

CORMAC

Shutta Road Retaining Wall & Parapet Safety Proposals Design and Access Statement

Version: 0

Structures Design Group



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Introduction

Shutta Road is a narrow access road situated in East Looe, Cornwall, it is built into the edge of a hillside and services residential properties.

There are 12 separately identified retaining walls along Shutta Road. They are the responsibility of Cornwall Council as Highway Authority. The Highway Authority manage all of their Highway assets in accordance to the Department for Transport's Design Manual for Roads and Bridges. As a result, the structures have been subject to an inspection regime. The accompanying document titled 'Shutta Road Retaining Walls Route Report' summarises the descriptions of the structures, their condition and recommendations for maintenance and repair.

The Structures Maintenance Engineers have identified work that was urgently required to be undertaken on Shutta Road. The proposals were initially developed for the areas of greatest need. Following a client instruction other less urgent works were added to the proposals.

Design Principles

The retaining walls and parapets along the western side of Shutta Road are all considered part of the public highway. They are maintained as assets of the highway authority and as a result they are subject to a regular inspection regime. The design and maintenance of highway structures are undertaken in accordance with Department for Transport standards (The Design Manual for Roads and Bridges) and in particular in accordance with:

CD 350 The design of highway structures

CD 351 The design and appearance of highway structures

CG 300 Technical Approval of Highway Structures

CG 304 Conservation of Highway Structures

CS 450 Inspection of highway structures.

CS 470 Management of sub-standard highway structures

CS 459 – The assessment of bridge substructures, retaining structures and buried structures

CS 461 – Assessment and upgrading of in-service parapets

These documents refer to further guidance such as:

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DfT – Guidance on the Design, Assessment and Strengthening of Masonry Parapets on Highway Structures.

DfT – Specification for Highway Works

Within these documents there are principles of conservation that are followed, these include: minimal changes to the structure and its appearance; modifications involve no loss in character, minimal loss of historic fabric and minimal adverse effect on the setting; minimal introduction of new material additional to the original fabric; any new materials to be in keeping with the original fabric; all work undertaken using methods of working and materials to reflect the appearance and local impact of the structure.

This document will show that the proposals intended to follow these principles, but external influences had an impact on what was actually achievable.

Proposal Development

The original scheme proposal was to only strengthen the retaining wall above the property known as Rivercroft Hotel. Various other strengthening schemes had been previously employed along the Shutta Road route, all had used rock anchors and masonry clad reinforced concrete.

The design for the retaining wall strengthening was developed taking into consideration that Shutta Road lies within the Looe Conservation Area. During the design development phase, the Cornwall Council Client asked for works to be undertaken on the Tregurtha Court and the Memorial sections of retaining walls at the same time as the Rivercroft Hotel retaining wall works. For both of these additional sections the main concerns were for the parapet (see Shutta Road Retaining Walls Route Report), they were leaning excessively, heavily cracked and in poor condition.

Considering the structural reports, the Cornwall Council client considered the works to be urgently necessary in the interests of safety. When developing the proposals, it became clear that the sections of parapet with excessive leaning, cracking and poor condition could not be repaired insitu. The sections of wall were subject to further inspection and as a result the least amount of parapet on each section were identified to be taken down based on safety to the public. For the remaining sections of the parapets and the retaining wall faces, appropriate repair measures were identified.

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During the Rivercroft Hotel design development, a Pre-App regarding the scheme was submitted. Advice was received and used to develop the works information, the requirement for planning permission was overlooked, because it was considered to be permitted development as works were undertaken under the Highways Act 1980.

Owing to the extremely narrow nature of Shutta Road it became clear that a road closure would be required to undertake the works. Following consultation with the emergency services, it was specified that emergency access will need to be maintained throughout the duration of the works. The proposals therefore were planned in 3 phases, with access being maintained for emergency vehicles from either side of each phase of the proposal. In this manner it was considered that the works could progress as planned whilst maintaining emergency access.

The proposals were displayed in a public exhibition for one day where residents, Cornwall Councillors and Town Councillors were invited to attend. Feedback was generally good; everyone could see that the work was needed, and the concern generally was about local access for deliveries and holiday makers. This concern was taken into account and a local collection point and delivery service was set up for the works, together with temporary parking spaces at a nearby car park on Station Road.

The Proposals

The proposals were as follows:

1. Phase 1. The rebuild of two sections and remedial works to other parts of Memorial Parapet including vegetation clearance, crack stitching and repointing.

The parapet will require vegetation clearance along specified lengths of the structure. Following this, sections of the parapet will be deconstructed and rebuilt to specifications in keeping with the preceding and succeeding parapets, using original or like for like materials. Cracked sections that do not require a full rebuild will be stitched using stainless steel bars and resin. Repointing and coping reconstruction will be carried out where necessary and any sections of highway that have been removed will be reinstated to highway standards. Original features such as the old gas lamp and granite lintel are to remain within the new structure.

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2. Phase 2. The rebuild and reduction in height of Tregurtha Court parapet wall, with stitching of cracked sections utilising steel ties to strengthen the wall.

The parapet will be rebuilt and reduced in height to 1.5m where it is deemed required, using original or like for like materials. Cracked areas of the parapet wall (which do not require dismantling and rebuilding) are to be stabilised using stainless steel bars and resin. Repointing of the parapet wall, coping reconstruction and vegetation clearance will be undertaken where necessary. The cracked and subsided highway seen between Tregurtha Court parapet and the Rivercroft Hotel retaining wall (adjacent to Dolphin House) will be resurfaced to highway standards.

3. Phase 3. The stabilisation of Rivercroft Hotel Retaining Wall which supports Shutta Road.

The stabilisation of the retaining wall will be achieved by incorporating a grout injected rock anchor system with additional parrress plates and repointing of the structure, ensuring its operational integrity. The chosen design allows the original structure to remain as is, however, the parapet that supports the above highway is to be deconstructed before the installation and re-built afterwards.

The rock anchor system will be installed via a specialist drilling contractor from the garden of the Rivercroft Hotel. The anchors will be inserted through the existing structure, through the overburden and socketed 3m into competent bedrock.

The parapet section of the wall will then be re-built using 'like for like' or original materials to match existing. The finishing of the wall and parapet will comprise full repointing of entire structure aiming to achieve minimal alteration from the original.

Owing to reported scaffolding difficulties it was decided to re-order the sequence of work to allow a suitable scaffold to be designed. Therefore, the proposed order was 2, 1 then 3. This was due to the unstable nature of the two parapet walls that were identified to be rebuilt.

Construction

The works commenced in early February 2020 as planned and the Tregurtha Court section was started. This initially involved the erection of scaffolding, the

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taking down of a section of the parapet and vegetation clearance prior to crack stitching, repointing and a rebuild of the parapet.

On 16th February 2020 a privately owned retaining wall collapsed, resulting in a full closure of the highway to both pedestrians and vehicles at the point of collapse. The road still remains closed today at this point, although pedestrians can now get past.

The implications of this was that there was no alternative access route for emergency vehicles. The road was subject to a traffic Regulation Order for the planned closure, however access for emergency services and pedestrians needed to be maintained. This meant that the required materials, as originally planned, could not be stored on the highway whilst undertaking the work. Owing to the urgent nature of the highway works, it was considered that they could not be delayed.

The Structures Maintenance Team were monitoring the walls along Shutta Road and instructed the commencement of the Rivercroft section owing to safety concerns after the pre-agreed movement threshold was exceeded. As a result, works commenced on this section on 11th May 2020 ahead of the original sequence whilst other works were proceeding.

In June 2020 the works team's attention returned to the reconstruction of the parapet along the Tregurtha Court retaining walls section. The existing stonework was reported being that it could not be reused and owing to the width of the existing wall, it was reported to be difficult to source local stone at such a narrow size. Concern was also raised about the stability of the proposed wall on a narrow road if the combination of siltstone and limestone mortar was used.

This was due to the narrow nature of the road and the evidence of vehicle scrapes along the route. A decision was made to use cementitious materials in order to get early strength gain. There was evidence of cementitious mortar uses along the route (see Shutta Road Retaining Walls Route Report) and as such in this instance it was considered acceptable by the project team.

A proposal was developed to use a blockwork inner core using cementitious mortar and then sticking stone panel slips onto the wall to replicate the look of local stone. To this effect, a test panel was erected, and stone slips were placed on the face, this was found to be not as consistent as hoped, not to highways

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specification (surface regularity) and labour intensive. There was a need to get the work done as soon as possible to reopen the road.



The test panel.

An alternative tile system was proposed, and samples were placed on the test panel shown below.



This gave a consistent surface finish and was considered aesthetically more pleasing than the slip trial.

The colour of the test panel was not considered too bright and was thought to be in keeping with the surroundings. Photographs above show test panel and the adjacent parapet wall (named Shutta Road on the asset list)

Additional works were then added to the list of requirements by the Cornwall Council Client who wanted all defects to be addressed whilst the road closure was in place on Shutta Road. This involved de-vegetation, crack stitching, repointing, renewing copings, re-assessing sections of retaining wall and

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parapet wall and taking appropriate action. As a result, the scope of works was amended.

Following concerns being raised the choice of mortar was amended for the remaining works to a cementitious Lime hybrid mix. This was considered an acceptable compromise with some early strength gain with the aesthetics of a lime mortar.

Conclusion

The works were considered to be safety critical and of an urgent nature. Cornwall Council's first duty is the protection of the public. As Highway Authority, Cornwall Council instructed the work to be undertaken. Sections of parapet were taken down without planning consent.

The original proposals were to re-use or replace materials on a like for like basis. An unplanned event influenced the proposals and a decision was made to use more modern materials with aesthetic finishes.

Currently works are at a position where they can now be safely put on hold whilst the relevant permissions are being sought. It is understood that the private wall works are now underway again and as such it is anticipated that the road will be able to be reopened in the near future. This will enable future work to be undertaken in an appropriate manner.

The proposed date for recommencing the works is currently late October and will be subject to permissions being granted and any conditions required.