NGN/PM/DR/8

MANAGEMENT PROCEDURE FOR

# THE CAPTURE OF PIPE ASSET RECORDS BY UIP/GT ORGANISATIONS VESTING PLANT IN NGN



**JUNE 2008**

**CONTENTS**

**FOREWORD**

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**BRIEF HISTORY**

| | | |
|---|---|---|
| First Published as Management Procedure for The Capture of Pipe Asset Records by UIP/GT Organisations Vesting Plant in Transco | 10/11/03 | EPSG/T02/692 |
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**MANDATORY AND NON-MANDATORY REQUIREMENTS**

In this document:

**must:** indicates a mandatory requirement.

**should**: indicates best practice and is the preferred option. If an alternative method is used then a suitable and sufficient risk assessment must be completed to show that the alternative method delivers the same, or better, level of protection.

# MANAGEMENT PROCEDURE FOR
# THE CAPTURE OF PIPE ASSET RECORDS BY UIP/GT ORGANISATIONS VESTING PLANT IN NGN

## 1. INTRODUCTION

Pipe Records describe the fundamental assets of NGN. The use and maintenance of Pipe Records determines the quality of information input to all operational decisions and all network investment decisions. Access to Pipe Records plays a positive role in ensuring the safety of the general public, gas consumers, gas field workers, and others engaged in excavations in the vicinity of the gas network. The on-going management of Pipe Records to a satisfactory standard is therefore critical to the continuing ability of NGN to successfully manage the gas supply business. The management of Pipe Records must ensure that the capturing and recording of new or modified assets, deleting removed assets, and correcting erroneous data for existing assets is executed to the required standards.

This document supports the requirements of IGE/TD/101 “Adoption of pipe systems by a GT – management of UIP activities”, in particular section 7.6.3 “Completion file”.

The objectives of this Requirements Document are:

- To ensure that all relevant pipe asset data is captured for recording in the asset databases to meet Regulatory, commercial and operational requirements.
- To ensure that, through the implementation of robust control processes for data capture, data being added to the asset databases is:
  - Accurate
  - Complete
  - Timely
  - Consistent
- To ensure errors identified in Records are managed appropriately, and corrective actions taken when necessary, to enhance Asset Records integrity

## 2. DISTRIBUTION PIPE ASSET RECORD REQUIREMENTS

### 2.1 Scope of Records Information

This document supports NGN’s requirements for compliance with IGE/TD/101 “Adoption of pipe systems by a GT – management of UIP activities”, in particular section 7.6.3 “Completion file” and is consistent with NGN’s policy NGN/PL/DR1, that applies mainly to pipe and plant assets, which are buried and not visible on the surface.
Records for the following assets must be considered within the scope of this policy:

| | |
|---|---|
| Mains pipes | All mains pipes must be recorded, irrespective of pressure range. |
| Service Pipes | A record of all service pipes laid must be provided |
| Plant | Plant items associated with Mains and Service assets, e.g. line valves, dip pipes, CP plant etc. must be recorded, where necessary, by reference to detail sketches, CADD files or hard copy drawings to maintain clarity. |

### 2.2 Positional Accuracy

Distribution pipes and plant must be located to within the tolerance indicated within Section 3.1 i.e.± 300 mm of their recorded position.

### 2.3 Attribute Accuracy

No errors are acceptable in recording factual attributes for new assets, such as size, material, type, SDR.
No errors are acceptable for the `Critical` items of attribute data denoted in Section 3.1.

### 2.4 Timeliness

NGN requires plans of appropriate scale and accuracy as defined by this document, to be in its possession, within 5 business days from commissioning.

## 3. THE ISSUE AND USE OF WORK DOCUMENTS FOR ASSET INFORMATION CAPTURE

A map template for capturing and recording as-built positional and attribute data for pipe assets must be provided to field staff. Forms must be provided for Field Staff to record errors found in the records held for existing assets. When this occurs, completed error reports should be returned from the Field with the Work Documents. Appendix A, Sections A1, A2 and A3 deals with this in detail. A sample error report form is included as Appendix C.

### 3.1 Standards for the Capture of Asset Information

Information returned from the Field must comply with the following standards:

| | |
|---|---|
| Position Measurements | Individual position and depth measurements must be taken with a precision of ±0.1 metres, enabling positional accuracy to be reproduced to ±0.3m (300 mm), accounting for achievable transcription accuracy.<br>Any change in the direction of pipes, the position of pipe fittings, points of change of material and diameter must be recorded. Additional measurements should be taken, normally at a minimum every 30 metres, or every 50 metres where the main runs parallel to a straight visible, permanent feature e.g. a kerbline.<br>Depths of cover must be recorded at points of positional measurement and at changes of depth of 0.1 metres. |
| References from Map features | Measurements should be taken from fixed OS Map features e.g. main corners of buildings, kerbs, and boundary walls/fences. Street furniture such as traffic signs, lampposts, or gateways to property, should not be used as measurement reference points. |
| Pipe & Plant attributes | The following attributes are safety critical and/or business critical and must always be recorded. For those with a (g) suffix, the prime archive is recorded on the graphical system, the remainder are archived in TeAR and transferred to graphical systems for display only:<br>Position of pipe (referenced to background geography or OS Grid) (g)<br>Depth (g)<br>Diameter<br>Material and SDR where applicable<br>Pressure tier<br>Lay method<br>Pipe Object number (where available)<br>Crossing Pipes/Connections (g)<br>Connected Plant, e.g. valves, siphons<br>Governors e.g. size, manufacturer, model, serial no: |
| Mains abandoned | Identification of main(s) abandoned and abandonment date(s). |

## 4. RECORDS QUALITY MANAGEMENT

Management of the Records Capture must ensure that new records are captured to the required standards of accuracy, timeliness and completeness as defined in the preceding sections, 3 and 4. It must also ensure the necessary actions are taken upon receipt of records error reports. To support Records quality management, the UIP/GT organisation should ensure it has an effective monitoring procedure covering:

- Work document production and issue
- Field capture of new/modified asset information
- Field capture of record errors for existing assets
- Records error reports validation, assessment and actioning
- Asset information validation and data entry of asset records
- Transfer of relevant pipe and plant information to NGN

Appendix D contains checklists for use in supporting records quality at the various stages of the records capture process.

# APPENDIX A

**THE ISSUE AND FIELD CAPTURE OF <7BAR PIPE ASSET RECORDS**

## A.1 WORK DOCUMENT PREPARATION

Experience has shown that the crucial first step in the process to ensure the adequate quality of records captured in the field is to give Field Staff the correct documents and supporting map information on which to record the as- built asset record for the works, which they have completed. This is given to Field Staff as a pack of Work Documents.

### A.1.1 Planning Works

To ensure asset records capture procedures can be followed by staff, the UIP/GT organisation is requested to provide the following work documents:

- work instructions which describe precisely, the work to be undertaken within the scope of this job or project
- a proposal drawing showing alphanumeric and graphical location details of pipe and plant to be constructed and the location records of existing gas plant
- a suitable map template for the production of an as-built pipe/plant location drawing (see section A2).

## A.2. AS-BUILT DRAWING TEMPLATES

**NOTE: Templates containing extracts of OS geography are produced under Copyright agreement. Templates provided by NGN should not be used other than for the capture and return of information to NGN. i.e. they should not be used by any other organisation for its own internal records capture process without the express agreement of the OS.**

### A.2.1 Template Definition

As-built drawing templates are large-scale pre-formatted map(s), included with project documentation, showing clearly the full extent of the works, and providing enough space for additional information to be added by Field Staff. Field Staff are required to record the location and technical nature of distribution pipes and plant on the templates for return and subsequent input into NGN's records systems. Templates are provided to simplify the production of as-built drawings and improve the overall quality of the information received and must form an integral part of the documentation provided to Field Staff.

### A.2.2 Template Production

As-built drawing templates should be provided to Field Staff before work commences. A minimum of 1:500 scale colour plots at a size of A4 or A3, multiple plots may be used to cover the full extent of the works. Where it is impractical to show connection detail on the as-built templates where this would compromise clarity and legibility, such detail must be shown on a separate sheet of paper showing just the extents of the connection and cross referenced to any larger-scale template. As-built drawing templates must take one of the following formats listed in order of preference. It is essential that templates are produced at scales large enough to allow Field Staff to show pipes and plant details legibly, even if this means that the extents of the works require more than one printed sheet. It is imperative that wherever possible, all as-built drawing templates show OS features as recorded in graphical systems, as these are essential to Field Staff when showing dimensions, and to the graphical system User when inputting such information.

### A.2.3 Templates from CD's or GIS

Where a UIP/GT organisation has access to NGN graphical information through CD's or GIS, then a template should be obtained by taking a print from this system provided that it can be created at the appropriate scale to provide clarity for recording purposes.

### A.2.4 Failure to provide Templates

Where it has not been possible for the GT to provide an adequate template, usually as a result of there being no existing map of the location of the works (this is likely where works are being carried out beyond the current gas supply area), then other forms of drawing will be acceptable as described below. All drawings must have a location and orientation mark point to allow referencing to the OS background.

#### A.2.4.1 Developers Drawings

Unmarked developers drawings should be used as the basis for the as-built drawing template in development areas where OS maps are unavailable or out-of-date. The developers drawing should be of a scale of 1:500 or greater, unmarked, and should include a location plan of the sites extent, thus enabling identification of the area for input into NGN's graphical records systems. Additionally, the developers drawing should be pasted onto an OS background showing existing OS features thus providing points of reference for Field Engineers when dimensioning, and for identification of the site location when input into NGN's graphical records system. Paper size should be limited to that which is practical to be taken on-site. Developers drawings may not show the full extent of the works, and may not accurately reflect the layout of the site when completed. In exceptional circumstances, and by prior agreement with NGN, in the absence of any OS recorded features in the vicinity, other fixed features may be used as points of reference. Such features may include permanent manhole covers, lamp columns, or hydrant covers. In such cases, a resurvey of the site should be carried out, when fixed OS features are established.

#### A.2.4.2 Blank or Grid Paper/Job Card

This is not a preferred option but either of these formats may be used where it is considered practical to do so, without compromising clarity and legibility for transcription. Both of these formats by their nature are likely to take the Field Engineer longer to produce, and are most likely to involve subsequent queries as to their content. Care should be taken to include features, which would normally be shown on OS maps, thus enabling NGN's graphical systems operators to correctly locate the works and to reference to map features in the immediate area. Such features include building lines, boundary lines, house numbers/ names and road names. Job cards should only be utilised in the simplest of cases.

#### A.2.4.3 Ordnance Survey Drawing

A suitable scale ordnance survey drawing should be used for overlaying the location and details of the constructed asset. The scale should be such that the drawing can be easily read and the information translated onto the digital records. Reference information must be provided to identify the job.

### A.3 TEMPLATE REFERENCE DETAIL

A representative from the organisation constructing pipework must provide the following reference details on the template by way of attaching a label onto the plot (which must not obscure any substantial part of the drawing) containing the details listed below. The label must be in two parts: the first on the left-hand side giving details of the works and who designed the project, the second on the right-hand side giving details of who recorded the as-built information:

**LHS**

| | |
|---|---|
| **Operational Unit** | Name and address of UIP/GT organisation |
| **Project Reference** | Use project reference |
| **Work Description** | Short description of type of work e.g. new main |
| **Location Address** | Use road name, village/town/city and postcode (if known). |
| **Map/Grid Reference** | Normally in the form AANNNNAA (e.g. SU4412SE) for urban areas. Grid references may be used as an alternative where it is expedient to do so. |
| **Project Designer** | Name, contact details and company, to be provided |

**RHS**
**Drawn By**
**Company**
**Telephone Number(s)**
**Date laid/Renewed**
**Checked by**
**Page # of ##**

The size of the label must be such so that it does not interfere with the pertinent information contained on the template, but large enough so that it remains legible and entries can be easily made.
A minimum of two copies of the as-built template must be provided to the Field Engineer, in addition to the proposal drawing (which should include all appropriate Pipe Object Numbers where available) and other necessary documentation.

All drawings must be consistent with industry symbols and a legend must be provided.

### A.4. FIELD CAPTURE OF ASSET INFORMATION

The source of information used to update the data held in NGN asset databases is as-built records returned from Field Staff, and relies upon their competence and diligence in capturing and recording information accurately to achieve the required record standards.

#### A.4.1 Alphanumeric Information

Field Staff are responsible for recording details of their work, which results in additions/modifications or deletions to NGN asset records. In the case of alphanumeric pipe and buried plant information, this should be recorded by a combination of work documents and graphical records for subsequent transference to the NGN asset repository.

#### A.4.1.1 Asset Attributes Captured on Work Documents

Attributes captured on work documents will be dependent upon the type of work undertaken and the material and size of the pipe. A list of `critical` attributes is given in 3.1 in the main body of the document above. These `critical` attributes must be recorded, if they apply to the work undertaken. It is necessary to adhere to the defined content, and standards of accuracy, to ensure accurate transference of the information to later stages of the data capture process.

#### A.4.2 Graphical Information

Field Staff are responsible for recording onto the as-built drawing template, technical information showing the location of pipes and plant in relation to OS mapping features. All pipes must be recorded, irrespective of pressure range and whether pipe is a main or a service. All plant items (e.g. governors, valves etc.) should be recorded and described (see A2.2 above). Where necessary and to aid clarity, supplementary sketches should be supplied. The Field Engineer must show the following on the as-built drawing template by using dimensions taken from specific permanent, visible, OS recorded geographical features:

- The location of all new pipes and plant, and where appropriate in relation to existing pipes and plant. The location of any exposed existing pipes and plant must also be recorded.
- The working pressure tier of the pipe and plant.
- The depth of all new pipes and plant, together with the depth of existing pipes and plant where such items are exposed.
- The location of any connections must be recorded.
- The location of the end point of a pipe must be recorded.

- Cathodic Protection (CP) system details, where applicable, must be recorded, denoting the position of ground-beds, electrical supply transformers and CP cable locations.
- Diameter/material of all pipes must be recorded, as must the lay method, jointing type, SDR and other physical descriptions ie Profuse etc. of any new pipes.
- Crossing pipes must be clearly annotated as such.
- Position measurements along the length of a straight main/service should be recorded at intervals of no more than 50 metres (see 3.1). Changes in direction and/or depth must also be recorded.
- Depth of cover must be measured and recorded at points of positional measurement where pipes and/or plant are exposed.
- Where existing pipes and plant details are shown to be inaccurate on existing records, the actual position and details must be determined and identified, and a note to this effect must be annotated on the template or on a supporting sketch and cross referenced to the template. An Asset Error Report form must be completed.

#### A.4.2.1 Dimension Criteria

Individual position measurements must be taken with a precision of ±0.1 metres, and repeatable to this criterion. This ensures that a pipe or plant item will normally be expected to be found within ± 0.3 metre of its indicated position. This tolerance allows for distortions during printing, the printed line width indicating a pipe, and achievable digitising accuracy. All dimensions must be in metres.

#### A.4.2.2 Points of Reference for Dimensions

It is absolutely essential that when dimensions are drawn onto the as-built drawing template that they refer to OS features, which will be shown on NGN's graphical records system. Where shown, the following features should be used as reference points for dimensions:

- Buildings. Dimensions measured from buildings, should follow a line of sight from an element of the building structure.
- Kerb lines. Dimensioned pipe offsets from kerblines should be placed at identifiable locations, eg. where kerb lines are crossed by building sight lines, or boundary lines.. Alternatively, the distance between dimensions should be recorded, provided at least one dimension is taken at a point where its position can be fixed in relation to OS map features.
- Boundary lines: Dimensions should be taken from other permanent features, such as boundary walls and boundary fence lines.,
- As examples, the following features should not be used as points of reference:
  - Trees
  - Gullies
  - Street furniture (excepting 2.4.1 above)

It is necessary that all dimensions are specific and are easily identifiable in the field. Where connection positions are indicated, it is necessary to show at least two complementary dimensions so that the location may be found in the future.

#### A.4.2.3. Pipe/Plant Location

To accurately record the position of apparatus, measurements must be taken to the crown of the pipe for both depth of cover and positional detail. Positional detail must also measure to the centre of the pipe. Items of plant must be recorded to the centre of the apparatus where practical.

Dimension construction must be straight line only. Triangulation should be avoided wherever possible, as this requires a minimum of two Field Staff to obtain this measurement to the required accuracy, and also to recreate the position from the dimensions with sufficient accuracy in the future.

#### A.4.2.3.3 Plant Description

Plant items must be described, and an arrow indicating the item to which the description refers to must be shown on the as-built template. Descriptions such as ‘open valve’, ‘governor’, or ‘cap end’ are acceptable. It is not necessary for Field Staff creating the record to draw the appropriate symbol for the particular item of plant. For further details, refer to Appendix B

#### A.4.2.3.4 Supplementary information required for valves

Compile a record card/sketch on which the following information is included.

- dimensional sketch of the valve location
- Ordnance Survey map reference
- address of the site
- size and safe operating limit
- make, type of valve, serial number (if available)
- installed position,open or closed
- date fitted
- details of pressure and/or rider points fitted
- number of turns and direction of rotation to close
- function of valve
- identification of each valve by a disc or cap secured to the valve spindle or non-interchangeable surface box, as appropriate.

#### A.4.2.3.5 Other Appropriate Information

Field Staff should include any other appropriate information in the form of a note on the as-built drawing. This should be recorded as necessary in the NGN graphical system.

### A.5 CAPTURING AND REPORTING ASSET RECORDS ERRORS AND CORRECTION

When field works reveal that the current record for existing assets is incorrect, it is important that such information is captured and recorded for subsequent action. Reporting of errors by Field Staff should be entered on the form `Asset Records Error Report`, a copy of this form is available from NGN on request. As much information as possible that defines and locates the error should be recorded on the form. Where possible, a sketch showing details of the error should be attached to the form.

NGN must be informed of any errors as soon as they are identified. Error reports must be returned with the Completion File. Should any error in the records lead to a reduction in the safety on site or increase the risk to people or property then NGN must be informed immediately.

### A.6 RETURN OF AS BUILT RECORDS

A draft “as-laid” record should be provided with the Certification information prior to the connection/commissioning (as defined in IGE/TD/101).

In addition, appropriate documents with asset records completed must be submitted with the completion file to NGN within 5 business days of commissioning the plant. Prior to submission, the as-built record must be checked for errors or omissions by the line manager/supervisor of the Field Staff who created the records. This is to eliminate subsequent queries, which are disruptive to the overall process, and frequently difficult to resolve when surface evidence of the works is disturbed or reinstated. The record should only be submitted to NGN once it has passed this check and any anomalies in the record have been rectified.

**APPENDIX B**

**EXAMPLES OF GOOD QUALITY RECORDS**

In Fig B1, line of sight and fixed reference points have been applied to the developers drawing. Services are shown and the labels provide sufficient data that will help the digitiser to identify the location of the site and the course of the new pipework with reference to the existing NGN main in the highway.

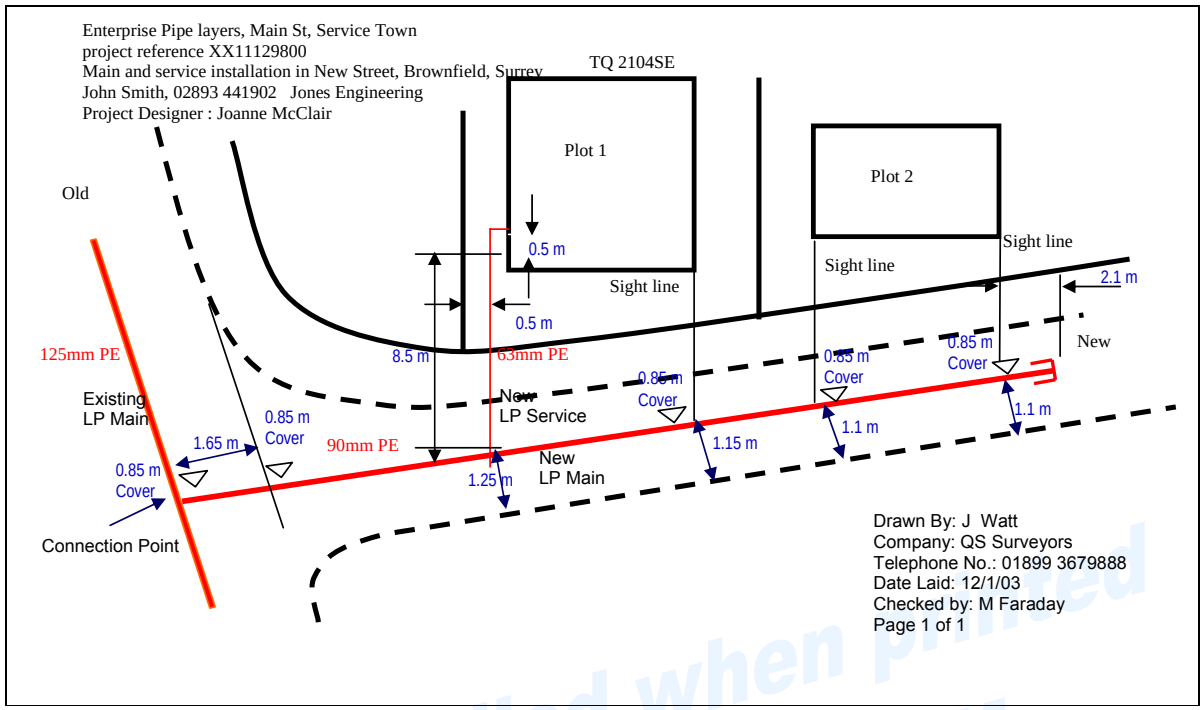



**Figure B1**

In the field sketch shown in Fig B2 below, background geography and line of sight has been used, along with dimensions referenced to fixed point e.g. kerbs. Other dimensions are referenced to these points

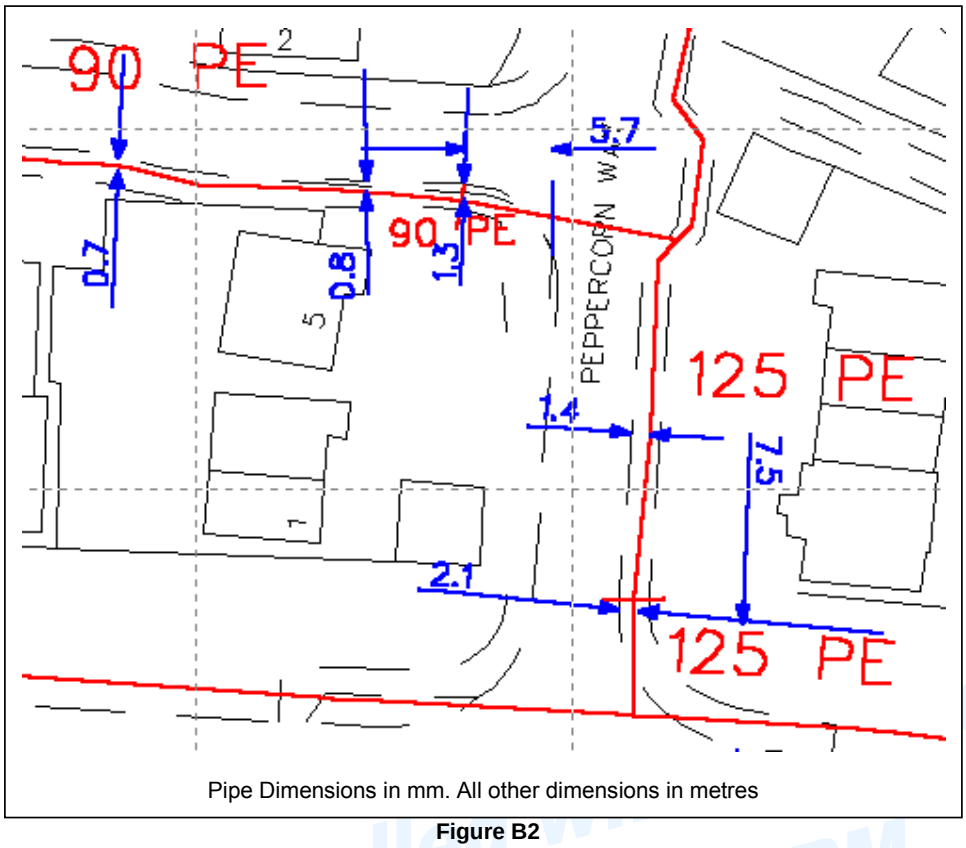
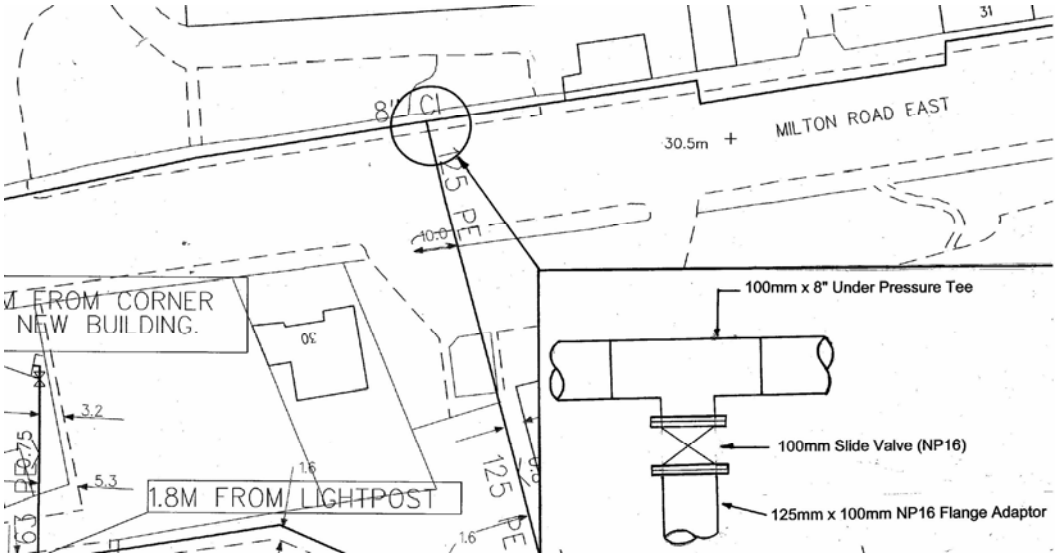



**Figure B2**

**NOTE** For the purpose of providing clarity on this example, the label and service details have not been shown

The drawing below shows some additional details that will be required to show details of the connection

**Figure B3 Template showing connection details**



**APPENDIX C**

**EXAMPLE OF ASSET RECORD – ERROR REPORT**

**Error No:xxxx**

Use this form to highlight any differences between the plant on GIS and that found on site.

PLEASE TAKE TIME TO COMPLETE THIS FORM TO ENSURE WE MAINTAIN A SAFE AND SECURE GAS SUPPLY NETWORK.

Name:……Employee No:……Phone No:……Date:……

Site Location
Address……

……Job Card No……

| **Pipe ID Number (from GIS)** | ( )TTR* | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|

| Pipe Location | E | | | | | | | | **N** | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

Are the pipe details on **GIS** missing or incorrect? MISSING INCORRECT

Are geography details on **GIS** missing or incorrect? MISSING INCORRECT

| Pipe Diameter | **GIS:** | **ACTUAL:** |
|---|---|---|
| Pipe Material | **GIS:** | **ACTUAL:** |
| Pipe Pressure | **GIS:** | **ACTUAL:** |
| **Pipe carrier (for inserted mains)** | **GIS:** | **ACTUAL:** |

Is the **plant** detail missing or incorrect?
(Governors, valves, pressure points, syphons etc.) MISSING INCORRECT

| Plant Location | E | | | | | | | | N | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

Brief details of incorrect/missing plant, pipe or geography data:……

……

……

**Please send this form to:** *The name and address should be obtained from the local NGN office.*

**NOTE:** *The form shown here is by way of example. The local NGN office will provide copies of a form similar to this and provide any relevant information on request.*

To clarify information please provide a dimensioned sketch on the rear of this page.

**Formatted:** Font: (Default) Arial, 10 pt

**APPENDIX D**

**SPECIFICATION FOR RECORD QUALITY MONITORING AND AUDIT CHECK SHEET**

**D.1 WORK PROPOSAL AND JOB ISSUE**

Work Package/Project No:……..

| | Records Item Quality Check | DR8 Ref | Y/N |
|---|---|---|---|
| 1. | Work Documents – Alphanumeric Records. | | |
| 1.1 | Work instructions accurate and complete? | A.1.1 | |
| 1.2 | All asset records relevant to proposal included in Work Documents? | A.1.1 | |
| | | | |
| 2. | Work Documents – Graphical Records. | | |
| 2.1 | Has the proposal drawing been created on a suitable template? | A.2 | |
| 2.2 | Is the `Reference Detail` label included on the template? | A.3 | |
| 2.3 | Are the following proposal items recorded? | | |
| 2.3.1 | Pipe diameter(s) | 3.1 | |
| 2.3.2 | Pipe material(s) | 3.1 | |
| 2.3.3 | Lay method(s) | 3.1 | |
| 2.3.4 | Pipes(s) to be abandoned | 3.1 | |
| 2.3.5 | Planned pipe object number(s) | 3.1 | |
| 2.4 | Does the drawing clearly show existing and proposed mains/plant? | A.1.1 | |
| 2.5 | Are PGT and NGN sites and approach mains displayed (if applicable) | A.1.1 | |
| 2.6 | Are proposed points of connection clear? | A.1.1 | |
| 2.7 | Are proposed plant items described adequately? | A.1.1 | |
| 2.8 | Is the drawing to a defined scale? | A.2 | |
| 2.9 | Is the background geography relevant to site conditions? | A.2.2 | |

## D.2 AS BUILT RECORDS

Work Package/Project No:……..

| Records Item Quality Check | | DR8 Ref | Y/N |
|---|---|---|---|
| 1. | Work Report – Alphanumeric Records. | | |
| 1.1 | Relevant `critical` data recorded accurately and completely? | 3.1 | |
| 1.2 | Relevant `mandatory` data recorded accurately and completely? | 3.1 | |
| 1.3 | Abandoned pipes identified, and abandonment dates recorded? | 3.1 | |
| 1.4 | Work Report submitted with graphical records if appropriate? * | A.4.2 | |
| 1.5 | Have errors found in existing records been reported? | 4 | |
| | | | |
| 2. | Work Report – Graphical Records. * | | |
| 2.1 | Has the as-laid drawing been created on a suitable template? | A.2 | |
| 2.2 | Are the drawing reference details completed in full? | A3 | |
| 2.3 | Are the following items recorded? | | |
| 2.3.1 | Dimensions every 30 -50m and at bends/tees/plant features? | A.4.2 | |
| 2.3.2 | Depths of cover | A.4.2 | |
| 2.3.3 | Pipe diameter(s) | A.4.2 | |
| 2.3.4 | Pipe material(s) | A.4.2 | |
| 2.3.5 | Lay method(s) | A.4.2 | |
| 2.3.6 | Pipe object number(s) | A.4.2 | |
| 2.3.7 | Abandoned pipes clearly marked? | A.4.2 | |
| 2.4 | Does the drawing clearly differentiate existing and new mains/plant? | A.4.2 | |
| 2.5 | Is connection detail legible? | A.4.2 | |
| 2.6 | Is the drawing to a defined scale? | A.4.2 | |
| 2.7 | Are dimensions referenced to suitable map features? | A.4.2 | |
| 2.8 | Are crossing pipes clearly indicated? | A.4.2 | |
| 2.9 | Are plant items described? | A.4.2.3 | |
| 2.10 | Does the background geography match that in DRS? | A.4.2 | |
| 2.11 | Have errors found in existing records been reported? | 4 | |

*Will not be expected for most instances of unplanned work, or when no excavation undertaken.