

Norfolk Boreas Offshore Wind Farm **Technical Note: Entrance and Egress onto the B1145**

Applicant: Norfolk Boreas Limited
Document Reference: ExA.AS-5.D14.V1
Deadline 14

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Author: Royal HaskoningDHV

Photo: Ormonde Offshore Wind Farm

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25/08/2020	01F	Final version for Deadline 13	RE	GD/VR	JL



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Glossary of Acronyms

AILs	Abnormal Indivisible Loads
CPC	Cawston Parish Council
DCO	Development Consent Order
HGV	Heavy Goods Vehicle
HIS	Highway Intervention Scheme
HP3	Hornsea Project Three
MfS	Manual for Streets
OFH2	Open Floor Hearing 2 held 2 nd July 2020
OFH3	Open Floor Hearing 3 held 16 th July 2020
OTMP	Outline Traffic Management Plan

1 Introduction

1. This Technical Note has been produced in response to concerns raised by the resident of Whitehouse Farm who currently experiences restricted visibility when exiting the private access onto the live carriageway on High Street, Cawston
2. The resident's concerns were two-fold;
 1. Due to the current restricted visibility the resident has to encroach onto the live carriageway to obtain enough forward visibility to egress which is an inherent safety concern – would this be made worse by the Cawston Highway Intervention Scheme (HIS)?
 2. Would the realignment of the High Street restrict visibility from the Chapel Street give way, to an extent that this would encourage dangerous turning manoeuvres onto the High Street in the vicinity of Whitehouse Farm?
3. A site visit was undertaken on 31st of July by the Applicant to meet with the resident of Whitehouse Farm to discuss the concerns. To aid the discussions a series of visibility technical drawings were presented.
4. After the site visit meeting, the resident requested additional details and amendments to the drawings presented. Thus, this Technical Note presents the amended drawings and a description of the contents depicted within. Explanatory text to accompany the requested additional drawings was provided to the resident on the 13th August 2020. The explanation provided forms the basis of this technical note.

1.1 Guidance

5. The visibility splays and Stopping Sight Distances (SSD) presented within the technical drawings contained within this Technical Note has been produced in line with the Manual for Streets (Chartered Institution of Highways and Transportation, 2007) Manual for Streets (Chartered Institution of Highways And Transportation, 2010) guidance documents. Manual for Streets (MfS) is predominantly used for the design, construction, adoption and maintenance of residential streets where the posted speed limit is 40mph or under.

2 Technical Drawings

2.1 Drawing TP-PB564-DR061 – Existing Eastbound Forward Visibility (30mph)

6. Technical drawing TP-PB564-DR061 (Appendix 1) illustrates the existing eastbound forward visibility for the current 30 mph posted speed limit. The required SSD of 43m is presented in accordance with the MfS guidance. It can be observed that the requisite forward visibility to a vehicle leaving Whitehouse Farm is could have the potential to be obstructed by a vehicle which is travelling westbound.

2.2 Drawing TP-PB564-DR062 – Existing Whitehouse Farm Access Visibility (30mph)

7. Technical drawing TP-PB564-DR061 (Appendix 2) illustrates the existing Whitehouse Farm access visibility for the current 30mph posted speed limit without the HIS. It can be observed that:
- The current achievable visibility distance to the north west is 14.8m which is lower than the MfS SSD guidance of 43m; and
 - A vehicle is required to encroach onto the carriageway by 1m to achieve the requisite 30mph visibility (43m) for an eastbound HGV.

2.3 Drawing TP-PB5864-DR065 – HIS Eastbound Forward Visibility (20mph)

8. Technical drawing TP-PB564-DR065 (Appendix 3) illustrates the eastbound HGV forward visibility for a 20mph safe stopping distance of 27m with the Highway Intervention Scheme (HIS) in place. The approaching HGV is placed at the ‘yield point’ as depicted in the drawings in the Outline Traffic Management Plan (OTMP) [REP10-016]. It can be observed that:
- The requisite forward visibility to a vehicle leaving Whitehouse Farm is achieved; and
 - A vehicle waiting at the yield point has clear visibility to a vehicle leaving Whitehouse Farm.

2.4 Drawing TP-PB564-DR066 – HIS Whitehouse Farm Access Visibility (20mph)

9. Technical drawing TP-PB564-DR066 (Appendix 4) illustrates the visibility for a vehicle leaving Whitehouse Farm with the HIS in place. It can be observed that:
- A vehicle is required to encroach onto the carriageway by 1.7m to achieve the requisite 20mph visibility (27m) for an eastbound HGV; and
 - A similar length of encroachment is required to see a vehicle at the yield point.

2.5 Drawing TP-PB564-DR067 – Existing Whitehouse Farm Access Visibility (20mph)

10. Technical drawing TP-PB564-DR066 (Appendix 5) illustrates the visibility for a vehicle leaving Whitehouse Farm for the current situation. It can be observed that a vehicle is required to encroach onto the carriageway by 1.7m to achieve the requisite 20mph visibility (27m) for an eastbound HGV.

2.6 Drawing TP-PB564-DR017 – F3.0

11. Technical drawing TP-PB564-DR017 (Appendix 6) illustrates the requisite 20mph visibility for Chapel Street with the HIS in place. There is clear visibility for a 20mph

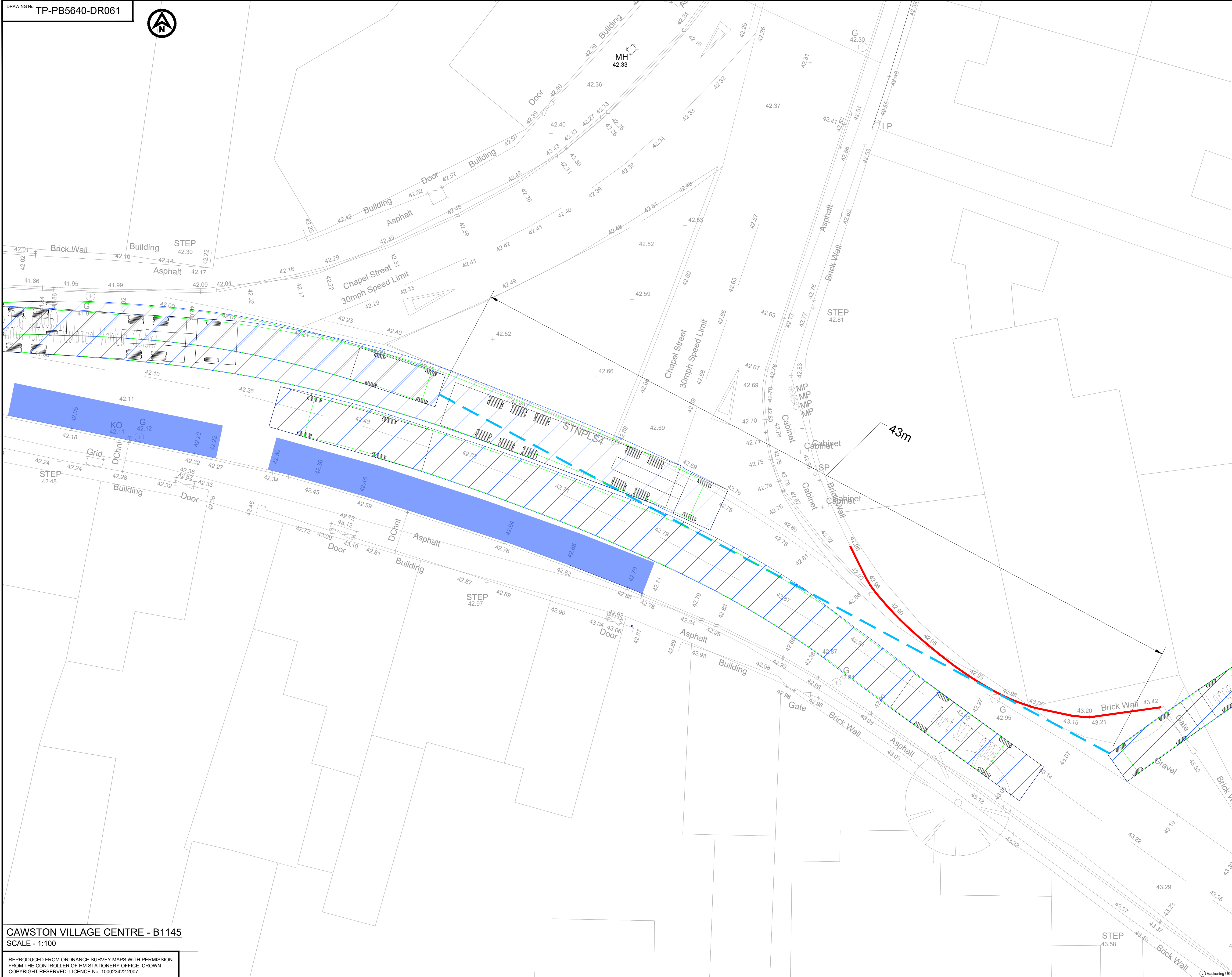
speed limit of 25m in accordance with MfS guidance. An additional 2m is also provided to account for the intensification of HGV movements.

3 References

Chartered Institution of Highways and Transportation, 2007. *Manual for Streets*, London: CIHT.
Chartered Institution of Highways And Transportation, 2010. *Manual for Streets 2 - Wider Application of the Principles*, London: CIHT.

4 Appendices

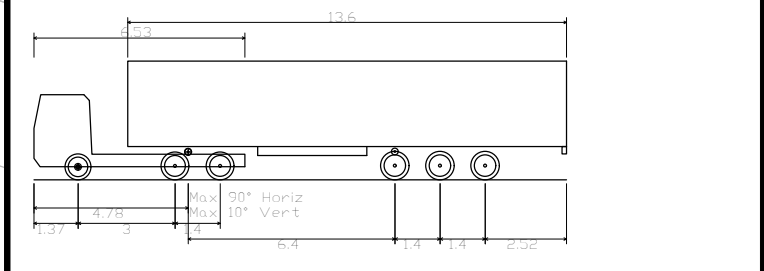
4.1 Appendix 1 - Drawing TP-PB5640-DR061



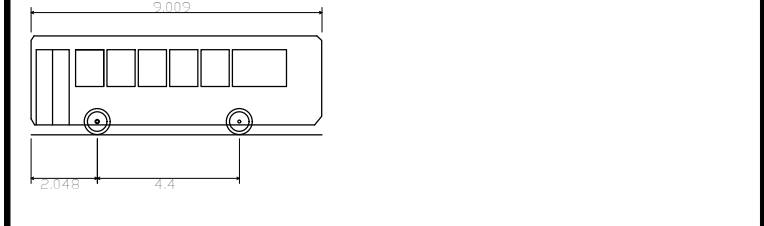
NOTES
 1. Do not scale from this drawing, all dimensions are in metres unless noted otherwise.
 2. This drawing has been based upon Ordnance Survey Maps and Topographical Survey Information and Royal Haskoning can not guarantee the accuracy of data.
 3. Services are to be protected in accordance with the requirements of the relevant statutory authorities.

GENERAL KEY
 MANUAL FOR STREETS STOPPING SIGHT DISTANCE FOR 30MPH (43m), 20MPH (27m)
 BRICK WALL
 PARKING AREAS

SWEPT PATH ANALYSIS
 VEHICLE BODY SWEEP PATH (FORWARD GEAR)
 VEHICLE CHASSIS SWEEP PATH



Max Legal Length (UK) Articulated Vehicle (16.50m)
 Overall Length 16.50m
 Overall Width 2.500m
 Overall Body Height 3.661m
 Min Body Ground Clearance 0.411m
 Max Track Width 2.500m
 Lock to lock time 6.00s
 Kerb to Kerb Turning Radius 6.530m



Part SLF 9.00m
 Overall Length 9.00m
 Overall Width 2.500m
 Overall Body Height 3.062m
 Min Body Ground Clearance 0.302m
 Track Width 2.500m
 Lock to lock time 4.00s
 Kerb to Kerb Turning Radius 7.383m

FOR CONSULTATION

REV	DATE	DESCRIPTION	BY	CHK	APP
F2.0	4.8.20	HGV SPA ADDED	RNE	ADR	ADR

REVISIONS

CLIENT



PROJECT
**NORFOLK BOREAS
 OFFSHORE WIND FARM**

TITLE
**CAWSTON HIGHWAY
 INTERVENTION
 EXISTING EASTBOUND
 FORWARD VISIBILITY (30MPH)**



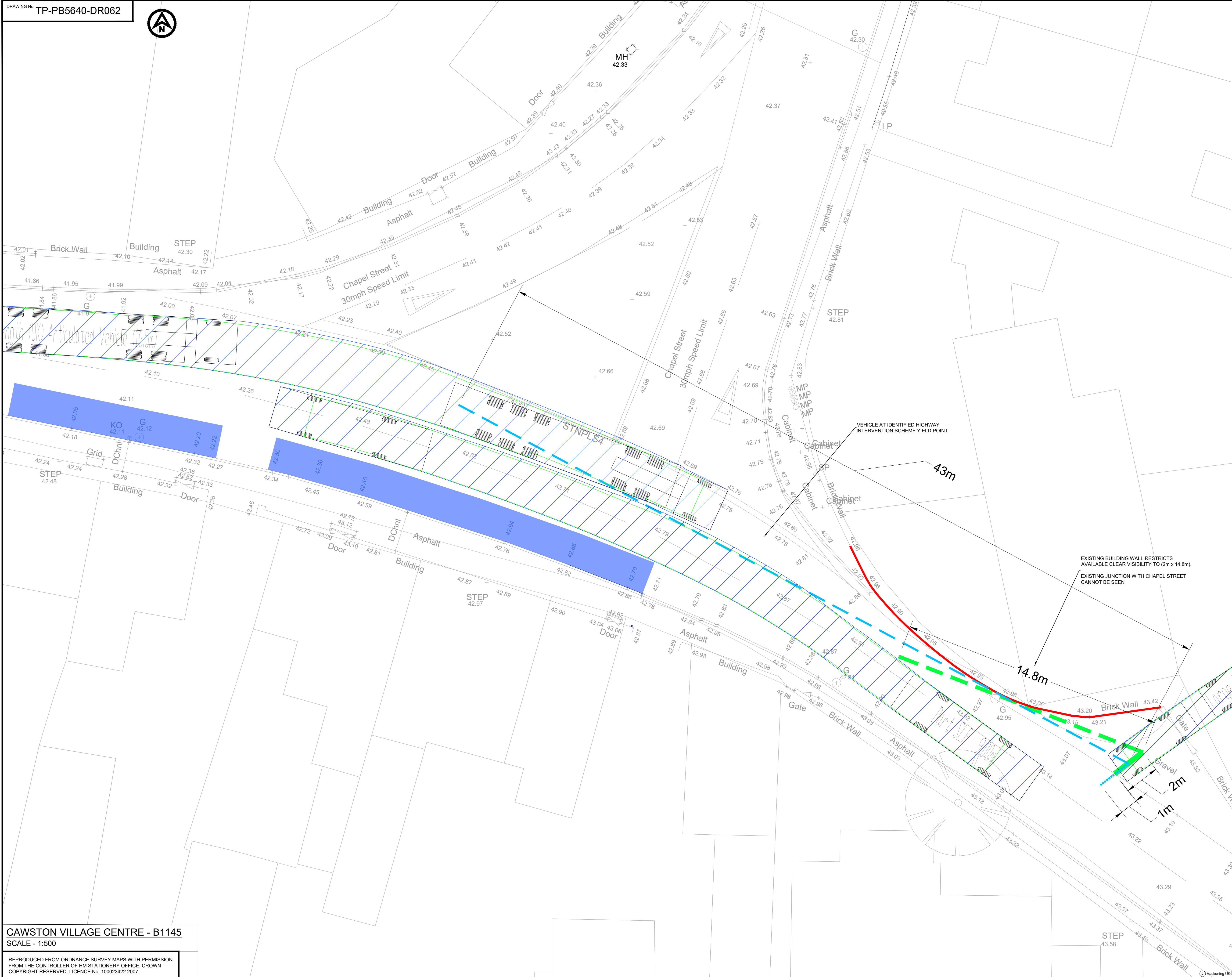
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DATE	29.07.2020	SCALE AT A1	1:100	CLIENTS REF.	

DRAWING No. **TP-PB5640-DR061** REVISION
 CLIENT DWG No. **F2.0**

CAWSTON VILLAGE CENTRE - B1145
 SCALE - 1:100

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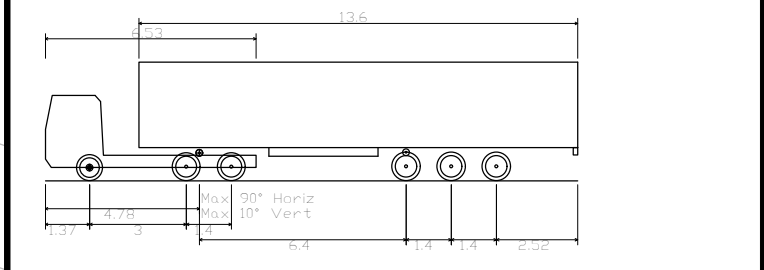
4.2 Appendix 2-Drawing TP-PB5640-DR062



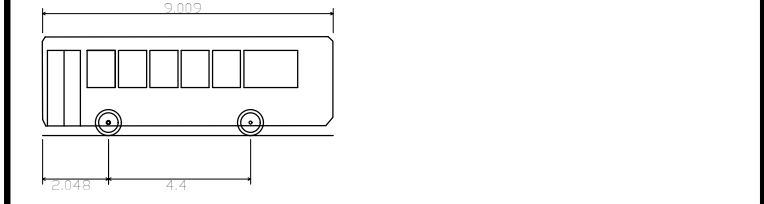
- NOTES**
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- GENERAL KEY**
- MANUAL FOR STREETS JUNCTION VISIBILITY SPLAY FOR 30MPH (43m)
 - ACHIEVABLE JUNCTION VISIBILITY SPLAY
 - MAXIMUM STRAIGHT LINE JUNCTION VISIBILITY
 - BRICK WALL
 - PARKING AREAS

- SWEPT PATH ANALYSIS**
- VEHICLE BODY SWEPT PATH (FORWARD GEAR)
 - VEHICLE CHASSIS SWEPT PATH



Max Legal Length (UK) Articulated Vehicle (16.5m)	16.500m
Overall Length	2.250m
Overall Width	3.680m
Overall Body Height	3.680m
Min Body Ground Clearance	0.410m
Max Track Width	2.300m
Lock to lock time	6.00s
Kerb to Kerb Turning Radius	6.530m



Dart SLF	9.00m
Overall Length	9.000m
Overall Width	2.350m
Overall Body Height	3.050m
Min Body Ground Clearance	0.300m
Track Width	2.300m
Lock to lock time	4.00s
Kerb to Kerb Turning Radius	7.380m

FOR CONSULTATION

F2.0	4.8.20	HGV SPA ADDED	RNE	ADR	ADR
		FIRST ISSUE			
REV	DATE	DESCRIPTION	BY	CHK	APP

REVISIONS

CLIENT



PROJECT
NORFOLK BOREAS
OFFSHORE WIND FARM

TITLE
CAWSTON HIGHWAY
INTERVENTION
EXISTING WHITEHOUSE FARM
ACCESS VISIBILITY (30MPH)



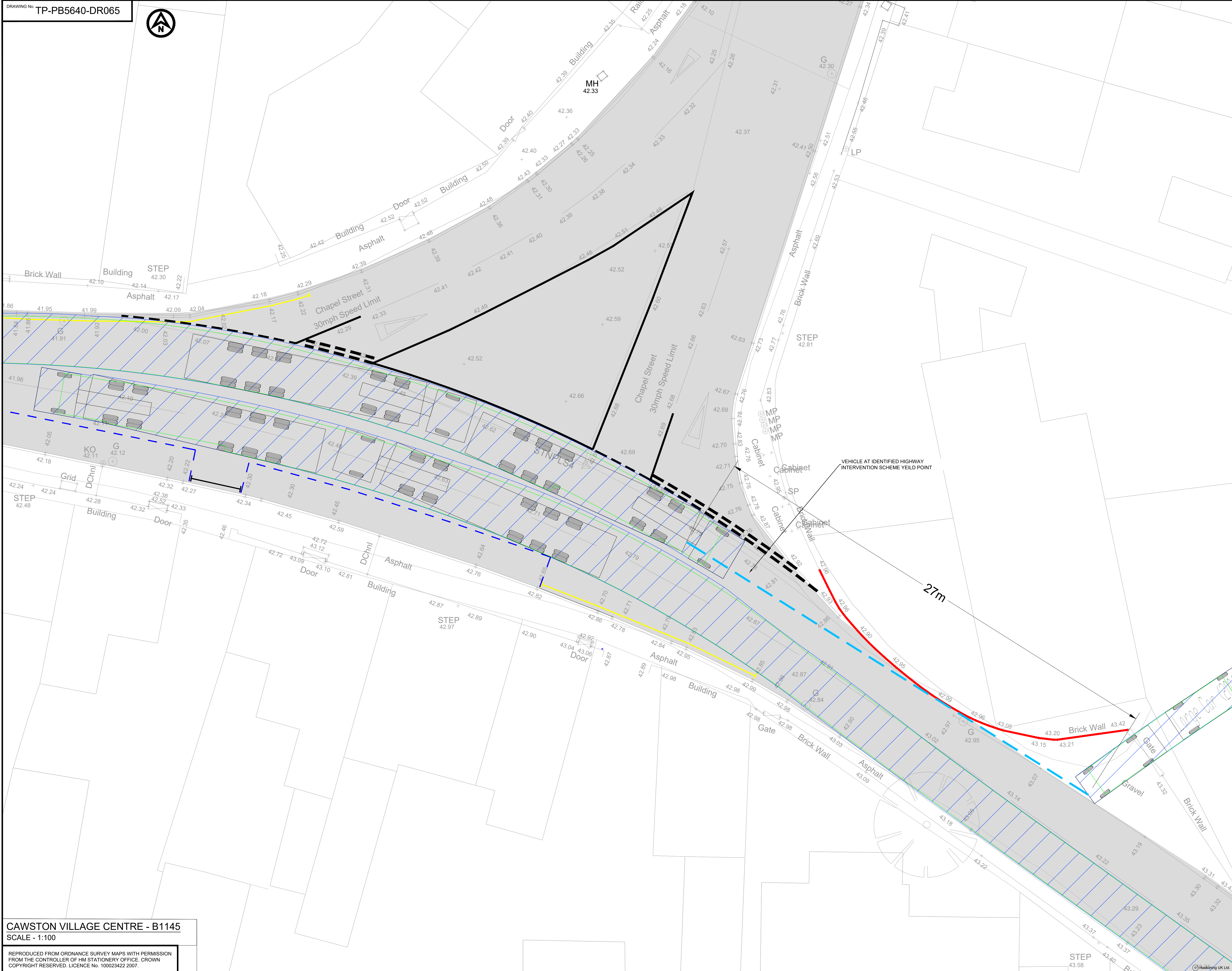
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DRAWING No: TP-PB5640-DR062 REVISION
CLIENT DWG No: F1.0

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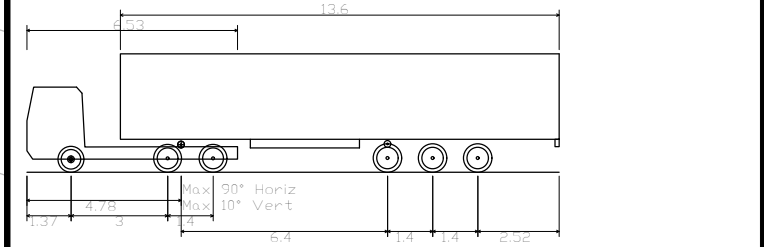
4.3 Appendix 3 - Drawing TP-PB5640-DR062



- NOTES**
- Do not scale from this drawing, all dimensions are in metres unless noted otherwise.
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- GENERAL KEY**
- DESIGNATED PARKING BAY LINE MARKINGS (DIAG 1028)
 - SINGLE YELLOW LINE MARKINGS (50mm THICKNESS) (DIAG 1017)
 - SINGLE WHITE LINE MARKINGS (50mm THICKNESS) (DIAG 1026.1)
 - ROAD RESURFACING WORKS TO BE COMPLETED TO HIGH STREET INCLUDING IRONWORKS RAISING AND LEVELING IN AGREEMENT WITH NORFOLK COUNTY COUNCIL
 - REALIGNED ROAD MARKINGS
 - MANUAL FOR STREETS STOPPING SIGHT DISTANCE FOR 20MPH (27m)
 - BRICK WALL

- SWEPT PATH ANALYSIS**
- VEHICLE BODY SWEPT PATH (FORWARD GEAR)
 - VEHICLE CHASSIS SWEPT PATH



Max Legal Length (UK) Articulated Vehicle (16.5m)	16.500m
Overall Length	15.500m
Overall Width	2.550m
Overall Body Height	3.281m
Min Body Ground Clearance	0.41m
Max Truck Width	2.300m
Lock to lock time	6.00s
Kerb to Kerb Turning Radius	6.530m

FOR CONSULTATION

FIRST ISSUE					
REV	DATE	DESCRIPTION	BY	CHK	APP

REVISIONS



PROJECT
NORFOLK BOREAS
OFFSHORE WIND FARM

TITLE
CAWSTON HIGHWAY
INTERVENTION
HIS EASTBOUND FORWARD
VISIBILITY (20 MPH)

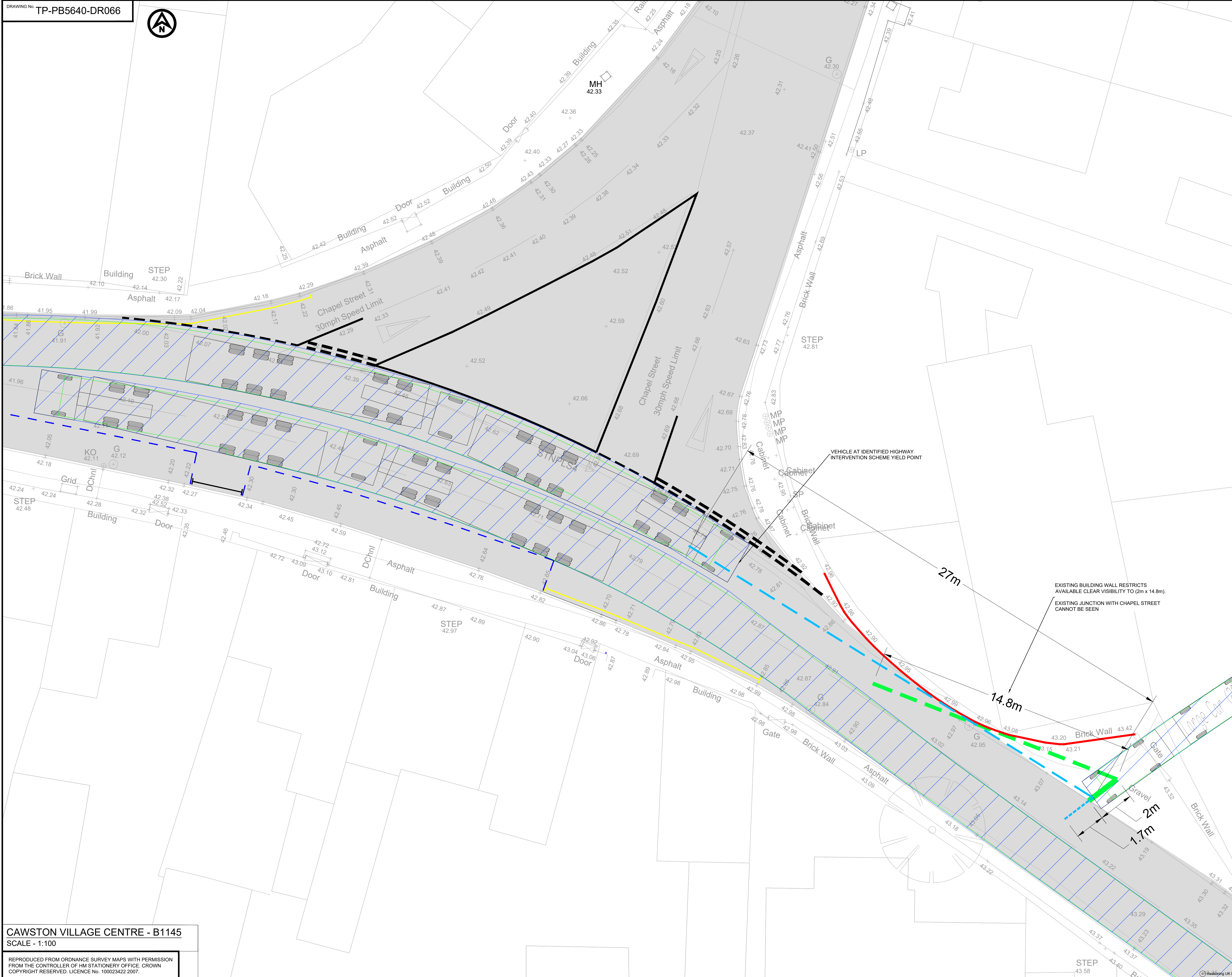


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DATE	29.07.2020	SCALE AT A1	1:100	CLIENTS REF.	
DRAWING No.	TP-PB5640-DR065			REVISION	
CLIENT DWG No.				F1.0	

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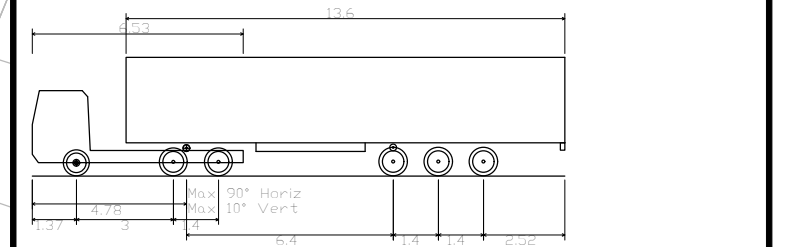
4.4 Appendix 4 - Drawing TP-PB5640-DR065



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 - SINGLE WHITE LINE MARKINGS (50mm THICKNESS) (DIAG 1026.1)
 - ROAD RESURFACING WORKS TO BE COMPLETED TO HIGH STREET INCLUDING IRONWORKS RAISING AND LEVELING IN AGREEMENT WITH NORFOLK COUNTY COUNCIL
 - REALIGNED ROAD MARKINGS
 - MANUAL FOR STREETS STOPPING SIGHT DISTANCE FOR 20MPH (27m)
 - ACHIEVABLE JUNCTION VISIBILITY SPY
 - BRICK WALL

- SWEPT PATH ANALYSIS**
- VEHICLE BODY SWEPT PATH (FORWARD GEAR)
 - VEHICLE CHASSIS SWEPT PATH



Max Legal Length (UK) Articulated Vehicle (16.5m)	16.500m
Overall Length	15.000m
Overall Width	2.500m
Overall Body Height	3.281m
Min Body Ground Clearance	0.41m
Max Truck Width	2.300m
Lock to lock time	6.00s
Kerb to Kerb Turning Radius	6.530m

FOR CONSULTATION

REV	DATE	DESCRIPTION	BY	CHK	APP
FIRST ISSUE					

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PROJECT
NORFOLK BOREAS
OFFSHORE WIND FARM

TITLE
CAWSTON HIGHWAY
INTERVENTION
HIS WHITEHOUSE FARM
ACCESS VISIBILITY (20MPH)

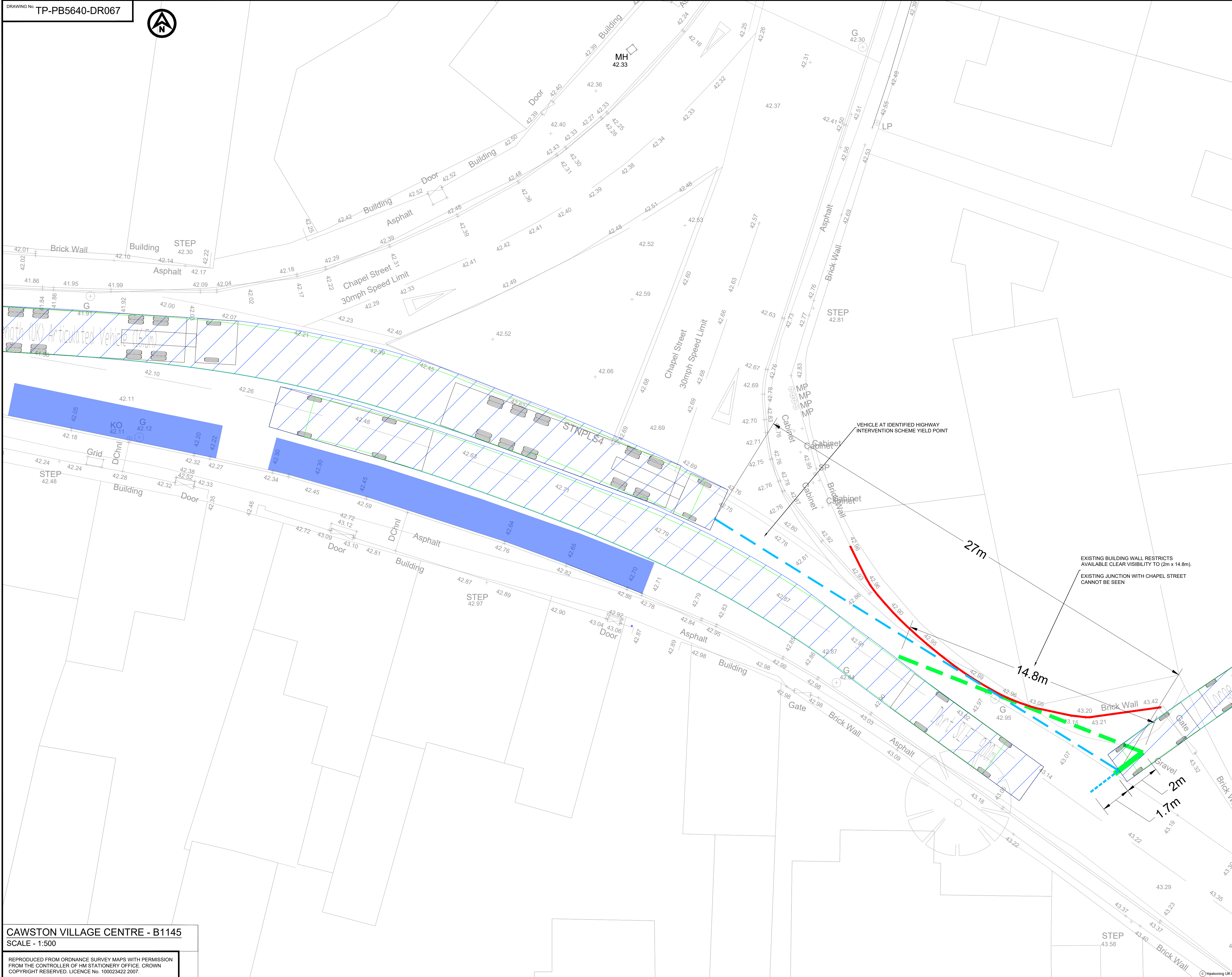


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DRAWING No.	TP-PB5640-DR066			REVISION	
CLIENT DWG No.				F1.0	

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SCALE - 1:100

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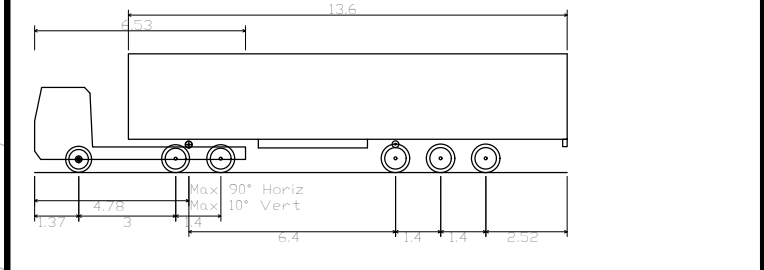
4.5 Appendix 5 – Drawing TP-PB5640-DR066



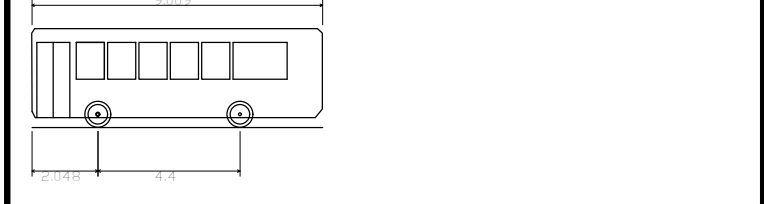
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 3. Services are to be protected in accordance with the requirements of the relevant statutory authorities.

- GENERAL KEY**
- MANUAL FOR STREETS JUNCTION VISIBILITY SPLAY FOR 20MPH (27m)
 - ACHIEVABLE JUNCTION VISIBILITY SPLAY
 - BRICK WALL
 - PARKING AREAS

- SWEPT PATH ANALYSIS**
- VEHICLE BODY SWEPT PATH (FORWARD GEAR)
 - VEHICLE CHASSIS SWEPT PATH



Max Legal Length (UK) Articulated Vehicle (16.5m)
 Overall Length 16.50m
 Overall Width 2.50m
 Overall Body Height 3.66m
 Min Body Ground Clearance 0.41m
 Max Track Width 2.50m
 Lock to lock time 5.05s
 Kerb to kerb Turning Radius 6.53m



Dart SLF 9.00m
 Overall Length 9.00m
 Overall Width 2.30m
 Overall Body Height 3.06m
 Min Body Ground Clearance 0.30m
 Track Width 2.00m
 Lock to lock time 4.00s
 Kerb to kerb Turning Radius 7.38m

FOR CONSULTATION

REV	DATE	DESCRIPTION	BY	CHK	APP

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PROJECT
 NORFOLK BOREAS
 OFFSHORE WIND FARM

TITLE
 CAWSTON HIGHWAY
 INTERVENTION
 EXISTING WHITEHOUSE FARM
 ACCESS VISIBILITY (20MPH)



DRAWN	RNE	CHECKED	ADR	APPROVED	ADR

DRAWING No. TP-PB5640-DR067
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 CLIENT DWG No. F1.0

CAWSTON VILLAGE CENTRE - B1145
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4.6 Appendix 6 – Drawing TP-PB5640-DR067



CLEAR VISIBILITY (50M) TO BE PROVIDED AT ALL TIMES TO RESTRICT HGV TRAFFIC CONFLICTS

AVAILABLE VISIBILITY (2.4m x 87m)

CLEAR VISIBILITY TO MANUAL FOR STREET GUIDELINES FOR A 20MPH SPEED LIMIT (2.4m x 25m)
 ADDITIONAL 2m TO ACCOUNT FOR INTENSIFICATION OF HGV MOVEMENTS (2.4m x 27m)

CLEAR VISIBILITY (50M) TO BE PROVIDED AT ALL TIMES TO RESTRICT HGV TRAFFIC CONFLICTS

CLEAR VISIBILITY (50M) TO BE PROVIDED AT ALL TIMES TO RESTRICT HGV TRAFFIC CONFLICT

- NOTES**
1. Do not scale from this drawing. All dimensions are in metres unless noted otherwise.
 2. This drawing has been based upon Ordnance Survey Maps and Royal Haskoning can not guarantee the accuracy of data.
 3. Access for pedestrians and cyclists is to be maintained at all times. accesses to properties are to be maintained and works programmed in consultation with property owners.
 4. Road markings and road signs are to be in accordance with the SI document 'Traffic signs regulations and general directions, 2016'.
 5. Manual For Streets SSD for a 20mph speed limit is 25m.
 6. HGV construction movements to be restricted to 9am to 3pm and 4pm to 6pm only.
 7. All vegetation clearance and cutback to comply with Norfolk County Councils policy of grass cutting of visibility splays. Requiring a maintenance regime of five cuts between May and September in Urban areas (defined as roads subject to less than a 40mph speed limit).

- GENERAL KEY**
- DESIGNATED PARKING BAY LINE MARKINGS (DIAG 1028)
 - SINGLE YELLOW LINE MARKINGS (50mm THICKNESS) (DIAG 1017)
 - SINGLE WHITE LINE MARKINGS (50mm THICKNESS) (DIAG 1026.1)
- VISIBILITY KEY**
- JUNCTION VISIBILITY SPLAYS FOR A 20MPH SPEED LIMIT
 - AVAILABLE FORWARD VISIBILITY SPLAYS

NOT FOR CONSTRUCTION

RNE/MAR/20 UPDATED NCC COMMENTS	RNE	ADR	ADR		
RNE/FEB/20 UPDATED TO SUIT STAGE 1 RSA	RNE	ADR	ADR		
FIRST ISSUE					
REV	DATE	DESCRIPTION	BY	CHK	APP

REVISIONS

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VATTENFALL

PROJECT

NORFOLK BOREAS OFFSHORE WIND FARM

TITLE

CAWSTON HIGHWAY INTERVENTION SCHEME HGV FORWARD VISIBILITY AND CHAPEL STREET JUNCTION VISIBILITY

Royal HaskoningDHV
 Enhancing Society Together

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 Tel: +44(0)1733 334455
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 www.royalhaskoningdhv.com

DRAWN	RNE	CHECKED	ADR	APPROVED	ADR
DATE	03.01.2020	SCALE AT 1:500	CLIENTS REF.		
DRAWING No.	TP-PB5640-DR017			REVISION	
CLIENT DWG No.				F3.0	

VISIBILITY ON THE B1145
 SCALE - 1:500

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