

CONSTRUCTION QUALITY ASSURANCE PLAN
FOR
INSTALLATION OF GROUNDWATER MONITORING BOREHOLES
AT
HENDY QUARRY

Prepared by:



Prepared for:



Project Quality Assurance**Report Status** : Draft**Report Reference** : TA1046/02 Rev 2**Report Date** : December 2018**Prepared for** : Tarmac Trading Limited**Prepared by** : Sirius Environmental Limited.
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1	19/12/2019	Minor amendments.	DJ	DT
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1 SCOPE OF THE CONSTRUCTION WORKS

1.1 Site Description

Hendy Quarry is located approximately 14km east of Bridgend, South Wales. The quarry can be accessed from the M4 via the A4116 and School Road.

Site Address: Hendy Quarry,
School Road,
Pontyclun,
CF72 8PG.

National Grid Reference: E: 305356, N: 181070.

1.2 Works Description

This document was prepared as a Construction Quality Assurance (CQA) Plan for the installation of 2 no. groundwater monitoring boreholes (BH07/08a & BH08/08a) at Hendy Quarry. The boreholes are required to replace existing monitoring installations (BH07/08 & BH08/08) at the facility.

All materials and workmanship will comply with BS 5930:2015 (The Code of Practice for Site Investigations).

The works will comprise:

- (i) site visit prior to mobilisation to confirm access / enabling requirements.
- (ii) setting out and service clearance necessary for undertaking the works.
- (iii) drilling of boreholes.
- (iv) installation of monitoring wells.

The positions of the proposed installations in relation to the site layout are shown on drawing **TA1046/02/01** in **Appendix 1**.

2 CQA SUPERVISION

2.1 Definitions

For the purpose of clarification, the following definitions are given:

Construction Quality Assurance (CQA)

- Means a planned and systematic pattern of all means and actions designed to provide confidence that items or services meet contractual and regulatory requirements and shall perform satisfactory in service.

CQA refers to means and actions employed by the Supervisor, to assure conformity of the preparation, production and installation of this CQA Method Statement, the Contract Drawings, and Specification. CQA is provided by Sirius.

Construction Quality Control (CQC):

- Means “those actions that provide a means to measure and regulate the characteristics of an item or service to contractual requirements”.

CQC refers to those actions taken by Manufacturers, Installers, Contractors, or the Employer to ensure that the materials and the workmanship meet the requirements of the Contract Drawings and Specification.

Employer:

Means ‘the person or persons, firm or company or other body whom own and have responsibility for the facility. The Employer has entered into a contract with a Contractor for the execution of the works detailed in the Specification and Contract Drawings. Personal representatives or other parties, e.g. the Supervisor, may represent the Employer on site.’

The Employer is Tarmac.

Contractor:

Means ‘the person or persons, firm, company or other body to whom the contract has been awarded by the Employer, and includes the Contractor’s personal representatives or other parties, e.g. Sub-contractors, Manufacturers.

The Contractor shall undertake the works under the terms of the contract.

Specification:

Means, 'that part of the Contract entered into between the Employer and the Contractor, which sets out the Employer's detailed requirements as to how the works should be constructed, tested, measured and quality assured'.

2.2 General

The CQA Project Team will comprise the following:

The CQA Manager – will be office based and responsible for the following:

- Administration of the CQA program.
- Attendance at selected progress or liaison meetings and is the key contact with regulatory officers.
- Production of the CQA Validation Report.

The CQA Inspector – The representative of the CQA Manager, located full time at the site during works requiring CQA supervision and responsible for the following:

- The on-site representative of the CQA Manager.
- To be fully familiar with all CQA requirements for the project.
- Attendance at all CQA-related meetings (e.g. Pre-construction and Progress).
- Preparation or overseeing the ongoing preparation of the as-built drawings.
- Assigning locations for testing and sampling.
- Keeping daily reports and records.
- Reporting to the CQA Manager any relevant observations.
- Reporting any unresolved deviations from this CQA Plan to the CQA Manager.
- Provision of all records and relevant data to the CQA Manager for the preparation of the final validation report, which will be submitted to Natural Resources Wales (NRW) for approval upon completion of the works.

Staff undertaking the roles of the CQA Manager and the CQA Inspector should have relevant experience in ground investigation / environmental drilling or be supervised by experienced staff until relevant experience is obtained.

2.3 Daily Meetings

Meetings will be held daily between the CQA Inspector and the Contractor's representative. The purpose of which is to:

- Review the work activities and locations for that day.
- Note the Contractor's installation personnel and plant for the day / shift.
- Review the previous days progress.
- Review the work schedule.

- Discuss any interfacing with other contractors and / or site operations.
- Discuss / highlight any problems and identify solutions.

2.4 Site Visits

It is anticipated that from time to time that Natural Resources Wales (NRW) will visit the site to review the works. During these visits the CQA Inspector shall make available all test results and daily records up to that date for inspection by NRW.

Any problem encountered during construction should be discussed with NRW upon their arrival to site prior to any subsequent site walkover. The CQA Inspector shall discuss the problems encountered any discuss any proposed remediation methods.

2.5 CQA Requirements

The CQA requirements associated with each component of the works are detailed in the individual sections below.

3 SETTING OUT / SERVICE CLEARANCE

Prior to commencement of the drilling works, the CQA Inspector will consult available, up to date service plans of the area. The boreholes will then be positioned with respect to anticipated buried services taking into account any statutory clearances required.

On site conditions will then dictate the final positioning of the boreholes. The locations will be constrained by the need to permit access by the drilling rig whilst not requiring significant enabling works such as vegetation clearance. Locations will also take into account operational activities such as heavy plant movement and will not be positioned within drainage channel or 'low spots' to eliminate the risk of flooding.

The borehole locations, including areas in the immediate vicinity, will then be scanned using Ground Penetrating Radar (GPR) in addition to Cable Avoidance Tool (CAT) and Signal Generator (Genny) to check for the presence of buried services prior to breaking ground. The utility clearance will be undertaken by an appropriately qualified subcontractor.

4 DRILLING

Tarmac will employ their own subcontractor to complete the intrusive works. A borehole of a minimum nominal diameter of 200mm should be completed using a tracked-mounted rotary drilling rig capable of utilising an air or air-mist flush.

The Contractor will set up the drilling rig at the specified locations under the supervision of the CQA Inspector. The CQA Inspector will then confirm the borehole specification with the Lead Driller ensuring suitable equipment is present.

The CQA Inspector will remain in attendance during drilling and log the nature of arisings whilst liaising with the Lead Driller regarding downhole conditions such as fractured rock, loss of flush etc..

The Contractor will ensure the verticality of the borehole during the drilling operations and will keep an up to date record of the exact length of drilling equipment in the borehole. This information will be made available to the CQA Inspector when requested.

A drilling schedule including provisional drilling depths and estimated quantities of materials is reproduced in **Table 1** below.

Table 1: Drilling Schedule

Borehole ID	Well Location Easting (m)	Well Location Northing (m)	Provisional Total Drill Depth (mbgl)	Estimated Slotted Pipework Length (m)	Estimated Plain Pipework Length (including 300mm upstand) (m)
BH07/08a	TBC	TBC	50	46	4.3
BH08/08a	TBC	TBC	50	46	4.3

The CQA Inspector shall record the following information for incorporation into the CQA Validation Report:

- Drilling record detailing geological strata encountered and depths.
- Depths of any groundwater encountered during drilling.
- Actual final borehole drill depth.
- Actual pipework details (including both slotted and plain pipework).
- Actual total pipework length.
- Actual gravel and bentonite seal depths (top and bottom of each).

5 MONITORING WELL INSTALLATION

The monitoring wells construction details are shown on Drawing **TA1046/02/02** presented in **Appendix 2**.

The well installation will consist of slotted and plain HDPE pipework of 90mm OD which will be manually screwed together. The slotted pipe (screen) will have an open hole area not exceeding 10% and a slot thickness of up to 1mm. The slotted section will have a screw / push-on cap fixed to the base of the pipework which will run from the base of the borehole to approximately 4 metres below ground level (mbgl).

Plain HDPE pipe (casing) will then continue from approximately 4mbgl to 0.3m above ground level. To ensure long term serviceability, the threads will be kept clean during installation.

The annulus between the borehole wall and the slotted pipework will be filled with washed, non-calcareous gravel of 6-10mm diameter to a minimum depth of 1m above the top of boundary between the slotted and plain pipework sections. Above the gravel, a seal will be constructed using bentonite pellets which will be hydrated on installation to ensure a seal.

A gas-tight valve and rubber bung will be placed at the end of the pipework visible at surface. A raised, lockable steel headwork of approximately 8" (200mm) diameter will be concreted into place. The concrete will be of minimum 300mm thickness.

6 CQA VALIDATION REPORT

Following completion of the works, Sirius Environmental will report fully on the quality control measures undertaken during installation.

The CQA Validation Report will constitute a Compliance Document and will include details of CQA together with an assessment of the works. As a minimum, the CQA Validation Report will include:

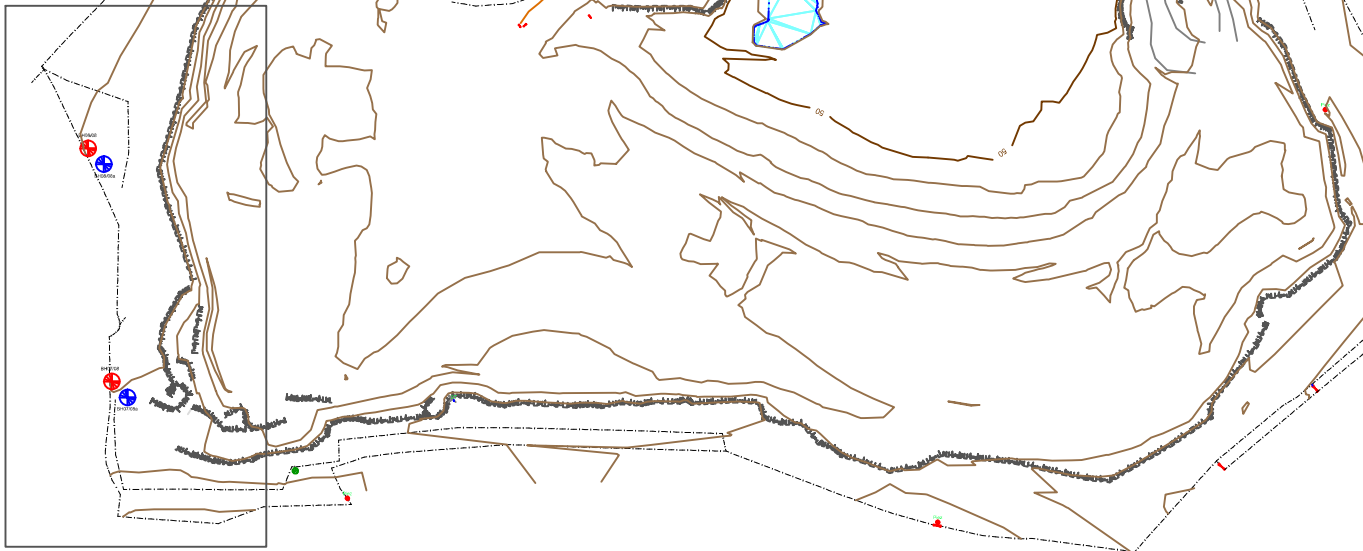
- Description of the works.
- Daily records.
- Photographic records.
- As-built drawings.

The quality assurance programme outlined in this CQA Plan is not an exhaustive list of procedures to be undertaken during the works but a summary of the minimum requirements which constitute the basic quality control procedures.

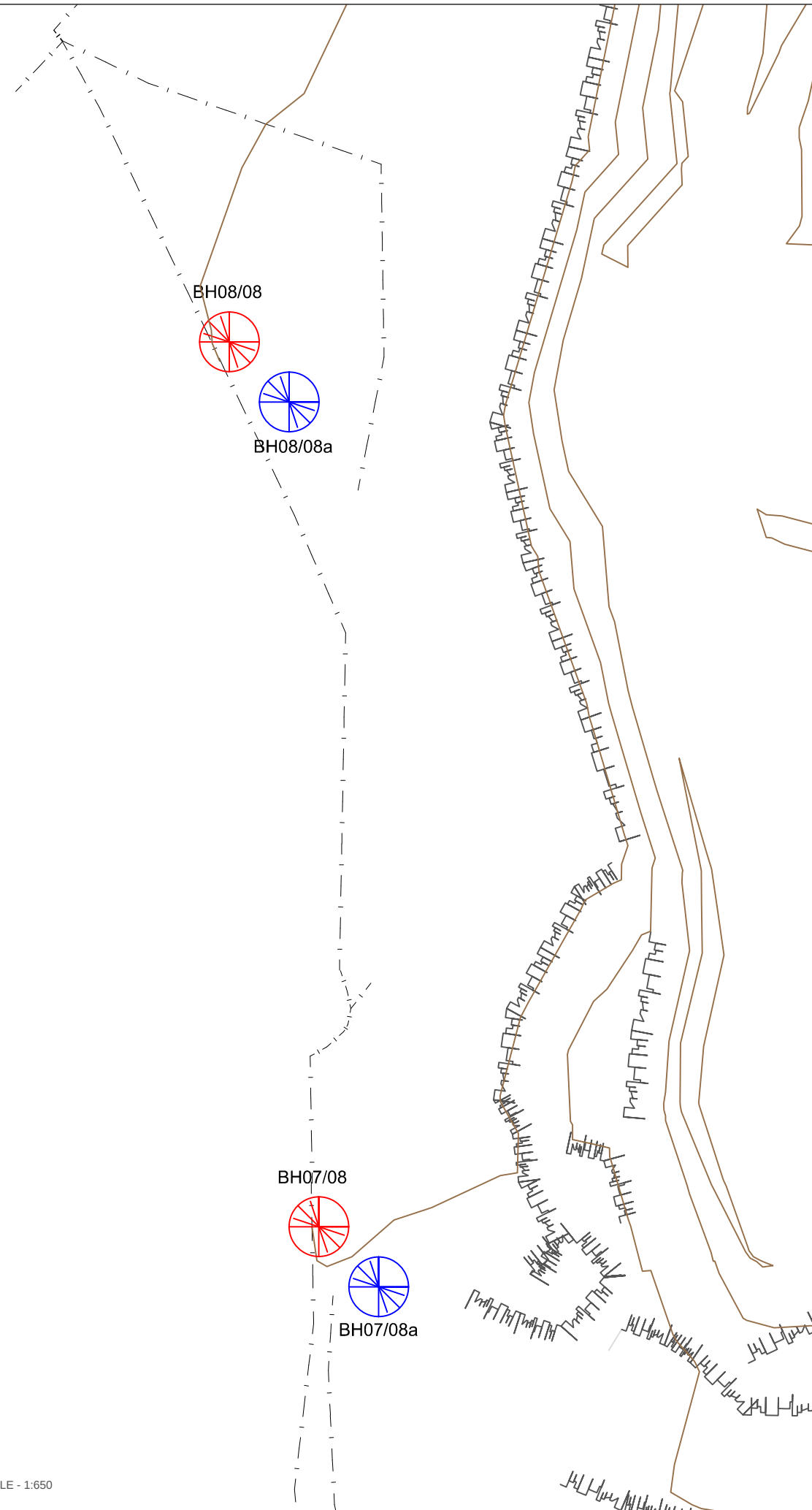


APPENDIX 1

PROPOSED LOCATION OF MONITORING BOREHOLES



SCALE - 1:3500



SCALE - 1:650

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NOTES

-  EXISTING MONITORING BOREHOLES
-  PROPOSED MONITORING BOREHOLES
-  QUARRY BOUNDARY FENCE

REV	DESCRIPTION	DATE	BY
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CLIENT



JOB TITLE

Hendy Quarry

DRAWING TITLE

Proposed Location of Monitoring Wells

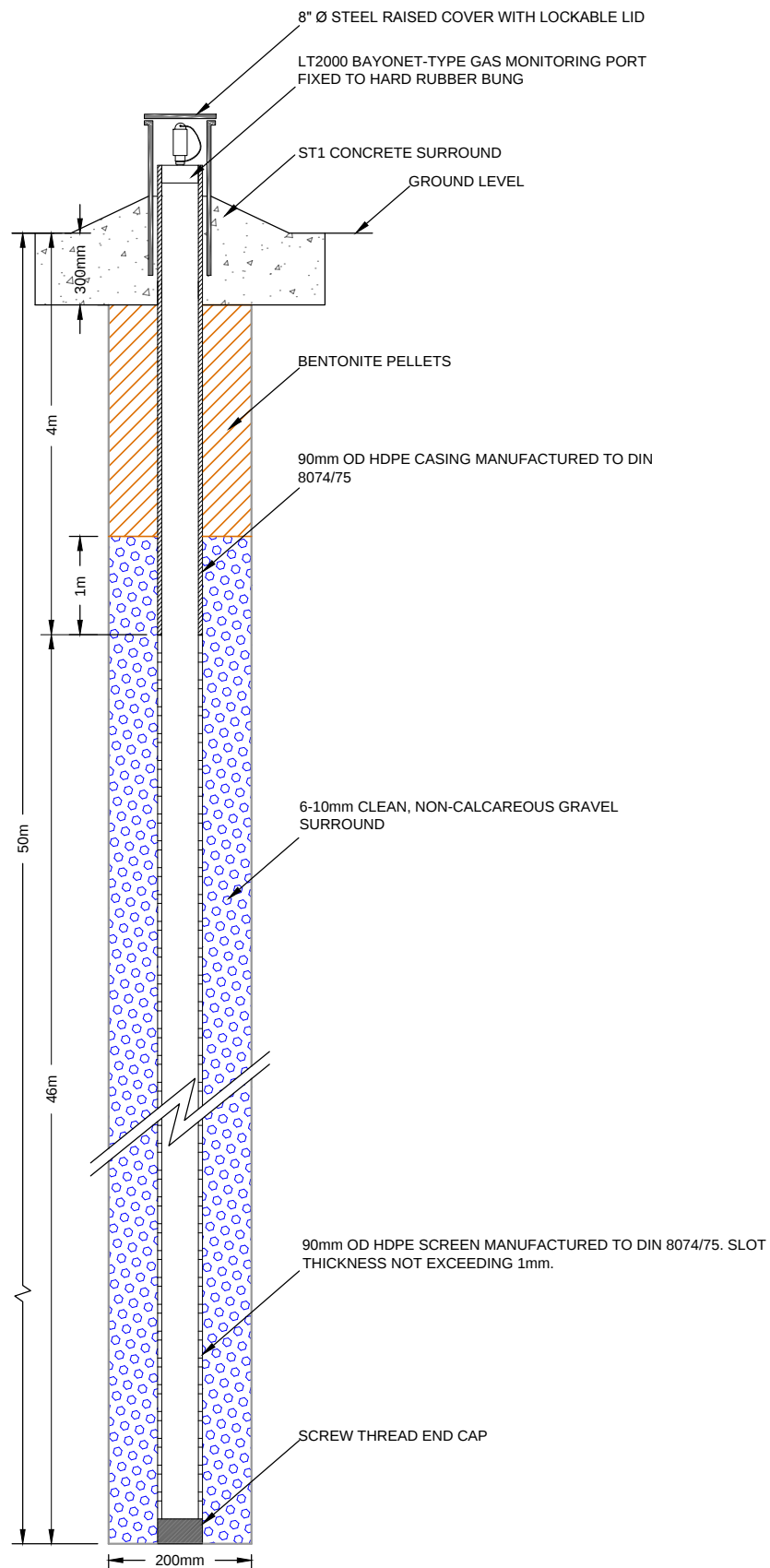
DRAWN	DATE	APPROVED	DATE
DJ	18/12/2018	DT	18/12/2018

SCALE	SHEET	DRAWING NUMBER	REVISION
See Drawing	A3L	TA1046/02/01	0



APPENDIX 2

PROPOSED MONITORING INSTALLATION SPECIFICATION



CLIENT



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JOB TITLE

Hendy Quarry

DRAWING TITLE

Proposed Monitoring Installation Specification

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1	Change from PVC to HDPE pipework.	19/12/18	DJ
REV	DESCRIPTION	DATE	BY
DRAWN	DATE	APPROVED	DATE
DJ	11/12/2018	DT	18/12/2018
SCALE	SHEET	DRAWING NUMBER	REVISION
Not to Scale	A4P	TA1044/02/02	1

