



## **KILDARE COUNTY COUNCIL**

### **Report on Civil Engineering Infrastructure**

**for**

### **Proposed Development of a New Machinery Yard and Regional Salt Barn, Jigginstown, Newhall, Naas, Co Kildare**



**Kildare County Council,  
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**17032-R-CEI  
Issue PL1**

**Kilgallen & Partners  
Consulting Engineers  
Well Road, Kylekiproe  
Portlaoise, Co. Laois**

## REVISION HISTORY

<b>Client</b>	Kildare County Council
<b>Project</b>	Proposed Development of a New Machinery Yard and Regional Salt Barn, at Jigginstown, Newhall, Naas, Co Kildare
<b>Title</b>	Report on Civil Engineering Infrastructure

<b>Date</b>	<b>Details of Issue</b>	<b>Issue No.</b>	<b>Origin</b>	<b>Checked</b>	<b>Approved</b>
15/02/19	Initial Issue	PL1	PB	MK	PB

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## **1. INTRODUCTION**

### **1.1 INTRODUCTION**

Kildare County Council proposes the construction of a machinery Yard and regional Salt Barn at Jigginstown, Newhall, Naas, Co. Kildare, hereafter referred to as the 'proposed development'.

This report describes the civil engineering infrastructure, proposed and existing that will serve the proposed development.

### **1.2 STRUCTURE OF THE REPORT**

The structure of this report is outlined as follows:

- Section 2 provides a description of the site of the proposed development and its immediate environs;
- Section 3 describes the proposed development;
- Section 4 describes transport infrastructure;
- Section 5 describes surface water drainage infrastructure;
- Section 6 describes water supply and wastewater infrastructure.

## 2. DETAILS OF SITE

### 2.1 SITE LOCATION AND DESCRIPTION

Figure 2-1 shows the location of the proposed development.

The site measures 1.88 hectares and is located on the southern side of the M7 Slip Road, which connects the Bundle-of-Sticks Roundabout to the southbound on-ramp to the M7 Motorway. This road also serves a Local Road (the Rathasker Road) located southwest of the site. Eastbound traffic flows (i.e. from the Local Road to the Bundle-of-Sticks Roundabout) are very low in comparison to the westbound traffic flows towards the M7.



**Figure 2.1 Site Location**

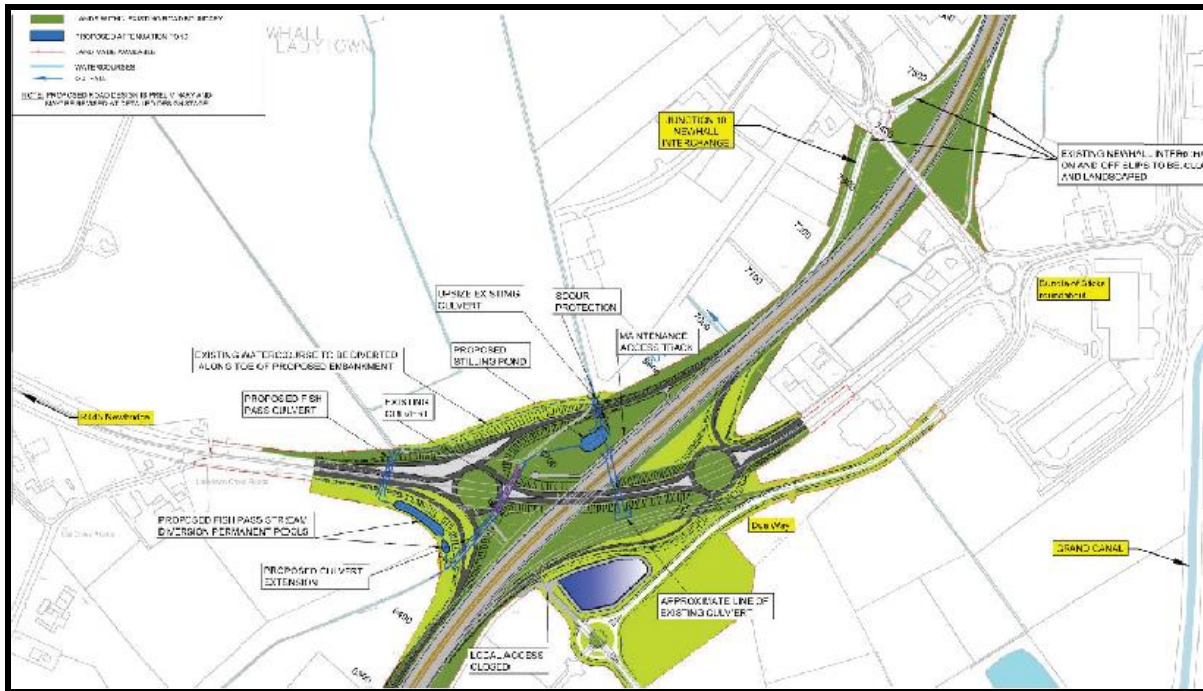
The site, which was historically used for agricultural purposes, is undeveloped and currently unused, and so does not generate traffic flows. There are no facilities for vulnerable road users on the M7 Slip Road - this is not untypical for a road of this nature.

Access to the site is from the existing M7 Slip Road.

### 2.2 UPGRADE OF M7 INTERCHANGE

Figure 2-2 shows the layout of the upgrade to the adjacent M7 Interchange that is under construction as part of the M7 Naas to Newbridge Bypass Upgrade Scheme. The upgrade will relocate the existing westbound M7 on-ramp. The existing M7 Slip Road will no longer connect to the M7 and will only carry traffic between the Bundle-of-Sticks Roundabout and the Local Rathasker Road. Figure 2-3 shows the proposed development and upgraded interchange in context.

The upgrade is due to be completed in April 2019 and will therefore be fully open during the construction and operational stages of the proposed development.



**Figure 2.2 Upgraded M7 Interchange**



**Figure 2.3 Proposed Development and Upgraded M7 Interchange in Context**



### 3. PROPOSED DEVELOPMENT

The proposed development is located on a 1.88 hectare site on the current M7 Slip Road southwest of the Bundle of Sticks Roundabout outside Naas.

The proposed development will provide a range of services to Kildare County Council including coordination of winter maintenance, coordination of surface dressing operations, vehicle hire and purchase, provision of vehicles for pothole repair and street sweeping, fuel storage, salt storage, bitumen storage, vehicle re-spray facility, plant storage, workshop facilities and offices for administration purposes. The two main structures to be constructed on the site are :

- An Administration building and workshop. The administration building comprises offices on the first floor (350sq.m) over storage and ancillary accommodation on the ground floor (320sq.m). The workshop will be 630sq.m and is attached to the Administration building.
- A 23,000 tonne (3,480sq.m) Regional Salt Barn for use by Kildare County Council and the Department of Transport. There is an open fronted lean-to (415sq.m) proposed to the side of the saltbarn for the storage of snow ploughs, gritters and other equipment associated with the salt barn. A small welfare building (52sq.m) is proposed for the use of night time gritter drivers.

Ancillary structures to be constructed on the site are:

- a 30,000 litre raised bitumen tank with access stairs and platform
- 2no. 10m x10m aggregate storage bays
- 1no. covered 10m x 10m covered ancillary storage bay
- covered truck wash area with raised platform
- brine storage tank

Other ancillary and associated works are

- site entrance
- weighbridges
- perimeter fences/walls
- internal fencing to secure storage areas
- parking areas
- fuel storage and pumps
- drainage and site services.

A direct access to the proposed development will be provided on the M7 Slip Road. The access will be a simple priority junction.

The Development is described in detail in the drawings and reports listed in Table 3-1.

Reference No	Type	Title
17032-000	Drg	Cover & Index of Drawings
17032-100	Drg	Site Location Map
17032-101	Drg	Site Layout Plan
17032-102	Drg	3d Site Layout Plan
17032-103	Drg	Contextual Sections & Elevations
17032-200	Drg	Admin & Workshop Ground Floor GA
17032-201	Drg	Admin & Workshop First Floor GA
17032-202	Drg	Admin & Workshop Elevations
17032-203	Drg	Admin & Workshop Sections
17032-205	Drg	Salt Barn GA & North East Elevation
17032-206	Drg	Salt Barn Elevations & Sections
17032-207	Drg	Truck Wash, Chip Store & Bitumen Tank
17032-210	Drg	Computer Generated Images
17032-211	Drg	Computer Generated Images
17032-DR-CEI-01	Drg	General Layout of Civil Engineering Infrastructure
17032-DR-CEI-02	Drg	Enabling Infrastructure in The Public Road
17032-R-CEI	Report	Report on Civil Engineering Infrastructure
17032-R-TIA	Report	Traffic Impact Assessment
17032-R-FRA	Report	Site Specific Flood Risk Assessment
	Report	Appropriate Assessment Screening Report
	Report	Ecological Impact Assessment (EcIA) Report
	Report	Archaeological Heritage Impact Assessment
	Report	Ground Investigation Report (March 2018)
17032-EIA	Report	EIA Screening Report

**Table 3-1 Schedule of Drawings showing details of Proposed Development**



## 4. TRANSPORT

### 4.1 TRAFFIC FLOWS

It is estimated that the workshop will attract 3 no. heavy goods vehicles per day for repair purposes and 5 no. light goods vehicles per day delivering equipment.

The Salt Barn will typically attract approximately 3 heavy goods vehicles per day. During peak times, this will increase to a maximum of 36 vehicles, equivalent to 3 vehicles per hour.

Table 4-1 shows the traffic that will be generated by the proposed development (all values are in terms of passenger car units).

Time Range	Staff / Visitors		Workshop		Salt Barn	
	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
07:00-08:00					7	7
08:00-09:00	30		1.7	1.7	7	7
09:00-10:00	3	3	1.7	1.7	7	7
10:00-11:00	3	3	1.7	1.7	7	7
11:00-12:00	3	3	1.7	1.7	7	7
12:00-13:00	3	3	1.7	1.7	7	7
13:00-14:00	33	33	1.7	1.7	7	7
14:00-15:00	3	3	1.7	1.7	7	7
15:00-16:00	3	3	1.7	1.7	7	7
16:00-17:00	3	3	1.7	1.7	7	7
17:00-18:00	3	30	1.7	1.7	7	7
18:00-19:00					7	7
12 hr total	87	87	17	17	84	84

**Table 4-1 Summary of Traffic Flows to and from the Development**

### 4.2 ACCESS TO THE PUBLIC ROAD

Upon completion of the upgrade to the M7 Interchange, the road from which the proposed development will be accessed will become a local road and will be lightly trafficked.

A simple priority junction is proposed as the direct access to the development. Given the public road will be lightly trafficked and the relatively low traffic flows generated by the development, this junction type is of sufficient capacity to serve the development.

Effectively all traffic generated by the development will travel via the Bundle of Sticks Roundabout, thus increasing traffic flows at the roundabout. The impact of these increased traffic flows on the operation of the roundabout was assessed (Report Ref. 17032-R-TIA). This assessment concluded that the proposed development will have a slight to moderate, permanent impact on the operation of the Bundle of Sticks Roundabout during peak AM and PM periods and an insignificant impact at other times of the day. Based on this conclusion, works to upgrade the capacity of the Bundle of Sticks Roundabout are considered neither necessary nor proportionate.

### **4.3 VULNERABLE ROAD USERS**

The proposed development does not include proposals for vulnerable road users. However, this is acceptable given its location and function. The proposed development will not preclude the provision of facilities for vulnerable road users on the existing M7 Slip Road upon completion of the M7 Interchange Upgrade.

### **4.4 INTERNAL ROAD NETWORK**

Traffic entering the Site will comprise heavy goods vehicles associated with the salt barn and work shop, and passenger cars associated with the staff and visitors.

A parking area for cars, with 39no spaces, is located close to the access. This allows the immediate segregation of passenger cars from larger goods vehicles. The surface to the car park and the length of access road shared by cars and heavy goods vehicles will be bituminous.

Heavy goods vehicles will proceed past the car parking area to the main yard area. Traffic movements within the main yard area will be delineated by markings and signs, which will be designed to minimise conflicting movements and provide clear unambiguous signals as to which movements have priority.

37no parking spaces are provided for gritter trucks. No dedicated parking bays are defined for articulated goods vehicles associated with the delivery and taking-away of salt; however areas are reserved adjacent to the salt barn to allow vehicles to queue while waiting to load or unload.

The surface of the main yard area will be concrete.

Roadmarkings will be used to delineate pedestrian routes through the yards area.

### **4.5 ROAD SAFETY AUDIT**

A Stage 1 Road Safety Audit was carried out for the proposed development in accordance with the TII Guidelines. The recommendation so this audit have either been incorporated into the proposed development or will be at design stage. A copy of the audit report is provided in Appendix I.

## **5. SURFACE WATER DRAINAGE**

### **5.1 SURFACE WATER COLLECTION NETWORK**

The surface water drainage network was designed in accordance with IS EN 752-4: Part 4 'Drain and sewer systems outside buildings' as published by the NSAI, and using the industry-standard software package 'Storm and Sanitary Analysis'.

In accordance with the above standard, pipes in surface water sewers have been designed using the Modified Rational Method (Wallingford method) to calculate the volume of surface water run-off under storm conditions. The Modified Rational Method is incorporated in the software design package, Autodesk Storm and Sanitary Analysis, which was used in the design process.

Site-specific rainfall data provided by Met Eireann was used as the basis for the design of the surface water system, after first being factored up by 10% to meet the required allowance for climate change.

In accordance with IS 752-4: Part 4, the surface water drainage network was initially designed to carry a 2 year storm without surcharge. Self-cleansing flows of greater than 0.75m/s are provided generally although this is not always possible at upstream pipe-runs where contributing areas are low. In these cases, minimum gradients of 1:DN or greater are provided, thus meeting the recommendations of IS EN 752-4 for ensuring self-cleansing flow velocities.

### **5.2 OUTFALL**

A ground investigation was carried out at the Site to determine the permeability of insitu soils. The investigation found these soils to be impermeable and so infiltration of run-off from roofs and paved areas to ground could lead to pluvial flood risk within the Development (The report on this ground investigation is included with the documents being made available as part of this consultation process). To avoid this risk, run-off from roofs and paved areas will not discharge to ground but instead will discharge to a positive outfall.

An open channel runs along the entire length of the Site's western boundary, sloping downwards from south to north. The channel does not carry significant flows of water and functions as an open drain for surrounding lands. The open drain discharges to a 450mm dia. surface water pipe under the existing M7 Slip Road; this pipe flows in a westerly direction along the southern boundary of this road before discharging to an open drain ['the M7 drain'] recently constructed as part of the M7 Interchange Upgrade.

Site inspection revealed that the invert level of the pipe is below the bed level of the M7 drain and therefore, this pipe relies on an upstream head of water to discharge to the M7 drain. The outfall may silt up over time, obstructing the hydraulic capacity of the existing outfall pipe and potentially causing the existing outfall pipe to surcharge. For this reason, a new outfall pipe, at a higher level than the existing outfall, will be constructed from the Site to the M7 drain.

A surface water outfall from the adjoining retail park runs close to the southern boundary of the Site and discharges to this open drain. This outfall pipe will be intercepted and incorporated into the drainage network for the proposed development described in Section 5.1.

### **5.3 SUDS STRATEGY**

A SUDS strategy has been prepared for the Development in accordance with the recommendations of the Greater Dublin Strategic Drainage Study (GSDSDS).

Table 5-1 lists the criteria for sustainable discharge of surface water run-off as set out in the GSDSDS and describes the performance of the surface water drainage system when measured against these criteria.

In accordance with recommendations of GSDSDS, a climate change factor of 10% has been applied to the design of the surface water sewers. This was achieved by applying a 10% factor to the rainfall data obtained from Met Eireann as described in Section 5.1.

Because of relatively low soil permeability, infiltration is not feasible.

#### Permissible Rate of Discharge

Compliance with GSDSDS requires the discharge of surface water run-off to be restricted in accordance with the criteria listed in Table 5-1, and in particular with sub-criterion 4.3 which requires a maximum discharge rate of  $Q_{BAR}$  or 2 l/s/ha, whichever is the greater, where separate "long term" storage cannot be provided. For the proposed Site  $Q_{BAR}$  is 4.21 lit/sec and so this is the maximum permissible rate of discharge of surface water run-off from the proposed development.

The drainage network will also intercept discharge from the adjoining retail park, as described in Section 5.2. The permissible rate of discharge through this outfall is 12.8 lit/sec. This currently discharges to the open drain at the western boundary but in the with-development scenario, will instead discharge to the drainage network for the proposed development. Accordingly, the permissible rate of discharge from the drainage network for the proposed development will be as follows:

Permissible discharge for run-off from the proposed development	4.2 lit/sec
Permissible discharge through the retail park outfall	12.8 lit/sec
	-----
Permissible rate of discharge from proposed drainage network	17.0 lit/sec

Discharge will be restricted by installing a constant head / variable discharge flow-control valve at the location shown on Drg No 17032-DR-CEI-01. Surface water attenuated by this control valve will discharge to an underground tank under the car parking area. The tank will provide sufficient storage to ensure that all surface water attenuated during the 100year critical storm can be stored without giving rise to flooding.

Criteria	Sub-Criterion	Return Period (yrs)	Design Objective	Design Proposal
1	River Quality Protection	1.1	Interception Storage of at least 5mm, and preferably 10mm, of rainfall where run-off to the receiving water can be prevented	<p>In situ soils are of low permeability and so the use of infiltration to provide interception storage is not feasible.</p> <p>Hydrochambers are proposed for the storage of attenuated surface water and the surface water drainage system has been designed to ensure that all surface water run-off passes through the chamber system before being restricted. The construction of a drainage layer under these chambers will allow the limited potential for infiltration to be maximised before discharge from the Site.</p> <p>In addition, catchpit manholes with sumps to trap silts will be used for all manholes on the surface water collection network.</p> <p>A Class 1 discharge bypass hydrocarbon separator, in accordance with IS EN 858, with integrated silt chambers will be installed immediately upstream of the discharge to the outfall pipe.</p>
		1.2	Where initial runoff from at least 5mm cannot be intercepted, treatment of runoff is required. Retention pond (if used) to have minimum pool volume equivalent to 15mm rainfall.	
2	River Regime Protection	2.1	Discharge rate equal to 1 year greenfield site peak runoff rate or 2l/s/ha, whichever is the greater. Site critical duration storm to be used to assess attenuation storage volume	The surface water network has been designed to comply with this sub-criterion.
		2.2	Discharge rate equal to 1 in 100 year greenfield site peak runoff rate. Site critical duration storm to be used to assess attenuation storage volume.	Both surface water networks initially designed to comply with this sub-criterion. The discharge rate was subsequently reduced in order to comply with Criterion 4.
3	Level of Service (flooding) for the Site	3.1	No flooding on site except where specifically planned flooding is approved. Summer design storm of 15 or 30 minutes are normally critical.	The Site has been modelled for rainfall events of 15mins and 30mins to ensure that flooding does not occur during 30 year and 100 year events.
		3.2	No internal property flooding - Planned flood routing and temporary flood storage accommodated on site for short high intensity storms. Site critical duration events.	The Site has been modelled for rainfall events of 15mins and 30mins to ensure that flooding does not occur during 30 year and 100 year events.
		3.3	No internal property flooding - Floor levels at least 500mm above maximum river level and adjacent onsite storage retention.	The maximum water level in the drainage network will be 83.5m, 725mm below the minimum floor level.
		3.4	No flooding of adjacent urban areas. Overland flooding managed within the development.	Compliance with sub-criterion 3.2 as described ensures there will be no overland flooding.
4	River Flood Protection (Sub-criterion 4.1, 4.2 or 4.3 to be applied)	4.1	<p>"Long-term" floodwater accommodated on site for development runoff volume which is in excess of the greenfield runoff volume.</p> <p>Temporary flood storage drained by infiltration on a designated flooding area brought into operation by extreme events only.</p> <p>100 year, 6 hour duration storm to be used for assessment of the additional volume of runoff.</p>	<p>It is not possible to meet either sub-criterion 4.1 or 4.2; accordingly, the surface water drainage network is designed to meet sub-criteria 4.3.</p> <p>The site area for Network A is 1.88ha, equivalent to a discharge rate of 3.76 lit/sec at 2 lit / sec / ha. <math>Q_{BAR}</math> for the Site is 4.2 lit/sec. Accordingly the permissible discharge is taken as 4.28 lit/sec.</p>
		4.2	Infiltration storage provided equal in volume to "long term" storage. Usually designed to operate for all events. 100year, 6 hour duration storm to be used for assessment of the additional volume of runoff.	
		4.3	Maximum discharge rate of $Q_{BAR}$ or 2 l/s/ha, whichever is the greater, for all attenuation storage where separate "long term" storage cannot be provided	

Table 5-1 SUDS STRATEGY

## **6. WASTEWATER AND WATER SUPPLY**

### **6.1 WATER SUPPLY**

Water supply for the development will be taken from an existing 150mm dia. located in the verge of the existing M7 Slip Road.

The water supply network and its connection to the existing watermain will comply with the 'Code of Practice for Water Supply' published by Irish Water and will be constructed in accordance with this code of practice and associated construction details.

The Development is expected to generate an average daily demand for 45,000 litres of potable water. A pre-connection enquiry has been submitted to Irish Water.

### **6.2 WASTEWATER**

Wastewater from the development will discharge to a network of sealed pipes operating under gravity. This network will discharge to a pumping station within the Site and from here will be pumped to an existing public wastewater east of the Bundle of Sticks Roundabout.

Wastewater from the development will be essentially domestic in nature but during periods when salt is being handled, run-off from the aprons surrounding the salt barn will also discharge to the wastewater network. At other times, the run-off from these aprons will discharge to the surface water drainage network.

The wastewater supply network, pumping station and rising main will comply with the 'Code of Practice for Wastewater' published by Irish Water and will be constructed in accordance with this code of practice and associated construction details.

The Development is expected to generate 45,000 litres of wastewater per day. A pre-connection enquiry has been submitted to Irish Water.



## **7. EARTHWORKS BALANCE**

3D models were prepared for the finished level of the proposed development and for the existing ground level. Using these models, a comparison model was created to estimate the bulk excavation and bulk fill requirements for the proposed development.

Based on this model, it is estimated that the development will generate a 30,000m<sup>3</sup> surplus of excavated soil which will require removal from the Site. The surplus excavated material will be transported to licensed waste facilities for soil recovery such as those at Kildare Sand & Gravel Rathangan, N&C Enterprises Kilmeague and / or Walshestown Restoration Punchestown. These surplus soils will be handled in accordance with Waste Management Regulations.

**Appendix I**  
**Road Safety Audit**

Title: **STAGE 1 ROAD SAFETY AUDIT**

For;

**Proposed Machinery Yard, Naas, Co. Kildare.**

Client: **Kilgallen & Partners**

Date: **February 2019**

Report reference: **0537R01**

VERSION: **DRAFT**

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## 1.0 Introduction

This report was prepared in response to a request from Mr. Paul Bergin, Kilgallen & Partners, Consulting Engineers, for a Stage 1 Road Safety Audit of the proposed machinery yard and salt barn at Naas, Co. Kildare.

The Road Safety Audit Team comprised of;

Team Leader: **Norman Bruton**, BE CEng FIEI, Cert Comp RSA, MSoRSA

TII Auditor Approval no. NB 168446

Team Member: **Owen O'Reilly**, B.SC. Eng Dip Struct. Eng NCEA Civil Dip Civil. Eng CEng MIEI

TII Auditor Approval no. OO1291756

The Road Safety Audit comprised an examination of the drawings and a site visit by the Audit Team, together, on the 10<sup>th</sup> February 2019.

The weather at the time of the daytime site visit was dry and the road surface was dry.

This Stage 1 Road Safety Audit has been carried out in accordance with the requirements of TII, Publication Number GE-STY-01024, dated December 2017.

The scheme has been examined and this report compiled in respect of the consideration of those matters that have an adverse effect on road safety. It has not been examined or verified for compliance with any other standards or criteria.

The problems identified in this report are considered to require action in order to improve the safety of the scheme for road users.

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

No previous road safety audits have been carried out for this scheme.

A location map showing where each problem occurs is provided in **Appendix A**.

A list of the documents provided to the Audit Team is provided in **Appendix B**.

The feedback form for the Design Team Leader to complete is provided in **Appendix C**.

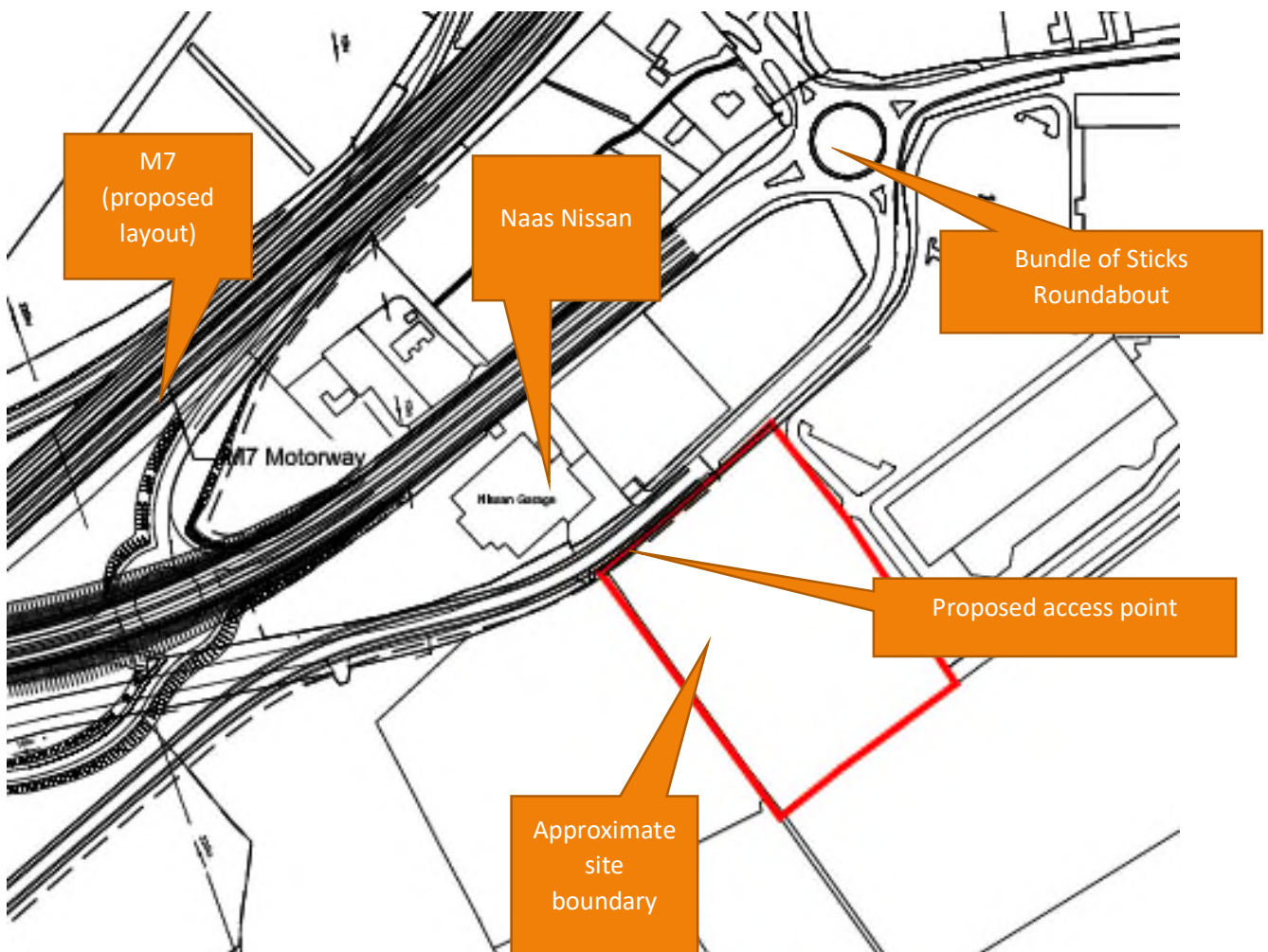
## 2.0 Background

It is proposed to construct a machinery yard and salt barn for regional use off the road between the Bundle of Sticks roundabout and the on ramp onto the M7 at Naas, Co. Kildare. The site is opposite the Naas Nissan commercial premises. The M7 junction 10 is currently being upgraded as part of the M7 widening works and this includes the road onto which the salt barn is being constructed. Some temporary traffic management was in place at the time of the site visit.

The site would be accessed by a priority junction which is designed to cater for heavy good vehicles.

The road is a single carriageway road with narrow hard shoulders which is two way at this location. The speed limit is 60km/hr however the actual speeds were perceived to generally to be in excess of the speed limit.

The site location map is shown below.

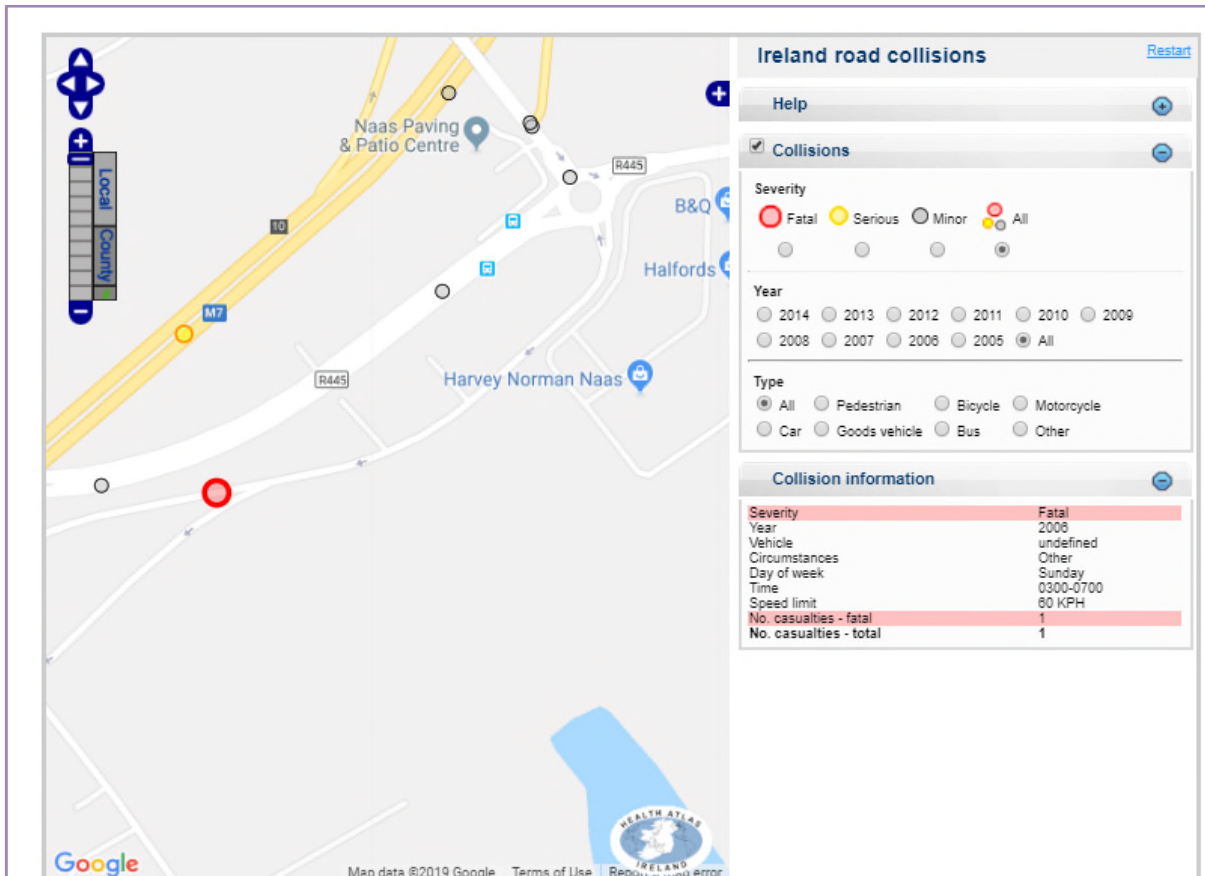




STAGE 1 RSA – MACHINERY YARD, NAAS  
KILGALLEN & PARTNERS



The Road Safety Authority’s website [www.rsa.ie](http://www.rsa.ie) shows that there have been no recorded injury collisions in the vicinity of the development between the years 2005 and 2014. There was one fatal collision to the West of the site in 2006 which is shown in red in the screenshot below.



## 3.0 Main Report

### 3.1 Problem

#### LOCATION

Drawing 17032-DR-RSA-S1 Rev 01 & Site Observation along site road boundary.

#### PROBLEM

It was observed during the site visit that there was evidence of heavy commercial vehicles parking in the hard shoulder and verge along the front of the site. If this practice continues to occur after construction, it could lead to a lack of visibility for driver exiting the site. This could result in collisions with oncoming traffic.



#### RECOMMENDATION

It is recommended that measures (passively safe) be put in place to prevent parking on the hard shoulder and verge.

### 3.2 Problem

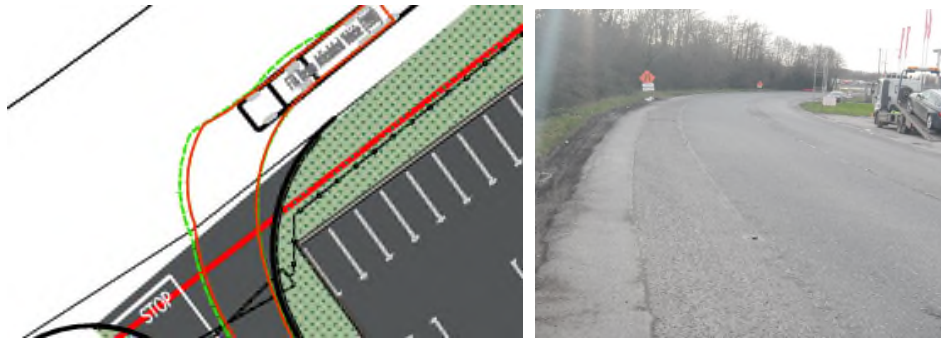
#### LOCATION

Drawing 17032-DR-RSA-S1 Rev 01

#### PROBLEM

There is a narrow hard shoulder on the public road. It is unclear what facilities, if any, are being provided to terminate the hard shoulder on approach to the junction. There is a risk that drivers wishing to turn right into the facility will use the hard shoulder to decelerate. This may lead to following drivers overtaking slow moving vehicles. The overtaking vehicles may not be visible to drivers exiting the site and this could lead to rear-end or side-swipe collisions.

STAGE 1 RSA – MACHINERY YARD, NAAS  
KILGALLEN & PARTNERS



*RECOMMENDATION*

It is recommended that as the design develops that the hard shoulder is taken into account and ensure that it is not used as a deceleration lane.

3.3 Problem

*LOCATION*

Drawing 17032-DR-RSA-S1 Rev 01 & Site observation.

*PROBLEM*

It is unclear if the design to date has taken account of the culvert and open drain on the western side of the site. There is a risk that any exposed headwalls or channels may be hazards to the occupants of errant vehicles.



*RECOMMENDATION*

It is recommended hazards associated with open channels and headwalls be removed or protected. The Clear Zone for hazards should be based on the operating speed of the road rather than the posted speed limit.

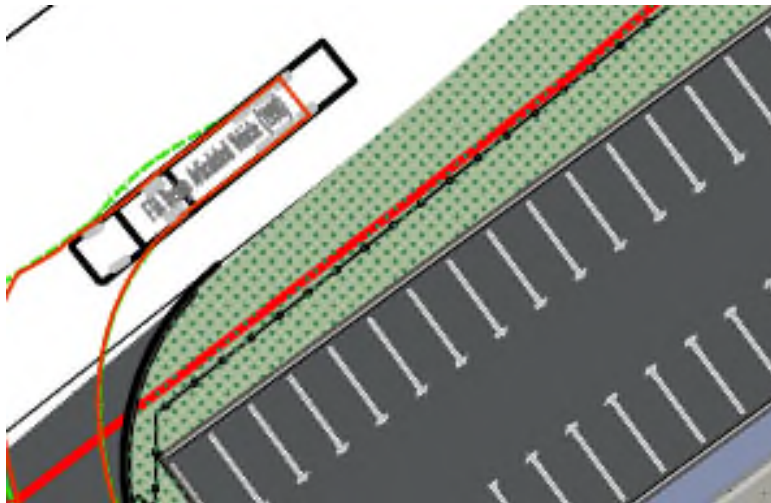
### 3.4 Problem

*LOCATION*

Drawing 17032-DR-RSA-S1 Rev 01

*PROBLEM*

It is unclear what type of security fencing is proposed along the road boundary. Fences with rails (like the existing timber post and rail fence) could lead to increased injury severity for vehicle occupants who collide with the fence should the rails penetrate the windshield, floor or engine block of the vehicle.



*RECOMMENDATION*

It is recommended that rail-less passively safe fencing is provided along the road boundary where the fence is within the Clear Zone.

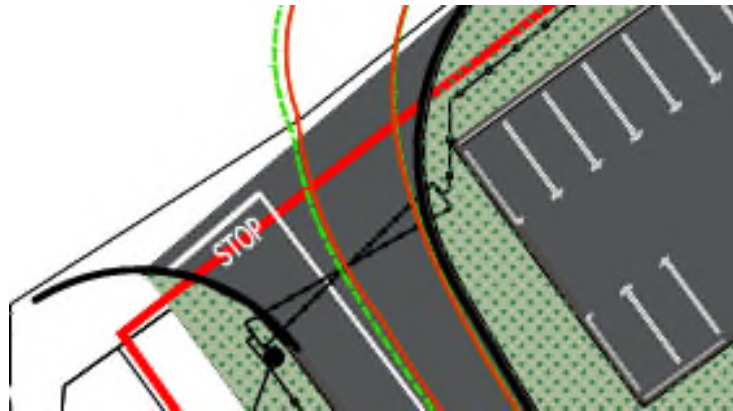
### 3.5 Problem

*LOCATION*

Drawing 17032-DR-RSA-S1 Rev 01

*PROBLEM*

The proposed development is shown to be gated at the access point. It is unclear if there will be a need for drivers to wait for the gates to be opened and if so where they will park. Vehicles parked partially on the running lane may lead to collisions with through traffic.



*RECOMMENDATION*

It is recommended that the gates be set back far enough so that a typical vehicle is completely off the carriageway while the driver is waiting for the gates to be opened.

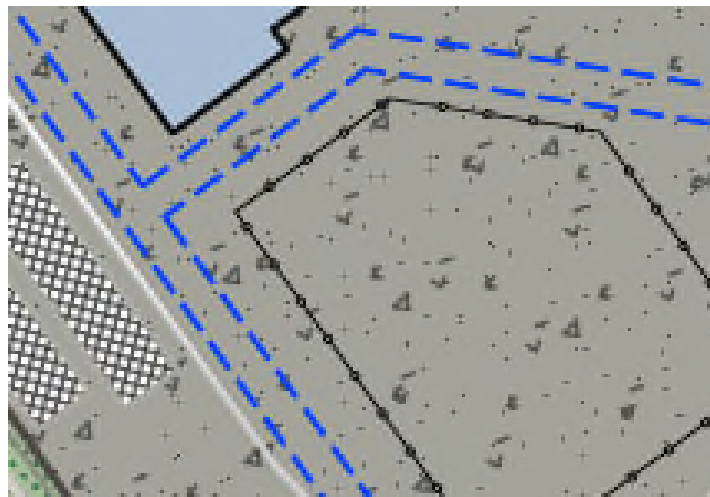
3.6 Problem

*LOCATION*

Drawing 17032-DR-RSA-S1 Rev 01

*PROBLEM*

The pedestrian routes through the yard are shown on the drawing. It is unclear if these routes are to be delineated with road markings and signage. Without adequate delineation pedestrians may stray from the prescribed routes and may put themselves at increased risk of being struck by moving machinery.



*RECOMMENDATION*

It is recommended that at the detailed design stage that pedestrian routes are clearly delineated.

## 4.0 Observations

### 4.1 Observation

It is unclear if there are any facilities for fuel storage and if so, how the fuel tanks are protected from errant vehicles if they are to be above ground.

### 4.1 Observation

There is no provision for a disabled parking bay, bicycle storage or electric vehicle charging.



## 5.0 Audit Statement

We certify that we have examined the site on the 10<sup>th</sup> February 2019. The examination has been carried out with the sole purpose of identifying any aspects of the design which could be added, removed or modified in order to improve the safety of the scheme.

The problems identified have been noted in this report together with associated safety improvement suggestions which we would recommend should be studied for implementation. The audit has been carried out by the persons named below who have not been involved in any design work on this scheme as a member of the Design Team.

**Norman Bruton**                      **Signed:** \_\_\_\_\_

**(Audit Team Leader)**            **Dated:** \_\_\_\_\_

**Owen O'Reilly**                    **Signed:** \_\_\_\_\_

**(Audit Team Member)**          **Dated:** \_\_\_\_\_

## Appendix A – Problem Location Map



## Appendix B

### **Information Supplied to the Audit Team**

- Drawing 17032-DR-RSA-S1 Rev 01

### **Information Supplied as Background Material**

- Site Location Map

## Appendix C

### Feedback Form

**SAFETY AUDIT FORM – FEEDBACK ON AUDIT  
REPORT**

Scheme: Machinery Yard, Naas

Stage: 1 Road Safety Audit

Date Audit (Site Visit) Completed: 10<sup>th</sup> February 2019

Paragraph No. in Safety Audit Report	Problem accepted (yes/no)	Recommended measure accepted (yes/no)	Alternative measures (describe)	Alternative measures accepted by Auditors (Yes/No)
3.1	Y	Y	Passively safe bollards will be installed in the verge. This reduction in available width between carriageway edge and fence will deter parking in the hard shoulder.	
3.2	Y	Y	The M7 Interchange Upgrade will be completed before the proposed development becomes operational. The existing M7 Slip Road will become a lightly trafficked local road and the risk of this conflict will reduce accordingly. However, measures to discourage the use of the hard shoulder as a deceleration land will be integrated into the detailed design.	
3.3	Y	Y	A risk assessment will be carried out for the road edge in accordance with TII Guidelines. A safety barrier or vehicle parapet will be incorporated into the detailed design based on the findings of this risk assessment.	
3.4	Y	Y	A risk assessment will be carried out for the road edge in accordance with TII Guidelines. Where the roadside boundary is within the clear zone and not passively safe, a safety barrier will be incorporated into the detailed design.	

3.5	Y	Y	The gate will be open at all times when the depot is operational. The gate had been set-back to 10m from the road edge to ensure adequate space is available for staff to turn-off the public road and park while opening the gate.	
3.6	Y	Y		

Signed... *Paul Bergin* .....  
**Design Team Leader**

**Date 19/02/19.**

Signed... *Norman Branton* .....  
**Audit Team Leader**

**Date**... 20/2/2019 .....

Signed.....  
**Employer**

**Date**.....