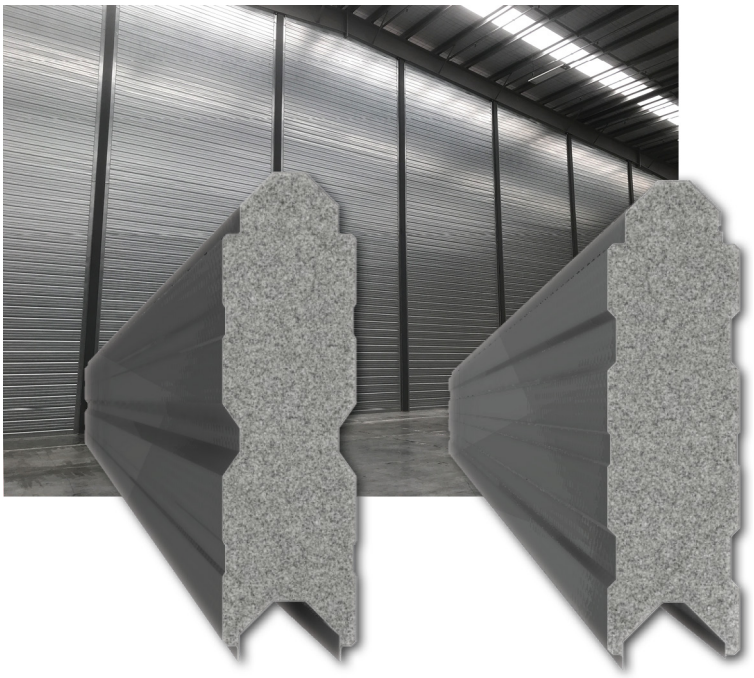
BRANZ Appraised
Appraisal No. 559 [2020]

KOROK® FS AND NCS SYSTEMS



Appraisal No. 559 (2020)

This Appraisal replaces BRANZ Appraisal 559 (2007).

BRANZ Appraisals

Technical Assessments of products for building and construction.

KOROK FIRE AND ACOUSTIC WALL SYSTEMS

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Product

1.1 The KOROK® FS and NCS Systems incorporate KOROK® panels that are used to construct non-loadbearing standard, fire and acoustically rated walls and partitions within the building envelope.

1.2 KOROK® panels are available in two panel profiles (KOROK® Gen 1 and KOROK® Gen 2 panels) and are made from lightweight aerated concrete encased in profiled galvanised steel sheet steel formwork.

Scope

2.1 The KOROK® FS and NCS Systems have been appraised for use as non-loadbearing standard, fire and/or acoustically rated internally located walls and partitions for all buildings of all importance levels as defined by AS/NZS 1170.

2.2 The KOROK® panels may be installed with either a vertical or horizontal orientation. The maximum span for the panels between structural supports is 8 m. The overall height or length of a KOROK® FS and NCS Systems wall will be determined by the structural support. When used as part of a fire rated system, the maximum unsupported span of the KOROK® panels is 6 m (vertical orientation) and 5 m (horizontal orientation). Greater spans are subject to specific engineering design and/or fire engineering assessment, and are outside the scope of this Appraisal.

Building Regulations

New Zealand Building Code (NZBC)

3.1 **In the opinion of BRANZ, the KOROK® FS and NCS Systems, if designed, installed, used and maintained in accordance with the statements and conditions of this Appraisal, will meet the following provisions of the NZBC:**

CLAUSE B1 STRUCTURE: Performance B1.3.1, B1.3.2 and B1.3.4. The KOROK® FS and NCS Systems meet the requirements for loads arising from self-weight, earthquake, wind, impact and creep and shrinkage [i.e. B1.3.3 (a), (f), (h), (j), and (q)]. See Paragraphs 8.1 - 8.2.

CLAUSE B2 DURABILITY: Performance B2.3.1 (a) not less than 50 years, B2.3.1 (b) 15 years, and B2.3.1 (c) 5 years. The KOROK® FS and NCS Systems meet these requirements. See Paragraphs 9.1 - 9.3.

CLAUSE C3 PROTECTION FROM FIRE: Performance C3.4 (a) and C3.6. The KOROK® FS and NCS Systems will meet or contribute to meeting these requirements. See Paragraphs 11.1, 12.1-12.6.

CLAUSE F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. The KOROK® FS and NCS Systems meet this requirement and will not present a health hazard to people.

CLAUSE G6 AIRBORNE AND IMPACT SOUND: Performance G6.3.1. The KOROK® FS and NCS Systems will contribute to meeting this requirement. See Paragraphs 14.1 - 14.2.

Technical Specification

General

4.1 The KOROK® FS and NCS Systems are non-loadbearing wall system that is attached to the structural frames of buildings to provide internal walls and partitions.

4.2 The KOROK® FS and NCS Systems covered by this Appraisal, and as described in the Technical Literature are:

- FS1
- FS2
- FS3
- NCS2
- NCS3
- NCS4

KOROK® Panels

4.3 KOROK® panels are manufactured from lightweight aerated concrete encased in a galvanised steel permanent formwork. The permanent formwork is roll-formed from zinc coated steel strips. The steel has a base metal thickness of 0.4 mm with ZM275 zinc coating. Paint coated steel coil may also be used for one or both faces.

4.4 The KOROK® Gen 1 panels and the KOROK® Gen 2 panels are supplied in length of up to 9 m. Both types of panels are 78 mm thick and the long edges are tongue and groove, so the pitch of the panels when installed is 250 mm.

4.5 The KOROK® panels are available in nominal densities of 400 kg/m^3. Other densities between 400 kg/m^3 and 1000 kg/m^3 can be provided upon request.

Accessories

4.6 Accessories and materials used with the KOROK® FS and NCS Systems that are supplied by KOROK Building Systems NZ Limited are:

- **KOROK® C-track** - 60 x 80 x 60 x 1.15 mm (base metal thickness) C-section available in galvanised steel and powder coated to match the paint coated steel coil.
- **KOROK® angle** - 50 x 60 x 1.15 mm (bmt) angle available in galvanised steel and powder coated to match the paint coated steel coil.
- **KOROK® metal fire flashing** - 0.7 mm (bmt) galvanised steel.
- 25 mm and 32 mm x 6 gauge GIB® Grabber™ scavenger head drywall self tapping screws.
- Fasteners for panel to panel connection (10 gauge by 16 mm tek screws), panel to C-track and angle connection (10 gauge by 16 mm or 32 mm tek screws), C-track and angle to concrete and C-track and angle to steelwork.

4.7 Accessories used with the KOROK® FS and NCS Systems that are supplied by KOROK Building Systems NZ Limited or the building contractor are:

Framing:

- Light gauge steel framing.

Plasterboard:

- 10 mm GIB® Standard Plasterboard.
- 13 mm GIB Fyreline®.
- 13 mm GIB Noiseline®.

Insulation:

- Pink® Batts® R1.8 (75 mm).

Fire rated sealants:

- Hilti CP606.
- Sika 400 PU.
- Promat Promaseal A.
- Promat Promaseal Grafitex Graf 4T.

Packaging, Handling and Storage

5.1 KOROK® panels are delivered to site in packages. They must be handled with care to avoid physical damage, particularly to the bottom edges and the finished exposed faces, and must be stored so that they are protected from the weather under clean, dry and ventilated conditions. They should be stored on bearers no more than 2 m apart.

5.2 Accessories used with the KOROK® FS and NCS Systems must also be handled with care to avoid damage. Components such as sealants and grouts must be stored in dry locations protected from the weather. Other components should be stored so that they are protected from the weather.

Technical Literature

6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for the KOROK® FS and NCS Systems. The Technical Literature must be read in conjunction with this Appraisal. All aspects of design, installation, use and maintenance contained within the Technical Literature and within the scope of this Appraisal must be followed.

Design Information

General

7.1 The systems described in the Technical Literature and covered by this Appraisal are KOROK® Systems FS1, FS2, FS3, NCS2, NCS3, and NCS4.

7.2 The KOROK® FS and NCS Systems Technical Literature contains design information and procedures required to allow building designers to design structures incorporating the KOROK® FS and NCS Systems. This includes incorporating both fire rated systems and noise control systems depending upon the users requirements.

7.3 KOROK® panels may be laid up either horizontally or vertically.

7.4 The maximum length of KOROK® panel allowed between structural supports is 8 m. Where the system is being used as a fire rated system, the maximum unsupported length of KOROK® panel allowed between structural supports is 6 m (vertical orientation) and 5 m (horizontal orientation). Greater spans are subject to specific engineering design and/or fire engineering assessment and are outside the scope of this Appraisal.

Structure

General

8.1 The KOROK® FS and NCS Systems are for use within concrete framed structures that have been designed in accordance with NZS 3101, and/or steel framed structures that have been designed in accordance with NZS 3404.

Design

8.2 Design of the KOROK® FS and NCS Systems must be in accordance with the information and methods given in the Technical Literature, and must be carried out by a suitably qualified design engineer considering all loading types as specified in Paragraph 3.1. Any variations to the design of the KOROK® FS and NCS Systems must be carried out by a suitably qualified design engineer. These variations are outside the scope of this Appraisal.

Durability

9.1 The KOROK® FS and NCS Systems are expected to have a serviceable life of at least 50 years.

9.2 Where KOROK® panels will experience regular use of chemical cleaning agents, or be in the presence of vapours that may attack galvanised steel components during service, then KOROK Building Systems NZ Limited should be contacted to determine the correct panel coating selection is made to ensure the required service life of the system is achieved.

9.3 The ability of the KOROK® FS and NCS Systems and other incorporated elements to remain durable is dependent on them remaining dry in service.

Maintenance

10.1 Where KOROK® panels are exposed an inspection should be carried out at least annually to ensure that no undue degradation is occurring. Where items such as corrosion are identified, then the cause must be determined, and repairs must be made to restore the system.

10.2 Where KOROK® panels are not exposed, then no maintenance should be required. In the event of damage to linings or claddings, these should be repaired immediately.

Prevention of Fire Occurring

11.1 Where required separation or protection must be provided to the KOROK® FS and NCS Systems from heat sources such as fireplaces, heating appliances and chimneys. Part 7 of NZBC Acceptable Solution C/AS1 and C/AS2, and NZBC Verification Method C/VM1 provide methods for separation and protection of combustible materials from heat sources. Whilst KOROK® panels are manufactured from non combustible materials, all components of the KOROK® FS and NCS Systems have to be considered.

Fire Affecting Areas Beyond The Fire Source

Internal Surface Finishes

12.1 KOROK® 78 mm Gen 1 and Gen 2 panels have been independently assessed to achieve a Group Number of 1-S. This assessed performance is based on testing to AS ISO 9705 of another KOROK® panel of identical composition.

12.2 Where KOROK® panels are finished with a waterborne or solvent borne paint coating of not more than 0.4 mm in thickness, the steel used for its manufacture is deemed to have a Group Number of 1-S in accordance with NZBC Verification Method C/VM2, Table A1.

12.3 When an applied finish other than those specified above is used over the KOROK® System, the Material Group Number must be obtained from the manufacturer or supplier of the finish product or system, for the complete lining system.

Fire Resistance Ratings (FRRs)

12.4 The KOROK® FS and NCS Systems can be used to provide FRRs as required by NZBC Acceptable Solutions C/AS2 and NZBC Verification Method C/VM2.

12.5 The Technical Literature gives three (FS1, FS2 & FS3) different fire rated wall systems incorporating KOROK® panels. These vary in rating from 60 minutes up to 4 hours depending on the system and the unsupported span chosen. Refer to the Technical Literature for details of available FRRs.

12.6 Where KOROK® walls are used as part of a fire rated system then the maximum unsupported span of the KOROK® panels between structural supports is 6 m (vertical orientation) and 5 m (horizontal orientation). Greater spans are subject to specific engineering design and/or fire engineering assessment and are outside the scope of this Appraisal.

Structural Stability During Fire

13.1 In order to satisfy the requirements of NZBC C6 Structural Stability, designers must ensure that fire rated elements are supported by building elements having at least the same FRR as the fire rated element they are supporting.

Airborne and Impact Sound

14.1 The Technical Literature gives three different KOROK® noise control systems for walls with Sound Transmission Class (STC) ratings of 58 to 76 (NCS2, NCS3, and NCS4).

14.2 KOROK® noise control systems NCS2 and NCS3 in the Technical Literature are based on KOROK® panels with concrete density of 400 kg/m^3. KOROK® NCS4 is based on KOROK® panels with a concrete density of 600 kg/m^3.

Installation Information

Installation Skill Level Requirement

15.1 All design and building work must be carried out in accordance with the KOROK® FS and NCS Systems Technical Literature and this Appraisal by competent and experienced designers and trades-people conversant with the KOROK® FS and NCS Systems.

General

16.1 The KOROK® FS and NCS Systems must be installed in accordance with the specifications contained in the Technical Literature.

Inspections

16.2 For inspection, reference must be made to the specific building design documentation and the Technical Literature.

Cutting Panels

16.3 KOROK® panels can be cut to length with the use of a sabre saw, circular saw or evacuated grinder to minimise dust. Where KOROK® panels are trimmed to width, the cut section of the panel is fitted with track and is always the last panel abutting the wall, column or soffit. The panel is then sealed and fixed with an angle section.

Health and Safety

16.4 Suitable safety glasses, ear muffs and face masks must always be worn when cutting KOROK® panels. The recommended installation practices of the insulation manufacturer must be followed when insulation is installed.

16.5 Where powder-actuated fasteners are used Worksafe guidelines on the use of powder-actuated hand-held fastening tools must be followed.

Framing

16.6 The structural frame to which the KOROK® FS and NCS Systems will be attached must be as per the designer's specifications, and must be plumb, level and in true alignment.

Fixing

16.7 The fixing of all KOROK® panels, channels and angles must be strictly in accordance with the Technical Literature.

Basis of Appraisal

The following is a summary of the technical investigations carried out:

Tests

17.1 Fire testing has been carried out to determine the performance of the KOROK® FS and NCS Systems under fire conditions. The test methods and results have been reviewed by BRANZ and found to be satisfactory.

17.2 Sound insulation testing has been carried out to determine the acoustic performance of the KOROK® NCS Systems. The test methods and results have been reviewed by BRANZ and found to be satisfactory.

Other Investigations

18.1 The KOROK® FS and NCS Systems Technical Literature has been examined by BRANZ and found to be satisfactory.

18.2 Site visits were carried out by BRANZ to assess the practicability of the installation of the systems, and to view completed installations.

18.3 An assessment was made of the durability of the systems by BRANZ technical experts and found to be satisfactory.

18.4 Assessments were made of the structure and fire for the KOROK® Gen 2 panel profile by BRANZ technical experts and found to be satisfactory.

18.5 A fire assessment of the systems has been carried out by an independent fire assessment body.

Quality

19.1 KOROK Building Systems NZ Limited's manufacturing process and details of the quality and composition of the materials have been examined by BRANZ and found to be satisfactory.

19.2 KOROK Building Systems NZ Limited is responsible for the quality of the product supplied.

19.3 Quality on site is the responsibility of the installer.

19.4 Designers are responsible for incorporating the KOROK® FS and NCS Systems into the design of their buildings.

19.5 Building owners are responsible for the maintenance of the KOROK® FS and NCS Systems in accordance with the instructions of KOROK Building Systems NZ Limited.

Sources of Information

- AS ISO 9705-2003 (R:2016) Fire tests – Full-scale room test for surface products.
- AS/NZS 1170 Structural design actions.
- ISO 5660-1:2002 Reaction-to-fire tests - Heat release, smoke production and mass loss rate - Heat release rate (cone calorimeter method).
- ISO 5660-2:2002 Reaction-to-fire tests - Heat release, smoke production and mass loss rate - Smoke production rate (dynamic measurement).
- NZS 3101.1 & 2: 2006 Concrete structures standard.
- NZS 3404.1 & 2: 2009 Steel structures standard.
- Ministry of Business, Innovation and Employment Record of amendments - Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.

BRANZ

In the opinion of BRANZ, KOROK® FS and NCS Systems are fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided they are used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to KOROK Building Systems NZ Limited, and is valid until further notice, subject to the Conditions of Appraisal.

Conditions of Appraisal

1. This Appraisal:
   a) relates only to the product as described herein;
   b) must be read, considered and used in full together with the Technical Literature;
   c) does not address any Legislation, Regulations, Codes or Standards, not specifically named herein;
   d) is copyright of BRANZ.
2. KOROK Building Systems NZ Limited:
   a) continues to have the product reviewed by BRANZ;
   b) shall notify BRANZ of any changes in product specification or quality assurance measures prior to the product being marketed;
   c) abides by the BRANZ Appraisals Services Terms and Conditions;
   d) warrants that the product and the manufacturing process for the product are maintained at or above the standards, levels and quality assessed and found satisfactory by BRANZ pursuant to BRANZ's Appraisal of the product.
3. BRANZ makes no representation or warranty as to:
   a) the nature of individual examples of, batches of, or individual installations of the product, including methods and workmanship;
   b) the presence or absence of any patent or similar rights subsisting in the product or any other product;
   c) any guarantee or warranty offered by KOROK Building Systems NZ Ltd.
4. Any reference in this Appraisal to any other publication shall be read as a reference to the version of the publication specified in this Appraisal.
5. BRANZ provides no certification, guarantee, indemnity or warranty, to KOROK Building Systems NZ Ltd or any third party.

For BRANZ

Chelydra Percy
Chief Executive

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23 June 2020