

Stage 1 RSA - Road Safety Audit Response Report

1.1 This report results from receipt of a Stage 1 RSA Report, undertaken dated July 2017.

1.2 The Designer's Response to the 'Problems' highlighted are indicated in the table below:

Item	Problem	Recommendation	Designer's Response
2.2	Location: General Summary: Proposed Signage It will be important that the new highway network is clearly signed throughout	I. Provide signing on each approach to new and modified junctions. II. Map-type signs will be required at roundabout junctions. III. Ensure adequate forward visibility to signs, and ensure adequate clearance between sign face and carriageway. IV. Where appropriate ensure adequate clearance for pedestrians and cyclists beneath sign face. V. Provide maximum speed limit signs at all changes of speed restriction	Accepted. Appropriate signing shall be provided at detailed design stage through agreement with the Highway Authority.
2.3	Location: General Summary: Dropped kerbs and tactile paving provision This problem may be addressed at the detail design stage. It will be necessary to provide dropped kerbs and tactile paving in relation to all pedestrian and off-road cycle routes.	Provide dropped kerbs and tactile paving as required throughout. This should include the provision of corduroy paving where proposed shared pedestrian / cycle facilities tie in with existing pedestrian only footways.	Accepted. Dropped kerbs and tactile paving are shown on drawings A/PHLYM.1/GA-1 and A/PHLYM.1/GA-2. Corduroy paving has been provided where appropriate.
2.4	Location: General Summary: Reflective bollards / signage on traffic islands Numerous solid refuge islands throughout the proposals will require the provision of reflective or internally illuminated bollards. Direction signing may also be required.	Ensure that islands are of sufficient size to accommodate such signing as may be required at a specific location.	Accepted. Appropriate signing and bollards will be provided at detailed design stage.

Persimmon Homes Thames Valley

North Littlehampton, Lyminster Bypass (Southern Section)

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Item	Problem	Recommendation	Designer's Response
2.5	Location: Highdown Drive (Northern End) Summary: Highway arrangement 'see through' For northbound traffic the alignment of Highdown Drive will result in headlights shining towards southbound vehicles on the Lyminster bypass and vice-versa. This could lead to confusion in relation to the road alignment particularly during periods of reduced visibility. The Audit Team note that 'possible bund or planting' is indicated on drawing 'A/PLYM.1/GA-2'.	Provide bund or some other form of screening at the northern end of Highdown Drive.	Accepted. Indicative bunding has been shown on the drawings, however, appropriate screening / landscaping will be provided and agreed with the Highway Authority at detailed design stage.
2.6	Location: Fitzalan Link / Worthing Road Roundabout. Summary: Confusion / conflict on the circulatory carriageway Three-lane approaches on all entry arms (apart from the southbound approach which consists of two lanes) and two-lanes on all exit arms of this roundabout could lead to potential conflict within the circulatory carriageway. This could result in sharp braking or side swipe collisions.	Provide lane destination guidance on all approaches.	Accepted. Lane destination markings have been added to the drawings where appropriate. Destination signing will be agreed with the Highway Authority at detailed design stage.
2.7	Location: Fitzalan Link / Highdown Drive (Northern end) Summary: Proposed right turn facility lane into Highdown Drive (Northern end) There is concern that the length of the right turn lane should have sufficient capacity for the volume of traffic that Howdown Drive and its adjoining roads will generate. Waiting traffic could tail back from right turn lane and obstruct the southbound through lane and potentially the proposed roundabout junction to the north with consequence risk of tail end collisions.	Ensure that the right turn lane provides sufficient capacity for anticipated right turning vehicles into Highdown Drive (Northern end).	Accepted. The capacity testing of Highdown Drive / Fitzalan Link priority junction taken from the TA Addendum dated Oct 2011 has been updated to accommodate the amended geometry with the reduced right turn lane. The results are attached. The results predict that no queuing is anticipated during the peak hour periods.

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Item	Problem	Recommendation	Designer's Response
2.8	Location: Central Island (Southern Roundabout) Summary: Junction 'see through' Details of chevron signing on the roundabout central island have not been submitted at this stage. It will be important that a "see through" effect is not created which could result in drivers overshooting the circulatory carriageway and central island.	Ensure "see through" is prevented by suitable provision and location of chevron signs and / or other features.	Accepted. Chevron block paving has been shown around the roundabout central island, appropriate chevron signing has also been added to the drawings as recommended.
2.9	Location: Central Island (Northern Roundabout) Summary: Confusion / conflict on the circulatory carriageway Two-lane approaches on all entry arms (apart from the east approach which consists of one lane) and two-lanes on all exit arms of this roundabout could lead to potential conflict within the circulatory carriageway. This could result in sharp braking or side swipe collisions.	Provide lane destination guidance on all approaches.	Accepted. Lane destination markings have been shown where possible, appropriate signing will be provided at detailed design stage and agreed with the Highway Authority.
2.10	Location: Central Island (Northern Roundabout) Summary: Junction 'see through' Details of chevron signing on the roundabout central island have not been submitted at this stage. It will be important that a "see through" effect is not created which could result in drivers overshooting the circulatory carriageway and central island.	Ensure "see through" is prevented by suitable provision and location of chevron signs and / or other features.	Accepted. Chevron block paving has been shown around the roundabout central island, appropriate chevron signing has also been added to the drawings as recommended.

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North Littlehampton, Lyminster Bypass (Southern Section)

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Item	Problem	Recommendation	Designer's Response
2.11	Location: Northern arm and all approaches to the roundabout (Northern Roundabout) Summary: Northern arm (stub) closed to general traffic The proposed northern arm of the roundabout junction will not be operational when the highway arrangement subject to this Audit is commissioned. It will therefore be important that drivers approaching the roundabout are either aware that the northern arm will be closed to general traffic, or that general traffic are not directed to on to the northern arm.	Until the northern arm linking the roundabout with the Lyminster Road is commissioned and open to general traffic: - Ensure that advanced signing and lining do not direct vehicles on to the temporary northern stub arm - Ensure that advanced signing indicates the positioning of northern stub arm in relation to the eastern, western and southern arms - Provide appropriate reflective barriers to prevent both vehicles and pedestrians from using the temporary northern stub arm	Accepted. Appropriate signing to be considered at detailed design stage and only erected when the northern bypass has been constructed. Appropriate reflective barriers or similar shall be agreed with the Highway Authority to prevent access to the northern arm before it is constructed.
2.12	Location: Elevated Bypass Summary: Restraint barriers - embankment The proposals as shown include a bridge over an existing road and railway. Additionally there is also a swale at the bottom of the western embankment.	- Provide vehicle restraint barriers and pedestrian fencing as required. - Ensure that adequate embankment width is provided as required for the provision of barriers or fencing.	Accepted. Appropriate vehicle restraint barriers and pedestrian fencing will be provided at detailed design stage and agreed with the Highway Authority.

Prepared By:

Name: Oliver Nevett

Signed:



Organisation: Mayer Brown Limited

Date: 19/07/2017

Attachments:

Picady5

- Capacity testing dated 19/07/2017

Updated drawings

- A/PHLYM.1/GA-1 Rev P10
- A/PHLYM.1/GA-2 Rev P9
- A/PHLYM.1/ST-1 Rev P6
- A/PHLYM.1/ST-2 Rev P7
- A/PHLYM.1/VIS-1 Rev P6
- A/PHLYM.1/VIS-2 Rev P7
- A/PHLYM.1/TR-1 Rev P4
- A/PHLYM.1/TR-2 Rev P4
- A/PHLYM.1/TK-1 Rev P4

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CAPACITIES, QUEUES, AND DELAYS AT 3 OR 4-ARM MAJOR/MINOR PRIORITY JUNCTIONS

PICADY 5.1 ANALYSIS PROGRAM
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Run with file:-
"T:__DESIGN AB PROJECTS\02 - CURRENT JOBS\PHLYM\02 MB Design\09 Calculations\PICADY HIGHDOWN\
Highdown Drive.vpi"
(drive-on-the-left) at 15:29:44 on Wednesday, 19 July 2017

RUN INFORMATION

RUN TITLE : Highdown Drive / Fitzallan Link
LOCATION : Littlehampton
DATE : 19/07/17
CLIENT : Greencore
ENUMERATOR : bsmith-laing [BSL755]
JOB NUMBER : WYGLittlehampton.1
STATUS : TIA Addendum
DESCRIPTION :

MAJOR/MINOR JUNCTION CAPACITY AND DELAY

INPUT DATA

MAJOR ROAD (ARM C) ----- MAJOR ROAD (ARM A)
I
I
I
I
I
I
I
MINOR ROAD (ARM B)

ARM A IS Fitzalan Link (S)
ARM B IS Highdown Drive
ARM C IS Fitzalan Link (N)

STREAM LABELLING CONVENTION

STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B
STREAM B-AC CONTAINS TRAFFIC GOING FROM ARM B TO ARM A AND TO ARM C
ETC.

GEOMETRIC DATA

I	DATA ITEM	I	MINOR ROAD B	I
I	TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	I	(W) 6.00 M.	I
I	CENTRAL RESERVE WIDTH	I	(WCR) 0.00 M.	I
I		I		I
I	MAJOR ROAD RIGHT TURN - WIDTH	I	(WC-B) 3.50 M.	I
I	- VISIBILITY	I	(VC-B) 100.00 M.	I
I	- BLOCKS TRAFFIC (SPACES)	I	YES (3)	I
I		I		I
I	MINOR ROAD - VISIBILITY TO LEFT	I	(VB-C) 45.0 M.	I
I	- VISIBILITY TO RIGHT	I	(VB-A) 25.0 M.	I
I	- LANE 1 WIDTH	I	(WB-C) -	I
I	- LANE 2 WIDTH	I	(WB-A) -	I
I	WIDTH AT 0 M FROM JUNCTION	I	10.00 M.	I
I	WIDTH AT 5 M FROM JUNCTION	I	7.30 M.	I
I	WIDTH AT 10 M FROM JUNCTION	I	6.30 M.	I
I	WIDTH AT 15 M FROM JUNCTION	I	5.30 M.	I
I	WIDTH AT 20 M FROM JUNCTION	I	4.20 M.	I
I	- LENGTH OF FLARED SECTION	I	DERIVED: 3 PCU	I

.SLOPES AND INTERCEPT

(NB:Streams may be combined, in which case capacity will be adjusted)

I	Intercept For	Slope For	Opposing	Slope For	Opposing	I
I	STREAM B-C	STREAM	A-C	STREAM	A-B	I
I	0.00	0.00	0.00	0.00		I

* Due to the presence of a flare, data is not available

I	Intercept For	Slope For	Opposing	Slope For	Opposing	Slope For	Opposing	I
I	STREAM B-A	STREAM	A-C	STREAM	A-B	STREAM	C-A	I
I	0.00	0.00	0.00	0.00	0.00	0.00	0.00	I

* Due to the presence of a flare, data is not available

I	Intercept For	Slope For	Opposing	Slope For	Opposing	I
I	STREAM C-B	STREAM	A-C	STREAM	A-B	I
I	721.27	0.28	0.28			I

(NB These values do not allow for any site specific corrections)

TRAFFIC DEMAND DATA

I	ARM	I	FLOW SCALE (%)	I
I	A	I	100	I
I	B	I	100	I
I	C	I	100	I

Demand set: Highdown Drive / Fitzallan Link 2016 AM

TIME PERIOD BEGINS 07.45 AND ENDS 09.15

LENGTH OF TIME PERIOD - 90 MIN.
LENGTH OF TIME SEGMENT - 15 MIN.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

I	ARM	NUMBER OF MINUTES FROM START WHEN				RATE OF FLOW (VEH/MIN)				I				
		I	FLOW STARTS	I	TOP OF PEAK	I	FLOW STOPS	I	BEFORE		I	AT TOP	I	AFTER
I	I	I	TO RISE	I	IS REACHED	I	FALLING	I	PEAK	I	OF PEAK	I	PEAK	
I	I	I	I	I	I	I	I	I	I	I	I	I	I	
I	ARM	A	I	15.00	I	45.00	I	75.00	I	3.33	I	4.99	I	3.33
I	ARM	B	I	15.00	I	45.00	I	75.00	I	1.61	I	2.42	I	1.61
I	ARM	C	I	15.00	I	45.00	I	75.00	I	6.81	I	10.22	I	6.81

Demand set: Highdown Drive / Fitzallan Link 2016 AM

I		I	TURNING PROPORTIONS						I				
I		I	TURNING COUNTS						I				
I		I	(PERCENTAGE OF H.V.S)						I				
I													
I	TIME	I	FROM/TO	I	ARM	A	I	ARM	B	I	ARM	C	I
I	07.45 - 09.15	I		I		I		I		I		I	
I		I	ARM	A	I	0.000	I	0.008	I	0.992	I		
I		I			I	0.0	I	2.0	I	264.0	I		
I		I			I	(0.0)	I	(50.0)	I	(17.0)	I		
I		I			I		I		I		I		
I		I	ARM	B	I	0.178	I	0.000	I	0.822	I		
I		I			I	23.0	I	0.0	I	106.0	I		
I		I			I	(13.0)	I	(0.0)	I	(8.5)	I		
I		I			I		I		I		I		
I		I	ARM	C	I	0.783	I	0.217	I	0.000	I		
I		I			I	427.0	I	118.0	I	0.0	I		
I		I			I	(11.7)	I	(7.6)	I	(0.0)	I		
I		I			I		I		I		I		

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA
THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR DEMAND SET Highdown Drive / Fitzallan Link 2016 AM
AND FOR TIME PERIOD 1

I	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	I
I	I	(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING	I
I	I	I	I	(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	I
I	07.45-08.00	I	I	I	I	I	I	I	I	I	I
I	B-C	1.33	10.32	0.129	I	0.00	0.15	2.1	I	0.11	I
I	B-A	0.29	5.07	0.057	I	0.00	0.06	0.8	I	0.21	I
I	C-AB	1.48	10.16	0.146	I	0.00	0.17	2.5	I	0.11	I
I	A-B	0.03	I	I	I	I	I	I	I	I	I
I	A-C	3.31	I	I	I	I	I	I	I	I	I
I	I	I	I	I	I	I	I	I	I	I	I

I	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	I
I	I	(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING	I
I	I	I	I	(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	I
I	08.00-08.15	I	I	I	I	I	I	I	I	I	I
I	B-C	1.59	10.08	0.158	I	0.15	0.19	2.7	I	0.12	I
I	B-A	0.34	4.69	0.073	I	0.06	0.08	1.1	I	0.23	I
I	C-AB	1.77	9.96	0.178	I	0.17	0.21	3.2	I	0.12	I
I	A-B	0.03	I	I	I	I	I	I	I	I	I
I	A-C	3.96	I	I	I	I	I	I	I	I	I
I	I	I	I	I	I	I	I	I	I	I	I

I	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	I
I	I	(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING	I
I	I	I	I	(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	I
I	08.15-08.30	I	I	I	I	I	I	I	I	I	I
I	B-C	1.95	9.73	0.200	I	0.19	0.25	3.6	I	0.13	I
I	B-A	0.42	4.18	0.101	I	0.08	0.11	1.6	I	0.27	I
I	C-AB	2.17	9.69	0.224	I	0.21	0.29	4.3	I	0.13	I
I	A-B	0.04	I	I	I	I	I	I	I	I	I
I	A-C	4.84	I	I	I	I	I	I	I	I	I
I	I	I	I	I	I	I	I	I	I	I	I

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I
I	08.30-08.45										I
I	B-C	1.95	9.73	0.200		0.25	0.25	3.7		0.13	I
I	B-A	0.42	4.17	0.101		0.11	0.11	1.7		0.27	I
I	C-AB	2.17	9.69	0.224		0.29	0.29	4.4		0.13	I
I	A-B	0.04									I
I	A-C	4.84									I

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I
I	08.45-09.00										I
I	B-C	1.59	10.07	0.158		0.25	0.19	2.9		0.12	I
I	B-A	0.34	4.69	0.073		0.11	0.08	1.3		0.23	I
I	C-AB	1.77	9.96	0.178		0.29	0.22	3.3		0.12	I
I	A-B	0.03									I
I	A-C	3.96									I

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I
I	09.00-09.15										I
I	B-C	1.33	10.32	0.129		0.19	0.15	2.3		0.11	I
I	B-A	0.29	5.06	0.057		0.08	0.06	0.9		0.21	I
I	C-AB	1.48	10.16	0.146		0.22	0.17	2.6		0.12	I
I	A-B	0.03									I
I	A-C	3.31									I

WARNING NO MARGINAL ANALYSIS OF CAPACITIES AS MAJOR ROAD BLOCKING MAY OCCUR

QUEUE FOR STREAM B-C

TIME SEGMENT	NO. OF VEHICLES IN QUEUE
08.00	0.1
08.15	0.2
08.30	0.2
08.45	0.2
09.00	0.2
09.15	0.1

QUEUE FOR STREAM B-A

TIME SEGMENT	NO. OF VEHICLES IN QUEUE
08.00	0.1
08.15	0.1
08.30	0.1
08.45	0.1
09.00	0.1
09.15	0.1

QUEUE FOR STREAM C-AB

TIME SEGMENT	NO. OF VEHICLES IN QUEUE
08.00	0.2
08.15	0.2
08.30	0.3
08.45	0.3
09.00	0.2
09.15	0.2

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

I	STREAM	I	TOTAL	I	DEMAND	I	* QUEUEING *	I	* INCLUSIVE QUEUEING *	I
I		I		I		I	* DELAY *	I	* DELAY *	I
I		I	(VEH)	I	(VEH/H)	I	(MIN)	I	(MIN)	I
I		I		I		I	(MIN/VEH)	I	(MIN/VEH)	I
I	B-C	I	145.9	I	97.3	I	17.4	I	17.4	I
I	B-A	I	31.7	I	21.1	I	7.4	I	7.4	I
I	C-AB	I	162.4	I	108.3	I	20.3	I	20.3	I
I	A-B	I	2.8	I	1.8	I		I		I
I	A-C	I	363.4	I	242.3	I		I		I
I	ALL	I	1293.8	I	862.6	I	45.1	I	45.1	I

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD
 * INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES
 WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD
 * THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS
 A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

*****END OF RUN*****

.SLOPES AND INTERCEPT

(NB:Streams may be combined, in which case capacity will be adjusted)

I	Intercept	For	Slope	For	Opposing	Slope	For	Opposing	I
I	STREAM	B-C	STREAM	A-C	STREAM	A-B	STREAM	A-B	I
I		0.00		0.00		0.00		0.00	I

* Due to the presence of a flare, data is not available

I	Intercept	For	Slope	For	Opposing	Slope	For	Opposing	Slope	For	Opposing	I	
I	STREAM	B-A	STREAM	A-C	STREAM	A-B	STREAM	C-A	STREAM	C-B	STREAM	C-B	I
I	0.00		0.00		0.00		0.00		0.00		0.00	I	

* Due to the presence of a flare, data is not available

I	Intercept	For	Slope	For	Opposing	Slope	For	Opposing	I
I	STREAM	C-B	STREAM	A-C	STREAM	A-B	STREAM	A-B	I
I		721.27		0.28		0.28		0.28	I

(NB These values do not allow for any site specific corrections)

TRAFFIC DEMAND DATA

I	ARM	I	FLOW	SCALE(%)	I
I	A	I	100		I
I	B	I	100		I
I	C	I	100		I

Demand set: Highdown Drive / Fitzallan Link 2016 PM

TIME PERIOD BEGINS 16.45 AND ENDS 18.15

LENGTH OF TIME PERIOD - 90 MIN.
 LENGTH OF TIME SEGMENT - 15 MIN.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

I	ARM	I	NUMBER OF MINUTES FROM START WHEN			I	RATE OF FLOW (VEH/MIN)			I					
			I	I	I		I	I	I						
											I	I	I		
														I	I
I	I	I	FLOW STARTS	TOP OF PEAK	FLOW STOPS	BEFORE	AT TOP	AFTER	I						
I	I	I	TO RISE	IS REACHED	FALLING	PEAK	OF PEAK	PEAK	I						
I	I	I	I	I	I	I	I	I	I						
I	ARM	A	I	15.00	I	45.00	I	75.00	I	4.39	I	6.58	I	4.39	I
I	ARM	B	I	15.00	I	45.00	I	75.00	I	0.96	I	1.44	I	0.96	I
I	ARM	C	I	15.00	I	45.00	I	75.00	I	5.54	I	8.31	I	5.54	I

Demand set: Highdown Drive / Fitzallan Link 2016 PM

I	I	TURNING PROPORTIONS						I		
		I	TURNING COUNTS						I	
			I	(PERCENTAGE OF H.V.S)						I
TIME		I FROM/TO	I ARM	A	I ARM	B	I ARM	C	I	
I	16.45 - 18.15	I	I	I	I	I	I	I	I	
I		I ARM	A	I	0.000	I	0.060	I	0.940	I
I		I		I	0.0	I	21.0	I	330.0	I
I		I		I	(0.0)	I	(4.8)	I	(13.6)	I
I		I		I	I	I	I	I	I	I
I		I ARM	B	I	0.013	I	0.000	I	0.987	I
I		I		I	1.0	I	0.0	I	76.0	I
I		I		I	(33.3)	I	(0.0)	I	(11.8)	I
I		I		I	I	I	I	I	I	I
I		I ARM	C	I	0.754	I	0.246	I	0.000	I
I		I		I	334.0	I	109.0	I	0.0	I
I		I		I	(15.0)	I	(8.3)	I	(0.0)	I
I		I		I	I	I	I	I	I	I

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA
THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR DEMAND SET Highdown Drive / Fitzallan Link 2016 PM
AND FOR TIME PERIOD 2

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
16.45-17.00									
B-C	0.95	10.02	0.095		0.00	0.10	1.5		0.11
B-A	0.01	4.22	0.003		0.00	0.00	0.0		0.24
C-AB	1.37	9.81	0.139		0.00	0.16	2.4		0.12
A-B	0.26								
A-C	4.14								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.00-17.15									
B-C	1.14	9.77	0.116		0.10	0.13	1.9		0.12
B-A	0.01	3.90	0.004		0.00	0.00	0.1		0.26
C-AB	1.63	9.57	0.171		0.16	0.20	3.1		0.13
A-B	0.31								
A-C	4.94								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.15-17.30									
B-C	1.39	9.43	0.148		0.13	0.17	2.5		0.12
B-A	0.02	3.47	0.005		0.00	0.01	0.1		0.29
C-AB	2.00	9.22	0.217		0.20	0.28	4.1		0.14
A-B	0.39								
A-C	6.06								

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I
I	17.30-17.45										I
I	B-C	1.39	9.43	0.148		0.17	0.17	2.6		0.12	I
I	B-A	0.02	3.47	0.005		0.01	0.01	0.1		0.29	I
I	C-AB	2.00	9.22	0.217		0.28	0.28	4.2		0.14	I
I	A-B	0.39									I
I	A-C	6.06									I

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I
I	17.45-18.00										I
I	B-C	1.14	9.77	0.117		0.17	0.13	2.0		0.12	I
I	B-A	0.01	3.90	0.004		0.01	0.00	0.1		0.26	I
I	C-AB	1.63	9.57	0.171		0.28	0.21	3.1		0.13	I
I	A-B	0.31									I
I	A-C	4.94									I

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I
I	18.00-18.15										I
I	B-C	0.95	10.02	0.095		0.13	0.11	1.6		0.11	I
I	B-A	0.01	4.21	0.003		0.00	0.00	0.0		0.24	I
I	C-AB	1.37	9.81	0.139		0.21	0.16	2.5		0.12	I
I	A-B	0.26									I
I	A-C	4.14									I

WARNING NO MARGINAL ANALYSIS OF CAPACITIES AS MAJOR ROAD BLOCKING MAY OCCUR

QUEUE FOR STREAM B-C

TIME SEGMENT	NO. OF VEHICLES IN QUEUE
17.00	0.1
17.15	0.1
17.30	0.2
17.45	0.2
18.00	0.1
18.15	0.1

QUEUE FOR STREAM B-A

TIME SEGMENT	NO. OF VEHICLES IN QUEUE
17.00	0.0
17.15	0.0
17.30	0.0
17.45	0.0
18.00	0.0
18.15	0.0

QUEUE FOR STREAM C-AB

TIME SEGMENT	NO. OF VEHICLES IN QUEUE
17.00	0.2
17.15	0.2
17.30	0.3
17.45	0.3
18.00	0.2
18.15	0.2

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

I	STREAM	I	TOTAL	I	DEMAND	I	* QUEUEING *	I	* INCLUSIVE QUEUEING *	I
I		I		I		I	* DELAY *	I	* DELAY *	I
I		I	(VEH)	I	(VEH/H)	I	(MIN)	I	(MIN)	I
I		I		I		I	(MIN/VEH)	I	(MIN/VEH)	I
I	B-C	I	104.6	I	69.7	I	12.2	I	12.2	I
I	B-A	I	1.4	I	0.9	I	0.4	I	0.4	I
I	C-AB	I	150.0	I	100.0	I	19.4	I	19.4	I
I	A-B	I	28.9	I	19.3	I		I		I
I	A-C	I	454.2	I	302.8	I		I		I
I	ALL	I	1198.9	I	799.2	I	31.9	I	31.9	I

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD
 * INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES
 WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD
 * THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS
 A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

*****END OF RUN*****

.SLOPES AND INTERCEPT

(NB:Streams may be combined, in which case capacity will be adjusted)

I	Intercept	For	Slope	For	Opposing	Slope	For	Opposing	I
I	STREAM	B-C	STREAM	A-C	STREAM	A-B	STREAM	A-B	I
I		0.00		0.00		0.00		0.00	I

* Due to the presence of a flare, data is not available

I	Intercept	For	Slope	For	Opposing	Slope	For	Opposing	Slope	For	Opposing	I	
I	STREAM	B-A	STREAM	A-C	STREAM	A-B	STREAM	C-A	STREAM	C-B	STREAM	C-B	I
I	0.00		0.00		0.00		0.00		0.00		0.00	I	

* Due to the presence of a flare, data is not available

I	Intercept	For	Slope	For	Opposing	Slope	For	Opposing	I
I	STREAM	C-B	STREAM	A-C	STREAM	A-B	STREAM	A-B	I
I		721.27		0.28		0.28		0.28	I

(NB These values do not allow for any site specific corrections)

TRAFFIC DEMAND DATA

I	ARM	I	FLOW	SCALE	(%)	I
I	A	I	100			I
I	B	I	100			I
I	C	I	100			I

Demand set: Highdown Drive / Fitzallan Link 2016 AM + Courtwick

TIME PERIOD BEGINS 07.45 AND ENDS 09.15

LENGTH OF TIME PERIOD - 90 MIN.
 LENGTH OF TIME SEGMENT - 15 MIN.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

I	ARM	NUMBER OF MINUTES FROM START WHEN			RATE OF FLOW (VEH/MIN)			I						
		I	I	I	I	I	I							
									I	I	I			
												I	I	I
I	A	I	15.00	I	45.00	I	75.00	I	3.35	I	5.02	I	3.35	I
I	B	I	15.00	I	45.00	I	75.00	I	1.55	I	2.32	I	1.55	I
I	C	I	15.00	I	45.00	I	75.00	I	6.97	I	10.46	I	6.97	I

Demand set: Highdown Drive / Fitzallan Link 2016 AM + Courtwick

I	I	TURNING PROPORTIONS										I	
		I	I	TURNING COUNTS						I			
				I	I	(PERCENTAGE OF H.V.S)					I		
						I	I	I	I				I
TIME		I	FROM/TO	I	ARM	A	I	ARM	B	I	ARM	C	I
I	07.45 - 09.15	I		I		I		I		I		I	
I		I	ARM A	I	0.000	I	0.007	I	0.993	I		I	
I		I		I	0.0	I	2.0	I	266.0	I		I	
I		I		I	(0.0)	I	(0.0)	I	(16.9)	I		I	
I		I		I		I		I		I		I	
I		I	ARM B	I	0.185	I	0.000	I	0.815	I		I	
I		I		I	23.0	I	0.0	I	101.0	I		I	
I		I		I	(13.0)	I	(0.0)	I	(5.9)	I		I	
I		I		I		I		I		I		I	
I		I	ARM C	I	0.789	I	0.211	I	0.000	I		I	
I		I		I	440.0	I	118.0	I	0.0	I		I	
I		I		I	(12.3)	I	(5.9)	I	(0.0)	I		I	
I		I		I		I		I		I		I	

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA
THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR DEMAND SET Highdown Drive / Fitzallan Link 2016 AM + Courtwick
AND FOR TIME PERIOD 1

I	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	I
I		(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING	I
I				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	I
I	07.45-08.00										I
I	B-C	1.27	10.56	0.120		0.00	0.14	2.0		0.11	I
I	B-A	0.29	5.05	0.057		0.00	0.06	0.9		0.21	I
I	C-AB	1.48	10.32	0.144		0.00	0.17	2.5		0.11	I
I	A-B	0.03									I
I	A-C	3.34									I
I											I

I	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	I
I		(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING	I
I				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	I
I	08.00-08.15										I
I	B-C	1.51	10.31	0.147		0.14	0.17	2.5		0.11	I
I	B-A	0.34	4.67	0.074		0.06	0.08	1.1		0.23	I
I	C-AB	1.77	10.11	0.175		0.17	0.21	3.2		0.12	I
I	A-B	0.03									I
I	A-C	3.99									I
I											I

I	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	I
I		(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING	I
I				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	I
I	08.15-08.30										I
I	B-C	1.85	9.95	0.186		0.17	0.23	3.3		0.12	I
I	B-A	0.42	4.15	0.102		0.08	0.11	1.6		0.27	I
I	C-AB	2.17	9.84	0.220		0.21	0.28	4.2		0.13	I
I	A-B	0.04									I
I	A-C	4.88									I
I											I

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I
I	08.30-08.45										I
I	B-C	1.85	9.95	0.186		0.23	0.23	3.4		0.12	I
I	B-A	0.42	4.15	0.102		0.11	0.11	1.7		0.27	I
I	C-AB	2.17	9.84	0.220		0.28	0.28	4.3		0.13	I
I	A-B	0.04									I
I	A-C	4.88									I

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I
I	08.45-09.00										I
I	B-C	1.51	10.31	0.147		0.23	0.17	2.7		0.11	I
I	B-A	0.34	4.67	0.074		0.11	0.08	1.3		0.23	I
I	C-AB	1.77	10.11	0.175		0.28	0.21	3.2		0.12	I
I	A-B	0.03									I
I	A-C	3.99									I

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I
I	09.00-09.15										I
I	B-C	1.27	10.56	0.120		0.17	0.14	2.1		0.11	I
I	B-A	0.29	5.04	0.057		0.08	0.06	1.0		0.21	I
I	C-AB	1.48	10.32	0.144		0.21	0.17	2.5		0.11	I
I	A-B	0.03									I
I	A-C	3.34									I

WARNING NO MARGINAL ANALYSIS OF CAPACITIES AS MAJOR ROAD BLOCKING MAY OCCUR

QUEUE FOR STREAM B-C

TIME SEGMENT	NO. OF VEHICLES IN QUEUE
08.00	0.1
08.15	0.2
08.30	0.2
08.45	0.2
09.00	0.2
09.15	0.1

QUEUE FOR STREAM B-A

TIME SEGMENT	NO. OF VEHICLES IN QUEUE
08.00	0.1
08.15	0.1
08.30	0.1
08.45	0.1
09.00	0.1
09.15	0.1

QUEUE FOR STREAM C-AB

TIME SEGMENT	NO. OF VEHICLES IN QUEUE
08.00	0.2
08.15	0.2
08.30	0.3
08.45	0.3
09.00	0.2
09.15	0.2

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

I	STREAM	I	TOTAL	I	DEMAND	I	* QUEUEING *	I	* INCLUSIVE QUEUEING *	I
I		I		I		I	* DELAY *	I	* DELAY *	I
I		I	(VEH)	I	(VEH/H)	I	(MIN)	I	(MIN)	I
I		I		I		I	(MIN/VEH)	I	(MIN/VEH)	I
I	B-C	I	139.0	I	92.7	I	16.0	I	16.0	I
I	B-A	I	31.7	I	21.1	I	7.5	I	7.5	I
I	C-AB	I	162.4	I	108.3	I	19.9	I	19.9	I
I	A-B	I	2.8	I	1.8	I		I		I
I	A-C	I	366.1	I	244.1	I		I		I
I	ALL	I	1307.6	I	871.7	I	43.4	I	43.4	I

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD
 * INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES
 WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD
 * THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS
 A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

*****END OF RUN*****

.SLOPES AND INTERCEPT

(NB:Streams may be combined, in which case capacity will be adjusted)

I	Intercept	For	Slope	For	Opposing	Slope	For	Opposing	I
I	STREAM	B-C	STREAM	A-C	STREAM	A-B	STREAM	A-B	I
I		0.00		0.00		0.00		0.00	I

* Due to the presence of a flare, data is not available

I	Intercept	For	Slope	For	Opposing	Slope	For	Opposing	Slope	For	Opposing	I	
I	STREAM	B-A	STREAM	A-C	STREAM	A-B	STREAM	C-A	STREAM	C-B	STREAM	C-B	I
I	0.00		0.00		0.00		0.00		0.00		0.00	I	

* Due to the presence of a flare, data is not available

I	Intercept	For	Slope	For	Opposing	Slope	For	Opposing	I
I	STREAM	C-B	STREAM	A-C	STREAM	A-B	STREAM	A-B	I
I		721.27		0.28		0.28		0.28	I

(NB These values do not allow for any site specific corrections)

TRAFFIC DEMAND DATA

I	ARM	I	FLOW	I	SCALE(%)	I
I	A	I	100	I		I
I	B	I	100	I		I
I	C	I	100	I		I

Demand set: Highdown Drive / Fitzallan Link 2016 PM + Courtwick

TIME PERIOD BEGINS 16.45 AND ENDS 18.15

LENGTH OF TIME PERIOD - 90 MIN.
 LENGTH OF TIME SEGMENT - 15 MIN.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

I	ARM	NUMBER OF MINUTES FROM START WHEN			RATE OF FLOW (VEH/MIN)			I			
		I	I	I	I	I	I				
									I	I	I
I	I	FLOW STARTS	TOP OF PEAK	FLOW STOPS	BEFORE	AT TOP	AFTER	I			
I	I	TO RISE	IS REACHED	FALLING	PEAK	OF PEAK	PEAK	I			
I	I	I	I	I	I	I	I	I			
I	ARM	A	I	15.00	I	45.00	I	75.00	I		
I	ARM	B	I	15.00	I	45.00	I	75.00	I		
I	ARM	C	I	15.00	I	45.00	I	75.00	I		
I					I	4.43	I	6.64	I		
I					I	1.01	I	1.52	I		
I					I	5.54	I	8.31	I		
I					I	4.43	I	4.43	I		
I					I	1.01	I	1.01	I		
I					I	5.54	I	5.54	I		

Demand set: Highdown Drive / Fitzallan Link 2016 PM + Courtwick

I	I	TURNING PROPORTIONS						I		
		TURNING COUNTS							I	
		(PERCENTAGE OF H.V.S)								I
TIME	I FROM/TO	I ARM	A I ARM	B I ARM	C I					
I	16.45 - 18.15	I	I	I	I	I	I			
I		I ARM A	I	0.000 I	0.062 I	0.938 I	I			
I		I	I	0.0 I	22.0 I	332.0 I	I			
I		I	I (	0.0) I	(9.1) I	(12.7) I	I			
I		I	I	I	I	I	I			
I		I ARM B	I	0.025 I	0.000 I	0.975 I	I			
I		I	I	2.0 I	0.0 I	79.0 I	I			
I		I	I (	0.0) I	(0.0) I	(1.3) I	I			
I		I	I	I	I	I	I			
I		I ARM C	I	0.752 I	0.248 I	0.000 I	I			
I		I	I	333.0 I	110.0 I	0.0 I	I			
I		I	I (	14.4) I	(9.1) I	(0.0) I	I			
I		I	I	I	I	I	I			

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA
THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR DEMAND SET Highdown Drive / Fitzallan Link 2016 PM + Courtwick
AND FOR TIME PERIOD 2

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I
I	16.45-17.00										I
I	B-C	0.99	11.06	0.090		0.00	0.10	1.4		0.10	I
I	B-A	0.03	5.62	0.004		0.00	0.00	0.1		0.18	I
I	C-AB	1.38	9.74	0.142		0.00	0.16	2.4		0.12	I
I	A-B	0.28									I
I	A-C	4.17									I

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I
I	17.00-17.15										I
I	B-C	1.18	10.78	0.110		0.10	0.12	1.8		0.10	I
I	B-A	0.03	5.20	0.006		0.00	0.01	0.1		0.19	I
I	C-AB	1.65	9.49	0.174		0.16	0.21	3.1		0.13	I
I	A-B	0.33									I
I	A-C	4.97									I

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I
I	17.15-17.30										I
I	B-C	1.45	10.40	0.139		0.12	0.16	2.4		0.11	I
I	B-A	0.04	4.63	0.008		0.01	0.01	0.1		0.22	I
I	C-AB	2.02	9.15	0.221		0.21	0.28	4.2		0.14	I
I	A-B	0.40									I
I	A-C	6.09									I

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I
I	17.30-17.45										I
I	B-C	1.45	10.40	0.139		0.16	0.16	2.4		0.11	I
I	B-A	0.04	4.62	0.008		0.01	0.01	0.1		0.22	I
I	C-AB	2.02	9.15	0.221		0.28	0.28	4.3		0.14	I
I	A-B	0.40									I
I	A-C	6.09									I

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I
I	17.45-18.00										I
I	B-C	1.18	10.78	0.110		0.16	0.12	1.9		0.10	I
I	B-A	0.03	5.20	0.006		0.01	0.01	0.1		0.19	I
I	C-AB	1.65	9.49	0.174		0.28	0.21	3.2		0.13	I
I	A-B	0.33									I
I	A-C	4.97									I

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I
I	18.00-18.15										I
I	B-C	0.99	11.06	0.090		0.12	0.10	1.5		0.10	I
I	B-A	0.03	5.61	0.004		0.01	0.00	0.1		0.18	I
I	C-AB	1.38	9.74	0.142		0.21	0.17	2.5		0.12	I
I	A-B	0.28									I
I	A-C	4.17									I

WARNING NO MARGINAL ANALYSIS OF CAPACITIES AS MAJOR ROAD BLOCKING MAY OCCUR

QUEUE FOR STREAM B-C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
17.00	0.1
17.15	0.1
17.30	0.2
17.45	0.2
18.00	0.1
18.15	0.1

QUEUE FOR STREAM B-A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
17.00	0.0
17.15	0.0
17.30	0.0
17.45	0.0
18.00	0.0
18.15	0.0

QUEUE FOR STREAM C-AB

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
17.00	0.2
17.15	0.2
17.30	0.3
17.45	0.3
18.00	0.2
18.15	0.2

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

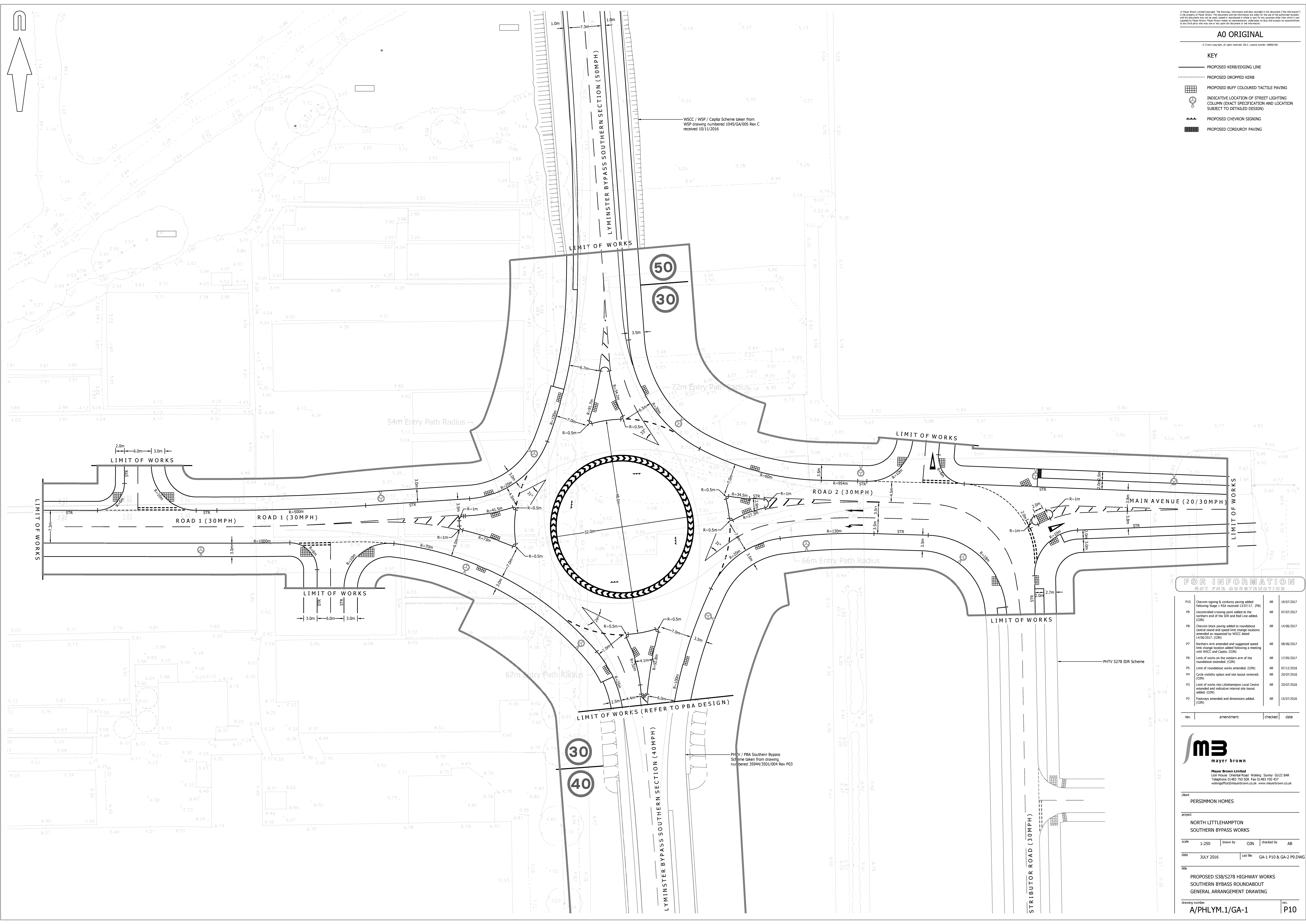
I	STREAM	I	TOTAL	I	DEMAND	I	* QUEUEING *	I	* INCLUSIVE QUEUEING *	I
I		I		I		I	* DELAY *	I	* DELAY *	I
I		I		I		I		I		I
I		I	(VEH)	I	(VEH/H)	I	(MIN)	I	(MIN)	I
I		I		I		I	(MIN/VEH)	I	(MIN/VEH)	I
I	B-C	I	108.7	I	72.5	I	11.4	I	11.4	I
I	B-A	I	2.8	I	1.8	I	0.5	I	0.5	I
I	C-AB	I	151.4	I	100.9	I	19.8	I	19.8	I
I	A-B	I	30.3	I	20.2	I		I		I
I	A-C	I	457.0	I	304.6	I		I		I
I	ALL	I	1208.5	I	805.7	I	31.7	I	31.7	I

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD
 * INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES
 WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD
 * THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS
 A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

*****END OF RUN*****

===== end of file =====

Printed at 15:30:22 on 19/07/2017]



A0 ORIGINAL

KEY

— PROPOSED KERB/EDGING LINE



INDICATIVE LOCATION OF STREET LIGHTING
COLUMN (EXACT SPECIFICATION AND LOCATION
SUBJECT TO DETAILED DESIGN)



FOR INFORMATION
NOT FOR CONSTRUCTION

P10	Cherwon signage & courtesy paving added to the northern end of the TSA and Right Lane added. (CON)	AB	19/07/2017
P9	Uncontrolled crossing points added to the northern end of the TSA and Right Lane added. (CON)	AB	09/07/2017
P8	Cherwon block paving added to roundabout corners and speed limit signage added. Additional signage as requested by WSCG dated 14/06/2017. (CON)	AB	14/06/2017
P7	Neonflex Arm amended and suggested speed limit change location added to paving a meeting with WSCG and CPCA. (CON)	AB	08/06/2017
P6	Limit of works on the western arm of the roundabout extended. (CON)	AB	17/05/2017
P5	Limit of roundabout works amended. (CON)	AB	07/12/2016
P4	Cycle visibility splays and site layout removed. (CON)	AB	20/02/2016
P3	Limit of works to Littleborough Local Centre extended and inductive intensive site layout added. (CON)	AB	20/07/2016
P2	Footways amended and dimensions added. (CON)	AB	15/07/2016

rev.	amendment	checked	date
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client
PERSIMMON HOMES

project

NORTH LITTLEHAMPTON
SOUTHERN BYPASS WORKS

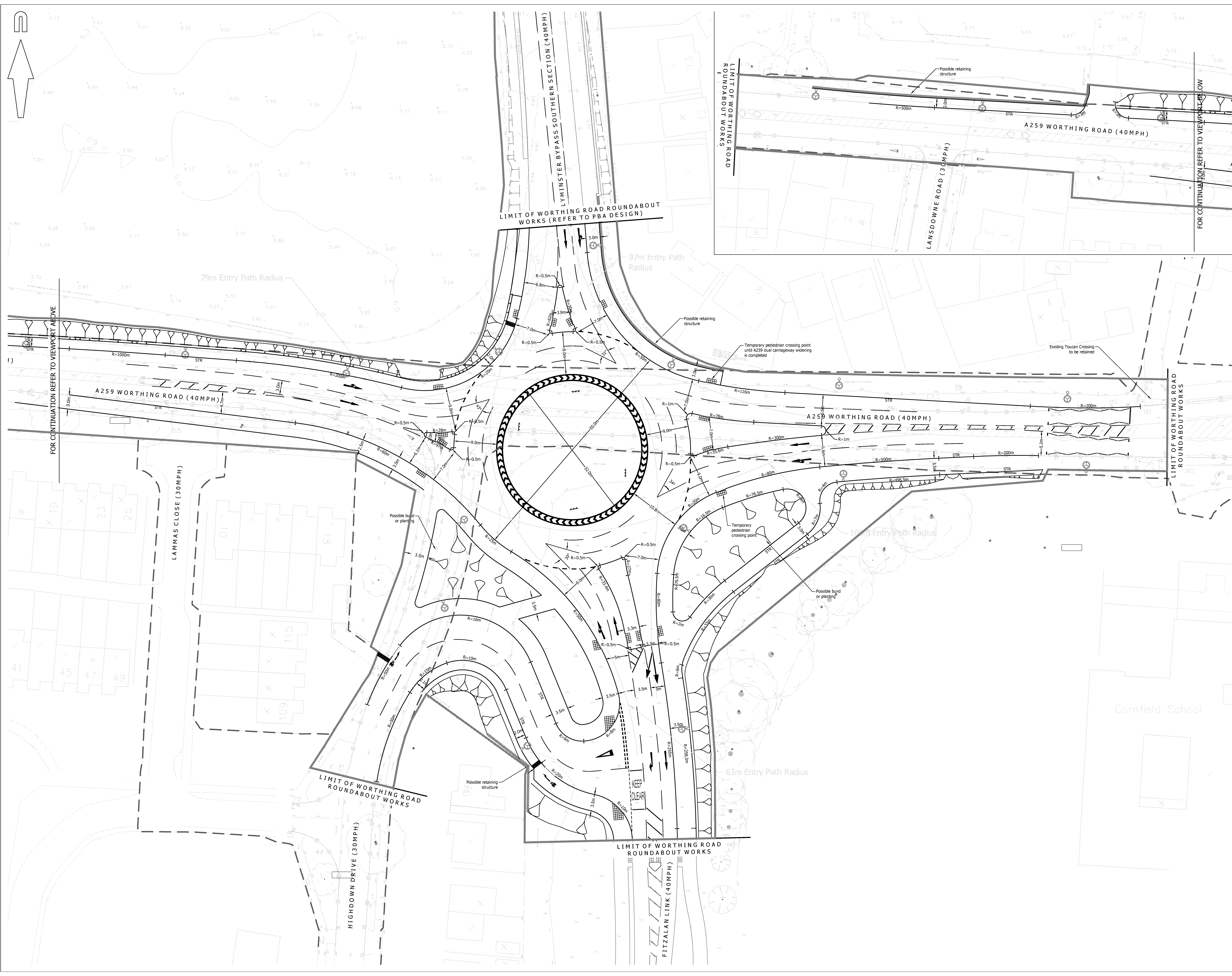
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date	JULY 2016	cad file	GA-1 P10 & GA-2 P9.DWG
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PROPOSED S38/S278 HIGHWAY WORKS
SOUTHERN BYPASS ROUNDABOUT
GENERAL ARRANGEMENT DRAWING

drawing number
A/PHLYM.1/GA-1

rev.
P10



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KEY

- PROPOSED KERB/EDGING LINE
- PROPOSED DROPPED KERB
- PROPOSED BUFF COLOURED TACTILE PAVING
- INDICATIVE LOCATION OF STREET LIGHTING COLUMN (EXACT SPECIFICATION AND LOCATION SUBJECT TO DETAILED DESIGN)
- PROPOSED CHEVRON SIGNING
- PROPOSED CORDUROY PAVING
- EXISTING HIGHWAY BOUNDARY
- POSSIBLE RETAINING STRUCTURE

FOR INFORMATION NOT FOR CONSTRUCTION

P9	Destination arrows, chevron signing & corduroy paving added following Stage 1 RSA received 13/07/17. (P9)	AB	19/07/2017
P8	Red Line added. (CON)	AB	07/07/2017
P7	Entry path radius added and tie in with Fitzalan Link amended. (CON)	AB	13/06/2017
P6	Fitzalan link speed limit amended. (CON)	AB	27/04/2017
P5	Roundabout splitter islands on the northern, eastern and southern arms amended as requested by WSCC and to tie into the WSCC VSP road widening scheme. (CON)	AB	20/04/2017
P4	Footway amended. (CON)	AB	07/12/2016
P3	Lyminster Bypass alignment updated, notes added and other minor amendments. (CON)	AB	20/10/2016
P2	Footway / Cycleway updated. (CON)	AB	20/07/2016

rev.	amendment	checked	date

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Client
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Project
**NORTH LITTLEHAMPTON
SOUTHERN BYPASS WORKS**

Scale
1:250

Drawn by
PB

Checked by
AB

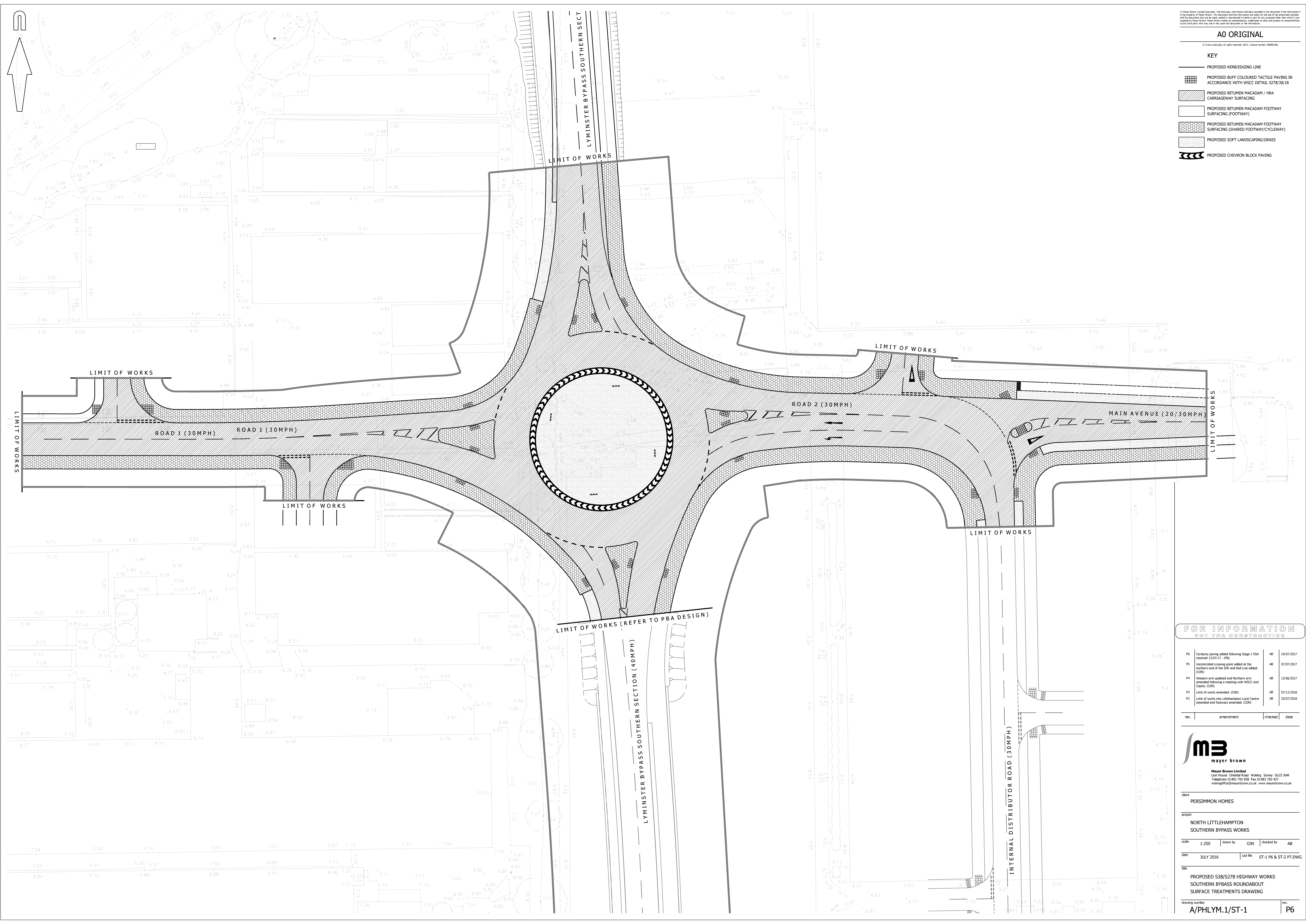
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Cad file
GA-1 P10 & GA-2 P9.DWG

Title
**PROPOSED S278 HIGHWAY WORKS
A259 WORTHING ROAD ROUNDABOUT
GENERAL ARRANGEMENT DRAWING**

Drawing number
A/PHLYM.1/GA-2

Rev.
P9



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KEY

- PROPOSED KERB/EDGING LINE
- PROPOSED BUFF COLOURED TACTILE PAVING IN ACCORDANCE WITH WSCC DETAIL S278/S818
- PROPOSED BITUMEN MACADAM / HRA CARRIAGEWAY SURFACING
- PROPOSED BITUMEN MACADAM FOOTWAY SURFACING (FOOTWAY)
- PROPOSED BITUMEN MACADAM FOOTWAY SURFACING (SHARED FOOTWAY/CYCLEWAY)
- PROPOSED SOFT LANDSCAPING/GRASS
- PROPOSED CHEVRON BLOCK PAVING

**FOR INFORMATION
NOT FOR CONSTRUCTION**

P6	Conduity paving added following Stage 1 RSA received 13/07/17. (PB)	AB	18/07/2017
P5	Uncontrolled crossing point added at the northern end of the L&N and Road Line added. (CLN)	AB	07/07/2017
P4	Western arm updated and Northern arm amended following a meeting with WSCC and Capital. (CLN)	AB	13/06/2017
P3	Limit of works amended. (CLN)	AB	07/12/2016
P2	Limit of works into Littlehampton Local Centre extended and Footway amended. (CLN)	AB	20/07/2016

rev	amendment	checked	date

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Client
PERSIMMON HOMES

Project
**NORTH LITTLEHAMPTON
SOUTHERN BYPASS WORKS**

Scale
1:250

Drawn by
CJN

Checked by
AB

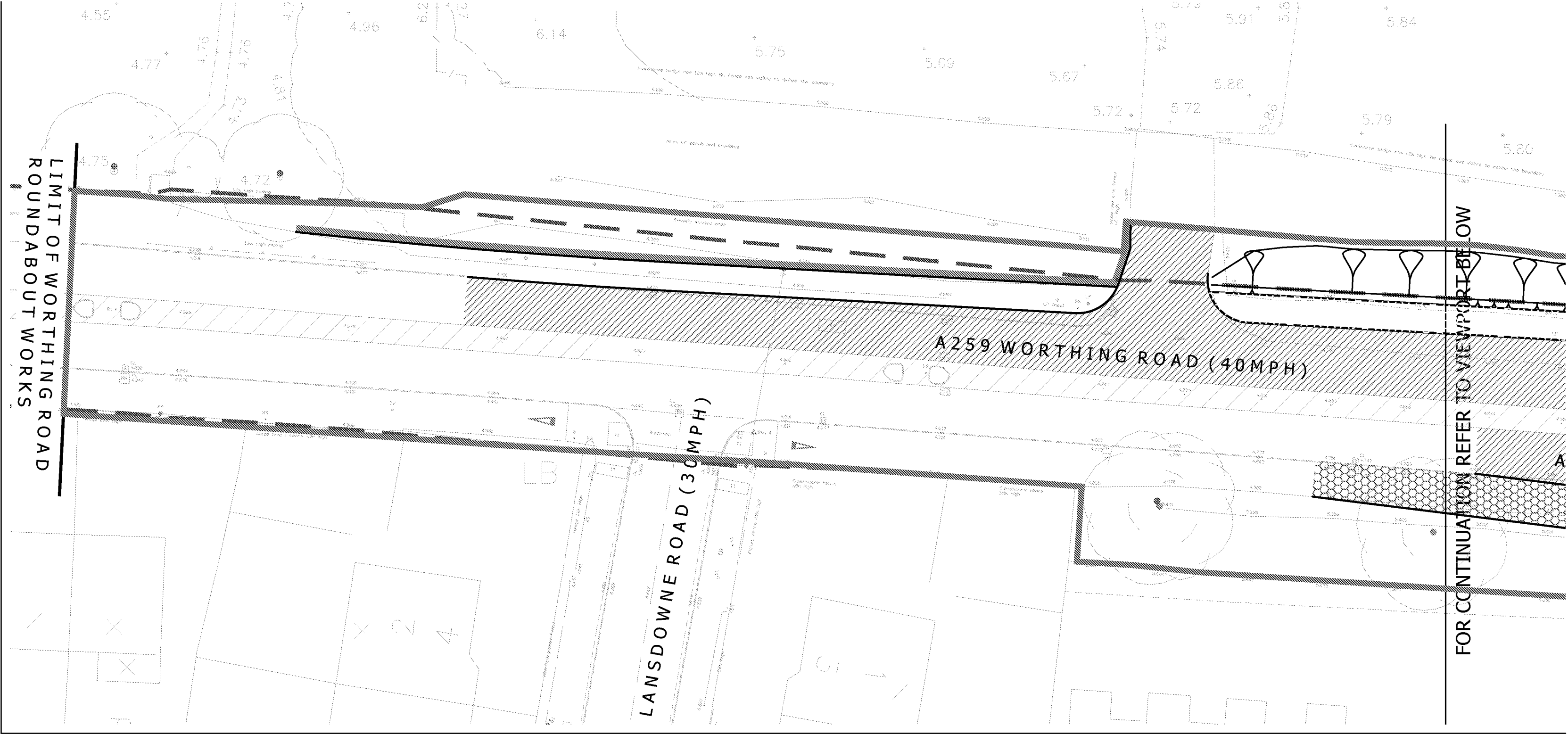
Date
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Cad file
ST-1 P6 & ST-2 P7.DWG

Title
**PROPOSED S38/S278 HIGHWAY WORKS
SOUTHERN BYPASS ROUNDABOUT
SURFACE TREATMENTS DRAWING**

Drawing number
A/PHLYM.1/ST-1

Rev.
P6



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KEY

- PROPOSED KERB/EDGING LINE
- PROPOSED BUFF COLOURED TACTILE PAVING IN ACCORDANCE WITH WSCC DETAIL S278/58/18
- PROPOSED BITUMEN MACADAM / HRA CARRIAGEWAY SURFACING
- PROPOSED BITUMEN MACADAM FOOTWAY SURFACING (FOOTWAY)
- PROPOSED BITUMEN MACADAM FOOTWAY SURFACING (SHARED FOOTWAY/CYCLEWAY)
- PROPOSED SOFT LANDSCAPING/GRASS
- PROPOSED CHEVRON BLOCK PAVING
- EXISTING HIGHWAY BOUNDARY
- POSSIBLE RETAINING STRUCTURE

**FOR INFORMATION
NOT FOR CONSTRUCTION**

P7	Destination arrows & corduroy paving added following Stage 1 RSA received 13/07/17. (PB)	AB	19/07/2017
P6	Red Line added. (CIN)	AB	07/07/2017
P5	Roundabout updated following discussions with WSCC, tie in with Fitzalan Link amended. (CIN)	AB	13/06/2017
P4	Footway amended. (CIN)	AB	07/12/2016
P3	Lyminster Bypass alignment updated, notes added and other minor amendments. (CIN)	AB	20/10/2016
P2	Footway / Cycleway amended. (CIN)	AB	20/07/2016

rev.	amendment	checked	date
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Client
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Project
**NORTH LITTLEHAMPTON
SOUTHERN BYPASS WORKS**

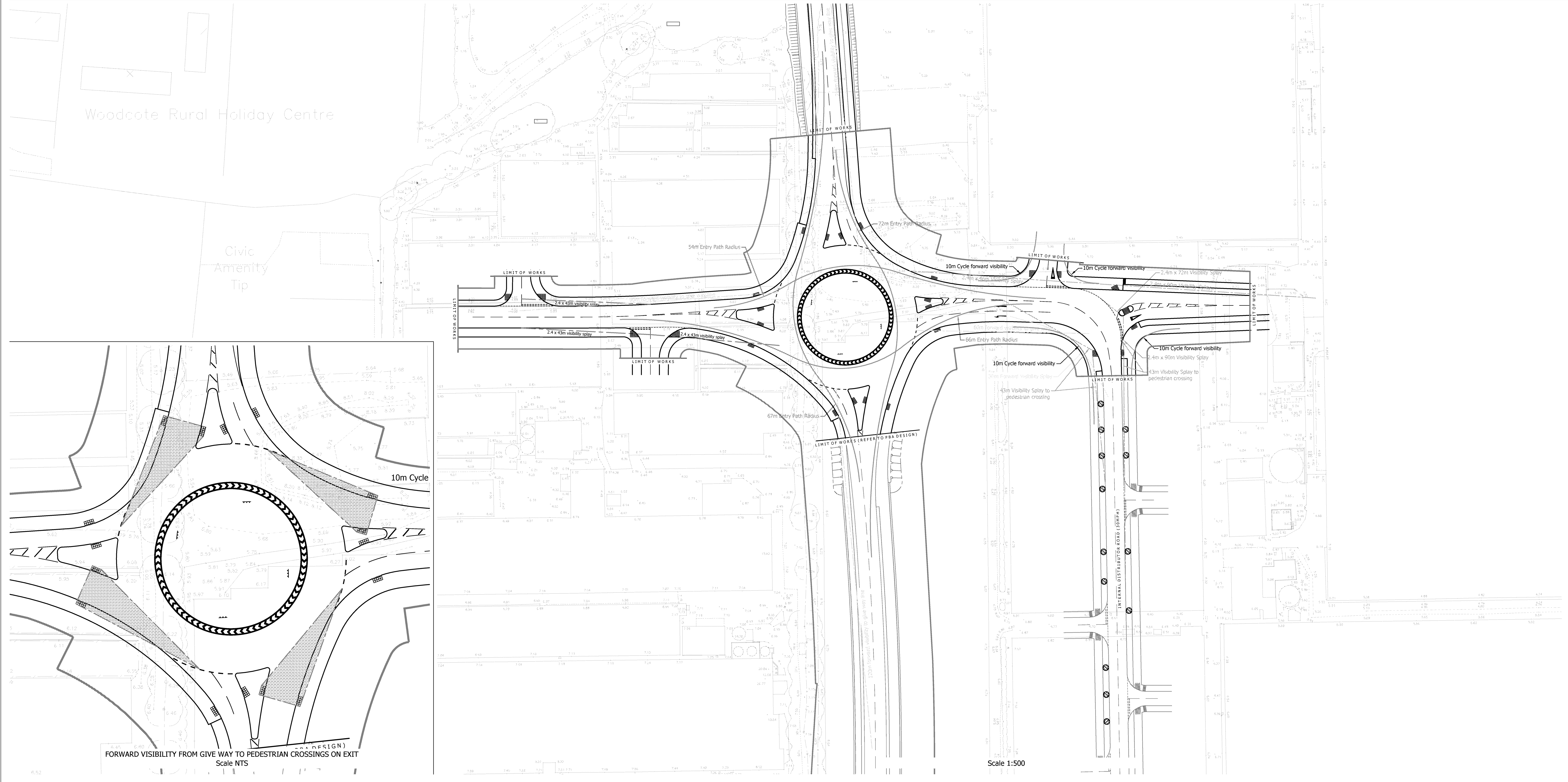
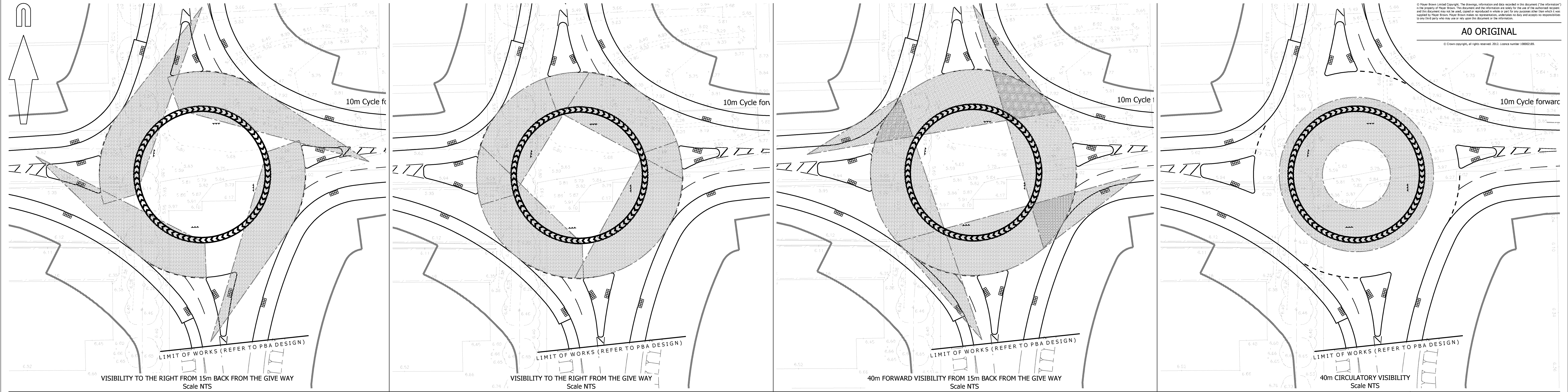
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Date
JULY 2016 cad file ST-1 P6 & ST-2 P7.DWG

Title
**PROPOSED S278 HIGHWAY WORKS
A259 WORTHING ROAD ROUNDABOUT
SURFACE TREATMENTS DRAWING**

Drawing number
A/PHLYM.1/ST-2

rev.
P7



KEY

- EXISTING KERB LINE
- PROPOSED KERB/EDGING LINE
- PROPOSED DROPPED KERB

FOR INFORMATION
NOT FOR CONSTRUCTION

P6	Chevron signing & cordons paving added following Stage 1 RSA received 13/07/17. (PB)	AB	19/07/2017
P5	Uncontrolled crossing point added at the northern end of the L&R and Road Line added. (CJN)	AB	07/07/2017
P4	Northern arm amended following meeting with WCC and Caple. (CJN)	AB	13/06/2017
P3	Limit of works amended. (CJN)	AB	07/12/2016
P2	Limit of works into Littlehampton Local Centre extended, footways amended and cycle visibility splays added. (CJN)	AB	20/07/2016

rev	amendment	checked	date

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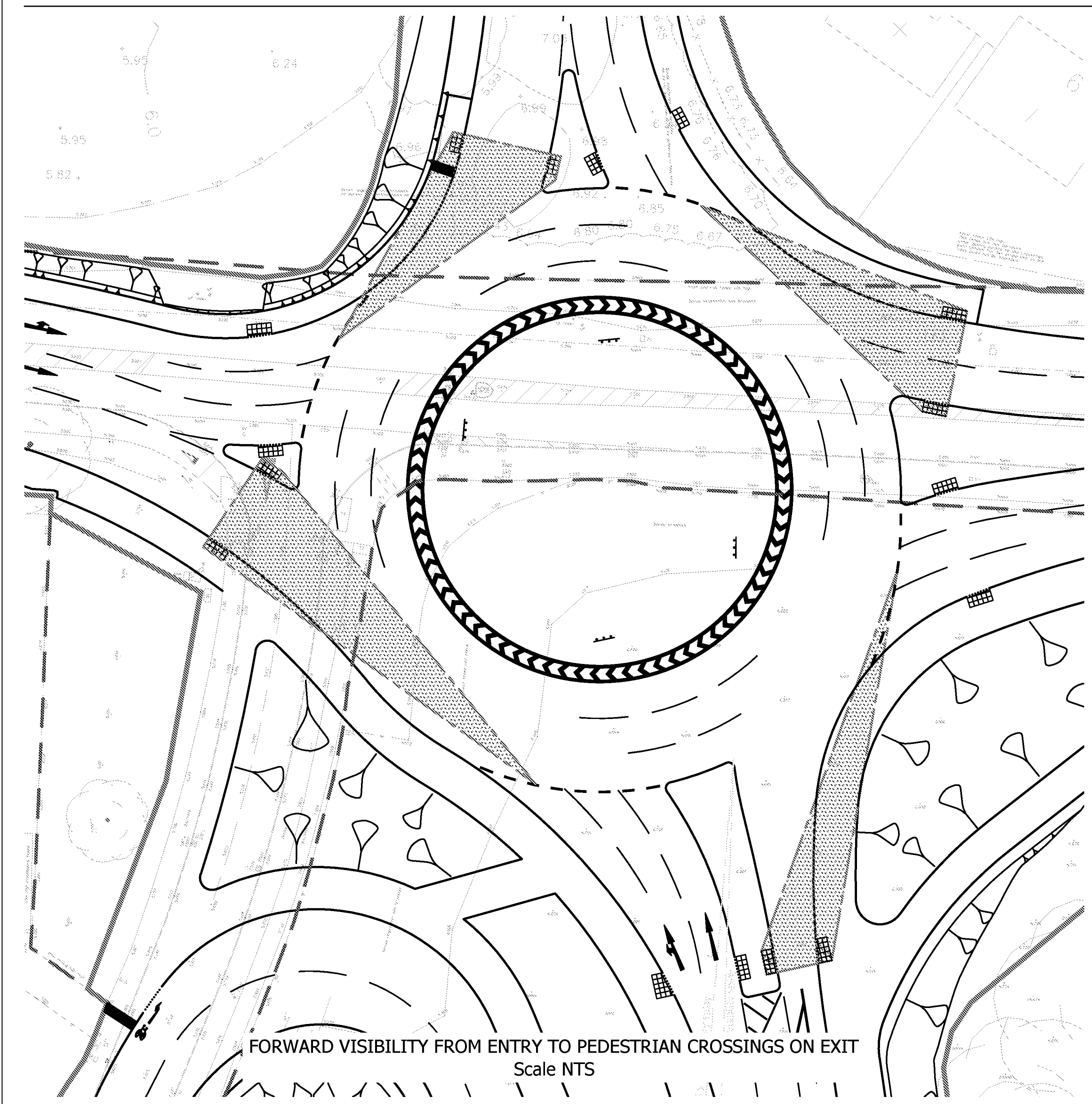
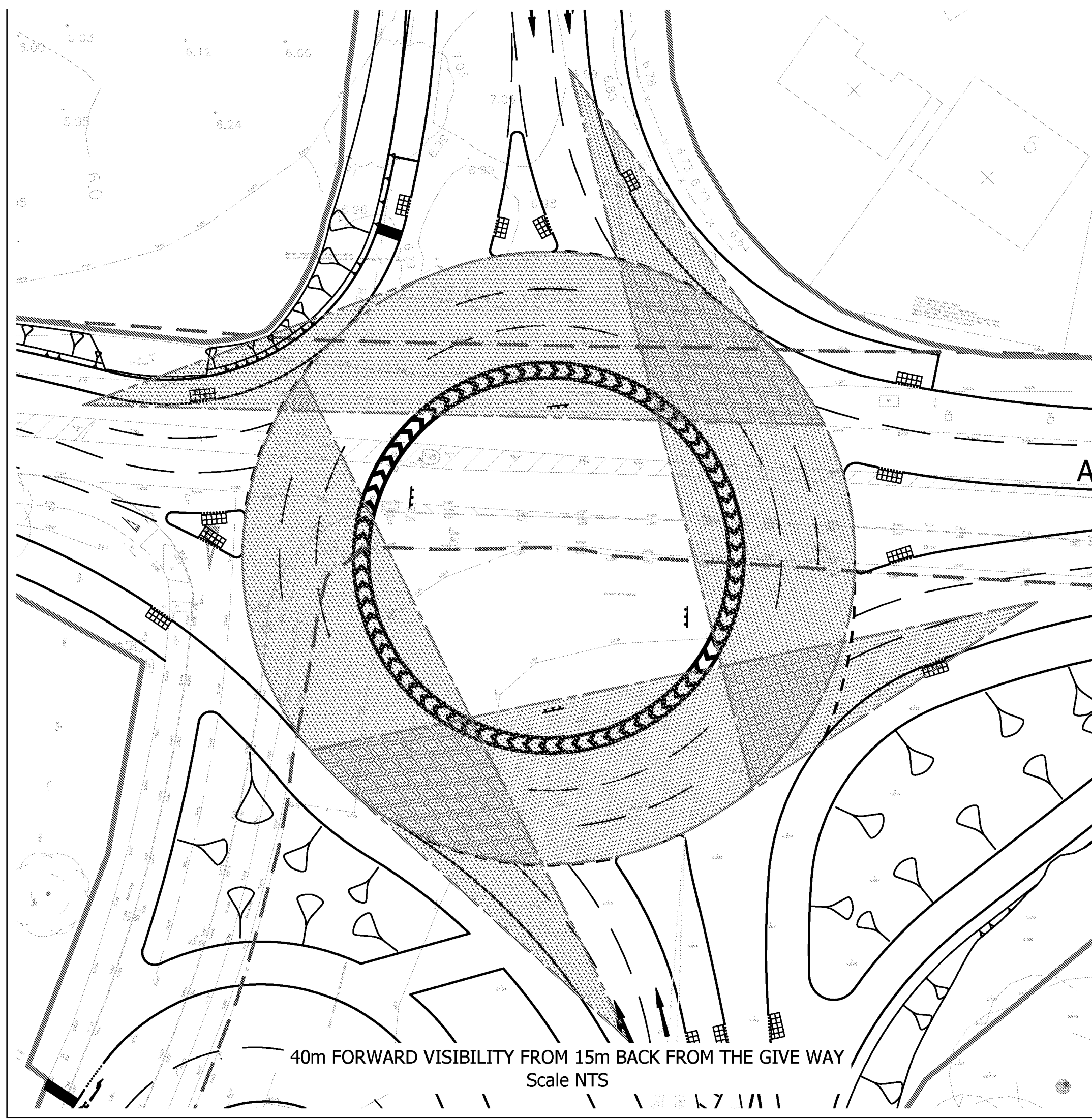
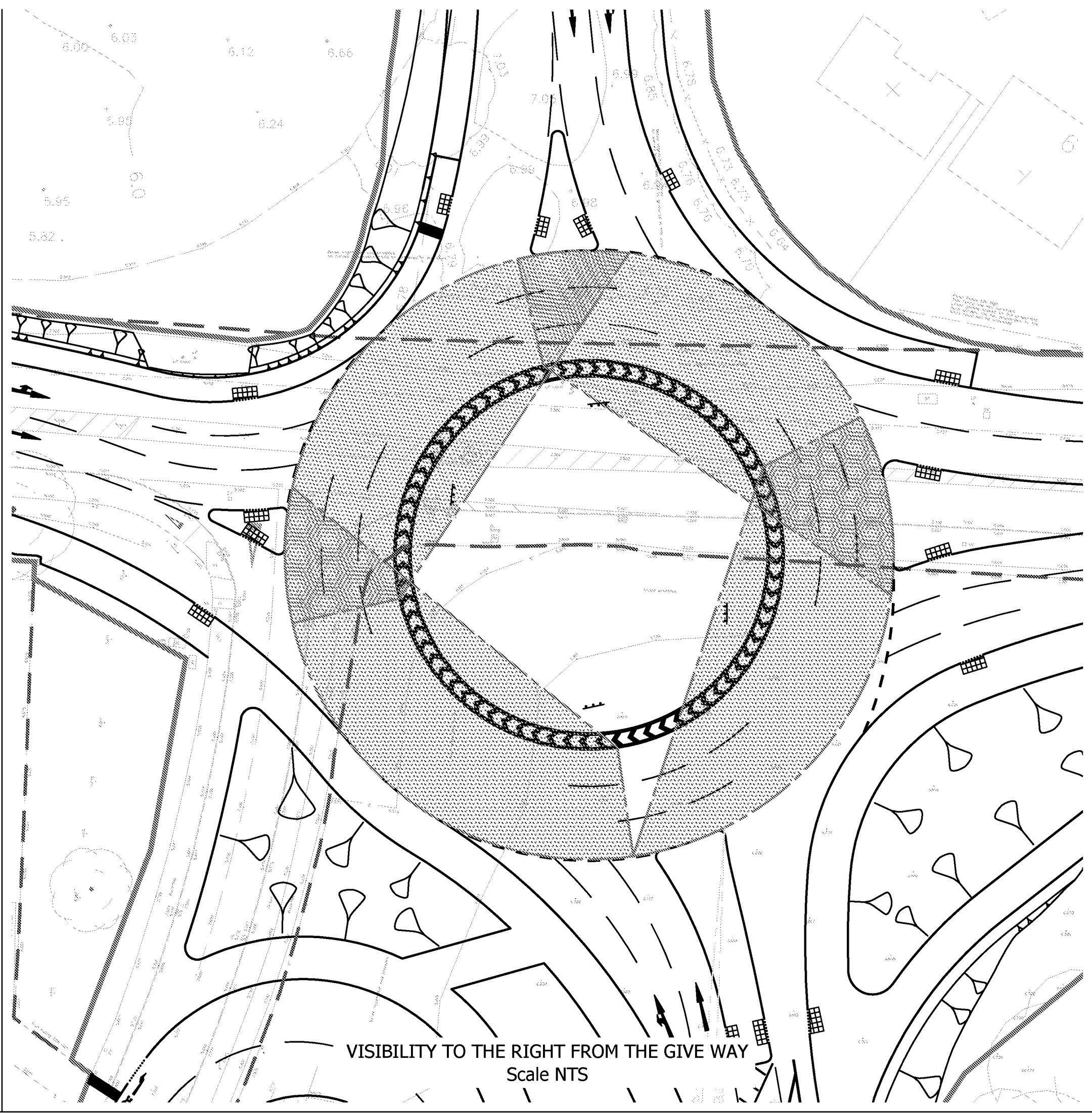
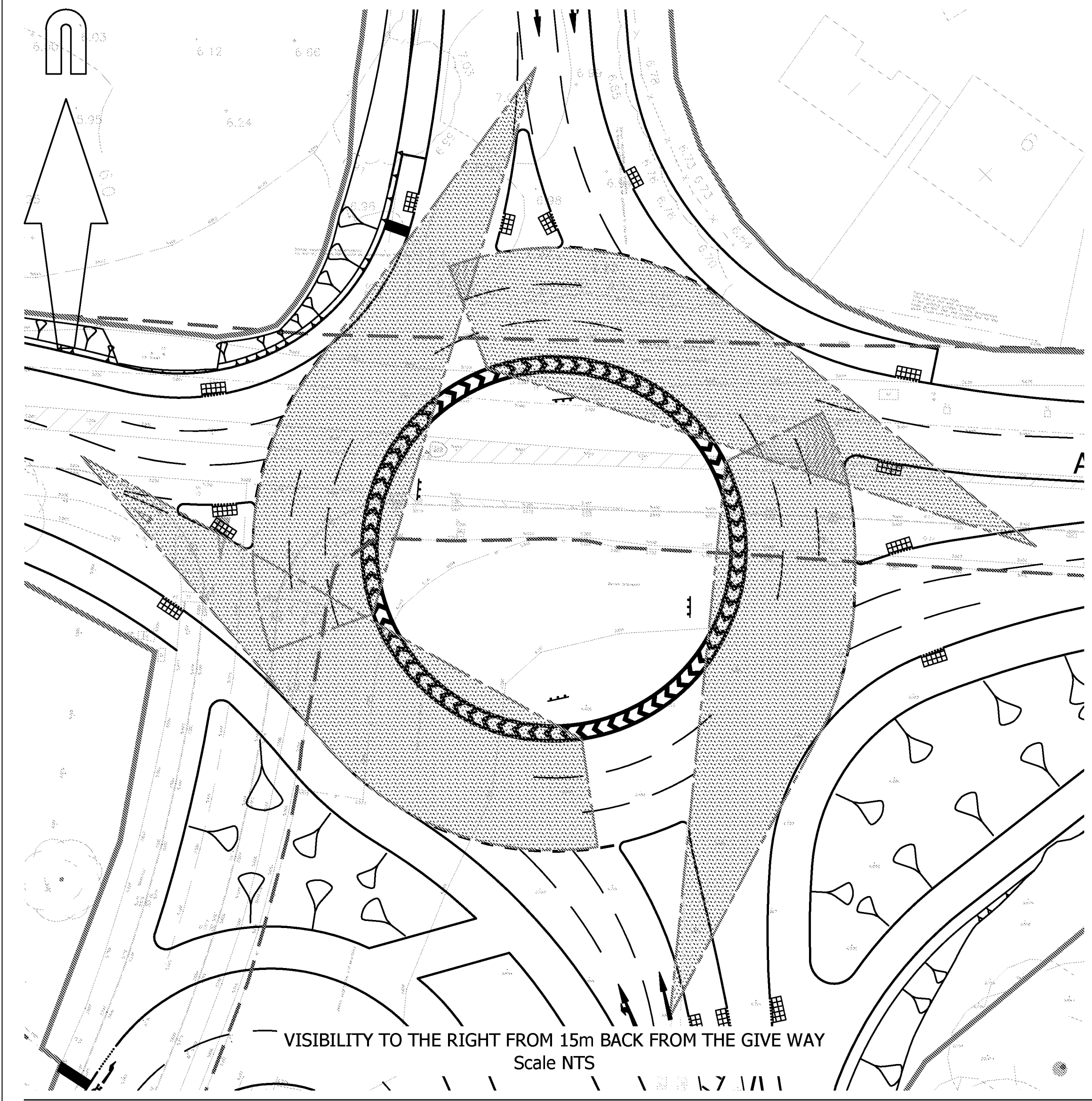
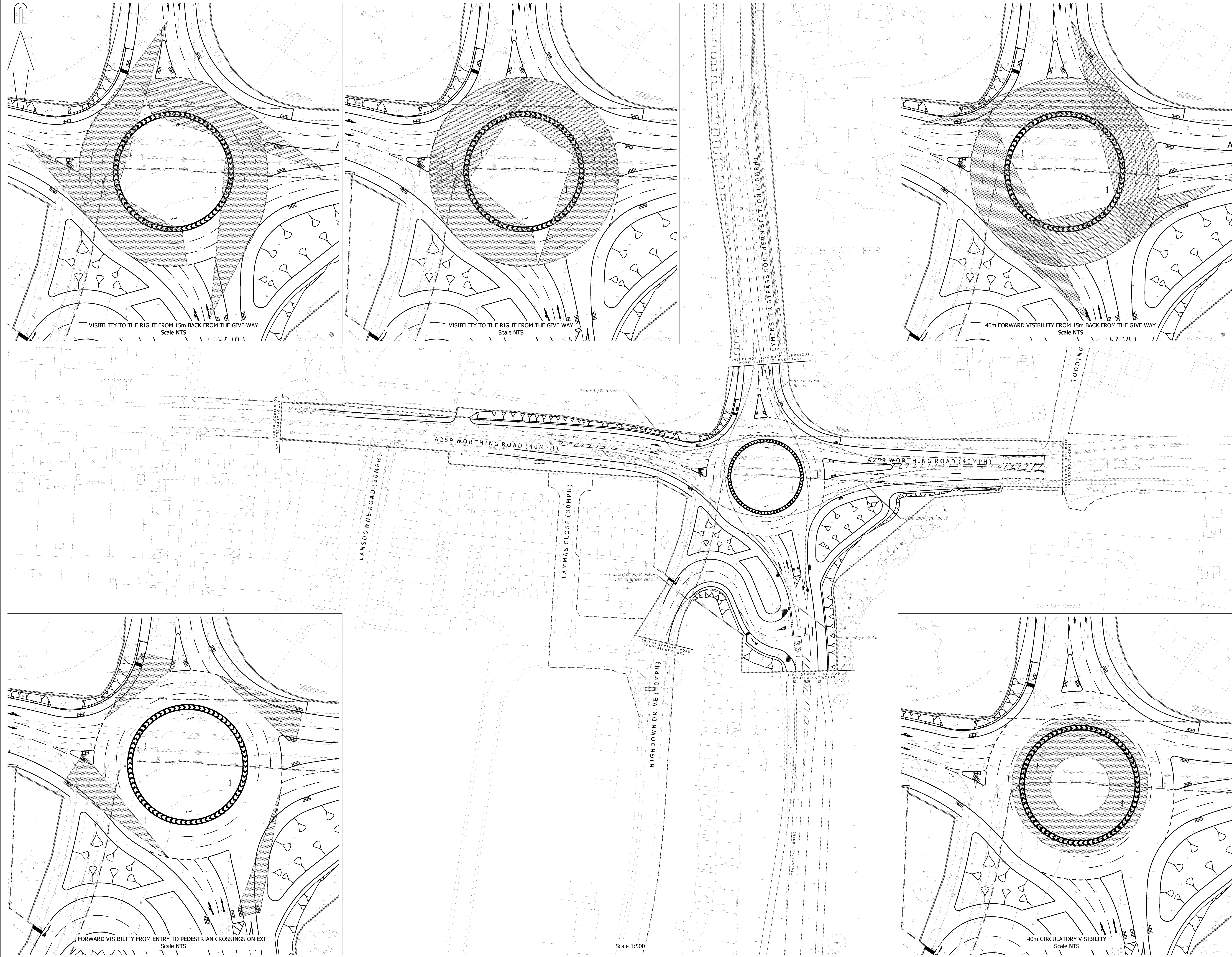
project
NORTH LITTLEHAMPTON
SOUTHERN BYPASS WORKS

scale AS SHOWN @ A0 drawn by PB checked by AB

date JULY 2016 cad file VIS-1 P6 & VIS-2 P7.DWG

title
PROPOSED S38/S278 HIGHWAY WORKS
SOUTHERN BYPASS ROUNDABOUT
VISIBILITY SPLAYS

drawing number A/PHLYM.1/VIS-1	rev. P6
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KEY

- EXISTING KERB LINE
- PROPOSED KERB/EDGING LINE
- PROPOSED DROPPED KERB
- EXISTING HIGHWAY BOUNDARY

**FOR INFORMATION
NOT FOR CONSTRUCTION**

P7	Destination arrows, chevron signing & corduroy paving added following Stage 1 RSA received 23/07/17. (PB)	AB	19/07/2017
P6	Visibility updates updated and Red Line added. (CIN)	AB	07/07/2017
P5	Roundabout amended following discussions with WSCC. (CIN)	AB	13/06/2017
P4	Footway amended. (CIN)	AB	07/12/2016
P3	Lyminster Bypass alignment updated, notes added and other minor amendments. (CIN)	AB	20/10/2016
P2	Footway / Cycleway amended. (CIN)	AB	20/07/2016

rev	amendment	checked	date
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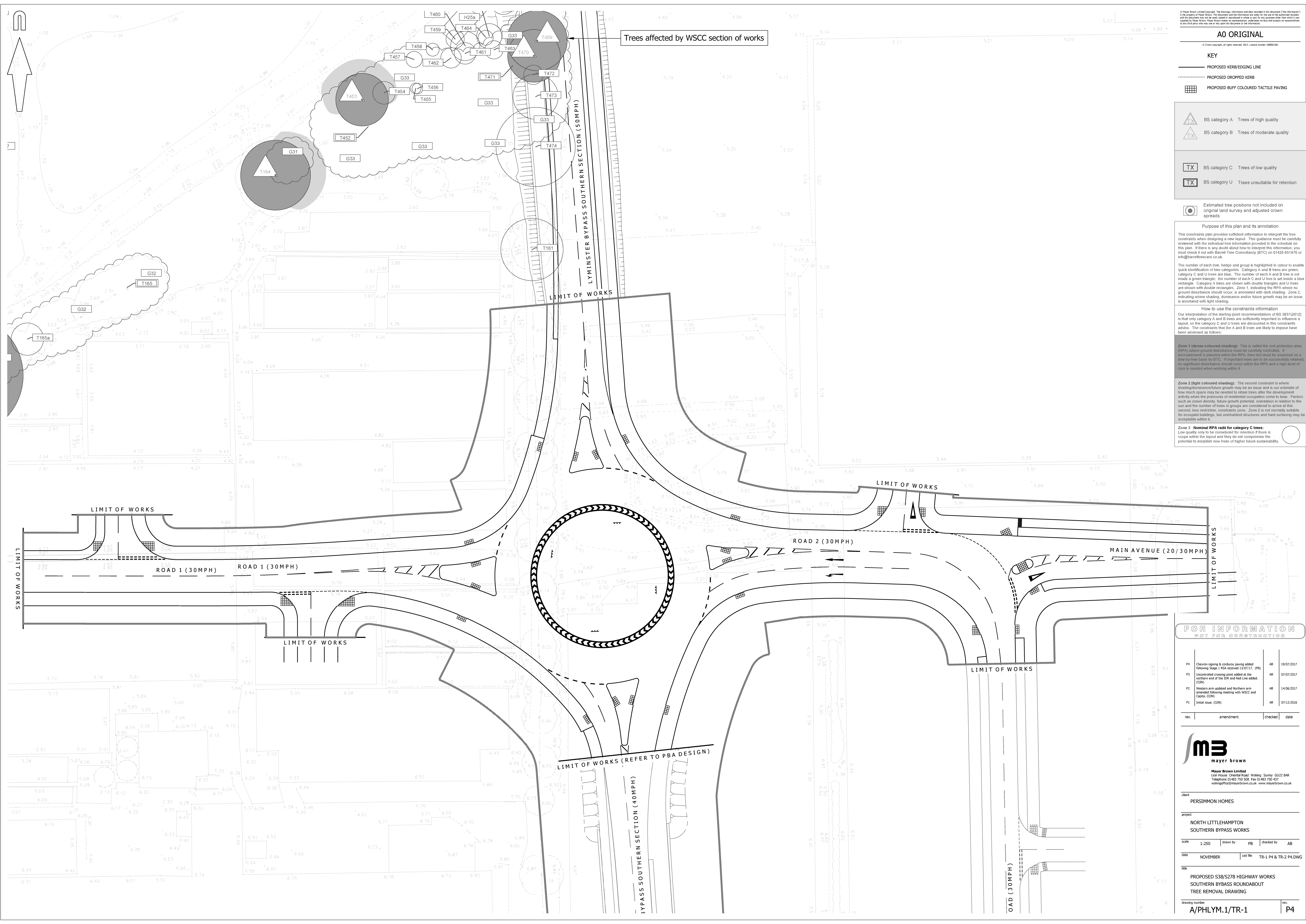
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**NORTH LITTLEHAMPTON
SOUTHERN BYPASS WORKS**

Scale AS SHOWN @ A0 drawn by PB checked by AB

Date JULY 2016 cad file VIS-1 P6 & VIS-2 P7.DWG

Title
**PROPOSED S278 HIGHWAY WORKS
A259 WORTHING ROAD ROUNDABOUT
VISIBILITY SPLAYS**

drawing number A/PHLYM.1/VIS-2	rev P7
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KEY

PROPOSED KERB/EDGING LINE

PROPOSED DROPPED KERB

PROPOSED BUFF COLOURED TACTILE PAVING

BS category A Trees of high quality

BS category B Trees of moderate quality

BS category C Trees of low quality

BS category U Trees unsuitable for retention

Estimated tree positions not included on original land survey and adjusted crown spreads

Purpose of this plan and its annotation

This constraints plan provides sufficient information to interpret the tree constraints when designing a new layout. This guidance must be carefully reviewed with the individual tree information provided in the schedule on this plan. If there is any doubt about how to interpret the information, you must check it out with Barrell Tree Consultancy (BTC) on 01425 651470 or info@barrelltreecare.co.uk.

The number of each tree, hedge and group is highlighted in colour to enable quick identification of tree categories. Category A and B trees are green, category C and U trees are blue. The number of each A and B tree is set inside a green triangle; the number of each C and U tree is set inside a blue rectangle. Category A trees are shown with double triangles and U trees are shown with double rectangles. Zone 1, indicating the RPA where no ground disturbance should occur, is annotated with dark shading. Zone 2, indicating where shading, dominance and/or future growth may be an issue, is annotated with light shading.

How to use the constraints information

Our interpretation of the starting-point recommendations of BS 5837:2012 is that only category A and B trees are sufficiently important to influence a layout, so the category C and U trees are discounted in this constraints advice. The constraints that the A and B trees are likely to impose have been assessed as follows:

Zone 1 (dense coloured shading): This is called the root protection area (RPA) where ground disturbance must be carefully controlled. If encroachment is planned within the RPA, then this must be assessed on a tree-by-tree basis by BTC. If important trees are to be successfully retained, no significant disturbance should occur within the RPA and a high level of care is needed when working within it.

Zone 2 (light coloured shading): The second constraint is where shading/dominance/future growth may be an issue and is our estimate of how much space may be needed to retain trees after the development activity when the pressures of residential occupation come to bear. Factors such as crown density, future growth potential, orientation in relation to the sun and the number of trees in groups are considered to arrive at this second, less restrictive, constraint zone. Zone 2 is not normally suitable for occupied buildings, but uninhabited structures and hard surfacing may be acceptable within it.

Zone 3 (Nominal RPA radii for category C trees): Low quality only to be considered for retention if there is scope within the layout and they do not compromise the potential to establish new trees of higher future sustainability.

FOR INFORMATION NOT FOR CONSTRUCTION

P4	Chevron signing & corduroy paving added following Stage 1 & 2 received 13/07/17.	AB	19/07/2017
P3	Uncontrolled crossing point added at the northern end of the IDR and Red Line added. (CIN)	AB	07/07/2017
P2	Western arm updated and Northern arm amended following meeting with WSCC and Capital (CIN)	AB	14/06/2017
P1	Initial issue. (CIN)	AB	07/12/2016

rev	amendment	checked	date

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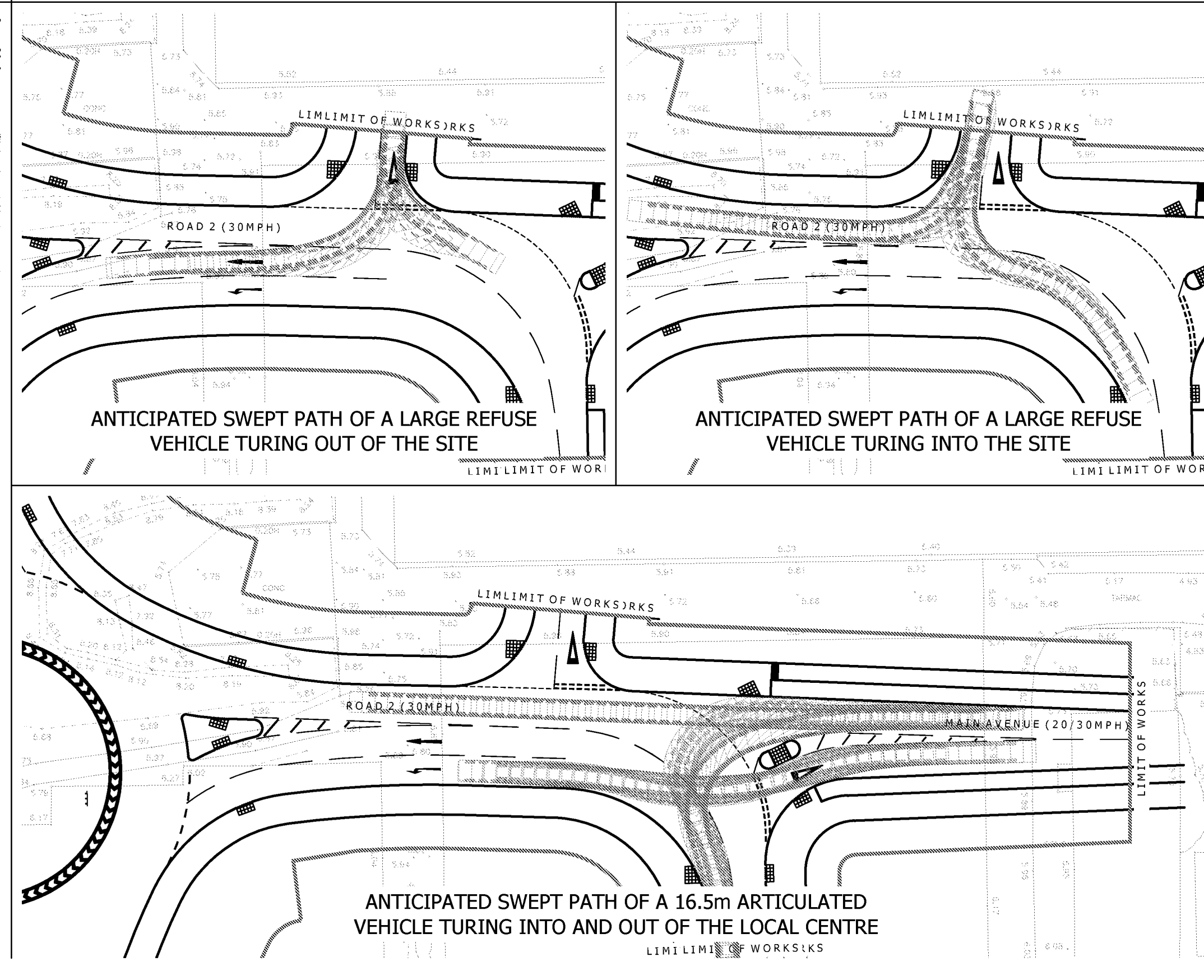
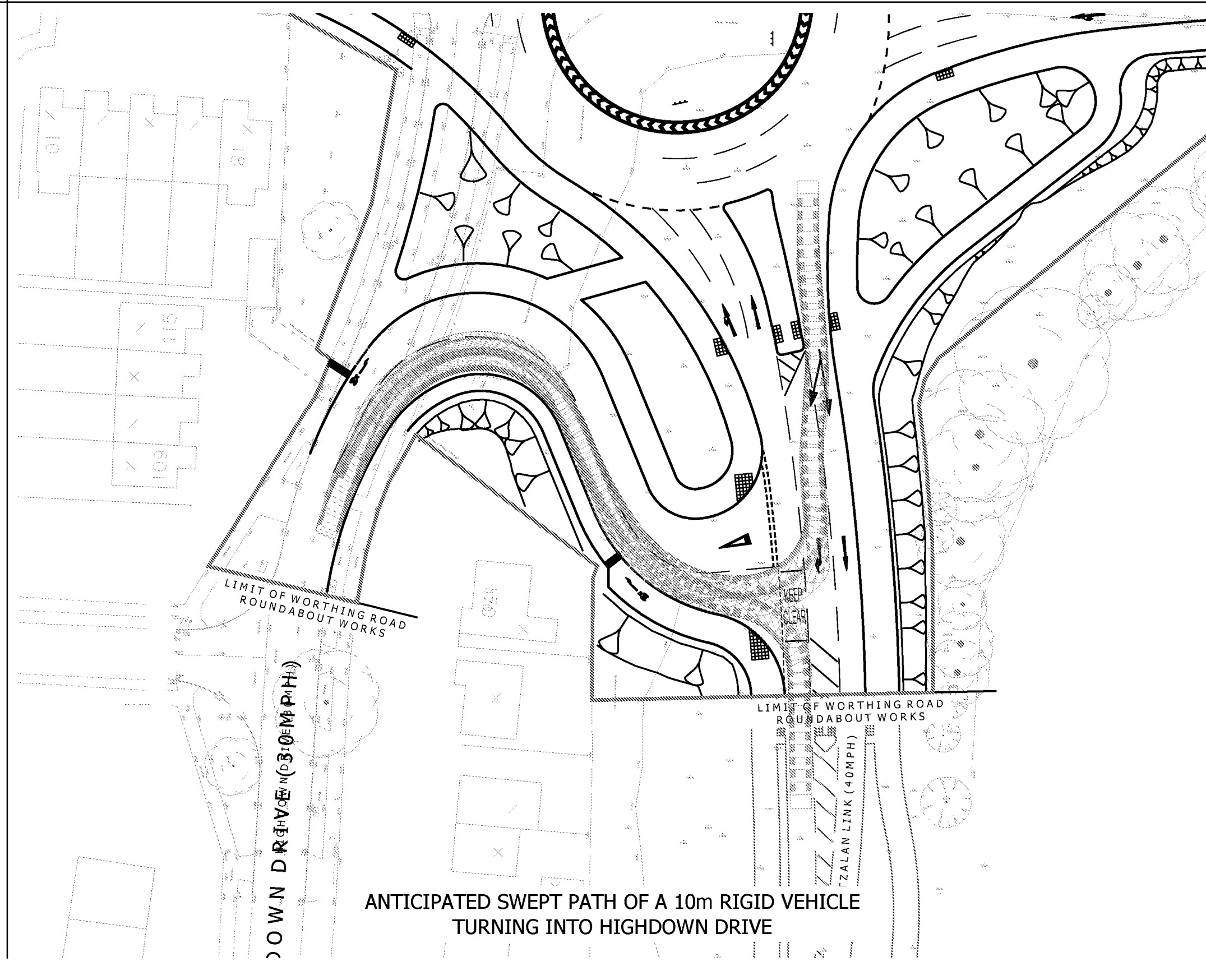
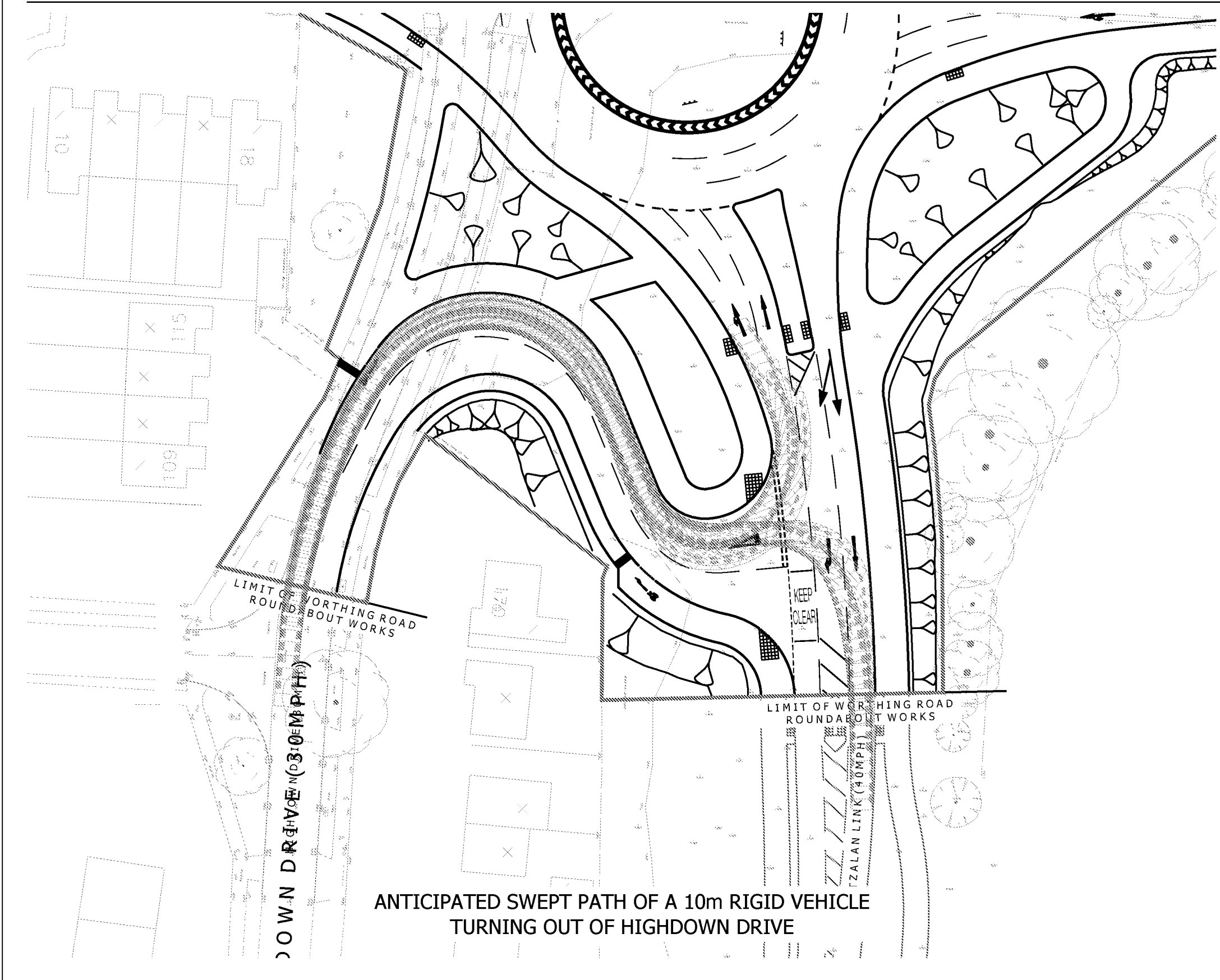
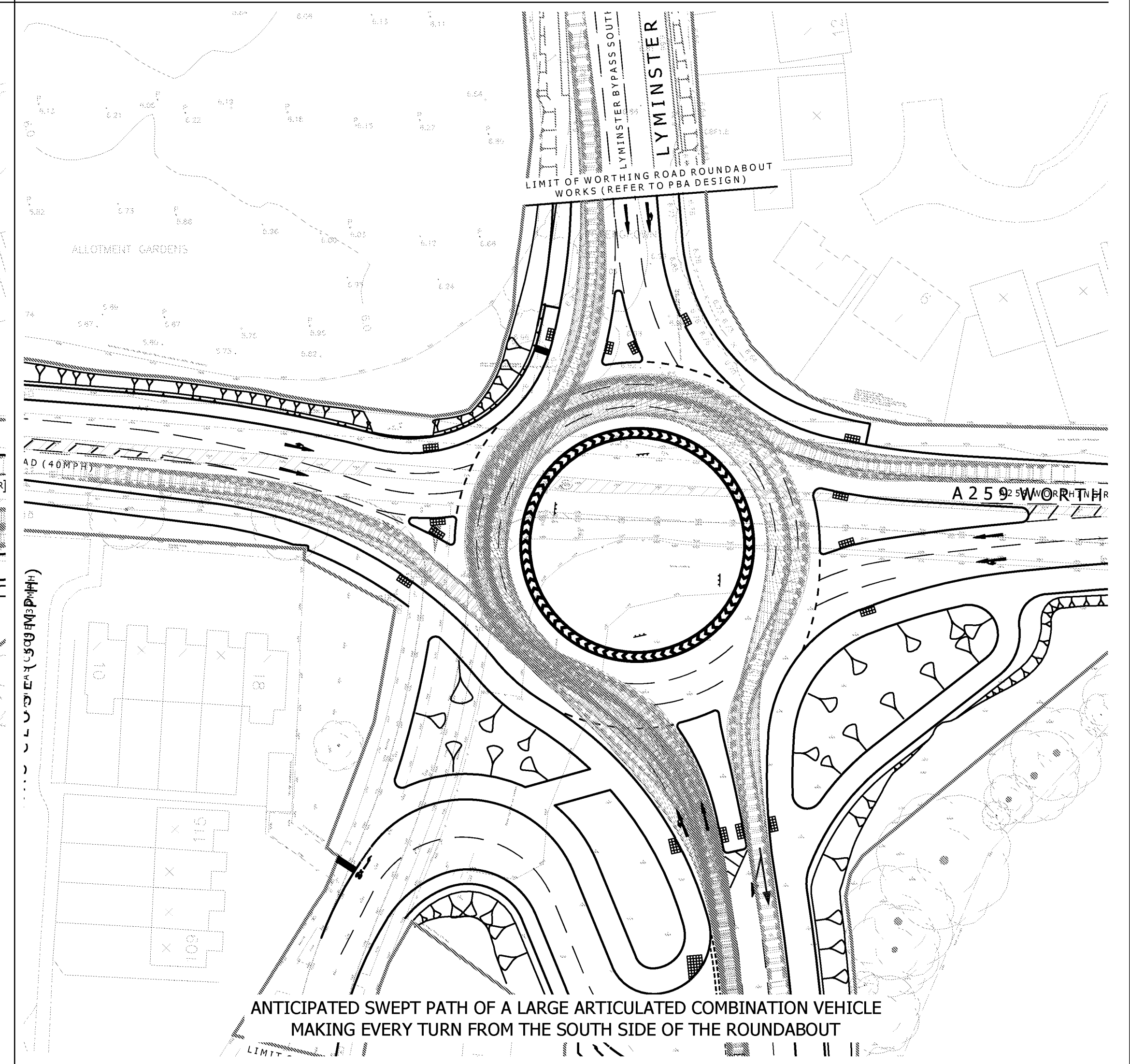
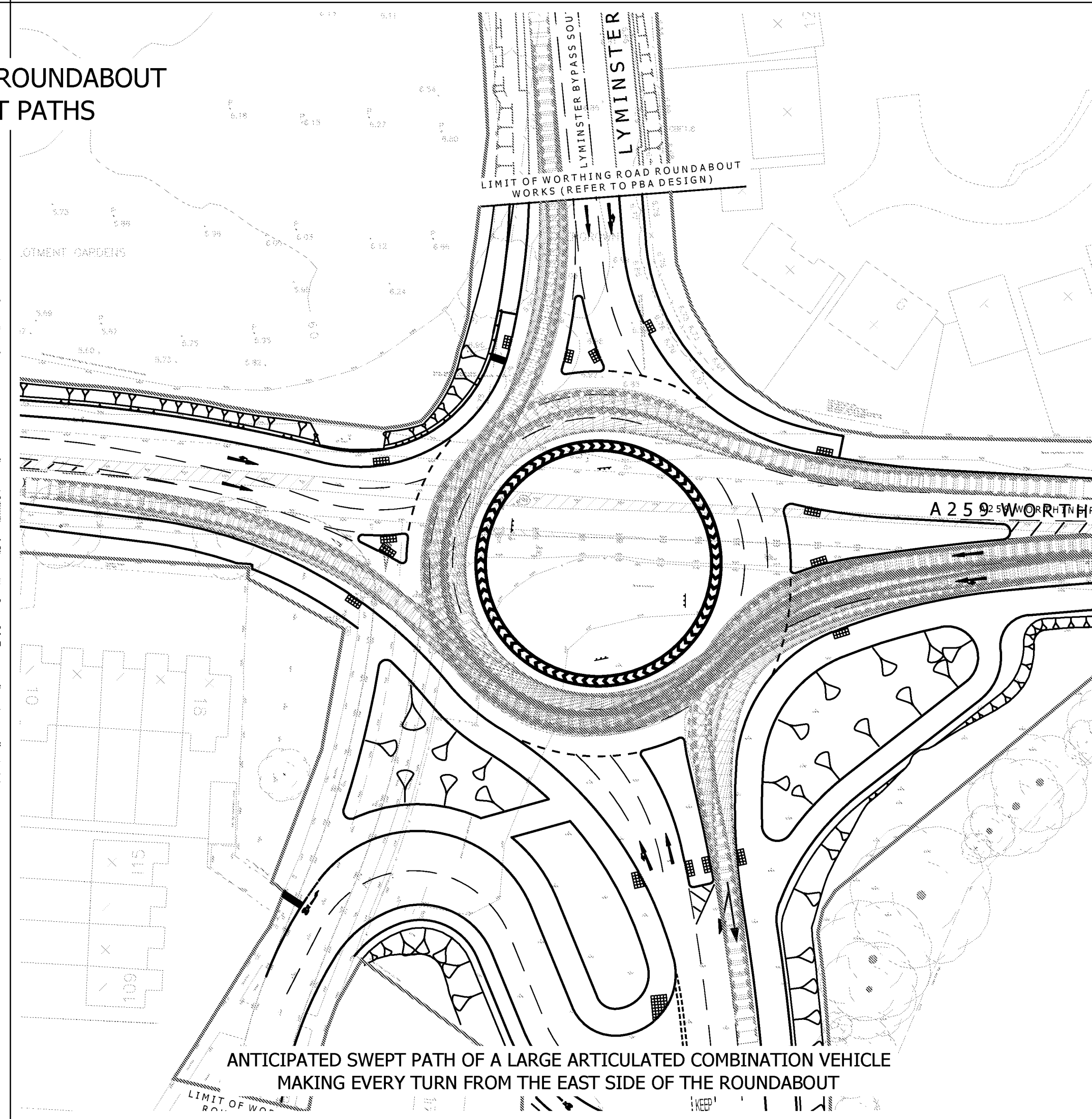
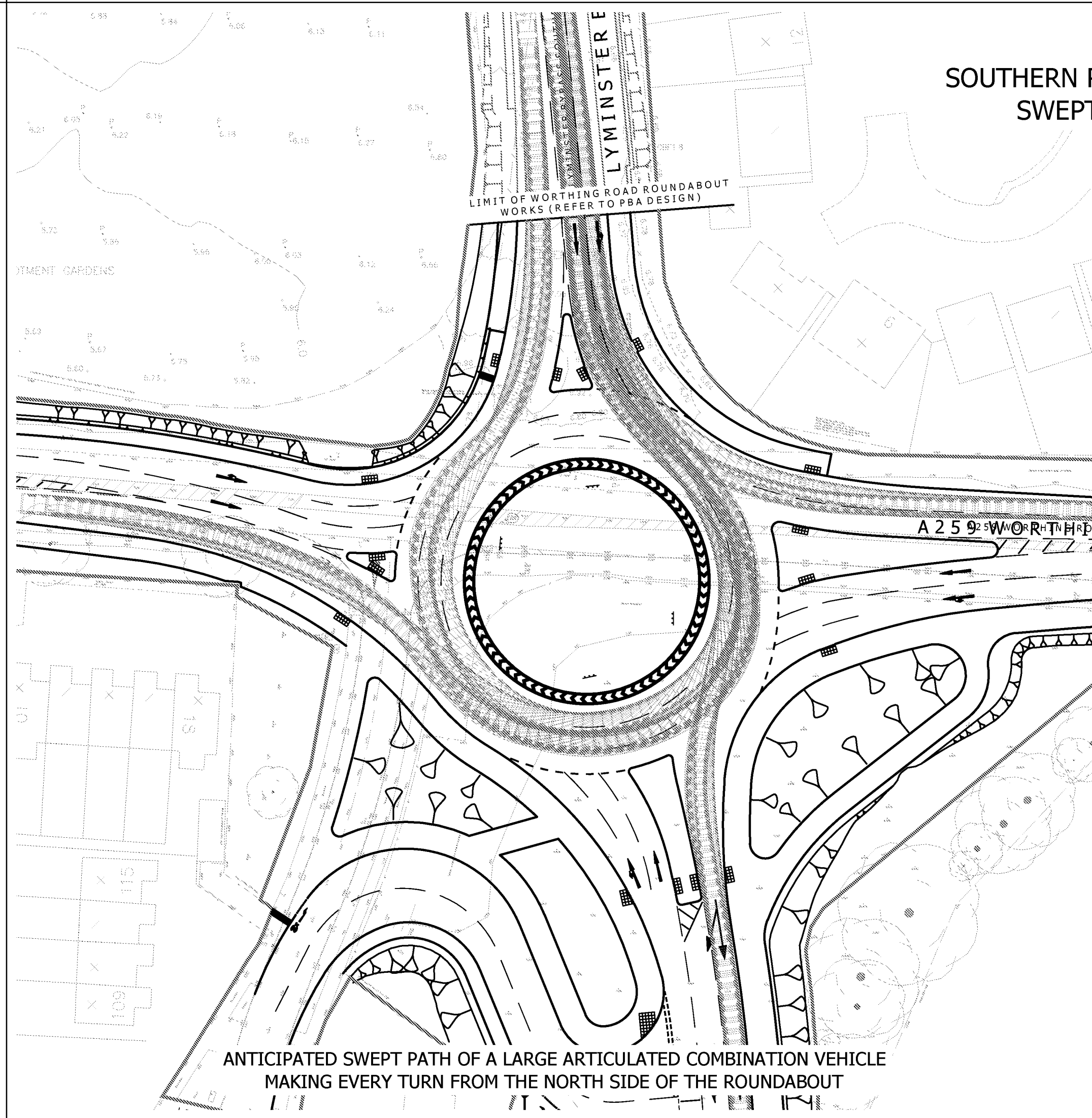
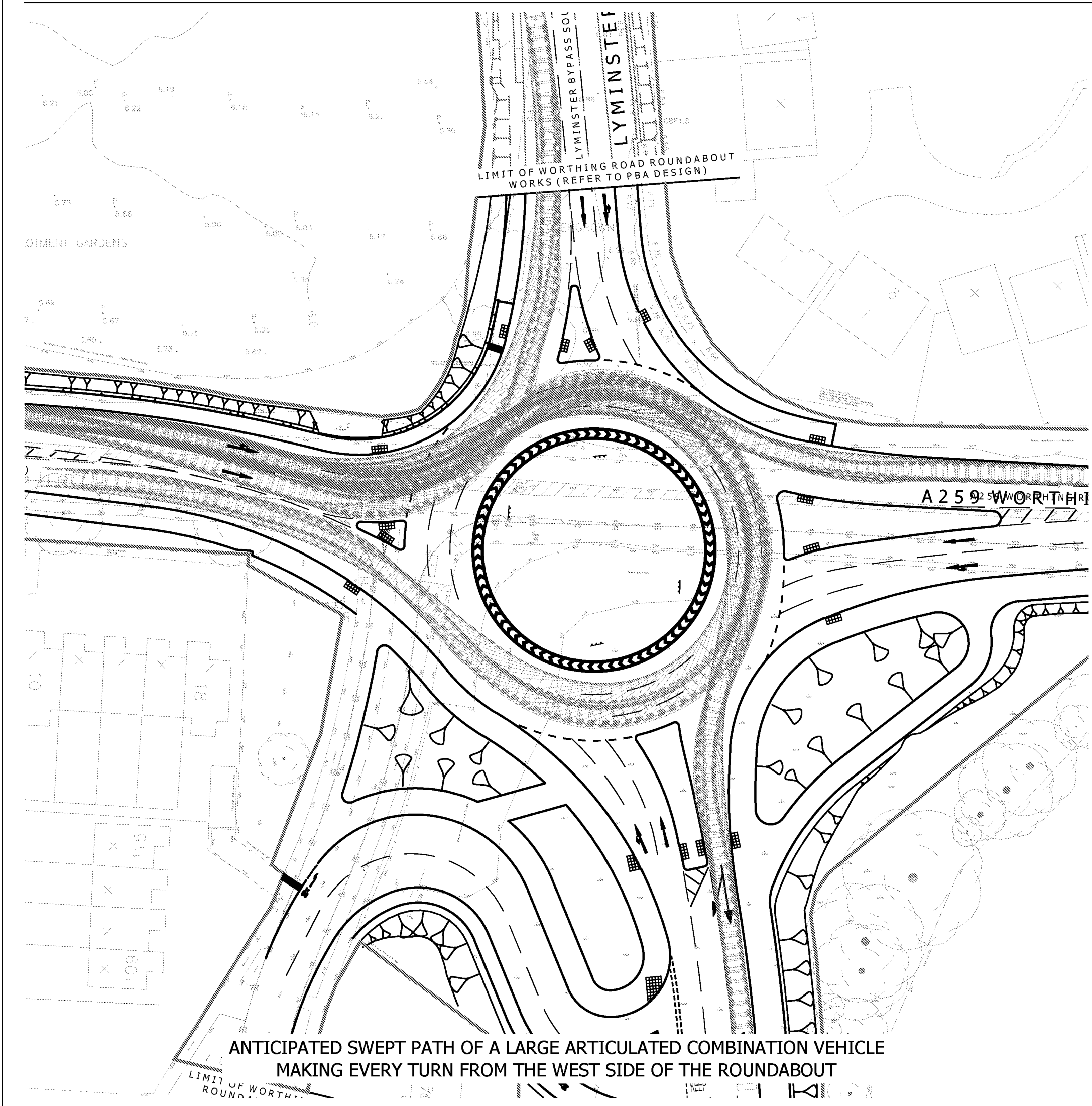
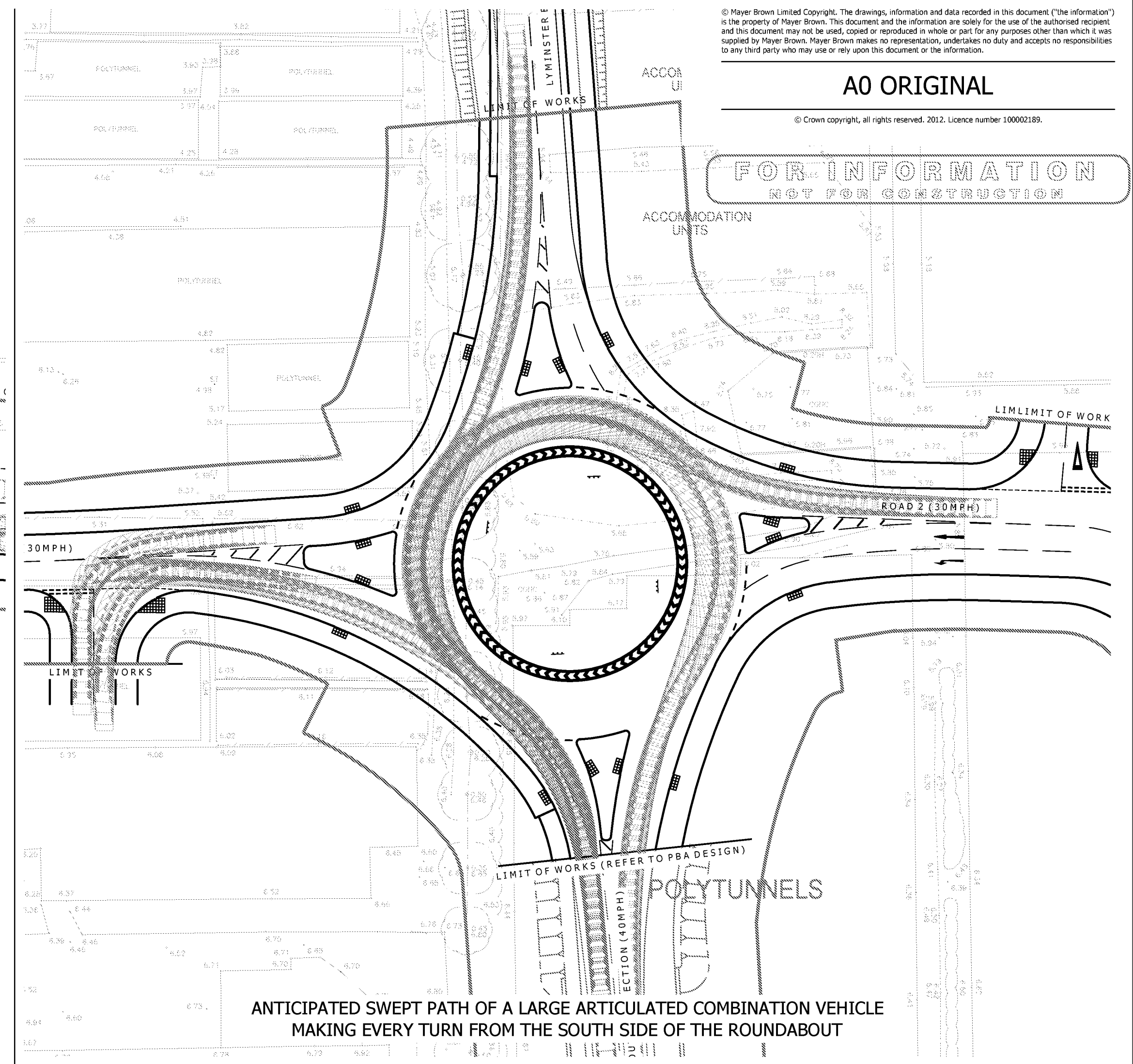
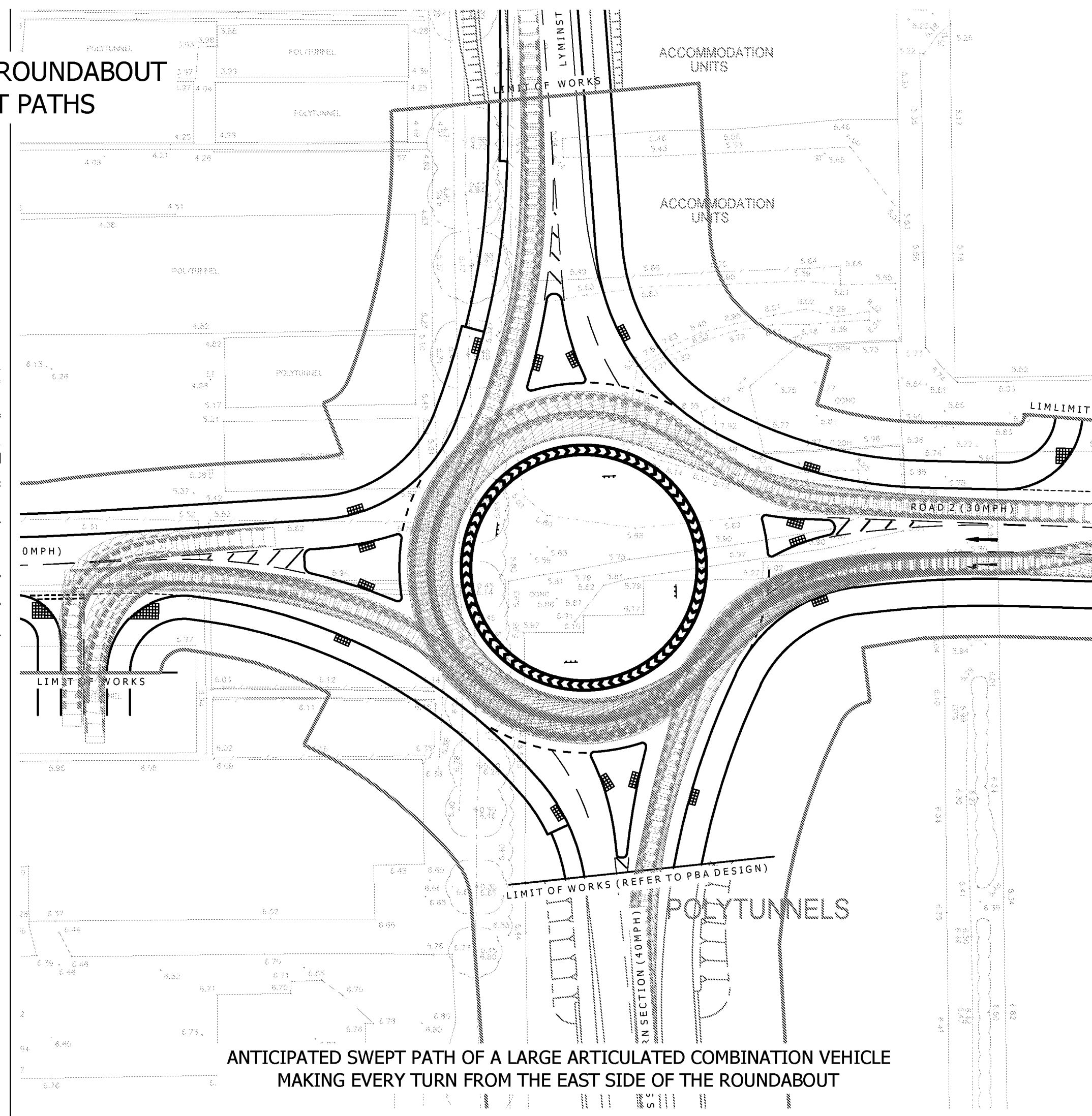
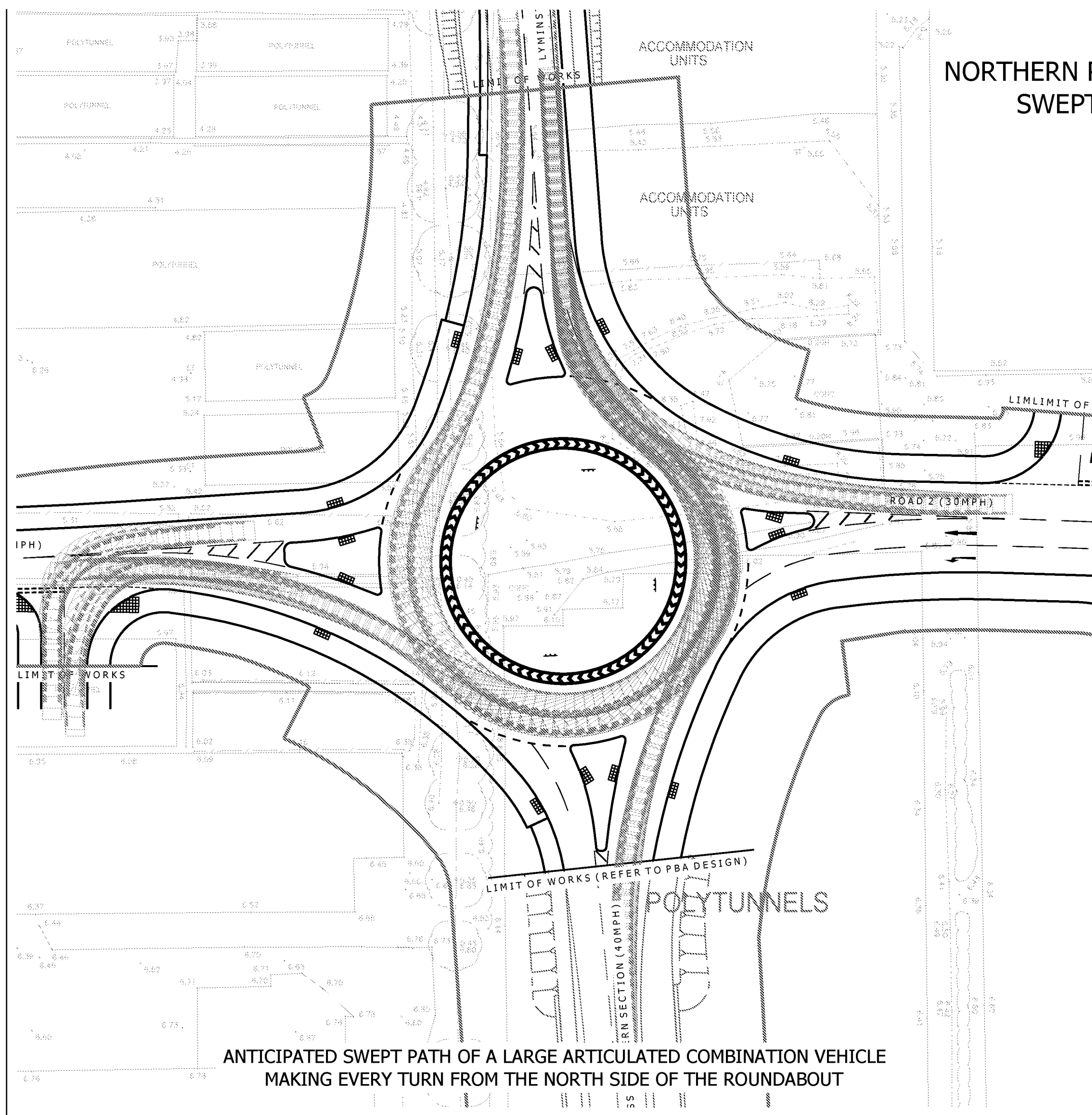
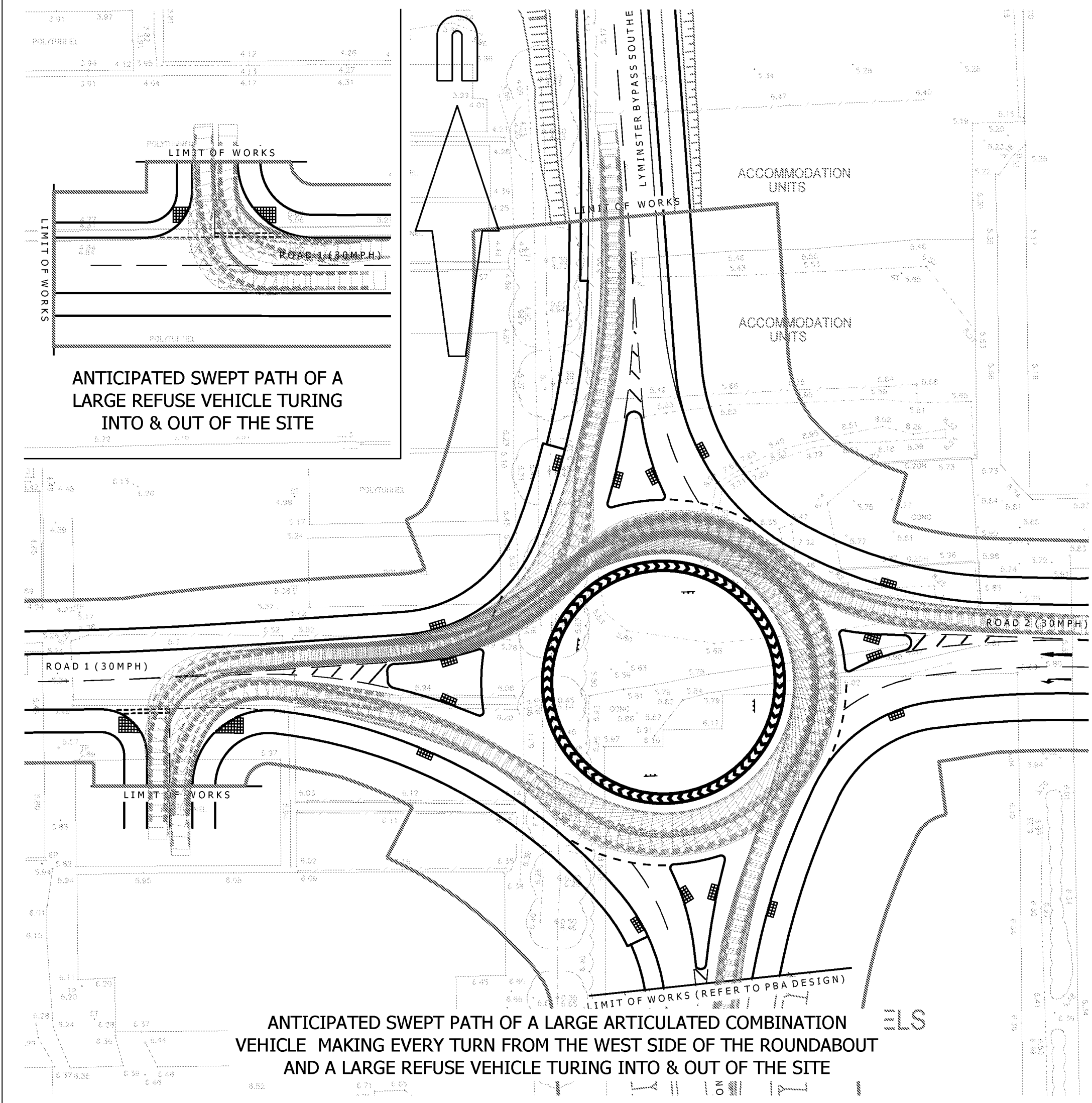
Project
NORTH LITTLEHAMPTON
SOUTHERN BYPASS WORKS

Scale 1:250 **Drawn by** PB **Checked by** AB

Date NOVEMBER **Cad file** TR-1 P4 & TR-2 P4.DWG

Title
PROPOSED S38/S278 HIGHWAY WORKS
SOUTHERN BYPASS ROUNDABOUT
TREE REMOVAL DRAWING

Drawing number A/PHLYM.1/TR-1 **rev.** P4



rev	amendment	checked	date
P5	Destination arrows, chevron signing & corduroy drawing added following Stage 1 PCA received 13/07/17. (PB)	AB	19/07/2017
P4	Unincorporated crossing point added at the northern end of the TIS and feed line added. (CORN)	AB	07/07/2017
P3	Roundabouts updated following discussions with WCC. (CORN)	AB	13/06/2017
P2	Footway amended. (CORN)	AB	07/12/2016

Vehicle Type	Overall Length	Overall Width	Overall Body Height	Min Body Ground Clearance	Track Width	Lock to Lock Time	Kerb to Kerb Turning Radius
Large Refuse Vehicle (3 axle)	9.860m	2.450m	3.814m	0.456m	2.450m	4.00s	9.500m
Articulated Combination	15.500m	2.550m	5.713m	0.456m	2.550m	4.00s	7.500m

Vehicle Type	Overall Length	Overall Width	Overall Body Height	Min Body Ground Clearance	Track Width	Lock to Lock Time	Kerb to Kerb Turning Radius
FTA Design Articulated Vehicle (1998)	16.490m	2.550m	3.870m	0.510m	2.470m	3.00s	6.550m
FTA Design HG Rigid Vehicle (1998)	10.000m	2.500m	3.645m	0.444m	2.470m	3.00s	11.000m

Client: PERSIMMON HOMES

Project: NORTH LITTLEHAMPTON SOUTHERN BYPASS WORKS

Scale: 1:500 | Drawn by: PB | Checked by: AB

Date: JULY 2016 | CAD file: TK-1 PS.DWG

Title: ANTICIPATED VEHICLE SWEEP PATHS

Drawing number: A/PHLYM.1/TK-1 | Rev: P5