Our Ref: ABP-303726-19

Your Ref: Eamon McMahon

An Bord Pleanála

NRB Consulting Engineers
8 Leopardstown Business Centre
Ballyogan Avenue
Leopardstown
Dublin 18

Date: 12th April 2019

Re: A mixed-use development which includes a six-storey hotel, six-storey car park, five-storey residential building, three five-storey office buildings, two-storey cultural/performance centre, two-storey mixed-use restaurant/café/specialist retail building, new sea wall around the existing Trinity Wharf site, 64 berth floating marina and all other site infrastructure works and ancillary works. Trinity Wharf, Trinity Street, Wexford.

Dear Sir / Madam

An Bord Pleanála has received your recent submission in relation to the above mentioned proposed development and will take it into consideration in its determination of the matter. A receipt for the fee lodged is enclosed.

The Board will revert to you in due course with regard to the matter.

Please be advised that copies of all submissions / observations received in relation to the application will be made available for public inspection at the offices of Wexford County Council and at the offices of An Bord Pleanála when they have been processed by the Board.

More detailed information in relation to strategic infrastructure development can be viewed on the Board's website: **www.pleanala.ie**.

If you have any queries in the meantime, please contact the undersigned officer of the Board.

Please quote the above mentioned An Bord Pleanála reference number in any correspondence or telephone contact with the Board.

Yours faithfully,

Fergal Kilmurray
Executive Officer
Direct Line: 01-873 7247

Teil	**Tel**	(01) 858 8100
Glao Áitiúil	**LoCall**	1890 275 175
Facs	**Fax**	(01) 872 2684
Láithreán Gréasáin	**Website**	www.pleanala.ie
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64 Sráid Maoilbhríde
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www.nrb.ie

28 March 2019
19-031/ER

An Bord Pleanála
64 Marlborough Street
Dublin
D01 V902

HAND DELIVERED BY REGISTERED POST

Dear Sirs,

PROPOSED DEVELOPMENT AT TRINITY WHARF, TRINITY STREET, WEXFORD
Ref PL303726 - OBSERVATION/COMMENT TO AN BORD PLEANÁLA (ABP)

Submission Made by & On Behalf Of
This submission is made by Mr. Eoin Reynolds of NRB Consulting Engineers Limited, on behalf of Mr Eamon McMahon of McMahon Building Supplies, Trinity Street, Wexford. All correspondence on this matter should be addressed to NRB Consulting Engineers at the above address.

Subject Matter of The Submission or Observation
The submission relates specifically to the location and design of the proposed vehicular access from Trinity Street, deficiencies within the applicants submitted assessment, and in particular to Traffic Safety issues (the majority of which have been highlighted in the applicants own independent Road Safety Audit, but which have not been addressed through a revised access design). It is our view, as set out below, that the creation of a vehicular access, that safely addresses the issues raised, will actually require a complete redesign of an access junction, and possibly an access junction in a different location entirely.

Reasons, Considerations & Arguments Upon Which Submission is Based
These are set out in the main body of this Report and Associated Images and Drawings below and attached, and are based on our long-experience in road junction design and in the assessment of commercial developments of the nature proposed.

We enclose a cheque in the sum of €50 representing the cost of making this submission.

Our Submission is set out generally under the following Headings; -

1. Expertise of NRB Consulting Engineers & Experience of Author, Eoin Reynolds ,
2. Impact of Proposed Development upon Mcmahon Building Supplies Business,
3. Inadequacy/Issues within Applicant Transportation Assessment,
4. Road Safety Audit Observations and Problems,
5. NRB-Highlighted Road Safety Concerns,
6. Conclusions.

(1) Expertise/Experience of NRB Consulting Engineers Ltd & of Eoin Reynolds
NRB are specialist in the area of private sector Traffic/Transport and Road Design and do not provide advice on any other discipline of Consulting Engineering. We have developed designs for many roads, signalised junctions, priority junctions and roundabouts throughout Ireland, from feasibility through to construction. We have a good relationship and reputation with Local Authorities all over Ireland, including in Wexford, where we would likely be best known for our work on the planning and delivery of the Tesco Store on the Distillery Road site nearby to the subject scheme.

NRB are highly experienced in producing creative but practical roads solutions that balance often competing demands in sometimes complex urban environments. Working for major developers including retailers, we design junctions at planning stage that are most importantly safe, and that can also actually be built to operate appropriately and safely.

As examples of our expertise in these matters, in terms of Traffic Signal Controlled junctions, we have designed and implemented major signal junctions at Tesco Clare Hall on the Malahide Road, the upgrade of all traffic signal junctions in Maynooth Town to SCOOT as part of the Carton Park Retail Development, the Traffic Signal Controlled Junctions at Mahon Point Shopping Centre in Cork and also more recently all of the junction upgrade works around Liffey Valley Shopping Centre just completed and implemented.

NRB believe that traffic is a consequence of development and is something to be accommodated through good and **safe** design, rather than representing a barrier to development. NRB also recognise the importance of safety and ease of access for customers for successful operation of commercial developments.

Originally from Wexford, **Eoin Reynolds** is a Chartered Engineer with over 29 years experience in civil engineering projects. He specialises in the area of Traffic and Transportation and Roads Design - assessing the infrastructure needs of development. Eoin provides advice to both private sector and public sector clients on all aspects of roads, road safety, traffic and transportation, and mobility management. Eoin is expert in the use of Traffic Engineering Modelling Software (TRICS, ARCADY, PICADY, LINSIG, TRANSYT and Micro-Simulation Techniques). He has given expert evidence at planning appeals, oral hearings and public enquiries.

Eoin was previously Director of the Irish Office of Waterman Boreham Transport Planning and prior to that was Manager of the Belfast office of JMP Consultants Ltd (owners and managers of the TRICS Database). He is a noted Professional/Expert Witness in the field of Traffic/Roads & Road Safety.

The remainder of the Report is written in the 1st Person by Eoin Reynolds as author.

(2) Impact of Development on McMahon Building Supplies

It is important to note that our client supports the proposed development BUT the current proposed access arrangement will, in my opinion, have disastrous implications for his long established successful town centre business, in terms of premises access for stocking/supplies and deliveries, and in terms of availability and convenience of customer parking. An alternative and safe access, given the frontage, is likely available to the applicant.

The concerns in terms of the impact upon McMahons are clearly set out as ***Figure 1*** below;

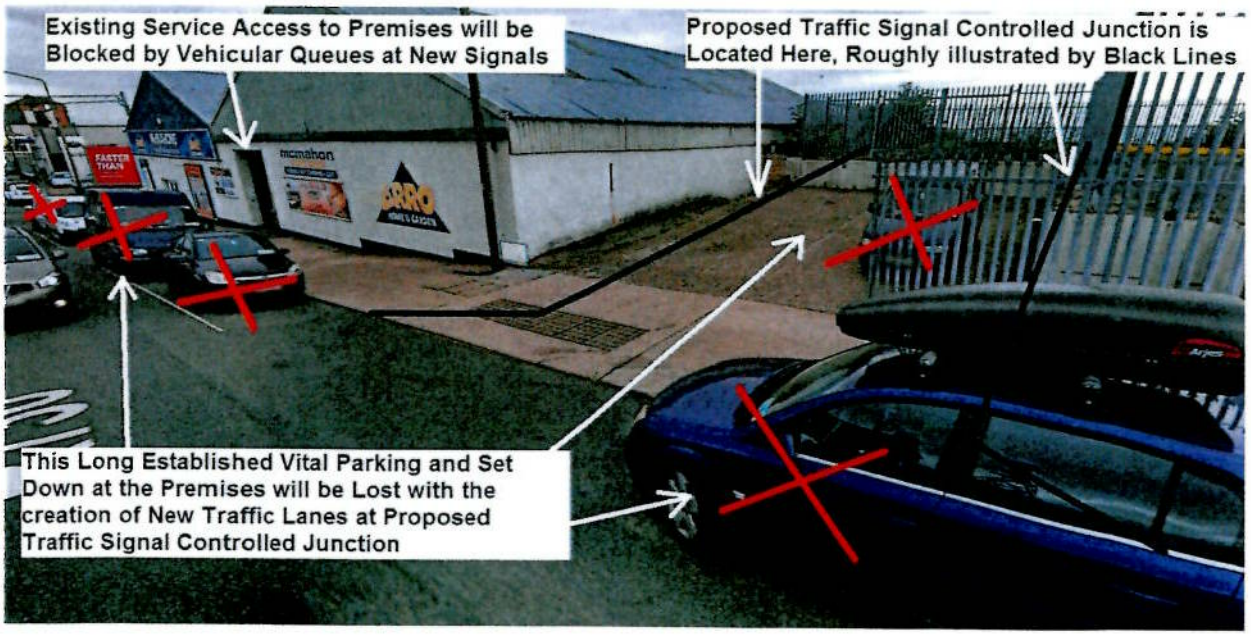


Figure 1 - Illustration of Impact upon McMahon Building Supplies

(3) Inadequacies/Issues with Transportation Assessment

I fully understand that reviewing and assessing the adequacy of Traffic/Transportation and Traffic Capacity Modelling is a specialist field, requiring experience that is not readily available to ABP in the consideration of planning applications of this nature. It can also be difficult to present any review of this nature, like this Report, in a coherent and readable manner.

Therefore my focus herein is on the proposed vehicular access junction, and clearly illustrating my concerns in terms of the applicants Transportation Assessment and the current inadequate and unsafe design. I am therefore restricting my comments to 'high level' rather than getting overly hung-up on detail (which I am willing to do, if necessary, subsequently), and the primary concerns are set out under specific sub-headings; -

3(i) - Traffic Survey Data

The Applicants Traffic Survey Data was undertaken during December 2016, supplemented by Validation Surveys in August 2018 (Reference Extract from Applicants Transportation Report Section 5.0 on Page 11, reproduced below as ***Figure 2***); -

> Traffic Surveys around Wexford Town were undertaken by Nationwide Data Collection (NDC) between Thursday, 1st December and Sunday, 3rd December 2016. The survey included 24-hour Automatic Traffic Counts (ATC) on Parnell Street, Trinity Street and William Street Lower, and a Junction Turning Count (JTC) at the Trinity Street / King Street / Paul Quay Junction during periods of peak traffic.
>
> Updated traffic surveys were carried out in 2018 by NDC which consisted of an ATC on Trinity Street and JTCs at the junctions of Trinity Street / William Street Lower / Fisher's Row and William Street / The Faythe between Thursday, 2nd August and Thursday, 9th August. These surveys where scheduled to capture peak seasonal traffic.

Figure 2 - Extract from Applicant TA Report

In my experience it represents best practice, and is a normal industry-standard requirement for critical Traffic Surveys of this nature to be undertaken during a Normal School Term. Traffic Surveys that are used in the assessment of developments of this nature are **NOT deemed acceptable** to be undertaken during school holidays OR during the Christmas period.

Regarding the December 2016 surveys; -

- This data dating from 2016 is very Old for use,
- It was collected during the Christmas Shopping Period when Traffic and Travel Patterns within Town Centres are very different than during a Normal Period,
- Our concerns are further highlighted by the fact that the ***Wexford Winterland*** Festival also takes place on the Wexford Quays during December and early January, and Travel patterns in & around the town alter very significantly due to this activity on the Quays just North of the subject site (evidence below as ***Figure 3***)

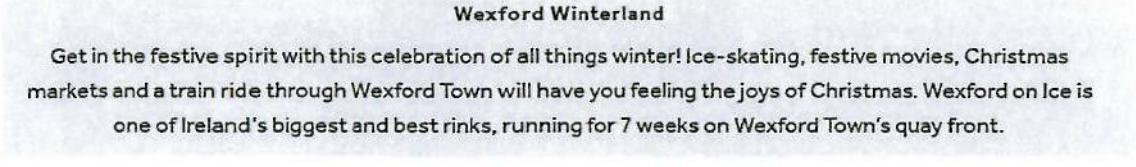


Figure 3 - Wexford Winter Wonderland Advert

Regarding the ***August 2018 Traffic Validation surveys***; -

- The first week of August is bang in the Middle of the School Holidays, in fact it is one of the most popular family holiday weeks, BUT there is no evidence whatsoever that traffic surveys in August are valid for use,

- Undertaking traffic surveys during Summer Holidays in the assessment of developments is highly irregular, in not deemed acceptable in terms of TII or Institution of Highways & Transportation Guidelines for Transportation Assessment, and I have never encountered this being undertaken before,

- Traffic Patterns during School Holidays are hugely different to normal term time, and

- Whilst there may be Seasonal Peaks in parts of Co. Wexford during August (for example, possibly in the middle of Rosslare Strand), there is no evidence whatsoever that they reflect a normal traffic pattern here on the vicinity of Trinity Street to the south of Wexford town.

I find it incredible that the assessment of this development, in Traffic and Transportation terms, has been based on Traffic Survey Data collected in December 2016 and in August 2018. I cannot understand why Valid and appropriate Traffic Surveys could not have been undertaken during other valid times (ie during Normal School Term).

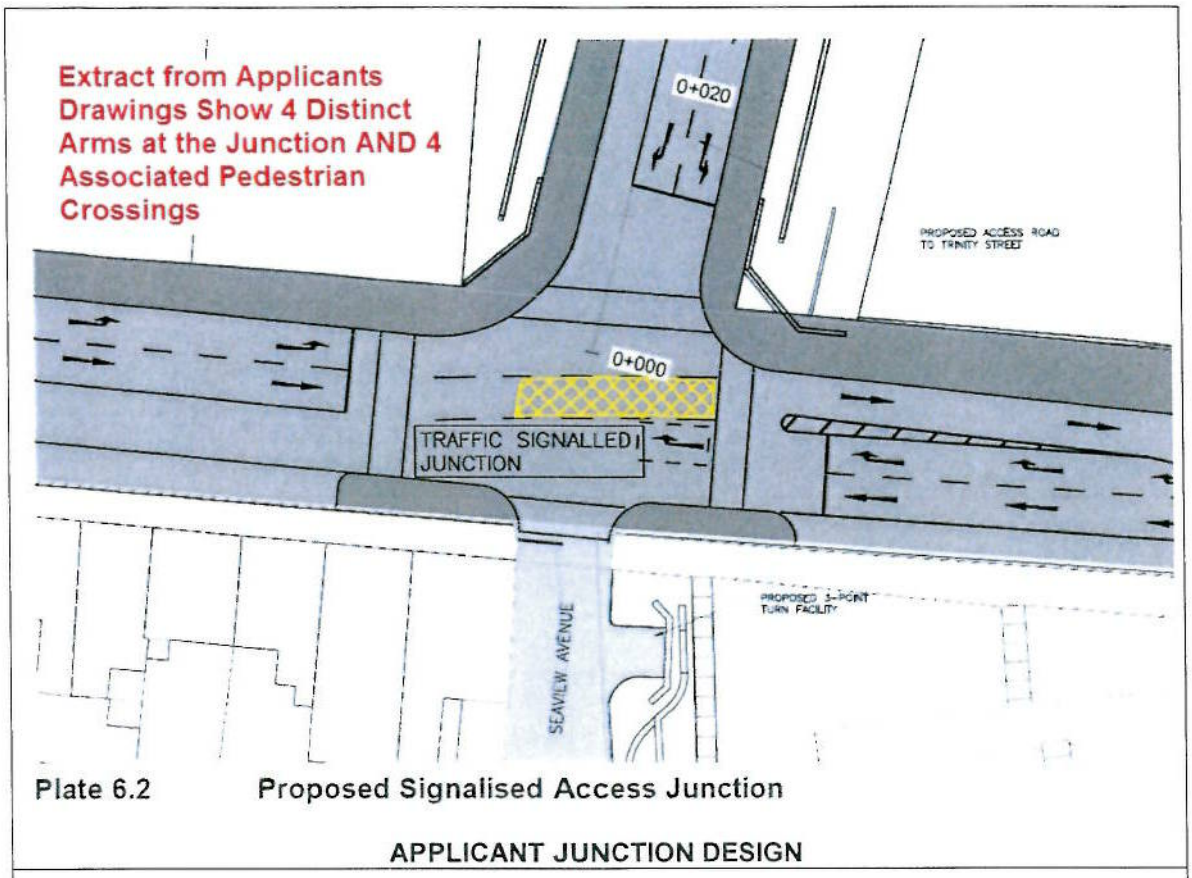
3(ii) - LiNSiG Traffic Capacity Assessment Modelling

I am considered expert in the use of LiNSiG, and as evidence and as an example, I have most recently myself built LiNSIG traffic models for all of the Broombridge LUAS Line traffic intersection junctions northwards from Dublin City Centre.

I appreciate that ABP may have some issues with the assessment & review of applicants LiNSiG Modelling, as it is such a particular specialist area, in terms of expertise available to ABP.

If necessary, I would therefore invite ABP to explore the accuracy of the applicants modelling through an independent 3rd Party Specialist review.

Based on my own review of the submission, there are very significant inadequacies and omissions, and some of these are illustrated simply in the extracted images below presented as ***Figure 4***; -



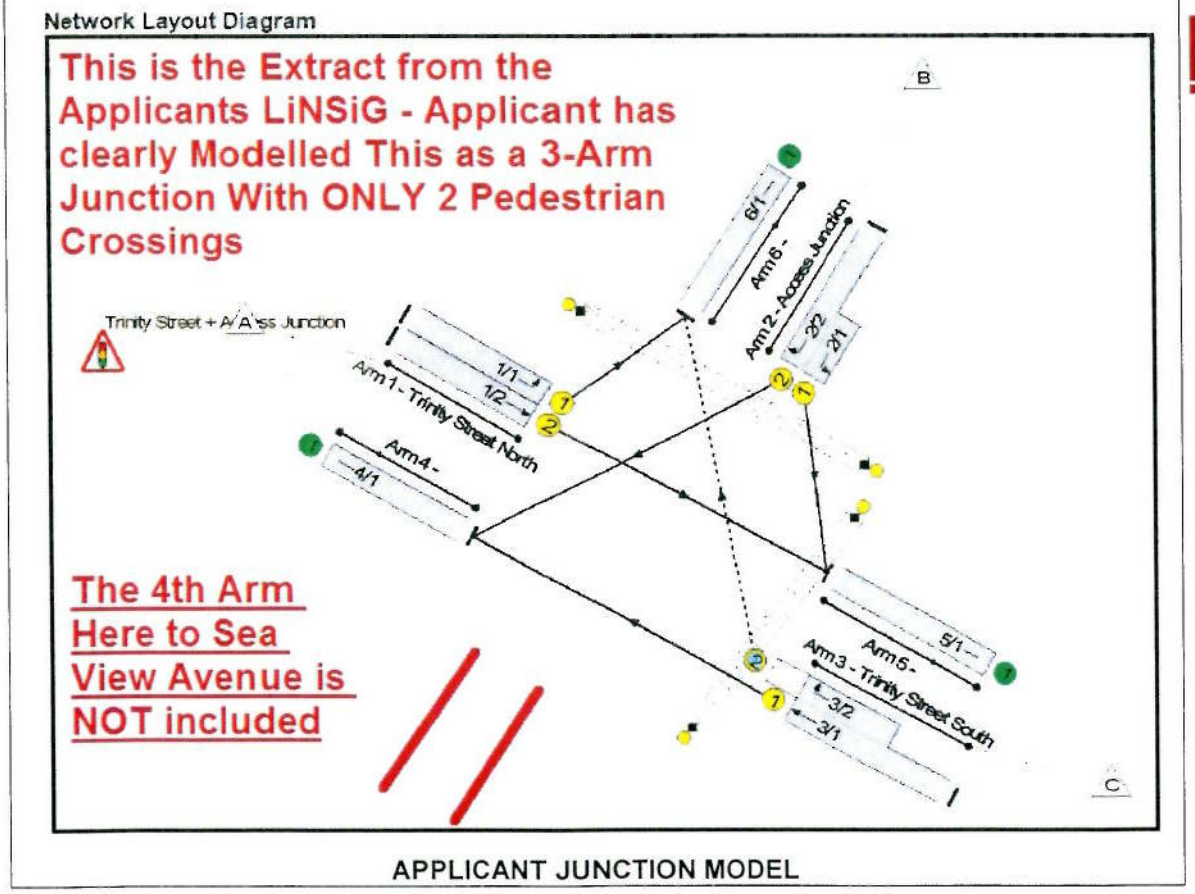


Figure 4 - Applicants Junction Design AND Associated LiNSiG Capacity Model (All Extracted Directly from the ROD TA Report)

My basic point illustrated, as simply as possible in ***Figure 4*** above, is that the LiNSiG Modelling undertaken clearly does not reflect the applicant-proposed junction design.

This is further confirmed through a review of the Junction LiNSiG "Stage" Diagram submitted which clearly shows ***NO PEDESTRIAN CROSSING OF 2 ARMS*** and ***NO SIGNAL STAGE FOR SEAVIEW AVENUE*** (As evidence Refer extract directly from the ROD Model Stage Diagram as ***Figure 5*** below)

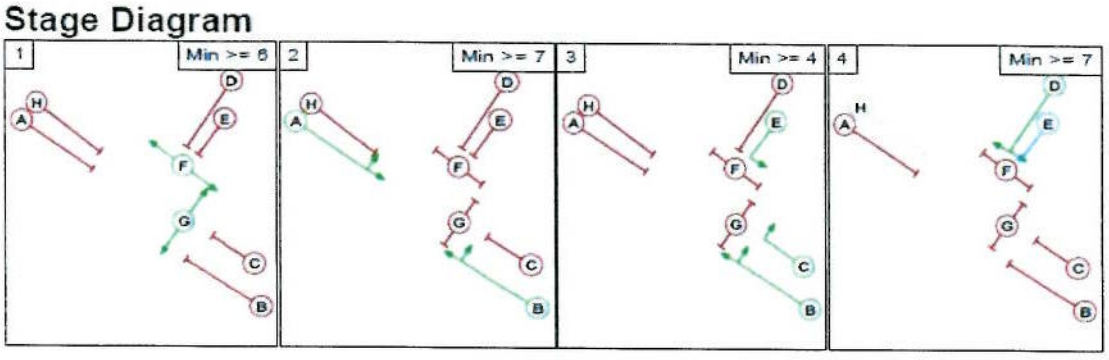


Figure 5 - ROD Stage Diagram (Clearly Shows No Ped Crossing of Trinity Street N or of Seaview Ave <u>AND</u> No Stage for Vehicles leaving Seaview Avenue)

The correct introduction of the 4th Arm into the capacity model, and the correct introduction of an all-red pedestrian phase, both of which are clearly illustrated in the Applicants Design, along with remedying other technical problems with the model which are difficult to explain in a coherent way (for example "cycle time", "inter-greens" and "stage minimums"), will have significant implications for Traffic Capacity and Modelled Traffic Queues and may have significant knock-on effects on traffic safety considerations.

In my opinion, and based on my own expertise in this area, the Traffic Capacity Assessment undertaken by the Applicant is therefore both erroneous and misleading to ABP and does not reflect what will actually occur in the event of a Grant of Planning.

3(iii) - Some Associated Traffic Safety Issues (More to Follow)

The inadequate and inaccurate modelling has potential further Traffic safety issues arising, some of which are addressed further below within my text and in the attached drawings.

We would also note in particular that the applicant has NOT illustrated any of the required traffic signal hardware such as Traffic Signal Primary and Secondary Poles, Filter Heads, Pedestrian Call Buttons and equipment, Tactile Facilities, Audible Equipment, Traffic Signal Control Boxes and Vehicle Detection Loops - All of which are in our experience basic and fundamental requirements for the safe and appropriate design of Traffic Signal Controlled Junctions of this nature.

<u>It should also be noted that the creation of a traffic signal junction at our clients premises at the service and collection entrance to his timber storage (Refer Figure 1) will in future require customers and large vehicle deliveries to cross 2 lanes of traffic immediately at a traffic signal junction, when traffic queues at the proposed stop-line will often physically prevent this occurring. This appears to have been totally ignored by the Applicants Design Team and indeed by the Road Safety Auditor.</u>

In my opinion, it has not been demonstrated by the applicant that the required traffic signal junction equipment can be accommodated safely, and this is clearly a Traffic Safety concern and is a matter that should be included in any planning application.

As an example - We note that the introduction of an Audible Mobility/Visibility Impaired on Call Pedestrian Crossing immediately beside long established private residential family homes (at their front door) will have significant nuisance and disturbance consequences for the residents - and this does not appear to have been addressed (illustrated in ***Figure 6*** below).

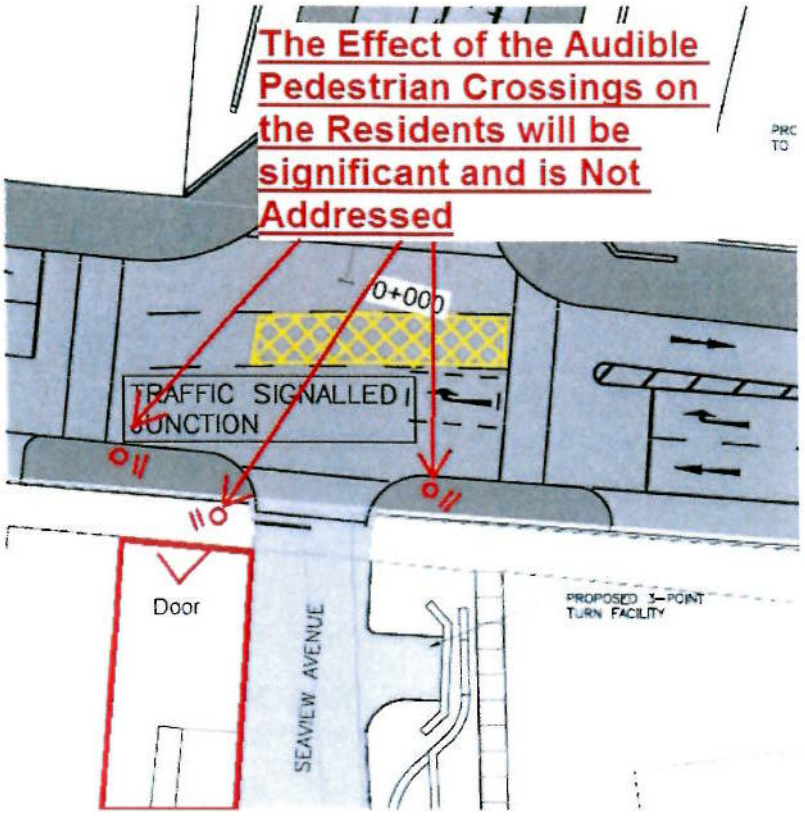


Figure 6 - Noisy Traffic Signal Equipment Not Shown

Notwithstanding the Noise Issue, people would be standing/queuing waiting to cross immediately outside the residents front door.

3(iv) - Various Other Items

Apart from the concerns set out above, I have identified significant other concerns under the following headings; -

- Traffic Generation and Appropriate use of the TRICS Database,
- Traffic Assignment and Distribution Methodology, and
- Implications for Long Vehicular Queues which have NOT been correctly modelled or illustrated. This is particularly of concern when there is interaction with a Mainline Rail at-grade crossing where long car queues in particular can lead to driver frustration and associated poor driver behaviour, with significant consequences for public safety.

(4) Road Safety Audit Observations and Problems

A Road Safety Audit is an independent and specialist review of a design which is done to ensure the highest standards are achieved in terms of Road Safety Practices. Responsible roads design by qualified Engineers is achieved through the full application of modern Design Guidance Principles and through the commissioning of follow-on specialist independent Road Safety Audits of said-design. **Design Standards/Guidelines for Roads, such as the TII "Design Manual for Roads & Bridges" (DMRB) are not there to allow sections to be 'cherry picked' by Professionals, applying some sections, and ignoring others. Similarly, Designers of course need to have due regard for Statutory Roads Legislation.**

The Correct Application of these procedures has proven successful in contributing to minimising the frequency and severity of road traffic accidents in Ireland over the past number of years.

The **normal** and **accepted** course of events is that a Stage 1 Preliminary Design is submitted for Audit, and following on from the Audit recommendations and Feedback, amendments are made to the design to address the safety concerns raised.

Having reviewed the Applicants Documents in this case we note that the ROD Report states the following; -

"All issues raised in the Road Safety Audit have been accepted so the proposed development will be satisfactory in terms of traffic operations and safety"
(Refer Section 11 ROD Report reproduced below as Figure 7)

11.0 ROAD SAFETY AUDIT

A Stage 1 Road Safety Audit has been carried out in accordance with Transport Infrastructure Ireland's (TII) Publication GE-STY-01024 – Road Safety Audit and included in ***Appendix H: Road Safety Audit Report***. All issues raised in the Road Safety Audit have been accepted so the proposed development will be satisfactory in terms of traffic operations and safety.

Subject to planning approval a Stage 2 Road Safety Audit will be carried out on the detailed design and a Stage 3 Road Safety Audit will be carried out in the constructed scheme.

Figure 7 - Extract Section 11 of ROD Report

Notwithstanding this statement by ROD, based on my review of the information, there appears to be no evidence that they have either accepted the Safety Audit Recommendations OR more importantly revised or supplemented the design to address the Auditors valid concerns.

Road Safety Audits are very strict and formal procedures (For National Roads in particular they have a Statutory Basis), and their correct implementation requires the Auditor and Designer to formally Sign Off on the Feedback Form. They also strictly require a Designer to amend their design to address the Audit. The design needs to be amended in order to clearly and unequivocally show that the safety-concern remedy can be accommodated safely on lands within 1st Party Control. In my recent experience, in the event of a traffic Accident, and particularly for fatal traffic accidents, Safety Audits are now often tracked and referenced by investigators to ensure the Audit Process and Recommendations were adhered to.

The Applicant does not appear to me to have adhered to these Audit procedures; -

- The Submitted Feedback Form appears Unsigned by Both The Auditor AND Designer (Copy of same extracted from the ROD Report enclosed as ***Appendix A***),

- The Myriad of Safety Problems with the Proposed Junction are correctly, clearly and unequivocally identified by the Auditor on a Drawing which the Auditor enclosed with the independent Audit (copy reproduced herein for convenience within ***Appendix A***). We have also identified other safety issues and departures from Design Standards which the Auditor appears to have overlooked, and

- There appears to have been no attempt whatsoever to address these significant safety issues by the Applicant Design Team through a revised access design. These are issues which have significant implications for public safety and in our experience they cannot simply be dismissed as "Detailed Design issues", as they are of such a fundamental nature.

I believe that the combination of all of these legitimate safety issues raised by the Auditor, combined by ones we identify, means that the proposed junction cannot in fact be constructed in a safe manner in this location given the constraints, without very significant design alteration that would impact upon the entire proposed development layout.

(5) NRB Highlighted Road Safety Concerns

I have undertaken my own review of Traffic Safety issues, to supplement the issues raised by the Auditor. These are set out on the Drawings enclosed as ***Appendix B***; -

- Drawing NRB-AP-001 clearly illustrates other Traffic Safety issues associated with the Applicant Proposed Junction, many of which are not easily addressed (if indeed they can be addressed in the current junction location). This drawing highlights many fundamental design deficiencies in the proposed junction layout, in terms of the application of Road Traffic Legislation, Current Roads Design Guidance and Best Practice. Our drawing includes specific reference to the relevant Legislation and Guidance and we would invite ABP to study this carefully

- We enclose the Signals Inter-visibility design Guidance Extract from the Applicable TII DMRB Roads Design Guideline as ***Appendix C*** - Signal Inter-visibility is a key and fundamental safety/design requirement for signal junctions that can very often overlooked by signal junction Designers at Planning Stage. In the particular circumstances of Seaview Avenue, with a private house boundary wall abutting the mouth of the junction, it is in our view demonstrably **not** possible to meet the Statutory Guidance inter-visibility requirements. The Intervisibility Envelope also Clearly Runs through the walls of our clients premises (McMahons) on the opposite side of Trinity Street. This means that a safe standard traffic signal controlled junction **cannot** be delivered here without very significant design alteration **AND** Knock-on implications in terms of its location and design. This issue is depicted for ease of reference in the extract from our drawing included below as ***Figure 8***,

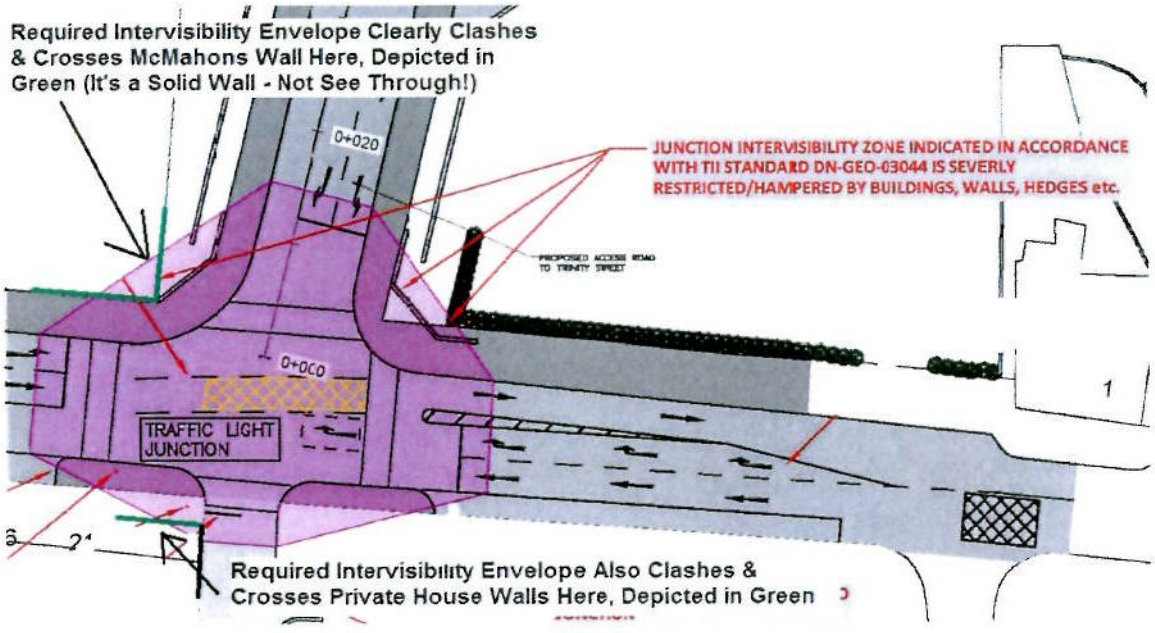


Figure 8 - Traffic Signal Junction Inter-Visibility

- Drawing NRB-AP-002 clearly illustrates that the design as currently proposed is deficient in terms of the Swept Path of Vehicle Types, with vehicles clashing with lanes in an unsafe manner.

- I would also highlight that a refuse lorry or fire tender will be unable to turn in a safe and appropriate manner within the current proposed turning head on Seaview Avenue - this will therefore require unsafe blind-reversing of these vehicles unexpectedly in the middle of a town centre Traffic Signal Controlled Junction.

(7) Conclusion

This Report and Review of the Application has identified significant issues associated with the current proposed design of the access to the subject site. I have concerns with the Traffic Survey data, the Transportation Assessment, the Junction Analysis submitted - BUT most importantly, in my opinion, very significant Roads Legislation, Design Deficiencies & Traffic Safety Issues have not been addressed.

In my opinion, these are of such a scale that they should not be left to Detailed Design Stage and cannot be dealt with by Planning Condition as they are matters of public safety and addressing them will in my opinion require a complete redesign of the access.

The access to, and day-to-day operation of, our clients premises, McMahons, will be disastrously affected by the current proposals, and the current operation of McMahons business appears to have been ignored by the Applicant.

The Traffic Signal Controlled Junction as proposed is demonstrably deficient in terms of the application of Roads Legislation and Roads Design Guidelines, with significant safety related issues identified both in the Applicants Safety Audit and herein.

In the absence of a significant redesign of the proposed vehicular access to provide a safe solution, fully compliant with Roads Legislation & Professional Roads Design Guidance, we would invite An Bord Pleanála to refuse planning permission for the proposed development.

Yours sincerely,

Eoin Reynolds
Chartered Engineer
Director

cc Mr Eamon McMahon (McMahons Building Supplies)

Enclosures

Appendix A	Road Safety Audit Feedback Form & Drawing prepared by Auditor ✓
Appendix B	NRB Drawings NRB-AP-001 and NRB-AP-002 ✓
Appendix C	Traffic Signals Design Guidance Extract from TII's Design Manual for Roads and Bridges Reference DNGEO-03044-02 ✓

Cheque Enclosed in the Sum of €50 Representing Cost of Observation (as per Telephone Conversation confirming acceptability of Same on 27th March 2019) ✓

APPENDICES - CONTENT

A	Copy of Applicants Road Safety Audit Feedback Form AND Auditors Drawing Highlighting Safety Problems
B	NRB Drawings NRB-AP-001 and NRB-AP-002
C	Traffic Signals Design Guidance Extract from TII's Design Manual for Roads and Bridges Reference DNGEO-03044-02

NRB consulting engineers

APPENDIX A

Copy of Applicants Road Safety Audit Feedback Form AND Auditors Drawing Highlighting Safety Problems

Road Safety Audit Feedback Form

Scheme: Proposed Trinity Wharf Development in Co. Wexford

Route No.: R730

Audit Stage: Stage 1 Road Safety Audit **Date Audit Completed:** 06/12/18

	To Be Completed By Designer			To Be Completed By Audit Team Leader
Paragraph No. in Safety Audit Report	Problem Accepted (Yes/No)	Recommended Measure(s) Accepted (Yes/No)	Describe Alternative Measure(s). Give reasons for not accepting recommended measure	Alternative Measures or Reasons Accepted by Auditors (Yes/No)
3.1				
3.2				
3.3				
3.4				
3.5				
3.6				
3.7				
3.8				
3.9				
3.10				
3.11				
3.12				
3.13				

Signed: _____ Designer **Date** _____

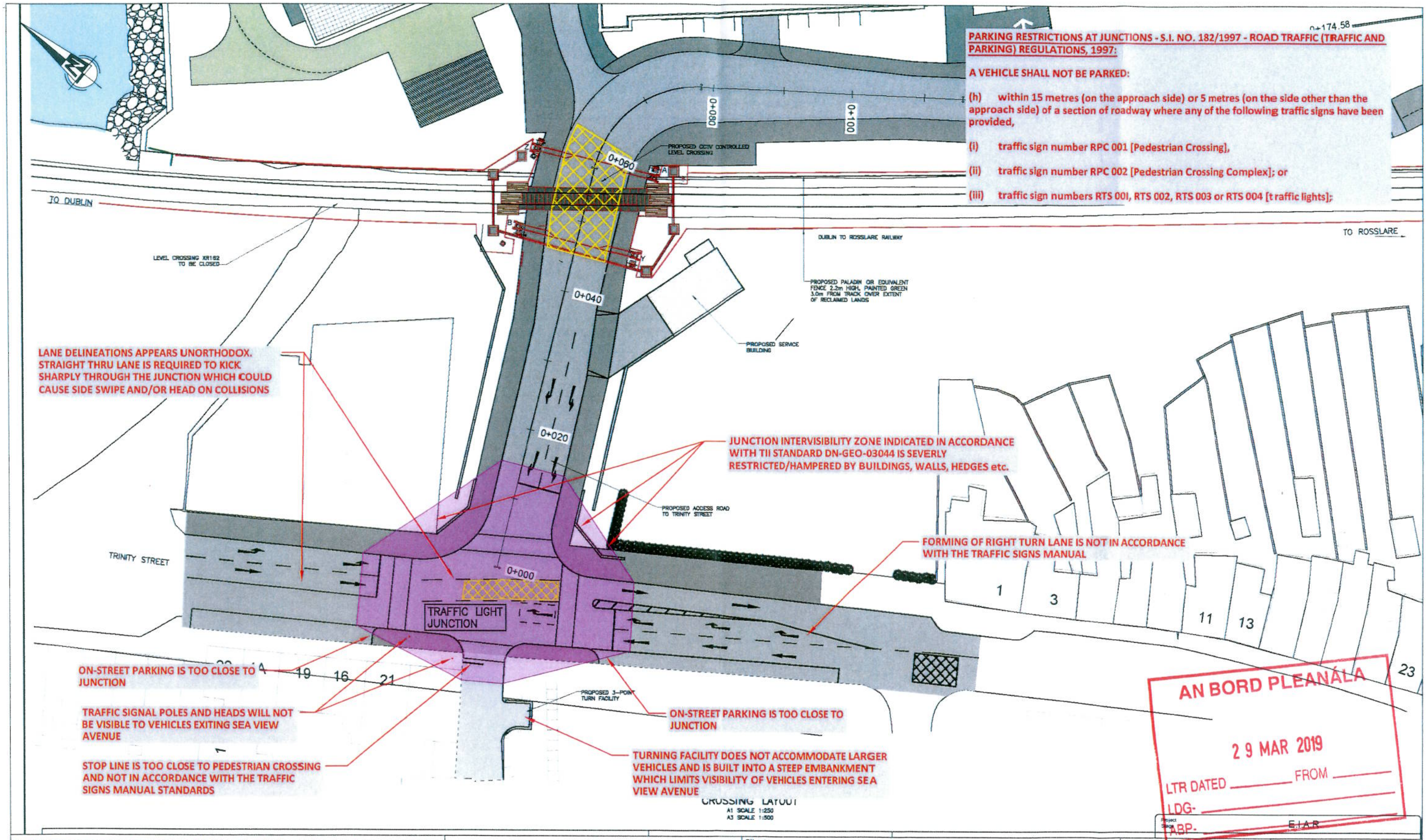
Signed: _____ Audit Team Leader **Date** _____

Signed: _____ Employer **Date** _____

NRB consulting engineers

APPENDIX B

NRB Drawings NRB-AP-001 and NRB-AP-002



NRB Consulting Engineers Ltd recommend that Road and land ownership boundaries are verified through Legal & Land searches by the Client.

This drawing is based upon a scanned copy of Roughan O'Donovan drawing 4004.9. NRB Consulting Engineers Ltd shall not be liable for any inaccuracies or deficiencies.

REV	DATE	AMENDMENTS	DRAWN	CHK	APP

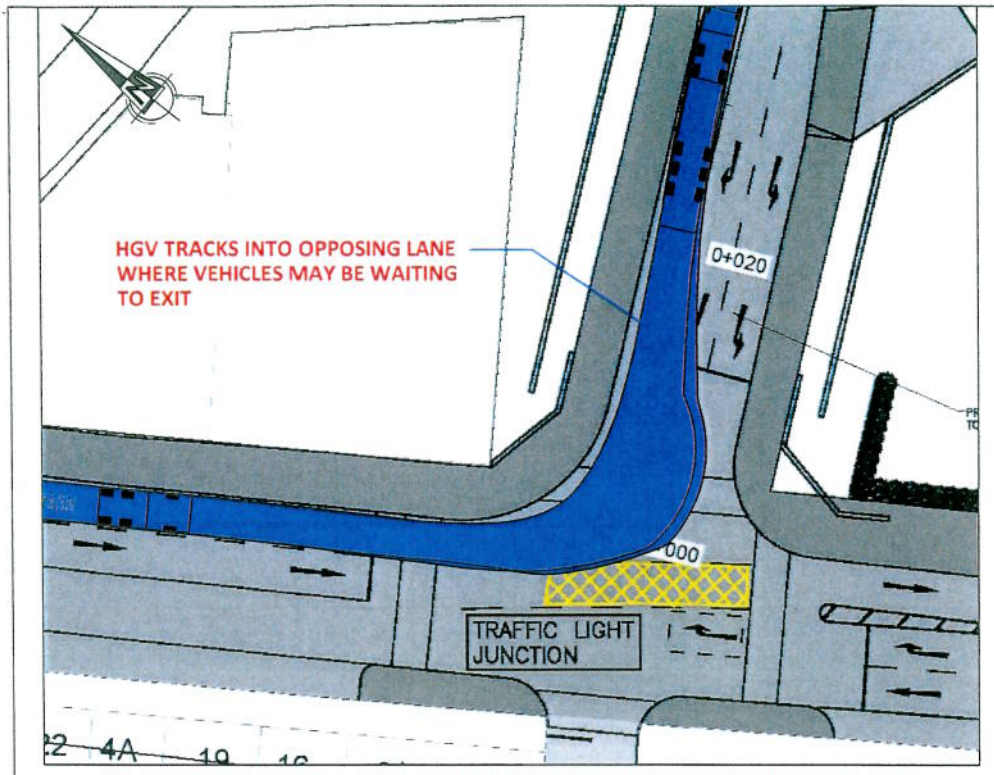
NRB Consulting Engineers Ltd
8 Leopardstown Business Centre
Ballyogan Avenue
Leopardstown
Dublin 18

Phone/Fax: +353 1 292 1941
Email: info@nrb.ie
Web: www.nrb.ie
Registered in Ireland No. 491679

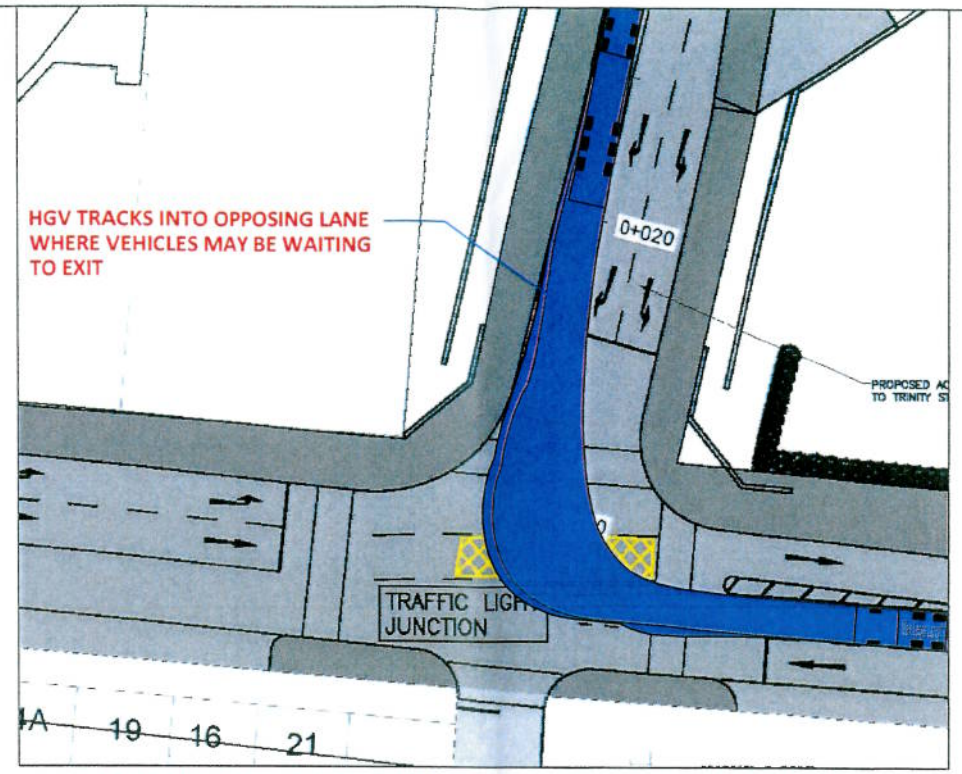
Client		Project No. 19-031	Drawing No. NRB-AP-001
Project	Trinity Street Wexford	Drawn PB / Checked ER 27/03/19 / Approved ER 27/03/19	
Title	Notes on Proposed Junction Layout	Date 26-Mar-19	Scale @ A3 1:500 / Rev -

NRB Consulting Engineers Ltd accept no responsibility for any unauthorised amendments to this drawing. Only figured dimensions to be worked to

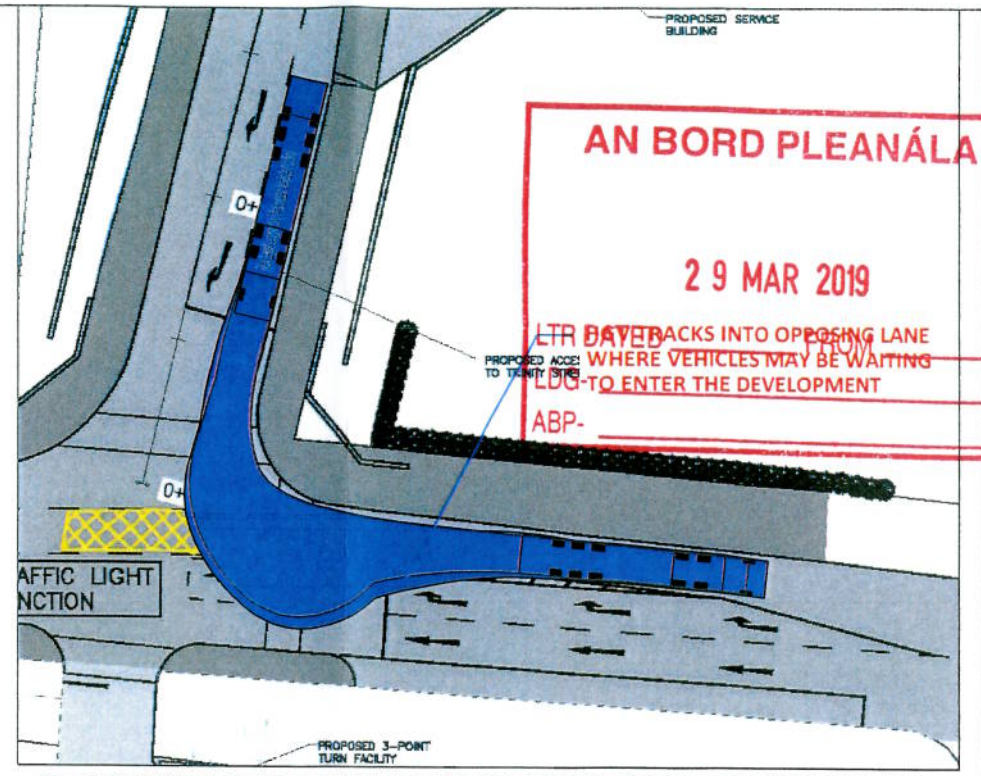
Purpose of Issue: ☐ Draft ☐ Information ☐ Approval ☐ As Built ☐ Tender ☐ Construction



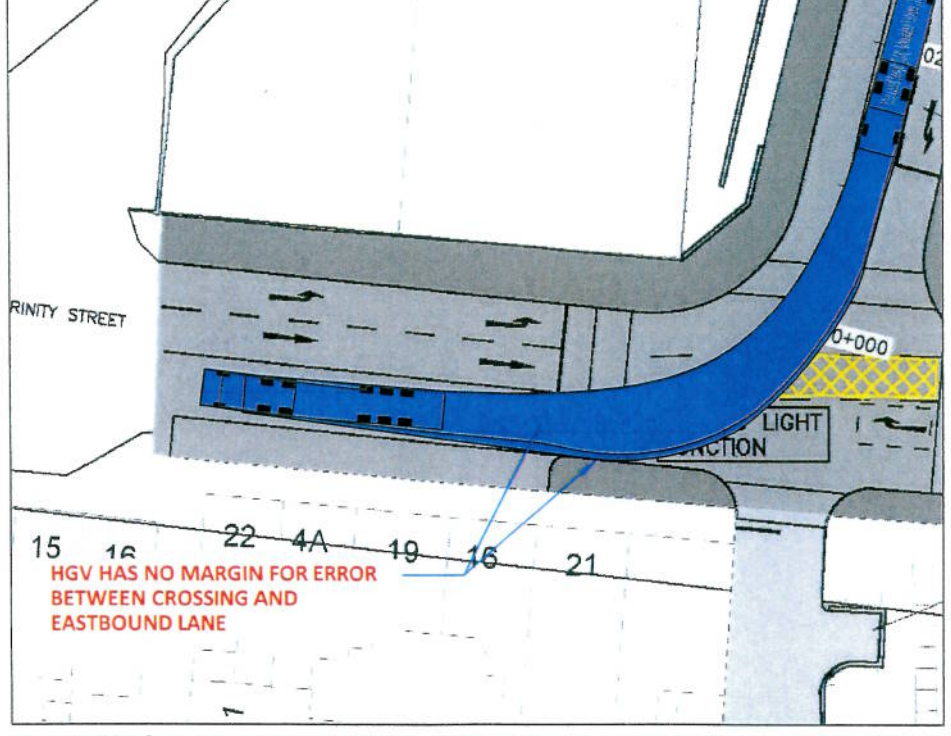
IT APPEARS THAT A HGV CANNOT MAKE THE LEFT IN TURN TO THE PROPOSED DEVELOPMENT



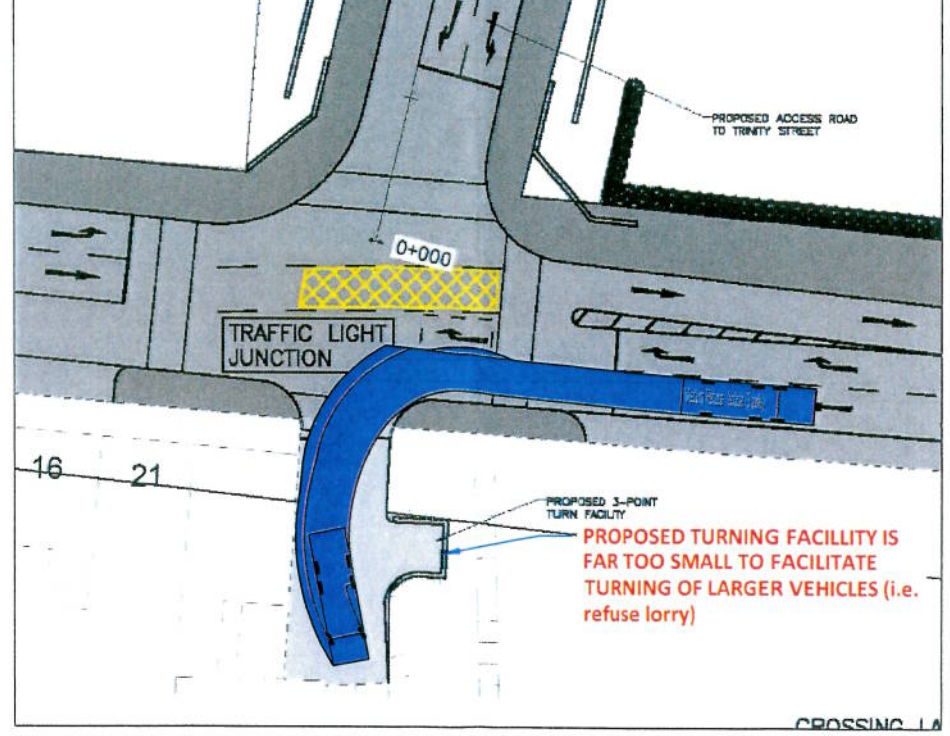
IT APPEARS THAT A HGV CANNOT MAKE THE RIGHT IN TURN TO THE PROPOSED DEVELOPMENT



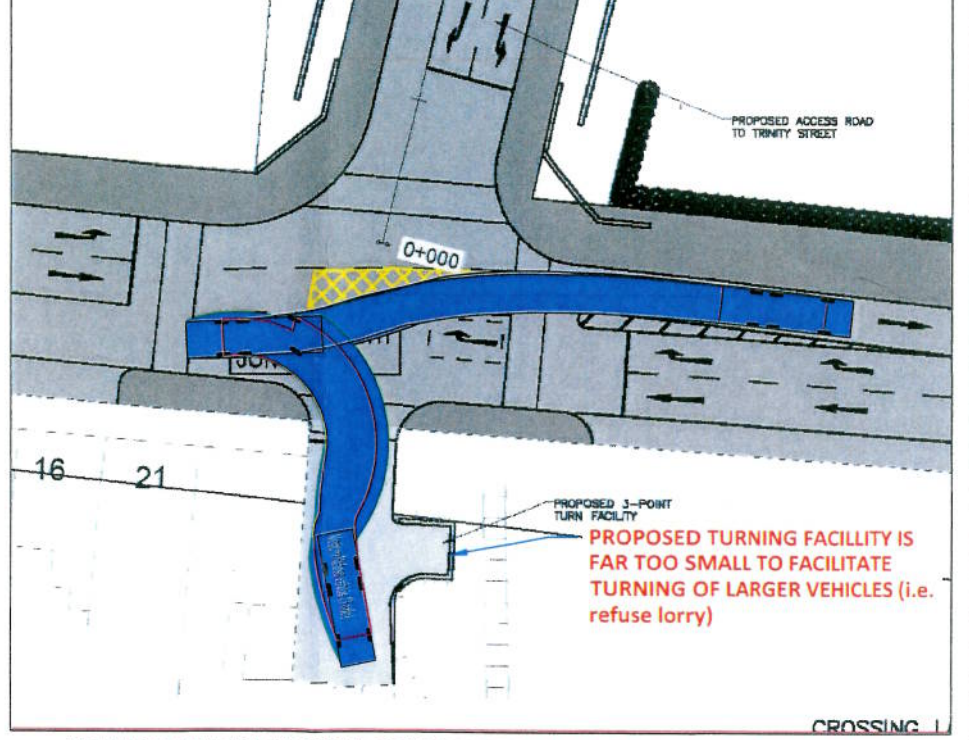
IT APPEARS THAT A HGV CANNOT MAKE THE LEFT OUT TURN FROM THE PROPOSED DEVELOPMENT



IT APPEARS THAT A HGV CANNOT JUST BARELY MAKE THE RIGHT OUT TURN FROM THE PROPOSED DEVELOPMENT WITH MINIMAL MARGIN FOR ERROR



REFUSE VEHICLES WILL NOW BE REQUIRED TO ENTER SEA VIEW AVENUE AS IT IS ILLEGAL FOR A VEHICLE TO SETDOWN IN A JUNCTION



REFUSE VEHICLES WILL NOW BE REQUIRED TO REVERSE INTO THE PROPOSED JUNCTION MAKING A SERIOUSLY UNSAFE MANOEUVRE

NRB Consulting Engineers Ltd recommend that Road and land ownership boundaries are verified through Legal & Land searches by the Client.

This drawing is based upon a scanned copy of Roughan O'Donovan drawing 4004.9. NRB Consulting Engineers Ltd shall not be liable for any inaccuracies or deficiencies.

REV	DATE	AMENDMENTS	DRAWN	CHK	APP

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Client		Project No. 19-031		Drawing No. NRB-AP-002
Project	Trinity Street Wexford	Drawn PB	Checked ER 27/03/19	Approved ER 27/03/19
Title	AutoTRACKs at Proposed Junction Layout	Date 27-Mar-19	Scale @ A3 1:500	Rev -
NRB Consulting Engineers Ltd accept no responsibility for any unauthorised amendments to this drawing. Only figured dimensions to be worked to.		Purpose of Issue ☐ Draft ☐ As Built ☐ Information ☐ Tender ☐ Approval ☐ Construction		

NRB consulting engineers

APPENDIX C

Traffic Signals Design Guidance Extract from TII's Design Manual for Roads and Bridges Reference DNGEO-03044-02

2.9 The visibility requirements for pedestrians using crossings are contained in **Chapter 4** of this document.

Junction Intervisibility Zone

2.10 The junction intervisibility zone is the area identified for the purpose of assessing visibility within the junction between drivers at each stop-line, or between drivers and pedestrians and facilitates identification of measures to mitigate the effect of obstructions. The junction intervisibility zone is defined as the area bounded by measurements from a distance of 2.5m behind the stop-line extending across the full carriageway width for each arm as indicated in **Figure 2/2**. If an Advance Stop-Line is provided **[See Figure 4/3]** the intervisibility zone is measured from a point 2.5m behind the cyclists' stop-line. This is because the cycle reservoir behind the Advance Stop-Line does not create any physical impediment to intervisibility.

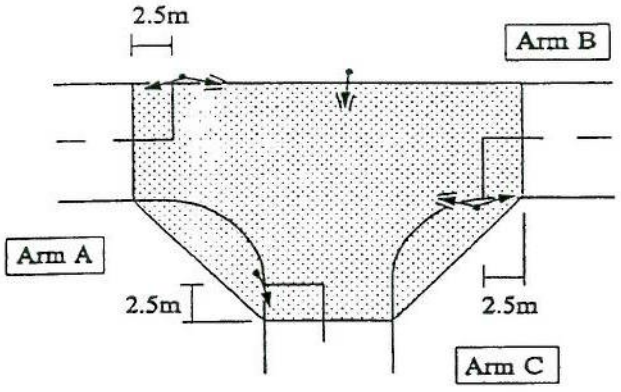

Figure 2/2: Junction Intervisibility Zone (without crossings)

2.11 To ensure that drivers of all vehicles on each entry lane are able to see the full extent of the pedestrian crossing (and its approach) the junction intervisibility zone should be extended, where necessary, to include the full width of the strip of tactile paving laid parallel to the edge of carriageway, as indicated on Arm A of **Figure 2/3**.

2.12 **Chapter 5** provides further examples to illustrate the junction intervisibility zones for a number of junction arrangements. At a staggered junction the layout will result in two independent junction intervisibility zones **[See Figures 5/6 and 5/7]**, however as the stagger length reduces the junction intervisibility zones will overlap, forming a single junction intervisibility zone.

2.13 Where a staggered pedestrian crossing is provided **[See Figure 5/3]**, the section of the crossing immediately adjacent to the junction should be included in the junction intervisibility zone. The junction intervisibility zone need not be extended to include a displaced pedestrian crossing which is remote from the main junction **[See Figure 5/1]**.

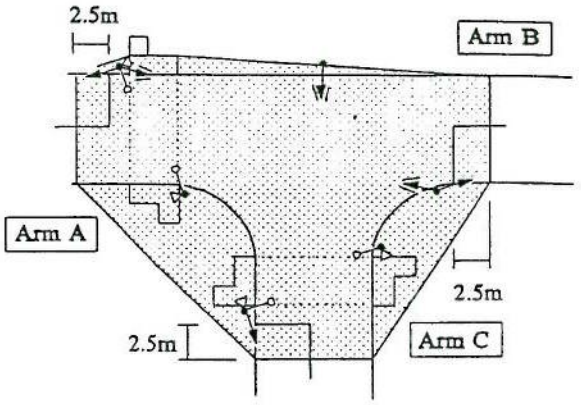

Figure 2/3: Junction Intervisibility Zone (with crossings)

Junction Intervisibility

2.14 Due to the control imposed on drivers, the visibility requirements measured from the stop-line for signal-controlled junctions are not as onerous as those for major/minor priority junctions **[See paragraph 7.6, TD 42 (DMRB 6.2.6)]**. It is essential however to provide adequate intervisibility for drivers at each stop-line, and between drivers at a stop-line and each of its associated exit lanes (and pedestrian crossings), to permit manoeuvres to be completed safely once the driver has entered the junction intervisibility zone. **Paragraphs 1.5 to 1.7** provide advice regarding installation of signal control at existing priority junctions.

2.15 Adequate intervisibility ensures a level of safety for all road users of the junction. Designers should aim to achieve the greatest level of intervisibility for both drivers and pedestrians within the junction intervisibility zone and it is important to consider the

General Problem 3.2: Insufficient swept paths

General Problem 3.3: Information regarding bicycle parking bays not provided to the Audit Team.

General Problem 3.4: Visibility at internal junctions and pedestrian crossings may be reduced or impacted by the location of proposed trees.

Problem 3.11: Insufficient space for drivers wishing to park in the end parking bays.

Problem 3.12: Pedestrians and cyclists may conflict with reversing vehicles at the marina.

Problem 3.9: Unclear if sufficient forward visibility is achieved to queueing vehicles exiting the development.

Problem 3.5: Perpendicular parking bays may result in drivers unintentionally driving against one-way traffic

Problem 3.6: Parking bays may lead to vehicles overhanging the adjacent kerbline, and reducing the effective width of the footway.

Problem 3.10: Vertical gradient on development access may limit visibility.

Problem 3.13: Drivers may enter the shared cycle/pedestrian footway at the development's southern extents

Problem 3.8: Southbound drivers travelling straight-ahead may sight onto the opposing right turn lane, leading to head-on collisions.

Problem 3.5: Discontinuous cyclists and pedestrian facilities.

Problem 3.1: Unclear if sufficient turning space provided within Seaview Avenue.