

PT/478/1120 - November 2020

Assessment Schedule for the Integrated Ladder system for manholes and access chambers as manufactured by Caswick Ltd.



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1. SCOPE

This schedule specifies characteristics for the Integrated Ladder system produced by Caswick Ltd. for incorporation into manholes and access chambers.

2. PRODUCT DESCRIPTION

2.1 Introduction

The Integrated Ladder system is developed for installation into precast concrete manholes. The assembled product gives access and egress to and from gravity sewers and other underground chambers.

The ladder comprises polypropylene encapsulated steps into which two tubular side rails (stringers) are attached. The steps are installed, and the stringers slid through rings on each step until they rest on the floor of the manhole. A cap is slid over the top end of each stringer. Brackets are fitted to support the stringers above the top step at the point of access.

The preferred method of installation of the steps into a pre-cast concrete manhole ring is by casting plastic inserts into the concrete at the time of manufacture. The steps are hammered into the inserts at the manufacturing site. The steps may be retrofitted to concrete manhole rings by drilling parallel holes at the correct centres and fixing the step into the holes using an epoxy or cementitious grout.

The steps are supplied with projections (distance between the wall and the step) of either 150 or 200 mm. The stringers are supplied in nominal 25 m length coils.

2.2 Applicable standards

The following relevant standard was identified:

BS EN 13101:2002⁽¹⁾ Steps for underground man entry chambers – Requirements, marking, testing and evaluation of conformity.

2.3 Approval History

The Integrated Ladder system was originally awarded WRC Approved™ certification in October, 2005 (PT/250/1005).

The product was re-assessed for WRC Approved certification in October, 2010 (PT/321/1010) and again in October 2015 (PT/385/1015).

Note: There have been no significant changes to the product, standards and testing undertaken since the re-assessment in 2015.

3. REQUIREMENTS AND TESTING

3.1 Materials and Components

The step rungs shall comply with the requirements of BS EN 13101:2002⁽¹⁾.

The stringers shall be manufactured from high impact, corrosion resistant copolymer in accordance with the manufacturer's specification.

The ancillary fitting brackets shall be manufactured from stainless steel 4301-304-03-I for use in clean water applications or stainless steel 4401-316-00-I for use in wastewater applications and shall comply with the requirements of BS ISO 16143-1:2014⁽²⁾.

3.2 Type Testing

The Integrated Ladder system shall comply with the following test requirements:

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Mechanical resistance

The locating eyes shall comply with the following:

- Loading test: 5kN load equally distributed between the 2 eyes on adjacent steps is applied for at least 60 seconds. The material shall not show any signs of failure.

When located in the locating eyes the stringers shall comply with the following:

- Deflection under load (test method as per BS EN 14396:2004⁽³⁾, Annex C): the maximum deflection shall not exceed 2.5 % of unsupported length when 0.5 kN load is applied for a minimum of 60 seconds. The maximum residual deflection of unsupported length shall not exceed 0.3 % when load is removed.
- Shock loading: a load of 5 kN is applied for 5 seconds followed by a load of 1.5 kN for 15 seconds. The stringer shall not show any signs of failure.

Appearance

The stringer shall comply with the requirements of BS EN 14396:2004⁽³⁾, 4.3.3.

Dimensional requirements

The dimensions of the stringers and locating eyes shall be in accordance with the manufacturer's specification.

The ladder shall not exceed a height of 6m without an intermediate platform. (BS EN 752:2017⁽⁴⁾, NA.6.4.4.4; BS 4211:2005⁽⁵⁾, Fig 1).

The clear space behind the ladder shall comply with the requirements of BS EN

752:2017⁽⁴⁾, NA.6.4.4.4; Sewers for Adoption⁽⁷⁾, Fig. B.8; Sector Guidance in relation to the adoption of sewerage assets by sewerage companies in England⁽⁸⁾ Fig.B.4 and Sewers for Adoption Northern Ireland⁽⁹⁾, Fig. 2.11

The ladder shall not obstruct the minimum clear access distance in accordance to BS EN 752:2017⁽³⁾, NA.6.4.3; Sector Guidance in relation to the adoption of sewerage assets by sewerage companies in England⁽⁸⁾ B5.2.7; Sewers for Adoption⁽⁷⁾, B3.2.6; Sewers for Adoption Northern Ireland⁽⁹⁾, Fig. 2.10 and Sewers for Scotland⁽¹⁰⁾, Table 3.

The distance between the top rung and the surface shall comply with the requirements of BS EN 752:2017⁽⁴⁾ NA.6.4.4.4; Sector Guidance in relation to the adoption of sewerage assets by sewerage companies in England⁽⁸⁾ B5.2.28; Sewers for Adoption⁽⁷⁾, B6.2.28; Sewers for Adoption Northern Ireland⁽⁹⁾, 2.12.16 and Sewers for Scotland⁽¹⁰⁾, 2.20.7.

3.3 Manufacture

To ensure the quality and performance of the Integrated Ladder system the manufacturing process shall include appropriate systems for:

- Specification of component materials;
- Verification of component materials received are to specification
- Handling and storage of all component materials and finished units
- Fabrication and quality of workmanship

The production of the Integrated Ladder system and related Quality Control procedures shall comply with requirements

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to ensure the stated performance of the product is reliably achieved.

The manufacture of the encapsulated steps shall comply with the factory production control requirements of BS EN 13101:2002⁽¹⁾.

The manufacture of the stringers shall comply with the factory production control requirements of BS EN 14396:2004⁽³⁾.

3.4 Installation

When installed in accordance with the installation documentation, the installation shall be practicable and shall be reasonably expected to perform as described.

4. APPROVAL

The Integrated Ladder system has been audited and has successfully met all the requirements stated within this assessment schedule.

Signed:

A handwritten signature in black ink, appearing to read 'Leo Caswell'.

Valid until: 1st November 2025

3. BS EN 14396:2004 Fixed ladders for manholes
4. BS EN 752:2017 Drain and sewer systems outside buildings. Sewer system management
5. BS 4211:2005+A1:2008 Specification for permanently fixed ladders
6. Civil Engineering Specification for the Water Industry, 7th edition, UKWIR, 2011
7. Sewers for Adoption, 7th edition, WRc plc, 2012
8. Sector Guidance in relation to the adoption of sewerage assets by sewerage companies in England, Water UK, 2020
9. Sewers for Adoption Northern Ireland, 1st edition, WRc plc, 2010
10. Sewers for Scotland, 4th edition, Scottish Water and WRc plc, 2018

5. REFERENCES

1. BS EN 13101:2002 Steps for underground man entry chambers – Requirements, marking, testing and evaluation of conformity
2. BS ISO 16143-1:2014 Stainless steels for general purposes. Corrosion-resistant flat products