



Stockton-on-Tees

BOROUGH COUNCIL

DEVELOPMENT & NEIGHBOURHOOD SERVICES



Technical Services

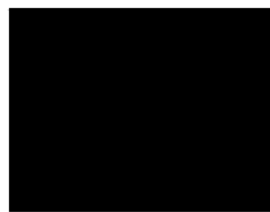
MOUNT LEVEN ROUNDABOUT

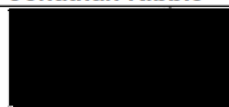
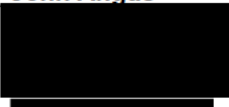
ROAD SAFETY AUDIT STAGE 3



REPORT



Date	21/09/2017	
Draft RSA Report	Prepared by Team Leader	Checked by Team Member
Name	Jonathan Kibble	John Angus
Signature		

Date	22/09/2017
Designer Comments	Prepared by Scheme Designer
Name	Rosstam Asadi
Signature	

Date		
RSA Additional Comments	Prepared by Team Leader	Checked by Team Member
Name	Jonathan Kibble	John Angus
Signature		

Date		
Final RSA Report	Prepared by Team Leader	Approved by Traffic & Network Safety Manager
Name	Jonathan Kibble	Joanne Roberts
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1 Introduction

- 1.1 This report details the results of a Stage 3 Road Safety Audit of Mount Leven Roundabout.
- 1.2 The audit has been undertaken in accordance with Stockton-on-Tees Borough Council's Road Safety Audit Procedure.
- 1.3 The audit team consisted of Mr J Kibble, Principal Engineer, Mr J Angus, Projects Officer and Neil Empson, Cleveland Police Traffic Management Officer who undertook a day audit on Monday 11th September 2017. Weather conditions on site were overcast whilst the road surface was damp. The roundabout circulatory was not fully open during the visit. The overrun area was coned off and the only permitted movements were east and west bound through the roundabout. Circulation of the roundabout was not possible due to traffic management. A temporary 30mph speed limit was in operation.
A night audit was conducted on the 28th of September with street lighting operational. The road surface was dry.
- 1.4 A list of information provided to the audit team has been provided as appendix A to this report.
- 1.5 A Stage 2 Road Safety Audit was conducted on this scheme in November 2014.
- 1.6 Road Safety Audit is based upon a qualitative risk assessment process and there is no measure of the success achieved by any recommendations. Road Safety Audit cannot guarantee the safe operation of the scheme under consideration in this report as accidents are rare and random events and are largely caused by factors outside the Audit Team's influence, such as driving behaviour and to a lesser extent vehicle condition.
- 1.7 The Following information was not made available to the audit team and as such any specific influence of these details on road user safety has not been considered by this audit:
 - Auto tracking
- 1.8 Departure from standard horizontal approach curvature is 2 steps below the desirable minimum

2 Site Description

- 2.1 The development site is located on the north side of the A1044 Leven Bank Road (adjacent to the access road to Mount Leven). The A1044 Leven Bank Road is a principal road broadly oriented east to west. The section of A1044 Leven Bank Road adjacent to the site is subject to a 40mph speed limit.



- 2.2 The A1044 Leven Bank Road is a single carriageway providing a link between Ingleby Barwick and Yarm. The A1044 is used by the Highways England as a tactical diversion route (TDR) for the A19 northbound and occasionally southbound. In the last twelve months the A1044 has been utilised approximately 24 times as a TDR, although the majority of these occasions have been overnight closures for maintenance work. The existing carriageway is approximately 6.7m to 7.2m wide and is predominately rural bounded on both sides by grass verge, and is unlit.
- 2.3 A speed survey undertaken in May 2013 indicated an 85th percentile speed of 40.5mph in both directions. The available traffic data for the A1044 Leven Bank Road was provided from a survey in April 2012. The peak two way traffic volumes was approximately 1400 and 1300 vehicles during the morning and evening peak hours respectively.





3 Scheme Description

- 3.1 The scheme comprises of the development of 350 Continuing Care Retirement Community units and 100 bed nursing home which will be accessed off the A1044 Leven Bank Road via a new roundabout.

4 Items raised at Stage 2 Road Safety Audit

The issue below identified in the Stage 2 audit had recommendations that required follow up in the Stage 3 audit.

4.2 Problem

Location: South side of proposed roundabout.

Summary: Increased risk of pedal cycle/vehicle collisions at the termination point of the westbound cycle bypass lane.

Description: The proposals show a cycle bypass lane on the south side of the roundabout. At the termination point the cyclist will enter the carriageway at 45 degrees in close proximity to the splitter island. There is concern that merging cyclists whilst entering the carriageway at a low speed at a narrow section of carriageway may have increased risk of collision with westbound vehicles.

Recommendation: Remove the cycle bypass lane and provide a wider circulatory to provide sufficient space for a cyclist to negotiate the roundabout adjacent to other road users safely.

Designers Response: Partially Accepted – Cycleway to be removed to remove priority conflicts with vehicles entering/exiting the retirement village. However, the circulatory carriageway is currently designed to be 5m wide with a 4.6m overrun area. Providing extra carriageway width may result in vehicles attempting to overtake cyclists whilst they negotiate the roundabout, which could result in sideswipe accidents.

Auditors Additional Comments: No longer considered an issue due to design change.

Traffic & Network Safety Managers Comments: No additional comments.

5 Stage 3 Audit

A GENERAL

A1 LANDSCAPING

A1.1 Issue: Vegetation obscuring warning signage

Location: East and west approaches

Summary: Scheme signage was partly obscured by vegetation in the verge.

Description: Scheme signage (particularly Sign Ref S6 and sign S2 and S3) partly obscured by parallel hedge. There is concern that minimal vegetation growth could lead to signs being obscured and in turn drivers being less aware of the approaching roundabout leading to sudden braking and potential shunt type collisions.

Recommendation: Ensure vegetation parallel to signs and in the drivers sight line is adequately cut back and maintenance put in place.

Designers Response: Recommendation accepted. All hedges and vegetation has now been cut back to ensure sign faces are not obscured.

Auditors Additional Comments: No further comments.

Traffic & Network Safety Managers Comments: No additional comments.

A2 ACCESS

A 2.0 Issue: Sub-standard visibility from Hillcroft



Location: Hillcroft property access, approx. 50m east of the roundabout on the northern side

Summary: Sub-standard visibility to the west for vehicles egressing to travel east or west bound may lead to T bone collisions.

Description: The visibility splay west of the junction is sub-standard for the speed limit of the road according to Manual for Streets. Although the roundabout geometry means approach speeds in excess of 30mph are unlikely to be achieved this is still sub-standard. Lack of adequate visibility may lead to 'T' bone type collisions when vehicles leaving Hillcroft are not able to see eastbound vehicles approaching in adequate time. There is also a potential for shunt collisions should a vehicle be turning into Hillcroft.

Recommendation: Improve visibility to the west to achieve visibility of the roundabout by removing hedge and coniferous trees along property boundary.

Designers Response: Recommendation rejected. The historical existing visibility coming from Hillcroft private entrance prior to the construction of the new roundabout was 37m. Since the new junction has been constructed the visibility has increased to 40m.



The new junction has introduced a traffic calming measure reducing vehicle speeds in the form of the roundabout island. Street lighting has also been installed as part of the junction works which will increase visibility in the hours of darkness.

Speed surveys were undertaken prior to the junction being built and also once it was fully operational. These speed surveys have confirmed that the 85% speed has reduced from 40.5mph to 33.3mph.

A combination of the reduction in speed, addition of street lighting and an increase in visibility from what was previously available albeit a small increase, improves the situation and provides adequate mitigation.

Auditors Additional Comments: No longer considered an issue. The increase in visibility and other mitigation measures described in the designers' response provides adequate mitigation.

Traffic & Network Safety Managers Comments: No additional comments.

C POWERED TWO WHEELERS

C1.0 Issue: Differing grip co-efficient between circulatory carriageway on roundabout and the over-run area.

Location: Roundabout circulatory.

Summary: Surface grip levels between the carriageway and the overrun area will be significantly different in the wet which may lead to powered two wheeler loss of control accidents.

Description: The grip coefficient of the HFS used on the overrun area is significantly greater than for the circulatory carriageway. There is concern that in adverse weather conditions the changes of coefficients of friction together with change in direction of road surface may increase the risk of loss of control type collisions of PTW road users.

Recommendation: Hatch the overrun area to further discourage drivers from using this area.

Designers Response: Recommendation rejected. The approaches to the junction and the circulatory carriageway have been surfaced using a high friction stone (PSV 68) Hot Rolled Asphalt. The high friction surface on the overrun area has a PSV value of 70. Therefore there is no significant difference in skid resistance between the 2 surfaces.

Auditors Additional Comments: No further comment.

Traffic & Network Safety Managers Comments: No additional comments.



D SIGNAGE

D1 ALL ROUNDABOUTS

D1 Issue: Missing and incorrectly positioned signage

Location: Leven Bank Road to east of roundabout

Summary: Sign Ref's S4, S9, S10, S11 and S12 not installed when audit carried out.

Description: Warning signs as above were not installed when the audit was carried out. The lack of sufficient warning signs of the presence of the roundabout may lead to an increase in shunt type collisions.

Recommendation: Ensure all signs are installed as per drawing TS10028-1200-001.

Designers Response: Recommendation accepted. All signs are now installed as per TS10028-1200-001.

Auditors Additional Comments: No further comment.

Traffic & Network Safety Managers Comments: No additional comments.

D LIGHTING

D1.0 Issue: Signs not illuminated

Location: Leven Bank Road to east of roundabout

Summary: Sign Ref's S19a, S17a, S17b, S17c, S13a and S13b not lit.

Description: Signage as above was not directly lit. Non-illumination of signage could reduce warning of speed limit and presence of the roundabout and splitter island leading to an increased likelihood of loss of control type collisions in the dark.

Recommendation: Ensure all signs are illuminated as required in TSRGD.

Designers Response: Recommendation accepted. All signs mentioned above are now illuminated. A fault on the system meant they weren't when the audit was undertaken.

Auditors Additional Comments: No further comment.

Traffic & Network Safety Managers Comments: No additional comments.



D1.1 Issue: Inconsistent light levels on circulatory area of the roundabout

Location: South side of roundabout circulatory

Summary: Light levels appear inconsistent on the roundabout circulatory

Description: The north, east and west sides of the roundabout are well lit however there is noticeable darkness on the south side of the roundabout. Inconsistent light levels may mask the presence of the roundabout alignment and pedal cyclists negotiating the roundabout leading to an increased likelihood of loss of control and shunt type accidents.

Recommendation: Ensure the south side of the roundabout is adequately lit.

Designers Response: The lighting design calculations have been checked with the as-built locations which has confirmed the lighting design is compliant with British Standard requirements. The lighting levels are not uniform due to restrictions imposed on lighting column positions due to the 11kV overhead line this has created the visual appearance of the south side gyratory of the roundabout to be less than that of the north side gyratory. The inclination and orientation of the luminaires have been checked on site which has confirmed that some of the luminaires have been installed to the incorrect inclination. These luminaires will be adjusted to the correct inclination which will improve the lighting levels to the south side of the gyratory of the roundabout from that as observed during the night time audit.

Auditors Additional Comments: No further comment.

Traffic & Network Safety Managers Comments: No additional comments.



8 Appendix A – Documents and Drawings

Documents

Audit Brief – Previous Stage 2 Audit
Exceptions Report

Drawings

Name
Leven Retirement Village S278 Drawings
TS10028 - 100 - 009 Scheme Info Board C2
TS10028 - 100 - 009 Scheme Info Board
TS10028-100-003 Site Compound Location
TS10028-100-004 Setting Out Information C1-Layout1
TS10028-100-005 Long Sections C1-Layout1
TS10028-100-006 Cross Sections Sheet 1 of 2 C1-Layout1
TS10028-100-007 Cross Sections Sheet 2 of 2 C1-Layout1
TS10028-100-008 Site Boundary & Ways Across Site C1-Layout1
TS10028-200-001 Site Clearance C1-Layout1
TS10028-300-001 Proposed Fencing C1-Layout1
TS10028-500-001 Drainage C1-Layout1
TS10028-500-001 Drainage Rev C2
TS10028-500-002 Drainage Details C1-Layout1
TS10028-600-001 Earthworks C1-Layout1
TS10028-600-002 Earthworks Details C1-Layout1
TS10028-700-001 Pavements C1-Layout1
TS10028-1100-001 Kerbs, Footways & Paved Areas C1-Layout1
TS10028-1100-002 Kerbs, Footways & Pavements Details C1-Layout1
TS10028-1200-001 Road Markings & Traffic Signs C1-Layout1
TS10028-1300-001 Road Lighting C1-TS-10028-1300-001 Rev T2
TS10028-1400-001 Road Lighting Schematic C1-TS-10028-1400-001 Rev T2
TS10028-2700-001 Existing Stats C1-Layout1
TS10028-2700-004 Cover Schedule C1-Layout1
TS10028-3000-001 Landscaping Layout C1
TS10028-3000-001 Landscaping Layout C1-Layout2



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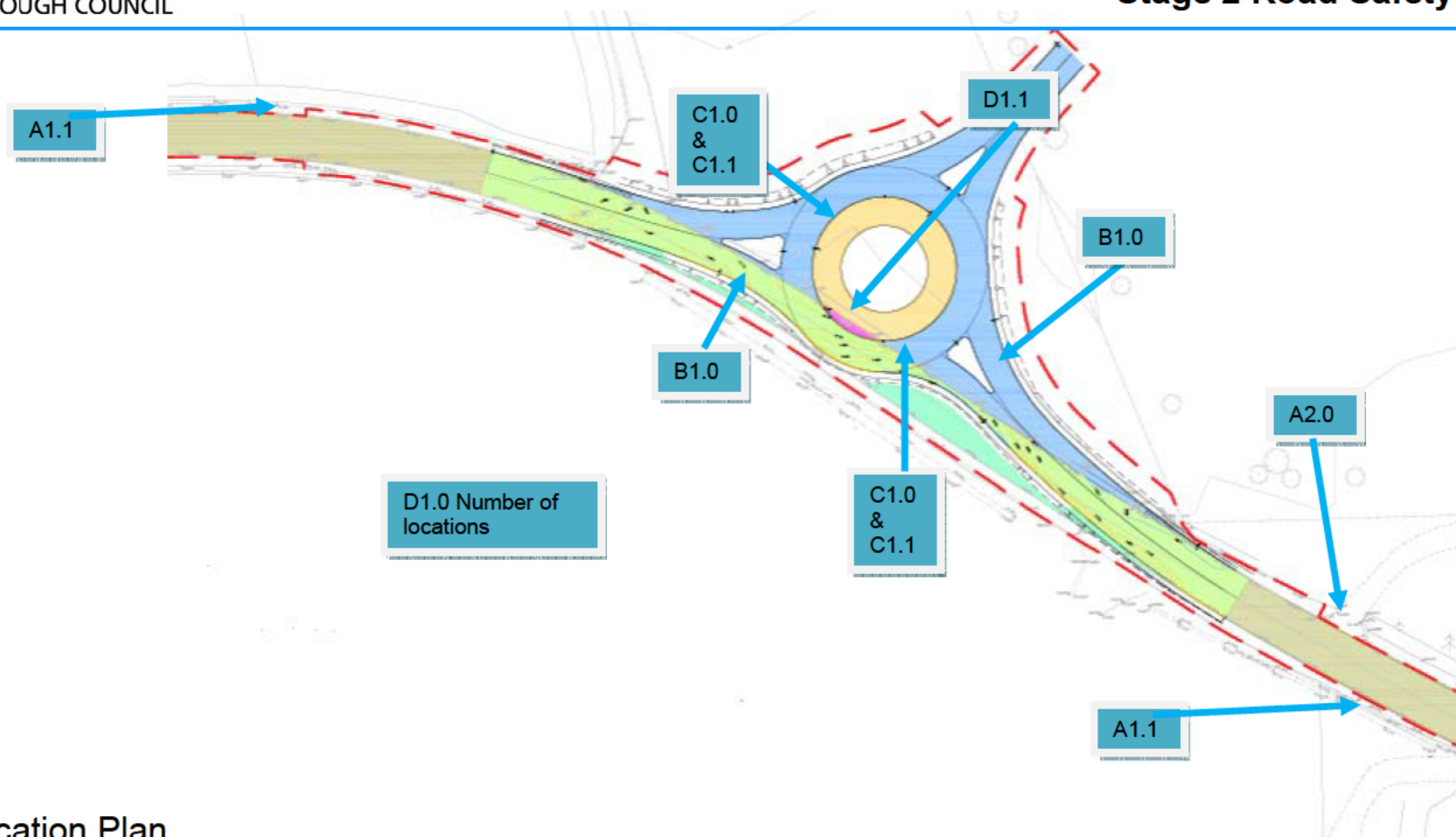


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Stage 2 Road Safety Audit



Location Plan