Append

EVOLVE

Costa Downlands Retail Park Implementation works

Approval in Principle

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Revision P03

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Revision	Date	Prepared By	Checked By	Purpose
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P02	08/08/25	MG	PK	Drawing updated
P03	08/09/25	PK	PK	Signed page added

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Glossary

Term	Definition
AIP	Approval in principle
N/A	Not Applicable
NGR	National Grid Reference
TAA	Technical Approval Authority
TAS	Technical Approval Schedule

Project Details

Details

Name of project	Costa Downlands Retail Park
Name of bridge or structure	Costa Downlands Retaining wall
Structure reference number	NH/25/11820
Summary	This AIP has been prepared by Evolve for the design of the retaining wall for the proposed Costa drive -through in Downlands Retail Park. The scope of this submission is limited to the retaining wall. This AIP report is based on the planning submission by Belshaw ref NH/25/11820 - AWDM/0728/25 Land at the South West Corner of Car Park, Downlands Retail Park, Lyons Way. This AIP is based on the model document contained in Appendix A of CG300 Technical approval of highway structures (revision 0.2.1). This considers design where UK National Standards (Eurocodes) are used. The proposed retaining structure is at highway level and therefore does not support the highway. It is anticipated that construction of the works will be started in 2026.

1 Highway Details

1.1 Type of highway

The retaining wall will be positioned adjacent to the A27 Sompting By-Pass and the access road (Lyons Way) into an existing retail park. The proposed retaining wall does not support the highway.

The retaining wall will accommodate slow-moving traffic around a new proposed drive-thru unit at high level behind the structure.

1.2 Design traffic speed

- 5 mph slow moving traffic behind the structure
- 30mph on Lyons Way

1.3 Existing restrictions

Not applicable.

2 Site Details

2.1 Obstacles crossed

Not applicable. Site is adjacent A27 and Lyons Way and is located at TQ 15283 05193.



Figure 1 Retaining wall location – (source: Google Maps)

3 Proposed Structure

3.1 Description of structure and design working life

The proposed retaining wall is formed in insitu reinforced concrete.

In accordance with the NA to BS EN 1990:2002+A1:2005, the design life of the permanent structure is 50 years.

3.2 Structural type

Insitu reinforced concrete cantilever retaining wall.

3.3 Foundation type

Reinforced concrete strip foundations as toe/heel of retaining wall.

3.4 Span arrangements

Not applicable

3.5 Articulation arrangements

Hydrophilic strips to joints

3.6 Classes and levels

3.6.1 Consequence Class

Consequence class CC2	(Medium, BS EN 1990 Table B1)

3.6.2 Reliability Class

Reliability class RC2	(Based on BS EN 1990, relation to Consequence Class)
K_{FI} = 1.0	(BS EN 1990 Table B3)

3.6.3 Inspection Level

Inspection level IL2	(relating to RC2, BS EN 1990 Table B5)

3.7 Road restraint requirements

Retaining wall is not designed for vehicle impact, protection from this is to be provided by a separate safety barrier system on the inner face. The outer face is protected by the slip road kerb, safety rail, footpath, knee rail and banked slope.

Retaining wall to maintain constant thickness up to 1.2m above road level to prevent headlight glare onto the roads below.

3.8 Proposals for water management

A layer of gravel and a perforated pipe can be placed directly behind the retaining wall to form a French drain and allow water to drain away from the wall. Drainage can be provided via weep holes towards the base of the wall. This will discharge to the landscaped areas at the front of the wall.

3.9 Proposed arrangements for future maintenance and inspection

3.9.1 Traffic Management

Maintenance could be completed without traffic management if the task can be carried out safely. Access shall be on foot at proposed new road level and at the front base of the wall.

3.9.2 Arrangements for future maintenance and inspection of structure. Access arrangements to structure.

It is proposed that the structure be subject to a programme of Safety, General and Principal Inspections in accordance with CS 450.

- Safety Inspections to identify obvious deficiencies, at a frequency to ensure timely identification of safety related defects.
- General Inspection every two years - visual inspection of all parts of the structure that can be inspected without the need for special access equipment or traffic management arrangements.
- Principal Inspection every six years - close examination, within touching distance, of all inspectable parts of the structure. A Principal Inspection should utilise as necessary suitable inspection techniques, access, and/or traffic management works.

Inspections are to be conducted from walking over and in front the structure, where this is safe to do so.

3.10 Environment and sustainability

- Concrete is to be chosen utilising the "Specifying Sustainable Concrete" document by the Concrete Centre in addition to the applicable design codes
- Use of cement replacement materials in concrete mix designs where possible
- Use of local supply of materials where possible
- Planting/landscaping to minimise visual impact

3.11 Durability, Material and Finishes

3.11.1 General

The wall will be designed and constructed with careful consideration to the minimisation of future maintenance requirements. Where future maintenance cannot be avoided then reasonable means to facilitate that maintenance will be included within the design and incorporated during construction.

3.11.2 Concrete

Concrete grades and exposure classes shall be in accordance with BS EN 206:2013 and BS 8500-1:2019. Concrete finishes shall be in accordance with Clause 1708 of the Specification for Highway Works.

Structural element	**Compressive strength class**	**Exposure class**	**Finish**
Wall	C32/40	XD3	F1 to buried faces. F3 finish to exposed faces.
Foundations	C32/40	XD3	F1 to buried faces.

3.11.3 Other materials

Element	Material
Reinforcement	High tensile deformed bars Grade 500B conforming to BS 4449:2005 and scheduled in accordance with BS 8666.
Backfill material	Compacted fill in accordance with the Specification for Highway Works. If possible, site won material from on-site earth excavations will be graded and reused in the construction.

3.12 Risks and hazards considered for design, execution, maintenance, and demolition. Consultation with and/or agreement from CDM coordinator.

A record of significant health and safety information is contained in Appendix C, which has been derived from a hazard identification process. The significant risks and hazards identified at this stage are summarised below.

Design

- Accuracy of ground conditions (based on site investigation)
- Existing services

Construction

- Stability of excavations
- Protection of general public in active retail park

Maintenance

- No issues expected with access

Demolition/decommissioning

- Unplanned collapse

Refer to **Appendix C** for CDM Risk Register.

3.13 Estimated cost & acceptance of recommendations of the structures Options Report

Insitu concrete proposed as a suitable option to create non-linear wall. Estimated cost of the wall to be confirmed by the project manager.

3.14 Proposed arrangement of construction

3.14.1 Construction of structure

The proposed construction sequence is as follows:

- Excavate surrounding area in preparation for the wall, providing temporary support to existing ground where required
- Ensure formation level is suitably prepared
- Lay blinding
- Place formwork
- Fix reinforcement bars with appropriate cover including wall starter bars
- Pour concrete for foundations
- Place formwork and bars for wall
- Pour concrete for walls
- Surfacing and finishes installed

3.14.2 Traffic management

Road closures are not anticipated in order to facilitate these works.

Temporary traffic management in the form of lane closures on Lyons Way could be undertaken if no other option.

3.14.3 Service diversions

Diversions to services are not expected, however if unexpected services are found to be present the contractor will isolate and divert as required. The contractor should be supplied with up-to-date services information prior to commencing any works.

3.14.4 Interface with existing structures

The retaining wall is to be positioned to the south west corner of the existing carpark. No other existing structures interface with the proposed wall. The proposed retaining wall is entirely within the site boundary, the toe of the retaining wall does not extend to land within the boundary of the SRN.

3.15 Deliberate damage and security

The base of the wall has a footway in front with kerb and metal railings.

The external face of the wall is in full view and will have new sloped landscaping to the front which should help to prevent loitering. The finishes are not smooth which should help to deter graffiti.

The internal face of the wall around the proposed new building is the main drive-through area which should deter anti-social behaviours.

4 Design Criteria

4.1 Actions

For design of sections the structural elements shall be subjected to design actions in accordance with the Eurocode and United Kingdom National Annex (UKNA).

4.1.1 Permanent actions

Structural elements subject to permanent actions shall be in accordance with BS EN 1991-1-1:2002.

4.1.2 Snow, wind, and thermal actions

The structure will be designed for wind loading in accordance with BS EN 1991-1-4 and UK National Annex NA to BS EN 1994-1-4

Snow load and thermal actions not considered.

4.1.3 Actions relating to normal traffic under AW regulations and C&U regulations

Not applicable.

4.1.4 Actions relating to General Order traffic under STGO regulations

Not applicable.

4.1.5 Footway or footbridge variable actions

Variable live loading of 2.5kN/m^2 as per BS EN 1991- 1-1

Additionally, allowance made for a variable surcharge behind the wall of 10kN/m^2

4.1.6 Actions relating to Special Order traffic, provision for exception abnormal indivisible; loads including location of vehicle track on deck cross-section

Not applicable

4.1.7 Accidental actions

The risk of accidental actions from the impact of vehicles on the retaining wall is considered to be low. The wall adjacent the drive-through road to be protected by safety barriers. Maximum speed 5mph.

The base of the wall is protected from traffic from Lyons Way and the A27 by means of existing metal railing and kerb, with proposed landscaping at base of wall.

4.1.8 Actions during construction

Geotechnical actions, wind actions and construction load to be in accordance with 4.3, 4.7 and 4.11 of BS EN 1991-1-6 and the UK National Annex to BS EN 1991-1-6.

4.1.9 Any special action not covered above

Not applicable

4.2 Heavy or high load route requirements and arrangements being made to preserve the route, including any provision for future heavier loads or future widening

Not applicable

4.3 Proposed minimum headroom to be provided

Not applicable

4.4 Set out measures that will be incorporated into design to minimise maintenance

The following are proposals to be considered to reduce maintenance:

- Weep holes to relieve hydrostatic pressure behind the wall
- Layer of free-draining gravel behind the wall to assist flow of water towards weep holes
- Regular inspections

4.5 Authorities consulted and any special conditions required

Adur & Worthing Councils

4.6 Standards and documents listed in the Technical Approval Schedule (TAS)

Refer to Appendix D

4.7 Proposed departures relating to departures from standards given in TAS

Not applicable

4.8 Proposed departures relating to methods for dealing with aspects not covered by standards in TAS

Not applicable

4.9 Proposed safety critical fixings

N/A (concrete)

5 Structural Analysis

5.1 Methods of analysis proposed for superstructure, substructure, and foundations

All elements shall be analysed in accordance with the applicable Eurocode document specific to the element being designed.

The structure will be analysed by using Tekla Tedds structural analysis software to provide analysis and design of the retaining wall using Coulomb theory.

The wall is designed as a free-standing cantilever.

Design is in accordance with EN1997-1:2004

5.2 Description of idealised structure to be used for analysis

The superstructure has been analysed as analytical models within Tekla Structural Designer.

The wall has been analysed as a free-standing cantilever. The base of the wall is fixed.

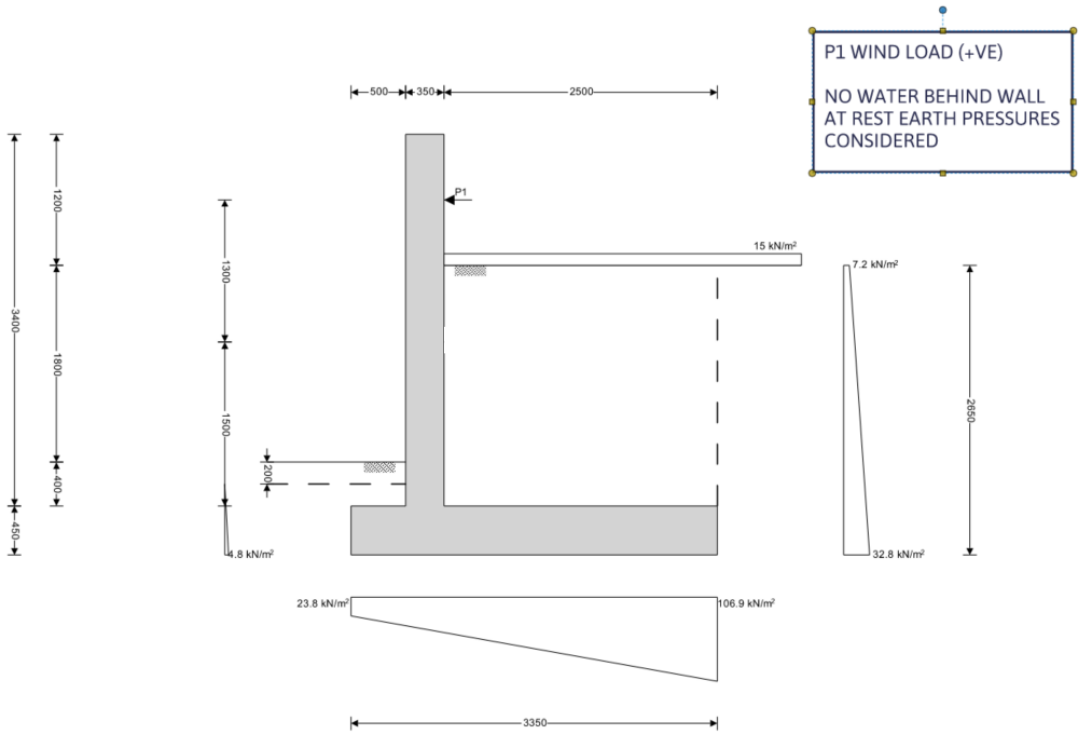


Figure 2 Retaining wall analysis sketch

5.3 Assumptions intended for calculation of structural element stiffness

Base is considered to be fixed. Checks will be made on sliding and overturning.

6 Geotechnical Conditions

The geotechnical conditions are explained in detail in the geotechnical report (REF 250509.SI.01) See Appendix B.

6.1 Acceptance of recommendations of the ground investigation report to be used in the design and reasons for any proposed changes

The ground investigation report recommendations are accepted.

6.2 Summary of design for highway structure in ground investigation report

The anticipated geology is described briefly below:

Published BGS data indicate that the site is underlined by superficial deposits of a Head Formation and bedrock deposits of the Tarrant Chalk Member.

Due to the developed nature of the site the potential for areas of Made Ground to be present on the site must be assumed.

6.2.1 Encountered Physical Gound Conditions

Six locations for boreholes were selected across the site to a depth of 5.45m below current ground level (bcgl) with window samples taken in each. In-situ testing in the form of Standard Penetration Testing at 1m intervals was undertaken during the advancement of the boreholes. Boreholes WS103 and WS105 were terminated early due to shallow obstructions being encountered.

A summary from Roberts Environmental Ltd is given below.

Strata	Description	Depth Encountered (mbcgl)	Base of Statum (mbcgl)	Approximate Thickness (m)
Site Surfacing (Black asphalt)	Asphalt.	Ground level	0.10-0.15	0.10-0.15
Site Surfacing (Topsoil)	Reworked natural: grass overlaying topsoil	Ground level	0.10	0.10
Made Ground (Granular sub-base)	Brown sandy GRAVEL sub-base. The gravel is angular to subangular, fine to coarse, and the sand component is fine-grained.	0.10-0.15	0.30-1.20	0.20-1.08
Made Ground (Cohesive Reworked Natural)	Brown gravelly reworked CLAY immediately beneath the sub-base layer. The gravel component comprises angular to subangular, fine to coarse flint.	0.30 to 1.00	0.80-1.30	0.30-0.70
Head Formation (Gravelly Sand)	Light brown gravelly fine SAND directly beneath the reworked natural material/topsoil. The	0.20-1.30	1.40-2.00	0.20-1.3

	gravel component comprises angular to subangular, fine to coarse flint.			
Head Formation (Gravelly Clay)	Brown gravelly CLAY. The gravel component comprises angular to subangular, fine to coarse flint.	1.40-2.00	2.50-5.45	1.10-3.95
Bedrock Deposits (Tarrant Chalk Member)	Not encountered during ground investigation works	N/A	N/A	N/A

6.2.2 Groundwater

The site is recorded to be located within a Groundwater Source Protection Zone III.

Observations relating to groundwater are based on specific conditions recorded during the ground investigation. The depth to groundwater may fluctuate with seasonal changes. Groundwater was monitored in three of the boreholes.

No groundwater was recorded, and all installed monitoring wells were observed to remain dry.

6.3 Differential settlement allowed for in the design of the structure

25mm between foundations

6.4 If the ground investigation report is not yet available, state when the results are expected and list the sources of information used to justify the preliminary choice of foundations

N/A

7 Check

7.1 Proposed category

CG300 category 0

Design Supervision Level (DSL) 2 – Normal Supervision. “Checking by different persons than those originally responsible and in accordance with the procedure of the organisation” (BS EN 1990 Table B4).

7.2 If category 3, name of proposed independent checker

Not applicable

7.3 Erection proposals or temporary works for which Types S and P proposal will be required, listing structural parts of the permanent structure affected with reasons

Some local temporary propping of the existing soil may be required during construction of the wall.

Note that temporary works approvals shall be part of a separate submission made by others.

8 Drawings and documents

8.1 List of drawings accompanying the submission

Drawing Number	Revision	Drawing Title
3453-EVE-00-XX-DS-S-0100	D	Site plan and typical retaining wall section
2227-01-P08-A	A	PROPOSED RETAINING WALL COFFEE DRIVE THRU
2227-01-P01-A	A	PROPOSED SITE PLAN COFFEE DRIVE THRU

The drawings are provided in Appendix A.

8.2 List of documents accompanying the submission

Number	Title	Originator
250509.SI.01	Ground Engineering Interpretive Report	Roberts Environmental Ltd
3453-EVE-00-XX-T-S-0275	CDM Risk Register	Evolve

9 The above is submitted for agreement

Signed: [redacted]

Name: MELANIE GOODWIN Design Team Leader

Engineering qualifications: M.Eng

Name of organisation: EVOLVE CONSULTING ENGINEERS

Date: 06/08/25

Signed: [redacted]

Name: HOI YAN CHOW Check Team Leader

Engineering qualifications: MENG MSC CENG MIStructE

Name of organisation: EVOLVE CONSULTING ENGINEERS

Date: 06/08/2025

10 The above is rejected/agreed subject to the amendments and conditions shown below

Signed: _____

Name: _____

Position: _____

TAA: Adur and Worthing Councils

Date: _____

Appendix A - Drawings

Appendix B – Geotechnical Report

Appendix C – CDM Risk Register

Appendix D – TAS Schedule

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