

|   |                                     |   |              |
|---|-------------------------------------|---|--------------|
| <b>Document Reference:-</b> NPS/002/025 |                                     | <b>Document Type:-</b> Code of Practice |              |
| <b>Version:-</b> 3.0                    | <b>Date of Issue:-</b> January 2023 | <b>Page</b> 1                           | <b>of</b> 12 |

# NPS/002/025 – Technical Specification for Replacement Covers and Frames for Existing Design Underground Link Box Chambers and Cable Draw/Inspection Pits

## 1. Purpose

This document details the requirements for a range of replacement metal frames and covers for existing design of 2 and 4-way underground link box chambers, draw-pit chambers and inspection chambers currently in service on the distribution network of Northern Powergrid (the Company).

This document supersedes the following documents, all copies of which should be destroyed;

| Document Reference | Document Title   | Version | Published Date |
|--------------------|--|---------|----------------|
| NPS/002/025        | Technical Specification for Replacement Covers and Frames for Existing Design Underground Link Box Chambers and Cable Draw/Inspection Pits | 2.1     | March 2019     |

## 2. Scope

Replacement metal frames and concrete filled and unfilled covers are required for situations where the cover and/or frame of an existing design brick built 2 and 4-way link box chamber, cable draw-pit chamber and inspection chamber requires replacing due to mechanical damage and or general wear and tear.

The covers shall be so designed for use in pathways, service areas or areas where slow moving vehicles (20mph or less) including HGV vehicles could operate.

### Link Boxes

2 and 4-way link boxes are utilized on the Company’s distribution network where the main function is to “link” together two or more distribution network cables.

### Draw Pits

Cable ‘draw’ pits were used predominantly within Northern Powergrid (Yorkshire) plc distribution area, the purpose of which was to aid in the installation of underground cables in a ducted system. The chambers are normally found on street corners in busy town centres and on industrial type estates etc. However, occasionally due to the reconfiguration of the curb line by the local authority, a number of chambers may now be located within the edge of the highway.

### Inspection Chambers

Inspection chambers are used within the Company’s distribution network; the brick built chamber are constructed with various opening sizes and are used to house oil tanks/gages etc. which are required to maintain oil pressure within the oil filled cable network.

Depending on the physical size of the chamber they can be located within footpaths or within the edge of the highway.

Cast metal frames and covers are required for situations where the existing frame or cover of the draw/inspection pits requires changing due to mechanical damage and or general wear and tear. The cast iron frames and lids shall

|                             |             |                        |                  |             |   |           |    |
|-----------------------------|-------------|------------------------|------------------|-------------|---|-----------|----|
| <b>Document Reference:-</b> | NPS/002/025 | <b>Document Type:-</b> | Code of Practice |             |   |           |    |
| <b>Version:-</b>            | 3.0         | <b>Date of Issue:-</b> | January 2023     | <b>Page</b> | 2 | <b>of</b> | 12 |

be so designed for use in pathways, service areas or areas where slow moving vehicles (20mph or less) including HGV vehicles could operate.

|   |                                     |   |              |
|---|-------------------------------------|---|--------------|
| <b>Document Reference:-</b> NPS/002/025 |                                     | <b>Document Type:-</b> Code of Practice |              |
| <b>Version:-</b> 3.0                    | <b>Date of Issue:-</b> January 2023 | <b>Page</b> 3                           | <b>of</b> 12 |

## 2.1. Table of Contents

|   |           |
|---|-----------|
| <b>1. PURPOSE</b> .....   | <b>1</b>  |
| <b>2. SCOPE</b> .....   | <b>1</b>  |
| 2.1. TABLE OF CONTENTS .....  | 3         |
| <b>3. TECHNICAL REQUIREMENTS</b> .....  | <b>4</b>  |
| 3.1. FRAMES FOR CONCRETE FILLED COVERS .....  | 4         |
| 3.2. CONCRETE IN FILLED COVER.....  | 4         |
| 3.3. RECESSED COVERS .....  | 4         |
| 3.4. DUCTILE IRON FRAMES AND ACCESS COVERS FOR DRAW PITS AND INSPECTION CHAMBERS .....                              | 4         |
| 3.5. GENERAL REQUIREMENTS.....  | 5         |
| 3.6. TYPE TEST REQUIREMENTS .....   | 5         |
| <b>4. REFERENCES</b> .....  | <b>6</b>  |
| 4.1. EXTERNAL DOCUMENTATION .....   | 6         |
| SURFACE BOXES, GUARDS AND UNDERGROUND CHAMBERS FOR THE PURPOSES OF UTILITIES. SPECIFICATION FOR SURFACE BOXES ..... | 6         |
| 4.2. INTERNAL DOCUMENTATION .....   | 6         |
| 4.3. AMENDMENTS FROM PREVIOUS VERSION.....  | 6         |
| <b>5. DEFINITIONS</b> .....   | <b>6</b>  |
| <b>6. AUTHORITY FOR ISSUE</b> .....   | <b>7</b>  |
| 6.1. CDS ASSURANCE .....  | 7         |
| 6.2. AUTHOR.....  | 7         |
| 6.3. TECHNICAL ASSURANCE .....  | 7         |
| 6.4. AUTHORISATION .....  | 7         |
| <b>APPENDIX 1 - SELF CERTIFICATION CONFORMANCE DECLARATION</b> .....  | <b>8</b>  |
| <b>APPENDIX 1 - CONT'</b> .....   | <b>9</b>  |
| <b>APPENDIX 2 – TYPICAL FRAME SIZES</b> .....   | <b>10</b> |
| <b>APPENDIX 3 – TYPICAL SIZE BRICK LINK BOX PITS</b> .....  | <b>11</b> |

|   |                                     |   |              |
|---|-------------------------------------|---|--------------|
| <b>Document Reference:-</b> NPS/002/025 |                                     | <b>Document Type:-</b> Code of Practice |              |
| <b>Version:-</b> 3.0                    | <b>Date of Issue:-</b> January 2023 | <b>Page</b> 4                           | <b>of</b> 12 |

### 3. Technical Requirements

#### 3.1. Frames for Concrete Filled Covers

Metal frames manufactured from 6mm (Min) hot dipped galvanised steel to BS EN1461 are required to sit on top of the existing brick work.

All joints fabricated in steel shall be formed and welded to provide a firm and ridged assembly that are free from distortion.

All weld slag, burrs and sharp edges shall be removed.

The sides of the frame and the supplied concrete filled/unfilled covers shall be 'flush' with each other as to not cause a tripping hazard.

For larger opening chambers (4-way link boxes) where two x single covers are supplied, a removable cross member shall be incorporated into the frame to aid the removal of the covers. A minimum of 60mm overlap flange is required beneath each unsupported cover end.

#### 3.2. Concrete in Filled Cover

Concrete filled covers shall meet the requirements of Group 2 class B125 as detailed in BS EN 124-4:2015 and be manufactured from 6mm (Min) hot dipped galvanised steel to BS EN1461 and supplied with reinforced high strength concrete infill. The finished level of the concrete shall be flush with the top of the metal cover.

The cover shall be supplied with centralised 'keyhole' lifting holes and have tapered sides to aid in the removal of the cover from the frame.

All covers shall be interchangeable with any other within a frame.

A centralised badge which states 'Danger Electricity' shall be embedded into the concrete and so recessed as to not cause a tripping hazard.

#### 3.3. Recessed Covers

Recessed covers are required for situations where the paving patterns are to be continued over the access point.

Covers shall meet the requirements of group 2 class B125 as detailed in BS EN 124-2015 and be manufactured from 6mm (Min) hot dipped galvanised steel to BS EN1461 and shall be capable of accommodating a paving thickness up to 60mm (75mm Cover).

The cover shall be supplied with centralised 'keyhole' lifting holes and incorporate a slide out type feature to aid its removal from the frame.

Due to the possibility that rain water may become 'trapped' within the frame of the cover; a 20mm diameter (approx) hole shall be positioned within the base of the cover.

#### 3.4. Ductile Iron Frames and Access Covers for Draw Pits and Inspection Chambers

Frames shall be manufactured from Ductile Iron (spheroidal graphite iron or nodular graphite iron) as specified in BS 5834-2 2011 and conforming to BS EN 124. All castings shall be free from air holes, voids etc.

To aid the installation onto existing chamber brickwork the frames shall have a minimum 75mm fixing flange.

The covers shall be supplied coated; the manufacture shall at the time of tendering state the material and method of coating.

At least one closed keyway shall be supplied in each covers; the opening size are as shown in Figure 1 of BS 5834-3

|                             |             |                        |                  |             |   |           |    |
|-----------------------------|-------------|------------------------|------------------|-------------|---|-----------|----|
| <b>Document Reference:-</b> | NPS/002/025 | <b>Document Type:-</b> | Code of Practice |             |   |           |    |
| <b>Version:-</b>            | 3.0         | <b>Date of Issue:-</b> | January 2023     | <b>Page</b> | 5 | <b>of</b> | 12 |

When assembled, the top of the cover shall be flush with top of the frame.

Each access cover on its upper surface shall be permanently and clearly marked stating 'Danger Electricity' and shall be so recessed as to not cause a tripping hazard.

### 3.5. General Requirements

Appendix 2 provides the opening dimensions of two typical brick built link box chambers and although not the full list, the typical openings and classification required of the draw pit and inspection chambers.

Appendix 3 shows a drawing of a typical brick built 2 and 4-way link box.

### 3.6. Type Test Requirements

All Type tests shall be in accordance with the appropriate British Standards; a self-certification conformance declaration Appendix 1 shall be completed by the supplier.

|   |                                     |   |              |
|---|-------------------------------------|---|--------------|
| <b>Document Reference:-</b> NPS/002/025 |                                     | <b>Document Type:-</b> Code of Practice |              |
| <b>Version:-</b> 3.0                    | <b>Date of Issue:-</b> January 2023 | <b>Page</b> 6                           | <b>of</b> 12 |

## 4. References

### 4.1. External Documentation

All equipment covered by this specification shall be in accordance with the latest versions of ENATS, BSEN, IEC and other relevant standards except where varied by this specification.

In this respect the following documents are particularly relevant:-

| Reference          | Title   |
|--------------------|---|
| BS EN 124 –1: 2015 | Gully tops and manhole tops for vehicular and pedestrian areas. Design requirements, type testing, marking, quality control.  |
| BS EN 124 –1: 2014 | Gully tops and manhole tops for vehicular and pedestrian areas. Gully tops and manhole tops made of steel reinforced concrete |
| BS EN 1461 – 2009  | Hot dip galvanized coatings on fabricated iron and steel articles. Specifications and test methods                            |
| BS 5834-2: 2011    | Surface boxes, guards and underground chambers for the purposes of utilities. Specification for surface boxes                 |

### 4.2. Internal Documentation

| Reference | Title |
|-----------|-------|
| n/a       |       |

### 4.3. Amendments from Previous Version

| Reference   | Description                            |
|-------------|--|
| 3.4. & 4.1. | * Update to latest BS specifications   |
| 6.4.        | * Added 'Approval'                     |
| Appendix 1  | * Update BS specifications and Clauses |

## 5. Definitions

| Term        | Definition         |
|-------------|--------------------|
| The Company | Northern Powergrid |

|                             |             |                        |                  |             |   |           |    |
|-----------------------------|-------------|------------------------|------------------|-------------|---|-----------|----|
| <b>Document Reference:-</b> | NPS/002/025 | <b>Document Type:-</b> | Code of Practice |             |   |           |    |
| <b>Version:-</b>            | 3.0         | <b>Date of Issue:-</b> | January 2023     | <b>Page</b> | 7 | <b>of</b> | 12 |

## 6. Authority for Issue

### 6.1. CDS Assurance

I sign to confirm that I have completed and checked this document and I am satisfied with its content and submit it for approval and authorisation.

|          |                          |             |
|----------|--------------------------|-------------|
|          |                          | <b>Date</b> |
| Liz Beat | Governance Administrator | 21/11/2022  |

### 6.2. Author

I sign to confirm that I have completed and checked this document and I am satisfied with its content and submit it for approval and authorisation.

**Review Period** - This document should be reviewed within the following time period.

|  |  |             |
|--|--|-------------|
| <b>Standard CDS review of 3 years?</b>   | <b>Non Standard Review Period &amp; Reason</b> |             |
| Yes  | Period: n/a                                    | Reason: n/a |
| <b>Should this document be displayed on the Northern Powergrid external website?</b> |  | Yes         |
|  |  | <b>Date</b> |
| Paul Hanrahan  | Engineer – Asset Management                    | 28/11/2022  |

### 6.3. Technical Assurance

I sign to confirm that I am satisfied with all aspects of the content and preparation of this document and submit it for approval and authorisation.

|               |                             |             |
|---------------|-----------------------------|-------------|
|               |                             | <b>Date</b> |
| Steve Salkeld | Policy & Standards Engineer | 21/11/2022  |
| Joe Helm      | Policy & Standards Manager  | 06/12/2022  |

### 6.4. Authorisation

Authorisation is granted for publication of this document.

|            |                            |             |
|------------|----------------------------|-------------|
|            |                            | <b>Date</b> |
| Paul Black | System Engineering Manager | 21/12/2022  |

|                             |             |                        |                  |             |   |           |    |
|-----------------------------|-------------|------------------------|------------------|-------------|---|-----------|----|
| <b>Document Reference:-</b> | NPS/002/025 | <b>Document Type:-</b> | Code of Practice |             |   |           |    |
| <b>Version:-</b>            | 3.0         | <b>Date of Issue:-</b> | January 2023     | <b>Page</b> | 8 | <b>of</b> | 12 |

## Appendix 1 - Self Certification Conformance Declaration

Replacement metal frames and covers for existing design 2 and 4-way underground link box chambers, draw-pit and inspection chambers covered by BS EN1461, BS5834 and BS EN 124 shall comply with the latest issues of the relevant international and international standards.

BS EN1461, BS5834 and BS EN124 are intended to amplify and/or clarify the requirements of those Standards.

This check sheet identifies the clauses of the aforementioned standard relevant to replacement metal frames and covers for existing design of 2 and 4-way underground link box chambers, draw-pit and inspection chambers. The manufacturer shall declare conformance or otherwise, clause by clause, using the following levels of conformance declaration codes.

### Conformance Declaration Codes

N/A = Clause is not applicable/ appropriate to the product.

Cs1 = the product conforms fully with the requirements of this clause.

Cs2 = the product conforms partially with the requirements of this clause.

Cs3 = the product does not conform to the requirements of this clause.

Cs4 = the product does not currently conform to the requirements of this clause, but the manufacturer proposes to modify and test the product in order to conform.

### Instructions for completion

- When Cs1 code is entered no remark is necessary
- When any other code is entered the reason for non- conformance shall be entered
- Prefix each remark with the relevant 'BS EN' 'IEC' or 'ENATS' as appropriate.

**Manufacturer:**

**Product Reference:**

**Name:**

**Signature:**

**Date:**

**NOTE:** One sheet shall be completed for each item or variant submitted.

|   |                                     |   |              |
|---|-------------------------------------|---|--------------|
| <b>Document Reference:-</b> NPS/002/025 |                                     | <b>Document Type:-</b> Code of Practice |              |
| <b>Version:-</b> 3.0                    | <b>Date of Issue:-</b> January 2023 | <b>Page</b> 9                           | <b>of</b> 12 |

## Appendix 1 - Cont'

Gully tops and manhole tops for vehicular and pedestrian areas – Design requirements, type testing, marking and quality control.

| BS EN 124-1:2015  |   |                  |         |
|-------------------|---|------------------|---------|
| Clause/Sub-clause | Requirement   | Conformance Code | Remarks |
| 4.<br>4.2         | Classification in the context of intended use:<br>Group 2 (at least class B 125)- - Pedestrian areas and comparable areas, car parks or car parking decks |                  |         |
| 5.3               | Frames in combination with concrete – compressive strength of at least C35/45 in accordance with EN 206:2013  |                  |         |
| BS EN 124-3:2015  |   |                  |         |
| 4.2<br>4.2.2      | Hot dip galvanizing   |                  |         |
| BS EN 124-5:2015  |   |                  |         |
| 9.                | Markings  |                  |         |
| BS 5834-2: 2011   |   |                  |         |
| 5.2               | Type and grade of cast iron used  |                  |         |
| 10.               | Coatings and corrosion protection<br>(Manufacturer to supply method and type of coating)  |                  |         |

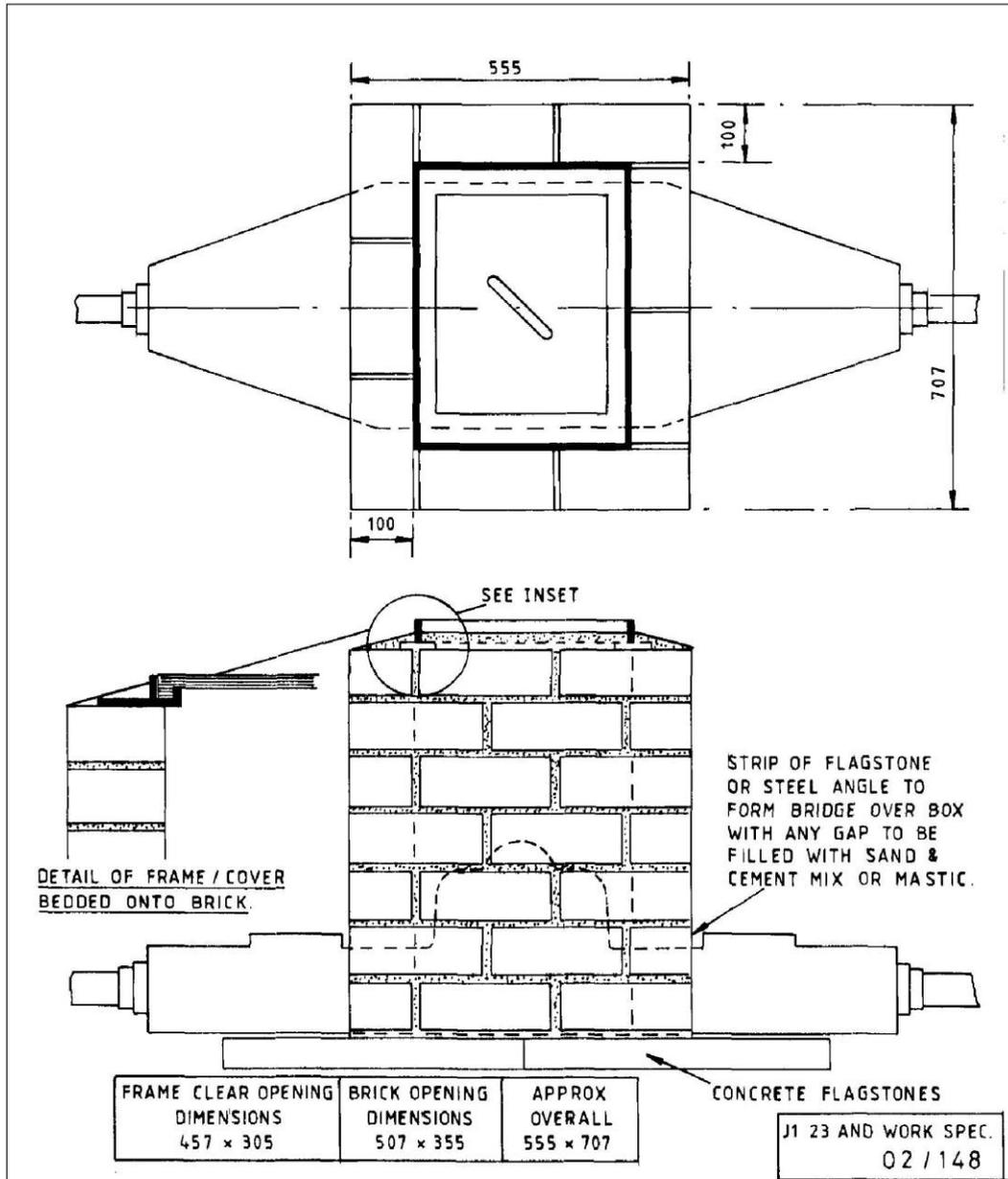
|                             |             |                        |                  |             |    |           |    |
|-----------------------------|-------------|------------------------|------------------|-------------|----|-----------|----|
| <b>Document Reference:-</b> | NPS/002/025 | <b>Document Type:-</b> | Code of Practice |             |    |           |    |
| <b>Version:-</b>            | 3.0         | <b>Date of Issue:-</b> | January 2023     | <b>Page</b> | 10 | <b>of</b> | 12 |

## Appendix 2 – Typical Frame Sizes

| <b>Galvanised Steel Frames and Concrete Filled Covers</b> |               |              |
|---|---------------|--------------|
|   | <b>Size</b>   | <b>Class</b> |
| 1   | 450mm x 450mm | B125         |
| 2   | 450mm x 600mm | B125         |
| 3   | 450mm x 750mm | B125         |
| 4   | 600mm x 600mm | B125         |
|   |               |              |
| <b>Ductile Iron Replacement Frames and Covers</b>         |               |              |
|   | <b>Size</b>   | <b>Class</b> |
| 1   | 450mm x 450mm | B125         |
| 2   | 450mm x 450mm | C250         |
| 3   | 450mm x 450mm | D400         |
| 4   | 450mm x 600mm | B125         |
| 5   | 450mm x 600mm | C250         |
| 6   | 450mm x 600mm | D400         |
| 7   | 450mm x 750mm | B125         |
| 8   | 450mm x 750mm | C250         |
| 9   | 600mm x 600mm | B125         |
| 10  | 600mm x 600mm | C250         |
| 11  | 600mm x 600mm | D400         |
| 12  | 600mm x 750mm | B125         |
| 13  | 600mm x 750mm | C250         |
| 14  | 600mm x 750mm | D400         |
| 15  | 750mm x 750mm | C250         |
| 16  | 750mm x 750mm | D400         |
| 17  | 900mm x 600mm | C250         |
| 18  | 900mm x 600mm | D400         |
| 19  | 900mm x 900mm | C250         |

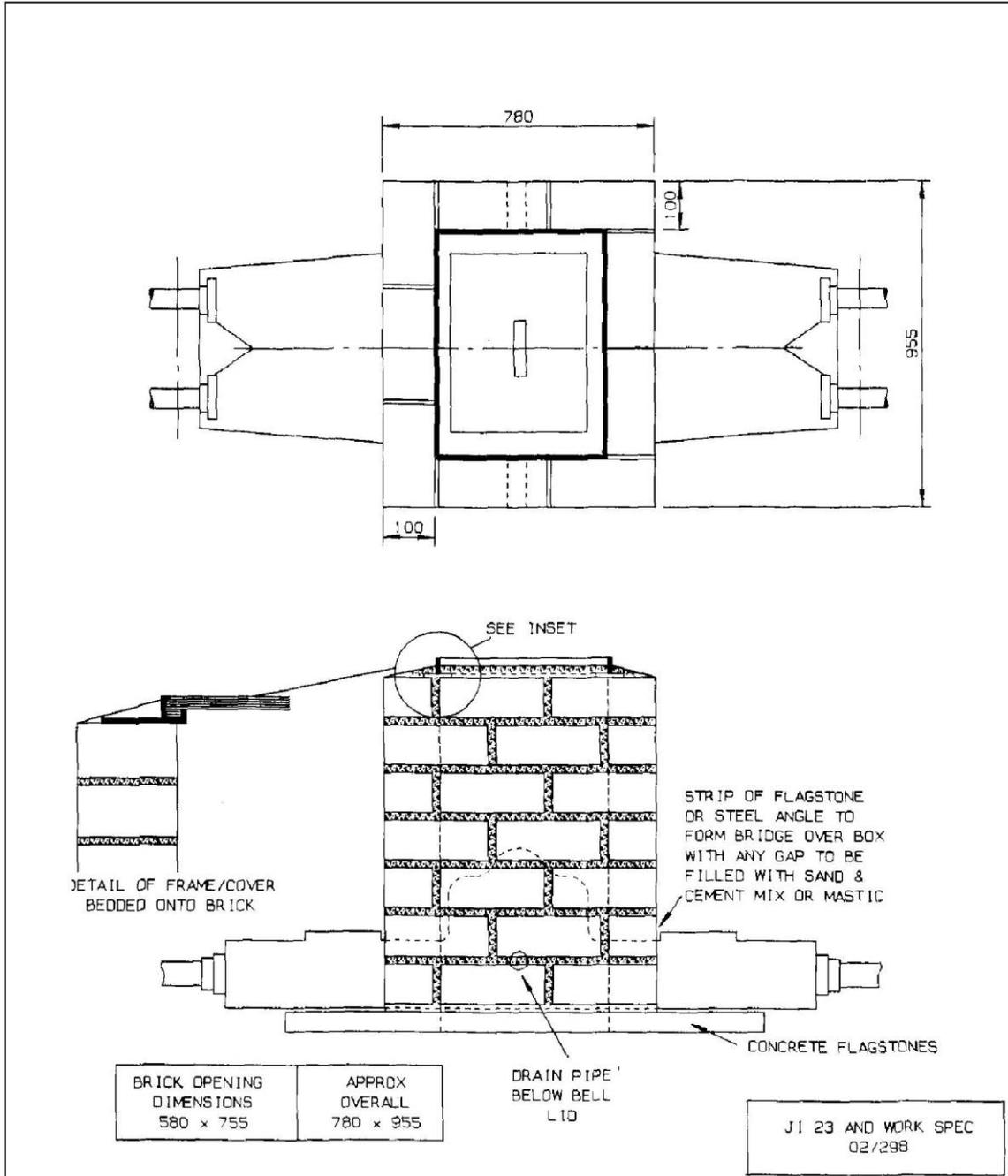
|                                  |                              |                                  |       |
|----------------------------------|------------------------------|----------------------------------|-------|
| Document Reference:- NPS/002/025 |                              | Document Type:- Code of Practice |       |
| Version:- 3.0                    | Date of Issue:- January 2023 | Page 11                          | of 12 |

### Appendix 3 – Typical Size Brick Link Box Pits



|                         |                         |   |                                |
|-------------------------|-------------------------|---|--------------------------------|
|                         |                         | Lloyds Court, 78 Grey Street, Newcastle Upon Tyne, NE1 6AF                                |                                |
|                         |                         | PAVEMENT PIT (BRICK BUILT) FOR LV UNDERGROUND 2 WAY LINK DISCONNECTING BOX (RESIN FILLED) |                                |
| Manufacturer Details    |                         |   |                                |
| Sheet No.<br>2          | Scale<br>N.T.S.         |   |                                |
| Prepared By             |                         | Type<br>LEGACY  | OTHER                          |
| Revised<br>23/11/11     | Grid Reference          | Ref No.<br>C980144  | Historic Drg.No.<br>1181040060 |
| Date Issued<br>13/10/09 | Checked By<br>R MCMAHON | Revision<br>B   | Notes                          |

|   |                                     |   |              |
|---|-------------------------------------|---|--------------|
| <b>Document Reference:-</b> NPS/002/025 |                                     | <b>Document Type:-</b> Code of Practice |              |
| <b>Version:-</b> 3.0                    | <b>Date of Issue:-</b> January 2023 | <b>Page</b> 12                          | <b>of</b> 12 |



|                         |                         |   |                                   |
|-------------------------|-------------------------|---|-----------------------------------|
|                         |                         | Lloyds Court, 78 Grey Street, Newcastle Upon Tyne, NE1 6AF                                  |                                   |
| Manufacturer Details    |                         | PAVEMENT PIT(BRICK BUILT) FOR LV UNDERGROUND<br>4 WAY LINK DISCONNECTING BOX (RESIN FILLED) |                                   |
| Sheet No.<br>3          | Scale<br>N.T.S.         |   |                                   |
| Prepared By             |                         | Type<br>LEGACY  | OTHER                             |
| Revised<br>22/11/11     | Grid Reference          | Ref No.<br>C980145  | Historic<br>Drg.No.<br>1181040060 |
| Date Issued<br>13/10/09 | Checked By<br>R MCMAHON | Revision<br>B   | Notes                             |