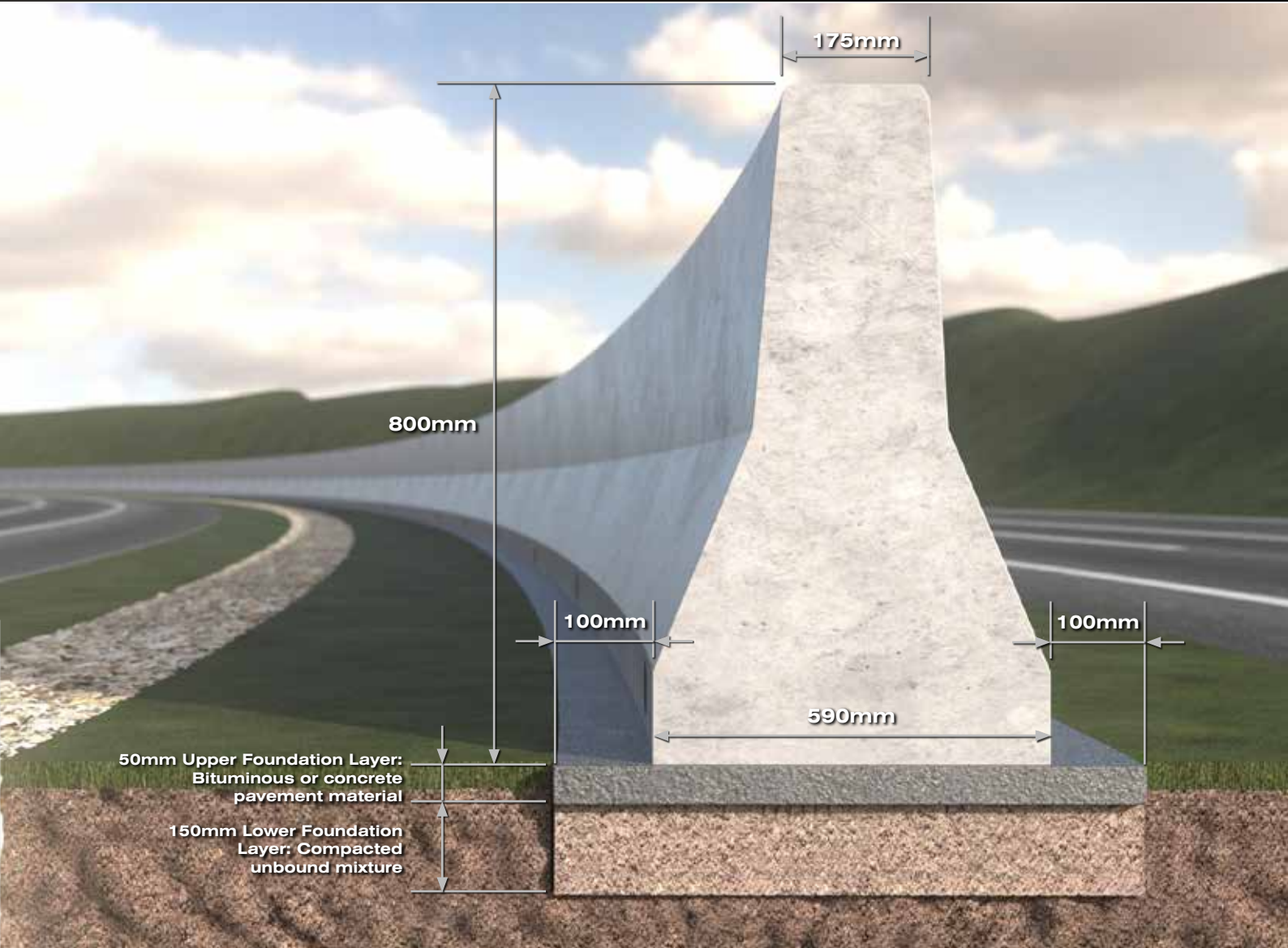


# Extrudakerb Concrete Barrier System (ECB)



**The ECB System offers a new and market leading “do optimal” approach to concrete barrier installations.**

The new profile barrier system is manufactured at point of need under fully certified Factory Production Control conditions

All aspects of system manufacture are fully automated and reflect the industries best practice including concrete batching, concrete transportation and re-tempering (Verifi), slipform paving and joint saw cutting.

- The system is fully CE Marked with, a Declared Performance of H2 / W1 / V12 / ASI B
- Full Declared Performance is achieved without the need for longitudinal steel strand.
- The system benefits from a reduced 50mm upper foundation thickness.
- The system offers use of a universal transition arrangement, allowing for a variety of third-party system connections.
- The cost of the new high-performance concrete barrier profile is comparable to lower performance steel barrier systems.
- The system can be used in a variable and wide arrangement, and offers a simple solution for crossing structures.

# Extrudakerb Concrete Barrier System (ECB)



TB51 Crash Test - Undertaken during 2019



Extrudakerb Concrete Barrier - ECB

## General Upper Foundation Layer

The upper foundation layer shall have a minimum thickness of 50mm and shall extend a minimum of 100mm either side of the footprint of the barrier.

## Concrete Upper Foundation Layer

The surface of the concrete shall have an average depth of macrotexture of not less than 1.0mm.

Evidence of surface texture compliance shall be provided by testing. Surface macrotexture shall be measured using the volumetric sand patch

technique as described in EN 13036-1. Ten individual measurements of the macrotexture depth per 1000m of length shall be taken at least 2m apart anywhere along a 50m length of the barrier foundation. The surface of the foundation shall be cleaned prior to constructing the concrete barrier. The surface on which the barrier is to be cast shall be free from loose material, detritus and any other contaminant, fluid or other material that may adversely affect the formation of the bond between the placed concrete and the concrete upper foundation.

TYPE	CONTAINMENT PERFORMANCE CLASS	WORKING WIDTH (W <sub>n</sub> )	ACCELERATION SEVERITY INDEX (ASI)	VEHICLE INTRUSION (V <sub>ln</sub> )
ECB	H2	W1	B	VI2
	N2			VI1
ECB Monolithic	H2	W1	B	VI2
	N2			VI1

(ECB Declared Performance)

## Sub-grade

The top of the sub-grade is the formation level to be used as a platform on which to place and compact the lower foundation layer.

The sub-grade shall be of sufficient competence at formation level to support the ECB system and foundation. This may be achieved if a minimum CBR of 2.5% is achieved at formation level underneath the footprint of the lower foundation layer.

Foundation competence shall be validated by a recognised site testing method at visually identified soft spots and at intervals in line with appropriate standards.

## Lower Foundation Layer

The lower foundation layer shall have a minimum thickness of 150mm and shall extend a minimum of 100mm either side of the footprint of the barrier, unless adjacent to a linear drainage system.

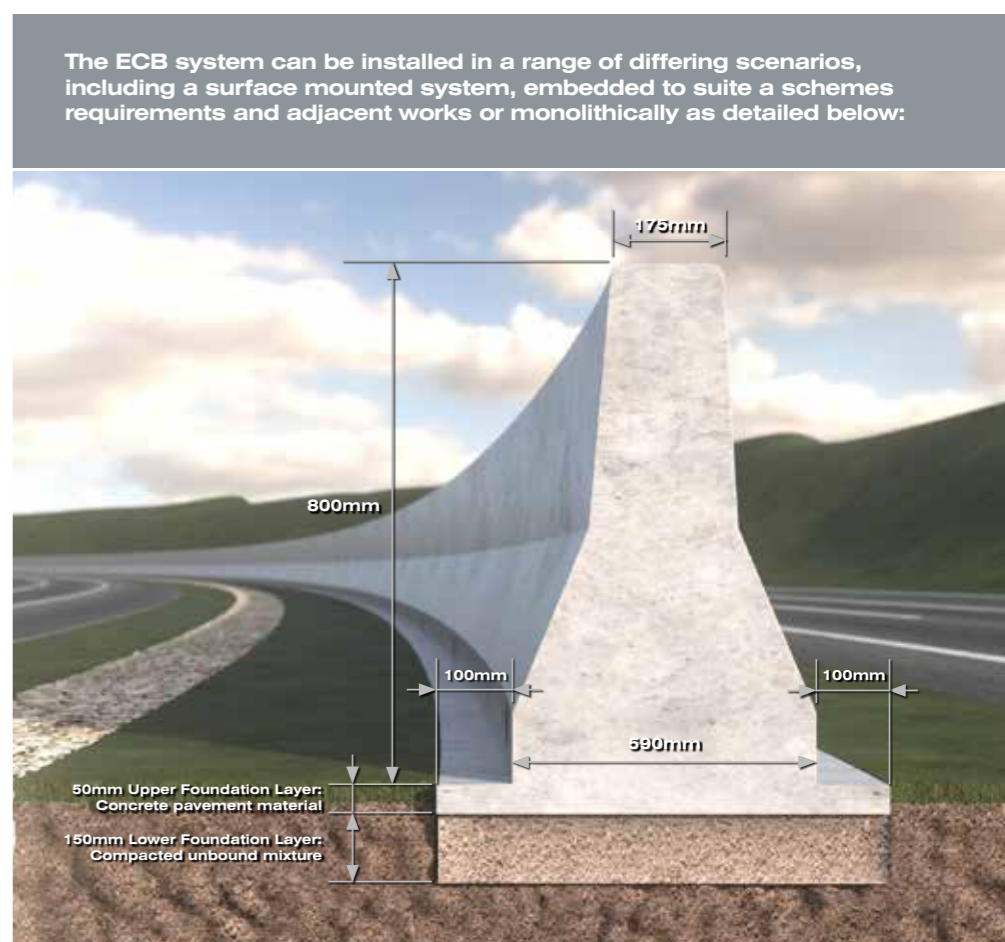
The surface of the material shall on completion of compaction and immediately before overlaying, be well closed, free from movement under construction plant and from ridges, cracks, loose material, holes, indents, ruts or other defects. All loose, segregated or otherwise defective areas shall be removed to the full thickness of the layer, and new material laid and compacted.

## Lower Foundation Material

The mixture shall be made from crushed rock, crushed slag, crushed concrete, recycled aggregates or well burnt non-plastic shale and may contain up to 10% by mass of natural sand that passes the 4 mm test sieve.

- The Lower foundation mixture shall comply with EN 13285.
- The properties of aggregates used in the mixture shall be in accordance with EN 13242.
- The mixture shall be transported, laid and compacted without drying out or segregation.
- Operations should be undertaken with the mixture at the optimum moisture content for the particular mix.
- The mixture shall not be used in a frozen condition but may be used, if acceptable, when thawed. The mixture shall not be laid on any surface which is frozen or covered with ice / snow.
- The mixture shall be placed and spread evenly, in line with the mixture requirements.
- Compaction shall be obtained over the full area using suitable compaction methods and plant in accordance with national highway standards.
- Where construction plant and other traffic is to be used, these shall not cause damage to placed materials.
- Surface of the material must be free from movement, have no ridges, no cracking, no loose material, no voids, no indentations or any other defects.
- The sub-grade must be of significant competence, at the foundation level, to achieve a minimum CBR value of 2.5%.

CONCRETE SPECIFICATION		PRODUCT
Item Type		Upper foundation layer, Foundation restraint slab, General
Classification requirements		XF4
Maximum aggregate size, D <sub>max</sub> (mm)		20
Minimum strength class		C28/35
Permitted cement types	CEM I, CEM IIA, CEM IIB-S	✓
	CEM IIB-V, CEM IIIA	✓
Minimum cement content (kg/m <sup>3</sup> )		300
Maximum water cement ratio		0.55
Chloride class Air content (%)		See Note T1 See Note T2
Consistence Class		S2
Design/Intended working life (years)		50
Other ites		Maximum blast furnace slag content - 55%. Where the foundation uses an existing concrete base refer to Note T3



## Concrete Specification Notes

- T1 - The chloride content class shall be established in accordance with EN 206-1 Table 10 and national provisions.
- T2 - For minimum air content requirements and allowable tolerances refer to BS8500-1:2015 + A2:2019.
- T3 - Where existing bituminous or concrete materials are used as the upper foundation layer they will be required to meet the minimum material performance requirements stated within the ECB specifications. These requirements shall be established by appropriate test methodology, with all results and certification being supplied as evidence. The scheme designer or road overseeing authority will be responsible for deeming that the upper foundation material is in compliance with ECB specifications.

# Extrudakerb Concrete Barrier System (ECB)

## Bituminous Upper Foundation Layer

The surface of the bituminous upper foundation shall be cleaned prior to constructing the concrete barrier. The surface on which the barrier is to be cast shall be free from loose material, detritus and any contaminant, fluid or other material that may adversely affect the formation of the bond between the placed concrete and the bituminous upper foundation. The surface of the foundation shall not exhibit characteristics such as bleeding or fatting up.

The average depth of surface macrotexture of the bituminous surface course shall not be less than 0.7mm. Evidence of surface texture compliance shall be provided by testing. The surface macrotexture of the bituminous surface course, on which the barrier is to be cast, shall be measured using a volumetric sand patch technique as described in EN 13036-1. Ten individual measurements of the macrotexture depth per 1000m of shall be taken at least 2m apart anywhere along a 50m length of the barrier foundation.

## Bituminous Upper Foundation Material

The bituminous upper foundation shall meet the requirements of a thin surface course, to clause 942 of the Manual of Contract Documents for Highway Works (MCHW), or equivalent.

- **Conformity shall be established in accordance with EN 13108-20 and EN 13108-21.**
- **The surface of the bituminous upper foundation shall be cleaned prior to constructing the concrete barrier.**
- **The surface on which the barrier is to be constructed shall be free from loose material, detritus and any contaminant, fluid or other material that may adversely affect the formation of the bond between the constructed concrete and the bituminous upper foundation.**
- **The surface of the foundation shall not exhibit characteristics such as bleeding or fatting up.**
- **The average depth of surface macrotexture of the bituminous surface course shall not be less than 0.7mm.**



For more information on the Extrudakerb Concrete Barrier System (ECB), call Extrudakerb on T: +44 (0) 1709 862 076 or E: [sales@extrudakerb.com](mailto:sales@extrudakerb.com)

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