



Meadows to George Street, Edinburgh

Active Travel, Footway and Carriageway Improvements

Road Safety Audit Stage 1
RSA 262/S1-A

Overseeing Organisation: City of Edinburgh Council

Overseeing Organisation Reference:
AECOM Reference: RSA/262/S1-A

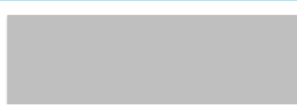
Quality information

Prepared by



Senior Engineer

Checked by



Principal Engineer

Approved by



Associate Director

Revision History

Revision	Revision date	Details	Authorised	Name	Position
-	26/07/2020	RSA Team Approval and Verification			Associate Director
0	27/07/2020	FINAL Report Issue to Client			Associate Director

Prepared for:

City of Edinburgh Council

Prepared by:

[REDACTED]
Senior Engineer

T: [REDACTED]

M: [REDACTED]

E: [REDACTED]@[aecom.com](mailto:[REDACTED]@aecom.com)

AECOM Limited
7th Floor, Aurora
120 Bothwell Street
Glasgow G2 7JS
United Kingdom

T: +44 141 248 0300
aecom.com

Printed on environmentally responsible paper. Made from 100% recycled post-consumer waste.

© 2020 AECOM Limited. All Rights Reserved.

This document has been prepared by AECOM Limited ("AECOM") for sole use of our client (the "Client") in accordance with generally accepted consultancy principles, the budget for fees and the terms of reference agreed between AECOM and the Client. Any information provided by third parties and referred to herein has not been checked or verified by AECOM, unless otherwise expressly stated in the document. No third party may rely upon this document without the prior and express written agreement of AECOM.

Table of Contents

1.	Project Details.....	5
2.	Introduction	6
3.	Items Outstanding from Previous Audits	8
4.	Items Resulting from the Stage 1 Road Safety Audit	9
4.1	General.....	9
4.2	Local Alignment	21
4.3	Junctions	31
4.4	Non-Motorised User Provision.....	35
4.5	Road Signs, Carriageway Markings and Lighting	51
5.	Audit Team Statement.....	56
	Appendix A Documents Submitted to the Audit Team	57
	Appendix B Problem Location Plans	59
	Appendix C Road Safety Audit Brief.....	66

1. Project Details

Report Title:	Meadow to George Street, Edinburgh Active Travel, Footway and Carriageway Improvements Stage 1 Road Safety Audit
Date:	26/08/2020
AECOM Document Reference:	RSA/262/S1-A
Overseeing Organisation Reference:	
Prepared By:	AECOM
On Behalf Of:	City of Edinburgh Council

2. Introduction

- 2.1** This report results from a Stage 1 (Preliminary Design) Road Safety Audit carried out on a proposal for active travel, footway and carriageway improvements between The Meadows and George Street, Edinburgh. The Audit was carried out at the request of City of Edinburgh Council.
- 2.2** The report indicates each of the problems identified together with recommendations to solve or mitigate the problems, the Audit Team Statement and a schedule of documents reviewed.
- 2.3** To the knowledge of the Audit Team, this is the first formal Road Safety Audit of the scheme.
- 2.4** The members of the Audit Team were:
- | | |
|---|--------------------|
|  | <u>Team Leader</u> |
| Principal Engineer, AECOM | |
|  | <u>Team Member</u> |
| Senior Engineer, AECOM | |
- 2.5** The Road Safety Audit took place at AECOM's Edinburgh office during July – August 2020 and comprised of an examination of the documents provided by the designers (see Appendix A). In addition to examining the documents supplied, the Audit Team visited the site on the 9th of July 2020 between 11:00 and 16:00hrs. During this time traffic flows were steady, and no congestion was evident. The weather conditions during the site visit were dry and clear. The carriageway surface was predominantly dry.
- 2.6** The site of the proposed measures is on Hanover Street, The Mound, Market Street, North Bank Street, Bank Street, George IV Bridge, Candlemaker Row, Forrest Road, Bristo Place and Teviot Place in Edinburgh City Centre. The site is predominantly a single carriageway of varying width bounded by commercial and residential properties, which is subject to a 20mph speed limit and illuminated by street lighting. George IV Bridge has extensive public transport infrastructure, including bus lanes and has a number of bus stops present. The Mound, at the time of the site visit had temporary cycle infrastructure installed following the Spaces for People initiative. In addition, at the time of the site visit, the carriageway surface of The Mound was being replaced.
- 2.7** The Meadows to George Street project aims to transform cycling, walking, public spaces and accessibility for all, on some of Edinburgh's busiest and most iconic streets. It will provide an essential north-south link in the city for active travel users. As an important part of the Edinburgh City Centre Transformation Strategy, it will be one of the first projects to deliver major street improvements. The scheme proposals include;
- Segregated cycling facilities;
 - Widened footways;
 - Shared space areas;
 - Revised junctions, crossings and public transport facilities; and
 - Introducing a bus gate between the High Street / Lawnmarket and Market Street
- 2.8** The terms of reference of the Road Safety Audit are as described in GG119 of the Design Manual for Roads and Bridges. The Road Safety Audit Team has examined and reported only on the road safety implications of the scheme as presented and has not examined or verified the compliance of the designs to any other criteria. The scheme has not been examined or verified for compliance with any other standards. However, in order to clearly explain a safety problem or the recommendation to resolve a problem, the Audit Team may on occasion have referred to a design standard for information only. Any Audit comments should not be construed as implying that a technical audit has been undertaken in any respect.
- 2.9** Section 3 of this report includes outstanding issues identified from previous Audit Reports and Section 4 describes the safety issues identified in the Stage 1 Audit together with recommendations for improvement, to either remove or reduce the associated risk in connection with this highway proposal.
- 2.10** Any recommendations included within this report should not be regarded as being prescriptive design solutions to the problems raised. They are intended only to indicate a proportionate and viable means of eliminating or mitigating the identified problem, in accordance with GG119, and in no way imply that a formal design process has been undertaken. There may be alternative methods of addressing a problem

which would be equally acceptable in achieving the desired elimination or mitigation and these should be considered when responding to this report.

- 2.11** No departures from standards have been notified to the Audit Team on the proposals.
- 2.12** All traffic sign and road marking diagram number references are made to The Traffic Signs Regulations and General Directions, 2016 (TSRGD).
- 2.13** Where applicable, the locations of problems are shown in conjunction with the scheme proposals in Appendix B where the reference numbers relate to the problems identified in this report.
- 2.14** The Design Organisation(s) and Overseeing Organisation are advised of the following:
 - a. The RSA team shall produce and issue an RSA report directly to the Overseeing Organisation for all stages. Where changes are agreed to an RSA report between the RSA team and Overseeing Organisation, a revised version of the RSA report shall be produced by the RSA team and issued to the Overseeing Organisation.
 - b. Following the issue of the Road Safety Audit report the Road Safety Audit Response Report is produced by the Design Organisation(s) in collaboration with the Overseeing Organisation. To assist with this, the Design Team must prepare a Road Safety Audit Response Report to the audit at Stage 1, 2 and 3 Road Safety Audits.
 - c. The Road Safety Audit Response Report must contain a response from the Overseeing Organisation and a Road Safety Audit action for each problem agreed between the Design Organisation(s) and the Overseeing Organisation. The Road Safety Audit Response Report shall be signed by the Overseeing Organisation and Design Organisation(s) to indicate their agreement on the Road Safety Audit actions. A copy of the signed Road Safety Audit Response Report is to be sent to the Audit Team Leader for information.

3. Items Outstanding from Previous Audits

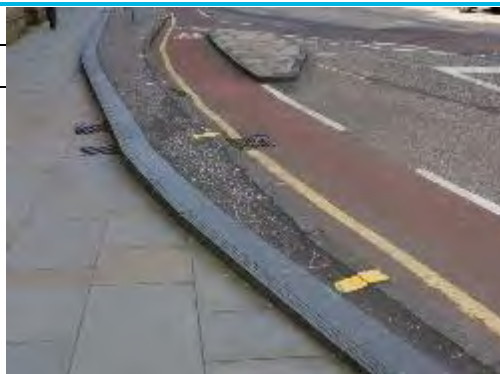
The Audit Team are not aware of any previous Road Safety Audit Reports for this scheme.

4. Items Resulting from the Stage 1 Road Safety Audit

4.1 General

Problem: 4.1.1

Location(s):	Scheme extents
Drawing(s):	60579473-SHT-C-0001 to 60579473-SHT-C-0007
Summary:	Risk of vehicles skidding and losing control and of pedestrians slipping and falling due to excess surface water.



Description:

From the plans provided it is unclear as to the relative levels at the interfaces between the new and existing sections of footway, and between the new sections of footway and carriageway. There is a risk that the relative levels could lead to water pooling at these interfaces. Excess surface water increases the risk of vehicles skidding and losing control and / or of pedestrians slipping and falling, particularly during periods of cold / freezing weather where the surface water could freeze and form ice.

Recommendation:

It is recommended that appropriate drainage is provided throughout the extents of the scheme.

Problem: 4.1.2

Location(s): Scheme extents

Drawing(s): 60579473-SHT-C-0001 to 60579473-SHT-C-0007

Summary: Risk that vehicles could lose control on utility covers especially in wet / damp conditions and strike pedestrians and / or street furniture resulting in personal injuries.



Description:

From the plans provided it is not clear if the existing ironwork is being raised / lowered to match the proposed surface course level and / or replaced due to being worn. There is a risk that vehicles could lose control especially in wet / damp conditions and strike pedestrians and / or street furniture resulting in personal injuries.

Recommendation:

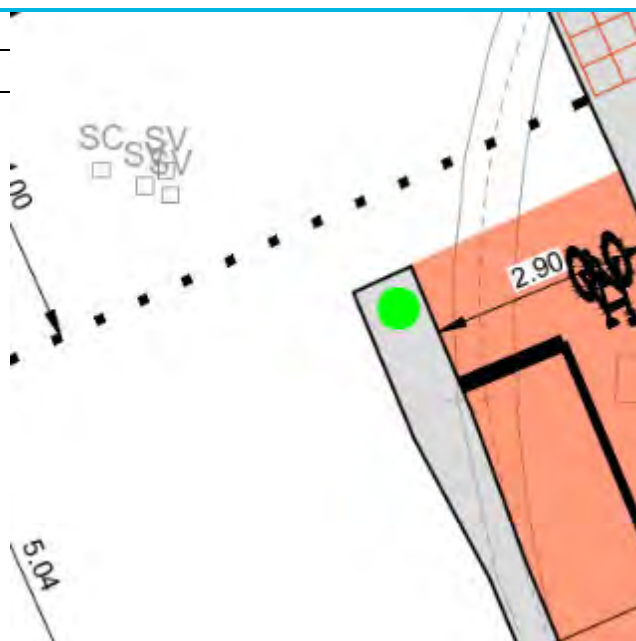
It is recommended that ironwork is raised / lowered and / or replaced to match the proposed surface course level.

Problem: 4.1.3

Location(s): Scheme Extents

Drawing(s): 60579473-SHT-C-0005

Summary: Risk of vehicles clipping sharp vertical faces of kerbs and causing damage to vehicle resulting in loss of control and potential collision.



Description:

Various locations within the scheme appears to have kerbs forming a sharp 90-degree edge, many on the leading edges of islands. If a vehicle clips the kerb there is a potential of loss of control collisions occurring or to damage to the vehicle which could lead to secondary loss of control collisions. It is noted that at this stage the drawings may be indicative to show the general layout, however, any kerb line or islands should be constructed with appropriate radii or tapers.

Recommendation:

It is recommended that a radius is formed at kerbed corners.

Problem: 4.1.4

Location(s): Various Locations

Drawing(s): 60579473-SHT-C-0001 to 60579473-SHT-C-0007

Summary: Risk of vehicles skidding during braking and overshooting the stop line and colliding with over road users.



Description:

From the plans provide no high friction surfacing appears to be proposed on the approaches to any of the traffic signalling facilities. There is a risk that if vehicles are not provided sufficient grip that they could skid and overshoot the stop line, potentially resulting in collision with pedestrians or other road users. Of particular concern are those stops on downhill gradients, such as, Bank Street, North Bank Street and The Mound.

Recommendation:

It is recommended that an appropriate length of surfacing with a suitable level of grip or High Friction Surfacing is provided on approach to traffic signals.

Problem: 4.1.5

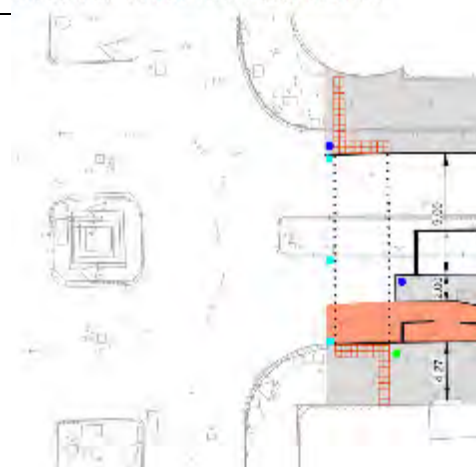
Location(s): Hanover Street at George Street

Drawing(s): 60579473-SHT-C-0001

Summary: Risk of vehicles mounting the kerb, resulting in collision with pedestrians and / or street furniture.

PHASE ANALYSIS AND DESIGN TO BE COMPLETED FOR EXTENTS

DRAWINGS 60579473-SHT-C-1211 TO 60579473-SHT-C-1219 FOR
ON REGARDING NEW SIGNALISED CROSSINGS AND JUNCTIONS



Description:

From the plans provided, the proposals do not appear to tie into neighbouring infrastructure. Therefore, as designed, the footway will extend into the carriageway. There is a risk that vehicles will mount the footway and collide with pedestrians and / or street furniture

Recommendation:

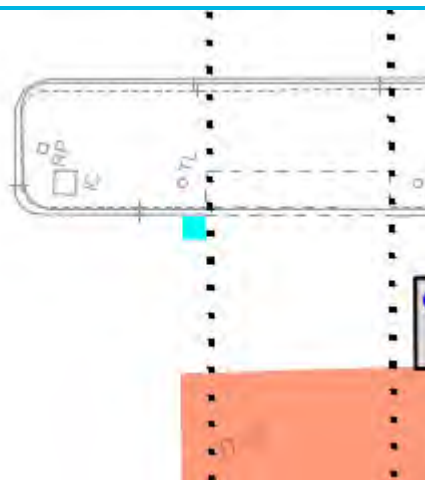
It is recommended that the scheme suitably ties into the neighbouring infrastructure.

Problem: 4.1.6

Location(s): Hanover Street at George Street

Drawing(s): 60579473-SHT-C-0001

Summary: Risk of vehicles losing control on drainage gully or a depression in the carriageway.



Description:

From the plans provided a drainage gully is proposed to be located in the running lane of the carriageway. There is a risk, particularly to two-wheeled vehicles, of losing control on the gully, especially during wet / damp conditions. In addition, over time with regular over running by vehicles there is a risk that a depression in the carriageway could be formed.

Recommendation:

It is recommended that the gully is relocated to the channel.

Problem: 4.1.7

Location(s): Junction with The Mound, North Bank Street, Mound Place and Market Street

Drawing(s): 60579473-SHT-C-0003

Summary: Risk of vegetation obscuring proposed traffic signals, increasing the risk of vehicles overrunning the stop line and potentially colliding with pedestrians.



Description:

From the plans provided a number of trees are located in the vicinity of the proposed new signalised junction. It is anticipated that these will impact visibility to the traffic signal heads. If visibility is restricted there is a risk of vehicles overrunning the stop line and potentially colliding with pedestrians.

Notwithstanding this, there is also concern that the general alignment of the junction could restrict visibility to the traffic signal heads with or without the vegetation.

Recommendation:

It is recommended that sufficient forward visibility is provided to the traffic signal heads.

Problem: 4.1.8

Location(s): Mound Place

Drawing(s): 60579473-SHT-C-0003

Summary: Risk during wet/damp conditions that motorised road users when braking will have insufficient grip and could lose control resulting in personal injury



Description:

It was observed during the site visit that the junction is surfaced on the approach to the existing stop or give way line with traditional cobbled setts. From the plans provided there was no indication if a different carriageway surfacing was being proposed. There is a risk during wet/damp conditions that motorised road users when braking will have insufficient grip and could lose control resulting in personal injury.

Recommendation:

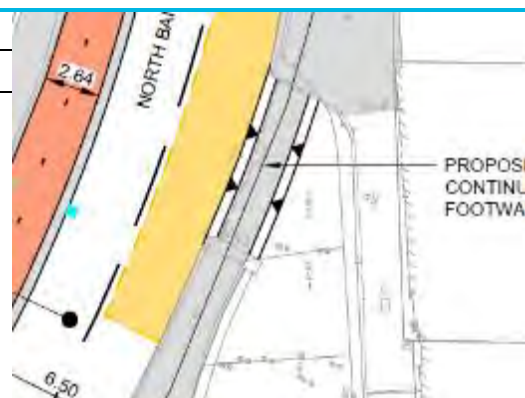
It is recommended that an appropriate level of grip material is provided on the approach to all stop lines.

Problem: 4.1.9

Location(s): North Bank Street

Drawing(s): 60579473-SHT-C-0003

Summary: Risk of vehicles skidding and losing control or of pedestrians slipping and falling due to the relative levels of carriageway and footways.



Description:

From the plans provided a continuous footway is provided across a private access to residential parking. There is evidence of surface water pooling between the existing and proposed interfaces. There is a risk that the relative levels could lead to water pooling at these interfaces.

Excess surface water increases the risk of vehicles skidding and losing control or of pedestrians slipping and falling, particularly during periods of cold / freezing weather where the surface water could freeze and form ice.

Recommendation:

It is recommended that appropriate drainage is provided.

Problem: 4.1.10

Location(s): Junction with Bank Street, Lawnmarket and George IV Bridge

Drawing(s): 60579473-SHT-C-0004

Summary: Risk of collision between vehicles and other road users due to them failing to stop or overshooting the stop line due to low grip surfacing.



Description:

It is noted that setts are used to surface the carriageway at this junction, it is unclear the relative grip available on the setts compared to standard carriageway surfacing materials. There is a risk that drivers braking on approach could skid or lose control particularly in wet conditions, resulting in potential impact with other users including pedestrians or cyclists crossing, or could collide into a queuing vehicle.

Recommendation:

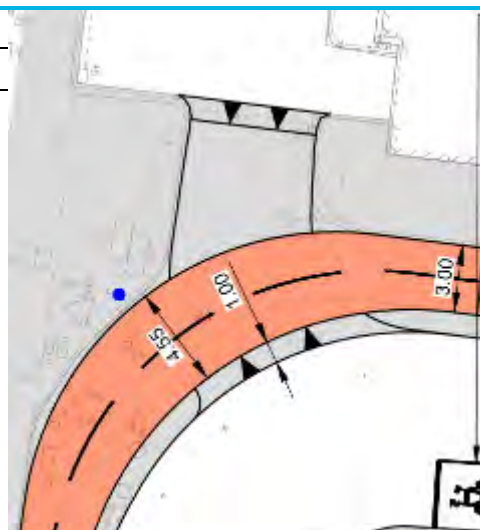
It is recommended that an appropriate level of grip material is provided on the approach to all stop lines.

Problem: 4.1.11

Location(s): St Giles Street

Drawing(s): 60579473-SHT-C-0004

Summary: Risk of drivers / riders entering the junction when it is unsafe to do so, potentially resulting in head-on collisions.



Description:

From the plans provided it appears St Giles Street is the minor arm of a major / minor junction, however the major arms on North Bank Street are traffic signal controlled. St Giles Street appears neither to be traffic signal controlled nor subject to any operational restrictions. Therefore, drivers from St Giles Street could emerge onto North Bank Street, into the path of oncoming vehicles, potentially resulting in head-on collisions.

Recommendation:

It is recommended that either St Giles Street is traffic signal controlled or the exit onto North Bank Street is prohibited.

Location(s): Forrest Road

Summary: Risk of pedestrians slipping and falling, particularly during periods of cold/freezing weather due to the presence of gullies in the footways.



From the plans provided there are a number of existing gullies located within the footway as shown by the image above to the left. The existing gullies proposed to be replaced within the footway as shown by the plans, highlighted above with the image to the right. There is a risk that the relative levels could lead to surface water pooling at these interfaces. Excessive water increases the risk of pedestrians slipping and falling, particularly during periods of cold/freezing weather.

There is an additional risk that if a non-pedestrian friendly gully cover is provided; pedestrians could trip and fall leading to personal injury.

It is recommended that the levels of the footway are adequate for drainage and that a suitable gully cover is provided.

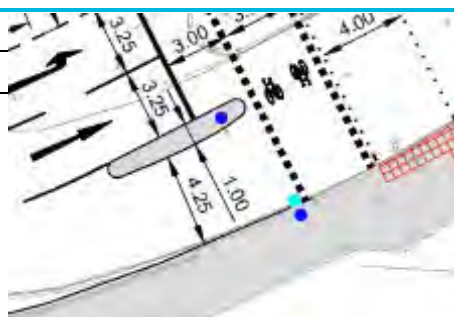
4.2 Local Alignment

Problem: 4.2.1

Location(s): Site extents

Drawing(s): 60579473-SHT-C-0001 to 60579473-SHT-C-0007

Summary: Risk of vehicles colliding with traffic signal heads.



Description:

The proposals include the provision of several traffic islands with new signal heads. An example is shown in the figure above. From the plans provided it is unclear as to what the clearance is proposed to be between the edge of the traffic signal heads and the adjacent carriageway. If the clearance is not appropriate, there is a risk that vehicles could collide with traffic signal heads.

Recommendation:

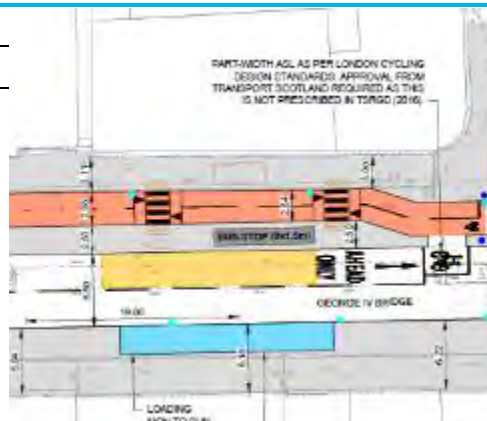
It is recommended that an appropriate clearance is provided from the edge of each of the traffic signals heads to the carriageway.

Problem: 4.2.2

Location(s): Hanover Street and George IV Bridge

Drawing(s): 60579473-SHT-C-0001, 60579473-SHT-C-0006

Summary: Risk that motorised road users could miss the nearside signals which may be obscured by bus shelters and / or stationary buses, resulting in collisions with pedestrians and other vehicles.



Description:

The position of the proposed bus stop and bus shelter upstream of the traffic signals is likely to restrict visibility. There is a risk that motorised road users could miss the traffic signals resulting in them driving through a red signal into conflict with pedestrians or other vehicles at the junction.

Recommendation:

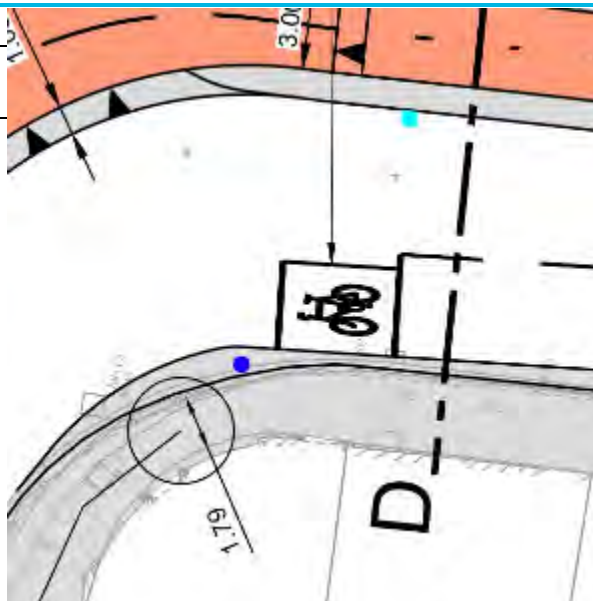
It is recommended that visibility to the nearside traffic signal head is not restricted.

Problem: 4.2.3

Location(s): Bank Street

Drawing(s): 60579473-SHT-C-0004 and 60579473-SHT-C-0009

Summary: Risk of an elevated footway, guardrail and pedestrians obscuring the traffic signal, increasing the risk of drivers overshooting the stop line and potentially colliding with oncoming vehicles.



Description:

The level difference between the western footway and the carriageway of Bank Street increases as traffic approaches the stop line. The footway is estimated to be around 0.5m above the carriageway with the guardrail estimated to increase the height by 1m. Signal mounting heights are between 2.1m and 4m (TSRGD 2016), there is a risk that the signals will be mounted around the same height as pedestrians on the footway. As a result, drivers may not observe the light and continue through the junction potentially into head-on conflict with other vehicles. There is a secondary risk of loss of control resulting from sudden braking on the downhill approach upon seeing the lights late.

There are a number of environmental factors which exacerbate this issue;

- Pedestrian volumes in the area are high, therefore there is a high probability that they may interfere with driver's visibility of the lights;
- The area is very cluttered with guardrail, cantilevered shop signs, built environment, queuing / congregation at shop fronts and product rails on the footway. All of which has the potential to distract visibility or reduce the conspicuity of the signals;
- The signal post appears to be located on the bend which potentially increases the impact of pedestrians and street furniture on visibility;
- Approaching drivers from George IV Bridge have limited forward visibility due to the crest at its junction with Lawnmarket, the lower elevation of the Bank Street signals and the volume of pedestrians.

In addition to the above, the relative height of pedestrians to the signal head could enable the lights to be vandalised.

Recommendation:

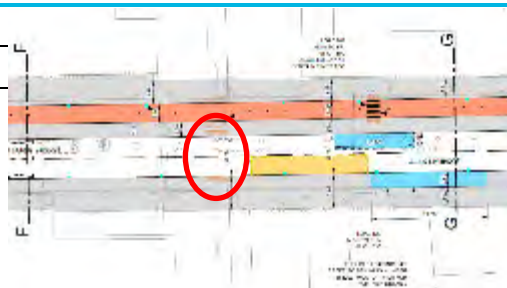
It is recommended that the signal post is relocated to a position where visibility is unrestricted and the traffic lights are not impacted by pedestrians.

Problem: 4.2.4

Location(s): George IV Bridge, western footway

Drawing(s): 60579473-SHT-C-0005

Summary: Risk that pedestrians could step out from the western footway onto the carriageway and be struck by passing vehicles resulting in personal injury



Description:

From the plans provided the visibility from the pedestrian crossing may be obstructed by the bus stop. There is a risk that pedestrians could step out on to the carriageway and be struck by passing vehicles resulting in personal injury.

Recommendation:

It is recommended that adequate visibility is provided for pedestrians utilising the crossing.

Problem: 4.2.5

Location(s): George IV Bridge

Drawing(s): 60579473-SHT-C-0005

Summary: Risk that drivers braking on approach to the zebra crossing could skid or lose control resulting in them colliding with pedestrians on the crossing or into the rear of other vehicles



Description:

There is concern that drivers approaching the newly proposed zebra crossing might not appreciate the presence of the controlled crossing or potential queuing vehicles on the approach. There is a risk that drivers braking on approach could skid or lose control particularly in wet conditions resulting in potential impact with other users including pedestrians crossing or could collide into a waiting vehicle.

Recommendation:

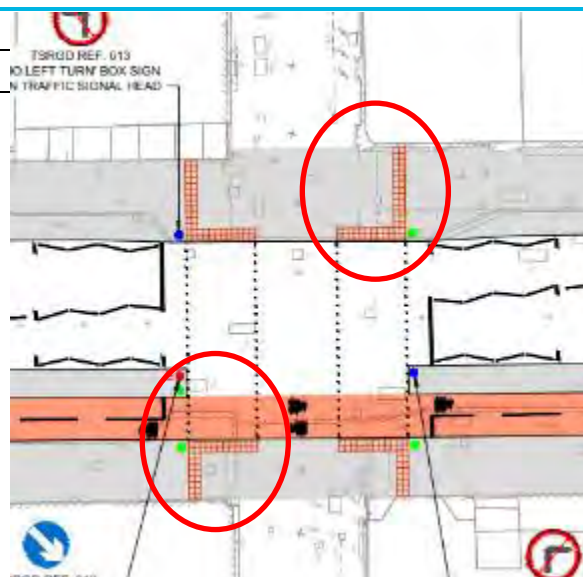
It is recommended that an appropriate level of grip is provided on the approach to the controlled crossing.

Problem: 4.2.6

Location(s): George IV Bridge

Drawing(s): 60579473-SHT-C-0001

Summary: Incorrect tactile paving layout and position of pedestrian push button could result in visually impaired pedestrians being unable to locate the push button. This could lead to them crossing the road out-with green signal and being struck by passing vehicles resulting in personal injury.



Description:

It is noted that the proposed layout at this crossing point is not to standard. The pedestrian push button and tactile paving stem should be located to the right side. Visually impaired pedestrians would attempt to locate the push button to the right of the stem. If they cannot locate a post, they may assume it is an uncontrolled crossing and step out in front of passing vehicles resulting in personal injury.

Recommendation:

It is recommended that the tactile paving layout is amended and that a pedestrian push button is erected on the right side of the crossing point.

Problem: 4.2.7

Location(s): Candlemaker Row

Drawing(s): 60579473-SHT-C-0006 and 60579473-SHT-C-0006

Summary: Risk of head-on collisions occurring if two vehicles meet travelling in opposite directions.



Description:

From the plans provided it was observed that Candlemaker Row has been reduced in width from a single carriageway to a single lane, with traffic flows remaining as a two-way flow, albeit restricted to public transport. It is unclear with the vertical and horizontal alignments, along with the existing built environment and high pedestrian flows how much inter-visibility opposing drivers will have of one another. There is a risk of head-on collision if drivers fail to give way to the oncoming vehicle.

Taking cognisance of the swept path analysis it appears a bus turning into Candlemaker Row would need to stop on George IV Bridge, as there is insufficient space for one vehicle to pass another. There is a secondary risk of shunt collisions caused by following vehicles not expecting a stationary bus on the carriageway.

The risks increase during the period of 06:30 and 10:30 when the road will not solely be restricted to buses.

The above issue is exacerbated by the proposal to provide a bus stop on Candlemaker Row, at the give way line in advance of the road narrowing. A stationary bus may confuse oncoming traffic from George IV Bridge, exacerbating the issues at that junction.

Recommendation:

It is recommended that opposing buses are either controlled or have sufficient visibility and space to give way to one another safely. It is also recommended that the bus stop on Candlemaker Row is relocated away from its proposed location.

Problem: 4.2.8

Location(s): Junction with Teviot Place, Lauriston Place, Forrest Road and Middle Meadow Walk

Drawing(s): 60579473-SHT-C-0007

Summary: Risk of sudden manoeuvres into the opposite carriageway could result in head-on collisions due to inconspicuous build out and incorrect signage.

Secondary risk of vehicles striking the build out and losing control.



Description:

From the plans provided the effective width of the footway will be restricted to be less than 2m wide by the existing masonry pillar and proposed traffic signals. There is a risk that pedestrians could step out onto the carriageway and be struck by passing motorised road users resulting in personal injury.

Recommendation:

It is recommended that the effective width be maximised.

Problem: 4.2.9

Location(s): Teviot Place

Drawing(s): 60579473-SHT-C-0007

Summary: Risk of drivers / riders not seeing traffic signals, proceeding into the junction when it is not safe to do so and being struck by passing vehicles, due to traffic signal heads being obscured.



Description:

From the plans provided there is a risk that some of the traffic signal heads could be obscured by large vehicles utilising the proposed taxi rank and loading bays. There is a risk that vehicles could proceed into a junction when it is not safe to do so if drivers / riders are unable to see the traffic signal heads at, or on the approach to, a junction. This risk is heightened if one or more of the traffic signal heads was to have a fault and not be functioning.

There is a secondary risk of shunt collisions if drivers observe the traffic signals late and brake suddenly potential resulting in following vehicles colliding.

Recommendation:

It is recommended that visibility to each of the traffic signal heads is appropriate.

Problem: 4.2.10

Location(s): Junction Teviot Place and Bristo Place

Drawing(s): 60579473-SHT-C-007

Summary: Risk of drivers / riders not seeing traffic signals, proceeding into the junction when it is not safe to do so and being struck by passing vehicles, due to signal heads being obscured.



Description:

From the plans provided there is a risk that some of the traffic signal heads could be obscured by public transport utilising the bus stand on Teviot Place. The risk is increased as a bus stand enables buses to remain stationary for a longer period than a standard bus stop. There is a risk that vehicles could proceed the junction when it is not safe to do so if drivers / riders are unable to see one or more of the traffic signal heads at, or on the approach to, a junction.

Recommendation:

It is recommended that visibility to each of the traffic signal heads is appropriate.

4.3 Junctions

Problem: 4.3.1

Location(s): Scheme Extents

Drawing(s): 60579473-SHT-C-0001 to 60579473-SHT-C-0007

Summary: Risk of conflict between pedestrians and vehicles due to high relative flows.



Description:

It is proposed that North Bank Street and Bank Street become a Bus Gate, with only buses, taxis and bicycles permitted to enter. This has the effect of forcing northbound traffic on George IV Bridge to turn left onto Lawnmarket, towards the Castle, it is understood traffic cannot turn right as there is a pedestrian zone in that direction. Similarly, southbound traffic will be restricted to turning onto Market Street. Coupled with the restrictions on Princes Street, Waverley Bridge and those proposed on Candlemaker Row, general traffic will be focused on a small number of routes in the Old Town.

The proposals do not provide any directional signage or advance signage to inform drivers of restrictions or alternative routes. Therefore, drivers may in frustration make unsafe manoeuvres, congestion may increase and there may be an increased conflict with other road users, including pedestrians. Of particular concern is high vehicle numbers potentially being diverted onto Lawnmarket which is an area of high pedestrian movements, particularly during events such as the Fringe Festival.

Recommendation:

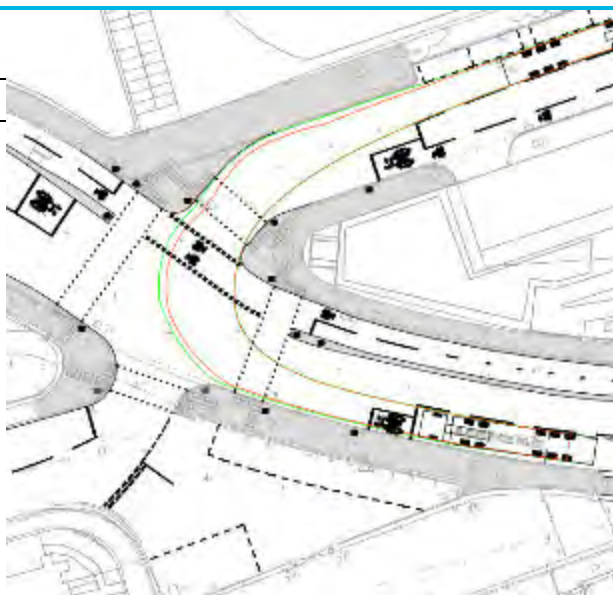
It is recommended that the traffic impacts of the bus lane are fully assessed and the impacts on other junctions considered. This may require adjustments to other junctions to accommodate anticipated traffic loadings. It is also recommended that a comprehensive signing strategy is undertaken to minimise the amount of through traffic attempting to use The Mound and George IV Bridge.

Problem: 4.3.2

Location(s): Junction with North Bank Street and Market Street

Drawing(s): 60579473-SHT-C-2604

Summary: Risk of buses overrunning the kerb, potentially resulting in collisions with pedestrians and street furniture.



Description:

The designer has provided a range of swept path analyses and on the drawing listed above where a note states that "Lothian Enviro 400 3 Axle Bus is more onerous than a maximum legal length articulated vehicle". Whilst the tracking between The Mound and Market Street has been based on the bus, the tracking between Market Street and the bus gate on North Bank Street has been based on the maximum length articulated vehicle. The swept path analysis shows that a lorry turning right into Market Street only just manages the manoeuvre. If the bus is more onerous the Audit Team are concerned that the bus may not manage the manoeuvre. As a result, this increases the risk of the bus mounting the footway and potentially colliding with pedestrians and / or street furniture.

It is noted that the turning manoeuvre will be on a considerable gradient, vehicles turning right into Market Street are faced with an adverse camber which may influence the turning performance of a vehicle. It is unclear if this has been considered as part of the swept path analysis.

Recommendation:

It is recommended that the most onerous vehicle expected to use the junction is accommodated.

Problem: 4.3.3

Location(s): Junction with Lawnmarket and George IV Bridge

Drawing(s): 60579473-SHT-C-2606

Summary: Risk of buses overrunning the kerb, potentially resulting in collisions with pedestrians and street furniture.



Description:

The swept path analysis shows a bus turning left from George IV Bridge into Lawnmarket only just manages the manoeuvre. The junction is surfaced in setts / paving which may have a different grip level to a standard bituminous surfacing, particular during wet periods. It is unclear if the surfacing and grip levels will impact on the turning movements of the buses. If turning performance is reduced there is risk of the bus mounting the footway and potentially colliding with pedestrians and or street furniture.

It is noted that the junction is at the point that the uphill gradients of Bank Street and George IV Bridge intersect, forming a subtle crest. This crest may also impact turning performance.

Recommendation:

It is recommended that the actual turning performance of a bus is tested on-site to determine if it can safely complete the manoeuvre.

Problem: 4.3.4

Location(s): Junction with George IV Bridge and Victoria Street

Drawing(s): 60579473-SHT-C-0005

Summary: Risk of conflict between pedestrians and vehicles due to high relative flows and non-standard junction layout.



Description:

It is proposed that a continuous footway is to be provided across Victoria Street at George IV Bridge. It is noted that the City of Edinburgh Council are proposing continuous footways throughout the city, however currently they are a non-typical arrangement in the local area. There is concern that vulnerable road users and visitors to the city unfamiliar with continuous footways may not be aware how to use such a facility. Pedestrians and motorists may be unsure who has right of way and in a confused situation there is an increased risk of conflict and collision.

The issue may be exacerbated if the restrictions proposed for Candlemakers Row diverts traffic onto Victoria Street, thus increasing turning movements at the junction.

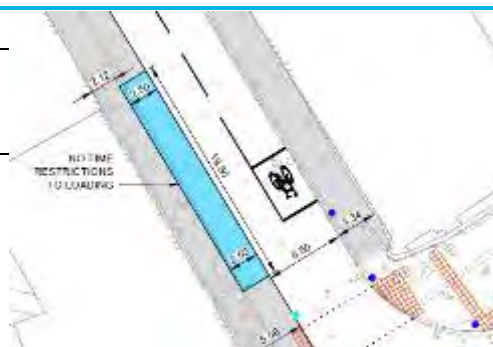
Recommendation:

It is recommended that the vehicular space, pedestrian space and priority is clearly defined.

4.4 Non-Motorised User Provision

Problem: 4.4.1

Location(s):	Flexible Loading Bays / Various Locations
Drawing(s):	60579473-SHT-C-0005, 60579473-SHT-C-0006, 60579473-SHT-C-0007 and 181203_MGS_OP_4100
Summary:	Risk that the vulnerable road users could step out into the carriageway and sustain personal injury.



Description:

From the plans provided it was observed that there are several locations where public amenities such as benches are to be located within the proposed flexible loading bays (shown in light blue above). The flexible loading bays are bounded by a single row of tactile paving; therefore, pedestrians must cross the tactile paving to access the benches. It is understood that the bay will have a limited upstand to the carriageway. No tactile paving is proposed along the carriageway edge. As a result, there is a risk that vulnerable road users, such as visually impaired pedestrians could be unaware that they are in a location open to motorised road users and could step out into the carriageway into traffic sustaining personal injury.

Recommendation:

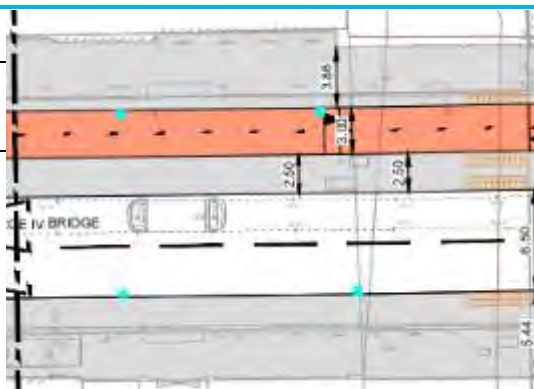
It is recommended that appropriate measures are provided to reduce the risk of vulnerable road users stepping out on to the carriageway.

Problem: 4.4.2

Location: Scheme Extents

Drawing(s): 60579473-SHT-C-0001 to 60579473-SHT-C-0007

Summary: Risk of collisions between opposing cyclists and pedestrians and cyclists resulting in personal injury.



Description:

The Audit Team have not been provided anticipated walking and cycling flow rates; however, it is acknowledged that the scheme passes through one of the busiest areas in Edinburgh, which becomes acutely busy during events such as the Fringe Festival. The addition of the new route, continuing development of Active Travel in the city and existing pedestrian and cycling flows active travel flows are likely to be high. The widths of the cycleway in general are 3.0metres. It is unclear if this will be sufficient for the predicted flow. Whilst it is noted that in DMRD CD195 and 'Cycling by Design' state the desirable width for two-way cycling is 3.0m; both qualify this based on flow. CD195 suggest 3.0m is suitable for 150 cycles per hour or less and 'Cycling by Design' 200 cycles per hour or less.

If footways and cycleways are not sufficiently wide there is a risk of conflict and potential collisions resulting in personal injury, either as a result of cyclists entering the footway due to congestion on the cycleway or pedestrians stepping onto the cycleway. It is noted that the width of footways alongside the cycleways are generally the same as currently.

The issue could be exacerbated by the limited physical segregation. Whilst it is noted there will be a 50mm separation in levels between the footway and cycleway the chamfered kerbs would make transition between the footway and cycleway fairly easy.

Recommendation:

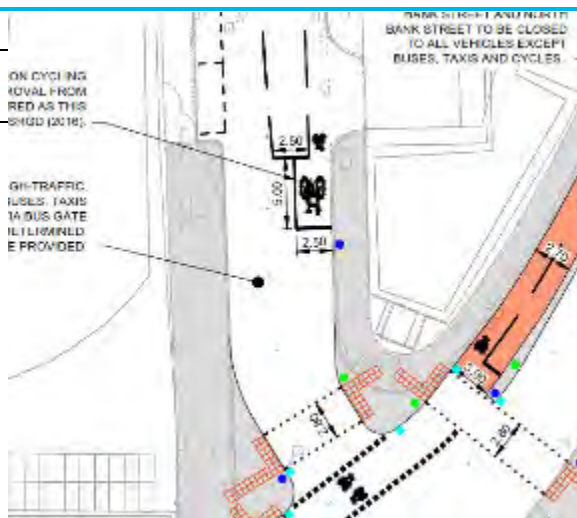
It is recommended that the footway and cycleway provision is sufficiently wide to accommodate likely pedestrian and cycle flows.

Problem: 4.4.3

Location(s): Market Street

Drawing(s): 60579473-SHT-C-0003 and 60579473-SHT-C-2604

Summary: Risk of left hooking injuries involving vehicles and cycles moving off from Market Street.



Description:

To enable vehicles to turn into Market Street the stop line has been setback approximately 20m from The Mound. An advanced stop line is provided to enable a cyclist to set off and get up to speed in front of traffic. However, due to the distance to the junction and that the cyclist will be moving off on an uphill gradient there is concern that vehicles may attempt to pass cyclists before reaching the junction. There is a risk of left hooking collisions both on Market Street where the road kinks left and during the left turn into North Bank Street. The swept path analysis for both left and right turning vehicles highlight there is limited space on the vehicles left for cyclists to be safe.

Recommendation:

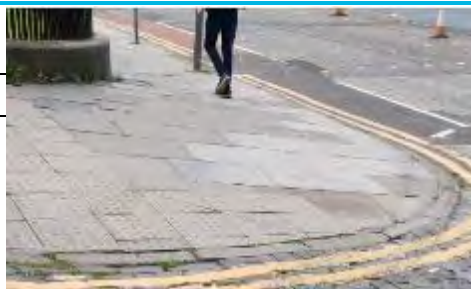
It is recommended that cyclists are provided an early start-up in the traffic signal phasing with sufficient time to reach the cycling facilities on The Mound / North Bank Street.

Problem: 4.4.4

Location(s): Junction with Market Street, The Mound and North Bank Street

Drawing(s): 60579473-SHT-C-0003

Summary: Risk that pedestrians may slip or inadvertently step onto the slopes and fall, resulting in personal injuries.



Description:

During the site investigation it was observed that there are significant gradient changes in the footway levels. An example is shown in the photograph above. There is a risk that pedestrians may slip or inadvertently step onto the slopes and fall, resulting in personal injuries.

Recommendation:

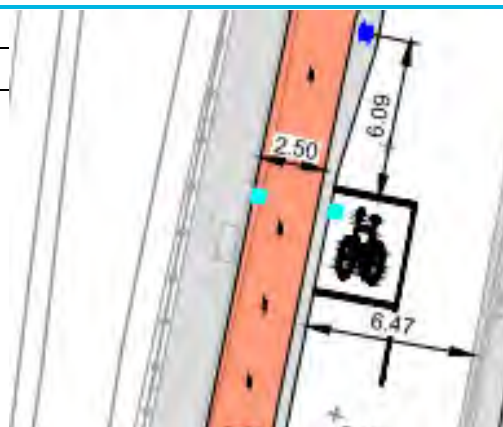
It is recommended that the footway profile is amended to reduce the risk of pedestrians falling on a steep gradient.

Problem: 4.4.5

Location(s): North Bank Street

Drawing(s): 60579473-SHT-C-0003 to 60579473-SHT-C-0004

Summary: Risk of head-on collisions between cyclists due to narrow cycle lane resulting personal injury.



Description:

Without prejudice to Problem 4.4.2, the widths of the cycleway on North Bank Street narrow to as low as 2.5 metres wide (inclusive of buffer space to kerbs). It is unclear if this will be sufficient for the predicted flow. It is noted that DMRB CD195 and 'Cycling by Design' indicates a desirable width of 3.0m for two-way cycling; the proposals are for between 2.5m – 3.0m.

There is a risk of head-on collision between opposing cyclists, particularly in the narrower sections of the cycleway. The severity of collision could be increased due to the downhill gradient which could result in a considerable speed differential between opposing movements.

There is a secondary issue that cyclists may take to the footway to avoid other cyclists. Whilst it is noted there will be a 50mm separation in levels between the footway and cycleway the chamfered kerbs would make transition between the footway and cycleway fairly easy.

Recommendation:

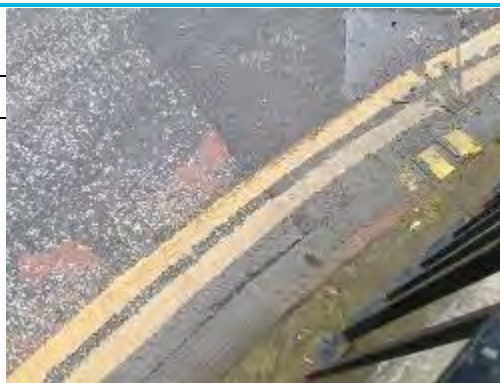
It is recommended that the cycleway is widened.

Problem: 4.4.6

Location(s): Junction with North Bank Street, Bank Street and St Giles Street.

Drawing(s): 60579473-SHT-C-0004

Summary: Risk that pedestrians may become trapped between the wall and motorised road users resulting in personal injury.



Description:

During the site investigation and from the plans provided it was observed that there are significant gradient changes in the footway levels. An example is shown in the photograph above. There is a risk that pedestrians may become trapped between the wall and motorised road users resulting in personal injury.

Recommendation:

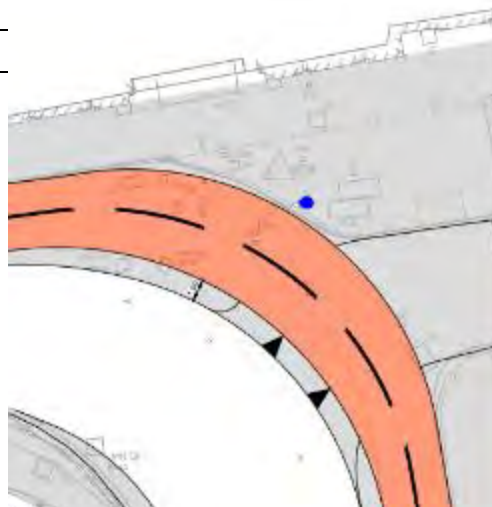
It is recommended that suitable measures be put in place to reduce the risk of pedestrians being trapped on the carriageway at this location.

Problem: 4.4.7

Location(s): Junction with St Gilles Street and North Bank Street

Drawing(s): 60579473-SHT-C-0004

Summary: Risk that visually impaired road users may not be able to determine that they have stepped onto the carriageway, potentially resulting in personal injuries if struck by a passing motorised vehicle.



Description:

From the plans provided it was observed that there is a lack of tactile paving provided at the raised table. There is a risk that visually impaired road users may not be able to determine that they have stepped onto the carriageway, leading to them sustaining personal injuries if struck by a passing motorised vehicle.

Recommendation:

It is recommended that suitable tactile paving be provided to warn visually impaired users of the change in status of the carriageway.

Problem: 4.4.8

Location(s): Western footway of Bank Street

Drawing(s): 60579473-SHT-C-0004

Summary: Risk of pedestrians tripping over a step in the centre of the footway, potentially resulting in personal injury.



Description:

The footway is at a raised level at this location and is stepped from the carriageway, this step is situated along the footway edge. However, the proposals appear to widen the footway without removing / relocating the step. Therefore, this step potentially becomes a tripping hazard in the centre of the footway, which could lead to personal injuries.

Recommendation:

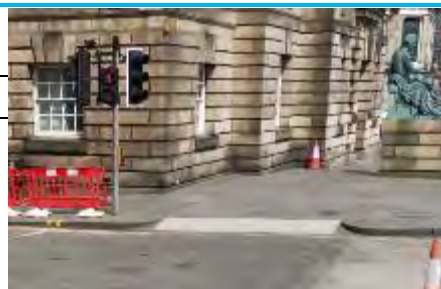
It is recommended that the widened footway is re-profiled to remove the step..

Problem: 4.4.9

Location(s): Junction with Bank Street, Lawnmarket and George IV Bridge

Drawing(s): 60579473-SHT-C-0004

Summary: Risk that pedestrians may slip and fall, especially in wet conditions resulting and personal injury.



Description:

During the site investigation it was observed that the levels between the existing footway and carriageway have a gradient greater than the 8% considered acceptable for vulnerable road users. It is not clear from the proposals if the gradients will be adjusted to provide an acceptable transition between the footway and carriageway. There is a risk that pedestrians may slip and fall, especially in wet conditions resulting and personal injury.

Recommendation:

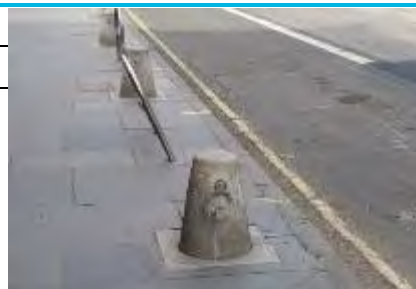
It is recommended that suitable transitions are provided between the footway and carriageway.

Problem: 4.4.10

Location(s): George IV Bridge

Drawing(s): 60579473-SHT-C-0005 and 60579473-SHT-C-0006

Summary: Risk that pedestrians may trip and fall and could result in personal injury.



Description:

During the site investigation it was observed that the existing concrete/granite bollards will remain in place as the footway is widened. There is a risk that the bollards may pose an obstruction and could result in personal injury as pedestrians may trip and fall.

Recommendation:

It is recommended the obstructions highlighted or removed.

Problem: 4.4.11

Location(s): Junction with George IV Bridge and Victoria Street

Drawing(s): 60579473-SHT-C-0005

Summary: Risk that visually impaired road users may not be able to determine that they have stepped onto the carriageway, potentially resulting in personal injuries if struck by a passing motorised vehicle.



Description:

From the plans provided it was observed that there is a lack of tactile paving provided at the raised table. There is a risk that visually impaired road users may not be able to determine that they have stepped onto the carriageway, leading to them sustaining personal injuries if struck by a passing motorised vehicle.

Recommendation:

It is recommended that suitable tactile paving be provided to warn visually impaired users of the change in status of the carriageway.

Problem: 4.4.12

Location(s): Junction with Candlemaker Row, George IV Bridge and Greyfriars

Drawing(s): 60579473-SHT-C-0006

Summary: Risk that visually impaired road users may not be able to determine that they have stepped onto the carriageway, potentially resulting in personal injuries if struck by a passing motorised vehicle.



Description:

From the plans provided it was observed that there is a lack of tactile paving provided at the raised table. There is a risk that visually impaired road users may not be able to determine that they have stepped onto the carriageway, leading to them sustaining personal injuries if struck by a passing motorised vehicle.

Recommendation:

It is recommended that suitable tactile paving be provided to warn visually impaired users of the change in status of the carriageway.

Problem: 4.4.13

Location(s): Forrest Road

Drawing(s): 60579473-SHT-C-0007

Summary: Risk that visually impaired road users may not be able to determine that they have stepped onto the carriageway, sustaining personal injuries if struck by a passing motorised vehicle.



Description:

From the plans provided it was observed that there is a lack of tactile paving provided at the junction. There is a risk that visually impaired road users may not be able to determine that they have stepped onto the carriageway, sustaining personal injuries if struck by a passing motorised vehicle.

Recommendation:

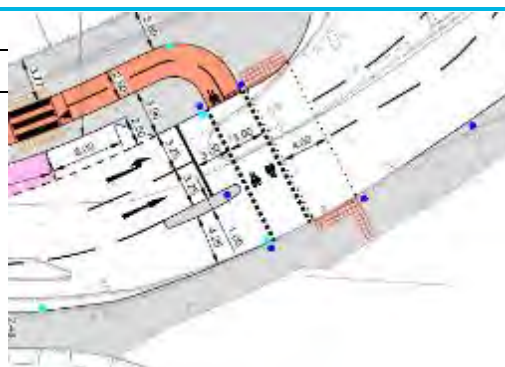
It is recommended that suitable tactile paving be provided to warn visually impaired users of the change in status of the carriageway.

Problem: 4.4.14

Location(s): Teviot Place and Bristo Place

Drawing(s): 60579473-SHT-C-0007

Summary: Risk that pedestrians and cyclists will be in-conflict and could increase the risk of personal injury being sustained.



Description:

From the plans provided there is a lack of suitable tactile paving to differentiate between the shared use and pedestrian only parts of the footway. There is a risk that pedestrians and cyclists will be in-conflict and could increase the risk of personal injury being sustained.

Recommendation:

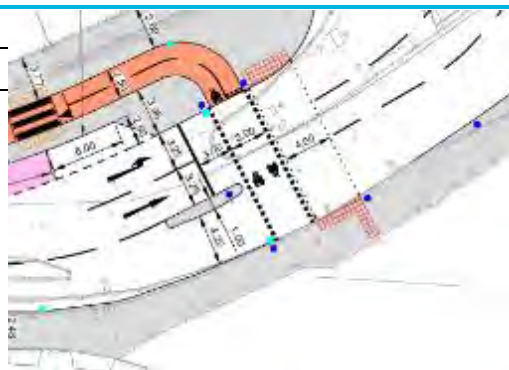
It is recommended that suitable tactile paving be provided to differentiate between the change of status of the footway.

Problem: 4.4.15

Location(s): Teviot Place and Bristo Place

Drawing(s): 60579473-SHT-C-0007

Summary: Risk that visually impaired road users may not be able to locate the crossing over Teviot Place on the northern footway.



Description:

From the plans provided there is a lack of suitable tactile paving stem to enable visually impaired pedestrians to locate the crossing over Teviot Place. If visually impaired pedestrians are unable to locate a crossing, they may become confused and cross at unsafe locations.

Recommendation:

It is recommended that suitable tactile paving is provided.

Problem: 4.4.16

Location(s): The Meadows at Teviot Place

Drawing(s): 60579473-SHT-C-0007

Summary: Risk of visually impaired pedestrians walking onto the carriageway, potentially resulting in collisions with vehicles.



Description:

It is anticipated that a dropped crossing will be provided to enable cyclists to cross Teviot Place. As this is directly in line with the path through The Meadows there is a risk visually impaired pedestrians will walk towards the dropped kerb with no warning that they are approaching a carriageway. As a result, they may inadvertently step onto the carriageway into conflict with vehicles, potentially resulting in collision. The risk is exacerbated as the cycleway appears flush with the footway.

Recommendation:

It is recommended that the cycleway is constructed at a lower level than the footway with some form of textured edging to discourage visually impaired pedestrians from entering. If they do not enter the cycleway then the risk of finding the dropped kerb is likely to be reduced.

4.5 Road Signs, Carriageway Markings and Lighting

Problem: 4.5.1

Location(s): Scheme extents

Drawing(s): 60579473-SHT-C-0001 to 60579473-SHT-C-0007

Summary: Risk of sideswipe and loss of control collisions resulting from vehicles striking kerbs in the carriageway.



Description:

From the plans provided it is shown that there are several segregated cycle lanes that are separated from the carriageway by delineation strip formed by precast concrete kerbs.

Motorised users and cyclists could fail to notice the delineation strip during the hours of darkness and adverse weather conditions with an increased risk of sideswipe and loss of control collisions by manoeuvres to avoid the kerbs.

Recommendation:

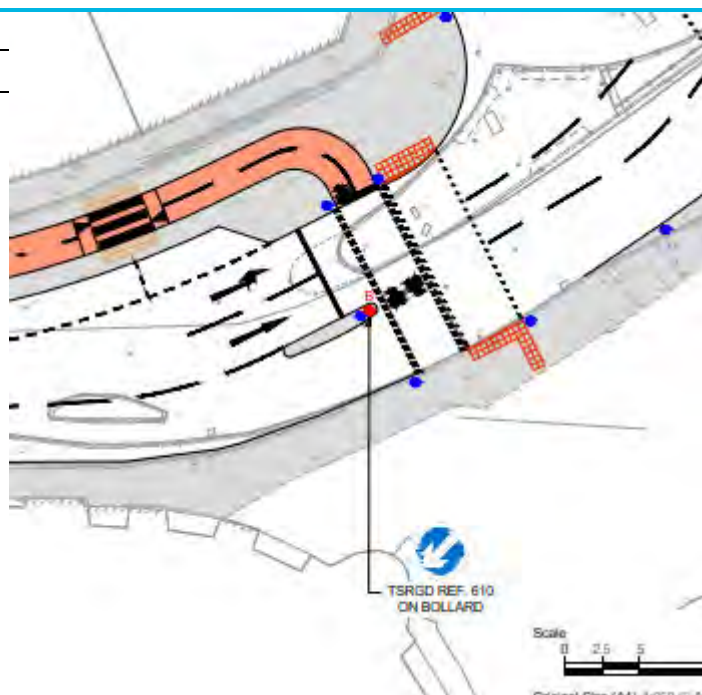
It is recommended that an appropriate feature is in place to highlight kerbed delineation.

Problem: 4.5.2

Location(s): Teviot Place / Bristo Place junction

Drawing(s): 60579473-SHT-C-1207

Summary: Risk of sideswipe and loss of control collisions resulting from vehicles striking kerbs in the carriageway.



Description:

A keep left bollard is proposed on the traffic island but is located away from its leading edge, therefore its effect is reduced. There remains a risk that a driver may not be aware of the islands leading edge, potentially resulting in collision and loss of control.

Recommendation:

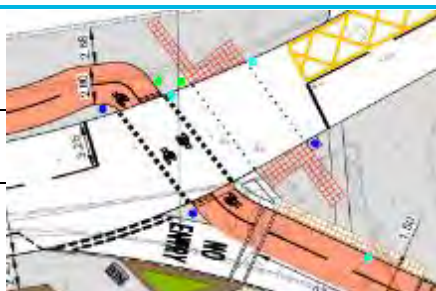
It is recommended that the bollard is relocated towards the leading edge of the island, within acceptable parameters.

Problem: 4.5.3

Location(s): Junction of George IV Bridge & Forrest Road and junction of Teviot Place, Forrest Road & Lauriston Place

Drawing(s): 60579473-SHT-C-0006 and 60579473-SHT-C-0007

Summary: Risk of conflict between vehicles proceeding through a green light and crossing cyclists.



Description:

From the plans provided it was observed that give way markings have been provided at the signalised crossing for cyclists. It is unclear if cyclists are provided a push button to activate the crossing. In any case there is a risk that cyclists may enter the carriageway during a vehicle green phase increasing the risk of collision.

Recommendation:

It is recommended that suitable road markings be provided for the signalised crossing, and push buttons are provided for cyclists.

Problem: 4.5.4

Location(s): Teviot Place / Bristo Place junction

Drawing(s): 60579473-SHT-C-0007

Summary: Risk of side swipe collisions as motorised road users make late manoeuvres across the lanes.



Description:

From the plans provided the lane destination arrow markings on the approach to the traffic signals at a number of junctions are close to the proposed stop lines, with no advanced signage. There is a risk that motorised road users may make sudden manoeuvres on seeing the arrows, increasing the risk of side swipe and rear end shunt collisions.

Recommendation:

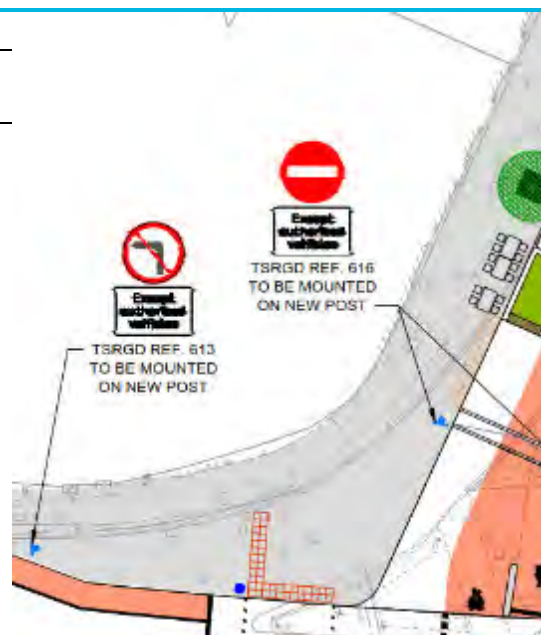
It is recommended that appropriate signage / markings are provided in advance of these locations.

Problem: 4.5.5

Location(s): Junction with Forest Road and Teviot Place

Drawing(s): 60579473-SHT-C-1207 and 60579473-SHT-C-2610

Summary: Risk of large turning vehicles overrunning the footway and colliding with pedestrians and / or street furniture.



Description:

It is noted that a rigid vehicle and refuse vehicle have been tracked turning into Forest Road from Teviot Place, it appears these will be the largest vehicle able to complete this manoeuvre. There is a risk that a large delivery vehicle may attempt to access Forest Road and overrun the footway, increasing the risk of collision with pedestrians and street furniture.

Recommendation:

It is recommended that the either a turning restriction or signage is provided to discourage larger vehicles from turning into Forest Road.

End of problems / recommendations raised in this Stage 1 Road Safety Audit

5. Audit Team Statement

We certify that this Road Safety Audit has been carried out in accordance with GG119.

AUDIT TEAM LEADER:

Name: 

Signed: 

Position: Principal Engineer

Date: 27th July 2020

Organisation: AECOM

Address: 120 Bothwell Street
Glasgow
G2 7JS

AUDIT TEAM MEMBER:

Name: 

Signed: 

Position: Senior Engineer

Date: 27th July 2020

Organisation: AECOM

There were no other persons involved in this Audit.

Enquiries regarding this Road Safety Audit should be made to the Audit Team Leader at the above address or email roadsafetyscotland@aecom.com

Appendix A Documents Submitted to the Audit Team

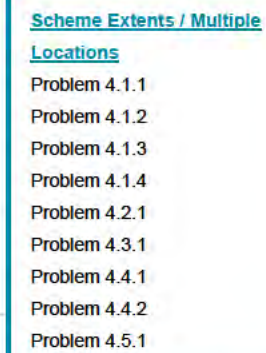
The following documents were submitted as part of the Road Safety Audit:

Document Number	Rev	Description	Date
		Road Safety Audit Brief	27/11/19
DRAWINGS			
60579473-SHT-C-0000	2	Design Proposals - Overview	05/06/20
60579473-SHT-C-0001	2	Design Proposals - Sheet 1 of 7	05/06/20
60579473-SHT-C-0002	2	Design Proposals - Sheet 2 of 7	05/06/20
60579473-SHT-C-0003	2	Design Proposals - Sheet 3 of 7	05/06/20
60579473-SHT-C-0004	2	Design Proposals - Sheet 4 of 7	05/06/20
60579473-SHT-C-0005	2	Design Proposals - Sheet 5 of 7	05/06/20
60579473-SHT-C-0006	2	Design Proposals - Sheet 6 of 7	05/06/20
60579473-SHT-C-0007	2	Design Proposals - Sheet 7 of 7	05/06/20
60579473-SHT-C-0008	1	Cross Sections - Sheet 1 of 3	05/06/20
60579473-SHT-C-0009	1	Cross Sections - Sheet 2 of 3	05/06/20
60579473-SHT-C-0010	1	Cross Sections - Sheet 3 of 4	05/06/20
60579473-SHT-C-0011	1	Cross Sections - Sheet 4 of 4	05/06/20
60579473-SHT-C-0901	1	Pavement Construction Details	05/06/20
60579473-SHT-C-1201	-	Traffic Signs and Markings - Sheet 1 of 7	05/06/20
60579473-SHT-C-1202	-	Traffic Signs and Markings - Sheet 2 of 7	05/06/20
60579473-SHT-C-1203	-	Traffic Signs and Markings - Sheet 3 of 7	05/06/20
60579473-SHT-C-1204	-	Traffic Signs and Markings - Sheet 4 of 7	05/06/20
60579473-SHT-C-1205	-	Traffic Signs and Markings - Sheet 5 of 7	05/06/20
60579473-SHT-C-1206	-	Traffic Signs and Markings - Sheet 6 of 7	05/06/20
60579473-SHT-C-1207	-	Traffic Signs and Markings - Sheet 7 of 7	05/06/20
60579473-SHT-C-1211	-	Hanover Street / Rose Street Traffic Signals Layout	05/06/20
60579473-SHT-C-1212	-	Princes Street / Hanover Street / The Mound Traffic Signals Layout	05/06/20
60579473-SHT-C-1213	-	The Mound / Market Street / North Bank Street Traffic Signals Layout	05/06/20
60579473-SHT-C-1214	-	North Bank Street / Bank Street Traffic Signals Layout	05/06/20
60579473-SHT-C-1215	-	Bank Street / Lawnmarket / George IV Bridge Traffic Signals Layout	05/06/20
60579473-SHT-C-1216	-	George IV Bridge / Chambers Street Traffic Signals Layout	05/06/20
60579473-SHT-C-1217	-	George IV Bridge / Bristo Place Traffic Signals Layout	05/06/20
60579473-SHT-C-1218	-	Teviot Place / Forrest Road / Lauriston Place Traffic Signals Layout	05/06/20
60579473-SHT-C-1219	-	Teviot Place / Bristo Place / Lothian Street Traffic Signals Layout	05/06/20
60579473-SHT-C-2601	1	Hanover Street / Rose Street Vehicle Swept Paths	05/06/20

STAGE 1 ROAD SAFETY AUDIT

60579473-SHT-C-2602	1	Princes Street / Hanover Street / The Mound Vehicle Swept Paths	05/06/20
60579473-SHT-C-2603	1	The Mound / Bank Street Vehicle Swept Paths	05/06/20
60579473-SHT-C-2604	1	The Mound / Market Street / North Bank Street Vehicle Swept Paths	05/06/20
60579473-SHT-C-2605	1	Bank Street / Lawnmarket / George IV Bridge Vehicle Swept Paths	05/06/20
60579473-SHT-C-2606	1	Bank Street / Lawnmarket / George IV Bridge Vehicle Swept Paths	05/06/20
60579473-SHT-C-2607	1	George IV Bridge / Chambers Street Vehicle Swept Paths	05/06/20
60579473-SHT-C-2608	1	Candlemaker Row / George IV Bridge Vehicle Swept Paths	05/06/20
60579473-SHT-C-2609	1	George IV Bridge / Bristo Port / Bristo Place Vehicle Swept Paths	05/06/20
60579473-SHT-C-2610	1	Teviot Place / Forrest Road / Lauriston Place Vehicle Swept Paths	05/06/20
60579473-SHT-C-2611	1	Teviot Place / Bristo Place / Lothian Street Vehicle Swept Paths	05/06/20
181203_MGS_OP_4100	-	Detailed Arrangements - Flexible Loading Bay	15/07/20
60579473_MGS_TrafficOps_v2.0	-	Proposed Traffic Operations	15/07/20
60579473_MGS_Collison_Analysis		Collision data within original Meadows to George Street project extents	15/07/20
60579473_MGS_Collision_Analysis_Type		Collision data plotted by type	15/07/20

Problem Location Plan 1

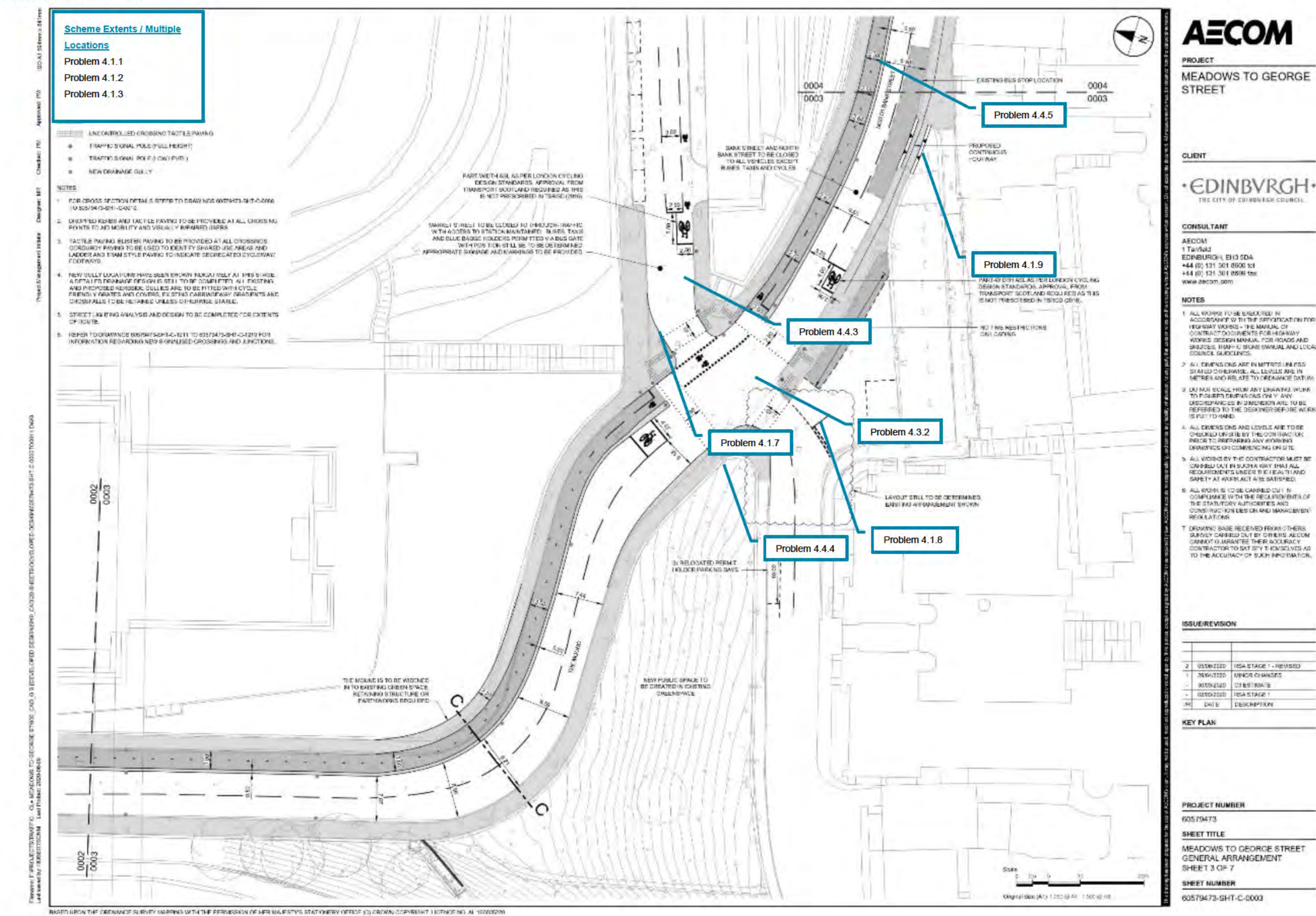


PROJECT NUMBER	60579473
SHEET TITLE	MEADOWS TO GEORGE STREET GENERAL ARRANGEMENT SHEET 1 OF 7
SHEET NUMBER	60579473-SHT-C-0001

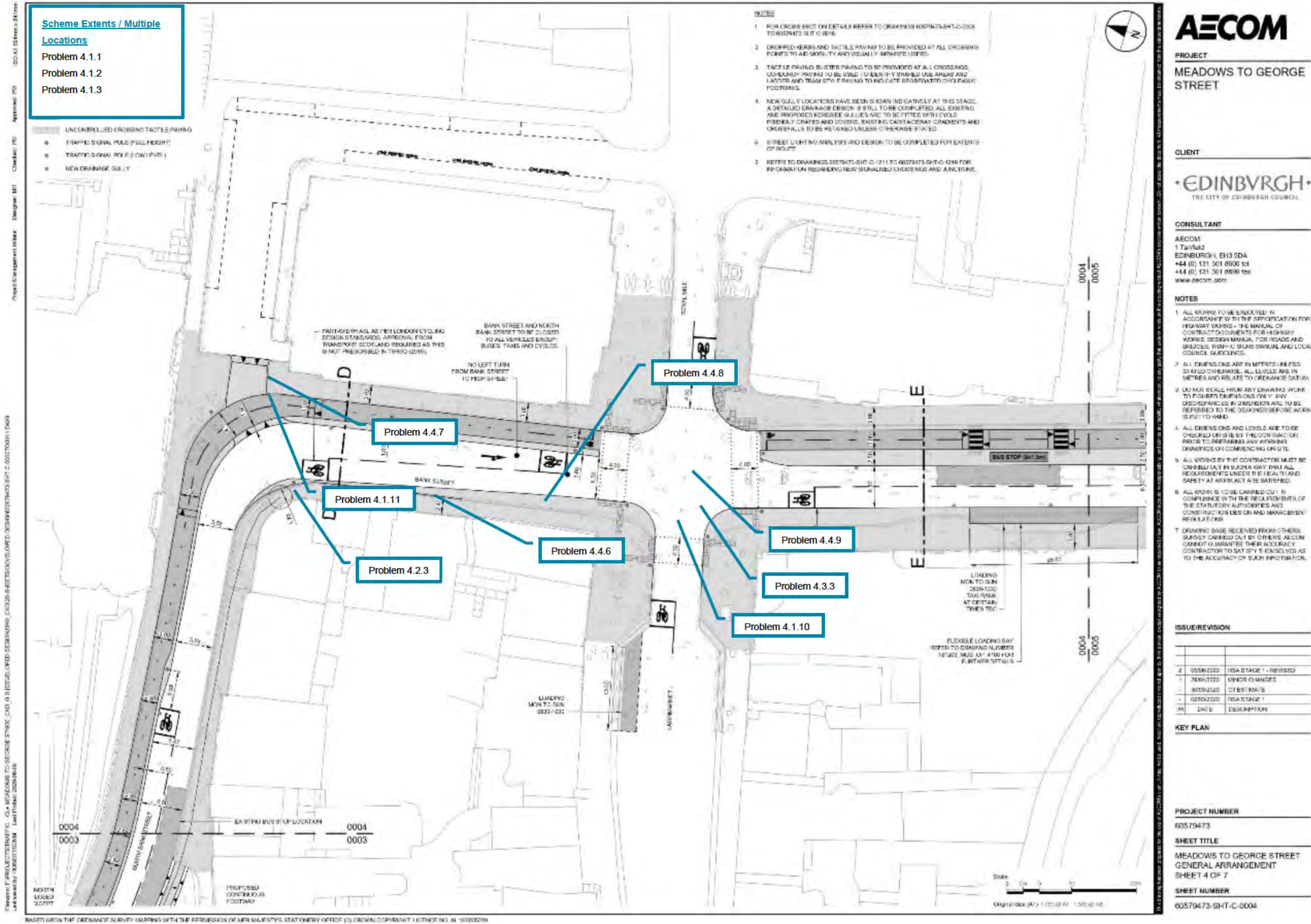
Problem Location Plan 2



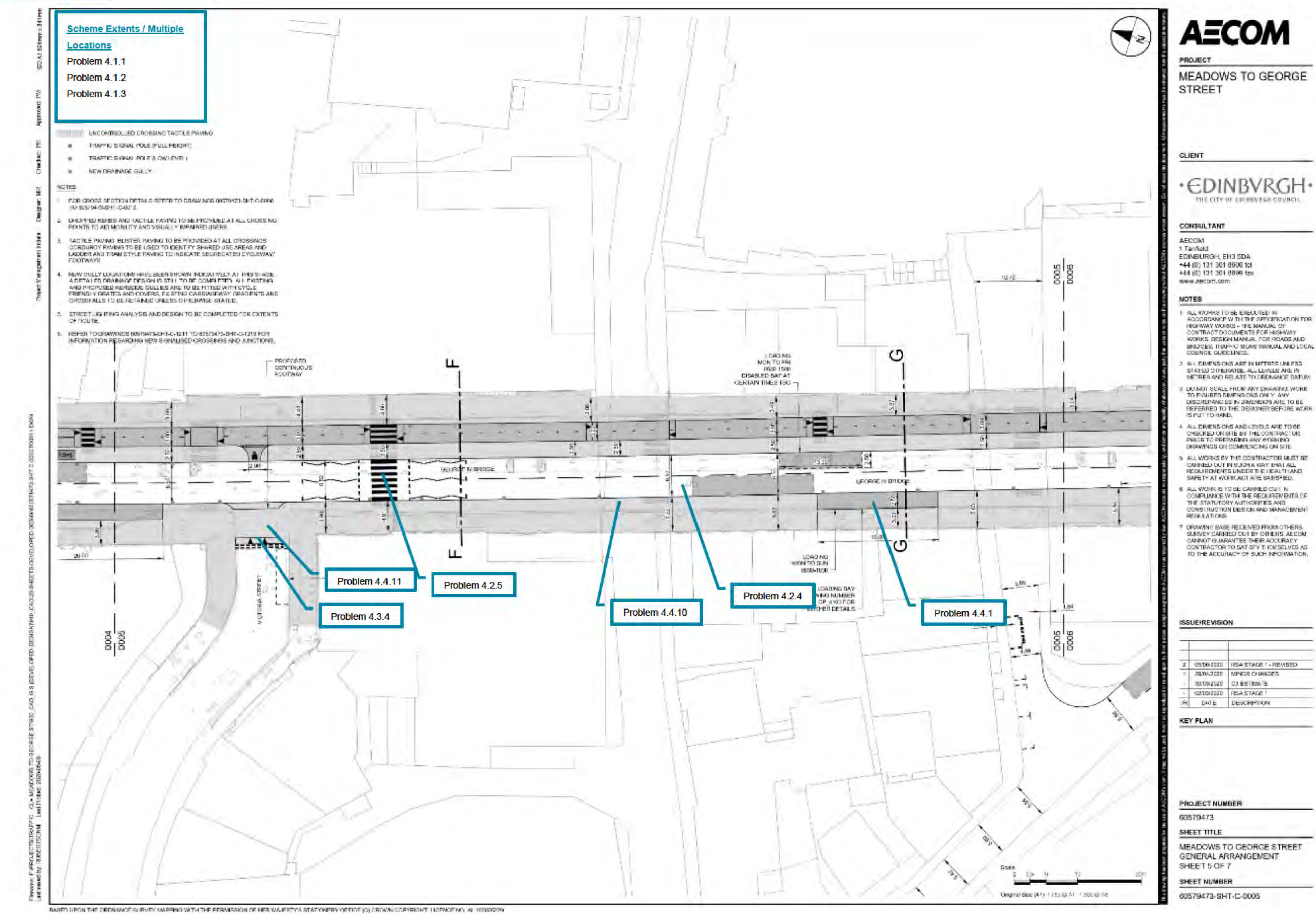
Problem Location Plan 3



Problem Location Plan 4



Problem Location Plan 5



Problem 4.1.3

- TRAFFIC SIGNAL POLE (FULL HEIGHT)
- TRAFFIC SIGNAL POLE (LOW OVER)
- NEW DRAINAGE GULLY

NOTES

3. FOR CROSS SECTION DETAILS REFER TO DRAWINGS 6059473 & IT C.O.D. TO 6259473-SH-4-0210
4. DROPPED KERBS AND TACTILE PAVING TO BE PROVIDED AT ALL CROSSING POINTS TO aid MOBILITY AND VISUALLY IMPAIRED USERS.
5. TACTILE PAVING BLISTER PAVING IS TO BE PROVIDED AT ALL CROSSINGS. CORRIDORY PAVING TO BE USED TO IDENTIFY SHARED USE AREAS AND LAUNDS & TOWN STYLE PAVING TO IDENTIFY DESIGNATED CYCLOWAY FOOTPATHS
6. NEW GULLY LOCATIONS HAVE BEEN SHOWN INDICATIVELY AT THIS STAGE. A DETAILED DRAINAGE DESIGN IS STILL TO BE COMPLETED, ALL EXISTING AND PROPOSED VERGERS/COLLERS ARE TO BE FITTED WITH CYCLIST FRIENDLY GRATES AND COVERS. EXISTING CARBONWAY GRADIENTS AND CROSSFALLS TO BE RETAINED UNLESS OTHERWISE STATED.
7. STREET LIGHTING ANALYSIS AND DESIGN TO BE COMPLETED POWERED BY ROUTE.
8. REFER TO DRAWING NUMBER 141-1211 TO 6259473-SH-4-0210 FOR INFORMATION REGARDING NEW SIGNALISED CROSSINGS AND JUNCTIONS
9. LOCATION OF STREET FURNITURE: TABLES/BENCHES ETC SHOWN INDICATIVELY. EXACT LOCATIONS STILL TO BE CONFIRMED.

AECOM

PROJECT

MEADOWS TO GEORGE STREET

CLIENT

• EDINBURGH •
THE CITY OF EDINBURGH COUNCIL

CONSULTANT

AECOM
1 Tanfield
EDINBURGH, EH3 6DA
+44 (0) 131 301 8600 tel
+44 (0) 131 301 8699 fax
www.aecom.co.uk

NOTES

- 1 ALL WORKS TO BE EXECUTED IN ACCORDANCE WITH THE SPECIFICATION FOR HIGHWAY WORKS - THE MANUAL OF CONTRACT DOCUMENTS FOR HIGHWAY WORKS DESIGN MANUAL FOR ROADS AND BRIDGES - HIGHWAY DESIGN MANUAL AND LOCAL COUNCILS' GUIDELINES.
- 2 ALL DIMENSIONS ARE IN METRES UNLESS STATED OTHERWISE. ALL LEVELS ARE IN METRES AND RELATE TO ORDNANCE DATUM.
- 3 LOCAL RESURS FROM ANY DRAWINGS WORK TO FURNISH DIMENSIONS ONLY ANY DISCREPANCIES IN DIMENSION ARE TO BE REFERRED TO THE DESIGNER BEFORE WORK IS PUT TO HAND.
- 4 ALL DIMENS ONES AND LEVELS ARE TO BE CHECKED ON SITE BY THE CONTRACTOR PRIOR TO PROCEEDING WITH ANY WORKS. DRAWINGS OR COMMENCING ON SITE.
- 5 ALL WORKS BY THE CONTRACTOR MUST BE DONE IN ACCORDANCE WITH ALL REQUIREMENTS UNDER THE HEALTH AND SAFETY AT WORK ACT ARE SATISFIED.
- 6 ALL WORKS TO BE COMPLIED WITH IN COMPLIANCE WITH THE REQUIREMENTS OF THE STATUTORY AUTHORITIES AND CONSTRUCTION DESIGN AND MANAGEMENT REGULATIONS.
- 7 DRAWING DATA RECEIVED FROM OTHERS, SURVEY CARRIED OUT BY OTHERS ACCORDING TO THE CONTRACTOR'S OBLIGATION TO THE CONTRACTOR TO SATISFY HIMSELF AS TO THE ACCURACY OF SUCH INFORMATION.

ISSUE/REVISION

2	05/09/2020	RSA STAGE 1 - REVISED
3	26/06/2020	MINOR CHANGES
4	30/09/2020	ESTIMATE
5	02/09/2020	RSA STAGE 1
6	Date	DESCRIPTION

KEY PLAN

PROJECT NUMBER

60579473

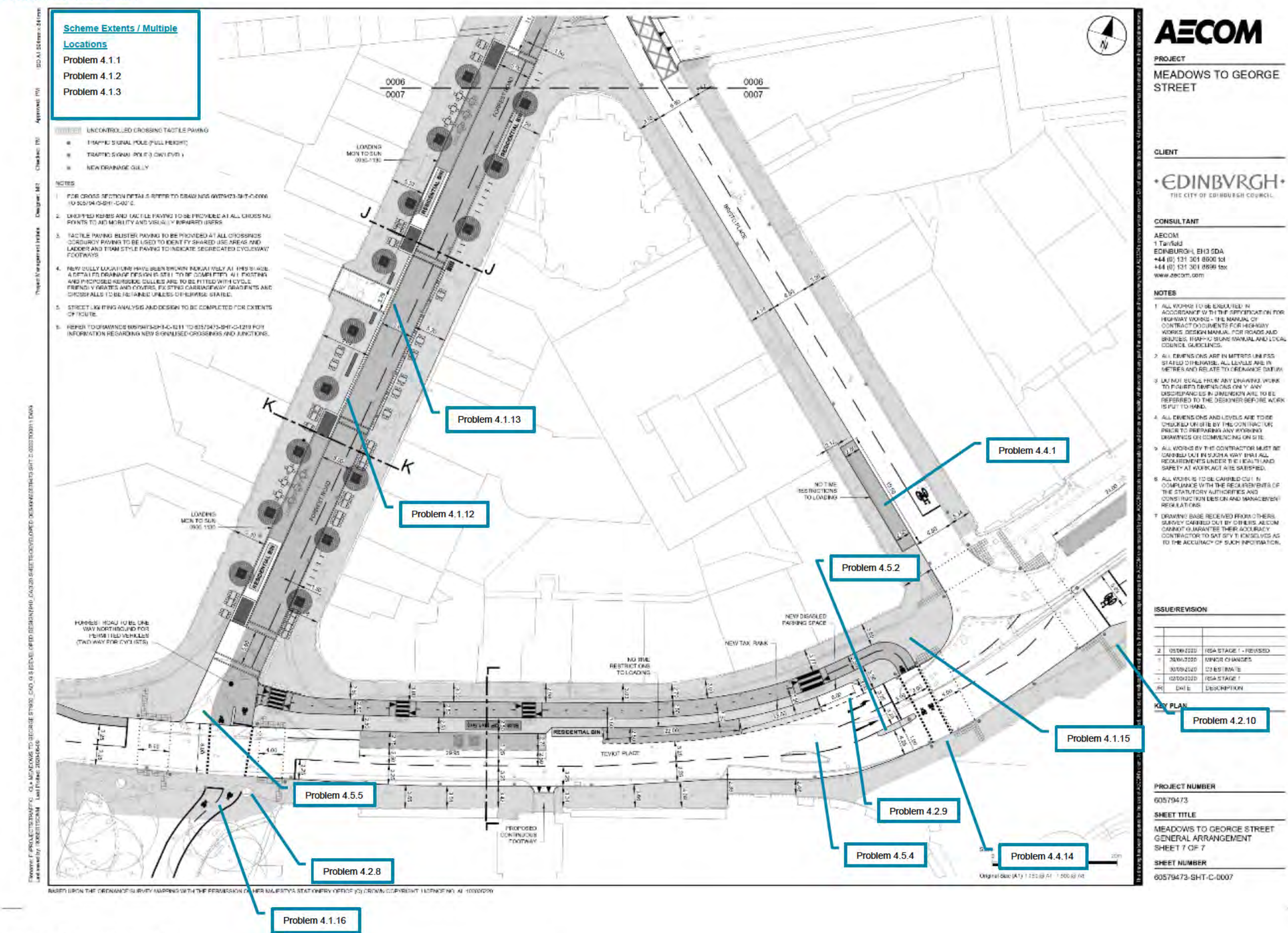
SHEET TITLE

MEADOWS TO GEORGE STREET
GENERAL ARRANGEMENT
SHEET 6 OF 7

SHEET NUMBER

60579472-SHT-C-0008

Problem Location Plan 7



Appendix C Road Safety Audit Brief

Road Safety Audit Brief		BSA File Ref
PREPARED BY		
Name		Finance Code
Organisation	AECOM	Stage
Project Title	Meadow to George Street	
Signed		
DOCUMENTS ATTACHED		
List drawings, previous RSA's and any data attached		
Drawing No	Title	Scale
60579473-SHT-C-0000	Design Proposals - Overview	1:2000 @A1
60579473-SHT-C-0001	Design Proposals - Sheet 1 of 7	1:250 @A1
60579473-SHT-C-0002	Design Proposals - Sheet 2 of 7	1:250 @A1
60579473-SHT-C-0003	Design Proposals - Sheet 3 of 7	1:250 @A1
60579473-SHT-C-0004	Design Proposals - Sheet 4 of 7	1:250 @A1
60579473-SHT-C-0005	Design Proposals - Sheet 5 of 7	1:250 @A1
60579473-SHT-C-0006	Design Proposals - Sheet 6 of 7	1:250 @A1
60579473-SHT-C-0007	Design Proposals - Sheet 7 of 7	1:250 @A1
60579473-SHT-C-0008	Cross Sections - Sheet 1 of 3	1:20 @A1
60579473-SHT-C-0009	Cross Sections - Sheet 2 of 3	1:20 @A1
60579473-SHT-C-0010	Cross Sections - Sheet 3 of 3	1:20 @A1
60579473-SHT-C-0011	Cross Sections - Sheet 4 of 4	1:20 @A1
60579473-SHT-C-0901	Pavement Construction Details	
60579473-SHT-C-1201	Traffic Signs and Markings - Sheet 1 of 7	1:250 @A1
60579473-SHT-C-1202	Traffic Signs and Markings - Sheet 2 of 7	1:250 @A1
60579473-SHT-C-1203	Traffic Signs and Markings - Sheet 3 of 7	1:250 @A1
60579473-SHT-C-1204	Traffic Signs and Markings - Sheet 4 of 7	1:250 @A1
60579473-SHT-C-1205	Traffic Signs and Markings - Sheet 5 of 7	1:250 @A1
60579473-SHT-C-1206	Traffic Signs and Markings - Sheet 6 of 7	1:250 @A1
60579473-SHT-C-1207	Traffic Signs and Markings - Sheet 7 of 7	1:250 @A1
60579473-SHT-C-1211	Hanover Street / Rise Street Traffic Signals Layout	1:100 @A1
60579473-SHT-C-1212	Princes Street / Hanover Street / The Mound Traffic Signals Layout	1:100 @A1
60579473-SHT-C-1213	The Mound / Market Street / North Bank Street Traffic Signals Layout	1:100 @A1
60579473-SHT-C-1214	North Bank Street / Bank Street Traffic Signals Layout	1:100 @A1
60579473-SHT-C-1215	Bank Street / Lawnmarket / George IV Bridge Traffic Signals Layout	1:100 @A1
60579473-SHT-C-1216	George IV Bridge / Chambers Street Traffic Signals Layout	1:100 @A1
60579473-SHT-C-1217	George IV Bridge / Bristo Place Traffic Signals Layout	1:100 @A1
60579473-SHT-C-1218	Twist Place / Forrest Road / Lauriston Place Traffic Signals Layout	1:100 @A1
60579473-SHT-C-1219	Twist Place / Bristo Place / Lothian Street Traffic Signals Layout	1:100 @A1
60579473-SHT-C-2601	Hanover Street / Rise Street Vehicle Sweep Paths	1:250 @A1
60579473-SHT-C-2602	Princes Street / Hanover Street / The Mound Vehicle Sweep Paths	1:250 @A1
60579473-SHT-C-2603	The Mound / Bank Street Vehicle Sweep Paths	1:250 @A1
60579473-SHT-C-2604	The Mound / Market Street / North Bank Street Vehicle Sweep Paths	1:250 @A1
60579473-SHT-C-2605	Bank Street / Lawnmarket / George IV Bridge Vehicle Sweep Paths	1:250 @A1
60579473-SHT-C-2606	Bank Street / Lawnmarket / George IV Bridge Vehicle Sweep Paths	1:250 @A1
60579473-SHT-C-2607	George IV Bridge / Chambers Street Vehicle Sweep Paths	1:250 @A1
60579473-SHT-C-2608	Candlemaker Row / George IV Bridge Vehicle Sweep Paths	1:250 @A1
60579473-SHT-C-2609	George IV Bridge / Bristo Place / Bristo Place Vehicle Sweep Paths	1:250 @A1
60579473-SHT-C-2610	Twist Place / Forrest Road / Lauriston Place Vehicle Sweep Paths	1:250 @A1
60579473-SHT-C-2611	Twist Place / Bristo Place / Lothian Street Vehicle Sweep Paths	1:250 @A1
181203 - MGS OP-4100	Detailed Arrangements - Flexible Loading Bay	1:100 @A1
60579473 - MGS TrafficOps v2.0	Proposed Traffic Operations	
60579473 - MGS Collision Analysis	Collision data within original Meadow to George Street project context	
60579473 - MGS Collision Analysis Type	Collision data plotted by type	
Please note that drawing sheet numbers may change. The drawings will be issued via internal transfer, assuming this is acceptable to the Road Safety Audit team		
TERMS OF REFERENCE		
List relevant DMRB documents and other guidance		
1	Edinburgh Street Design Guidance (The City of Edinburgh Council)	
2	Cycling by Design (Transport Scotland)	
3	Handbook for Cycle-friendly Design (Sustrans Technical Guidance)	
4	The Traffic Signs Regulations and General Directions 2016	
5	London Cycling Design Standards (Transport for London)	
6		

Responsible by		Road Safety Team	
ADMIN DETAILS			
RSA Reference:		Batch:	
Title:			
Finance Code:		Cost:	
Telford:		CEPATS:	
Assigned to:		Date:	

PROJECT SUMMARY			
Location:	Edinburgh City Centre Hanover Street, The Mound, Market Street, North Bank Street, Bank Street, George IV Bridge, Candlemaker Row, Farnell Road, Bristo Place, Tait's Place		
Type of Scheme:	Active travel, footway and carriageway improvement scheme		
Description:	The Meadows to George Street project aims to transform cycling, walking, public spaces and accessibility for all, on some of Edinburgh's busiest and most iconic streets. It will provide an essential north-south link in the city for active travel users. As an important part of the Edinburgh City Centre Transformation Strategy, it will become one of the first projects to realise major street improvements.		
Construction Start Date:		Completion Date:	
* Select Scheme Progress			
STAGE 1	Preliminary Design	STAGE 2	Detailed Design
STAGE 3	Completion of Construction	STAGE 4	Post Opening Monitoring
AUTHORISATION			
Design Organisation:	AECOM 1 Tanfield, Edinburgh EH3 5DA		
Overseeing Organisation:	The City of Edinburgh Council Warrington Court, 4 East Market Street, Edinburgh EH8 8BS		
SCHEME DETAILS			
Commitment Request:	Description:	Attached	
		Yes	No
Collaboration Met:	Description:	Attached	
	Basic addition analysis carried out for period between 30 September 2015 and 30 September 2017	Yes	No
Traffic Survey Data:	Description:	Attached	
		Yes	No
Environmental Information/ Constraints:	Description:	Attached	
		Yes	No
Departures from Standards			
Include status details i.e. approved/pending/rejected and any design strategy records			
None			

CHECKLIST			
Tick all that are included and provide reasons for omissions			
Site Plan	☒	Scale Layout Plans	☒
Previous RSA Reports	☒	Construction Details	☒
Collision Data and Analysis	☒	Collision Data Plot	☒
Traffic Signal Staging	☒	Traffic Survey(s)	☒
Design Standards Used	☒	Environmental Information	☒

BRIEF APPROVAL	
Name	Date
Organisation	E-mail
Signed	