TSP

Miller Homes

South Drive Footpath Level Crossing

Level Crossing Report

B91244-REP-OPS0001
P05
Final
February 2017

Authorisation Sheet	
Client:	Miller Homes
Project Title:	South Drive Footpath Level Crossing
Address:	Nautilus House, Redburn Court, Earl Grey Way, Royal Quays, North Shields, NE29 6AR
Prepared By:	
Name:	Julian Heathcote
Signature:	JHeathcote
Position:	Senior Transport Planner
Date:	08/02/17
Checked By:	
Name:	John Lowe
Signature:	John Lowe
Position:	Associate Director (Level Crossings)
Date:	08/02/17
Authorised By:	
Name:	John Lowe
Signature:	John Lowe
Position:	Associate Director (Level Crossings)
Date:	08/02/17

Document History					
Version No.	Approved by Date	Description	Prepared By	Reviewed By	Approved By
P01	30/01/17	Draft issue for client comment	JH	JL	JL
P02	01/02/17	Updated to client comments	JH	JL	JL
P03	03/02/17	Updated to client comments	JH	JL	JL
P04	06/02/17	Updated to client comments	JH	JL	JL
P05	08/02/17	Updated to client comments	JH	JL	JL

Table of Contents

1.0 Scope of Works

Miller Homes are developing a former Siemens and Narec Clothing Laboratories site off Victoria Road West in Hebburn, Tyne and Wear. The site is proposed to accommodate new housing units and is bounded on the West side by the Newcastle and South Shields line of the Tyne and Wear Metro (Nexus). There is also a third, Network Rail, line used by freight trains to and from Jarrow Oil terminal.

The North End of the site is partially bounded by South Drive, a road off Victoria Road West. This terminates in a footpath level crossing which leads to Riverside Park. The level crossing also provides one of two main access points to allotments.

TSP has been commissioned by Miller Homes to prepare a high level report that outlines the existing arrangement and usage of the level crossing and assesses how the proposed development may impact on the crossing and whether the current arrangements are likely to accommodate the new development.

2.0 Background

Miller Homes are developing a former Siemens and Narec Clothing Laboratories site off Victoria Road West in Hebburn, Tyne and Wear. The site is proposed to accommodate approximately 334 new housing units and is bounded on the West side by the Newcastle and South Shields line of the Tyne and Wear Metro (Nexus). There is also a third, Network Rail, line used by freight trains to and from Jarrow Oil terminal.

The North End of the site is partially bounded by South Drive, a road off Victoria Road West. This terminates in a footpath level crossing which leads to Riverside Park, the park being bounded immediately to the West by the River Tyne and forming a recreational area for dog walkers and residents, particularly children. The level crossing also provides one of two main access points to allotments. National Cycle Route no.14 runs along the western boundary of Riverside Park. The South Tyneside Heritage Trail is also routed across the level crossing. Due to the housing development there is a possibility that use of the footpath level crossing may increase and hence a change in the risk profile.

It is not known whether there is any planned increase in service level over either the Nexus or Network Rail lines. The Nexus line has 3 sections of single track varying in length from just under 1400m to just over 460m in length. The combination of the varying lengths of single line sections, irregular distances between the single lines as well as keeping a clockface timetable on other sections of the line through the centre of Newcastle will limit the opportunity for any significant increase in frequency of Nexus trains.

In terms of the Miller Homes development the nearest access/egress point from the new development is proposed to be on Victoria Road West. Consequently anyone walking from the nearest dwelling to the level crossing would need to travel approximately 425 metres. Occupants of the furthest property from the crossing would need to walk approximately 900 metres.

A site visit was carried out on 24th January 2017 and during the site visit a census of pedestrian users was undertaken.

This document will provide the necessary information to contribute to a discussion on the risks.

3.0 Reasons for the assessment

There is a need to assess whether the Miller Homes development will affect the risk rating of South Drive Footpath Level Crossing due to increased use.

3.1 Approach to the assessment

A number of steps have been carried out for the assessment. Due the timescale, these have by necessity been limited to:-

- Site visit (24th January 2017)
- Census of pedestrian usage during the site visit
- Research on the Network Rail website for the current Risk Assessment of the level crossing

3.1.1 Weather conditions

The weather during the site visit was dry, cloudy and cold with a slight breeze.

4.0 Site Description

4.1 Crossing Details

Photograph illustrating access gate to level crossing from South Drive

Crossing Name	South Drive Footpath Level Crossing
Level crossing Type	Public footpath with self closing gates
Network Rail Line of Route/Nexus line of route	Jarrow Branch/Newcastle & Shields
NR Engineers Line Reference (ELR)	JAW
OS Grid Reference	NZ 303 637
Post code	NE31 1RB
Road Name	South Drive
Local authority	South Tyneside Council
Supervising Signal box	NR Tyneside Nexus South Gosforth
Number of running lines	Three (Network Rail one, Nexus two)

Maximum speed	Network Rail15mph (24kph) Nexus 34 mph (55kph) Out Shields, 37mph (60kph) In Shields
Current electrification	Nexus Overhead 1.5 kV DC : Network Rail none
Proposed electrification	None known
Trains per day	Nexus 172 : Network Rail : 1

South Drive is a footpath level crossing protected by self-closing gates approximately 1.5m wide, being sufficient to allow a pedestrian to walk through whilst also pushing a bike. The crossing is not classed as permitting vehicles or horses through. The crossing surface is formed from proprietary rubber Holdfast deck panels of varying widths. There are also “stop, look and listen” signs on each side of the level crossing although these were partially obscured by graffiti at the time of the site visit.

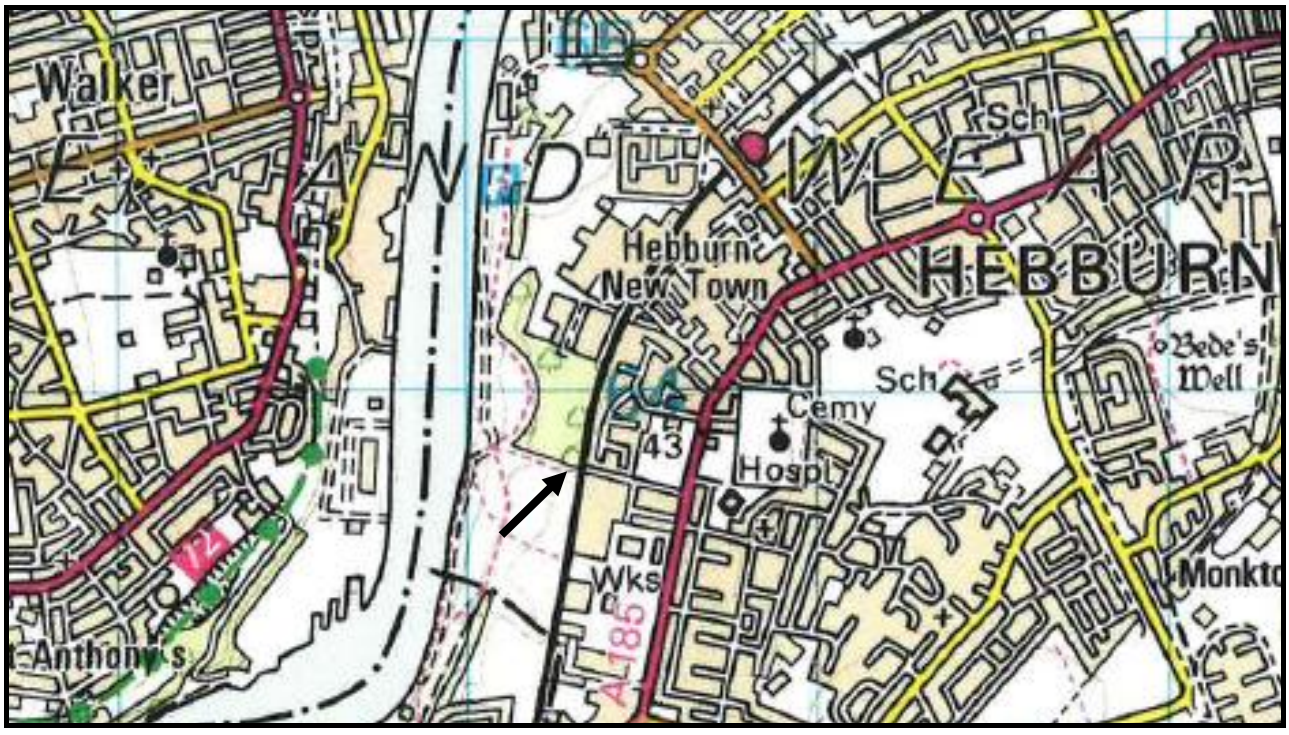
The approach from South Drive is by an adopted and illuminated road with made up footpaths. There is also a footpath from Woodvale Drive which runs alongside the railway from the North for a distance of approximately 20m. The approach from Riverside Park is by a made-up footpath which is lit. It would appear to be adopted by South Tyneside Council as it had been salted on the day on the visit. The crossing itself is lit by a floodlight positioned in the cess of the Out Shields side of the Nexus lines.

The crossing is provided with whistle boards only with no telephones or other audible or visual warnings for users and is located approximately 970m on the Pelaw side of Hebburn station.

At the level crossing, there is a road rail access point (RRAP). Although it has the appearance of a level crossing, this is purely for the use of maintenance staff requiring access to the railway. As far as can be ascertained, it is for the use of Nexus staff only, but this needs to be confirmed.

4.2 Environment

Photograph illustrating level crossing in relation to proposed development site (top right), allotments and Riverside Park (bottom left)



Extract from OS Map illustrating crossing in relation to surrounding topography

4.2.1 Public approaches

The approach from South Drive is by means of an adopted road. The Miller Homes development site is to the left of the picture.

Photograph illustrating South Drive approach to level crossing

At the level crossing, there is also a footpath from Woodvale Close. This appears to be adopted and is lit.

Photograph illustrating access from existing residential area

The approach from Riverside Park is by means of an illuminated and surfaced pathway. The path leads down to the main area of the park, the River Tyne and National Cycle Network no.14.

Photograph illustrating Riverside Park approach to level crossing

Although the level crossing is accessible for all mobility impaired persons from South Drive, people who have difficulty taking a step of more than 12-15cm would not be able to use the Riverside Park gate.

Photograph illustrating Riverside Park access gate

4.2.1 Local properties, businesses and amenities

The crossing forms a link between the housing areas to the East of the railway and Riverside Park, allotments and National Cycle Route No. 14. A padlocked gate forms the rear entrance to a central avenue giving access to the allotments.

Photograph illustrating padlocked gate forming rear access to allotments

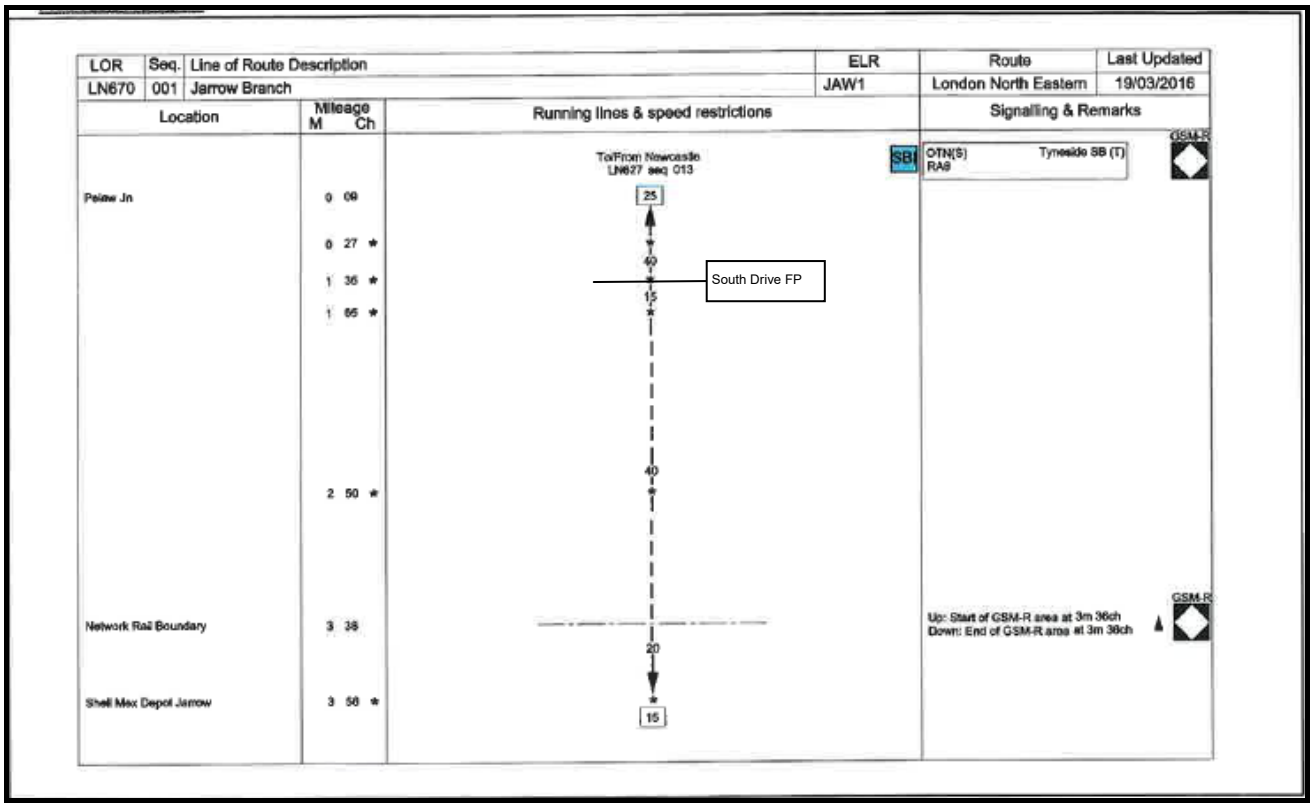
The principal road access to the allotments is from North Farm Road, through the Siemens site and thence exiting via a gate giving access to the Riverside Park. By definition, it would be possible for Siemens staff to walk over the level crossing, via the Riverside Park and then through the gates to the Siemens site. It is not known how much this route is used given there is a large staff car park on the site as well.

Photograph illustrating vehicular access to allotments with Siemens site in background

4.2.2 Rail approach and usage

The Sectional Appendix below shows the current situation for the Network Rail line. As South Drive Level Crossing is a non-signalled level crossing, it does not appear in the Sectional Appendix, but it has been annotated for information. In the time available, it has not been possible to obtain information about the Nexus lines. From observation, the Nexus lines appear to be bi-directionally signalled. It is assumed this facility is used by exception, with the normal use being left hand running.

The Network Rail line is not electrified as it is only used by occasional freight services to Jarrow Freight terminal. There are two Nexus lines at the level crossing as this section of track forms a passing loop for trains between Pelaw and Hebburn Stations. These are electrified at 1.5kV DC by the overhead system. The current permissible speed is 15mph (24kph) in both directions for the freight line. The Metro measurements are metric. From this their speeds are 34 mph (55kph) Out Shields, 37mph (60kph) In Shields. There are whistle boards in both directions for the freight line with the same boards only being provided for normal direction running on the Metro line. No signal controls are provided. On a typical weekday there are 172 Nexus Metro trains. There is less than one freight train per day as this service runs only occasionally.



4.3 Future Developments

4.3.1 Railway

In the time available, it has not been possible to establish whether there are any proposed developments for the railway, apart from major renewals work covering most of the Nexus infrastructure that will be taking place over the whole network until 2021.

4.3.1 Non Railway

In addition to the development by Miller Homes, Persimmon are redeveloping a site at North Farm Road. This is approximately 450m north of South Drive Level Crossing. As most of the attractions for residents from this site are by road via North Farm Road or St Aloysius View, or using their own paths to Riverside Park, it would seem unlikely that much use would be made of the footpath level crossing. It is assumed that unless they are allotment holders, no access would be allowed through the Siemens site.

4.4 Incident History

Analysis of the data shown on the Network Rail website showed that no incidents were reported in the 12 months prior to the last assessment date in January 2016 and none have been reported since. The sample census indicated that users were sensible with people waiting at the signs until the trains had passed, although it cannot be discounted that the sight of railway staff at site may have altered behaviours. Similarly all the drivers ‘whistled up’ before the crossing. Again, knowledge of railway staff on site may have altered behaviours.

5.0 Option Assessment

5.1 Residual risks

5.1.1 Current residual Risks

The results of the pedestrian census taken during the site visit on 24th January 2017 are shown below. The weather on the day of the site visit was dry, cloudy and cold (approximately 2°C) with a slight breeze. As it was a working day during term-time, this would have influenced the results, probably adversely. The site visit was undertaken between 12:25 and 13:40.

	Adults		Children		Cyclist	Motor Cycle	Cars Vans, HGV	Total
Date	Able	MIP	Acc	Unacc				
24/01/17	10	0	0	0	3	N/A	N/A	13

The above figures can be broken down as follows

4 crossings by an individual associated with the allotments (one of these with a bicycle)

2 crossings by cyclists who were kitted out in proper cycling gear and had come from or going to National Cycle Route 14

5 crossings by dog walkers accessing the Riverside Park.

2 crossings by individuals accessing the Riverside Park but without a dog

The latest Network Rail Census states that on average 12 pedestrians or cyclists use the level crossing on a daily basis. Whilst a comparison of the two sets of figures would appear to indicate that there may be a skew, a proper census (06:00 – 24:00) over a period of several consecutive days would be required to determine accurately the number of users.

The footpath level crossing is part of the South Tyneside Heritage Trail. It also leads to National Cycle Route 14. It is understood that the heritage trail is supported by a small number of local people but is much less popular than formerly. The access to National Cycle Route 14 is still an attraction.

The so-called ‘decision points’ (i.e. the points at which users should make a decision on whether to cross) were marked on the level crossing by white lining marked perpendicular to the footway. To the Riverside Park side of the railway the marking was almost completely worn away as is illustrated in the photograph below. The white lining on the east of the railway was more prominent but at the time of the site visit was partially obscured by road salt.

The distance from the boundary gate to the decision point on the South Drive side was estimated to be between 6 and 7 metres and the corresponding distance on the Riverside Park side was approximately 2 metres. The overall distance between decision points was estimated to be 16 metres giving an overall gate-to-gate distance of approximately 24 metres.

As the surface of the crossing is nominally level, the assumed walking speed can be taken as 1.2m/s. Using the distance between decision points of 16 metres, this equates to a crossing time of approximately 13.3 seconds. The Nexus whistle boards in the In Shields (Down) direction give approximately 17 seconds warning whilst those in the Out Shields (Up) direction give approximately 26 seconds. These warning times assume, of course, that train drivers sound their horn, that users are not hard of hearing or wearing headphones and are not distracted by background noise or dogs.

Photograph illustrating length of crossing and partially obscured signage

Photograph illustrating length of crossing and signage obscured by graffiti

Warning times i.e. the time from when an approaching train can first be seen to subsequent arrival at the crossing, are estimated below. Note that values are only estimates as In practise accurate values can only be established by standing at the decision points and using specialist equipment[1].

	Position on crossing	**Approximate Warning Time (trains approaching from Hebburn)**		**Approximate Warning Time (trains approaching from Pelaw)**
Up side	3.5 metres from running edge.	11 seconds		25 seconds
Down side	3.5 metres from running edge.	13 seconds		25 seconds
	Decision Point			Zero seconds

The conclusion from this exercise is that the whistle boards do provide enough warning for someone to cross the railway lines but warning times, based on visibility only, appear to be insufficient, certainly from the decision point on the Riverside Park approach as sighting is completely obscured by the Stop, Look, Listen signage. In the time available, it has not been possible to determine whether any derogations apply to the crossing.

[1] Due to the requirement to be on-site as soon as possible, insufficient time was available for TSP staff to complete all safety paperwork required to collect accurate data.

5.1.2 Projected Residual Risks

The development is due to build approximately 334 housing units. The nearest house is just over five minutes walk away from the level crossing with the majority up to twice this distance. The attrition rate for walking vs. distance is quite high. It has not been possible to determine the exact change in the figures that the proposed development will make to the level crossing in the time available, however some initial figures have been estimated. The basis of the estimate has been taken partly from the National Travel Survey data of 2014 published by the Department for Transport on 2nd September 2014. Industry professionals have also correlated some of the calculations. It is estimated that there could be about 80 dog-owning households within this new development and that there could be a total for all reasons of just over 900 daily pedestrian trips from, and into, the estate. Walking in connection with journeys to and from work are acknowledged to be on average longer than those undertaken for other reasons such as leisure, shopping etc. In urban areas 90% of walking trips are likely be less than 5 minutes which corresponds to approximately 400m. From these figures, this would correspond to 10% of trips being over this distance and would mean that approximately 90 trips leaving and entering the site in all directions will have the aim of being greater than 400m. These trips will be for all reasons including accessing local facilities such as schools, commuting, shopping as well as leisure such as jogging, dog walking and walking. Due to the location of the crossing, the only reason to cross the line at this point is for leisure, dog walking and accessing the allotments with a potential of a few walking commuters to the Siemens factory. It is worth noting that National Travel Survey data from 2014 gave 18% of all walking trips as leisure, 19% as other (including “just walking”) and 10% as personal business. If it is assumed that 66% of the leisure walks are likely to use the level crossing with a quarter of each of the others, this will give a figure of approximately 19% of the 90 trips that may use the level crossing. This may then generate an additional 17 trips over the crossing in a 12 hour period which equates to approximately three crossings per two hours.

5.2 Options considered

There are various options that could be considered, not all of which are necessarily viable.

5.2.1 Closure

Closure has been considered with the following observations.

The alternative route between the level crossing and Riverside Park would be via Victoria Road West and North Farm Road. The distance would be approximately 1.4km as shown in the diagram below. The entire route would be on a segregated footway. If this option was chosen it is anticipated that the Persimmon development would be completed by the time the footpath diversion came into operation.

5.2.2 Provide enhanced fencing / signage / white lining

The current arrangement does not direct the user to the decision point on either side of the railway. In addition signage instructing the user on how to cross is currently poorly positioned and partially obscured by graffiti. White lining defining the decision points is also badly worn.

Providing fencing that guides the user to the point at which the decision should be made to wait or cross, clearly marking the decision point on the ground and providing signage that is legible and correctly positioned so that it does not obscure visibility of approaching trains will enhance safety.

5.2.3 Relocate decision point to obtain minimum sighting.

Relocating the crossing to provide sufficient sighting and consequent warning times would only be possible if the crossing moved approximately 100m to 150m south of the current crossing. This option would be further complicated by the pointwork in this area for the loop for Nexus Metro trains. This option would result in amendments being required to the public rights of way which would require all the relevant guidance, permissions and consultations to be completed. This may also increase the distance that users have to walk to get to their destination which may in itself be unacceptable. It may also introduce issues with security as the route would have no natural surveillance.

5.2.4 Provide telephones

Provision of telephones is unlikely to help. As can be seen from the hoardings protecting the allotments, minor vandalism does occur. If the phones were vandalised, users would use the crossing without this protection and they would be likely to fall into disuse through default.

5.2.5 Provide Supplementary Audible Warning Device (SAWD)

From March 2017 Network Rail is introducing a supplementary audible warning device (SAWD) for use on footpath crossings providing they have existing whistle board protection (as at South Drive Level Crossing). The product is intended to be a supplementary control to the existing 'stop, look, listen' level crossing control. The SAWD system is designed to be a cost effective means of reducing the risk to users of footpath crossings by providing them with an audible warning of approaching trains. It should be noted, however, that SAWD's can only be configured to detect trains on 1 or 2 lines and there are 3 at the site of the crossing although the 2 Nexus lines carry a significant proportion of the rail traffic and hence contribute a far greater risk to users. Similarly the SAWD is a Network Rail system so it is not clear whether this would be accepted on Nexus operated lines.

5.2.6 Upgrade crossing to provide Miniature Stop Lights and Audible Alarms

This form of protection involves red / green lights and audible warning devices linked to the signalling and initiated by approaching trains.

5.2.7 Provide Underpass

Technically this is feasible and would address all the issues. This solution appears to have been undertaken for North Farm Road. This would be a very expensive solution.

5.2.1 Provide Footbridge

This is achievable from a technical point of view, but is likely to require mobility impaired access ramps and land purchase. This would be a very expensive solution.

5.3 Option selection summary

The existing level crossing has a risk rating of C4. Any crossing where the rating is A,B,C and/or 1,2 or 3 is considered by Network Rail as being in the high risk category. This risk rating is established by Network Rail using their All Level Crossing Risk Model (ALCRM) which is a software tool used across the industry to establish level crossing risk based on the relevant inputs. The software is run by Network Rail and whilst TSP is not aware of the data inputs to ALCRM, pedestrian usage is likely to be a significant factor.

The Office of Road and Rail (ORR) will insist that any developments that have the potential to change usage of the crossing will need to be fully assessed via a suitable and sufficient risk assessment. The ORR will not accept any development that increases the risk rating.

6.0 Conclusions

The current arrangement at South Drive Level Crossing is such that the point on each approach at which users should decide whether to wait or cross (the decision point) is not readily apparent and signage instructing users how to cross has been obscured with graffiti. On the Down side the position of the signage obscures sighting of approaching trains. Warning times (based on sighting of trains from the decision points) do not appear to be adequate and this appears to have been acknowledged by the operators by the presence of whistle boards although this form of protection relies very heavily on train drivers sounding their horn on each and every approach and assumes that users are not hard of hearing, using headphones, wearing hoods or are not distracted by dogs or other background noise. A high proportion of users during the site visit were either elderly and/or walking dogs.

The current risk rating of the crossing is C4 which is towards the higher end of the risk ratings used by Network Rail – the highest being A1 and the lowest M13.

Network Rail will run the ALCRM software once the results of the 9 day census has been received from TSP. One possible output from ALCRM is that current pedestrian usage results in an increase in the risk rating, irrespective of any potential increase in user numbers created by the Miller Homes development.

If the risk rating is increased then options include closure, relocation of the crossing, provision of a footbridge or underpass or extra measures at the crossing to reduce the current risk to users. In the simplest form, this may mean enhanced fencing, signage and white lining so that users have a clearly defined point at which to wait or decide to cross. If these changes are proven to be inadequate then enhanced protection in the form of a supplementary audible warning device (SAWD) or miniature stop lights will become necessary.

Early joint discussions with Network Rail, Nexus, the Office of Road and Rail and South Tyneside Council are recommended, so that a way forward can be established. In any event, a suitable and sufficient risk assessment will be necessary and this will require a formal census of pedestrian users over a period of 9 consecutive days (including two weekends). Miller Homes, aided by TSP, have commissioned a nine day census commencing on Saturday 4th February 2017 and ending on Sunday 12th February 2017. This will allow the existing pedestrian usage to be input to ALCRM to calculate the impact of the proposed development and determine what, if any, effect this has on the risk rating.

TSP Projects, York (Head Office)
Meridian House, The Crescent, York, YO24 1AW, UK
T: +44 (0) 1904 454 600, F: +44 (0) 1904 454 601

TSP Projects, Birmingham
Alpha Tower, Crowne Plaza
Suffolk Street, Birmingham, B1 1TT, UK
T: +44 (0) 121 242 1240, F: +44 (0) 121 246 4664

TSP Projects, Manchester
1st Floor, Fairbairn Buildings, 70-72 Sackville Street,
Manchester, M1 3NJ, UK
T: + 44 (0) 161 242 2990, F: +44 (0) 161 242 2999

TSP Projects, Reading
Office 1.09, Dukesbridge House, 23 Dukes Street
Reading, Berkshire, RG1 4SA, UK
Tel: +44(0) 843 4878776

TSP Projects, Workington
Curwen Road, Derwent Howe, Workington, Cumbria,
CA14 3YX, UK
T: +44 (0)1900 68000, F: +44 (0)1900 601111.