

BAM Civil Ltd

Castlelake SHD,
Carrigtwohill, Co. Cork

Quality Audit

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Castlelake SHD, Carrigtwohill, Co. Cork

Quality Audit

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Rev	Prepared By	Reviewed By	Approved By	Issue Date	Reason for Revision
2.0	AP	TAG	TAG	14 th June 2022	Final
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1 Introduction

1.1 General

This report was prepared in response to a request from Mr Oliver Ryan of BAM Civil Ltd to provide a Quality Audit of the proposed Castlelake SHD in Carrigtwohill, Co. Cork. The Quality Audit shall consider the following elements:

- Road Safety Audit
- Access Audit
- Walking Audit
- Non-Motorised User Audit
- Cycle Audit

The Quality Audit followed a site visit on the 13th April 2022. At the time of the site visit the weather conditions were dry and the road surface was dry. Traffic volumes during the site visit were low, pedestrian and cyclist volumes were moderate and traffic speeds were considered to be generally within the posted speed limit.

This report contains three primary sections, with each section focussing on different implications to the users of the scheme. The Road Safety Audit identifies safety implications of the scheme, whilst the Accessibility & Walking Audit focusses more on accessibility implications for pedestrians associated with the development. Finally, the Non-Motorised User and Cycle Audit predominantly focusses on cycle use, as pedestrians have been discussed as part of the accessibility and walking audit, and there are currently no requirements for equestrians as part of this development.

2 Background

A new Strategic Housing Development (SHD) is proposed in Carrigtwohill, east Cork. The development shall include the following:

- Housing units including:
 - 226 Houses
 - 288 Duplex units
 - 208 Apartment units
- 1 no. Creche
- Internal streets and junctions
- Parking provision to include vehicle, mobility impaired and cycle parking
- Connection to Inter-Urban Cycleway, with connection to the local Train Station
- Public Lighting

Internal roads are proposed as part of the development, which shall form two junctions with Station Road in the east, and tie into an existing roundabout junction at Oakbrook in the west.

- **Station Road:** Station Road is a two-way single carriageway road with a footpath on its eastern side. The road provides access to residential areas in the east, and to Carrigtwohill Train Station in the north. The speed limit is 50kph.
- **Oakbrook:** The development will tie-in to an existing roundabout junction in the west. The existing cross section at the proposed tie-in is a two-way single carriageway road with segregated cycle track and footpaths on both sides, with a grass verge between the cycle track and the road. The speed limit is 50kph. The roundabout junction is located in a residential catchment area, and is beside Castlelake which includes a walking track around the lake.

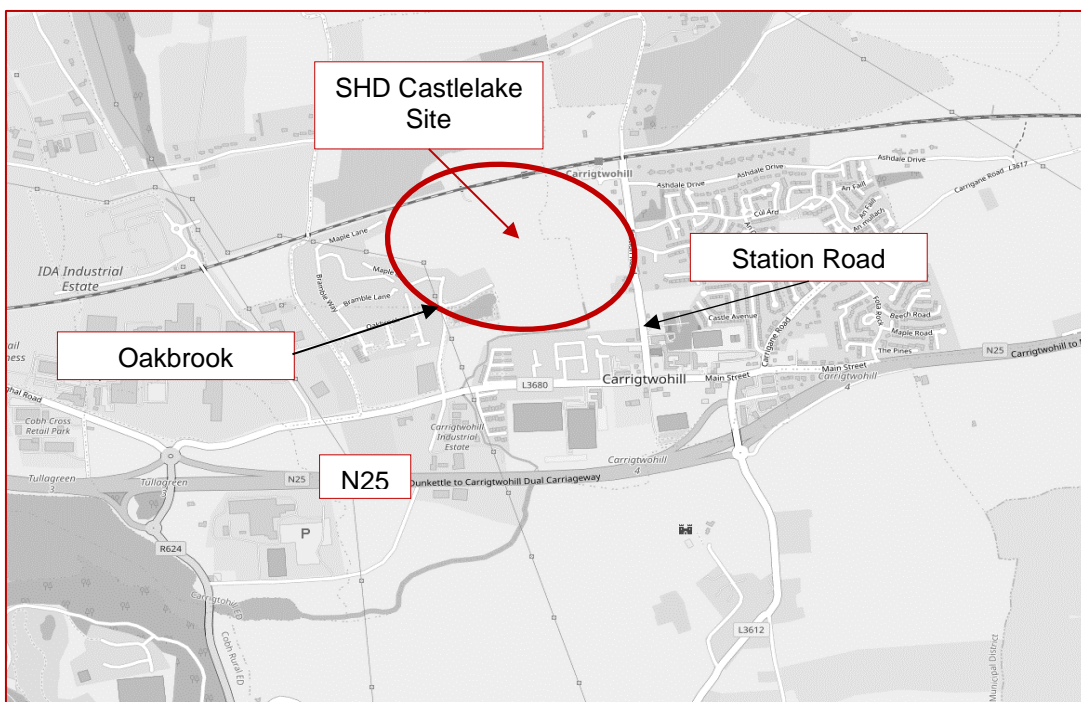


FIGURE 2-1 LOCATION PLAN

3 Road Safety Audit

3.1 Introduction

This Road Safety Audit has been carried out in accordance with the requirements of GE-STY-01024 (previously NRA HD19/15) dated December 2017, contained on the Transport Infrastructure Ireland (TII) Publication's website.

The members of the Road Safety Audit Team are independent of the design team, and include:

Mr. Aly Gleeson

(BSc, MEng, MBA, RSACert, CEng, FIEI)
Road Safety Audit Team Leader

Mr. Antonis Papadakis

(MSc, MIEI)
Road Safety Audit Team Member

The Audit took place during April 2022 and comprised an examination of the documents provided by the designers (see section 3.8). A site visit was undertaken on the 13th April 2022. At the time of the site visit the weather conditions were dry and the road surface was dry. Traffic volumes during the site visit were low, pedestrian and cyclist volumes were moderate and traffic speeds were considered to be generally within the posted speed limit.

Where problems are relevant to specific locations these are shown on drawing extracts within the main body of the report. Where problems are general to the proposals sample drawing extracts are within the main body of the report, where considered necessary. Road Safety problem locations are also shown in Appendix A - Road Safety Audit Problem Locations.

The scheme has been examined and this report compiled in respect of the consideration of those matters that have an adverse effect on road safety and considers the perspective of all road users. It has not been examined or verified for compliance with any other standards or criteria. The problems identified in this report are considered to require action in order to improve the safety of the scheme and minimise collision occurrence.

If any of the recommendations within this road safety audit report are not accepted, a written response is required, stating reasons for non-acceptance. Comments made within the report under the heading of Observations are intended to be for information only. Written responses to Observations are not required.

3.2 Items Not Submitted for Auditing

Details of the following items were not submitted for audit; therefore, no specific problems have been identified at this stage relating to these design elements, however where the absence of this information has given rise to a safety concern it has been commented upon in Section 0: -

- Vehicle swept paths
- Drainage
- Public Lighting

3.3 Collision History

The Road Safety Authority website (www.rsa.ie) was consulted to identify historical collisions in the vicinity of the proposed scheme. The website includes summary information on recorded collision occurrence for the period 2005 to 2016 (see Figure 3-1). There were two collisions near the development site, which include:

- 1) Minor Injury Collision in 2014 involving a cyclist. The collision occurred on a Monday, between 4pm and 7pm.
- 2) Minor Injury Collision in 2010 involving a Single Vehicle. The collision occurred on a Sunday, between 11pm and 3am.

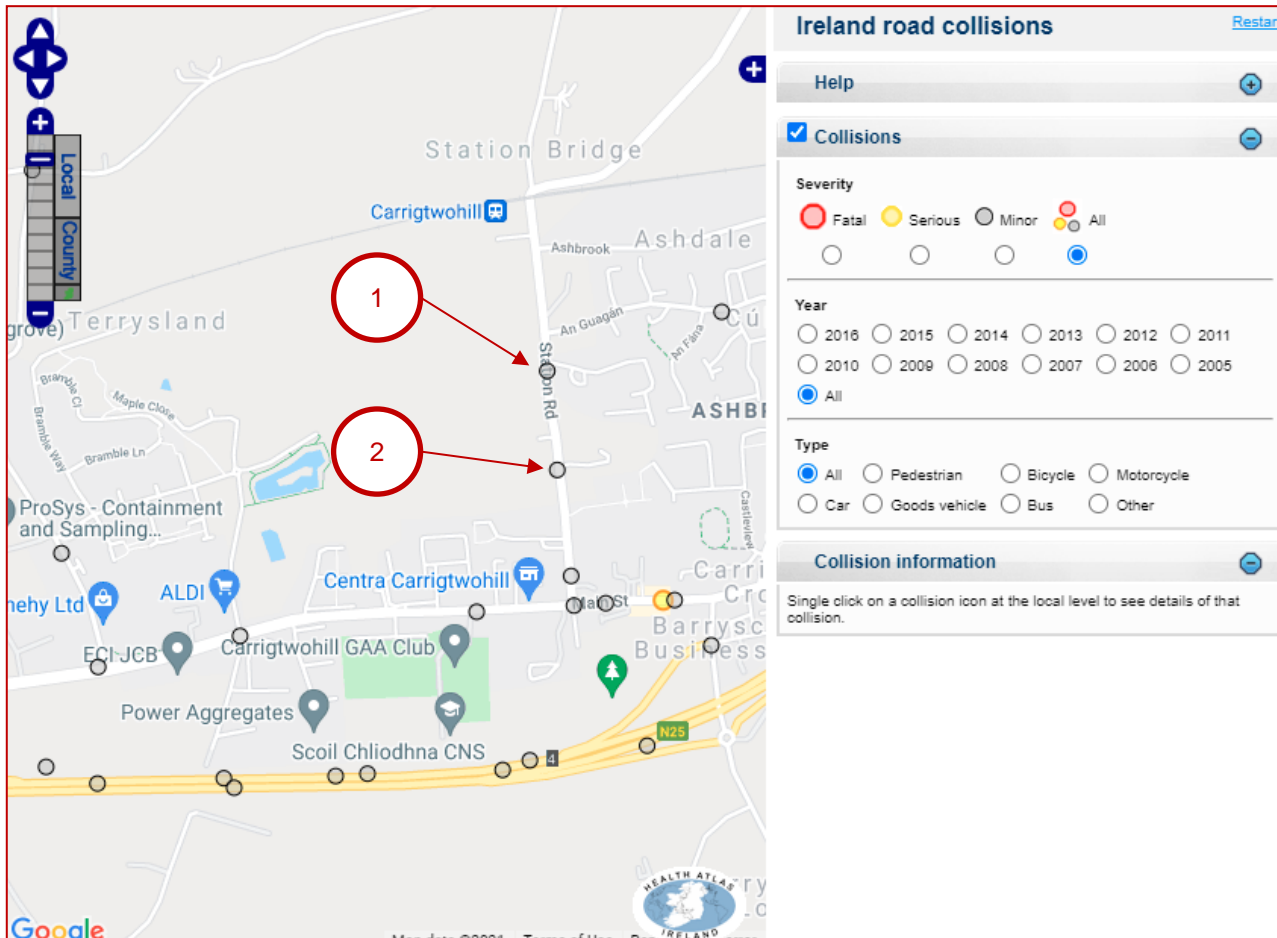


FIGURE 3-1: HISTORICAL COLLISIONS IN THE VICINITY OF THE DEVELOPMENT SITE (SOURCE WWW.RSA.IE)

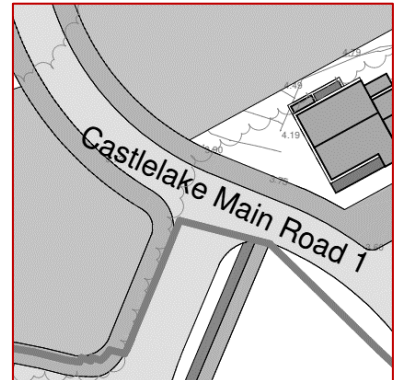
3.4 Road Safety Audit

3.4.1 Problem

Drawing: Drawing no. CHD-WIL-ZZ-ZZ-SK-A-1004 (Rev. P04)

Summary: Junction control, or priority, has not been indicated at the junctions within the proposed development sites.

The junction control (stop, yield etc.), and thus priority, at the development's internal junctions has not been indicated. The absence of adequate road markings and signage may lead to driver confusion and hesitation resulting in drivers misinterpreting priority at the junction and entering the junction at the same time as opposing vehicles where there is an increased risk of side-swipe or side-on collisions.



Recommendation

Ensure the junction control, and priority, at internal junctions between residential streets and main roads, and at crossroads, is clear via signage and road markings.

3.4.2 Problem

Location: General Problem

Example: Drawing no. CHD-WIL-ZZ-ZZ-SK-A-1004 (Rev. P04)

Summary: The swept path of vehicles has not been provided. It is therefore unclear if all vehicles can safely turn within the development.

Details regarding the swept path of vehicles has not been provided to the Audit Team. It is therefore unclear if all vehicles can safely turn within the development.

Also, perpendicular parking is provided on Blandcrest Street 08, however no protection is provided to the southernmost parking spaces. Turning traffic may strike or collide with exposed vehicles parked the southernmost space, leading to material damage and personal injury collisions.



Recommendation

Ensure the swept path of large vehicles can be accommodated within the proposed development.

Also, modify the kerb line at the junction of Blandcrest Street 08 and Blandcrest Street 05 to ensure the southernmost parking space is protected by a kerb line.

3.4.3 Problem

Drawing: Drawing no. CHD-WIL-ZZ-ZZ-SK-A-1004 (Rev. P04)

Summary: It is unclear if the proposed development will be sufficiently lit during the hours of darkness.

Information regarding public lighting within the proposed development has not been provided to the Audit Team and it is therefore unclear if the development will be sufficiently lit during the hours of darkness.

If the proposed development is not sufficiently lit during the hours of darkness there is a risk that inter-visibility between drivers and vulnerable road users will be reduced resulting in an increased risk of vehicle-pedestrian collisions.

Recommendation

Ensure the proposed development is sufficiently lit during the hours of darkness.

3.4.4 Problem

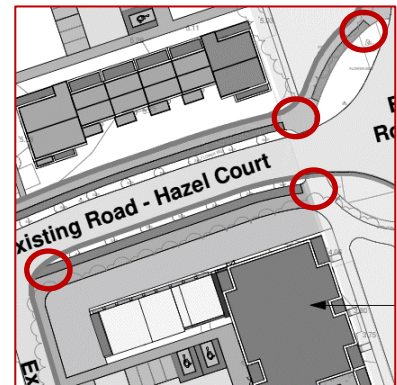
Location: General Problem

Example: Drawing no. CHD-WIL-ZZ-ZZ-SK-A-1004 (Rev. P04)

Summary: Tactile paving has not been indicated at the transitions between shared surfaces and segregated footways.

Tactile paving (e.g. ladder and tram) has not been indicated at the start and end of shared and segregated surfaces. This could lead to visually impaired pedestrians inadvertently entering the cycle track, or approaching shared surfaces and being unaware of the presence of cyclists, which may increase the risk of pedestrian-cyclist collisions.

Also, it is unclear how cyclists are to safely transition to the carriageway at the end of the cycle track. Drivers may be less attentive to a cyclist entering the carriageway from a raised cycle track resulting in an increased risk of vehicle-cyclist collisions.



Recommendation

Tactile paving (e.g. ladder and tram) at the interfaces between shared and segregated surfaces should be provided.

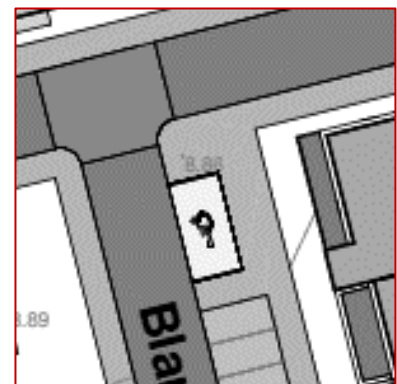
Measures should be provided upstream of a junction to safely guide cyclists into the traffic lane. These measures should also include guidance for drivers such that they will be aware of the potential for cyclists to enter the traffic lane, and clearly advise of the priority between cyclists and motorised vehicles at the transition.

3.4.5 Problem

Drawing: Drawing no. CHD-WIL-ZZ-ZZ-SK-A-1004 (Rev. P04)

Summary: Absence of dropped kerbs and tactile paving at the mobility impaired parking spaces.

Mobility impaired parking spaces have been indicated throughout the development. It is unclear from the information provided if dropped kerbs and associated tactile paving are proposed at each Mobility impaired parking space. The absence of dropped kerbs could lead to difficulties for mobility impaired road users in accessing the footpath once they leave their vehicle, and force users to travel long distances within the carriageway until a dropped crossing is found, which may increase the risk of vehicle/pedestrian collisions.



Recommendation

Provide dropped kerbs & tactile paving at mobility impaired parking spaces to permit safe access to/from the footways.

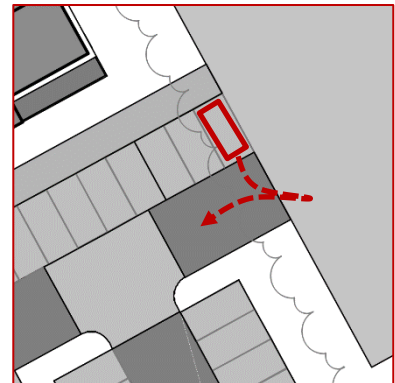
3.4.6 Problem

Location: General Problem

Example: Drawing no. CHD-WIL-ZZ-ZZ-SK-A-1004 (Rev. P04)

Summary: It is unclear if there is sufficient space for vehicles to safely exit all parking spaces within the development.

Drivers may be unable to safely exit parking spaces located at the extents of the carpark, where they are in areas constrained by adjacent parking spaces, building structures, or kerbs. The constrained nature of these parking spaces may lead to material damage collisions.



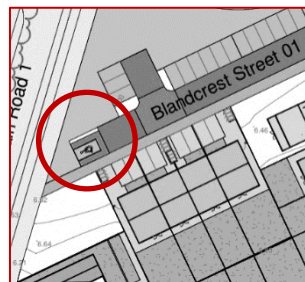
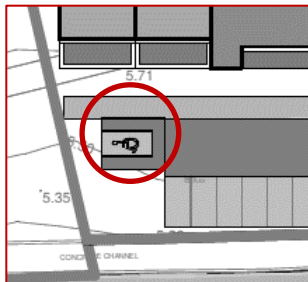
Recommendation

Swept path analysis should be undertaken within the internal carparks, and the layout adjusted where necessary.

3.4.7 Problem

Drawing: Drawing no. CHD-WIL-ZZ-ZZ-SK-A-1004 (Rev. P04)

Summary: Unclear if there is sufficient space for vehicles to safely perform a u-turn manoeuvre when exiting the internal street.



Mobility impaired parking spaces are located at the end of Blandcrest Street 01 and Station Road Street 03. Given the local constraints at each parking space, users within the Mobility impaired parking spaces may be required to reverse long distances to exit the street. This may increase the risk of material damage and vehicle/pedestrian collisions.

Recommendation

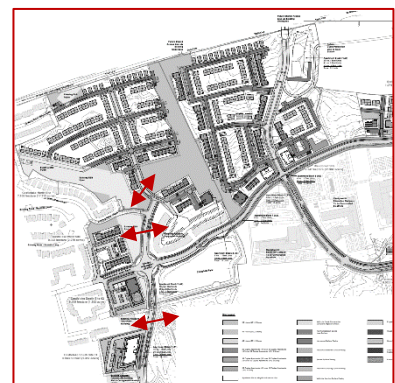
The mobility impaired parking spaces should be reoriented to provide safe access and egress.

3.4.8 Problem

Drawing: Drawing no. CHD-WIL-ZZ-ZZ-SK-A-1004 (Rev. P04)

Summary: Failure to provide VRU facilities on all pedestrian desire lines may lead to slips, trips, and falls.

The development proposes uncontrolled pedestrian crossing points (i.e. tactile paving) in certain locations, but not all pedestrian desire lines have been accommodated within the scheme extents. No facilities have been provided between the existing public open space and the surrounding residential developments, for example across Castlelake Avenue or Castlelake Main Road. Failure to provide an appropriate facility for non-motorised users at these expected desire line could result in unsafe



crossings of the carriageway, leading to slips, trips, and falls.

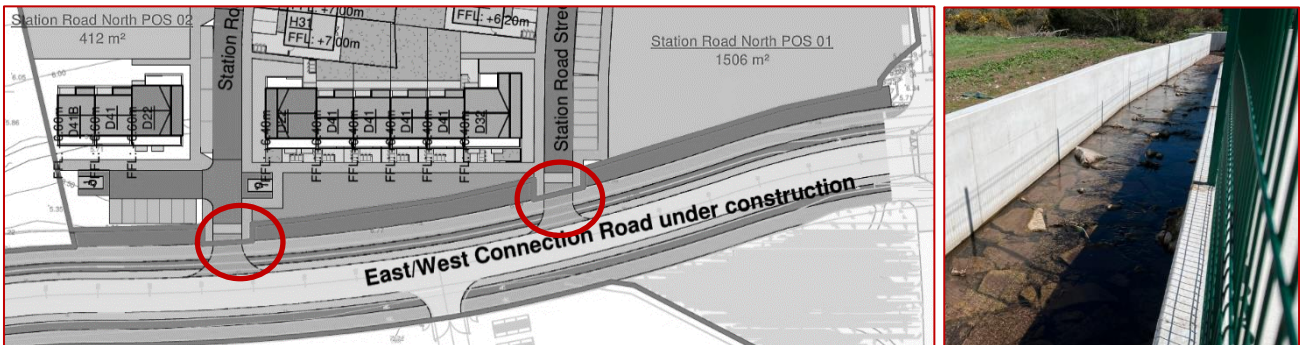
Recommendation

A thorough review of likely pedestrian desire lines should be undertaken, and tactile paving/dropped kerbs provided to facilitate safe VRU movement.

3.4.9 Problem

Drawing: Drawing no. CHD-WIL-ZZ-ZZ-SK-A-1004 (Rev. P04)

Summary: Proposed structures over the open drainage channel may restrict inter-visibility between drivers and crossing pedestrians/cyclists.



Two new accesses are proposed across an existing open drainage channel at the development's north-eastern extents. The accesses will need to span the open drainage channel, so may include a parapet and handrailing to prevent users from falling into the channel. The provision of a parapet and handrailing may limit inter-visibility between drivers existing Station Road Streets 02 & 03 and pedestrians/cyclists on the footway, leading to possible vehicle/pedestrians and vehicle/cyclist collisions.

Recommendation

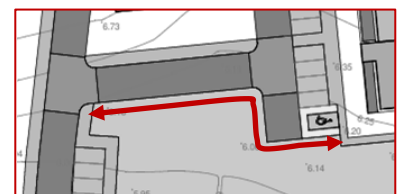
When developing the structural design at the two accesses, ensure sufficient inter-visibility is provided between drivers and pedestrians/cyclists. This may require a wider structure over the open channel at both locations.

3.4.10 Problem

Drawing: Drawing no. CHD-WIL-ZZ-ZZ-SK-A-1004 (Rev. P04)

Summary: Lack of a pedestrian link between the footpaths may lead to pedestrians creating an informal pathway through the grass verge, leading to slips, trips, and falls.

Pedestrian links between footpaths have not been indicated at two locations (Apartment Block 7 and the Station Road North site). Where footways are not provided, pedestrians may likely continue along the shortest route to their destination, which may result in the creation of informal walking paths through the grass verge. These informal paths may deteriorate over time, leading to slips, trips, and falls.



Recommendation

Paved footpath links should be provided through the verge between the footpaths.

3.4.11 Problem

Location: General Problem

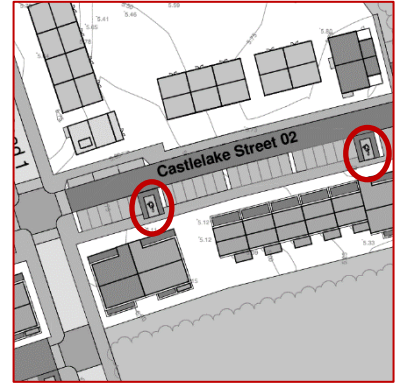
Example: Drawing no. CHD-WIL-ZZ-ZZ-SK-A-1004 (Rev. P04)

Summary: Inset mobility impaired parking spaces reduce the effective width of the footway.

Inset mobility impaired parking spaces are indicated at several locations within the development. These inset spaces reduce the effective width of the footway, and may force opposing pedestrians to step into the parking space, which may increase the risk of vehicle/pedestrian collisions.

Recommendation

Ensure the effective width of the footpaths within the development are sufficient to accommodate the expected volume of pedestrians (in both directions) during peak times, particularly wheelchair users and parents with buggies.



3.4.12 Problem

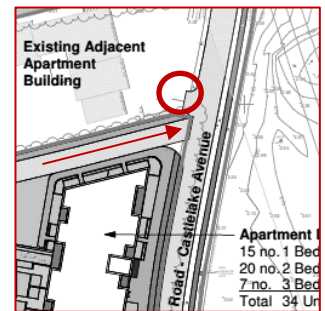
Drawing: Drawing no. CHD-WIL-ZZ-ZZ-SK-A-1004 (Rev. P04)

Summary: The Apartment block 1 development access is in close proximity to an adjacent apartment block access onto Castlelake Avenue.

The development access for Apartment Block 1 is proposed in the northeast corner of the site. However, the proposed access is in close proximity to an existing development access to the north of the site. Proximity of the accesses could result in complicated interactions between the two accesses, driver uncertainty and confusion, as well as vehicles in adjacent accesses blocking each other's visibility. This may lead to side-on, material damage and personal injury collisions.

Recommendation

The proposed development access to/from the Castlelake Avenue should be relocated, ensuring visibility requirements are met at the revised access.



3.5 Observations

3.5.1 At this early stage, trees and planting has not been indicated. It is important that trees and plants are located away from junctions, pedestrian crossings, and property accesses.

3.6 Road Safety Audit Team Statement

We certify that we have examined the drawings referred to in this report. The examination has been carried out with the sole purpose of identifying any features of the design that could be removed or modified in order to improve the safety of the scheme.

The problems identified have been noted in this report together with associated safety improvement suggestions, which we would recommend should be studied for implementation.

The Road Safety Audit Team has not been involved in the design of this scheme.

ROAD SAFETY AUDIT TEAM LEADER

Aly Gleeson

Signed:



Dated:

14th June 2022

ROAD SAFETY AUDIT TEAM MEMBER

Antonios Papadakis

Signed:



Dated:

14th June 2022

3.7 Road Safety Audit Brief Checklist

Have the following been included in the audit brief?: (if 'No', reasons should be given below)

	Yes	No
1. The Design Brief	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Departures from Standard	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. Scheme Drawings	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4. Scheme Details such as signs schedules, traffic signal staging	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Collision data for existing roads affected by scheme	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6. Traffic surveys	<input type="checkbox"/>	<input checked="" type="checkbox"/>
7. Previous Road Safety Audit Reports and Designer's Responses/Feedback Form	<input type="checkbox"/>	<input checked="" type="checkbox"/>
8. Previous Exception Reports	<input type="checkbox"/>	<input checked="" type="checkbox"/>
9. Start date for construction and expected opening date	<input type="checkbox"/>	<input checked="" type="checkbox"/>
10. Any elements to be excluded from audit	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Any other information? (if 'Yes', describe below)	<input type="checkbox"/>	<input checked="" type="checkbox"/>

3.8 Documents Submitted to the Road Safety Audit Team

DOCUMENT/DRAWING TITLE	DOCUMENT/DRAWING NO.	REVISION
Site Layout Plan (Alternative Layout)	CHD-WIL-ZZ-ZZ-SK-A-1004	P04

3.9 Road Safety Audit Feedback Form

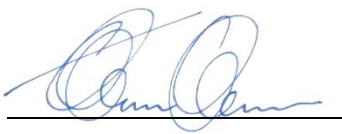
Scheme: Castlelake Strategic Housing Development, Carrigtwohill, Co. Cork


Route No.: Local Roads

Audit Stage: 1 Date Audit Completed: 27.04.2022

To be Completed by Designer				To be Completed by Audit Team Leader
Paragraph No. in Safety Audit Report	Problem Accepted (Yes/No)	Recommended Measure(s) Accepted (Yes/No)	Describe Alternative Measure(s). Give reasons for not accepting recommended measure	Alternative Measures or Reasons Accepted by Auditors (Yes/No)
3.4.1	Yes	Yes		
3.4.2	Yes	Yes		
3.4.3	Yes	Yes		
3.4.4	Yes	Yes		
3.4.5	Yes	Yes		
3.4.6	Yes	Yes		
3.4.7	Yes	Yes		
3.4.9	Yes	Yes		
3.4.10	Yes	Yes		
3.4.11	Yes	Yes		
3.4.12	Yes	Yes		

Signed:  Designer Date 14/06/2022

Signed:  Audit Team Leader Date 14th June 2022

Signed:  Employer Date 14th June 2022

4 Accessibility & Walkability Audit

4.1 Introduction

The proposed development is located on a green field site, north of the N25 national road in Castlelake, Carrigtwohill, Co. Cork. The development will consist of 722 residential units, a Creche building and associated parking, public open spaces (located centrally within the residential development, and to the north of the development), internal streets, footways, and pedestrian crossing points. Schools shall also be developed within the area, though this is being progressed by a Third Party, and is not subject to this audit.

The development shall include an internal network of footways and crossing points to support pedestrian movement to Carrigtwohill town center, which can be accessed via the two proposed accesses on Station Road to the east of the development site, or by the large public open space to the west of the development toward Oakbrook where the development ties into an existing roundabout junction, which leads south towards Carrigtwohill Main Street.

Proposed footpaths will link up with existing footpaths in the local area, providing a comprehensive network of connected pedestrian facilities. In addition, Carrigtwohill Railway Station is located to the immediate east of the proposed development, and can be accessed via Station Road. Station Road is also subject to a proposal by Cork County Council to upgrade the existing pedestrian and cyclist facilities, which shall tie into the proposed development.

Footpaths shall be 2.0m wide, with uncontrolled crossing points throughout the development. In addition, controlled pedestrian crossing facilities have been provided (under a separate project) at the intersection between the two 6.5m wide links roads running through the development (planning reg ref 19/05707). These will provide enhanced connectivity for pedestrians travelling between the residential catchment areas and the future schools being located in the southeast corner of the development.

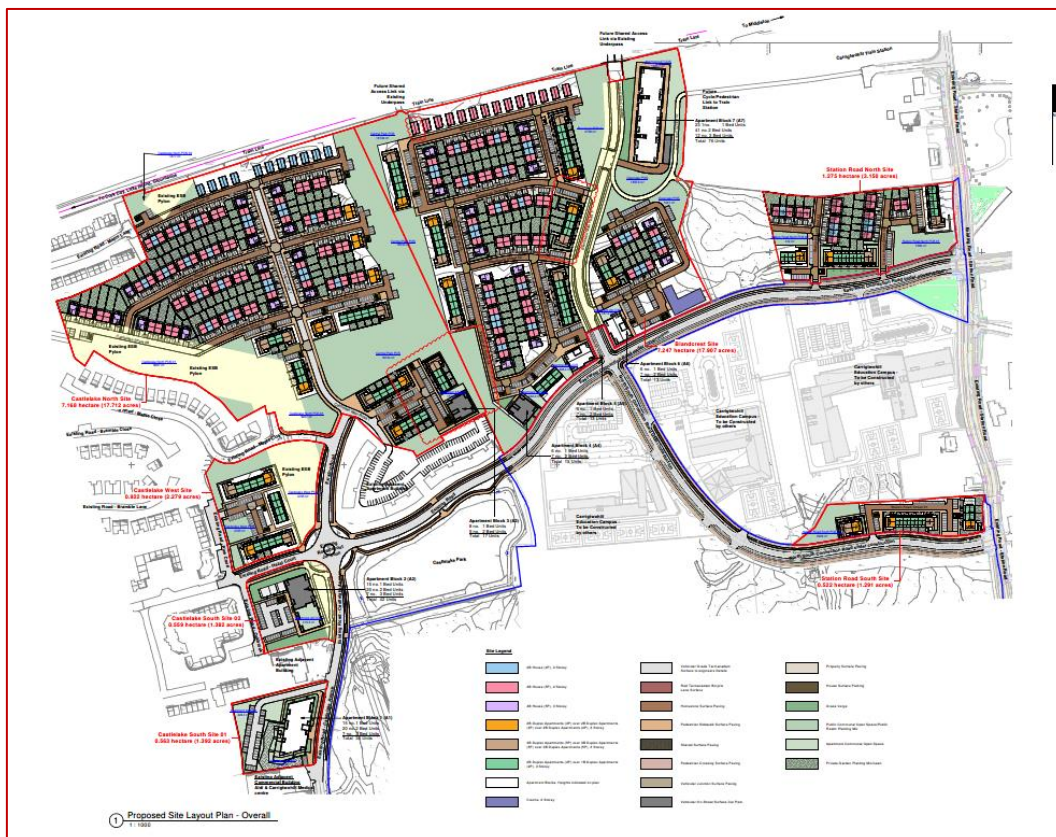


FIGURE 4-1 PLAN OF PROPOSED DEVELOPMENT

4.1.1 Access to local bus network

Bus stops are located on the main street near the development's Station Road accesses. These bus stops serve the Bus Éireann Route 240, 241, 260 and Route 261 local bus services, and the Transport for Ireland Route 211 bus service. Route 240 travels from Cork to Ballycotton and takes approximately 19 minutes to reach Carrigtwohill from Cork, and 1hr and 4 minutes to reach Ballycotton. Route 241 travels from Cork to Trabolgan and takes approximately 19 minutes to reach Carrigtwohill from Cork, and 54 minutes to reach Trabolgan.

Route 260 travels from Cork to Ardmore and takes approximately 19 minutes to reach Carrigtwohill from Cork, and 1hr and 53 minutes to reach Ardmore. Route 261 travels from Cork to Ballinacurra and takes approximately 19 minutes to reach Carrigtwohill from Cork, and 18 minutes to reach Ballinacurra. Route 211 travels from Hoffman Park to Cobh and takes approximately 20 minutes to reach Carrigtwohill from Cork, and 1hr and 9 minutes to reach Cobh.

Residents of the proposed development will therefore have good access to existing bus services, with connections to Cork City and neighbouring towns and villages.

TABLE 4-1 BUS ROUTE NEAR DEVELOPMENT

Bus Stop (Name)	Bus Stop (Number)	Proximity to the development	Bus Route	Travelling between
Church Lane (Eastbound & Westbound)	244801/244531	300m	240	Cork Bus Station - Ballycotton
			241	Cork Bus Station- Trabolgan
			260	Cork Bus Station- Ardmore
			261	Cork Bus Station- Ballinacurra
Ryan & Aherne Place (Westbound)	244521	550m	240	Cork Bus Station - Ballycotton
			241	Cork Bus Station- Trabolgan
			260	Cork Bus Station- Ardmore
			261	Cork Bus Station- Ballinacurra
Carrigtwohill Maryville (Eastbound)	-	650m	211	Inchera, Hoffman Park- Cobh, O' Neil Place
West End Terrace (Westbound)	244811	700m	240	Cork Bus Station - Ballycotton
			241	Cork Bus Station- Trabolgan
			260	Cork Bus Station- Ardmore
			261	Cork Bus Station- Ballinacurra

4.1.2 Access to the Train

The development is located 350m southwest of the Carrigtwohill Rail Station, which provides access to rail stops between Middleton, Cobh, Mallow and Cork, as well as connecting services with Intercity services and the broader Irish rail network.

Given its proximity to Carrigtwohill Rail Station, the development is considered to have good access to the local rail network.



FIGURE 4-2 MALLOW- COBH AND MIDDLETON AREA RAIL SERVICES

4.1.3 Local Amenities

Carrigtwohill town centre is located approximately 350m south of the proposed development, and includes a number of amenities, as detailed in Table 4-2. Given the range of amenities in close proximity to the proposed development, and the comprehensive footway network between the development and Carrigtwohill town, residents of the new development will have good access to local amenities.

TABLE 4-2: LOCAL AMENITIES CLOSE TO THE PROPOSED DEVELOPMENT

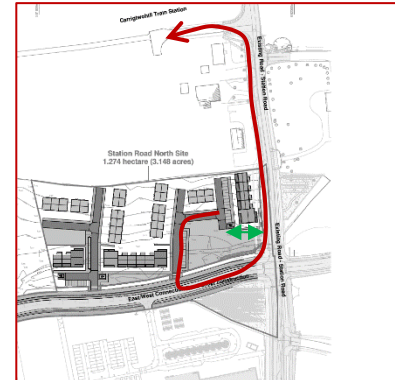
Amenity	Distance (approx.)	Pedestrian Journey Time (approx.)	Direction from Development
Castlelake Walk/Park	100m	1min	West
Carrigtwohill Primary Care Centre	550m	6min	Southwest
Aldi Supermarket	450m	5min	Southwest
Carrigtwohill GAA Club	1km	13min	South
Centra Carrigtwohill Supermarket	400m	5min	Southeast
St Alloysius' College Catholic Girls Secondary School	450m	6min	Southeast
Guilders Public House	300m	4min	Southeast
San Maria Restaurant	300m	4min	Southeast
Cotter's Pharmacy	400m	5min	Southeast
St Mary's Roman Catholic Church	210m	3min	Southeast
The Dispensary Medical Centre	150m	2min	Northeast
All Aboard Carrigtwohill Childcare Centre	80m	1min	East

4.2 Building Accesses

4.2.1 Issue

Unclear if there will be a pedestrian/cycle link provided between Station Road North Site and Station Road.

The Carrigtwohill Train Station is likely to be an attractive destination for commuting residents of the new apartment block at the Station North site. However, there are currently no direct pedestrian links between the development and Station Road. As a result, pedestrians will be forced to travel a circuitous route to gain access to Station Road. This may discourage some residents from using the train station.



Recommendation

Provide a pedestrian link between Station North and Station Road.

4.3 Pedestrian Crossing Facilities

Accessibility issues relating to Pedestrian Facilities have been discussed in Section 3.4.8.

4.3.1 Issue

Information regarding dropped kerbs and tactile paving has not been provided throughout the scheme. A failure to provide dropped kerbs along pedestrian desire lines could result in pedestrians, particularly mobility impaired pedestrians, being unable to safely and independently travel through the development, leading to slips, trips and falls.

Similarly, failing to provide sufficient tactile paving provision at dropped kerbs may lead to visually impaired pedestrians being insufficiently aware that they are entering/exiting a carriageway resulting in an increased risk of being struck by a vehicle.

Recommendation

Dropped kerbs and tactile paving should be provided at pedestrian crossing locations. The type, and depth, of tactile paving should be appropriate for the type of crossing provided.

4.4 Target Groups

Accessibility issues relating to Target groups have been discussed in Section 3.4.4, 3.4.5, 3.4.10, and 3.4.11.

4.5 Subways

No accessibility issues have been identified relating to Subways.

4.6 Junctions

Accessibility issues relating to Junctions have been discussed in Section 3.4.1, 3.4.2, 3.4.9, and 3.4.12.

4.7 Signage

No accessibility issues have been identified relating to Signage.

4.8 Public Transport

No accessibility issues have been identified relating to Public Transport.

4.9 Lighting

Accessibility issues relating to Lighting have been discussed in Section 3.4.3.

4.10 Visibility

No accessibility issues have been identified relating to Visibility.

4.11 Waste Facilities within the Development

No accessibility issues have been identified relating to Waste Facilities within the Development.

4.12 Carriageway Markings for Pedestrians

No accessibility issues have been identified relating to Carriageway Markings for Pedestrians.

4.13 Parking

Accessibility issues relating to Parking have been discussed in Section 3.4.6 and 3.4.7.

4.13.1 Issue

Electric Vehicle (EV) parking spaces have not been indicated within the development's carpark. It is likely that a percentage of the parking provision will be required for EVs, now or in the future. These typically require additional width to support a buffer zone to account for potentially different charging port connections on vehicles. The additional width allows space for electric cables, as well as user access to connect/disconnect the charging cables.

All of the parking spaces within the carpark appear to have similar dimensions. There is a risk therefore that, should any of these spaces be designated for EVs as the design progresses, the required space will not be available to accommodate the necessary buffer zone and infrastructure for EV parking spaces.

Recommendation

A sufficient number of parking spaces within the carpark should be designated as EV parking spaces and sufficient space should be provided at these spaces in accordance with Section 7.6.16 of the Traffic Signs Manual (2019), Chapter 7 'Road Markings'.

5 Non-motorised User and Cycle Audit

The existing cycle infrastructure within Carrigtwohill Town is limited, however, segregated pedestrian and cycle facilities are provided on Castlelake Avenue and the newly constructed link roads which run through the Castlelake SHD Development site. Existing cycle facilities are discontinuous in places, with limited connections to the local road network within Carrigtwohill Town Centre, or transitions between on-street and off-street facilities.

Secure bicycle parking is not consistently provided within Carrigtwohill Town. Residents from the development, who may choose to cycle into the town, will therefore have limited opportunity to secure their bicycles.



The development proposes traffic calming within the internal streets, including junction tables, which shall passively encourage lower vehicle speeds that will benefit cyclists. Additionally, a new inter-urban cycleway connection is proposed at the northern extents of the scheme, which will provide a high quality off-road connection for cyclists wishing to access Carrigtwohill Train Station, and other destinations on the cycle route.

5.1 External Cycle Provision

5.1.1 Issue

Pedestrian and cycle improvements are currently proposed on Station Road. These proposals are being developed by Cork County Council, and are not subject to this audit. At the time of this audit, the proposals for Station Road were not known, and the programme for implementing these proposals was not clear. If the new link roads are opened to the public prior to the implementation of Station Road's pedestrian and cycle improvements, the Audit Team is concerned that the lack of cycle connectivity between Station Road and the newly constructed links roads will discourage users from cycling to the station.

Recommendation

The two accesses on Station Road should not be opened to the public until the Station Road improvements have been completed.

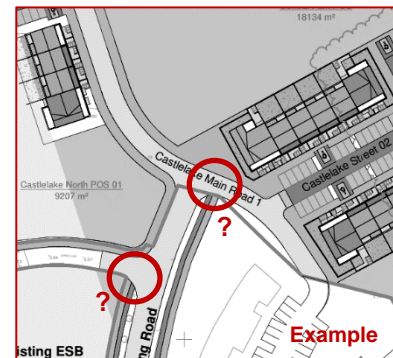
5.2 Internal Cycle Provision

5.2.1 Issue

Cycle facilities have been included in the link roads within the SHD Development. These shall provide high quality access for cyclists wishing to travel between the development and the new schools proposed in the south-eastern extents of the scheme. However, cycle connections at the interface between residential catchment areas and the recently constructed link roads have not been fully developed at this stage. It is not, therefore, known how residents will safely access the existing segregated cycle tracks.

Recommendation

Care should be exercised in safely connecting residential streets into the newly constructed link roads.



5.3 Quality Audit Action Plan

Issue	Situation	Action/Adjustment	Priority	Cost
4.2.1	<p>Unclear if there will be a pedestrian/cycle link provided between Station Road North Site and Station Road.</p> <p>The Carrigtwohill Train Station is likely to be an attractive destination for commuting residents of the new apartment block at the Station North site. However, there are currently no direct pedestrian links between the development and Station Road. As a result, pedestrians will be forced to travel a circuitous route to gain access to Station Road. This may discourage some residents from using the train station.</p>	<p>Provide a pedestrian link between Station North and Station Road.</p>	1	B
4.3	<p>The development proposes uncontrolled pedestrian crossing points (i.e. tactile paving) in certain locations, but not all pedestrian desire lines have been accommodated within the scheme extents. No facilities have been provided between the existing public open space and the surrounding residential developments, for example across Castlelake Avenue or Castlelake Main Road. Failure to provide an appropriate facility for non-motorised users at these expected desire line could result in unsafe crossings of the carriageway, leading to slips, trips, and falls.</p>	<p>A thorough review of likely pedestrian desire lines should be undertaken, and tactile paving/dropped kerbs provided to facilitate safe VRU movement.</p>	1	B
4.3.1	<p>Information regarding dropped kerbs and tactile paving has not been provided throughout the scheme. A failure to provide dropped kerbs along pedestrian desire lines could result in pedestrians, particularly mobility impaired pedestrians, being unable to safely and independently travel through the development, leading to slips, trips and falls.</p> <p>Similarly, failing to provide sufficient tactile paving provision at dropped kerbs may lead to visually impaired pedestrians being insufficiently aware that they are entering/exiting a carriageway resulting in an increased risk of being struck by a vehicle.</p>	<p>Dropped kerbs and tactile paving should be provided at pedestrian crossing locations. The type, and depth, of tactile paving should be appropriate for the type of crossing provided.</p>	1	B

Issue	Situation	Action/Adjustment	Priority	Cost
4.4	<p>Tactile paving (e.g. ladder and tram) has not been indicated at the start and end of shared and segregated surfaces. This could lead to visually impaired pedestrians inadvertently entering the cycle track, or approaching shared surfaces and being unaware of the presence of cyclists, which may increase the risk of pedestrian-cyclist collisions.</p> <p>Also, it is unclear how cyclists are to safely transition to the carriageway at the end of the cycle track. Drivers may be less attentive to a cyclist entering the carriageway from a raised cycle track resulting in an increased risk of vehicle-cyclist collisions.</p>	<p>Tactile paving (e.g. ladder and tram) at the interfaces between shared and segregated surfaces should be provided.</p> <p>Measures should be provided upstream of a junction to safely guide cyclists into the traffic lane. These measures should also include guidance for drivers such that they will be aware of the potential for cyclists to enter the traffic lane, and clearly advise of the priority between cyclists and motorised vehicles at the transition.</p>	1	B
4.4	<p>Mobility impaired parking spaces have been indicated throughout the development. It is unclear from the information provided if dropped kerbs and associated tactile paving are proposed at each Mobility impaired parking space. The absence of dropped kerbs could lead to difficulties for mobility impaired road users in accessing the footpath once they leave their vehicle, and force users to travel long distances within the carriageway until a dropped crossing is found, which may increase the risk of vehicle/pedestrian collisions</p>	<p>Provide dropped kerbs & tactile paving at mobility impaired parking spaces to permit safe access to/from the footways.</p>	1	B
4.4	<p>Pedestrian links between footpaths have not been indicated at two locations (Apartment Block 7 and the Station Road North site). Where footways are not provided, pedestrians may likely continue along the shortest route to their destination, which may result in the creation of informal walking paths through the grass verge. These informal paths may deteriorate over time, leading to slips, trips, and falls.</p>	<p>Paved footpath links should be provided through the verge between the footpaths.</p>	1	B
4.4	<p>Inset mobility impaired parking spaces are indicated at several locations within the development. These inset spaces reduce the effective width of the footway, and may force opposing pedestrians to step into the parking space, which may increase the risk of vehicle/pedestrian collisions.</p>	<p>Ensure the effective width of the footpaths within the development are sufficient to accommodate the expected volume of pedestrians (in both directions) during peak times, particularly wheelchair users and parents with buggies.</p>	1	A

Issue	Situation	Action/Adjustment	Priority	Cost
4.6	<p>The junction control (stop, yield etc.), and thus priority, at the development's internal junctions has not been indicated. The absence of adequate road markings and signage may lead to driver confusion and hesitation resulting in drivers misinterpreting priority at the junction and entering the junction at the same time as opposing vehicles where there is an increased risk of side-swipe or side-on collisions.</p>	<p>Ensure the junction control, and priority, at internal junctions between residential streets and main roads, and at crossroads, is clear via signage and road markings.</p>	1	B
4.6	<p>Details regarding the swept path of vehicles has not been provided to the Audit Team. It is therefore unclear if all vehicles can safely turn within the development.</p> <p>Also, perpendicular parking is provided on Blandcrest Street 08, however no protection is provided to the southernmost parking spaces. Turning traffic may strike or collide with exposed vehicles parked the southernmost space, leading to material damage and personal injury collisions.</p>	<p>Ensure the swept path of large vehicles can be accommodated within the proposed development.</p> <p>Also, modify the kerb line at the junction of Blandcrest Street 08 and Blandcrest Street 05 to ensure the southernmost parking space is protected by a kerb line.</p>	1	A
4.6	<p>Two new accesses are proposed across an existing open drainage channel at the development's north-eastern extents. The accesses will need to span the open drainage channel, so may include a parapet and handrailing to prevent users from falling into the channel. The provision of a parapet and handrailing may limit inter-visibility between drivers existing Station Road Streets 02 & 03 and pedestrians/cyclists on the footway, leading to possible vehicle/pedestrians and vehicle/cyclist collisions.</p>	<p>When developing the structural design at the two accesses, ensure sufficient inter-visibility is provided between drivers and pedestrians/cyclists. This may require a wider structure over the open channel at both locations.</p>	1	C
4.6	<p>The development access for Apartment Block 1 is proposed in the northeast corner of the site. However, the proposed access is in close proximity to an existing development access to the north of the site. Proximity of the accesses could result in complicated interactions between the two accesses, driver uncertainty and confusion, as well as vehicles in adjacent accesses blocking each other's visibility. This may lead to side-on, material damage and personal injury collisions.</p>	<p>The proposed development access to/from the Castlelake Avenue should be relocated, ensuring visibility requirements are met at the revised access.</p>	1	A

Issue	Situation	Action/Adjustment	Priority	Cost
4.9	Information regarding public lighting within the proposed development has not been provided to the Audit Team and it is therefore unclear if the development will be sufficiently lit during the hours of darkness. If the proposed development is not sufficiently lit during the hours of darkness there is a risk that inter-visibility between drivers and vulnerable road users will be reduced resulting in an increased risk of vehicle-pedestrian collisions.	Ensure the proposed development is sufficiently lit during the hours of darkness.	1	C
4.13	Drivers may be unable to safely exit parking spaces located at the extents of the carpark, where they are in areas constrained by adjacent parking spaces, building structures, or kerbs. The constrained nature of these parking spaces may lead to material damage collisions.	Swept path analysis should be undertaken within the internal carparks, and the layout adjusted where necessary.	1	A
4.13	Mobility impaired parking spaces are located at the end of Blandcrest Street 01 and Station Road Street 03. Given the local constraints at each parking space, users within the Mobility impaired parking spaces may be required to reverse long distances to exit the street. This may increase the risk of material damage and vehicle/pedestrian collisions.	The mobility impaired parking spaces should be reoriented to provide safe access and egress.	1	A
4.13.1	<p>Electric Vehicle (EV) parking spaces have not been indicated within the development's carpark. It is likely that a percentage of the parking provision will be required for EVs, now or in the future. These typically require additional width to support a buffer zone to account for potentially different charging port connections on vehicles. The additional width allows space for electric cables, as well as user access to connect/disconnect the charging cables.</p> <p>All of the parking spaces within the carpark appear to have similar dimensions. There is a risk therefore that, should any of these spaces be designated for EVs as the design progresses, the required space will not be available to accommodate the necessary buffer zone and infrastructure for EV parking spaces.</p>	A sufficient number of parking spaces within the carpark should be designated as EV parking spaces and sufficient space should be provided at these spaces in accordance with Section 7.6.16 of the Traffic Signs Manual (2019), Chapter 7 'Road Markings'.	1	A

Issue	Situation	Action/Adjustment	Priority	Cost
5.1.1	<p>Pedestrian and cycle improvements are currently proposed on Station Road. These proposals are being developed by Cork County Council, and are not subject to this audit. At the time of this audit, the proposals for Station Road were not known, and the programme for implementing these proposals was not clear. If the new link roads are opened to the public prior to the implementation of Station Road's pedestrian and cycle improvements, the Audit Team is concerned that the lack of cycle connectivity between Station Road and the newly constructed link roads will discourage users from cycling to the station.</p>	<p>The two accesses on Station Road should not be opened to the public until the Station Road improvements have been completed.</p>	1	A
5.2.1	<p>Cycle facilities have been included in the link roads within the SHD Development. These shall provide high quality access for cyclists wishing to travel between the development and the new schools proposed in the south-eastern extents of the scheme. However, cycle connections at the interface between residential catchment areas and the recently constructed link roads have not been fully developed at this stage. It is not, therefore, known how residents will safely access the existing segregated cycle tracks.</p>	<p>Care should be exercised in safely connecting residential streets into the newly constructed link roads.</p>	1	B

Priority

- 1 – Immediate works required;
- 2 – Essential works required within 1 year;
- 3 - Desirable works required within 2 years;
- 4 – Long term works;
- 5 - Specific needs (e.g. pedestrian desire line not catered for)

Cost (Indicative cost only)

- A – Up to €2,500
- B – From €2,500 up to €10,000
- C - Between €10,000 up to €20,000

