detail on drg. no. R/21/103/15 by 1-1.5m.	Nr.	1	100	100.00
33.	K211	Trap to be raised as detail on drg. no. R/21/103/15 to include cover, pipework and fittings. by 2-2.5m. <u>CLASS L : PIPEWORK - SUPPORTS & PROTECTION</u> <u>Ancillaries</u>	Nr.	1	250	250.00
34.	L511	Gravel bed and surround to 100mm VC pipework.	m	14	10	140.00
						5990.00

Page total carried to Part 5 Summary

HEALDFIELD ROAD QUARRY RECLAMATION - GAS CONTROL SCHEME
PART 5 - DRAINAGE (contd)

Item No.	CESMM Code	Item Description	Unit	Quantity	Rate	Amount £ p
35.	L511	Sand bed and surround to 125mm MDPE pipework.	m	237	10	2370.00
36.	L511	Sand bed and surround to 180mm MDPE pipework.	m	225	10	2250.00
37.	L512	Sand bed and surround to 250mm MDPE pipework.	m	67	10	670.00
38.	L511	Sand bed and surround to gas well heads and existing pipework.	m^3	5	10	50.00
39.	L999	Visqueen 1000 to trench bottom where instructed.	m^2	150	10	1500.00
40.	L999	Detectable 'Gas' marker tape over pipelines.	m	529	10	5290.00

Page total carried to Part 5 Summary | 12130

HEALDFIELD ROAD QUARRY RECLAMATION
GAS CONTROL SCHEME

PART 5 - DRAINAGE

Page No.	PAGE TOTALS £	p
B19	7527.50	
B20	6200.00	
B21	6824.00	
B22	5990.00	
B23	12130.00	
Total Part Summary carried to Grand Summary	37,321.50	

HEALDFIELD ROAD QUARRY RECLAMATION - GAS CONTROL SCHEME
PART 6 - ROADWORKS

Item No.	CESMM Code	Item Description	Unit	Quantity	Rate	Amount £ p
		CLASS R : ROADS AND PAVING				
1.	R114	Granular material - Type 1 sub-base depth 150mm to underside of concrete slabs within compound.	m²	50	3	150.00
2.	R117	Granular material - Type 1 sub-base depth 300mm to compound surfacing.	m²	50	6	300.00
3.	R170	Geotextile - Terram 1000 or similar to compound formation.	m²	100	1	100.00
4.	R351	Apply bituminous spray tack coat, to existing entrance road. To include for cleaning of surface prior to application.	m²	170	2	340.00
5.	R231	Dense bitumen macadam wearing course, 25mm depth of 10mm nominal size.	m²	170	10	1700.00
					Page total carried to Grand Summary	2590.00

HEALDFIELD ROAD QUARRY RECLAMATION - GAS CONTROL SCHEME
PART 7 - FENCING **PAGE B26**

Item No.	CESMM Code	Item Description	Unit	Quantity	Rate	Amount £ p
		CLASS X : MISCELLANEOUS WORKS - FENCING				
1.	X195	Steel palisade security fence to BS 1722 Part 12, 2.4 high, hot dip galvanised to BS 729, and including concrete cill to base.	m	36	40	1440.00
2.	X297	Steel palisade security gates - double leaf to BS 1722 Part 12, 2.4m high x 4m wide, hot dip galvanised including cill to base.	Pair	1	800	800.00
3.		Stockproof fencing as drg. no. R/S/700/9.	m	150	3	450.00
4.		Timber Type 2 field gate as drg. no. R/S/700/14, 3.5m wide.	Nr.	1	400	400.00
5.	X135	Chain link fence, plastic coated, on concrete posts type PLC 180A as drg. no. R/S/700/4.	m	380	20	7600.00
6.		1.8m chain link gates, double on RHS posts, 6m wide as drg. no. R/S/700/3A.	Nr.	1	800	800.00
7.		1.8m chain link gates, single on RHS posts, 1m wide as drg. no. R/S/700/3A.	Nr.	2	200	400.00
8.		Repairs to existing railway side fence.	m	350	5	1750.00
					Page total carried to Grand Summary	13,680.00

HEALDFIELD ROAD QUARRY RECLAMATION - GAS CONTROL SCHEME
PART 9 - GAS CONTROL EQUIPMENT

Item No.	CESMM Code	Item Description	Unit	Quantity	Rate	Amount £ p
		CLASS X : MISCELLANEOUS WORKS - GAS CONTROL BUILDING				
1.	X999	Installation of intrinsically safe lighting and power sockets (2 x double 240V single phase) including consumer unit and connecting to incoming supply.	Sum			2500.00
2.	X999	Installation of gas monitoring alarm GMI single point (or similar approved) including sensor and control unit and connection to incoming supply.	Sum			1000.00
3.	X999	Installation of gas pumping system incorporating 2 pumps (Donkin V50 MK7 single stage or similar approved), duty and standby with explosafe electric motors of 7.5 KW, including water knockout pots incorporating knitmesh demister pads, all interconnecting pipe-work, controls, gas volume and quality controls, connection to incoming supply, commissioning, testing and all works designed to control maximum 500m³/hr of landfill gas and be compatible with flare stack specified.	Sum			35,000.00
		Page total carried to Part 9 Summary				38,500

HEALDFIELD ROAD QUARRY RECLAMATION - GAS CONTROL SCHEME
PART 9 - GAS CONTROL EQUIPMENT (contd) **PAGE E28**

Item No.	CESMM Code	Item Description	Unit	Quantity	Rate	Amount £ p
		FLARE STACK				
4.	X999	Landfill gas flare stack to burn maximum 500m³/hr, (Hofsetter Type EGH02F-500 with FRL flame pipe extension or similar approved) with automatic flame control and ignition, height of flame outlet to be between 5.0 and 6.0m above ground, including fixing to prepared foundation, connection to pump system and all works.	Sum			10,000.00
		Page total carried to Part 9 Summary				10,000.00

HEALDFIELD ROAD QUARRY RECLAMATION
GAS CONTROL SCHEME

PAGE NUMBER: B29

PART 9 - GAS CONTROL EQUIPMENT

Page No.	PAGE TOTALS £	p
B27	38,500.00	
B28	10,000.00	
Total Part Summary carried to Grand Summary	48,500	

HEALDFIELD QUARRY, CASTLEFORD

GRAND SUMMARY

PART 1 -	PRELIMINARIES	125,850.00
PART 2 -	SITE INVESTIGATION AND SITE CLEARANCE	15,325.00
PART 3 -	EARTHWORKS	2,623.50
PART 4 -	STRUCTURES	25,239.00
PART 5 -	DRAINAGE	37,321.50
PART 6 -	ROADWORKS	2,590.00
PART 7 -	FENCING	13,690.00
PART 9 -	GAS CONTROL EQUIPMENT	48,500.00
	SUB TOTAL	271,139.00
	+ 5% CONTINGENCIES	13,556.95
	SUB TOTAL	284,695.95
	ADJUSTMENT ITEM (IF ANY)	—
	TOTAL AMOUNT OF TENDER	284,695.95
Electricity Supply		3,500.00
+5% Conti.		175.00
		288,370.95
Admin 12%		34,604.51
	£	322,975.46

CITY OF WAKEFIELD METROPOLITAN DISTRICT COUNCIL

ENVIRONMENTAL SERVICES DEPARTMENT

ENVIRONMENT DIVISION

INSTRUCTIONS TO TENDERERS

CONDITIONS OF CONTRACT

SPECIFICATION OF WORKS

BILL OF QUANTITIES

FOR

HEALDFIELD ROAD QUARRY, INVESTIGATION WORKS

Reg 13

Environmental Services Department
King Charles II House
Pontefract
WF8 1BQ

Tel : Wakefield 290900

Ref : R/21.103

Date : MAR 1992

environment
DIVISION

CONTENTS

INSTRUCTIONS FOR TENDERING

TENDERS MUST BE SUBMITTED IN ACCORDANCE WITH THE FOLLOWING INSTRUCTIONS.

TENDERS NOT COMPLYING WITH THESE INSTRUCTIONS MAY BE REJECTED BY THE EMPLOYER WHOSE DECISION IN THE MATTER SHALL BE FINAL.

1. The tender document must be treated as private and confidential. Tenderers should not disclose the fact that they have been invited to tender or release details of the tender document other than on an In Confidence basis to those who have a legitimate need to know or whom they need to consult for the purpose of preparing the tender.

2. The tender should be made on the Form of Tender incorporated in the tender document. It should be signed by the Tenderer and submitted with the Bill of Quantities, which should be fully priced and totalled in ink, and accompanied by the Conditions of Contract and the Specification, to the address and not later than the date and time stated in paragraph 8 below.

3. No UNAUTHORISED alteration or addition should be made to the Form of Tender, to the Bill of Quantities or to any other component of the tender document.

4. Tenders must not be qualified and must not be accompanied by statements that could be construed as rendering the tender equivocal and/or placing it on a different footing from other tenders.

5. Any queries arising from the tender documents which may have a bearing on the offer to be made should be raised with the Engineer as early as possible in the tender period. The Engineer will be ready to consider properly reasoned requests for an extension of the tender period.

6. The attention of Tenderers is drawn to the Programme of Works Clause in the Specification in which certain conditions are detailed affecting the phasing of the Contractor's programme. Tenderers will be required to supply an Initial Programme for consideration with their tender.

7. Attention is directed to any Special Requirements in Relation to Statutory Bodies which may be included in the Conditions of Contract and to the fact that it will be necessary when effecting the insurance required by Clause 23 of the Conditions of Contract to let the Insurers know of these Special Requirements.

8. Tenders should be sent by registered post or recorded delivery service or delivered by hand, sealed in the pre-addressed envelope provided not bearing any indication of the Tenderer marked on the envelope or in the franking thereon, addressed to the Head of Administration, Wakefield Metropolitan District Council, Post Room, Room 43, County Hall, Wakefield and clearly marked "TENDER FOR **HEALDFIELD ROAD QUARRY, INVESTIGATION WORKS**" so as to arrive not later than NOON on Wednesday 22nd April 1992. Tenders delivered by hand **must be taken to Room 43 (Mail Registration) and a receipt obtained.**

9. Unit rates and prices must be quoted in pounds and decimal fractions of a pound. Such fractions need not be restricted to any specific number of decimal places but the product of multiplying the rate by the quantity must be expressed in pounds and whole new pence (i.e. to two decimal places).

10. Tenders should be submitted exclusive of Value Added Tax (V.A.T.).

11. Any tender received after the date and time for receipt stated above will be opened to identify the sender and returned to that person or firm.

12. Tenderers should note that the Contract will not include a Contract Price Flunctuations Clause.

13. The Employer does not bind himself to accept the lowest or any tender. Tenderers should note that they may be expected to enter negotiations with a view to reducing their submitted tender. Every effort will be made to reach a decision on award of the contract within 60 days of the closing date for submission of tenders. Tenders should therefore remain open for acceptance for a minimum of 60 days.

14. Tenderers should note that it is expected that a period of 'two weeks' will elapse between the date of the Contract and the date for Commencement of the Works notified in writing by the Engineer.

15. Tenderers are required to submit with their tender a comprehensive method statement outlining the planned operations for carrying out the works.

16. Prior to submission of tenders, Tenderers are required to visit the site, satisfy themselves on all points affecting the tender and in particular to take note of and allow for the conditions on site.

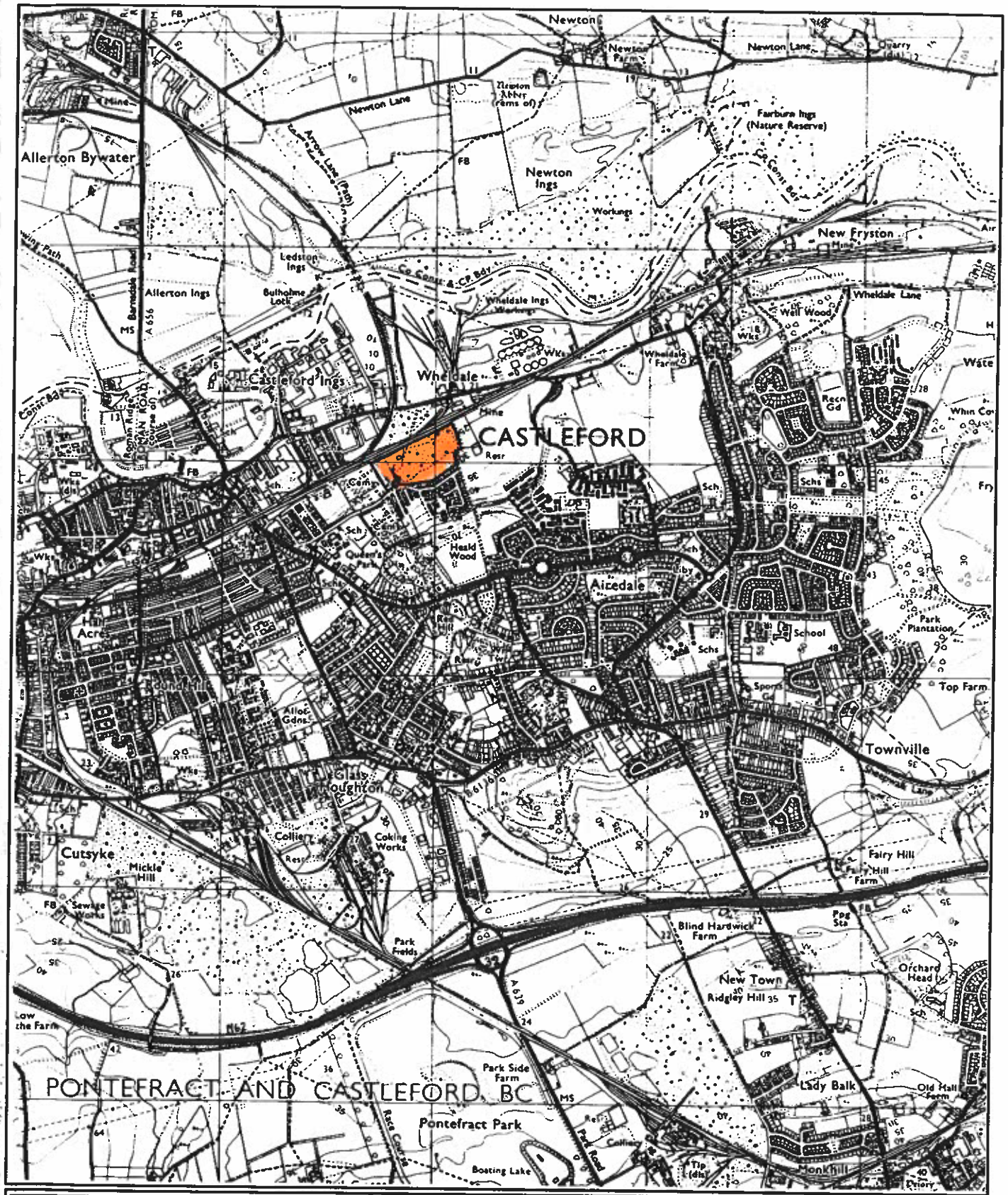
BRIEF DESCRIPTION OF THE WORKS

(For information for tendering purposes only and NOT forming part of the contract documents)

The site is a former quarry which has been filled with putrescible waste, upto 18m depth. The landfilling took place from 1948 to 1985, table 1 shows the types of waste deposited. There have been problems with landfill gas since 1986 and various measures have been taken to reduce the amount of gas migrating from the site, to the adjacent properties.

In June 1990 a series of gas wells and a pumping extraction/flaring unit were installed. These measures have been successful at intercepting gas migrating towards the houses and the monitoring boreholes are now only showing very low levels of methane gas.

It is now intended to install a gas pumping and monitoring system to cover the whole site. This tender is for the investigation of the fill including a contaminated land survey and assessment; investigation of the water table; a pumping trial to investigate the gas and design of a permanent gas extraction scheme.



City of Wakefield Metropolitan District Council

CHIEF OFFICER

ENVIRONMENTAL SERVICES DEPT.
KING CHARLES II HOUSE, PONTEFRACT

environment DIVISION

PROJECT.
Healdfield Road Quarry

DRAWING TITLE.
Site location

SCALE.
1:25,000

DATE.
Mar 1992

GRID REF.
SE:4440:4260

DRAWN.
PD

Reg 13

LIST OF PROPOSED SUB-CONTRACTORS

It is the wish of the Wakefield Metropolitan District Council that local firms should be used whenever the need arises to employ sub-contractors.

Tenderers are therefore required, wherever practicable, to include with their tender(s) a list in the form below of the names and addresses of the sub-contractors which they would propose to employ on the Contract.

Acceptance of a tender shall NOT be deemed to constitute approval of any sub-contractor so listed for the purposes of Clause 4 of the Conditions of Contract.

Type of Work	Sub-Contractor	Address of Sub-Contractor

All Permanent and Temporary Works in connection with:-

HEALDFIELD ROAD QUARRY, INVESTIGATION WORKS

FORM OF TENDER

INCORPORATING COLLUSIVE TENDERING CERTIFICATE

(NOTE: The Appendix forms part of the Tender)

To the Council of the City of Wakefield.

GENTLEMEN,

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

We undertake to complete and deliver the whole of the Permanent Works comprised in the Contract within the time(s) stated in the Appendix hereto.

If our tender is accepted we will, when required, provide good and sufficient sureties or obtain the guarantee of a Bank or Insurance Company (to be approved in either case by you) to be held and firmly bound to you 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 hereto.

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 certify that this is a bona fide tender, 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 certify 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. communicating to a person other than the person calling for these tenders the amount or the 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. entering 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. offering or paying or giving or agreeing to pay or give any sum of money 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 and any body or association, corporate or unincorporate; and "any agreement or arrangements" includes any such transaction, formal or informal, and whether legally binding or not.

Signature: .....

Firm: .....

Address: .....

.....

Tel. No: ..... Date: .....

APPENDIX TO THE FORM OF TENDER

(Note: Relevant Clause numbers are shown after the description)

Amount of Bond	10	10% of Tender Total *NA under £50,000*
Minimum Amount of Insurance	23 (2)	£1,000,000
Time for Completion	43	14 Weeks
Liquidated Damages for Delay	47 (1)	£150 per day
Period of Maintenance	49 (1)	52 weeks
Method of Measurement adopted	57	See Preamble to Bill of Quantities
Percentage of Value of Goods and Materials to be included in Interim Certificates	60(2)(b)	97 per cent
Minimum Interim Certificate	60 (2)	£10,000
Calculation of Retention	60 (4)	Payments made under any Contract Price Flunctuations Clause shall not be subject to a retention.

CONDITIONS OF CONTRACT

The Conditions of Contract referred to in the Tender shall be the Conditions of Contract, Fifth Edition (June 1973) (Revised January 1979), incorporating amendments sheets 1, 2 and 3, approved by the Institution of Civil Engineers jointly with the Association of Consulting Engineers and the Federation of Civil Engineering Contractors and commonly known as the ICE Conditions of Contract, modified and added to as follows:-

CLAUSE 1

Sub-clause (1)(a) is deleted and substituted by the following:-

(a) "Employer" means THE COUNCIL OF THE CITY OF WAKEFIELD and includes the Employer's successors;

Sub-Clause (1)(c) is deleted and substituted by the following:-

(c) "Engineer" means HEAD OF ENVIRONMENT, ENVIRONMENTAL SERVICES DEPARTMENT or other the Engineer appointed from time to time by the Employer and notified in writing to the Contractor to act as Engineer for the purposes of the Contract in place of the said HEAD OF ENVIRONMENT.

CLAUSE 2

The following paragraphs shall be added:-

The Engineer's Representative shall, in addition to acting generally on behalf of the Engineer, on site, issue site instructions covering additional work at tendered rates or work under provisional items in the Bill of Quantities. In specific cases, the Engineer's Representative will be empowered to issue site instructions for additional or amended work at new rates or daywork rates but in these cases, the site instructions will be confirmed by a formal Variation Order signed by the Engineer. The Engineer's Representative will be empowered to agree interim and final measurements except in the case of serious contentious matters or claims in the final measure.

CLAUSE 4

Delete the first sentence and substitute the following:-

The Contractor shall neither sub-let the whole of the Works nor the major element of it.

CLAUSE 22

Sub-Clause (1)(b)(v) line 1 - before "injuries" the following is inserted:- "except as provided by sub-clause (3) of this Clause;"

The following sub-clause is added:-

Extension of Indemnity

(3) For the purpose of this Contract provisos (a) and (b) (v) to 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 and in relation to this sub-clause proviso (a) to the said sub-clause (1) shall have effect with the insertion (for the removal of doubt) of the expression "Engineer or the" before the second occurrence in that provision of the word "Employer".

CLAUSE 29

The following sub-clause is added:-

Pollution

(3) Subject and without prejudice to any other provisions of the Contract the Contractor shall take all reasonable precautions,

(a) in connection with any rivers, streams, waterways, drains, watercourses, lakes and the like to prevent:-
   i. silting,
   ii. erosion of their beds or banks,
   iii. pollution of the water so as to affect adversely the quality or appearance thereof or cause injury or death to animal and plant life;

(b) in connection with underground water resources (including percolating water) to prevent:-
   i. any interference with the supply to or abstraction from such sources,
   ii. pollution of the water so as to affect adversely the quality thereof.

CLAUSE 32

This Clause is deleted in its entirety and substituted by the following:-

"Unless otherwise provided for in the Specification and/or Bill of Quantities all the old building materials on or in the Site at the time the Contractor received possession thereof shall remain the property of the Employer and shall not be removed by the Contractor from the site until instruction for such removal has been given by the Engineer.

All other materials or items of any description whatsoever including any articles of antiquarian value or interest and all timber, growing crops and the like found or being upon or excavated from the Site shall remain the property of the Employer and shall be dealt with by the Contractor as the Engineer may direct."

SPECIAL CONDITIONS

Special Conditions

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

Corrupt Gifts and Payments of Commission

73. (1) The Contractor or anyone employed by him or acting on his behalf shall not:-

a. offer to give or agree to the giving, to any person in the service of the Employer, any gift or consideration of any kind as an inducement or reward for doing or forebearing to do, or for having done or foreborne to do, any act in relation to the obtaining or execution of his or any other Contract with the Employer, or for showing or foreboding to show favour or disfavour to any person in relation to this or any other Contract with the Employer; or

b. enter into this or any other contract with the Employer in connection with which commission has been paid or agreed to be paid by him or on his behalf or to his knowledge, unless before the Contract is made particulars of any such commission and of the terms and conditions of any agreement for the payment thereof have been disclosed in writing to the Employer.

(2) Any breach of the above prohibitions or the commission of any offence under the Prevention of Corruption Acts 1889 to 1916, or the giving of any fee, or reward the receipt of which is an offence under sub-section (2) of Section 117 of the Local Government Act, 1972 by the Contractor or anyone employed by him or acting on his behalf (whether such breach or offence is with or without the knowledge of the Contractor) in relation to this or any other Contract with the Employer shall entitle the Employer to enter upon the Site under Clause 63 and expel the Contractor therefrom and, thereupon the provisions of Clause 63 shall have effect as if such breach or offence as aforesaid were expressed in Clause 63(1) as a ground therefor. In that case the Contractor shall not be entitled to payments on the Contract or Contracts beyond those (if any) provided for by Clause 63. In addition to the costs and expenses recoverable by the Employer as provided for in Clause 63(4) the Employer shall also be entitled to recover from the Contractor any other costs or losses incurred by the Employer consequent upon such entry and expulsion under this Clause and to receive from the Contractor such sum as in the opinion of the Employer represents the amount or value of any gift consideration or commission paid or agreed to be paid in breach of this Clause.

(3) In every sub-Contract for any part of the Works the Contractor shall incorporate such provisions as will impose on the Sub-Contractor liabilities similar to those imposed on the Contractor by this Clause and such provisions as will entitle the Contractor to determine the sub-contract on terms equivalent to those contained in Clause 63. In the event of any breach by the sub-contractor of any such provision, the Contractor shall without prejudice to any of his obligations under this Contract take action in accordance with the terms of the sub-contract to exercise his rights against the sub-contractor. Failure by the Contractor to take such action shall be grounds for the exercise by the Employer of his right under sub-clause (2) of this Clause to enter the Site and expel the Contractor. When the Contractor exercises his rights against a sub-contractor in accordance with this Clause he shall make no claim nor agree to any claim being made on his behalf against the Employer in respect of any consequential delays and extra costs arising from the Contract.

(4) Any dispute as to the amount recoverable by the Employer from the Contractor under this Clause shall be settled in the manner provided for in Clause 66.

Contractor's Insurance

74. (1) The Contractor's public liability insurance policies for the Contract must contain an endorsement in the following terms:-

"It is hereby declared and agreed that the Council of the City of Wakefield is indemnified by this Policy jointly with the Insured in respect of a Contract made between the Council of the City of Wakefield as Employer and the Insured as Contractor relating to a Contract for HEALDFIELD ROAD QUARRY, INVESTIGATION WORKS. It is further declared and agreed that notwithstanding the Council of the City of Wakefield is indemnified by this Policy as extended by this endorsement the Insured Contractor is indemnified against liability for loss of or damage to property owned by or for which the Council of the City of Wakefield is responsible."

(2) The Contractor will be required to supply certificates from his Insurers confirming that insurance cover to meet the requirements of the Contract is in force, and that his public liability policies will be endorsed in accordance with sub- clause (1) of this Clause.

(3) The Contractor shall immediately notify the Employer and the Insurers of any happening or event which may give rise to any claim, demand, proceeding, damage, cost or charge whatsoever arising out of the particular work, and the Contractor shall indemnify the Employer against any loss whatsoever which may be occasioned to the Employer by the Contractor's failure to give such notification.

Recovery of Sums Due from 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.

Special Requirements in Relation to Statutory Bodies, etc.

76. The Contractor shall comply with the Special Requirements in relation to Statutory Bodies, etc., which may be included in the pages immediately following these Conditions of Contract. Compliance with such Special Requirements shall not relieve the Contractor of any of his other obligations and liabilities under the Contract and fulfilment of such other obligations and liabilities shall not relieve him of his responsibilities to comply with the said Special Requirements.

Special Requirements in Relation to:

NATIONAL POWER and YORKSHIRE ELECTRICITY

1. In these Special Requirements the following expressions shall have the meanings assigned to them:

   (i) "Board" means Yorkshire Electricity and/or National Power.

   (ii) "Board's Engineer" means the District Manager of Yorkshire Electricity and/or National Power or his nominated representative.

   (iii) "Plant or equipment" means any plant, equipment, gear machinery, apparatus or appliance or any part thereof as defined in the Construction (General Provisions) Regulations 1961 and the Construction (Lifting Operations) Regulations 1961.

2. The Work should be carried out to conform with the Requirements of the Health and Safety Executive Guidance Note No. G.S.6 "Avoidance of Danger from Overhead Electric Cables" and the National Joint Utilities Group document "Recommendations on Avoidance of Danger from Underground Electricity Cables".

3. (i) Except under such restrictions as the Board's Engineer may impose for the safety of persons and the protection of property, a distance of 15 metres shall be maintained at all times between any part of any plant or equipment or anything connected to such plant and equipment (e.g. the jib of a crane hoist rope load etc.), and any part of the Board's electric lines where these lines are carried on steel towers or a distance of 9 metres where the lines are carried on wood poles. Excavation spoil must not be dumped or accumulated so as to cause infringement of these distances. The permission of the Board's Engineer must be obtained in writing before plant or equipment is operated or work of any kind is carried out within the above distances.

   (ii) The Contractor shall give at least fourteen days notice to the Board's Engineer of the dates upon which it is intended to operate plant or equipment or carry out any work for which permission has been given by the Board's Engineer under paragraph 3(i). Such operations or work, shall only be carried out in the presence of the Board's Engineer unless notice shall have been obtained in writing from the Board's Engineer that he does not require to be present.

   (iii) In the event of the Board requiring work to be executed on the overhead electric lines or supports during the period of the Contract, the Contractor shall afford all facilities to the Board or its contractors and the Contractor shall amend his programme of working to suit any and all requirements of the Board during such period of working.

(iv) The Contractor shall consult the Board's Engineer as early as possible and such consultation shall not be less than fourteen days before it is proposed to commence work to ascertain whether any underground electricity cables or apparatus will be affected by the proposed work in which event the Contractor shall make all necessary arrangements with the Board's Engineer to safeguard the cables or apparatus.

(v) Work should not be carried out in the immediate vicinity of the overhead lines during periods of poor visibility. If this is not reasonably practicable additional precautions must be taken to ensure maintenance of the appropriate safety clearance.

4. The above requirements will not relieve the Contractor of any responsibility for taking every precaution to avoid risk to persons or damage to property including compliance with Regulation 44(2) of the Construction (General Provisions) Regulations 1961.

5. In order to comply with the above requirements the Contractor should contact the following addresses:-

National Power
Beckwith Knowle
Otley Road
Harrogate HG3 1PS — Telephone: Harrogate 702000

Yorkshire Electricity
West Yorkshire Area,
PO Box 161
161 Gelderd Road
Leeds LS1 1QZ — Telephone: Leeds 415255

Special Requirements in Relation to:

BRITISH TELECOMMUNICATIONS

1. Before commencing any work or moving heavy plant or equipment over any portion of the Site, the Contractor shall confirm details of British Telecommunications underground plant within the Site with the appropriate General Manager. (Dial 100 and ask for FREEPHONE 111).

2. Where such details show that the Contractor's works or the movement of plant or equipment may endanger British Telecommunications plant, the Contractor must give the General Manager at least one week's notice of the date on which it is intended to commence such work, or movement of plant, and equipment in order that the presence of buried plant can be indicated by markers to be supplied by British Telecommunications and placed by the Contractor under the supervision of a British Telecommunications representative. The Contractor shall ensure that British Telecommunications plant is protected from danger.

3. In the event of a British Telecommunications marker being disturbed for any reason, it shall not be replaced other than in the exact position and to its former depth unless the repositioning is carried out at the direction and under the supervision of a British Telecommunications representative.

4. The above requirements do not relieve the Contractor of any of his obligations under the Contract

Special Requirements in Relation to:

BRITISH GAS CORPORATION - North Eastern Region (NEGAS)

1. The position of mains and services are only approximate. Detailed plans of the mains in question may be inspected at the NEGAS Area Office and the Contractor is advised to verify positions by means of trial holes. The information supplied to the Employer has been taken from existing records, the accuracy of which cannot be guaranteed and, whilst every care has been taken in the provision of this information, NEGAS will not legally accept liability for any discrepancy, omission or deviation, whether arising from inadvertance or negligence or from any other cause whatsoever on the part of NEGAS or any officer, servant or agent of NEGAS.

2. Before commencing work or moving heavy plant or equipment over any portion of the Site, the Contractor must contact the NEGAS Excavation Superintendent (see paragraph 6 below).

3. In the interest of public safety and for the security of gas supplies, the Contractor shall comply with the following requirement:-

   (i) Heavy construction traffic, plant and machinery should only cross NEGAS mains where advised by NEGAS. It may be necessary to restrict certain traffic or machines to specially strengthened areas.

   (ii) Before excavating within 3 metres of any NEGAS apparatus, the Contractor shall first establish the exact position of buried equipment by means of hand-excavated trial holes. Excavation within 1 metre of the established position of any NEGAS apparatus shall be carried out by hand in the presence of a designated NEGAS employee. Special care must be taken in the vicinity of indicated High Pressure apparatus.

   (iii) No structures, temporary or permanent, shall be erected within 2 metres of the established position of any NEGAS apparatus.

   (iv) No mains, cables, ducts, sewer pipes or other equipment shall be laid directly above or directly below, and in line with, NEGAS apparatus or in such a position as to make access to gas equipment difficult.

   (v) A minimum gap of 150mm shall be maintained where 'Undertaker's Works' cross NEGAS apparatus with minimum clearance of 300mm where such works are adjacent to NEGAS apparatus.

   (vi) Where it is necessary to excavate below a main, the main shall be supported to the satisfaction of the NEGAS Engineer during all stages of the operation. On completion, permanent supports will, if necessary, be constructed to avoid further settlement.

(vii) NEGAS shall be given 48 hours' notice of intention to backfill over or adjacent to a main. A NEGAS representative will be in attendance during the operation and advise on the suitability and consolidation of backfill material over the main.

(viii) Approval in writing from NEGAS shall be obtained before:-

(a) piling is carried out within 14 metres of NEGAS mains and services,

(b) welding or other hot work involving a naked flame is carried out within 14 metres of NEGAS apparatus,

(c) explosives are used within 400 metres of NEGAS mains.

4. If a main or service is damaged, or a leak is suspected, the following precautions shall be observed immediately:-

(a) Evacuate all personnel from the vicinity.
(b) Notify NEGAS - Telephone (day):
(night):
(c) Remove all sources of ignition from the vicinity.
(d) Keep pedestrians and vehicles away from the damaged.section.
(e) Do not interfere with leak.

5. The above requirements do not relieve the Contractor of any responsibility for taking every precaution to avoid risk to persons or damage to property.

6. The Assistant Engineer for this NEGAS Area is: Vicarage Street North, Wakefield. Telephone Wakefield 379511.

The Excavation Superintendent for the Area is
Telephone:

Special Requirements in Relation to:

YORKSHIRE WATER (Water Supply)

1. The information in the Contract regarding the location of public water mains has been taken from the existing records of Yorkshire Water. Whilst every care has been taken in the provision of this information, its accuracy cannot be guaranteed and no record is kept of communication pipes. There may also be privately owned supply pipes present which are unrecorded. The Contractor must therefore use his best endeavours to ascertain the location of all water mains and service pipes likely to be affected by the Works (including verifying positions by means of trial holes), and shall take all precautions necessary to avoid damage to this apparatus.

2. The Contractor shall give sufficient notice to the Distribution Engineer to enable him to agree with the Contractor any protection or support works which the Distribution Engineer considers should be carried out by the Contractor prior to the commencement of any work which may affect any public water main, associated fittings or service pipes. Any such protection and support works shall be completed to the satisfaction of the Distribution Engineer.

3. No temporary hutments, spoil heaps or material stores shall be erected or deposited over any public water main and the Contractor shall so conduct his work that he does not obstruct access to any public water main. Any extra costs incurred by Yorkshire Water by reason of any delay or extra work involved in obtaining access to any public water main resulting from the Contractor's activities will be recharged to the Contractor.

4. The Contractor shall not make any connection to a public water main and shall pay all charges for any connections carried out by Yorkshire Water where applicable. Fire hydrants or wash-out hydrants shall only be used following receipt of specific approval from the Distribution Engineer and the Contractor shall use only stand-pipes provided by Yorkshire Water. Any costs associated with such hire and use of stand-pipes shall be paid by the Contractor.

5. In order to comply with the above the Contractor should contact:-

Distribution Engineer
Yorkshire Water
Central Division
Area Office
38 Southgate
Wakefield
WF1 1TF

Telephone: Wakefield 372101

Special Requirements in Relation to:

BRITISH RAILWAYS BOARD

1. DEFINITIONS

(a) The "Board" means the British Railways Board.

(b) The "Board's Engineer" means the Chief Civil Engineer of the Eastern Region or other the Engineer appointed for the time being to act on his behalf.

(c) The "Works" means for the purpose of these Special Requirements that part of the work to be executed and constructed over upon or under the Board's land (or other land used by the Board) or in such close proximity that it may affect such land or the Board's traffic.

(d) "Handsignalman" means for the purpose of these Special Requirements handsignalmen and traffic supervisors.

2. RESTRICTIONS OCCUPATIONS AND ISOLATION

Demolition, excavating, piling and temporary or permanent works or any other works in the vicinity of the track, which in the opinion of the Board's Engineer require speed restrictions track occupations or electrical isolations shall be carried out on dates and times agreed in writing by the Board's Engineer. The restrictions occupations and isolations are strictly limited on most routes to minimise delays to the Board's railway traffic. They should be avoided wherever practicable. Occupations and isolations are likely to be available only at weekends or for short periods at night.

3. USE OF THE BOARD'S LAND

The Contractor shall from time to time be allowed to take possession of so much of the Board's land as has been agreed for the carrying out of the Works. Where access to the working site is required by way of the Board's land the route of such access shall be agreed with the Board's Engineer. Any other land belonging to the Board which is required for temporary use outside that which is essential for the actual carrying out of the Works shall be the subject of separate negotiations with the Board's Estate Surveyor. The Contractor shall be responsible for ensuring that any persons employed on their behalf do not trespass beyond the agreed limits of the working area or access route and shall if required to do so provide and maintain to the satisfaction of the Board's Engineer temporary fencing of an approved type to prevent trespass on the railway.

4. PREVENTION OF ACCIDENTS

Before entry is made on to the Board's land, the Contractor shall obtain in the interests of personal safety copies of the Board's current Track Safety Handbook. A copy shall be given to each person employed on behalf of the Contractor who may work on, or about the track including persons recruited during the progress of the Works. The Contractor shall ensure that such persons are fully conversant with the requirements of the Handbook and that these requirements are strictly observed.

A poster (obtainable from the Board) which draws attention to the Handbook and the need for care on the track shall be erected and maintained in a prominent position at the place of work preferably in the messroom.

5. HIGH VISIBILITY OF CLOTHING

The Contractor shall ensure that sufficient high visibility clothing of a pattern and a shade of orange colour approved by the Board's Engineer is supplied to all persons employed on their behalf who may work on, or about the track and shall ensure that such persons wear this clothing.

6. ACCESS AND ACCOMMODATION FOR BOARD'S REPRESENTATIVES

The Board's Engineer or his representative shall at all reasonable times have free access to any premises where work is being carried out of materials prepared or manufactured for the Works.

7. METHOD OF CARRYING OUT THE WORKS AND USE OF PLANT

All operations on or affecting the Board's land shall be carried out in such a manner so as to avoid risk of danger to the Board's traffic facilities and passengers or persons entitled to be on the Board's property, and as to avoid (except to the extent previously agreed in writing) any interference to the free movement of the Board's traffic and any such passengers or persons other than the Board's employees.

All excavations shall be properly guarded and all walkways and routes used by the Board's employees shall be kept safe and free from debris.

The Contractor shall submit full details (including calculations and drawings when considered necessary by the Board's Engineer) of all proposed temporary works (including formwork) excavations, piling and demolition over, under or in the vicinity of the Board's railways or other property and of the methods proposed for the execution of the Works in sufficient time for full consideration to be given by the Board's Engineer and if necessary for revised proposals to be submitted and approved.

In particular the Board's Engineer may require the submission of drawings showing the proposed method of using and handling plant and materials in the vicinity of the tracks. Plant and materials shall not be used or handled in such a manner that even in the event of mishandling or failure such plant and materials could move or fall foul of rail traffic, i.e. within 2 metres of a vertical plane from the nearest rail on which traffic may run (subject to Requirement 12.1 when working near overhead electrified lines).

The use and handling of mechanical plant and materials in the vicinity of the track shall be carried out only under such restrictions as the Board's Engineer may impose for the protection of rail traffic. Unless foolproof guard rails, locking devices or other safety measures can be provided to the satisfaction of the Board's Engineer, such work shall only be carried out during occupations or if the Board's Engineer considers conditions are suitable between the passage of trains with work ceasing on receipt of instructions from the Board's handsignalman and not restarting until permitted by him to do so.

The Contractor shall ensure that the method of carrying out the Works and all safety arrangements required in connection therewith, are approved in writing by the Board's Engineer and shall ensure that any rules regulations or instructions imposed by the Board's Engineer for the protection of rail traffic are strictly observed.

Excavation near any railway line or structures shall not commence until the agreed measures required to maintain the stability of the track and/or structures have been carried out and have been inspected and approved by the Board's Engineer.

8. CONFIRMATION OF PROGRAMME OF WORK ON OR NEAR THE RAILWAY.

After the method of carrying out the Works has been agreed with the Board's Engineer (and taking into account any provisional arrangements which have been made) the Contractor shall in all cases submit written notice of programme of work and of any speed restriction occupation and isolation requirements to the Board's Engineer at least 10 weeks in advance of the proposed commencement of work on or near the railway tracks.

The Board reserve the right to cancel or alter the dates and times of the agreed speed restrictions, occupations or isolations at short notice if this proves necessary because of any emergency affecting the safe or uninterrupted running of rail traffic but in such an event alternative arrangements will be made as soon as the Board's programme permits.

9. HANDSIGNALMEN LOOKOUTMEN AND RAILWAY SUPERVISORS

Before commencing any work in the vicinity of the track the Contractor shall ascertain whether the Board's Engineer considers it necessary to appoint handsignalmen for the control of trains; lookoutmen for the protection of persons employed on their behalf at the site and/or railway; supervisors for inspecting the Works and ensuring the safety of the Board's traffic and property. The Contractor shall only proceed with the Works or allow such persons to approach and remain close to the tracks when such handsignalmen lookoutmen and/or railway supervisors have been provided and are in position and whilst they are acting as such. However, in the case of supervisors only, such supervisors may authorise specific work to proceed in their absence.

The Contractor shall ensure that wherever work is in progress in the vicinity of the railway the person at site in charge of the Works has ascertained from the Board's representative the best method of stopping trains in the event of a mishap that could affect the safety of trains, and in the case of an electrified line how to have the current switched off in the event of an emergency.

10. INTERFERENCE WITH DRAINS AND SERVICES

The Contractor shall not interfere with the Board's cables signals telegraph wires or any other apparatus affecting the working of the railway. The Contractor shall give sufficient notice to the Board's Engineer to enable him to arrange for any diversion protection or support works which the Board's Engineer considers should be carried out prior to the commencement by the Contractor of any work which may affect such apparatus.

The Contractor shall when necessary, and to the complete satisfaction of the Board's Engineer, locate, divert or support other pipes and services including public utilities.

Any springs watercourses or drains which may be interfered with or cut through shall be preserved and pipes and other means be provided so as not to stop or diminish their present usage, and should any drain or spring appear, adequate measures shall be provided to convey the water and soil therefrom to a suitable outlet and every reasonable precaution taken to protect the Board's works and property from injury in consequence of the Works. The Contractor shall not be allowed without the prior approval of the Board's Engineer to make temporary or permanent connections to the railway mains, drains, pipes or other services.

11. CROSSING THE TRACK

Persons engaged on the Works shall not be allowed to cross or convey material across the tracks except under such special conditions as the Board's Engineer may previously approve in writing. Only in exceptional circumstances will the provision of a temporary level crossing be permitted over any railway track.

If the Board are prepared to accept the provision of a level crossing, then for a level crossing required for construction, traffic over lines used by passenger trains (or which could be used by diverted passenger trains without any special arrangements being made) and all temporary public level crossings, time must be allowed to enable the approval of the Railway Inspectorate of the Department of the Environment to be obtained in addition to the period of notice required by the Board as described in Requirement 8.

12. ELECTRIFIED RAILWAYS

The Contractor's attention is drawn to the presence in some areas of electric traction equipment which may be either overhead or conductor rail. This equipment is lethal and the Contractor shall obtain from the Board's Engineer and shall post in prominent positions agreed with the Board's Engineer warning notices and shall be solely responsible for seeing that such warning notices and other instructions including those given in the Board's Track Safety Handbook are observed.

12.1 Overhead Electrical Equipment

Overhead electrical equipment is charged at high voltage and the Contractor shall observe the following precautions:-

(1) Work shall not be carried out, cranes or other plant erected, operated and dismantled, or materials stored within the prohibited space which is that space within 3 metres of the live overhead equipment together with anywhere vertically above this space.

(2) When persons are working the figure of 3 metres used in determining the prohibited space in paragraph (1) shall be increased by the length of any tool or material being handled. However, normal work on the permanent way, platforms, walkways and the like below the equipment is permitted without special precautions provided the tools or equipment are not at any time raised above head height.

(3) When scaffolding is being erected or dismantled the figure of 3 metres used in determining the prohibited space in paragraph (1) shall be increased by the length of the longest individual unit of the scaffolding (The Board's Engineer may require the scaffolding or similar apparatus to be earthed).

(4) If a crane or other equipment is used, crane stops, fencing warning notices etc. shall be provided by the Contractor to ensure that there can be no encroachment on the prohibited space defined in paragraph (1) by crane load or other equipment even if the crane load or equipment slips, fails or overturns.

(5) Portable ladders used in the vicinity of the live overhead equipment shall be of wood or other non-conducting material, and shall not be reinforced by metal attachments running along the stiles of the ladders. Even ladders without reinforcement can lead to serious electrical shocks if allowed to come close to live overhead equipment and therefore special precautions must be taken to ensure the ladder cannot slip and encroach on the prohibited space defined in paragraph (1).

(6) Any disturbance of or attachment to any equipment forming part of the electric system shall only be carried out by the Board's staff.

Where it is impracticable to comply with any of the above requirements the Contractor shall arrange with the Board's Engineer for special precautions to be taken which could take one of the following forms:-

(a) The issue by the Board's Engineer of a "Permit to Work" which assures the holder that the overhead equipment is isolated and earthed and will not be made live whilst the Permit is in the holder's possession.

It is the responsibility of the Contractor to whom a "Permit to Work" is issued to:-

(i) Confirm immediately to the Board's Engineer their understanding of the limits of isolation given therein.

(ii) Ensure that persons employed on their behalf fully understand the limits of the isolation.

(iii) Ensure that no work is commenced within the limits specified unless and until the "Permit to Work" is in his possession.

(b) The erection of approved protection platforms and/or screens.

The erection of these may need to be carried out under cover of a "Permit to Work" following which work may be carried out normally behind screens or on platforms without a further "Permit to Work".

12.2 Conductor rail equipment

Work in the vicinity of a conductor rail or associated electrical equipment may involve the provision of a temporary protection guards and/or protective boarding conductor rail alterations (any of which would normally be carried out by the Board) and/or the isolation by the Board of a length of conductor rail and such other electrical equipment as considered necessary by the Board's Engineer.

It is the responsibility of the Contractor to:-

(1) Ascertain from the Board's representative at site responsible for traction current arrangement the limits of isolation.

(2) Ensure that persons employed on their behalf fully understand the limits of isolation.

(3) Ensure that work is not carried out beyond the limits of isolation.

13. USE OF EXPLOSIVES

Explosives shall not be used in connection with the Works without the written consent of the Board's Engineer and then only under such conditions as he may impose.

14. STACKING OF MATERIALS ETC.

The Contractor shall stack and place all materials, plant and appliances in such a manner as to prevent their causing injury or damage to persons or property, and at a safe distance from railway tracks or platform edges normally not less than 2 metres but subject to Requirement 12.1. The Contractor shall also strictly observe any instructions given by the Board's Engineer as to the precautions to be taken and the distance from railway tracks and platform edges within which materials plant and appliances shall not be stacked or placed.

15. SCREENING OF LIGHTS

All lights provided by the Contractor shall be so placed or screened as not to interfere with any signal of the Board and any temporary works which may interfere with the sighting of the Board's signals shall not be erected without the consent of the Board's Engineer.

16. FIRE PREVENTION

The Contractor shall during the performance of the Works make adequate arrangements to the satisfaction of the Board's Engineer for the protection of the Works and any temporary works, and any adjacent property of the Board from fire and shall give effect to the requirements (if any) with regard to such protection that has been laid down by the Board. The Contractor shall give the Board's Fire Officers all facilities periodically to inspect the fire prevention arrangements on the Board's land, and within such distance from it as such officers may consider necessary and shall at the Contractor's own cost remove such surplus materials and take such steps to reduce the fire risk as the Board's Engineer may from time to time require.

17. NOTICE OF ACCIDENTS

In the case of any casualty or accident arising out of the Works and occurring on the Board's land, the Contractor shall comply with the requirements of the Notice of Accidents Act 1894 or any statutory modification or re-enactment thereof and shall supply the Board's Engineer within 24 hours with four copies of the Notice sent to the Railway Inspectorate of the Department of the Environment as required by that Act. This is in addition to any statutory requirement to notify the Factory Inspectorate under the Factories Act 1961, or any statutory modification or re-enactment thereof.

18. ADVERTISEMENTS

The Contractor shall not permit any advertisements to be displayed on or above the Board's premises without the permission of the Board's Engineer.

19. SANITARY ACCOMMODATION

Sanitary accommodation will only be allowed on the Board's property when specifically agreed and a site has been allocated by the Board's Engineer.

Unless agreed by the Board's Engineer the Contractor shall not use the waiting rooms mess rooms or sanitary facilities provided by the Board for its passengers or staff.

The Contractor shall ensure that such accommodation meets with the approval of the local public health officer and shall remove thoroughly disinfect and fill in all pits sumps etc. When no longer required all to the satisfaction of the Board's Engineer.

20. CLEARANCE OF THE BOARD'S LAND AND PROPERTY

The Contractor shall prevent mud or water falling or draining on to the Board's land and property and particularly on to the track ballast and walkways. The Contractor shall not leave rubbish on the Board's land and property and shall subject to the approval of the Board's Engineer clear away and remove all constructional plant surplus materials and temporary works as and when in the opinion of the Board's Engineer these cease to be required for the work being carried out on the Board's land and property. All damage to the Board's land and property shall be made good to the satisfaction of the Board's Engineer.

Special Requirements in Relation to:

WAYS ACROSS THE WORKS

The Contractor shall maintain to the satisfaction of the Engineer, ways across the works as listed in the following schedule and indicated on drawing no. .

Name of Road	Description	Classification	Traffic Density in one direction (comm. vehicles/day)
Entrance road - used by owners of adjacent former allotment gardens for access to their land.			

INDEX TO SPECIFICATION

This index relates to the complete list of standard clauses and this may contain references to clauses which are not applicable to this contract.

SPECIFICATION

Note: Any clauses in this Specification which relate to work or materials not required by the Works, shall be deemed not to apply.

101 BRITISH STANDARDS

1. Where a current British Standard Specification is applicable, all materials, workmanship and tests contained in the standards shall be complied with unless specifically modified by this Specification. The editions of the British Standard referred to are those current at the date when the Tenders are invited.

102 ACCESS TO SITE

1. Access to the site shall be as shown on the contract drawings or as described in the contract document.

2. The Contractor may make his own arrangements for other access to the site at his own expense but only with the approval of the Engineer. The Contractor shall maintain the site access in good repair and make good, at his expense, any damage which, in the Engineer's opinion, occurs as a result of the Contractor's activities.

103 OFFICES, ETC.

1. The Contractor shall obtain prior approval from the Engineer for the siting of all huts, sheds, offices and other temporary buildings which are required either by the Contractor for his own use or by the Engineer.

2. The Contractor shall site his machine servicing and refuelling areas so that no pollution will occur and to minimise nuisance to adjacent property.

3. Where an item is included in the Bill of Quantities for providing, maintaining and removal on completion of temporary lock-up accommodation for the exclusive use of the Engineer's Representative, this shall be as detailed in the Contract. If the installation of a telephone is included this shall be a separate connection for the sole and private use of the Engineer.

104 WELFARE FACILITIES, SANITARY ACCOMMODATION

1. The Contractor shall provide welfare facilities as prescribed in the Working Rule Agreement published by the Civil Engineering Construction Conciliation Board for Great Britain. The sanitary accommodation and disposal arrangements shall comply with the requirements of the local Environmental Health Authority.

105 WATER SUPPLY

1. The Contractor shall provide and pay all charges in connection with adequate supplies of clean water which may be required for all purposes on the works. Local stream, pond or other surface or spring water may not be considered as suitable for use in the works and the Engineer's agreement to the Contractor's proposed source must be obtained.

106 DATUM FOR LEVELS AND SETTING OUT

1. The Contractor will be given a suitable ordnance or temporary bench mark on or near the site to which all levels shall be referred. As soon as the Contractor takes possession of the site, works bench marks must be established at a ratio of one per hectare of land area of the site.

   Levels will be agreed with the Engineer and a list supplied to him. Checks must be made on these bench marks every month and any adjustments agreed and recorded.

2. The Contractor shall, at his own expense, set out his working area where not otherwise defined, by means of stout posts atleast 1.2m high and set at 5.0m intervals. These posts shall be clearly marked in red and white stripes and maintained throughout the Contractor's operations on the site. The Engineer will only allow work to proceed when these posts are intact. The Engineer will require bunting to be provided and maintained at the Contractor's expense between the posts if any plant runs outside the boundary as marked above.

3. A datum or datum points may be provided before commencement of work on site. The Contractor shall afford these points such protection as deemed necessary by the Engineer and shall maintain such protection throughout the Contract period.

107 EXISTING GROUND LEVELS

1. The Contractor shall satisfy himself that the existing ground levels as indicated on the drawings or schedule of cross section levels are correct. Should the Contractor wish to dispute any levels, he shall submit to the Engineer, a schedule of the position of the levels considered to be in error and a set of revised levels. The existing ground relevant to the disputed levels shall not be disturbed before the Engineer's decision as to the correct levels is given.

108 PRIVATELY AND PUBLICLY OWNED SERVICES

1. If any privately owned service - for water, electricity, drainage, etc., passing through the site will be affected by the works, the Contractor shall provide a satisfactory alternative service in full working order to the satisfaction of the owner of the service and of the Engineer before cutting the existing service.

2. Drawings showing Statutory Undertakers' apparatus known to be affected by the works are included in the Contract. Drawings showing other apparatus within the Contract boundary are available for inspection This information is the latest available BUT IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE COMPLETENESS AND ACCURACY OF THE INFORMATION PRIOR TO THE COMMENCEMENT OF ANY WORKS.

3. Notwithstanding the fact that the information on affected services is not exhaustive, the final position of these services within the works has been discussed with the various bodies and to this extent the bodies are familiar with the final proposals. The intermediate stages of the works are unknown at the design stage, these being dictated by the Contractor's methods of working. Accordingly, the Contractor's programme must take into account the period of notice and duration of diversionary works on each body as contained in the Contract and the Contractor must also allow for any effect of these services and alterations upon the Works.

4. No clearance of, or alterations to, apparatus shall be carried out unless specifically ordered by the Engineer.

5. Any services affected by the Works must be temporarily supported by the Contractor who must also take all measures reasonably required by the various bodies to protect their services and property during the progress of the works.

6. The Contractor may be required to carry out certain works for, and on behalf of, the various bodies and he shall also provide with the prior approval of the Engineer, such assistance to the various bodies as may be authorised by the Engineer.

7. The Employer will not be held liable or responsible for any delay which may occur due to non-completion of or any damage occurring to such service in consequence of the Contractor's operations.

109 ADVERTISEMENTS AND PHOTOGRAPHS

1. No advertisements shall appear on any temporary or permanent part of the works without the written permission of the Engineer. All press representatives shall be referred to the Engineer. Photographs for publication shall not be made of any part of the works without the permission of the Engineer to whom enquiries regarding the approval of prints shall also be made.

110 DUST AND MUD

1. The Contractor shall employ the best practicable means to minimise the emission of dust from the site during the construction of the works. Sprinkling equipment in a serviceable condition must be kept ready for use on site at all times. Should this nuisance occur, sprinkling equipment shall be used to minimise its effect and the Contractor shall amend his method of working if necessary.

2. All existing highways used by the vehicles of the Contractor or any of his Sub-Contractors or suppliers of material or plant, and similarly any new roads which are part of the works and which are being used by traffic, shall be kept clean and clear of all dust and mud dropped by the said vehicles or their tyres. All dust and mud from the works spreading on these highways shall be immediately cleared by the Contractor as detailed in sub-clause (3) of this Clause.

3. Clearance shall be effected immediately by manual sweeping and removal of debris or, if so directed by the Engineer, by mechanical sweeping and clearing equipment and all dust, mud and other debris shall be removed entirely from the road surface. Additionally, if so directed by the Engineer, the road surface shall be hosed or watered using suitable equipment.

4. Compliance with the foregoing will not relieve the Contractor of any responsibility for complying with the requirements of any Highway Authority in respect of keeping roads clean.

111 TEMPORARY DIVERSION OF VEHICULAR AND PEDESTRIAN TRAFFIC

1. The Contractor shall construct temporary diversion ways wherever the works will interfere with existing public or private road or other ways over which there is a public or private right of way for any traffic.

2. The standard construction and width of the diversion shall be as shown on the drawings for the class or classes of traffic using the existing way.

3. Diversion ways must be constructed in advance of any interference with the existing ways and shall be maintained in a condition satisfactory to the Engineer for as long as required.

112 TRAFFIC SAFETY AND CONTROL

1. The Contractor shall provide, erect and maintain such traffic signs, lamps, barriers and traffic control signals and such other measures as may be necessitated by the construction of the works in accordance with the recommendations contained in Chapter 8 of the Traffic Sign Manual published by Her Majesty's Stationery Office for the Department of the Environment and any amendments thereof. Compliance with this Clause shall not relieve the Contractor of any of his other obligations and liabilities under the Contract and under the relevant provisions of the Highways Acts and Road Traffic Act.

2. Wherever single file traffic is necessary on a highway by reason of the construction of the works, the Contractor shall provide and maintain a minimum carriageway width of 3m, wider where necessary at curves and junctions as agreed by the Engineer. When alternate one-way (shuttle) working of traffic is required, the Contractor shall provide and maintain electric traffic control light signals and such traffic signs as may be required by the Engineer. The traffic control light signals shall normally be vehicle actuated but fixed time or manual actuation may be accepted by the Engineer in suitable cases. Manually operated 'Stop-Go' signs will be permitted only if agreed by the Engineer.

3. All signs, lamps, barriers and traffic control signals shall be in accordance with the requirements of the Traffic Signs Regulations and General Directions, current at the date of execution of the work.

4. The Contractor shall phase the work in a manner acceptable to the Police and the Engineer for the operation of traffic and shall, before commencing work, produce an agreed phased programme.

5. Traffic signs shall comply with BS 873 and road danger lamps with BS 3143 except that the flashing rate for flashing lamps shall be within the rate 120 - 150 flashes per minute. The minimum luminous intensity of the lamps shall be 0.5 candela for steady lamps, 1.0 candela for ripple lamps at their peak and 1.5 candela for flashing lamps at their peak.

113 CONTROL OF VIBRATION AND NOISE

1. The Contractor shall comply with the general recommendations set out in BS 5228 Code of Practice for Noise Control on Construction and Open Sites, together with the specific requirements set out below.

   (a) The Contractor's attention is drawn to the current legislation and in particular to procedures contained in Part III of the Control of Pollution Act, 1974 relating to control of noise on construction and demolition sites. Attention is also drawn to the British Standard Code of Practice for Noise Control on Construction and Open Sites (BS 5228 Part 1 : 1984).

   (b) The Contractor shall employ the best practicable means to minimise noise and vibration from within the site and compound and shall pay particular attention to the selection of the most appropriate available plant in order to minimise the neighbourhood noise (as mentioned in BS 5228, Section 3). All plant and equipment shall be maintained so as to avoid unnecessary noise and the Contractor shall make full use of suppressors and other mechanical means of reducing noise where these are commercially available.

   (c) Any machinery which is in intermittent use shall be shut down during periods of non-use, but if this is not practicable, shall be throttled back to a minimum.

   (d) Where operations require the use of compressors and breakers, pumps or generators the following conditions shall apply:

      (i) Compressors shall be silenced by all effective means,

      (ii) Breakers shall be fitted with mufflers and, where commercially available, dampened tools and accessories shall be used,

      (iii) Pumps and generators, if operating outside normal working hours, shall be acoustically screened.

2. Immediately the Contract is awarded the Contractor shall apply to the Chief Environmental Health Officer of the District Council for a normal consent under Section 61 of the Control of Pollution Act. An application Form for 'prior consent' is available from the District Council and will require particulars of:-

   (i) The works, and the method by which they are to be carried out,

   (ii) The proposed arrangements to minimise noise resulting from the work.

114 SUBMISSION OF SAMPLES AND TEST CERTIFICATES

1. As soon as possible after the Contract has been awarded, the Contractor shall submit to the Engineer a list of the suppliers from whom he proposes to purchase the materials necessary for the execution of the works. Each supplier must be willing to admit the Engineer, or his representative, to his premises during ordinary working hours for the purpose of obtaining samples of the materials in question. Alternatively, if required by the Engineer, the Contractor shall deliver the samples of the materials to the Engineer's office. Samples shall be taken in accordance with the relevant British Standard where applicable. Materials subsequently supplied shall conform within any specific tolerances to the quality of samples which have been approved by the Engineer.

2. The information regarding the names of the suppliers may be submitted at different times as may be convenient but the sources of supply shall not be changed without the Engineer's prior approval.

3. When any material or article is required to comply with a British Standard, such material or article or its container shall bear the stamp of the registered certification trade mark of the British Standards Institution. Alternatively, the Contractor shall submit to the Engineer, test certificates furnished by the supplier or manufacturer of the material or article indicating compliance with the relevant British Standard.

4. Materials or equipment specified in the Contract by means of a manufacturer or suppliers name or reference mark may be substituted by similar materials or equipment in the works subject to the prior approval of the Engineer.

5. During the Contract period the Contractor shall submit samples to the Engineer's site office when so instructed. Sample size shall be in accordance with Table 100/1.

   Suitable containers shall be provided by the Contractor.

TABLE 100/1

Material	Frequency of Testing	Size of Samples
Ready mixed	3 No. cubes per wagon	150 mm cube concrete
Sand	2 No. samples per wagon	3kg
Cement	2 No. samples per wagon	10kg
Pipe bedding	2 No. samples per wagon	25kg
Sub-base	2 No. samples per wagon	50kg
Lime	2 No. samples per wagon	2kg
Coated Materials	2 No. samples per wagon	2kg

115 SAFETY

1. The Contractor shall be responsible for all safety precautions being implemented. Records of inspections, examinations and tests as required by the various regulations should be available for the Engineer's inspection. The Contractor's attention is also drawn to the various Codes of Practice, advisory notes and manuals issued for specific operations and these shall be complied with.

2. Because of the nature of the site, particular attention is drawn to substances which may be encountered during the works. These may include:-

   Asbestos

   Hot and Burning Materials

   Drums and other Containers

   Unidentified Liquids, Slurries and Sludges

   Spent Oxides

   Sealed (or burst) Bags of Chemicals

   Gases (see sub-clause 3 of this Clause)

   Unusual Objects

   The Contractor shall inform the Engineer immediately upon discovering any such substances, cease work in the immediate vicinity and agree his method of working with the Engineer before restarting.

3. Safety precautions are required to be taken in and adjacent to sewers, culverts, drains, manholes, excavations and other confined spaces, etc., where, because of the nature of the site, toxic flammable or oxygen deficient atmospheres may be present. The minimumtesting equipment that the Contractor shall have on site at all timesshall be able to detect an oxygen deficient atmosphere, the presenceof methane gas and the Contractor shall ensure that his personnel do not smoke in all areas where such risks exist.

4. The Contractor's attention is drawn to the need for the Engineer to have free access at all times to the works. For the purpose of making any necessary inspections, the Contractor shall provide all equipment and labour required by the Engineer's Representative and his assistants.

116 PROGRAMME OF WORKS

1. In accordance with Clause 14 of the General Conditions of Contract, the Contractor will be required to provide an initial Programme of Works as soon as practicable after acceptance of the tender.

2. The Contractor's attention is drawn to the need to phase the works to take into account the following:-

   (i) Working hours shall be as follows:-

Monday to Fridays	0730 to 1930
Saturdays	0800 to 1300
Sundays and Bank Holidays	Not At All

   (ii) The need for an interim gas control system to be provided as soon as the contractor takes possession of the site.

   (iii) Installation of gas wells, piezometers, vents and initial monitoring shall be carried out within two weeks of commencement of the works.

   (iv) The initial report shall be provided within three weeks of completion of the pumping trial.

   (v) The final report, including the design of a permanent scheme, shall be provided within three weeks of the initial report.

117 TEMPORARY DRAINAGE

1. The Contractor shall be responsible for the temporary drainage of the works. He shall carry out his operations so that water shall not stand on the site. Trenches and excavated pits shall be kept free of water and the Contractor shall arrange for the immediate disposal of water shed onto the earthworks or completed formation or any other intermediate stage of the permanent works. Where practicable, water shall, with the prior consent of the Engineer, be discharged into the outfall(s) for the permanent drainage system. Adequate means for trapping silts shall be provided in temporary systems discharging into permanent works and the Contractor shall not allow water on the site to become polluted by this method of working.

2. All temporary and permanent drainage works shall be kept free of silt and rubbish for the duration of the Contract period.

3. Immediately prior to completion of the works, the Contractor shall clean out all permanent ditches and silt traps and dispose of the arisings.

Clauses 118 and 119 are not used.

120 EQUIPMENT FOR THE ENGINEER'S REPRESENTATIVE

i The following equipment shall be supplied for the sole use for the Resident Engineer for the duration of the contract.

	1No.	automatic level, minimum magnification 25 x, erect image and horizontal circle reading to parts of degree.
	1No.	5m levelling staff with levelling bubble
	6No.	2m ranging rods
*	1No.	35 mm auto focus compact camera with built in data back and electronic flash (including all batteries)
	12No.	35mm 400ASA slide films, 36 exposure, contractor to cover cost of processing
	4No.	Safety helmets of a colour not worn by the Contractor's employees
	1No.	6" total station with legs, prisms for a range of 1000m, tripod and monopod for prisms, data logger compatible with MOSS and connectable to Apollo Domain computer.
	2No.	battery packs and charger, for above
*	1No.	GMI Landsurveyor 1 - Gas Detector - together with carrying strap, flexible plastic probes, suction bulb, 1.5m sampling line.
*	1No.	electronic calculator with LCD display, triganometrical functions and memory
	Road nails, road chalk, pegs (long and short), profile boards, nails etc., as required	

* signifies to be retained by the Engineer.

Clauses 121 to 200 are not used.

201. PROVISION OF INTERIM GAS CONTROL SYSTEM

1. At present the owners of the southern part of the site, Biffa Waste Services Ltd are operating a gas pumping and flaring system. This system comprises 9 vertical extraction wells, forming a barrier towards Healdfield Road, and connected to a positive extraction and flaring unit. Wells 5 to 9 have individual gas collector lines running to a 5 way inlet manifold, which is housed in a below ground level manifold chamber. A main collector line transfers the gas from this manifold to an inlet on the flare/extraction unit manifold. Wells 1 to 4 have individual gas collector lines running to other inlets on the flare/extraction unit manifold. The flare/extraction unit has a capacity of $500m^3/hr$, is skid mounted and located in a compound together with a mobile generator and fuel tank.

2. Whilst the installed gas system is of a permanent nature the flare/extraction unit, its manifold, the mobile generator, fuel tank and compound are of a temporary nature and are hired from Biffa Environmental Technology. The contractor on taking possession of the site shall become responsible for the provision, installation, maintenance and running of a gas control system (similar to the existing), until a permanent one is installed for the whole site. This system must be approved by the Engineer and the contractor shall carry out weekly monitoring of it and the existing boreholes, to prove its effectiveness.

202. SPIKE SURVEY

1. A spike survey is to be carried out, on a 20m grid, as shown on drg R/21.103/5 and readings of CO_2, CH_4 and O_2 taken immediately after each hole is produced. Permanent 'Gasvent' probes shall be installed as shown on drg R/21.103/5 and used for the survey as well as during the pumping trial. Three tests are to be carried out such that readings are taken during falling; rising and steady atmospheric pressure.

Table 1: Examples of Wastes Deposited at Healdfield Road Quarry Between 1972 and 1985

Food Processing Sludges
Agricultural Wastes
Tars, Pitch, Bitumen, Asphalt
Pesticides, Herbicides
Asbestos
Scrap Rubber, Latex
Fellmongering, Tannery Wastes
Leather Shavings
Industrial Effluent Sludges
Filter Cakes - Containing:
- Copper
- Zinc
- Cadmium
- Manganese
- Sodium
- Iron Hydroxide
- Ferric Phosphates and Sulphates
- Calcium Phosphates and Sulphates
- Aluminium

Polyurethane Foams/Resins with Isocyanate
Cosmetic/Pharmaceutical Wastes
Lead Smelting Slag
Wool Scouring Waste
Caustic Soda Wash
Incinerator Ash/Clinker
Wood/Paper Pulp
Fuel/Oil/Water Solutions
Septic Tank Wastes
Polyacrylamide Jelly
Water Treatment Chemicals

203. LANDFILL DETERMINATION

(i) Trials pits are to be excavated along the northern edge of the waste, to prove its extent. These shall be at a maximum spacing of 50m, upto 20m long and 2m in depth.

(ii) Six boreholes up to 20m deep are to be sunk through the waste, to investigate the type of waste deposited and its depth. Samples from the boreholes shall be taken at intervals of 3m and analysed for the parameters in Table 2. Should the water table be intercepted in any of these boreholes then samples shall be taken and analysed for the parameters in Table 2.

(iii) Three 15m deep boreholes are to sunk on the perimeter of the site, to investigate the ground water regime. These ground water monitoring boreholes shall be constructed as drawing number R/21.103/6. Samples of ground water shall be taken from each and analysed for the parameters in Table 2.

(iv) Samples of ground water shall be taken, where possible, from the existing boreholes on site and analysed for the parameters in Table 2.

(v) The site shall be divided into thirty approximately equally sized areas (50 x 50m) and samples collected for a contaminated land survey, in accordance with the guidelines contained in ICRCL 59/83, from the top 1.0m in these areas. The samples shall be analysed for the parameters in Table 2 and reported to these guidelines, in accordance with the afteruse proposals shown on drg R/21.103/1A.

(vi) Any records of waste input, previous monitoring etc. will be made availiable to the successful tenderer.

N.B. A qualified analytical chemist shall be available as backup to these works on site.

Table 2: Soil and Water Analysis Parameters

pH value	Arsenic	Iron	Cadmium
Cyanide	Thiocyanate	Mercury	Nickel
Selenium	Zinc	Copper	Chromium
Boron	Lead	Calcium	Aluminium
Manganese	Magnesium	Sulphates	Sulphites
Phosphates	Chlorides	Phenols	Potassium
Asbestos	Dissolved solids		
Electro-conductivity		Total hydrocarbons	
Total organic carbon		Polyaromatic hydrocarbons	

204. PUMPING TRIAL

Two gas wells shall be installed, as drawing number R/21.103/6. These shall be connected to a Gas Well Pumping and Scientific Monitoring Unit, a pumping trial shall be carried out for four weeks. Around the two wells a minimum of eight piezometric tubes are to be driven to 3m depth, on a 'figure-of-eight' pattern at various distances, to allow for analysis of:

Spheres of influence
Homogeneity of the waste
Migration rates through the fill

The assessment undertaken during the trial shall include:

(i) Readings of atmospheric pressure.

(ii) Monitoring of all existing boreholes, piezometric tubes and 'Gasvent' probes, sampling for O_2, CH_4, CO_2 and suction pressure variation.

(iii) Continuous analysis and recording of the gas collected.

This monitoring shall commence prior to active extraction, in order to determine the long term equilibrium of gas within the site, and consist of three sets of readings taken during falling; rising and steady atmospheric pressure. The pumping trial itself shall be controlled, in order that the following are achieved.

(i) An initial removal of the gas reservoir occurs.

(ii) The gas production rate is assessed and determined.

(iii) The spheres of influence are calculated at different extraction rates (each rate to be continued for a minimum of one day) - indicating porosity etc. of the waste.

(iv) The volume of gas potentially extractable at an optimum 50% V/V - indicating utilisation potential.

(v) Compare the wells against each other to indicate the homogeneity of the fill.

205. **REINSTATEMENT**

Following the investigation works any disturbance of the surface shall be reinstated and wastes buried at a depth of at least 1m.

206. **RESULTS AND ANALYSIS**

A diary shall be kept of the works and trial, then the results are to be tabulated and the following calculated:

(i) Total hours pumped.

(ii) Flow rate in m^3/hr - averages for each day.

(iii) Flow rate Vs methane concentrations.

(iv) Corrected volume combusted.

(v) Cumulative volume combusted, which gives an average methane production X% V/V.

(vi) Methane extraction versus atmospheric pressure.

From these results the total production potential for the site shall be calculated, along with computer modelling, thus giving an indication of the practicalities of extracting the gas and its relevance to migration control.

Details of the results and analysis shall be provided, in the form of an interim report, to the Engineer for his consideration.

Table 3 gives results from a computer model and the pumping trial results shall be compared with these.

207. **DESIGN OF PERMANENT GAS MIGRATION CONTROL SCHEME**

The design shall be carried out following the investigation works and analysis under Clause 206. It shall cover a scheme of gas collection for the whole site, incorporating the existing system which is shown on drawing no. R/21/103/4; the flaring of the collected gas and a ring of monitoring boreholes. Furthermore the investigation of a heating system, for possible adjacent greenhouses, to utilise the extracted gas.

This design shall include the detailing, specification, drawings and itemisation of the system, to allow the Client to go to tender for a Permanent Gas Migration Control Scheme.

208. **ASSESSMENT OF GROUND WATER AND CONTAMINATED LAND SURVEY**

The information gained from the contaminated land survey and tests on soil and water samples from boreholes, shall be used to assess the alternatives for restoration of the site. As a framework for this drawing number R/21.103/1A, Illustrative Landscape Proposals, is included.

There is the possibility of importing colliery spoil as a capping layer and the suitability of this, together with other options, shall be considered. Recommendations are to be made on which method of preventing the migration of contaminants and methane from the waste is economically viable.

From the results of ground water testing, the risk and probability of ground water pollution shall be examined and a range of remedial works examined.

209. **FINAL REPORT**

Three bound copies of the final report shall be provided, consisting of all the results of the investigations, analysis, assessment and design of a permanent scheme.

Table 3: Computer Model Results

Assumptions made:

Carbon/Organic Content	= 0.18	Assumed density	= 0.85
Percentage Methane v/v	= 50.0	% Recovery Rate	= 60.0
Temperature °C	= 35.0	Power Conversion	
Half Life, Years	= 10.0	Efficiency, %	= 31.1

Year	Deposition (Tonnes)	Maximum Methane (m^3)	Methane Recovery @ 60% (m3)	Maximum Production (m3/hr)	Recovery @ 60% (m3/hr)	Recoverable Power (MW)
1970	10000	121095	72657	14	8	0.01
1971	10000	234081	140448	27	16	0.02
1972	30000	581690	349014	66	40	0.06
1973	30000	906021	543612	103	62	0.10
1974	30000	1208632	725179	138	83	0.13
1975	30000	1490979	894587	170	102	0.16
1976	30000	1754417	1052650	200	120	0.19
1977	30000	2000214	1200128	228	137	0.21
1978	30000	2229551	1337730	255	153	0.24
1979	30000	2443529	1466118	279	167	0.26
1980	30000	2643178	1585907	302	181	0.28
1981	30000	2829457	1697674	323	194	0.30
1982	30000	3003262	1801957	343	206	0.32
1983	30000	3165428	1899257	361	217	0.34
1984	30000	3316733	1990040	379	227	0.35
1985	30000	3457907	2074744	395	237	0.37
1986		3226341	1935805	368	221	0.34
1987		3010282	1806169	344	206	0.32
1988		2808693	1685216	321	192	0.30
1989		2620603	1572362	299	179	0.28
1990		2445109	1467065	279	167	0.26
1991		2281367	1368820	260	156	0.24
1992		2128591	1277155	243	146	0.23
1993		1986046	1191627	227	136	0.21
1994		1853046	1111828	212	127	0.20
1995		1728953	1037372	197	118	0.18
1996		1613170	967902	184	110	0.17
1997		1505141	903085	172	103	0.16
1998		1404346	842608	160	96	0.15
1999		1310302	786181	150	90	0.14
2000		1222555	733533	140	84	0.13
2001		1140684	684410	130	78	0.12
2002		1064296	638577	121	73	0.11
2003		993023	595814	113	68	0.11
2004		926523	555914	106	63	0.10
2005		864477	518686	99	59	0.09
2006		684162	410497	78	47	0.09
2007		638345	383007	73	44	0.08

Clauses 210 to 410 are not used.

411 CEMENT

1. Unless otherwise stated in the Contract, all cement used in the works shall be Sulphate Resisting Portland Cement to BS 4027.

2. Cement shall be stored in dry weatherproof conditions.

412. WATER FOR USE WITH CEMENT

1. In accordance with Clause 105, the Engineer's approval shall be obtained regarding the source of water and the manner of its use. All water used with cement and aggregates must be suitable for such use when tested in accordance with BS 3148.

413 AGGREGATES FOR USE IN CONCRETE

1. Aggregates shall consist of naturally occurring materials complying with the requirements of BS 882. Water absorption shall not exceed 2% when measured in accordance with BS 812. Sand shall be fine aggregate resulting from the natural disintegration of rock.

2. Coarse aggregates shall have a flakiness index not exceeding 35 when measured by the sieve method described in BS 812.

3. Aggregates for granolithic concrete shall comply with BS 1201. Coarse aggregate shall be graded to Table 1 of BS 1201 and have an aggregate abrasion value, as defined in BS 12, not exceeding 10.0. Fine aggregate shall be naturally occurring sand to Table 2 of BS 1201.

4. All aggregates shall be kept free from contact with deleterious matter and in the case of aggregates passing a 5mm sieve, they shall be deposited on the site of mixing for not less than 8 hours before use. Aggregates of different sizes or specification shall be stored in different hoppers or stockpiles and shall be kept separate from each other. Coarse aggregates, unless otherwise agreed by the Engineer, shall be stockpiled in two separate sizes.

414 PROVISION OF CONCRETE

1. Ordinary structural concrete shall be provided in accordance with CP 110 and to the prescribed mixes detailed in sub-Clause 2 or 3 of this Clause, as required in the Contract.

2. Prescribed mixes for ordinary structural concrete shall be provided in accordance with Table 400/1 which gives the weights of cement and total dry aggregates in Kilogrammes to produce approximately one cubic metre of fully compacted concrete together with the percentages by weight of fine aggregates in total dry aggregates.

Table 400/1

	Nominal max size of Aggregate (mm)	20		10	
	Workability	MEDIUM	HIGH	MEDIUM	HIGH
Concrete Grade	Limits of Expected Slump (mm)	25-75	75-125	10-25	25-50
	Cement (Kg)	320	350	360	410
	Total Aggregate (Kg)	1800	1750	1750	1650
20	Sand: Zone 1(%)	40	45	50	55
	Zone 2(%)	35	40	45	50
	Zone 3(%)	30	35	40	45

3. Adjustments to mix proportions necessitated by variations in the physical characteristics of the constituents of the mix shall be agreed with the Engineer.

4. Admixtures may not be used in ordinary structural concrete.

5. The quantity of water used in mixing any concrete shall not exceed that required to produce a concrete of the workability appropriateto the situation in which the concrete is used. The workability shallbe such as to give slump values, determined in accordance with BS 1881, to be agreed in advance with the Engineer.

415. MIXING CONCRETE

1. Weighing and water-dispensing mechanisms shall be maintained in good order. Their accuracy shall be maintained within the tolerances described in BS 15 and checked against accurate weights and volumes when required by the Engineer.

2. Weights of cement and each size of aggregate as indicated by the mechanisms employed shall be within a tolerance of ±2% of the respective weights per batch agreed by the Engineer. The weight of the fine and coarse aggregates shall be adjusted to allow for the free water contained in them. The water to be added to the mix shall be reduced by the quantity of free water contained in the fine and coarse aggregates, which shall be determined by the Contractor by a method approved by the Engineer immediately before mixing begins, and further as the Engineer requires.

3. Unless otherwise agreed by the Engineer, concrete shall be mixed in a batch type mixer manufactured in accordance with BS 15 or in a batch type mixer, a specimen of which has been tested in accordance with BS 3963 and having a mixing performance within the limits of Table 6 of BS 15. Where appropriate, the batch capacity, method of loading, mixing time and drum speed shall conform to the details furnished in accordance with the requirements of BS 3963 for the mix which corresponds most closely to the mix proportions being used. The mixing blades of pan mixers shall be maintained within the tolerances specified by the manufacturers of the mixer and the blades shall be replaced when it is no longer possible to maintain the tolerance by adjustment.

4. Mixers which have been out of use for more than 30 minutes shall be thoroughly cleaned before any fresh concrete is mixed. Unless otherwise agreed by the Engineer, the first batch of concrete through the mixer after cleaning shall then contain only two thirds of the normal quantity of coarse aggregate. Mixing plant shall be thoroughly cleaned before changing from one type to another.

5. Concrete shall not be mixed when the air temperature in the shadeis below 3°C unless special precautions are taken which have been approved by the Engineer. No frozen material or materials containing ice shall be used and those which have been exposed to frost shall be completely thawed before use.

6. During hot weather, the Contractor shall ensure that the constituent materials of the concrete are sufficiently cool to prevent concrete from stiffening in the interval between its discharge from the mixer and compaction in its final position.

416 READY MIXED CONCRETE

1. Ready mixed concrete as defined in BS 5328 may be used only with the agreement of the Engineer. Mixes shall be as detailed in Clause 414 and water shall be added under supervision at the central batching plant. Under no circumstances is the water to be added in transit or at the site.

2. Concrete shall be carried in purpose-made agitators or truck mixers and the concrete shall be thoroughly re-mixed on receipt at the site. Unless otherwise agreed by the Engineer, truck mixers and their mixing and discharge performance shall comply with BS 4251. Re-mixing shall continue for a number and rate of revolutions not less than 7 revolutions per minute, for 10 minutes.

3. The concrete shall be compacted in its final position within 2 hours of the introduction of cement to the aggregates.

4. Each load shall be accompanied by a delivery note which shall contain the following information:-

a) Name or number of ready-mixed concrete depot
b) Serial number of ticket
c) Date
d) Truck number
e) Name of purchaser
f) Name and location of site
g) Grade of mix description of concrete
h) Specified workability
i) Type of cement
j) Nominal maximum size of aggregate
k) Quantity of concrete in cubic metres
l) Time of loading and introduction of cement
m) Details of admixtures

417 TRANSPORT AND PLACING OF CONCRETE

1. The method of transporting and placing concrete shall be subject to the approval of the Engineer. Concrete shall be so transported and placed that contamination, segregation or loss of the constituent materials does not occur.

2. All formwork and reinforcement contained in it shall be clean and free from standing water, snow or ice immediately before the placing of the concrete.

3. Concrete shall not be placed in any part of the structure until the Engineer's approval has been given. If placing of concrete is not started with 24 hours of approval being given, approval shall again be obtained from the Engineer. Placement of concrete shall then proceed continuously over the area between construction joints. Fresh concrete shall not be placed against insitu concrete which has been in position for more than 30 minutes unless a construction joint is formed in accordance with Clause 419. When insitu concrete has been in place for 4 hours (or less, as directed by the Engineer, depending upon the mix, type of cement and weather conditions), no further concrete shall be placed against it for a further 20 hours.

4. Concrete, when deposited, shall have a temperature of not less than5°C and not more than 32°C. It shall be compacted in its final position within 30 minutes of discharge from the mixer unless carried in purpose-made agitators, operating continuously, when the time shall be within 2 hours of the introduction of cement to the mix and within 30 minutes of discharge from the agitator.

5. Except where otherwise agreed by the Engineer, concrete shall bedeposited in horizontal layers to a compacted depth not exceeding 0.5m where internal vibrators are used, or 0.3m in all other cases.

6. Unless otherwise agreed by the Engineer, concrete shall not be dropped into place from a height exceeding 2.0m. When trunking or chutes are used, they shall be kept clean and used in such a way as to avoid segretation. Concrete shall not be pumped from aluminium conduits.

7. No concrete shall be placed in flowing water. Underwater concrete shall be placed in position by tremies, or by pipeline from the mixer. Full details of the method proposed shall be submitted in advance to the Engineer and his approval obtained before placing begins. Where the concrete is placed by a tremie, its size and method of operation shall be in accordance with Civil Engineering Code of Practice 'Foundations'. During and after placement of concrete under water, pumping or de-watering operations in the immediate vicinity shall be suspended until the Engineer permits them to be continued.

418 COMPACTION OF CONCRETE

1. All concrete shall be compacted to produce a dense homogenous mass. Unless otherwise agreed by the Engineer, it shall be compacted with the assistance of vibrators. Sufficient vibrators in serviceable condition shall be on site so that spare equipment is always available in the event of breakdowns.

2. Internal vibrators shall be capable of producing not less than 10,000 cycles per minute, and external vibrators not less than 3,000 cycles per minute.

3. Vibrations shall not be applied by way of reinforcement. Where vibrators of the immersion type are used, contact with reinforcement and all inserts, shall be avoided so far as is practicable.

4. Concrete shall not be subject to vibration between 4 and 24 hours after compaction.

Clause 419 is not used.

420 CURING OF CONCRETE

1. Immediately after compaction, and for 7 days thereafter, concrete shall be protected against harmful effects of weather, including rain, rapid temperature changes, frost and from drying out. The methods of protection used shall be subject to the approval of the Engineer.

2. When elevated-temperatures curing is used, 4 hours must elapse from the completion of the concrete before its temperature is raised. The rise in temperature within any period of 30 minutes shall not exceed 10°C and the maximum temperature attained shall not exceed 70°C. The rate of subsequent cooling shall not exceed the rate of heating.

3. The method of curing used shall prevent loss of moisture from the concrete. On concrete surfaces which are to be waterproofed, curing membranes shall be of the non-disintegrating type. Details of all curing methods to be used shall be subject to the approval of the Engineer.

421 USE OF CEMENT IN COLD WEATHER

1. No concreting or any other work involving the use of cement shall be carried out during heavy rain or below a shade temperature of 2°C on a rising thermometer or 4°C on a falling thermometer. All concrete placed during cold weather or when frost is likely to occur, or occurs, shall be protected from freezing by approved means.

422 TESTING OF CONCRETE

1. Sampling shall be in accordance with the requirements given in BS 1881: Part 1. A simple batch sampling procedure shall be adopted and the number, frequency and location of batches to be sampled shall be decided by the Engineer.

2. 150 mm cubes shall be made, cured and tested, all in accordance with BS 1881. All cubes made in compliance with this Clause shall be cast in the presence of the Engineer's Representative.

Clause 423 is not used.

424 CEMENT MORTAR

1. Mortar shall consist of two and a half parts of sand to one part cement, measure by volume of dry material.

2. Sand for use in cement mortar shall comply with Table II of BS 1200.

3. An impervious hard stage is to be provided for hand mixing of mortar. The sand and cement shall be thoroughly mixed in the dry state after which water may be added in such amounts as are necessary to make the mortar workable. The material must be turned over at least twice, following addition of water to ensure the correct consistency.

4. Machine mixing will be permitted.

5. Any plasticizer used shall be free from chlorides.

6. Mortar shall be used within one hour of mixing.

Clauses 425 to 502 are not used.

503. MATERIAL FOR SURROUNDS TO WELLS

1. Material shall have a grading within the following range:

BS 410 Test Sieve	Percentage by Mass Passing
63mm	100
37.5mm	85-100
20mm	0-25
10mm	0-5

3. Material shall meet the following requirements.

a) Water soluble sulphate content shall not exceed 2.5g/1when tested in accordance with BS 1377 Test 10.

b) The Magnesium Sulphate Soundness Value shall not exceed 12% when tested in accordance with Clause 515 of the specification.

c) The aggregate crushing value (ACV) of any 14mm to 10mm fraction of the material shall not exceed 35 when tested in accordance with Section 7, Paragraph 34 of BS 812 modified as follows:-

i) The prepared test sample shall be immersed in water at room temperature for 48 hours prior to test.

ii) The sample shall then be removed from the water, allowed to drain at room temperature for one minute and then tested in the crushing cylinder in the normal manner, and

iii) The crushed specimen shall be surface dried in accordance with paragraph 34(i) of BS 812 before being sieved.

d) Limestone shall not be used.

e) The compaction fraction shall not exceed 0.2 when tested as below:-

The following apparatus shall be used:

i) Open ended cylinder 250mm long and 145 to 160mm internal diameter.

ii) Metal rammer with a striking face 40mm diameter and of total mass 1Kg.

Method

Stand the cylinder on a firm flat surface.

Using a sample of material having a moisture content equal to that of the material at the time of use, pour the sample of material into the cylinder without supplementary compaction and strike off the material level with the top of the cylinder. Lift the cylinder clear of its contents and place on a fresh area of flat surface. Replace about one quarter of the material in the cylinder and tamp vigorously until no further compaction is evident. Repeat this process quarter by quarter until the whole of the material is measured loose in the cylinder is compacted.

The final measurement from the top of the cylinder to the compacted surface divided by the height of the cylinder is the compaction fraction value.

504 TYPES OF PIPE, JOINTS AND JOINTING

1. Pipes shall comply with the following requirements unless specified otherwise:

a) Uplasticized PVC(uPVC) Pipes and Fittings

Shall be to the class specified in the Contract and shall comply with requirements of BS 3505.

2. Individual lengths of pipe shall be jointed strictly in accordance with the manufacturer's instructions using the approved joints to provide a pipeline which, other than where perforated pipes are specified, is of a wholly watertight construction. No change of pipe type will be permitted between manholes and no mixing of joints will be allowed. Unless the manufacturer's instructions state otherwise, socket and spigot joints shall have a space no greater than 13mm between the spigot and the inner end of the socket at any point on the circumference of the completed joint.

Clauses 505 to 514 are not used.

515 MAGNESIUM SULPHATE SOUNDNESS TEST

1. The Magnesium Sulphate Soundness Test is carried out on a 1Kg mass of the material which passes a 20mm BS sieve and is retained on a 14mm BS sieve. The test sample is washed and dried, and is then subjected to five cycles of 17 hours immersion in a saturated solution of crystalline Magnesium Sulphate, in such a manner that the solution covers the sample to a depth of at least 10mm.

2. For the immersion period, the sample is kept at a constant temperature within the range of 15°C to 20°C. After the immersion period the sample is removed from the solution, allowed to drain, and is then dried in a suitable oven at a temperature of 100°C for 5 hours. The sample is allowed to cool to room temperature before immersion for the second cycle.

3. After the completion of the final cycle the sample is washed and dried and sieved through a 10mm BS sieve.

4. The amount of material that passes this sieve, expressed as a percentage of the original dry mass of the sample, is reported as the Magnesium Sulphate Soundness Value.

Clause 515 is the last clause.

APPENDIX 1

LIST OF DRAWINGS

The drawings referred to in the Form of Tender are as follows:

Drawing Number	Title	Scale
R/21.103 /1A	Illustrative Landscape Proposals	1:2500
/4	Existing Gas Extraction System	1:1250
/5	Proposed Investigation - Showing Services	1:1250
/6	Gas/Water Monitoring Boreholes	N.A.
/7	Contaminated Land Survey and Site Boundary	1:1250

PREAMBLE TO BILL OF QUANTITIES

1. The Bill of Quantities is compiled in accordance with the Civil Engineering Standard Method of Measurement (CESMM) 2nd Edition (1985) and as modified and extended herein. The various clauses contained within this Preamble shall take precedence over the CESMM in the event of any dispute.

2. The prices and rates entered against the various items in the Bill of Quantities shall be deemed to cover all materials, labour, plant, profit and other charges in connection with the work identified in the item and for complying with all requirements of the Contract relevant thereto including Specified Requirements of any clause not separately itemised in the Bill of Quantities.

3. Items against which no price or rate is entered shall be deemed to be covered by the other prices and rates in the Bill of Quantities.

4. The Tenderer shall include in his prices and rates for the effect on the phasing of the Works of alterations or additions to existing services and mains to the extent that such work is set forth or reasonably implied in the documents on which the tender is based.

5. (i) Rock shall be defined as natural material comprising geological strata or deposits which, in the opinion of the Engineer will in its removal have a significantly adve require the use of blasting, approved pneumatic tools or other specialist equipment for its removal, but excluding individual masses less than $0.2m^3$.

   (ii) Artificial hard material shall be defined as any material other than rock which, in the opinion of the Engineer, will in its removal have a significantly adverse effect on the rate of production for any operation and/or require the use of blasting, approved pneumatic tools or other specialist equipment for its removal, but excluding individual masses less than $0.2m^3$.

   (iii) No additional payment will be made for the breaking down of rock and artificial hard material into pieces to permit incorporation in the works as specified.

6. For the purposes of Clause 60 of the Conditions of Contract interim additional or deductions on account of the amount, if any, of the Adjustment Item shall be made by instalments in interim certificates in the proportion that the amount referred to in Clause 60(2) bears to the total of the Bill of Quantities before the addition or deduction of the amount of the Adjustment Item.

7. Method-Related Charges, if any, shall be certified and paid pursuant to Clauses 60(1)(d) and 60(2) of the Conditions of Contract.

DAYWORK SCHEDULE

When works are ordered to be carried out on a Daywork basis, payment for such works will be in accordance with the following:-

The plant rates are to include for fuel and consumable stores, repairs and maintenance, insurance of plant, head office charges and profit together with driver and attendants. This method of calculation to apply irrespective of whether the plant be directly owned, hired or in the ownership of a sub-contractor.

The Contractor is to list below the items, types of plant he intends to use to carry out the works.

(NB - Hire rates must include for driver)

ITEM OF PLANT	TYPE OR SIZE	HIRE RATE PER HOUR (including driver)

HEALDFIELD ROAD, QUARRY **B4.**

PART 1 PRELIMINARIES

Item No.	CESMM Code	Item Description	Unit	Quantity	Rate	Amount £ p
1.	A110	Performance Bond, cost of providing bond of surety - this item MUST be priced separately.	Sum			500.00
2.	A120	Cost of providing insurance of the works.	Sum			500.00
3.	A130	Cost of providing insurance of constructional plant.	Sum			500.00
4.	A140	Cost of providing insurance against damage to persons and property.	Sum			500.00
		Specified Requirements Temporary Works				
5.	A270	Provision, installation and removal of interim gas control system as clause 201.	Sum			2000.00
6.	A270	Running and maintenance of interim gas control system during investigation works.	Wk	14	1,000.00	14,000.00
7.	A270	Running and maintenance of interim gas control system following investigation works.	Wk	26	1,000.00	26,000.00
					Page total carried to part 1 summary	44,000.00

HEALDFIELD ROAD, QUARRY **B5.**

PART 1 PRELIMINARIES

Item No.	CESMM Code	Item Description	Unit	Quantity	Rate	Amount £ p
		Equipment for use by Engineers Staff				
8.	A233	Establishment and removal of equipment for the Engineer, clause 120.	Sum			2500.00
9.	A233	Maintenance of equipment for the Engineer, clause 120.	Sum			2500.00
10.	A242	Attendance upon Engineer's staff, chainman.	Hr.	50	10.00	500.00
		Testing of Materials in accordance with Clause 14				
11.	A250	Provision of and testing of samples.	Sum		100	100.00
		Provisional Sums to be Instructed by the Engineer				
11.	A420	Trial holes to investigate existing service locations.	Sum			200.00

Page total carried to part 1 summary	5800.00

HEALDFIELD ROAD, QUARRY **B6.**

PART 1 PRELIMINARIES

Item No.	CESMM Code	Item Description	Unit	Quantity	Rate	Amount £ p
		Method Related Charges *Items for Method Related Charges, if any, shall be inserted by the tenderer in accordance with Section 7 of the CESMM.*				
		Total for this page *Total for any additional pages attached*				--------
					Page total carried to part 1 summary	

HEALDFIELD ROAD QUARRY **B7**

PART: 1 PRELIMINARIES

Page No.	PAGE TOTALS	
	£	p
B4	44,000	00
B5	5,800	00
B6	00	00
Total Part Summary carried to Grand Summary	49,800	00

HEALDFIELD ROAD, QUARRY **B8.**

PART 2 SITE INVESTIGATION AND DESIGN

Item No.	CESMM Code	Item Description	Unit	Quantity	Rate	Amount £ p
1.	B999	Spike survey as clause 202, to include installation of Gas Vents.	Sum			6,000.00
2.	B112	Trial pits as clause 203.	Nr.	7	500.00	3,500.00
3.	B310	Boreholes as clause 203, to include sampling and analysis.	Nr.	6	2,500.00	15,000.00
4.	B310	Ground water monitoring boreholes as clause 203 to include sampling and analysis.	Nr.	3	2,500.00	7,500.00
5.	B999	Collection of ground water samples from existing boreholes and analysis as clause 203.	Nr.	12	500.00	6,000.00
6.	B999	Contaminated land survey, as clause 203, to include sampling and analysis.	Sum			5,000.00
7.	B999	Pumping trial, as clause 204, to include analysis and assessment.	Sum			13,500.00
8.	B999	Design of permanent gas migration control system, as clause 207.	Sum			3,000.00

Page total carried to part 2 summary | 54,500.00

HEALDFIELD ROAD, QUARRY

PART 2 SITE INVESTIGATION AND DESIGN

Item No.	CESMM Code	Item Description	Unit	Quantity	Rate	Amount £ p
9.	B999	Assessment of ground water and Contaminated Land Surveys, as Clause 208, to include recommendations/remedial works.	Sum			2,000.00
10.	B999	Final report, to include details of permanent gas migration control system and recommendations on restoration/remedial works.	Sum			2,000.00
11.	B999	Reinstatement of site, as clause 205.	Sum			2,500.00
					Page total carried to part 2 summary	6,500.00

HEALDFIELD ROAD QUARRY **B10**

PART: 2 SITE INVESTIGATION AND DESIGN

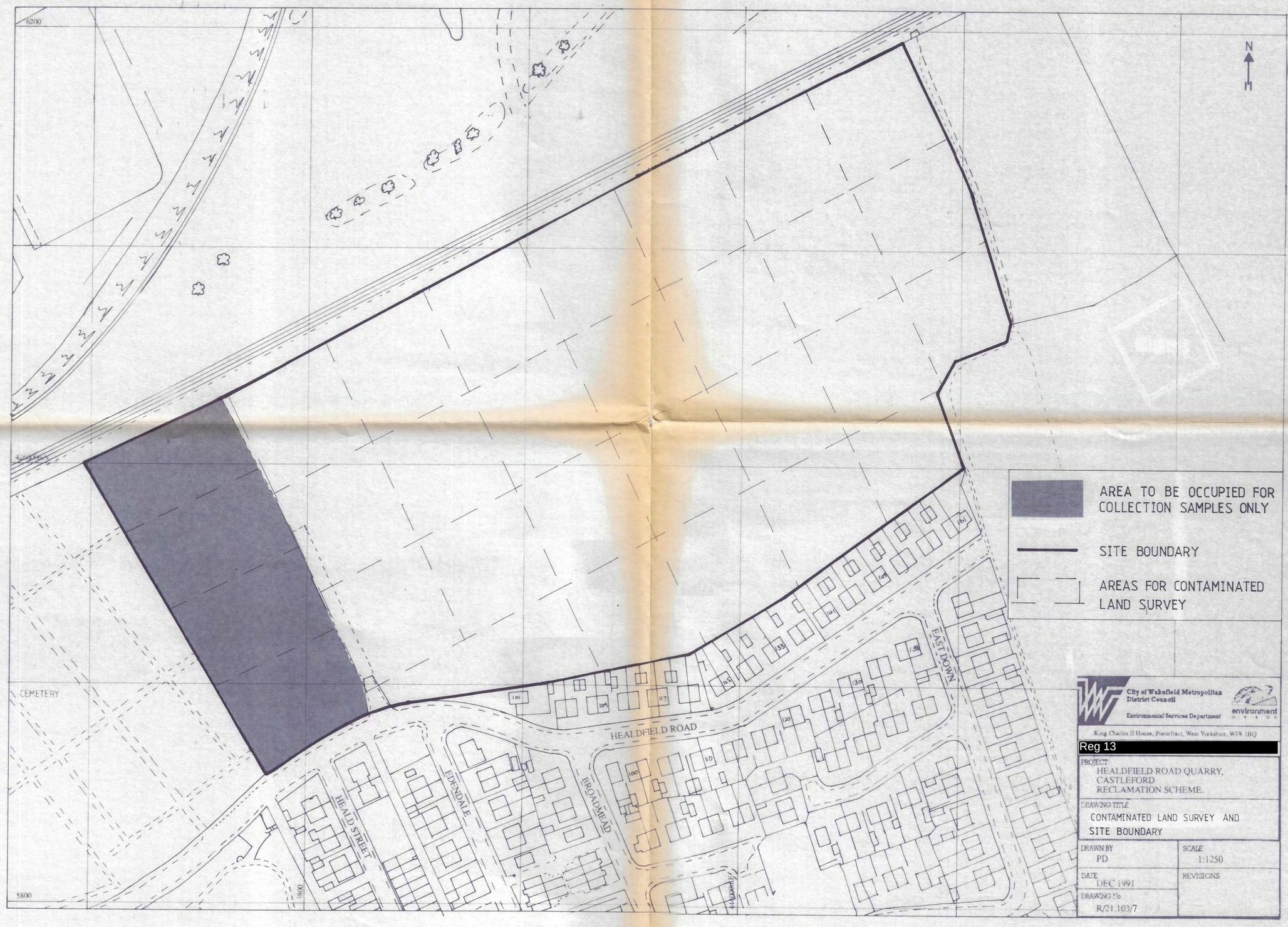
Page No.	PAGE TOTALS	
	£	p
B8	54,500	00
B9	6,500	00
Total Part Summary carried to Grand Summary	61,000	00

HEALDFIELD ROAD QUARRY **B11**

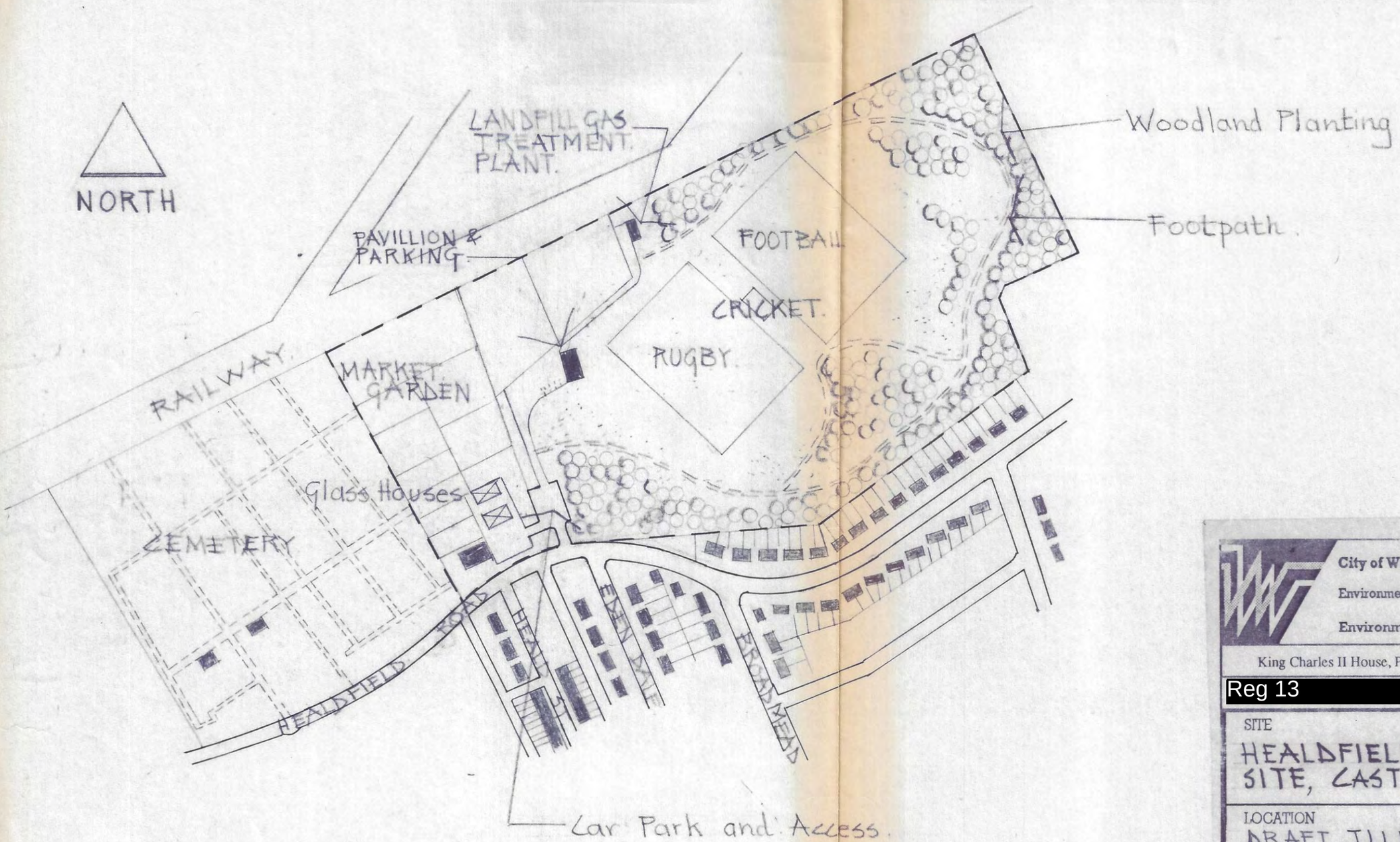
GRAND SUMMARY

PART 1 : Preliminaries	49,800.00
PART 2 : Site Investigation and Design	61,000.00
Total	110,800.00
Add 5% as a General Contingency Allowance	5,540.00
Total	116,340.00
Adjustment Item	00.00
TENDER TOTAL	£116,340.00

RFI4956 - Annex C



RFI4956 - Annex C



City of Wakefield Metropolitan District Council
Environmental Services Department
Environment Division

King Charles II House, Pontefract, West Yorkshire, WF8 1BQ.

Reg 13

SITE
HEALDFIELD ROAD QUARRY SITE, CASTLEFORD

LOCATION
DRAFT ILLUSTRATIVE LANDSCAPE PROPOSALS

DRAWN BY	SCALE
CRT	1:2500
DATE: February 91	REVISIONS: A July 91.
DRAWING No: R/21/103/1A	

RFI4956 - Annex C

PGM1
△24.740

PGM2

PGM3

PEG1

23 EXISTING CONTOURS

23 PROPOSED CONTOURS – These are finished levels and where filling is to take place it shall take account of the need for 500 mm depth of sub-soil. See also drg.no R/21103/11 for excavation to prepare the site prior to filling with imported material as capping layer.

SITE BOUNDARY

EXISTING GAS EQUIPMENT – Excavation and filling, around existing covers and across pipe runs, shall be carried out carefully. Fill material to within 1m of covers to be left adjacent, for others.

City of Wakefield Metropolitan District Council

Environmental Services Department

environment DIVISION

King Charles II House, Pontefract, West Yorkshire, WF8 1BQ.

Reg 13

PROJECT
HEALDFIELD ROAD QUARRY, RECLAMATION SCHEME

DRAWING TITLE
EXIST & PROP CONTOURS with CONTRACT BOUNDARY

DRAWN BY	SCALE
PD	1:500
DATE	REVISIONS
NOV 1992	
DRAWING No.	
R/21·103/10	

RFI4956 - Annex C

City of Wakefield Metropolitan District Council

Reg 13

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ENVIRONMENT DIVISION

PROJECT

HEALDFIELD ROAD QUARRY

DRAWING TITLE

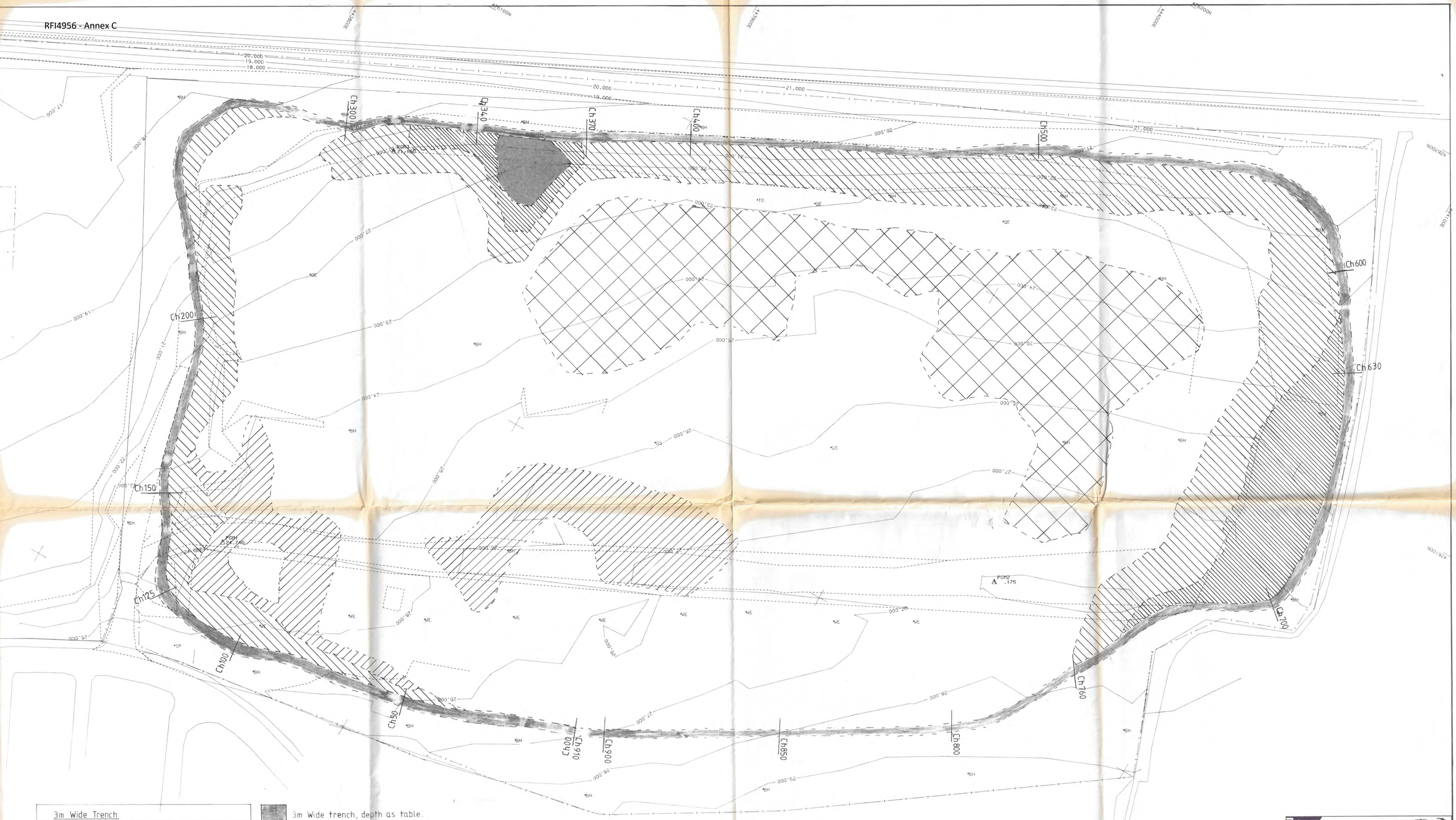
LANDSCAPE PROPOSALS

DRAWN	TRACED	CHECKED
KGM		

SCALE	DATE
1:1000	NOV 92

DRAWING No.	REV.
R/21/103/8	

RFI4956 - Annex C



3m Wide Trench			
Chainage	Depth	Chainage	Depth
0 0	0·5	370	1·5
50	0·5	600	1·0
100	1·0	630	1·5
125	1·0	700	2·0
150	1·5	760	0·5
200	1·0	910	0·5
250	0·5		
300	0·5		
340	1·5		

3m Wide trench, depth as table.

Excavation depth 0·25m

Excavation depth 0·25-0·75m

Excavation depth 0·75-1·5m

Excavation depth 1·5-2·0m

Filling area, for waste excavated, max 1m depth

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Environmental Services Department
environment DIVISION
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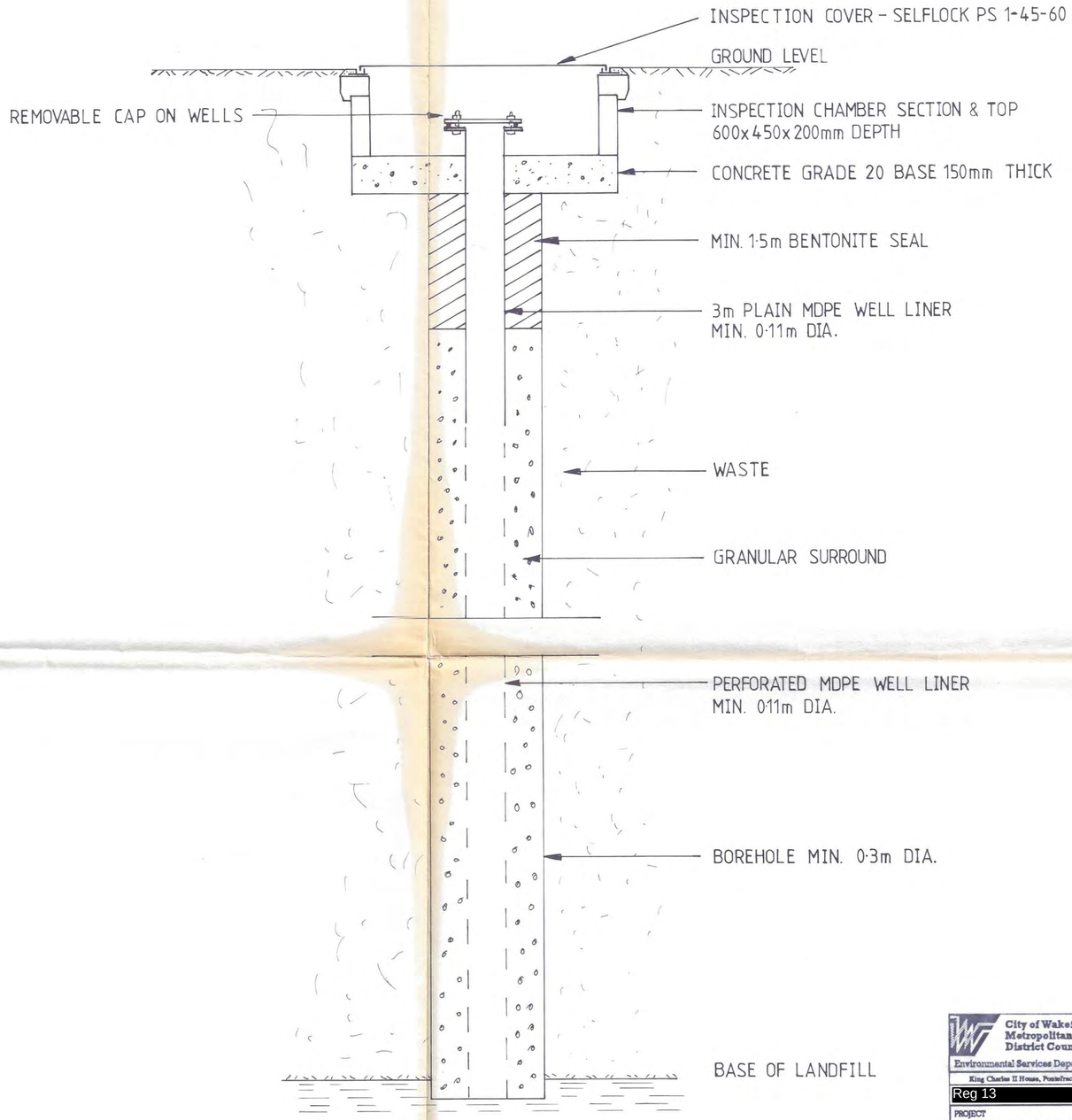
Reg 13

PROJECT: HEALDFIELD ROAD QUARRY. RECLAMATION SCHEME.

DRAWING TITLE: PRELIMINARY EARTHWORKS.

DRAWN BY	SCALE
PD	1:500
DATE: NOV 1992	REVISIONS
DRAWING No: R/21·103/11	

RFI4956 - Annex C



City of Wakefield Metropolitan District Council
Environmental Services Department — environment DIVISION
King Charles II House, Pontefract, West Yorkshire, WF8 1BQ.

Reg 13

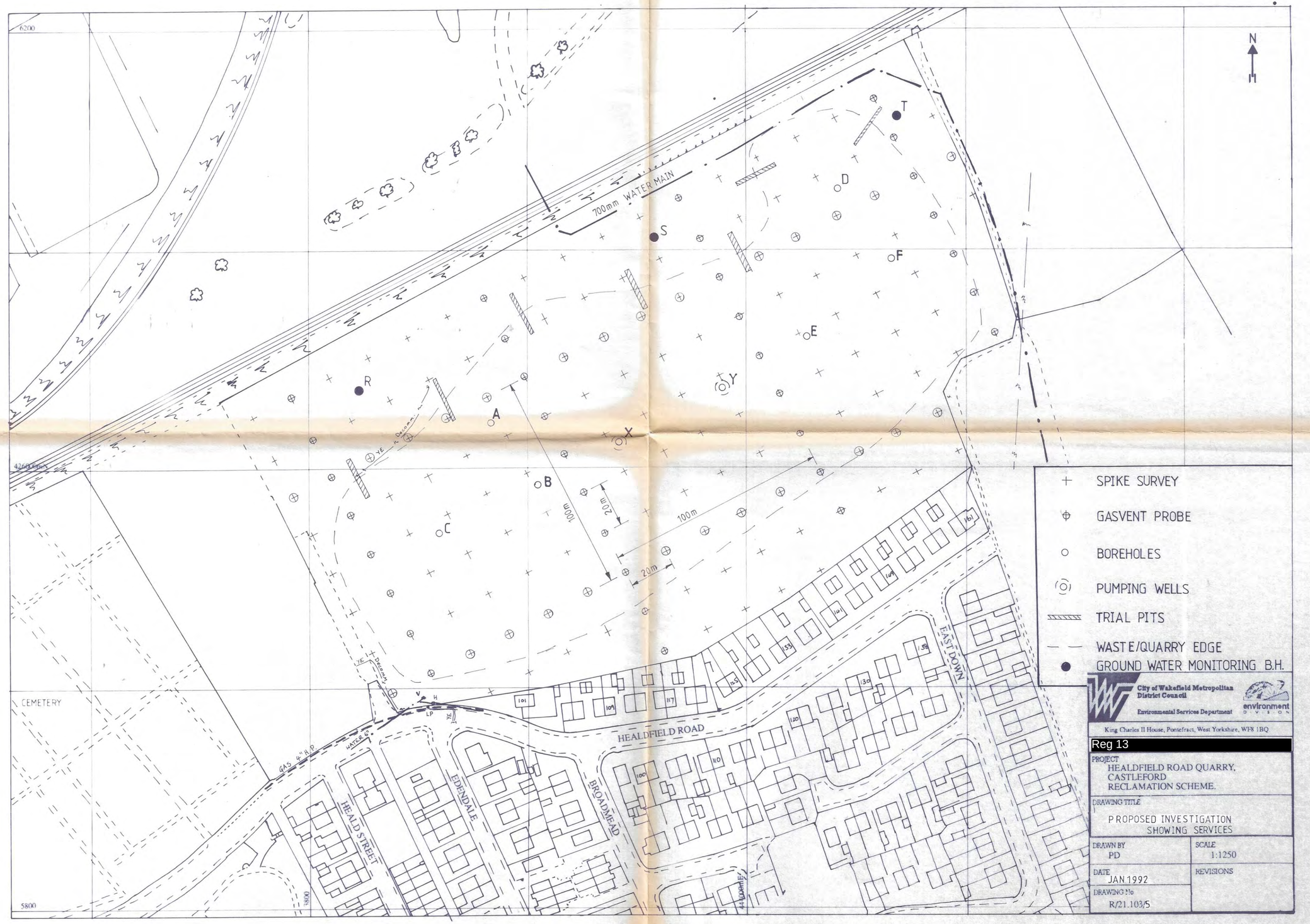
PROJECT
HEALDFIELD ROAD QUARRY, INVESTIGATION WORKS.

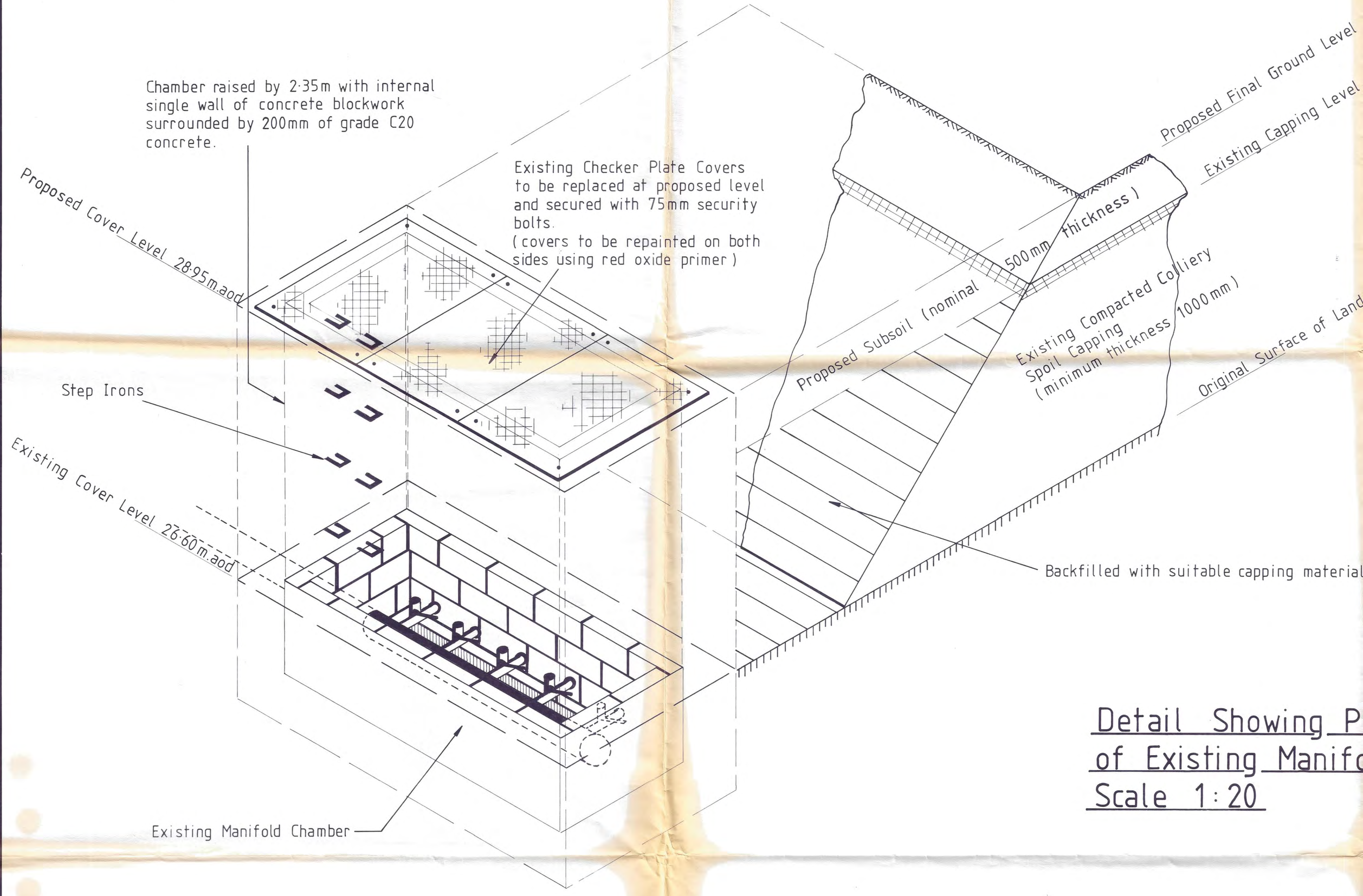
DRAWING TITLE
GAS/WATER MONITORING BOREHOLES

DRAWN BY	SCALE
PD	NA
DATE	REVISIONS
MAR 1992	
DRAWING No	
R/21/103/6	

RFI4956 - Annex C

RFI4956 - Annex C

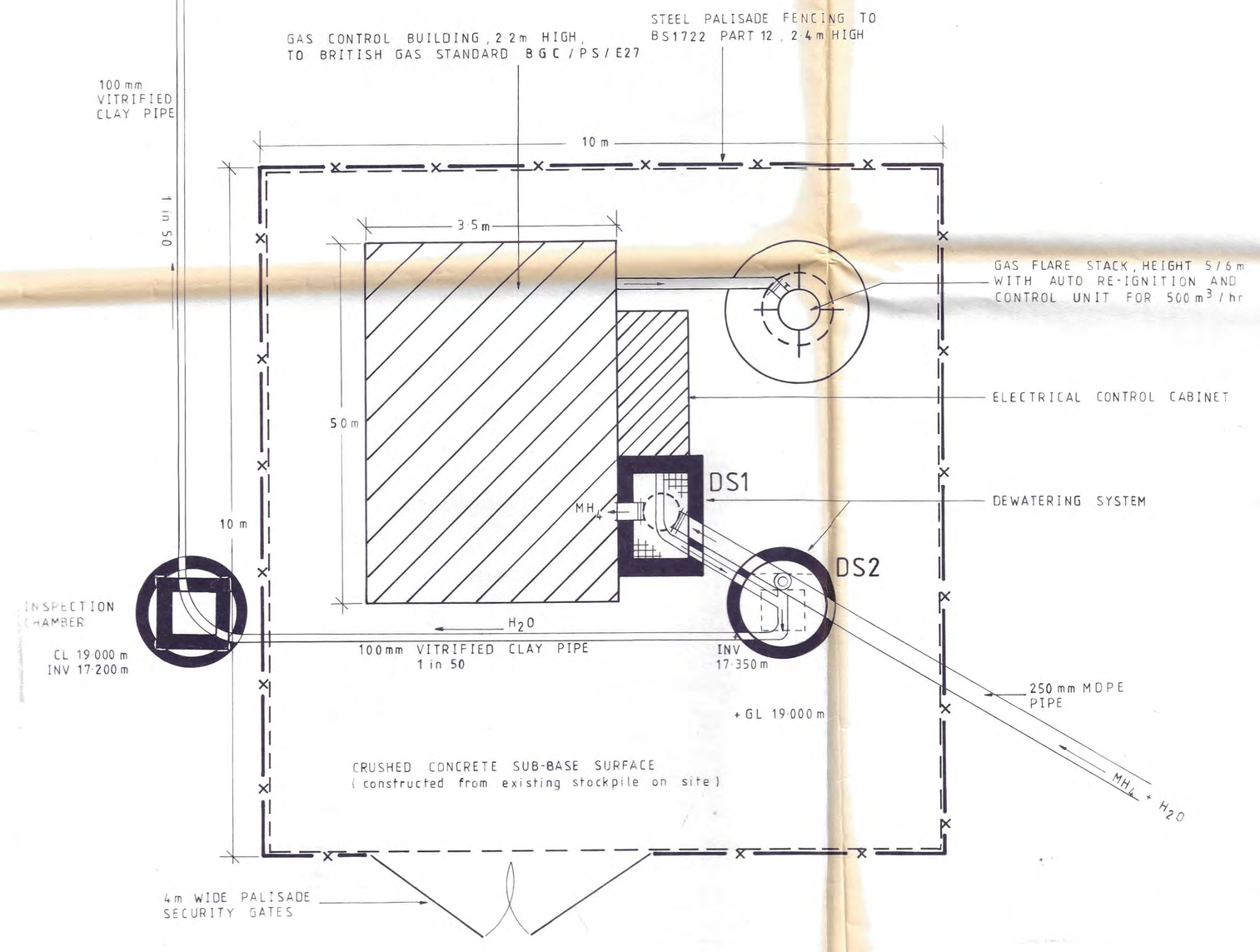




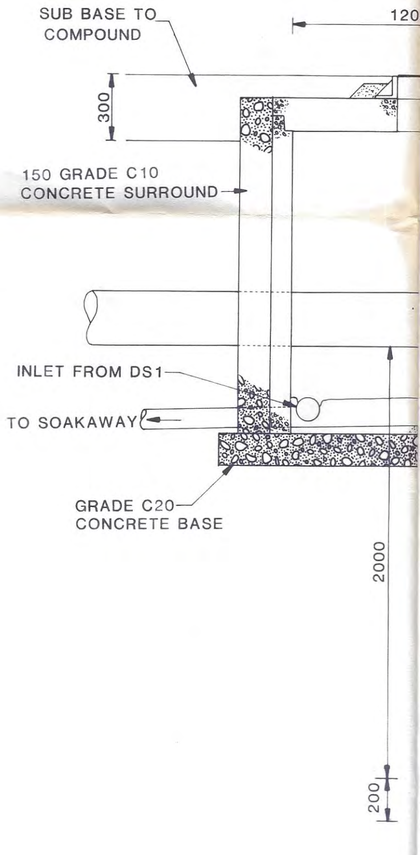
Detail Showing P
of Existing Manifo
Scale 1:20

RAILWAY

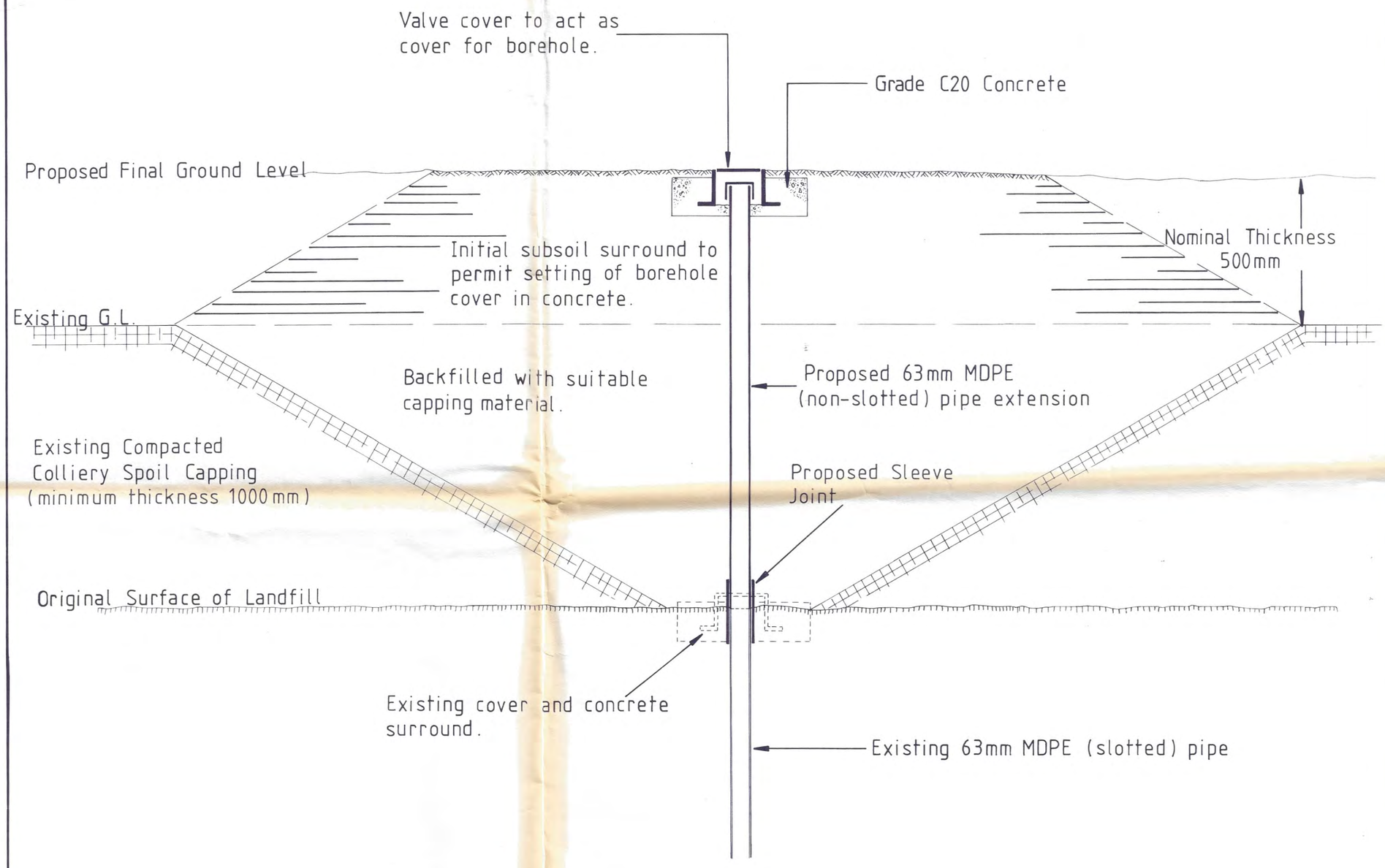
PLAN OF GAS CONTROL COMPOUND
SCALE 1:50



CONDENSATE CHAMBER DETA
SCALE 1:20



RFI4956 - Annex C

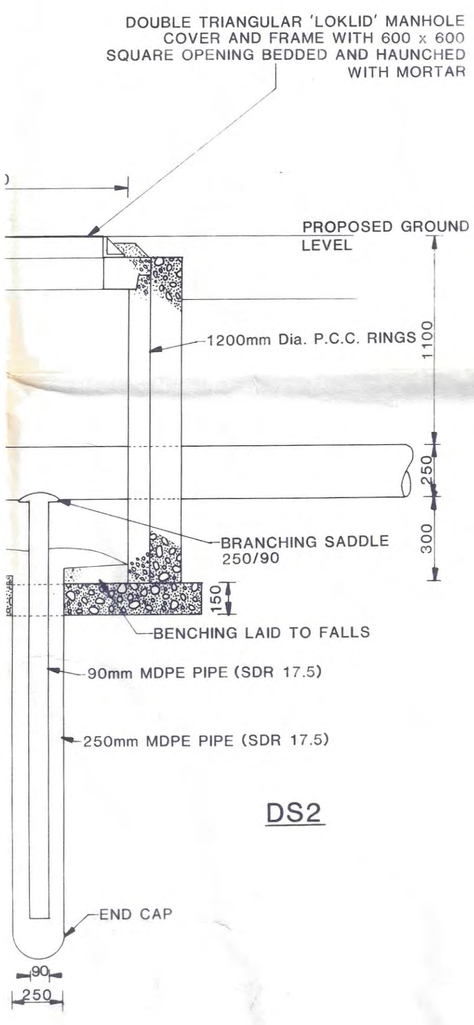


roposed Raising
ld Chamber.

Typical Detail Showing Proposed Raising of Existing Water/Gas Monitor Boreholes.
Scale 1:10

NOTE: Due to initial ground forming using colliery spoil to achieve desired gradients, the depths of existing borehole covers beneath final proposed ground levels varies (min one metre cap plus formation). Therefore the amount of extension differs for each borehole and is accounted for in the Bill items.

AIL



DS2

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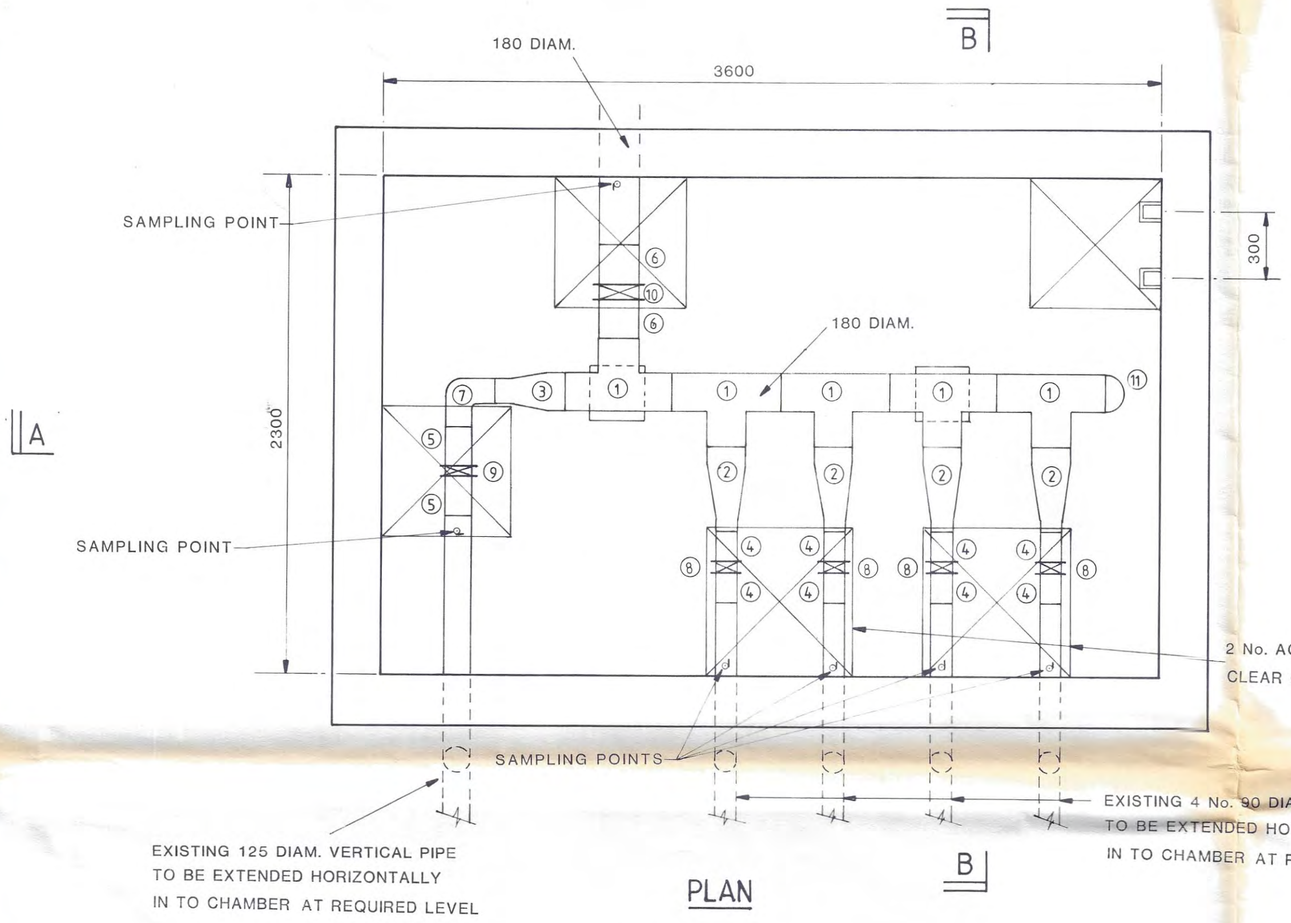
Environmental Services Department
environment DIVISION
King Charles II House, Pontefract, West Yorkshire, WF8 1BQ.

Reg 13

PROJECT: HEALDFIELD ROAD QUARRY RECLAMATION SCHEME	
DRAWING TITLE: LANDFILL GAS CONTROL CONTRACT - GENERAL DETAILS 2	
DRAWN BY: DJL	SCALE: AS SHOWN
DATE: FEB 1993	REVISIONS:
DRAWING No.: R/21/103/16	

RFI4956 - Annex C



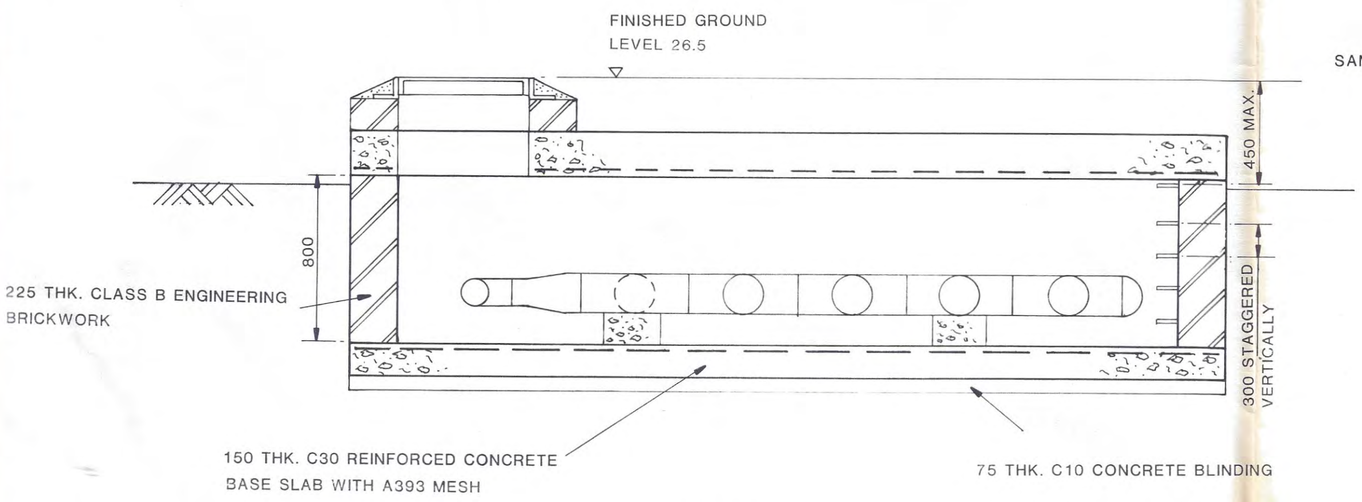
PLAN

PIPE FITTINGS SCHEDULE

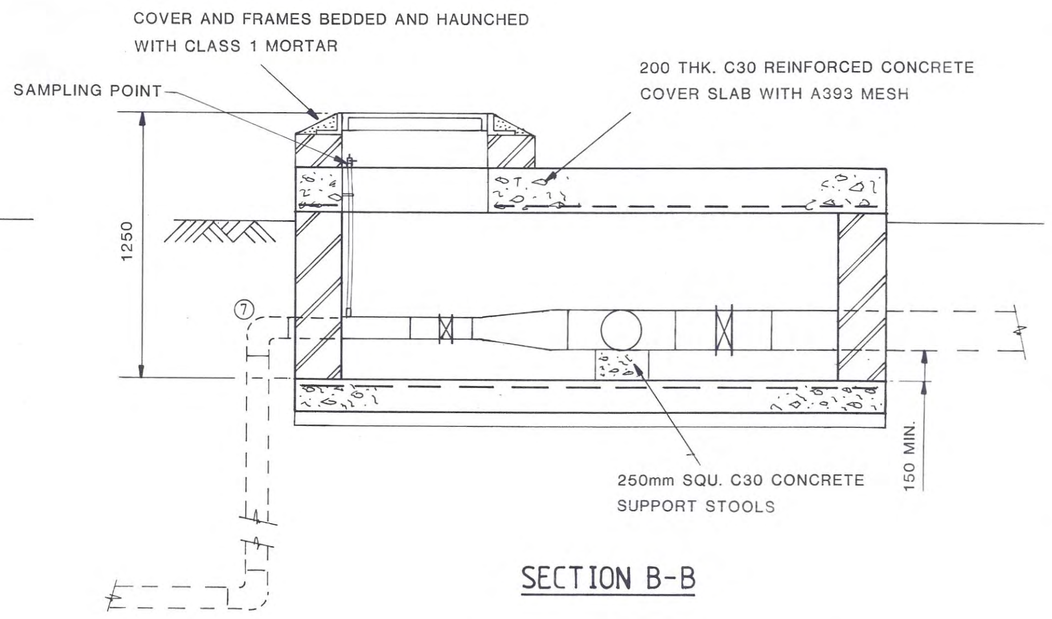
(1)	180mm EQUAL TEE
(2)	180-90mm REDUCER
(3)	180-125mm REDUCER
(4)	90mm STUB FLANGE
(5)	125mm STUB FLANGE
(6)	180mm STUB FLANGE
(7)	125mm 90°ELBOW
(8)	90mm BUTTERFLY VALVE
(9)	125mm BUTTERFLY VALVE
(10)	180mm BUTTERFLY VALVE
(11)	END CAP

NOTES

1. ALL DIMENSIONS IN mm UNLESS NOTED OTHERWISE.
2. ALL LEVELS IN METRES AOD(N).
3. ALL ACCESS COVERS TO BE GRADE A DOUBLE TRIANGULAR HINGED AND LOCKABLE. CLEAR OPENING TO BE 600mm SQU. UNLESS NOTED OTHERWISE.
4. ALL PIPEWORK FITTINGS TO BE OF BLACK POLYETHYLENE WITH ELECTROFUSION JOINTS.
5. THE EXISTING PUMPING STATION AND MANIFOLD ARE THE PROPERTY OF BIFFA ENVIRONMENTAL TECHNOLOGY AND WILL BE REMOVED BY THEM. IF USE OF THE EXISTING MANIFOLD IS BEING CONSIDERED THEN BIFFA E.T. MUST BE CONSULTED.
6. CHAMBER DIMENSIONS SHOWN MAY BE AMENDED TO SUIT ANY REDESIGN OF THE MANIFOLD APPROVED BY THE ENGINEER.

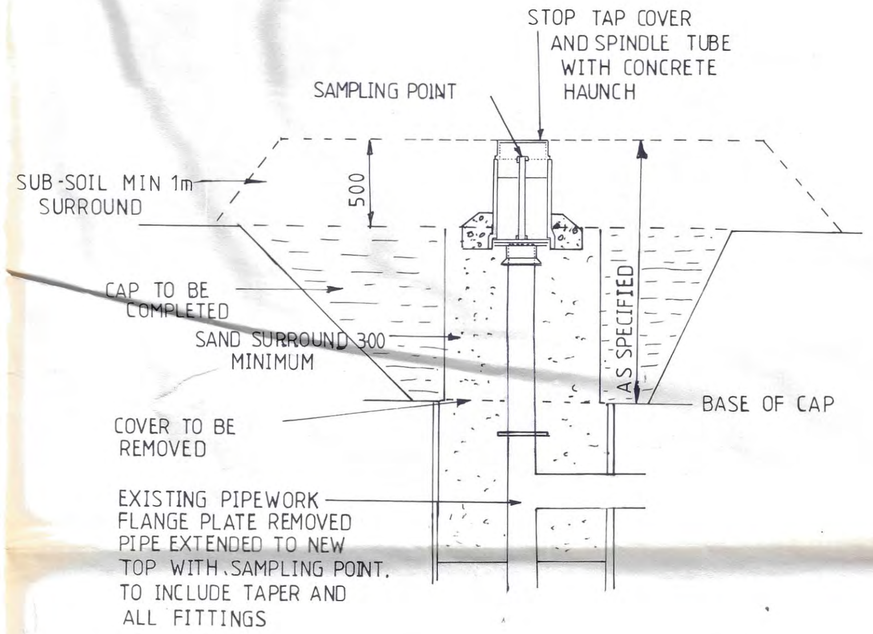


SECTION A-A

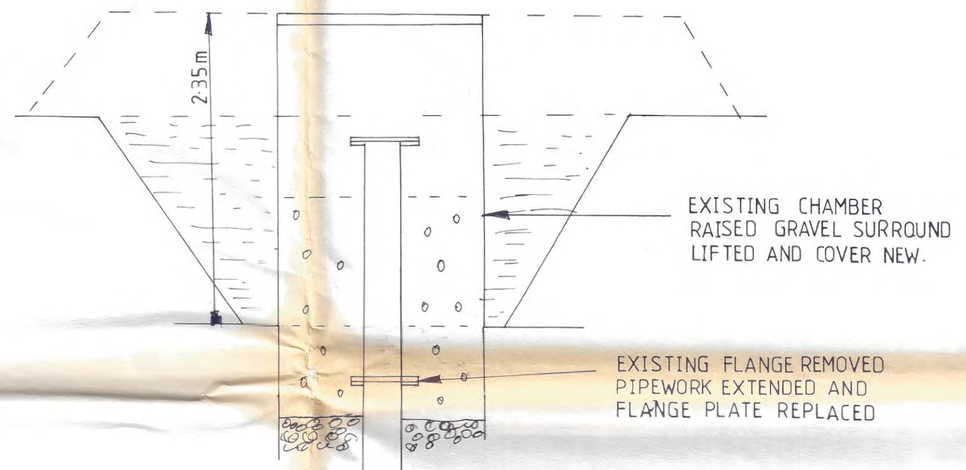


SECTION B-B

MANIFOLD CHAMBER
SCALE 1:20



RAISING OF EXISTING GAS WELLS



RAISING OF EXISTING TRAP (DS)

City of Wakefield Metropolitan District Council
Environmental Services Department
environment DIVISION
King Charles II House, Pontefract, West Yorkshire, WF8 1BQ.

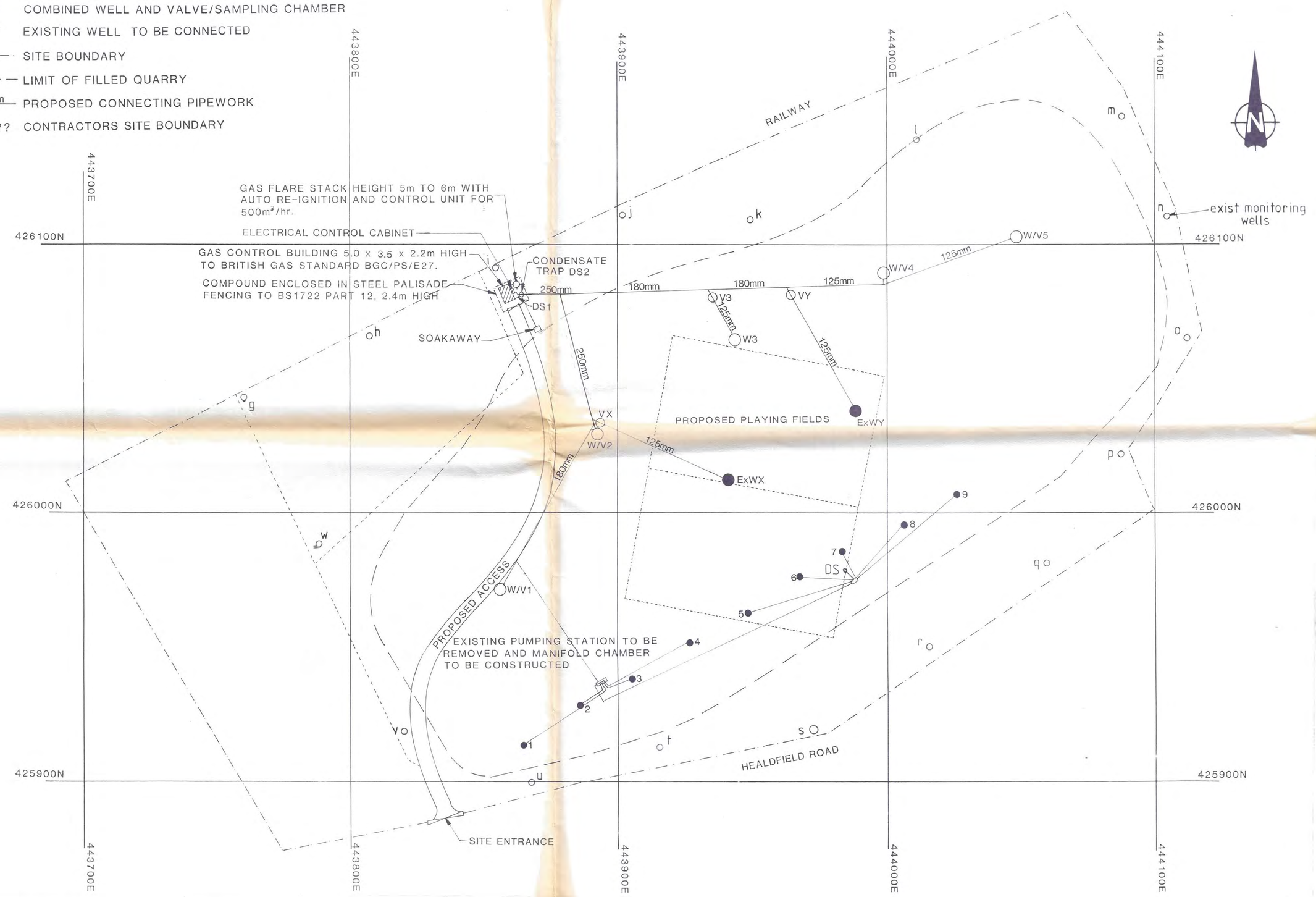
Reg 13

PROJECT: HEALDFIELD ROAD QUARRY RECLAMATION SCHEME	
DRAWING TITLE: LANDFILL GAS CONTROL CONTRACT - GENERAL DETAILS 1	
DRAWN BY: DJL	SCALE: AS SHOWN
DATE: FEB 1993	REVISIONS
DRAWING No.: R / 21 / 103 / 15	

RFI4956 - Annex C

KEY:

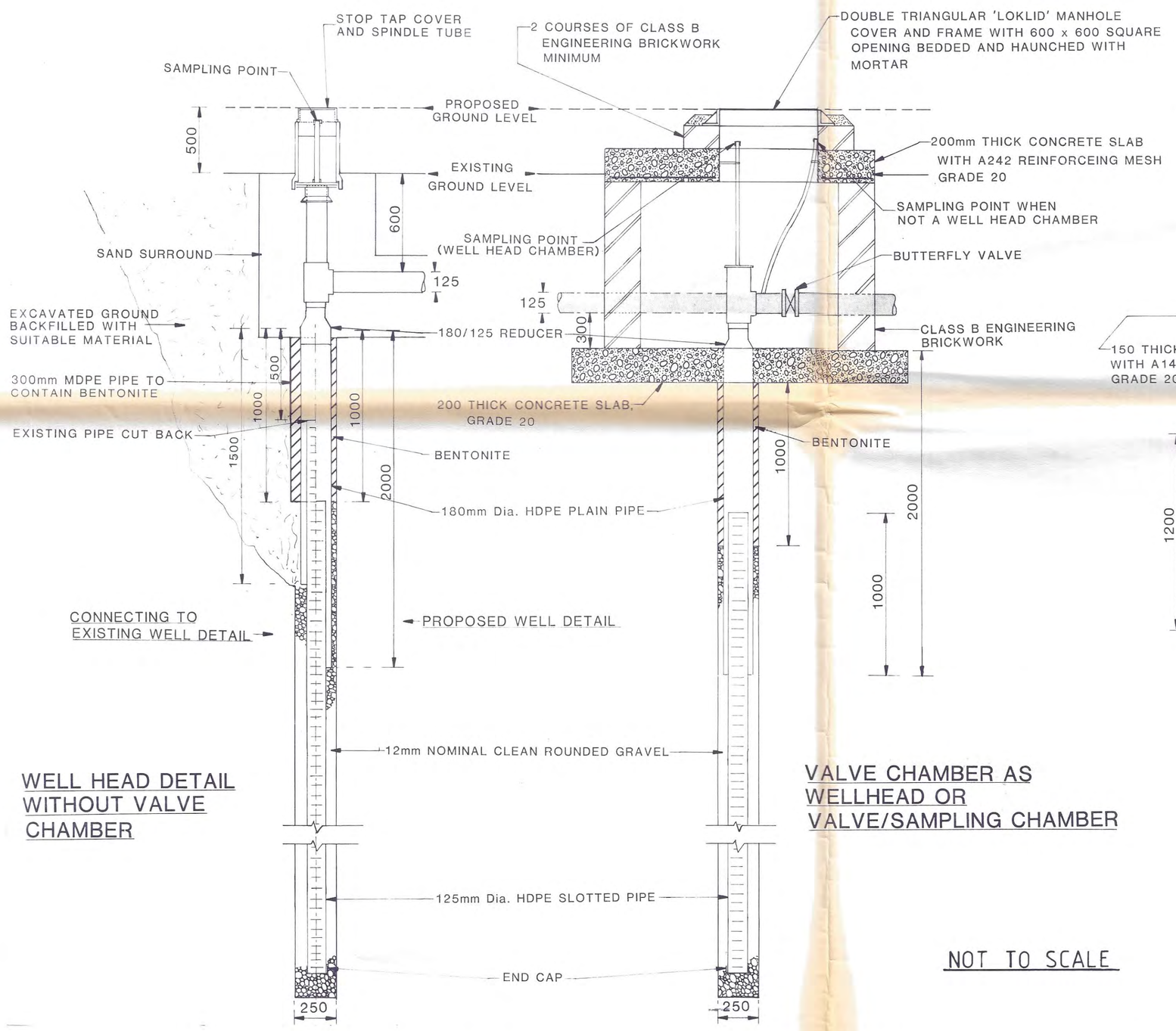
- ●2 EXISTING EXTRACTION WELLS
- ○V3 VALVE AND SAMPLING CHAMBER
- ◯W/V4 COMBINED WELL AND VALVE/SAMPLING CHAMBER
- ●ExWY EXISTING WELL TO BE CONNECTED
- —·—·— SITE BOUNDARY
- — — — LIMIT OF FILLED QUARRY
- 125mm PROPOSED CONNECTING PIPEWORK
- ?????? CONTRACTORS SITE BOUNDARY



SITE LAYOUT

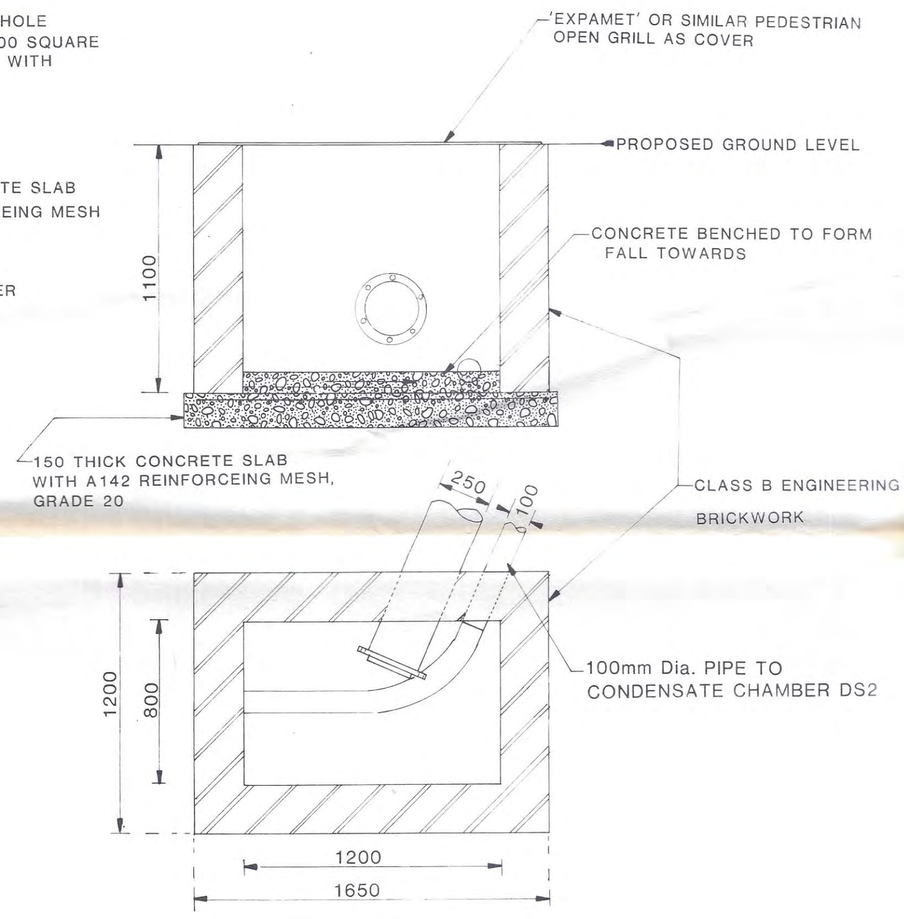
1 : 1000

INTERNAL DIMENSIONS:
1200 x 800 x 1000mm DEEP



WELL HEAD DETAIL WITHOUT VALVE CHAMBER

VALVE CHAMBER AS WELLHEAD OR VALVE/SAMPLING CHAMBER



CONDENSATE CHAMBER (DS1)

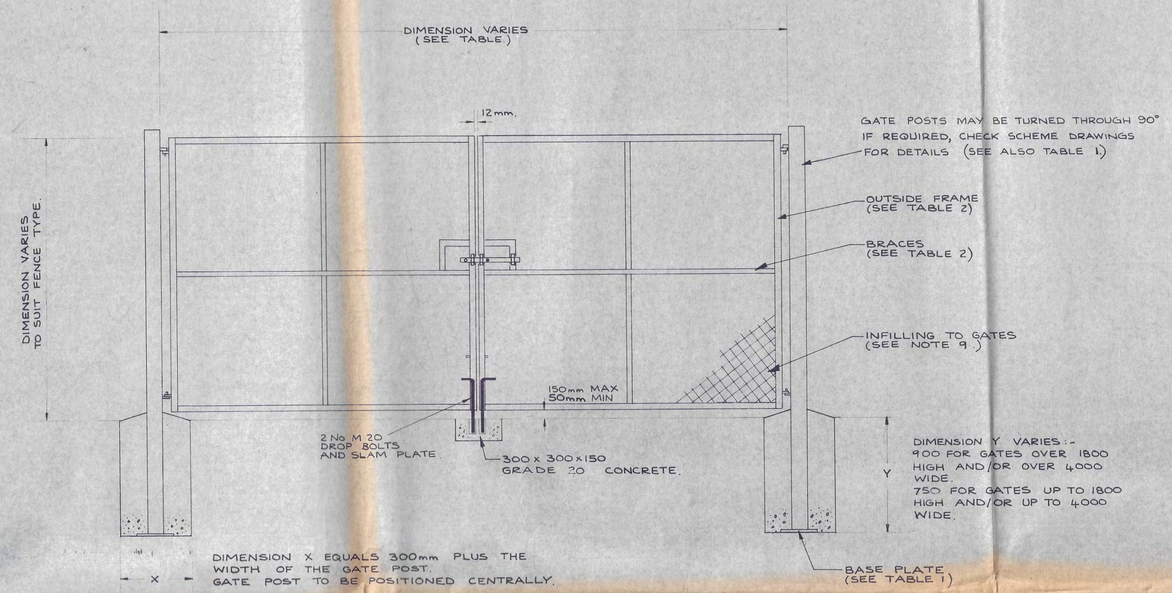
INTERNAL DIMENSIONS:
1200 x 800 x 1000mm DEEP

NOT TO SCALE

NOTE:
ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED.

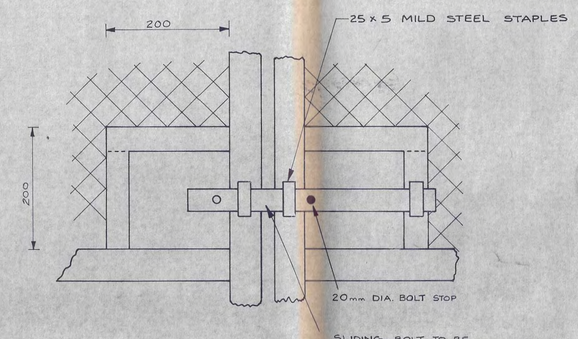
UDOG3918

RFI4956 - Annex C



ELEVATION ON 4m DOUBLE GATE

LATCH DETAIL



A1
841 x 594

NOTES

1) ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED.
2) CONCRETE SHALL BE GRADE 20 AND TO BE PRODUCED USING SULPHATE RESISTING CEMENT.
3) ALL WORKMANSHIP AND MATERIALS TO BE IN ACCORDANCE WITH B.S. 1722 PART 1 SUPPLEMENT NUMBER 1. 1972, UNLESS OTHERWISE SPECIFIED.
4) MINIMUM CONCRETE COVER TO POSTS SHALL BE 75mm.
5) VERTICAL BRACES SHALL BE PROVIDED AT NOT GREATER THAN 1·2m CENTRES AND THERE SHALL BE ONE CENTRAL HORIZONTAL BRACE.
6) SINGLE OR DOUBLE GATES AS SPECIFIED MAY BE USED TO FILL OPENINGS UPTO 5000. DOUBLE GATES TO BE PROVIDED FOR OPENINGS 5000 – 10 000.
7) POST SHALL BE OF THE SQUARE STEEL HOLLOW SECTION ONLY.
8) BASE PLATE TO BE WELDED TO BOTTOM OF POST.
9) CHAIN LINK INFILLING TO GATES SHALL BE OF SIMILAR MESH AND GAUGE TO THE FENCING SPECIFIED
10) GATE STOP TO BE PROVIDED TO SECURE GATE WHEN OPEN AND TO BE OF SIMILAR CONSTRUCTION TO GATE STOP DETAIL SHOWN.
11 NUTS AND BOLTS USED TO FIX CHAINLINK SHALL BE PLATED AND THREADS BRUISED TO PREVENT EASY REMOVAL.

GATE HEIGHT			
1200 AND 1400	1800		
SECTION	SECTION	WIDTH OF OPENING	BASE PLATE DIMENSIONS
76·2 x 76·2 x 4	76·2 x 76·2 x 4	SINGLE LEAF GATE UP TO 1m.	250 x 250 x 5
76·2 x 76·2 x 4	101·6 x 101·6 x 4	DOUBLE LEAF GATE 1-3m	250 x 250 x 5
101·6 x 101·6 x 4	101·6 x 101·6 x 4	" 4m	250 x 250 x 5
152·4 x 152·4 x 4·9	152·4 x 152·4 x 4·9	" 5m	300 x 300 x 6
152·4 x 152·4 x 4·9	152·4 x 152·4 x 4·9	" 6m	300 x 300 x 6
152·4 x 152·4 x 4·9	177·8 x 177·8 x 6·3	" 8m	300 x 300 x 6
177·8 x 177·8 x 6·3	203·2 x 203·2 x 9·5	" 10m	300 x 300 x 6

TABLE 1 GATE POST & BASE PLATE DIMENSIONS

OUT SIDE FRAME SECTION	BRACES SECTION	WIDTH OF GATE
38·1 x 38·1 x 3·2	38·1 x 38·1 x 3·2	UP TO 3m
50·8 x 50·8 x 4	50·8 x 50·8 x 3·2	3m - 5m

NOTE : THE WIDTH IS THE WIDTH OF A SINGLE LEAF GATE OR ONE LEAF OF A DOUBLE GATE.

TABLE 2 GATE FRAME AND BRACES DIMENSIONS

STANDARD DETAILS
GATES FOR CHAIN LINK FENCES

AMENDMENTS	DATE
1200 WIDE GATES ADDED	MAY 1985

	INITIALS	DATE
DRAWN BY	R.L.H	Nov. 83
CHECKED BY	L.R.B	APRIL 84
TRACED BY	A.E.H.	Nov. 83
CHECKED BY	JH	JULY 85

SCALES: SCALED DIMENSIONS NOT TO BE TAKEN FROM THIS DRAWING.

WEST YORKSHIRE Metropolitan County Council

DIRECTORATE OF TRAFFIC, HIGHWAYS AND ENGINEERING
COUNTY HALL WAKEFIELD WF1 2QW

Reg 13

DRAWING No.
W.M.L.R/S/700 E/3A

DATE NOVEMBER 1983.

Reg 13

LAT 3.83

700MM WATER MAIN

WATER MAIN

PROPOSED TRACK 0.3m THICK SUB-BASE TYPE 1 COMPACTED TO CLAUSE 306 (IMPORTED FROM WHELDALE SITE)

PGM1 △24.740

PGM2

PEG1

WATER 6"

HEALDFIELD ROAD

23 EXISTING CONTOURS

23 PROPOSED CONTOURS - These are finished levels and where filling is to take place it shall take account of the need for 500mm depth of sub-soil. See also drg no. R/21103/11 for excavation to prepare the site prior to filling with imported material as capping layer.

SITE BOUNDARY

EXISTING GAS EQUIPMENT - Excavation and filling around existing covers and across pipe runs, shall be carried out carefully. Fill material to within 1m of covers to be left adjacent, for others.

City of Wakefield Metropolitan District Council

Environmental Services Department

environment DIVISION

King Charles II House, Pontefract, West Yorkshire, WF8 1BQ.

Reg 13

PROJECT: HEALDFIELD ROAD QUARRY, RECLAMATION SCHEME

DRAWING TITLE: EXIST & PROP CONTOURS with CONTRACT BOUNDARY (SERVICES)

DRAWN BY	SCALE
PD	1:500
DATE	REVISIONS
NOV 1992	
DRAWING No.	
R/21·103/10A	