

Appendix I



EXISTING ACCESS TO
POLHILL GARDEN CENTRE

START OF ADVISORY
CYCLE LANE

END OF ADVISORY
CYCLE LANE

EXTENT OF SCHEME

Mark	Revision	Date	Drawn	Chkd	Appd

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Drawing Issue Status

FOR INFORMATION

**FORT HALSTEAD, KENT
 A224 POLHILL
 PROPOSED CYCLE LANE SCHEME**

Client
**MERSEYSIDE
 PENSION FUND**



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TECHNICAL NOTE

Job Name: Fort Halstead
Job No: 41290
Note No: 5503 - TN01
Date: April 2020
Prepared By: H Wenman / F Mott
Subject: **A224 / Old London Road Cycleway Feasibility**

This Technical Note has been prepared to test the feasibility of a cycleway linking the Fort Halstead development site to Knockholt station. This follows a consultation response from KCC Highways and Transportation and a later meeting between the applicant and KCC, where investigation of an 'off carriageway' cycle route was requested, as a means to increase cycle accessibility between Knockholt rail station and the development site.

The following information is based on visual inspections and measurements taken between Knockholt Station and Fort Halstead (development site) along London Road, Old London Road, and A224 London Road. The visit was undertaken on 2nd March 2020 to understand the feasibility of a 3.5 metre wide cycleway along the western edge of this stretch of road – this being the most logical location for the facility given the footway that runs along the east side of the road.

With respect to the type of cycleway proposed, a 3.5m wide facility is a typical dimension for a two-way cycleway that is located separate from vehicle lanes. This would allow for two 1.5m lanes to be provided, plus a 0.5m wide buffer to adjacent traffic. It is judged that use of carriageway space is not possible, given the nature of the route in question, vehicle speeds (and limits) and the abundance of junctions and right turn lanes particularly on the southern A224 part of the route. Such a measure would also require wholesale regrading of carriageway cross falls, significantly increasing costs.

DOCUMENT ISSUE RECORD

Technical Note No	Rev	Date	Prepared	Checked	Reviewed (Discipline Lead)	Approved (Project Director)
41290/5503/TN01	-	19.04.2020	HW / FM	JSL	JSL	JSL

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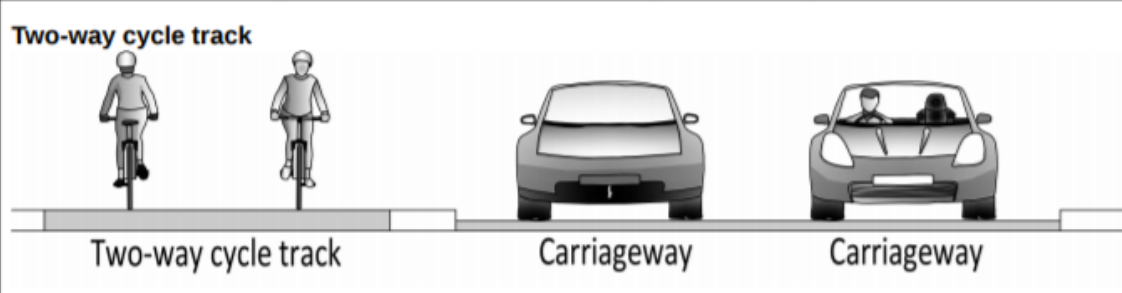
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TECHNICAL NOTE

Design Guidance

Design guidance for cycleways can be found in CD 195 Designing for cycle traffic. Within this guidance in table E/1.1 it is stated that roads with a speed limit of 40mph and over require the minimum provision of a cycle track, which is a track separate from the main carriageway for use by cyclists. Table E/3.1 states that a two-way cycleway with peak hour cycle flows less than 150 should have a desirable minimum width of 3m, while when peak hour cycle flows are 150 or greater the desired minimum is 4m. An extract of this table can be seen in the figure below.

Cycle route type	Peak hour cycle flow (either one-way or two-way depending on cycle route type)	Desirable minimum width	Absolute minimum width (for sections up to 100m)
Two-way cycle track	<150	3.0 metres	2.5 metres
	150 or greater	4.0 metres	3.5 metres




Given the speed of traffic on this route it is considered desirable to include a separation strip between the cycleway and the general traffic carriageway to help protect cyclists from the draught created by passing motor traffic and from debris thrown up by vehicles. The CD 195 Table E/3.26 states that on a 40mph road a desirable minimum horizontal separation of 1.0m and an absolute minimum of 0.5m should be provided between the carriageway and the cycleway. On a 50mph a desirable minimum horizontal separation of 2.0m and an absolute minimum of 1.5m should be provided between the carriageway and the cycleway. It is therefore assumed that a 3.5m wide section of verge is required to facilitate this, however this would require a relaxation of the standards south of Shacklands roundabout on the A224 London Road as this has a 50mph speed limit, thus to be compliant with DMRB standards a 4.5m cycleway would be required.

DMRB CD 127 Cross-sections and headrooms is also outlined later in the note when discussing the potential of narrowing the carriageway to make room for the 3.5m cycleway.



TECHNICAL NOTE

Visible Constraints



There are 12 visible constraints noted in this document and their locations can be seen in drawing 41290_5503_006 (found in Appendix A) and described in the table below. The review runs in a north to south direction, from Knockholt station towards the development site.

REF.		Comment	Photograph
1.		<p>Location: London Road, between Knockholt train station entrance and Station Court.</p> <p>In this location a narrow footway currently exists.</p> <p>A shared pedestrian / cycleway would be constrained in this location due to large mature trees located in the middle of the verge. Between the hedgerow and the trees there is a width of only 2.6m. Tree roots under the verge would potentially make it extremely difficult to construct a cycleway without causing damage to tree root zones, and in time roots would lift the cycleway surface causing level issues. It is doubtful that the loss of these trees would be acceptable.</p>	



TECHNICAL NOTE

REF.		Comment	Photograph
2.		<p>Location: London Road, alongside the boundary with Chamber Furniture.</p> <p>In this location a narrow footway currently exists. The Chamber Furniture boundary appears to abut the back of footway.</p> <p>A shared pedestrian / cycleway would be constrained in this location due to the verge being only 1.5m in width. 1.5m is below the desired minimum footway width of 1.8m in Kent Design.</p>	
3.		<p>Location: Old London Road, just south of Watercroft Road.</p> <p>In this location there is currently no footway.</p> <p>A shared pedestrian / cycleway may be constrained in this location due to a large ditch at the edge of the verge and a utilities box on the verge. However, there is 5m width between the road and the ditch and 4m between the road and utilities box.</p> <p>At this location there may also be issues with the gradient, which at the back of the verge is approximately 0.7m higher than the carriageway, as can be seen in the photograph to the right.</p>	


TECHNICAL NOTE

REF.		Comment	Photograph
			
4.		<p>Location: Old London Road, boundary with Bluebell Cemetery</p> <p>A shared cycleway may be constrained in this location due to gradient issues as can be seen in the photographs to the right. Gradient difference is approximately 0.7m, with the boundary being higher than the road.</p>	



TECHNICAL NOTE

REF.		Comment	Photograph
5.		<p>Location: Old London Road, opposite Badgers Rise</p> <p>A cycleway may be contained in this location due to a gas substation. However, this is 4.1m from the road edge, which is further than the 3.5m minimum needed for a cycleway.</p>	
6.		<p>Location: Old London Road</p> <p>A cycleway may be constrained in this location due a ditch at the edge of the verge. The distance between the carriageway and the ditch is 4.1m.</p>	



TECHNICAL NOTE

REF.		Comment	Photograph
7.		<p>Location: Old London Road, short off-road cycleway</p> <p>In this location there is already a short section of northbound off-road cycleway, which is 1.5m in width and 43m in length, due to the presence of a pedestrian refuge island. However, a 3.5m wide cycleway would be constrained in this location due to a ditch at the edge of the verge located less than 3m from the carriageway.</p> <p>This ditch is evident in the photograph to the right.</p> <p>The ditch continues for several meters going south after the short section of off-road cycleway and remains a constraint as there is a maximum of 3.5m between the carriageway and the ditch. After this the verge widens to 5m.</p>	



TECHNICAL NOTE

REF.		Comment	Photograph
8.		<p>Location: Old London Road, just north of Crest Close</p> <p>In this location a cycleway will be constrained as there is only 1.8m of verge between the carriageway and the private hedgerow.</p>	
9.		<p>Location: Old London Road, opposite Crest Close by Roundabout bus stop</p> <p>In this location a formal footpath restarts, which is 2m wide. A cycleway would be constrained in this location due to the bus stop which can be seen in the photograph to the right. There is also less than 3m width between the carriageway and the private boundary fence.</p>	

TECHNICAL NOTE

REF.		Comment	Photograph
10.		<p>Location: A224 London Road outside the Toby Carvery</p> <p>In this location just to the north of the Toby Carvery the existing footway is 1.4m wide.</p> <p>A shared 3.5m off-carriageway cycleway may be constrained in this location as the width of the verge between the carriageway and the fence is 3m.</p>	
11.		<p>Location: A224 London Road, just south of Toby Carvery</p> <p>A shared pedestrian / cycleway may be constrained in this location as the width of the verge between the carriageway and the hedgerow is only 2.5m. There is also a small ditch at the edge of the verge which would likely render the construction of a cycleway problematic.</p>	

TECHNICAL NOTE

REF.		Comment	Photograph
12.		<p>Location: Between Toby Carvery and Mumbai central</p> <p>In this location there is 3m between the carriageway and the middle of the hedgerow. However, this may be a constraint for a cycleway as the hedgerow would have to be set back, potentially into private land, and well maintained to ensure the pathway is not obstructed following growth. The removal of the hedgerow will be undesirable for ecological reasons and thus may render a 3.5m cycleway in this location unachievable.</p> <p>Along this stretch there is what is believed to be a BT inspection cover, which could give rise to additional utilities diversion costs.</p> <p>It is also noted that this stretch of verge between the Toby Carvery and the development site currently has no formal kerb line.</p>	 


TECHNICAL NOTE

Notes from Drawing 41290_5503_006

In drawing 41290_5503_006 KCC highway definition boundary data has been used to understand the highway boundary extent and the constraints to the proposed cycleway caused by private land. This drawing illustrates several land ownership constraints which may impact the feasibility of an off-carriageway cycleway. These are described in the table below, which references constrain points noted on the drawing. Overall, when using the Highway Boundary data provided by KCC approximately 943m of the potential cycleway would require the use of third-party land. That is approximately 29% of the 3200m potential cycleway. The Land Registry information used for an earlier iteration of this note (prior to the highway boundary information being made available by KCC) suggests that some of the highway land is within private land ownership (potentially over 40%) which would render almost 71% of the route widening unachievable.

REF.	Location	Comment
A.	London Road outside Knockholt Station	The cycleway would not be able to reach the entrance of Knockholt train station as there are visible landownership constraints outside Broke Lodge and the adjacent land.
B.	London Road outside Chamber Furniture	In this location the KCC highway boundary data suggest there would be visible land ownership constrains outside Chamber Furniture as a 3.5m cycleway would require at least 0.5m of privately owned land, plus removal of the hedgerow part of which would be within 3 rd party land (notwithstanding potential ecological issues).
C.	London Road opposite Kent Leisure Buildings	In this location there is currently a 1.8m footway and approximately 3.5m between the carriageway and the private properties. However, the KCC highway boundary data suggests that outside several of these properties up to 1m of the verge is private land owned by the properties connected to the footway.
D.	A224 London Road – outside the Toby Carvery	In this location the landownership issues raised in reference 10 are confirmed within the KCC highway boundary data.
E.	A224 London Road – between the Toby Carvery and south of Orchard Barn	In this location the landownership issues raised in reference 12 are confirmed within the KCC highway boundary data confirming that for a 3.5m cycleway privately owned land would be required. However, the land ownership constraint does stretch the entire length of the A224 as suggested in reference 12.
F.	A224 London Road – Outside Oak Tree Farm	In this location there is a grassy embankment within the site entrance which is shown within the KCC highway boundary data to be privately owned. This would constrain the feasibility of the cycleway as the cycleway either side of the site entrance will not be connected without diverting cyclists into the carriageway. This grassy embankment can be seen in the photograph below.

TECHNICAL NOTE

		
G.	A224 London Road – Between Polhill business centre and approximately 75m north of Otford Lane	In this location the KCC highway boundary data shows a pinch point in the highway land where for a 3.5m cycleway up to 1m of private land would be required.

Other Potential Measures

This section looks at other potential measures which could be provided to assist safe movement of cyclists along the route in question. It is considered that one such measure could be 'Orca' lane separation devices, which are in use in other parts of the UK.

These devices are lane separators designed to provide light segregation as a standalone product. They are designed to be placed within the cycle lane and positioned up to the white marking which highlights the edge of the carriageway. These types of cycle paths are becoming increasingly popular, especially in central London, and offer good value for money and adoptability. However, they are highly controversial due to safety fears and there is very little official guidance on where they should and shouldn't be used, however emerging guidance suggests they should only be used on 20mph roads, and not on high speed roads. A list of the guidance that does exist and has been reviewed is included in the following footnote^{1 2}.

Therefore, when considering the design guidance mentioned earlier in the note they would not be appropriate for the type of road, and road speeds in question within this study.

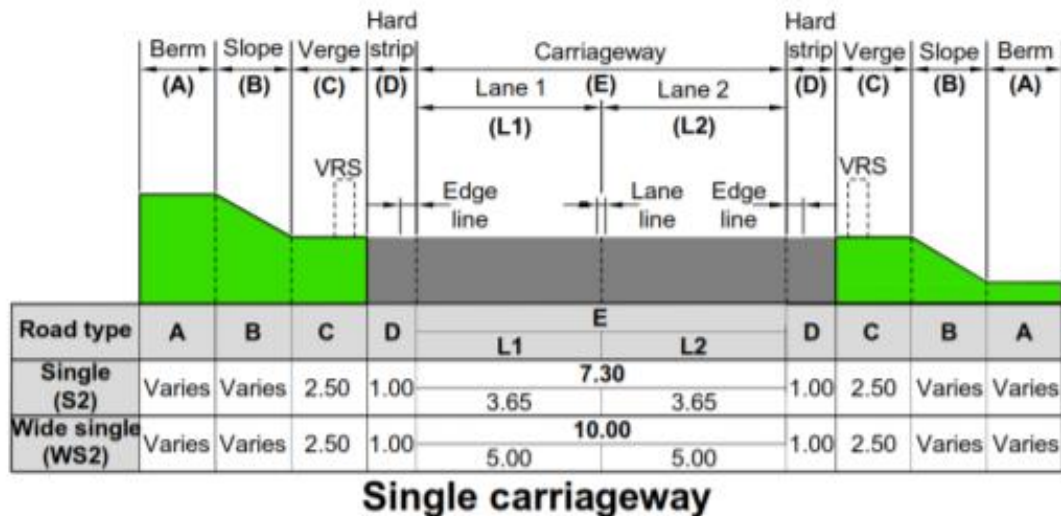
¹ <http://www.rediweldtraffic.co.uk/products/cycle-lane-products/orca-cycle-lane-product/>

² DMRB CD 195 Designing for cycle traffic
<https://www.standardsforhighways.co.uk/ha/standards/dmr/vol6/section3/CD%20195%20Designing%20for%20cycle%20traffic-web.pdf>

TECHNICAL NOTE

Feasibility of narrowing the carriageway

This section looks at the feasibility of narrowing the existing carriageway and using this extra width to ensure a 3.5m cycleway can be maintained for the entire distance of the cycleway, thus avoiding the pinch points where private land would be required. Design guidance for the width of a principal route road carriageway can be found in DMRB CD 127 Cross-sections and Headrooms. This suggests that a rural S2 road should be 7.3m wide with 1m hard strips on each side of the carriageway as illustrated in the diagram below, meaning the width of a principal road should be approximately 9.5m.



As the A224 London Road is a principal road this will need to be compliant with this guidance. Measurements taken from OS mapping using CAD and verified using measurements from Google earth suggest the A224 London road is currently approximately 9m in width. This suggests the carriageway should not be narrowed if to remain compliant with DMRB standards.

These standards do not apply to London Road and Old London Road which are north of Shacklands roundabout. Therefore, a drawing (41290/5503/007) has been completed to illustrate how the road to the north of Shacklands roundabout could be narrowed in certain places to make room for the 3.5m cycleway. Although this may be possible it will come at an extremely high cost as the crown line, camber and drainage within the carriageway would have to be completely reconstructed to provide the correct camber and crossfall gradients necessary to maintain safe transit for vehicles.

Crash data involving cyclists along this route

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TECHNICAL NOTE

Crash data has been obtained from KCC for 5 years between 01/10/2014 and 30/09/2019, and is reviewed within this note to provide context.

During this period 337 crashes were recorded within the wider sample area. Along London Road, Old London Road, and A224 London Road 18 crashes were recorded, with 7 of these involving cyclists. The table below explores the scenarios under which these collisions involving cyclists occurred. The full KCC data output can be found in Appendix E of the Transport Assessment.

All of the collisions involving cyclists occurred outside the peak hours (0800-0900 and 1700-1800), although one occurred at 07:20 and could feasibly have been a commuter. The summary of each of the PIAs is included below:

KCC REF.	Date	Time of day	Location	Severity	Circumstances
70	25/07/2015 (Saturday)	12:45	London Road outside Knockholt Station	Serious	A cyclist was hit by a vehicle travelling round the bend at speed
161	14/12/2016 (Wednesday)	11:19	Shacklands roundabout towards Polhill on London Road	Serious	A cyclist was cycling around the roundabout when a vehicle pulls out from the junction and collides with it
183	02/05/2017 (Tuesday)	10:45	London Road outside Knockholt Station	Slight	A cyclist was cycling in the cycle lane when a vehicle in stationary traffic pulled slightly to the nearside and caused a collision with the cyclist
220	12/10/2017 (Thursday)	07:20	A224 Pole Hill at junction with Otford Lane (Site access)	Slight	A cyclist was cycling up Polhill when a vehicle turned right out of Otford Lane and collided with the cyclist
236	28/12/2017 (Thursday)	09:30	London Road near junction with Sevenoaks Road	Slight	A group of cyclists travelling close together were hit by a vehicle that had skidded on black ice
280	07/09/2018 (Friday)	13:20	Shacklands roundabout	Serious	A cyclist has hit an uneven patch of road which has caused the rider to fall off his pedal cycle
329	25/07/2019 (Thursday)	19:30	Shacklands roundabout	Serious	A vehicle pulled out in front of a cyclists taking part in a cycling event. The cyclist lost control crossed into the opposing carriageway, hit the kerb and fell into the verge, sustaining serious injury

It is of note that the majority of accidents occur at junctions, with two accidents taking place on links without junctions, for different reasons. Both these two accidents occurred near Knockholt station and appear to be due to actions of drivers which could be attributed to poor car driving.

TECHNICAL NOTE

It is of our opinion and experience of the route that many of the cyclists using this route are pleasure/sports/competitive cyclists who are unlikely to use a formal cycleway even if one were provided. The route is a well documented sports 'velo' cycling route, and is shown on the popular Strava mobile phone tracking app as being well used by amateur athletes who are undertaking the hill climb 'King of the Mountain' challenge up A224 Polhill. This is relevant in the timing of the majority of accidents, which are seen to occur outside of normal commuting hours and would suggest sports cyclists are cycling at speed, particularly at the Shacklands roundabout which has a level gradient at that point.

It is therefore considered unlikely that a separate 'off-carriageway' cycle route would act to reduce the number of personal injury accidents to cyclists at this location. It would however be a recommendation that further work is carried out by the Highway Authority to understand the exact circumstances behind each accident, and remedial measures that could be undertaken to reduce the frequency and severity of accidents involving sports cyclists, if this group is indeed found to be the main source of such accidents.

Conclusion

This review confirms the following key points:

1. Site review confirms that there are a number of physical constraints that would preclude design and construction of an off-carriageway cycle route to current DMRB standards, based on utilisation of the current verges between the site access and Knockholt rail station;
2. Review of OS mapping, Land Registry mapping and KCC highway definition plans confirms that some sections of verge are within private ownership , rendering delivery of certain sections constrained by land;
3. Consideration has been given to the potential to utilise carriageway space to widen the verge and provide a 3.5m minimum cycle route. This confirms that on the A224 this would reduce the carriageway width below the required DMRB minimum width, so would not be acceptable, and on Old London Road would require the regrading of the full width of carriageway in order to reset crown lines, cambers and cross falls, making the scheme very high cost; and
4. Review of accident data suggests that the majority of cycle accidents in the area could be attributed to fast travelling sports cyclists, and not commuters. This matter is highlighted to the Highway Authority for review and remedial action.

It is concluded that an off carriageway two-way cycle route between the development site and Knockholt rail station, running along the A224 and Old London Road, is constrained by land and physical features that would unfortunately render the proposal undeliverable. The feasibility of an off road cycle route on the A224 in particular is very constrained, with no scope to widen into the carriageway due to DMRB compliance issues on this 50mph speed limit section of road.

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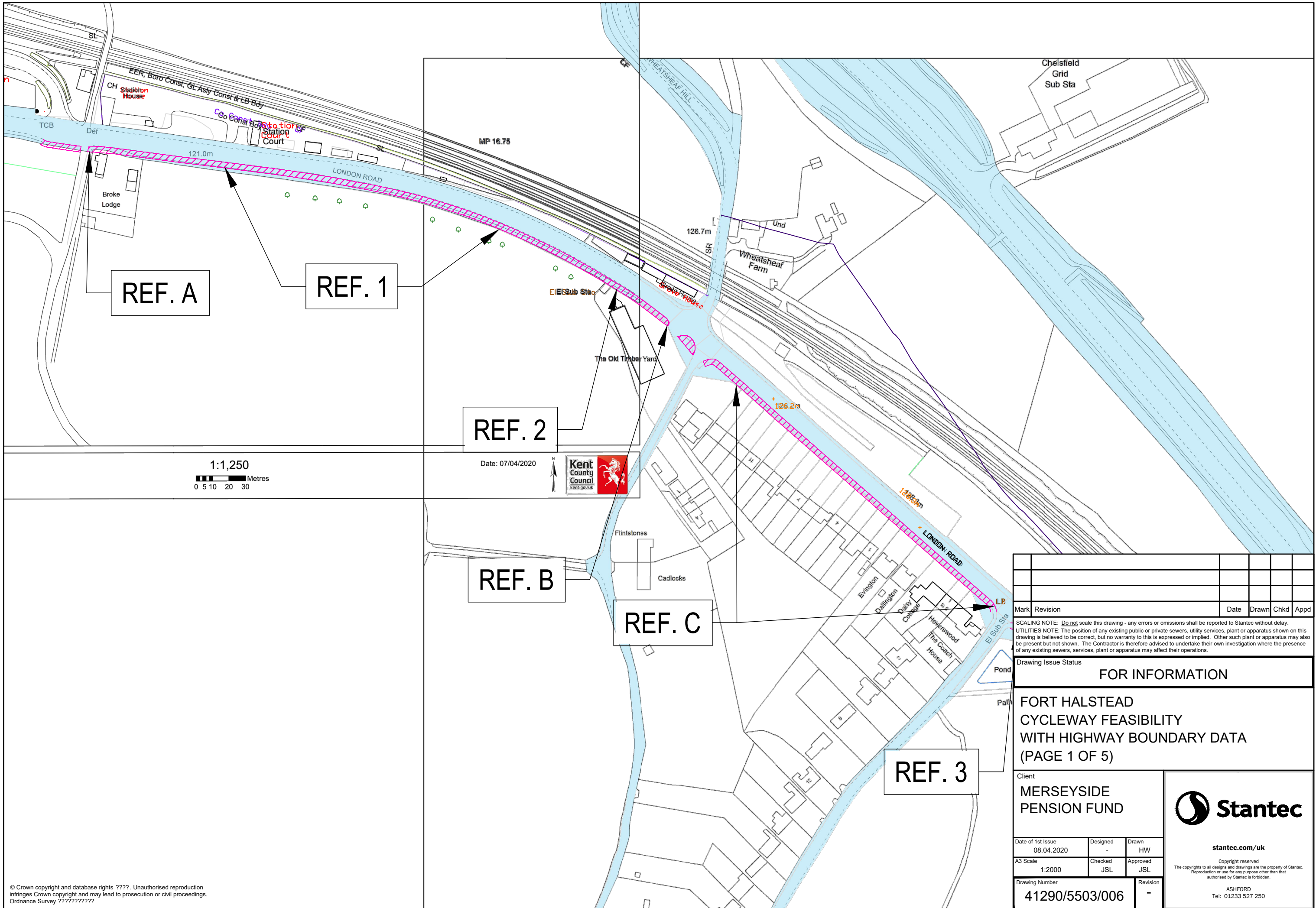
Review of PIA data confirms that cyclists are not significantly impacted at commuting times, with anecdotal information and at least one PIA record suggesting that the majority of accidents involve fast traveling sports and amateur competitive cyclists, where online evidence shows they frequently use the locality.

The route currently includes advisory cycle lanes on Old London Road, and the development includes proposals to include further advisory cycle lanes on the A224 between Shacklands roundabout and the Polhill site access. These advisory cycle lanes appear to be functioning safely at the current time and would include a range of signage and other marking to ensure they operate safely. Signage warning vehicle drivers of cyclists is recommended to deal with the demand from the development and also existing cyclist users.



TECHNICAL NOTE

Appendix A



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**FORT HALSTEAD
 CYCLEWAY FEASIBILITY
 WITH HIGHWAY BOUNDARY DATA
 (PAGE 1 OF 5)**

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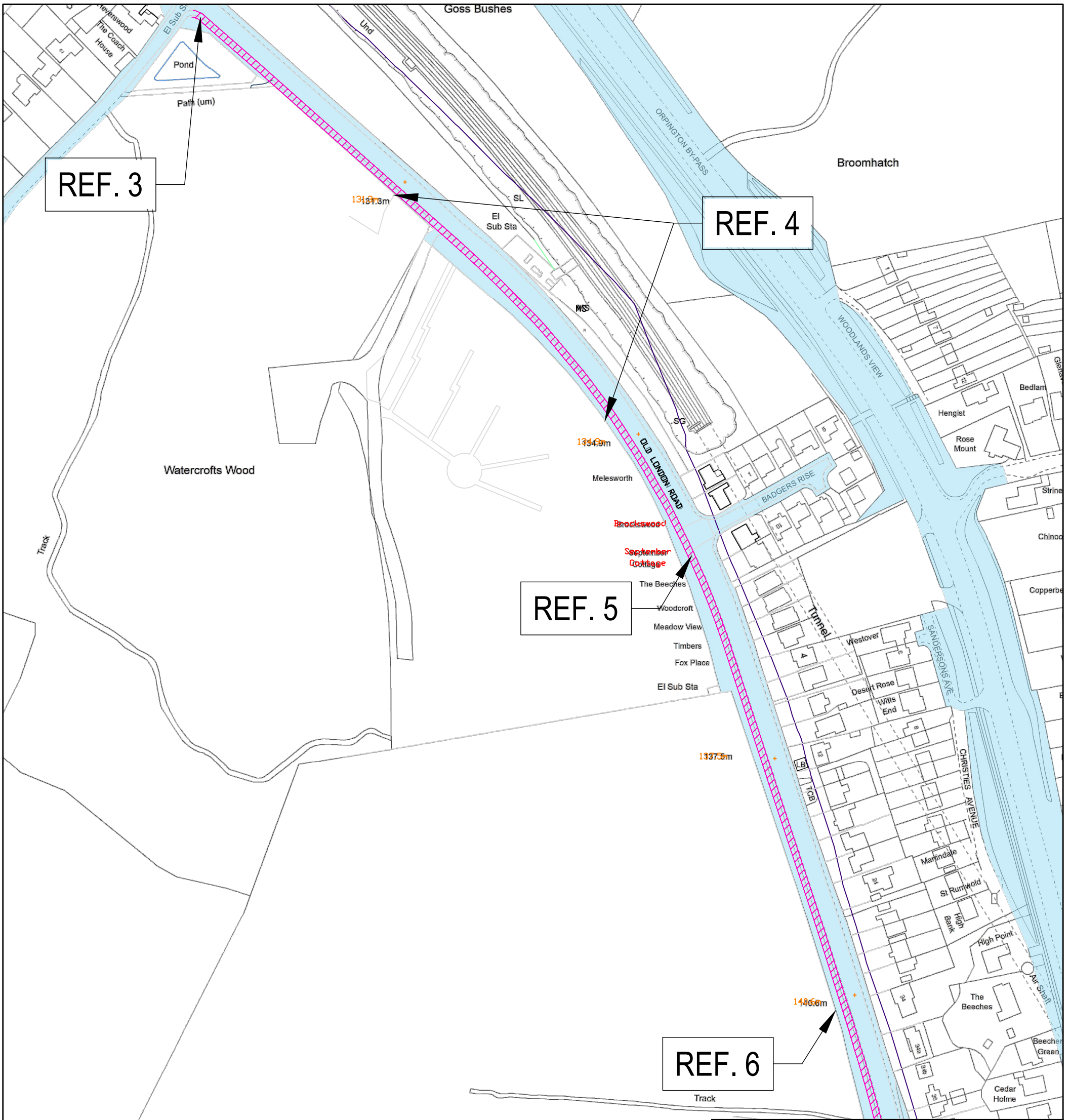
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**FORT HALSTEAD
 CYCLEWAY FEASIBILITY
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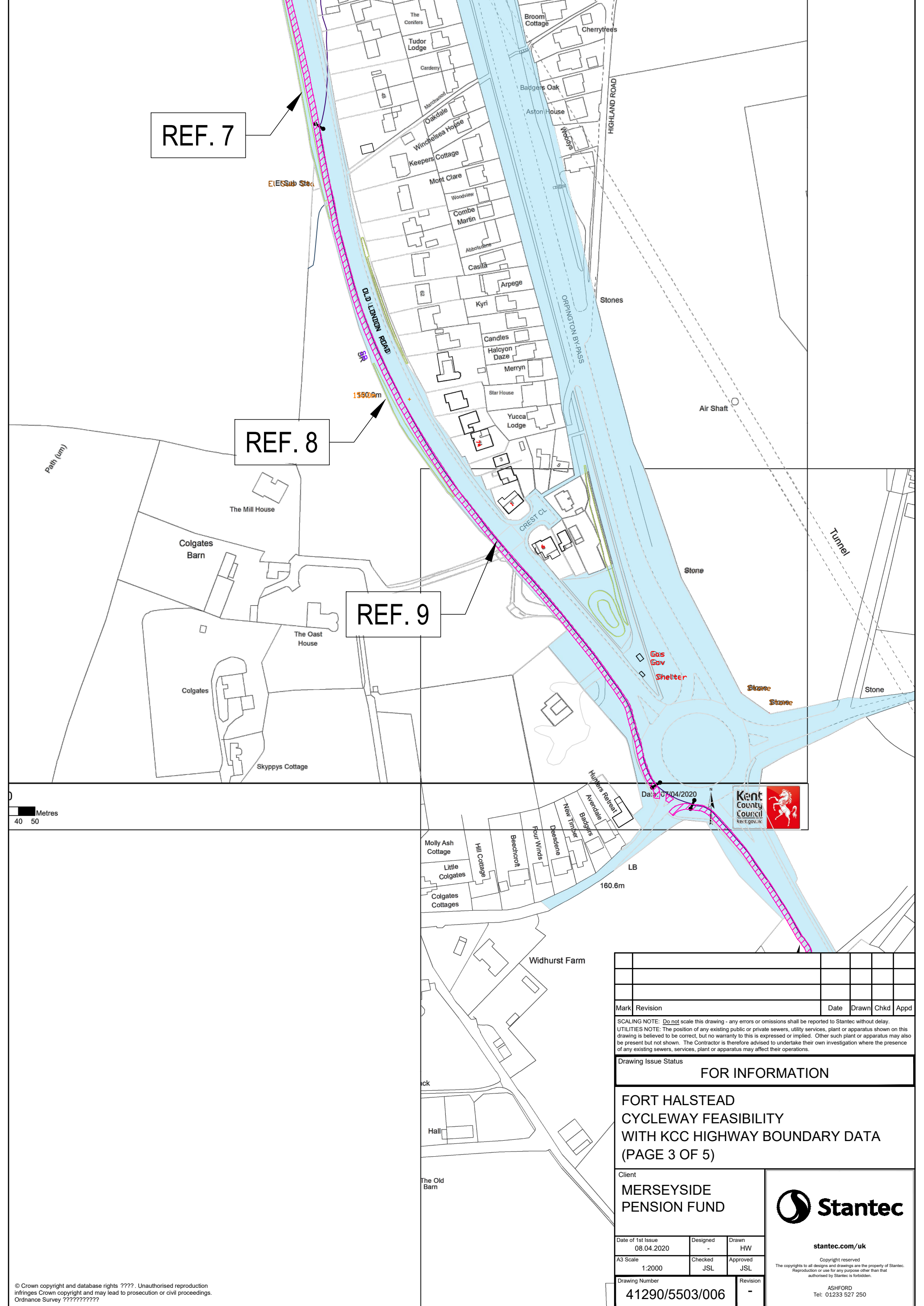


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 WITH KCC HIGHWAY BOUNDARY DATA
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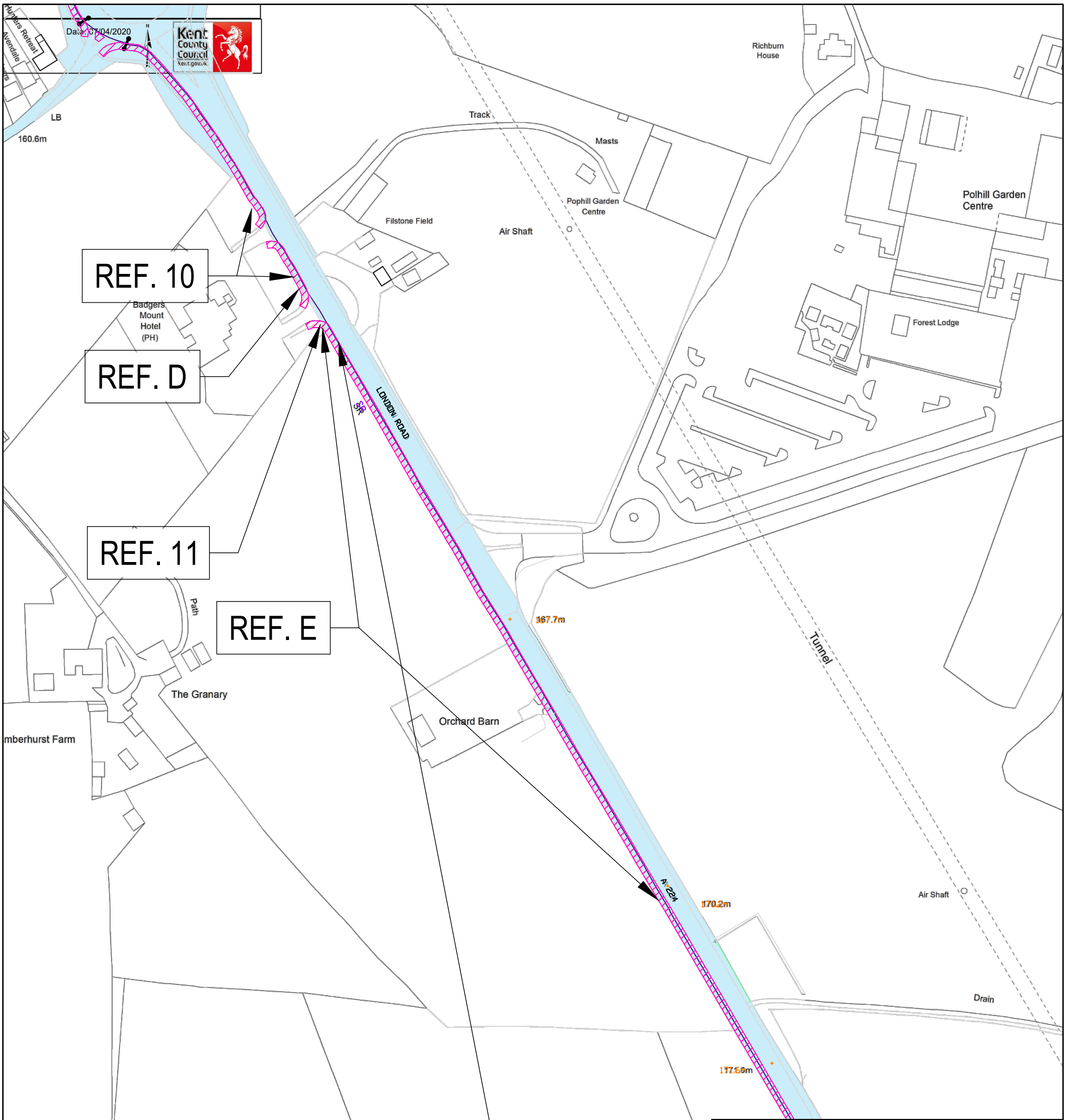
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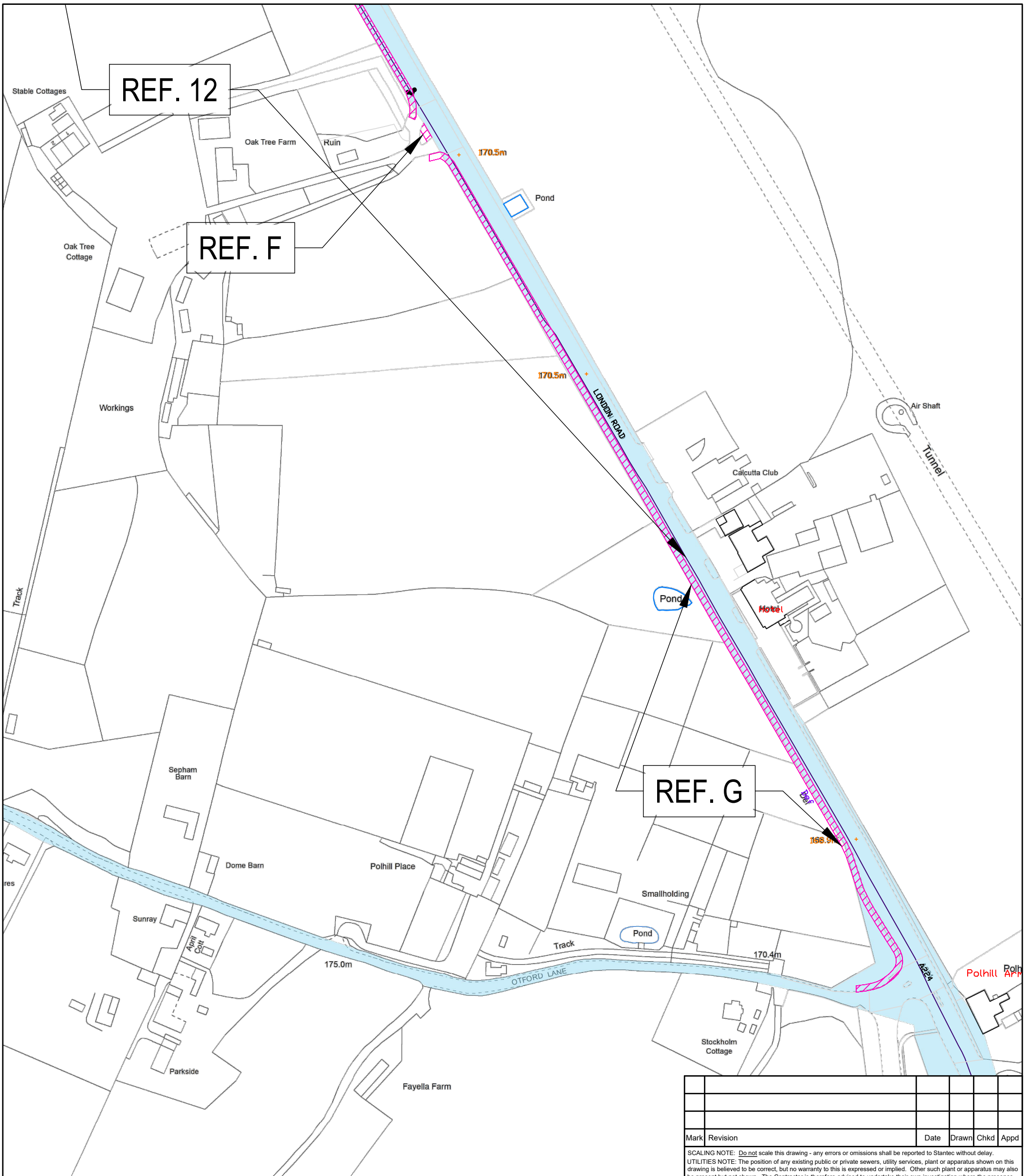
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