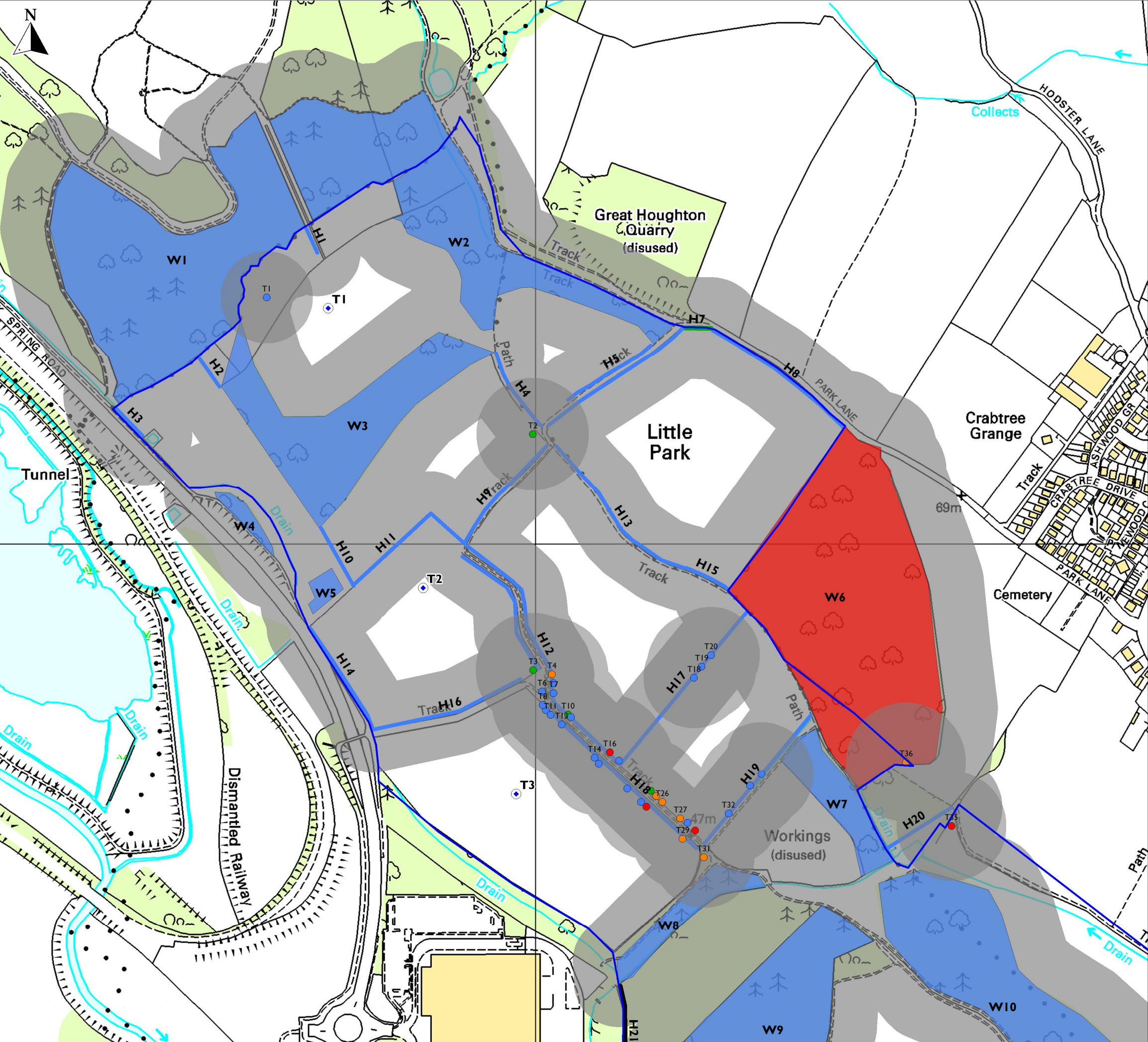




LEGEND

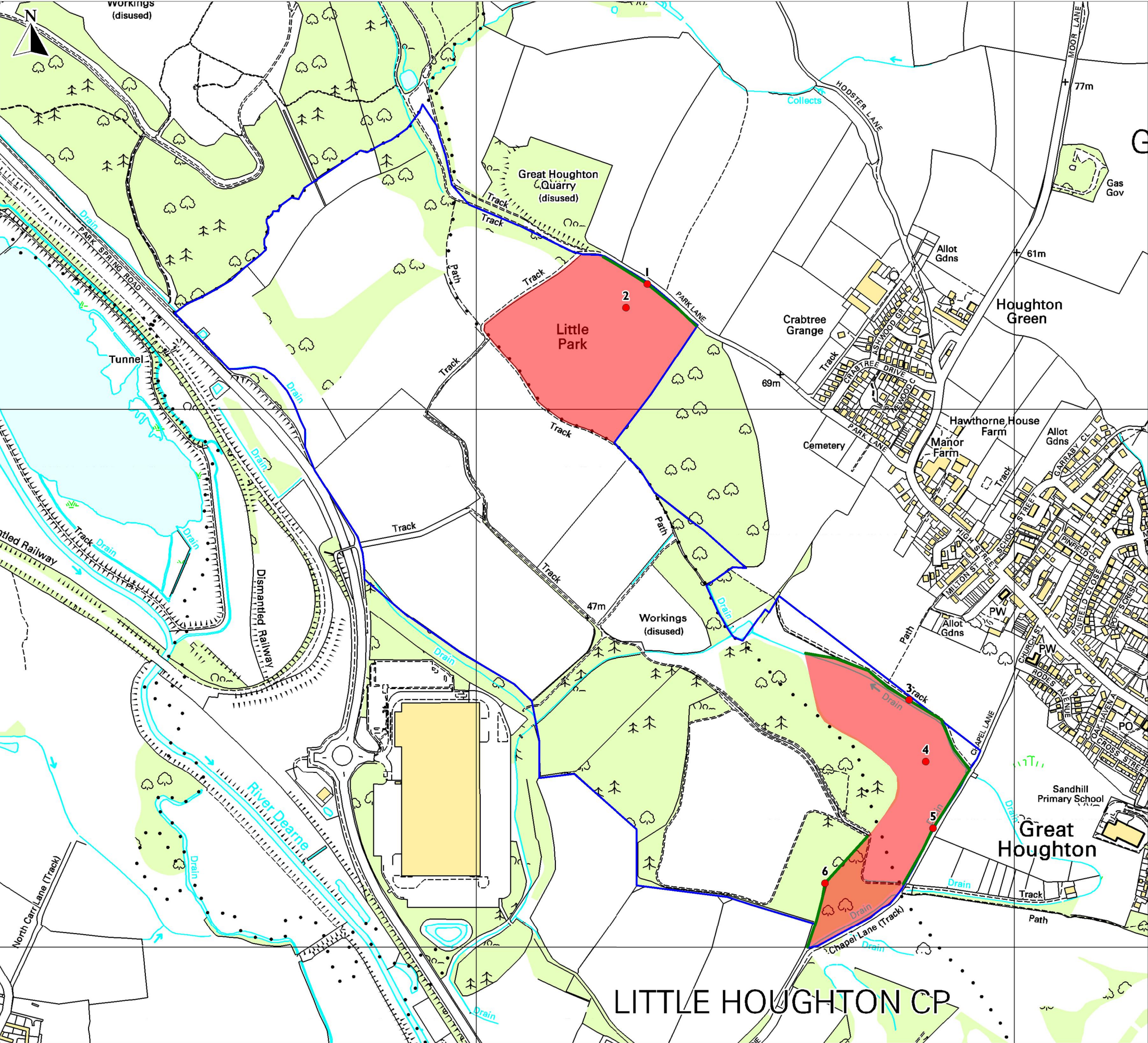
- Site boundary
- Turbine
- Tree with potential for roosting bats
- Negligible
- Low
- Medium
- High
- Stand-off buffer
- Hedge with potential for roosting bats
- Negligible
- Low
- Medium
- High
- Stand-off buffer
- Woodland with potential for roosting bats
- Negligible
- Low
- Medium
- High
- Stand-off buffer

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PARK SPRING WIND FARM

Tree and Hedge Locations and Stand-off Distance

DOCUMENT REFERENCE PSR157	LAST REVISION DATE January 2013	
SITE DESIGN VERSION V5	SCALE 1:5,000 @ A3	
DRAWN RH	CHECKED LM	APPROVED GS
PARSONS BRINCKERHOFF		EDF ENERGY
FIGURE 5		



LEGEND

- Site boundary
- Hedgerow
- Field in which enhancements are proposed
- Enhancement location
- Hedgerow to be gapped up and oaks managed to develop into standards within hedgerow
- 3 - 5m habitat strip along edge of the field
- Hedgerow to be gapped up
- Three standard trees to be planted and managed in the corners either end of the field and 3 - 5m habitat strip
- Hedgerow to be gapped up
- New hedgerow with post and wire fencing to prevent horses in adjacent paddock damaging the whips

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PARK SPRING WIND FARM		
Proposed onsite enhancements		
DOCUMENT REFERENCE	LAST REVISION DATE	
PSR158	June 2013	
SITE DESIGN VERSION	SCALE	
V5	1:7,000 @ A3	
DRAWN	CHECKED	APPROVED
RH	LM	GS
PARSONS BRINCKERHOFF		EDF ENERGY
FIGURE 6		

10.1 ORNITHOLOGY – VANTAGE POINT DATA

PARK SPRING WIND FARM ENVIRONMENTAL STATEMENT:

APPENDIX 10.1. BIRD VANTAGE POINT DATA

Park Spring Vantage Point Survey observation information April-July 2011

Date	Start time	Finish time	Weather	Observer
11/04/2011	17:45	20:15	cloud 3-5/8, wind WSW 2-3, light rain 17:56 - 18:04, visibility excellent	Mike Hoit
12/04/2011	05:45	07:45	cloud 0 - 1/8, wind WNW 2, precipitation 0, visibility excellent	Mike Hoit
26/04/2011	15:35	18:35	cloud 8/8, wind NE 3, precipitation 0, visibility excellent	Mike Hoit
27/04/2011	06:00	07:30	cloud 7/8, visibility excellent, wind none	Keith Langdon
04/05/2011	08:30	10:00	cloud 8/8 > 6/8, wind W 1, precipitation 0, visibility excellent	Mike Hoit
04/05/2011	12:45	15:45	cloud 6/8 - 0/8, wind 0 - SE 1 - SSE 2, precipitation 0, visibility excellent	Mike Hoit
16/05/2011	14:55	16:55	cloud 7-8/8, wind W / WSW 4-5, precipitation 0, visibility excellent	Mike Hoit
16/05/2011	17:40	20:10	cloud 6/8 - 8/8, wind W / WNW 4-5, precipitation 0, visibility excellent	Mike Hoit
02/06/2011	09:45	11:45	cloud 4/8 - 7/8, wind 0 - WSW 1-2, precipitation 0, visibility excellent	Mike Hoit
02/06/2011	12:15	14:45	cloud variable 1-7/8, wind WSW 1 - 0 - WNW 1-2, precipitation 0, visibility excellent	Mike Hoit
20/06/2011	19:55	21:55	cloud 6/8 - 8/8, wind W 1, visibility excellent	Mike Hoit
21/06/2011	05:40	08:10	cloud 4/8 - 7/8, wind SSW 2, precipitation 0, visibility excellent	Mike Hoit
05/07/2011	05:25	07:25	cloud 0 < 3/8, wind SSE 1, precipitation 0, visibility excellent	Mike Hoit
05/07/2011	08:35	10:35	cloud 4/8 > 2/8, wind SSE - S 1, precipitation 0, visibility very good, slight heat haze	Mike Hoit
19/07/2011	11:55	14:25	cloud 7/8 > 2/8, wind 0, thunderstorm / heavy rain 11:55 - 12:15, visibility excellent	Mike Hoit
19/07/2011	14:50	17:20	cloud 2/8 - < 7/8, wind W 2-3 - WSW 2, precipitation 0, visibility excellent	Mike Hoit

Park Spring Vantage Point Survey key species bird data April-July 2011

Date	Time	Species	Count	Direction of flight	Flight height (m)	Activity	Time bird observed (sec)	Notes
11/04/11	17:53	L	1	E	18	feed	20	landed
11/04/11	17:57	L	1	circle	10	display	65	male
11/04/11	18:09	PE	1	circle NNW	88		85	female
11/04/11	18:14	L	2	circle	15	display	150	
11/04/11	18:27	L	1	circle	10	display	45	
11/04/11	18:43	GA	3	N	15		20	
11/04/11	18:44	L	2	circle	5	display	75	
11/04/11	19:04	L	1	circle	6	mobbing	85	male, mobbing C
11/04/11	19:13	L	1	NW			145	appeared to land
11/04/11	19:25	L	6	NNW	25	feed	70	landed
11/04/11	19:34	L	1	circle	20	display	210	
11/04/11	20:04	L	1	NW	19	roost	85	
12/04/11	05:50	L	2	circle	10	display		making frequent display / mobbing flights over this area until 07:45
12/04/11	06:32	L	1	W	20	feed	75	female, appeared to land
12/04/11	07:12	L	1	ENE	22	feed	105	landed
12/04/11	07:16	L	1	circle	5	mobbing	45	male, landed
12/04/11	07:21	L	2	circle	15	display	35	
12/04/11	07:26	MR	1	circle N	50		195	female, imm
12/04/11	07:27	L	3	circle	35	flushed	90	
12/04/11	07:36	L	1	circle	15	display	150	female

Date	Time	Species	Count	Direction of flight	Flight height (m)	Activity	Time bird observed (sec)	Notes
26/04/11	15:38	L	1	NNW	38	feed	550	dropped out of view
26/04/11	15:59	L	1	circle	20	display	60	dropped out of view
26/04/11	16:03	PE	1	NW	95	hunt	165	male
26/04/11	16:10	L	1	SE	31		95	
26/04/11	16:11	L	3	circle	15	display	180	
26/04/11	16:19	L	1	W	30		130	
26/04/11	16:23	L	4	circle	5	display	60	
26/04/11	16:24	L	1	WNW	8	roost	25	landed
26/04/11	17:03	L	1	N	9	mobbing	85	
26/04/11	17:07	L	2	circle	8	display	120	
26/04/11	17:11	L	1	NNW	16	feed	135	landed
26/04/11	17:40	L	3	circle	10	display	150	
26/04/11	17:54	L	5	circle	15	display	60	
26/04/11	18:03	L	1	circle	10	display	70	male
26/04/11	18:13	L	2	circle	8	display	35	
26/04/11	18:24	L	3	SSE	38	feed	35	dropped out of view
27/04/11	06:06	L	1	circle	45		20	
27/04/11	06:08	L	2	circle	10	display	45	
27/04/11	06:17	L	2	NW	28		50	
27/04/11	06:17	L	1	NW	10	display	40	
27/04/11	06:44	L	1	circle	20	display	60	
27/04/11	06:51	L	3	SSE	23	display	50	
27/04/11	06:53	GA	4	ENE	25		40	
27/04/11	07:07	GA	4	circle N	35		45	
27/04/11	07:20	L	1	SE	15		25	
04/05/11	08:49	L	5	SE	30	roost	35	dropped out of view
04/05/11	09:05	GA	2	NNW	35	feed	55	appeared to land
04/05/11	09:19	L	1	ESE	20	feed	100	male, landed
04/05/11	09:20	L	3	circle	15		55	
04/05/11	13:22	L	1	circle	7	mobbing	95	landed
04/05/11	13:32	OP	1	NNW	68	migrate	195	
04/05/11	13:32	L	10	SSE	50	mobbing	75	
04/05/11	13:36	L	1	SSE	53	feed	90	
04/05/11	14:25	L	1	NW	20		120	dropped out of view
04/05/11	15:01	L	2	circle	15	display	120	
16/05/11	15:31	L	1	WSW	14	feed	75	
16/05/11	19:49	L	1	NW	25	feed	130	
02/06/11	10:17	L	1	NNW	4		25	landed
02/06/11	11:10	L	1	SE	11	feed	70	landed
02/06/11	12:56	L	1	NW	16	feed	80	
20/06/11	20:05	ET	1	SSE	35	roost	115	
20/06/11	20:32	L	15	circle	28		45	
21/06/11	05:44	L	2	SW	25		105	dropped out of view
21/06/11	06:27	L	1	SSE	35	feed	40	
21/06/11	06:34	L	1	circle NNE	9	feed	65	landed
21/06/11	06:43	GA	1	circle	23		25	dropped out of view
21/06/11	07:52	L	1	NNW	28	feed	185	
05/07/11	05:37	CU	1	NNW	55	feed	95	appeared to land
05/07/11	06:03	L	7	WNW	80	feed	125	dropped out of view
05/07/11	06:42	L	25	circle	40		100	took off & landed
05/07/11	09:47	L	15	circle	38		45	landed
05/07/11	09:53	PE	1	circle NNE	138	hunt	100	
19/07/11	12:21	PE	1	NNE	53	hunt	25	male
19/07/11	13:16	L	9	SW	40	roost	135	appeared to land
19/07/11	13:17	PE	1	NW	30	hunt	65	male
19/07/11	15:23	HY	1	N	15		35	carrying prey - dropped out of view
19/07/11	15:59	PE	1	S	35	hunt	50	male, dropped out of view

Date	Time	Species	Count	Direction of flight	Flight height (m)	Activity	Time bird observed (sec)	Notes
19/07/11	15:59	L	65	circle	35	flu	115	dropped out of view
19/07/11	16:05	PE	1	circle NNE	45		55	male - carrying prey

Note: species codes are all standard 2-letter BTO codes: GA = gadwall, ET = little egret, MR = marsh harrier, OP = osprey, PE = peregrine, HY = hobby, L = lapwing, CU = curlew.

Park Spring Vantage Point Survey observation information August 2011 – March 2012

Date	Start time	Finish time	Weather	Observer
08/08/11	13:30	16:30	cloud variable 2-6/8, wind W 5, visibility excellent	Mike Hoit
08/08/11	16:30	18:00	cloud 5-6/8, wind SW 5-6, visibility excellent	Keith Langdon
24/08/11	16:05	18:05	cloud variable 3-6/8, wind SW 2 - SW 2-3, precipitation 0, visibility excellent	Mike Hoit
25/08/11	05:40	08:10	cloud 8/8, wind SE 1, steady > light rain, visibility very good, slightly hazy	Mike Hoit
16/09/11	12:10	15:10	cloud 8/8, wind SE 3, precipitation 0, visibility excellent	Mike Hoit
16/09/11	15:10	16:40	cloud 8/8, wind SE 3, visibility excellent	Keith Langdon
28/09/11	06:30	07:30	cloud 0/8, wind 0 - variable E 1, visibility very good, a little hazy	Keith Langdon
28/09/11	10:00	11:00	cloud 0/8, wind SE 2, visibility excellent	Keith Langdon
28/09/11	07:30	10:00	cloud 0/8, wind 0 - ESE 1, precipitation 0, visibility excellent, slightly hazy	Mike Hoit
10/10/11	12:35	14:05	cloud 7/8, wind WSW 6-7, visibility excellent, little intermittent drizzle	Keith Langdon
10/10/11	14:05	17:05	cloud 8/8, wind WSW 5-6, intermittent light drizzle, visibility excellent	Mike Hoit
26/10/11	08:15	10:15	cloud 1/8, visibility excellent, wind 0	Keith Langdon
26/10/11	10:15	12:45	cloud 1/8, wind ESE 1, precipitation 0, visibility excellent	Mike Hoit
07/11/11	12:25	15:25	cloud 8/8, wind NNW 2, occasionally very light drizzle, visibility excellent, slightly hazy	Mike Hoit
07/11/11	15:25	16:55	cloud 8/8, wind NNW 1, slightly murky but visibility good/moderate, very light drizzle on & off	Keith Langdon
22/11/11	11:15	13:15	cloud 8-7/8, wind WSW 2-3, visibility excellent	Keith Langdon
22/11/11	13:15	15:45	cloud 7>5/8, wind WSW 2, precipitation 0, visibility excellent	Mike Hoit
05/12/11	12:55	15:55	cloud 7/8 > 3/8, wind SW 3, occasionally 4, sleet/hail 13:08 - 13:20, visibility excellent	Mike Hoit
04/12/11	15:55	16:25	cloud 6-7/8, wind SW 2-3, visibility excellent	Keith Langdon
06/12/11	07:30	08:30	cloud 4-2/8, wind SW, visibility excellent	Keith Langdon
21/12/11	07:45	09:45	cloud 8/8, light drizzle, wind none, visibility moderate - good	Keith Langdon
21/12/11	09:45	12:15	cloud 8/8, wind 0, precipitation 0, visibility very good, slightly misty/hazy	Mike Hoit
02/01/12	12:05	14:05	cloud 0/8, visibility excellent, wind WSW 3	Keith Langdon
02/01/12	14:05	16:55	cloud 1-0/8, wind WSW 2-3, precipitation 0, visibility excellent	Mike Hoit
20/01/12	07:35	10:05	cloud 8/8, very light rain, wind NNW 1, visibility very good	Keith Langdon
20/01/12	10:05	12:05	cloud 8/8, wind WNW 1 - WNW 2, occasional drizzle, visibility excellent	Mike Hoit
01/02/12	08:20	10:50	cloud 5>1/8, wind NE 1-2, precipitation 0, visibility excellent	Mike Hoit
01/02/12	10:50	12:50	cloud 0/8, visibility excellent	Keith Langdon
16/02/12	13:20	15:20	cloud 8/8, wind W/WNW 4, visibility excellent	Keith Langdon
16/02/12	15:20	17:50	cloud 8/8, wind W 4, precipitation 0, visibility excellent	Mike Hoit
14/03/12	09:25	12:25	cloud 8/8, wind 0, visibility excellent	Dave Farrow
14/03/12	08:25	09:25	cloud 8/8, wind 0, visibility good but murky	Keith Langdon
15/03/12	12:25	12:55	cloud 8/8, wind S 1-2, visibility good but murky	Keith Langdon
28/03/12	07:40	10:40	cloud 0/8, wind W 1, visibility excellent, warm	Dave Farrow
28/03/12	10:40	12:10	cloud 0/8, wind WNW 2, visibility excellent	Keith Langdon

Park Spring Vantage Point Survey key species bird data August 2011 – March 2012

Date	Time	Species	Count	Direction of flight	Flight height (m)	Activity	Time bird observed (sec)	Notes
24/08/11	16:43	L	5	SSE	65	feed/roost	45	dropped out of view
24/08/11	17:34	PE	1	SE	150	hunt	40	male
16/09/11	12:22	BW	4	SE	93	migrate	195	all juvs
16/09/11	13:38	ML	1	SW	11	hunt	50	female, dropped out of view
16/09/11	13:42	L	35	circle	58	flushed	85	dropped out of view
16/09/11	13:42	L	80	circle	70	flushed	200	
28/09/11	10:40	GP	180	W	45	flushed	90	
28/09/11	10:40	DN	3	W	45	flushed	90	same line
28/09/11	07:43	L	3	SSE	50	feed	155	
28/09/11	07:46	L	1	SSE	43	feed	130	
28/09/11	07:48	L	28	circle	43	flushed	165	landed
28/09/11	07:53	L	23	SSE	48	feed	190	
28/09/11	08:08	L	6	N	48	feed	95	landed
28/09/11	08:09	L	15	SSE	38	feed	120	
28/09/11	08:22	L	35	circle	20		45	landed
28/09/11	08:25	L	52	circle	35		285	landed
28/09/11	08:37	WN	3	S	35	feed	50	landed
28/09/11	09:29	PE	1	NNW	30	hunt	70	adult male, dropped out of view
28/09/11	09:57	GX	1	NW	45	migrate	85	juv
10/10/11	15:10	L	80	circle	38	flushed	150	took off & landed
10/10/11	15:10	GP	130	circle	38	flushed	150	took off & landed
10/10/11	16:24	GP	12	N	90	roost	160	landed
10/10/11	17:03	L	8	NW	33	feed	80	
26/10/11	08:31	GP	1000	circle	55	flushed	120	
26/10/11	08:31	L	20	circle	55	flushed	120	
26/10/11	08:33	GP	16	WSW	48	roost	35	
26/10/11	08:36	GP	11	S	58	roost	30	
26/10/11	08:37	GP	600	circle	55	flushed	180	same line/area
26/10/11	08:37	L	15	circle	55	flushed	180	same line/area
26/10/11	08:51	GP	140	S	58	roost	90	
26/10/11	09:42	GP	1000	circle	150	flushed	300	same line/area
26/10/11	09:42	L	4	circle	150	flushed	300	same line/area
26/10/11	10:34	GP	5	SE	53	roost	25	landed
26/10/11	10:40	GP	1500	circle NW	120	flushed	330	took off & landed
26/10/11	10:47	L	1	S	35	feed	60	
26/10/11	11:01	GP	1500	circle	145	flushed	390	took off & landed
26/10/11	11:01	L	19	circle SW	53	flushed	165	took off & landed
26/10/11	11:03	GP	34	SSE	125	flushed	70	took off & landed
26/10/11	11:06	L	75	circle S	95	flushed	240	landed
26/10/11	11:06	GP	5	circle S	95	flushed	240	landed
26/10/11	11:09	GP	850	circle	165	flushed	270	took off & landed
26/10/11	11:09	L	150	circle	165	flushed	270	took off & landed
26/10/11	11:09	GP	450	circle	300	flushed	170	
26/10/11	11:11	L	19	circle	65		150	landed
26/10/11	11:12	PE	1	ESE	175		75	female - carrying prey
26/10/11	11:17	WN	15	N	25		85	
26/10/11	11:24	GP	750	circle	115		270	
26/10/11	11:34	GP	350	circle	78		195	
26/10/11	11:38	GP	110	NNW	190	roost	170	landed
26/10/11	11:42	GP	175	circle	180		450	
26/10/11	11:42	L	250	circle	180		450	
26/10/11	11:42	GP	600	circle	300		355	
26/10/11	12:14	GP	11	NNW	150	roost	95	landed
26/10/11	12:18	GP	48	SSE	180		105	
26/10/11	12:24	L	420	circle	175		330	

Date	Time	Species	Count	Direction of flight	Flight height (m)	Activity	Time bird observed (sec)	Notes
26/10/11	12:24	GP	230	circle	175		330	
26/10/11	12:26	GP	23	NNW	238		65	joined above
26/10/11	12:31	GP	11	NNW	238	roost	90	landed
07/11/11	13:10	GP	80	NNW	105	roost	100	landed
07/11/11	13:16	CU	1	SSE	38	feed	65	
07/11/11	15:55	GP	2600	circle	55		300	
07/11/11	16:50	GP	5	E		feed		heard only as getting towards dusk
22/11/11	11:35	WG	28	NE	28	roost	30	
22/11/11	11:36	L	65	circle	83		60	
22/11/11	11:36	GP	4000	circle	158		180	
22/11/11	11:36	L	400	circle	108		420	
22/11/11	11:54	GP	2500	NNW	20	roost	1680	
22/11/11	12:00	L	100	circle	28		150	
22/11/11	12:14	GP	180	NNW	200	roost	480	
22/11/11	12:31	WG	25	NW	25	feed	60	
22/11/11	12:35	GP	40	SSE	38		15	
22/11/11	12:37	WG	25	N	28		30	
22/11/11	12:45	L	31	W	20		45	
22/11/11	12:58	GP	800	circle	83		360	same line/area
22/11/11	12:58	L	50	circle	83		360	same line/area
22/11/11	13:09	GP	1000	circle	133		300	same line/area
22/11/11	13:27	GP	55	NNW	170	roost	70	landed
22/11/11	13:52	L	110	circle	100		180	landed
22/11/11	13:54	L	34	NNW	180	roost	160	landed
22/11/11	14:22	GP	1100	circle SE	280		445	took off & landed
22/11/11	14:22	GP	1800	circle SE	280		480	
22/11/11	14:22	L	450	circle ESE	120		390	took off & landed
22/11/11	14:30	L	17	NNW	50	roost	125	
22/11/11	14:32	GP	650	circle SE	200		570	
22/11/11	14:40	L	3	NNE	130	roost	95	landed
22/11/11	14:46	GP	2100	NNW	238	roost	360	landed
22/11/11	14:54	GP	250	NNW	195	roost	220	landed
22/11/11	15:00	GP	70	NNW	155	roost	105	
22/11/11	15:10	L	42	NNW	118	roost	225	
22/11/11	15:21	GP	500	circle	200		220	landed
22/11/11	15:29	GP	275	circle	120		150	
22/11/11	15:29	L	100	circle	120		150	
22/11/11	15:29	GP	130	circle SSW	118	feed	200	landed
22/11/11	15:34	L	125	circle	50		180	
05/12/11	13:30	L	55	NE	73	roost	195	landed
05/12/11	13:49	GP	17	NNW	35	roost	85	
05/12/11	13:58	GP	33	ESE	90	roost	95	landed
05/12/11	14:12	ML	1	NNW	16	hunt	25	male, landed
05/12/11	14:20	ML	1	WNW	16	hunt	40	male, landed, same as above
05/12/11	14:41	GP	2400	circle	165		975	
05/12/11	14:41	GP	450	circle	263		200	
05/12/11	14:41	L	29	circle S	90	feed	205	landed
05/12/11	14:52	GP	25	NNW	175		40	
05/12/11	15:00	PE	1	ESE	43	hunt	35	female
05/12/11	15:02	GP	12	SW	103	roost	75	
05/12/11	15:08	WG	13	NNW	63		135	
05/12/11	15:15	GP	850	circle	170		200	landed
05/12/11	15:15	L	20	circle	170		200	landed
05/12/11	15:39	GP	18	NNW	138	roost	105	
05/12/11	15:49	GP	30	NNW	63		40	landed
04/12/11	15:56	L	20	SSE	38	roost	20	
06/12/11	08:00	GP	600	SSE	175	roost	1800	at least

Date	Time	Species	Count	Direction of flight	Flight height (m)	Activity	Time bird observed (sec)	Notes
06/12/11	08:01	L	250	SSW	60	roost	300	
06/12/11	08:16	GP	400	SSE	125		960	
06/12/11	08:17	GP	12	SW	90		40	joined line 10
06/12/11	08:20	L	100	circle	50		120	
06/12/11	08:25	L	100	circle	60		300	
06/12/11	08:29	GP	200	SSE	135		60	from lines 10/17
06/12/11	08:29	L	60	SSE	135		60	from lines 10/17
21/12/11	08:23	GP	23	SSE	30		30	
21/12/11	08:30	GP		circle	38		60	
21/12/11	08:30	L		circle	38		60	
21/12/11	08:38	L	1	S	35		150	
21/12/11	09:46	GP	47	SW	110	roost	165	appeared to land
21/12/11	09:55	GP	10	SW	163	roost	130	appeared to land
21/12/11	10:34	GP	27	SSE	88		210	appeared to land
21/12/11	10:44	GP	25	circle	95		180	landed
21/12/11	11:04	GP	43	SSE	88	feed	100	
21/12/11	11:36	GP	32	NNW	45	roost	85	appeared to land
21/12/11	11:38	L	5	circle	45		60	appeared to land
21/12/11	11:39	GP	9	NNW	70	roost	80	appeared to land
21/12/11	12:05	L	90	circle	175		325	landed
21/12/11	12:05	GP	350	circle	175		325	landed
21/12/11	12:12	GP	3	SSE	48	feed	85	
21/12/11	12:05	PE	1	circle	65	hunt	180	juv
21/12/11	12:20	GP	19	SSE	83	roost	75	
21/12/11	12:54	GP	13	WSW	55		120	
02/01/12	14:47	GP	155	NNW	150	roost	225	appeared to land
02/01/12	15:29	GP	140	circle	138		325	appeared to land
02/01/12	15:47	GP	45	circle S	150		175	
02/01/12	15:43	GP	65	circle S	225		215	
02/01/12	16:27	L	20	circle	40		110	
20/01/12	08:03	ML	1	NNW	30	hunt	15	
20/01/12	08:41	GN	4	NNW	63	feed	50	
20/01/12	09:15	L	18	WNW	40	roost	80	
20/01/12	09:35	T	1	SSE	95		75	female
20/01/12	10:12	WN	2	N	23	feed	35	landed
20/01/12	11:20	L	31	circle	85	flushed	205	
20/01/12	11:23	GN	1	NW	78		105	female, landed
20/01/12	11:20	L	46	circle	140	flushed	180	
20/01/12	11:53	L	115	ESE	163	roost	145	landed
01/02/12	09:21	L	100	circle	110	flushed	245	took off & landed
01/02/12	09:59	L	75	NE	145		155	
01/02/12	10:38	L	39	SSE	33	feed	195	
01/02/12	10:38	L	2	ESE	73	feed	155	
01/02/12	10:58	L	80	NNW	28	feed/roost	70	same line
01/02/12	11:13	L	1	N	20	feed	40	
01/02/12	12:05	L	1	NNW	28	feed/roost	40	same line
01/02/12	12:11	L	11	E	35		120	
01/02/12	12:26	L	60	S	28		60	
16/02/12	14:01	L	1	S	58	roost	50	
16/02/12	14:17	L	120	circle	58	flushed	240	
16/02/12	14:17	GP	35	circle	58	flushed	240	
16/02/12	14:17	L	70	circle	58		90	
16/02/12	14:28	TU	2	SSE	23		20	
16/02/12	14:03	L	48	circle	58		120	
16/02/12	14:56	L	43	S	48		90	
16/02/12	15:05	L	60	circle	48		300	same line
16/02/12	15:05	GP	20	circle	48		300	same line

Date	Time	Species	Count	Direction of flight	Flight height (m)	Activity	Time bird observed (sec)	Notes
16/02/12	16:00	WN	3	N	45		35	landed
16/02/12	16:29	L	180	circle	100	flushed	180	
16/02/12	16:29	GP	30	circle	100	flushed	180	
16/02/12	16:34	GP	23	circle	250		145	landed
16/02/12	17:16	L	80	circle	60		105	landed
16/02/12	17:29	ML	1	SW	11		25	female, dropped out of view
14/03/12	09:45	L	2	SE	50		85	
14/03/12	09:55	L	1		55	display	25	
14/03/12	10:07	L	2	NW	55		60	
14/03/12	10:13	L	1	WNW	25		70	
14/03/12	10:17	L	8		20	circle	170	
14/03/12	10:19	L	3	ENE	25	display	220	
14/03/12	10:26	L	14	ESE	30	direct	150	
14/03/12	10:48	L	1	NW	13		25	
14/03/12	10:49	L	2		30	display	40	
14/03/12	10:57	L	6		25	display	155	
14/03/12	11:04	L	1	ESE	25	direct	165	
14/03/12	11:13	L	1	ESE	20	direct	150	
14/03/12	12:05	L	6		13	display	150	
14/03/12	12:09	L	45		13	circle	120	
14/03/12	12:10	L	20	SE	13		130	
14/03/12	08:25	L	12	circle	8		100	
14/03/12	08:32	L	12	W	15	roost	60	
14/03/12	09:21	L	2	circle	30	display	60	
15/03/12	12:25	L	8	circle	30		80	
15/03/12	12:48	L	3	NNW	28		50	
28/03/12	08:05	WN	55		18	flushed	240	
28/03/12	08:05	GA	3		18		160	
28/03/12	08:05	L	1	SE	13		50	
28/03/12	08:11	GA	13		50		170	
28/03/12	08:12	GP	16	S	18		20	dropping to ground/flash
28/03/12	08:13	WN	3	SE	45		90	
28/03/12	08:23	GA	3	SE	23		20	
28/03/12	08:23	SV	1	SE	23		20	
28/03/12	08:38	L	2	NW	25		30	
28/03/12	08:53	GP	280	SE	53	roost	65	dropped to flash
28/03/12	09:02	GP	120	SE	53	roost	55	
28/03/12	09:18	WN	2	SE	13		40	dropped to flash
28/03/12	09:21	L	1	NNW	8	direct	30	dropped to flash
28/03/12	09:34	L	1	NW	13	to roost	60	dropped to flash
28/03/12	09:35	PE	1	NNE	55	direct	140	
28/03/12	10:09	L	1	NW	13		25	dropped to flash
28/03/12	10:14	L	2	SE	15	direct	140	from flash
28/03/12	10:19	L	1	NNW	20	direct	50	to flash
28/03/12	10:48	L	2	N	50		45	
28/03/12	10:53	L	3	WNW	28	to roost	50	

Note: species codes are all standard 2-letter BTO codes: WG = white-fronted goose, WN = wigeon, GA = gadwall, T = teal, SV = shoveler, MR = marsh harrier, GP = golden plover, L = lapwing, PE = peregrine, BW = black-tailed godwit, ML = merlin, CU = curlew, ET = little egret, GN = goldeneye, GX = gannet, DN = dunlin.

10.2 ORNITHOLOGY – BIRD COLLISION RISK MODELLING

PARK SPRING WIND FARM ENVIRONMENTAL STATEMENT: APPENDIX 10.2 BIRD COLLISION RISK MODELLING

[illegible][illegible]

[illegible]

PARK SPRING WIND FARM				
BAND ET AL 2007 COLLISION MODEL				
	Peregrine	Golden plover	Lapwing	Black-headed Gull
Collision risk height	92	92	92	92
Risk corridor Width	750	750	750	750
Risk corridor Area	69,000	69,000	69,000	69,000
Annual number of flights through collision zone	119	200,760	58,803	57,932
% at rotor height	92%	63%	74%	74%
Annual number flying through risk window	110	126,479	43,514	42,869
No turbines	3	3	3	3
Rotor diameter	92	92	92	92
Rotor swept area	6648	6648	6648	6648
Allowance for overlap	0%	0%	0%	0%
Proportion of risk window occupied by rotors	29%	29%	29%	29%
Annual no bird rotor passes	32	36556	12577	12390
Band individual collision risk	7.4%	6.3%	6.6%	7.2%
Turbine downtime	10%	10%	10%	10%
Non-avoidance collisions	2	2068	750	808
Avoidance rate	98%	98%	98%	98%
Predicted collisions	0.04	41.4	15.0	16.2

13.1 TRAFFIC & TRANSPORT – SWEPT PATH ANALYSIS

ROUTE ASSESSMENT

The access route to site is proposed as follows:

A1(M) J37 – A635 (West through Hickleton) – A6195 (North on Rotherham Rd) — A6195 (West on Park Spring Rd) – site entrance.

For the purposes of this route assessment, the starting point is considered to be the exit from the A1(M), Junction 37 on to the A635. Table 1 below provides a summary of the findings of the swept path analysis. Photographs of each pinch point are shown on the swept-path drawings and in the Photographs section of this report.

In undertaking swept-path analysis, AutoTrack pro version 10.21.0 for AutoCAD2013, an AutoCAD plug-in has been used. AutoTrack is a swept-path analysis software package that allows the modelling of all types of steered vehicles and is used in combination with ordnance survey landline mapping to demonstrate the extent of highway modifications for negotiating a corner.

For each pinch point the worst case basis has been adopted, using the transport of a blade at 46m in length. It has also been assumed that the vehicle will have independent rear steering. In addition, the crane delivery vehicle has also been used as part of the assessment, and relevant drawings will be included where deemed necessary.

Table 1 summarises the findings of the swept path analysis and suggests appropriate mitigation measures where applicable.

Table 1: Swept Path Analysis

	Description	Associated Drawing Number	Results / Proposed mitigation
PP1	Exit round-about from the A1(M) at Junction 37 on to the A635.	PSR001	There is no requirement for third party land at this corner. Street furniture will need to be removed at this corner. Highway verge modification will be necessary and temporary paving will need to be installed. A short section of highway verge modification will be required on the inside of the approach to the roundabout. Furthermore two sign posts on the inside of the corner will need to be removed.
PP2	Gradual S-Bend through the village of Marr.	PSR002	There is no requirement for third party land at this corner. No street furniture will need to be removed. Use of the pavement and temporary paving will not be necessary. No further action necessary.
PP3	Right-hand bend in Hickleton.	PSR003	There is no requirement for third party land at this corner. No street furniture will need to be removed. Use of the pavement and temporary paving will not be necessary. No further action necessary.

PP4	Long left-hand bend exiting Hickleton.	PSR004	There is no requirement for third party land at this corner. Street furniture will need to be removed at this corner. Use of the pavement will be necessary and temporary paving will need to be installed. Three lampposts and a road sign will require removal to complete this turn. Furthermore temporary paving will be necessary on the central reservation of the corner.
PP5	Second exit of the roundabout on the A635.	PSR005	There is no requirement for third party land at this corner. Street furniture will need to be removed at this corner. Use of the pavement and temporary paving will not be necessary. Two lampposts on the outside of the roundabout junction will need to be removed, also a small section of the roundabout will require temporary paving.
PP6	Third exit from the roundabout on the A635, west of Goldthorpe.	PSR006	There is no requirement for third party land at this corner. Street furniture will need to be removed at this corner. No highway verge modifications or temporary paving will be necessary. Three lampposts and a road sign will need to be removed to complete this corner.
PP7	Third exit at the roundabout from the A635 on to the A6195 south of Middlecliffe.	PSR007	There is no requirement for third party land at this corner. Street furniture will need to be removed at this corner. No highway verge modifications or temporary paving will be necessary. A road sign will need to be removed to complete this corner.
PP8	First exit from the roundabout on the A6195, to stay on the A6195 (Park Spring Rd)	PSR008	There is no requirement for third party land at this corner. Street furniture will need to be removed at this corner. No highway verge modifications or temporary paving will be necessary. A road sign will need to be removed from the traffic island at the exit of the roundabout.
PP9	Second exit on the roundabout west of Little Houghton to stay on the A6195 (Park Spring Rd)	PSR009	There is no requirement for third party land at this corner. Street furniture will need to be removed at this corner. Use of the pavement will be necessary and temporary paving will need to be installed. Three road signs and three lampposts will require removal prior to handling this corner.
PP10	Right-hand turn from the	PSR010	There is no requirement for third party land at

	A6195 (Park Spring Rd) to the site entrance.	this corner. No street furniture will need to be removed. Highway verge modification will be necessary and temporary paving will need to be installed. The site entrance will have to be constructed to handle the abnormal load vehicle and the construction vehicles required for construction and maintenance.
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Photographs

PP1: Roundabout at the exit of the A1(M) on to the A635.



PP2: Gradual s-bend through the village of Marr.



PP3: Right-hand bend in Hickleton.



PP4: Long left-hand bend exiting Hickleton**PP5:** Second exit of a roundabout on the A635.**PP6:** Third exit of the roundabout on the A635 west of Goldthorpe.**PP7:** Third exit from the roundabout on the A635 on to the A6195.

PP8: First exit of the roundabout on the A6195 to stay on the A6195 (Park Spring Road).

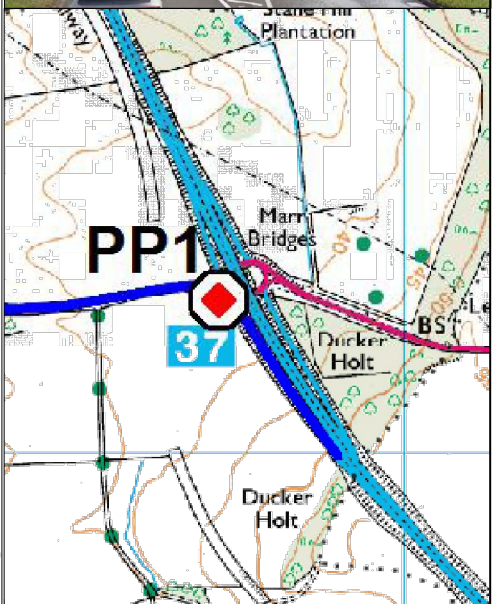
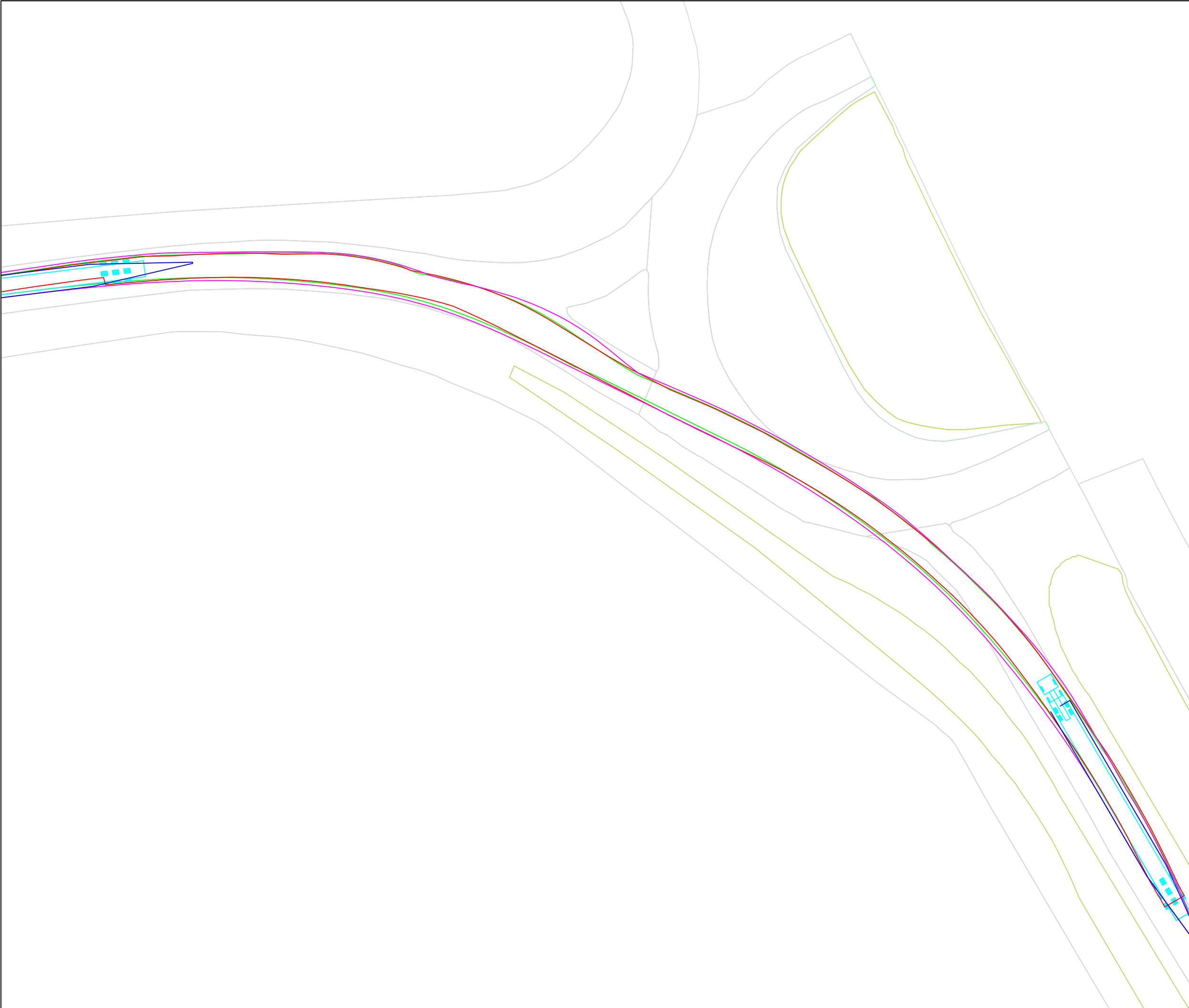


PP9: Second exit of the roundabout on the A6195 continuing on Park Spring Road.



PP10: Right-hand turn to the site entrance.





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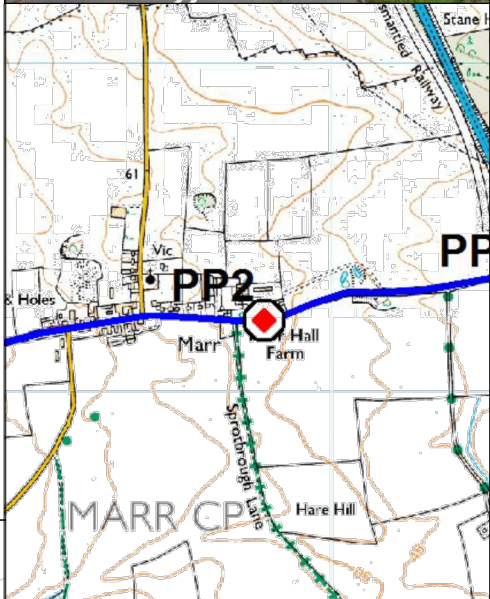
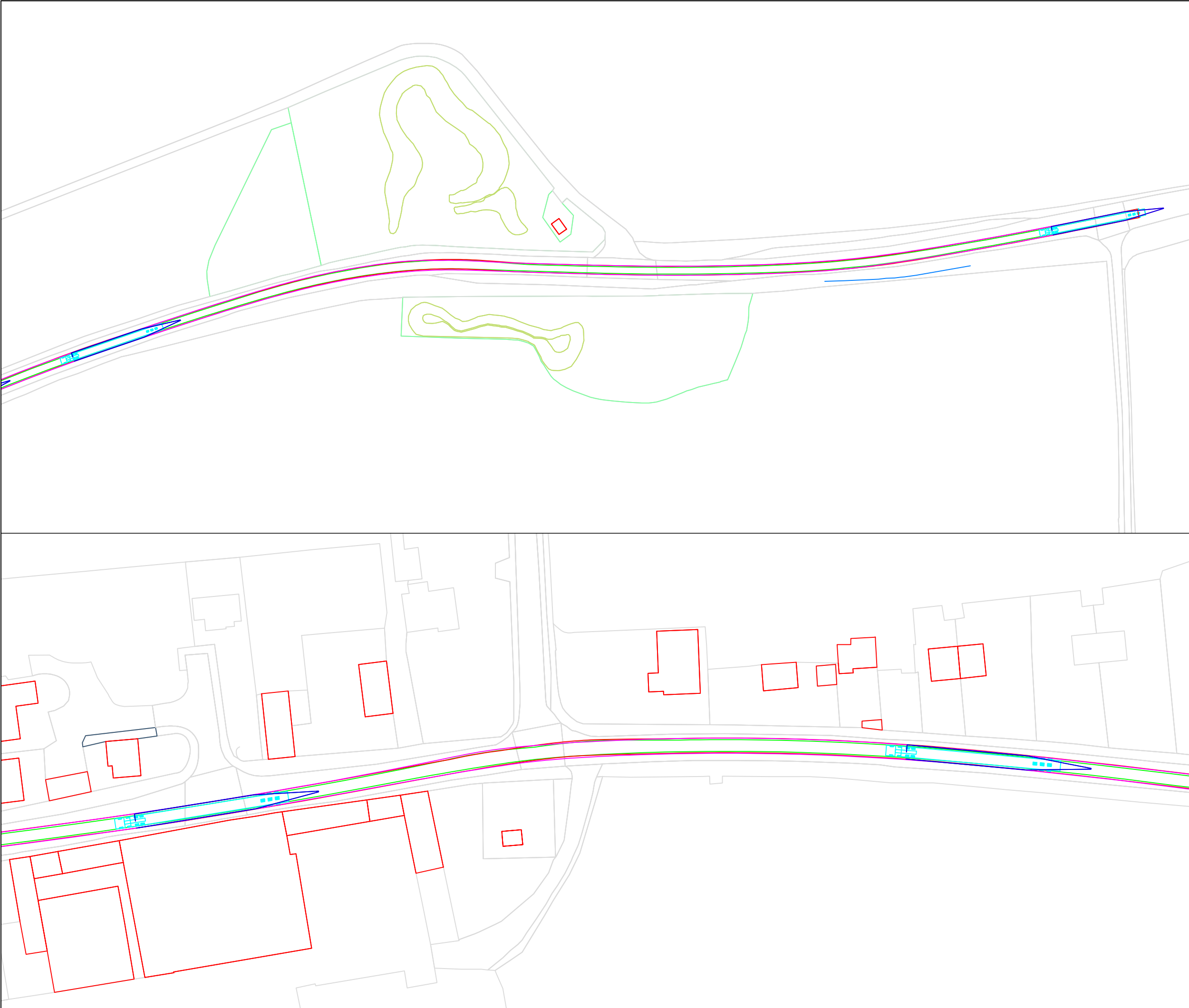
Tel: 44-(0)191-226-2000
Fax: 44-(0)191-226-2104

Client: EDF-ER

Site/Project: PARK SPRING
ROUTE: A1 - A635 - A6195

Title: PP1 - EXIT FROM A1(M)
J37

Drawn: T STRANGE	Checked: R HUNTER
Designed: R HUNTER	Approved: L MORTIMER
Date: 22/05/2013	Scale: A3 Sheet:
Project Number: PARK SPRING	Drawing Number: PSR001
	Revision: 1



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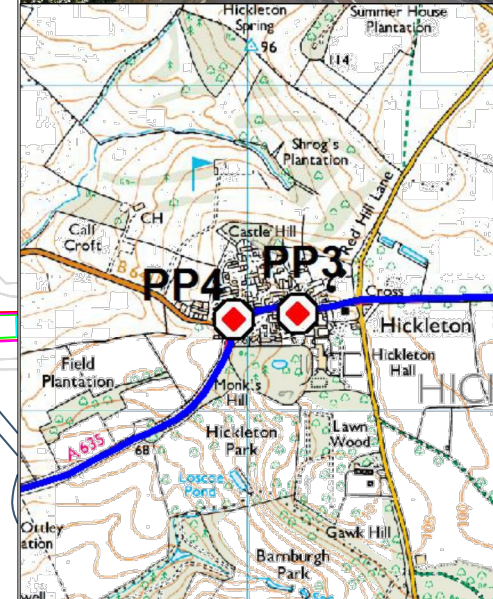
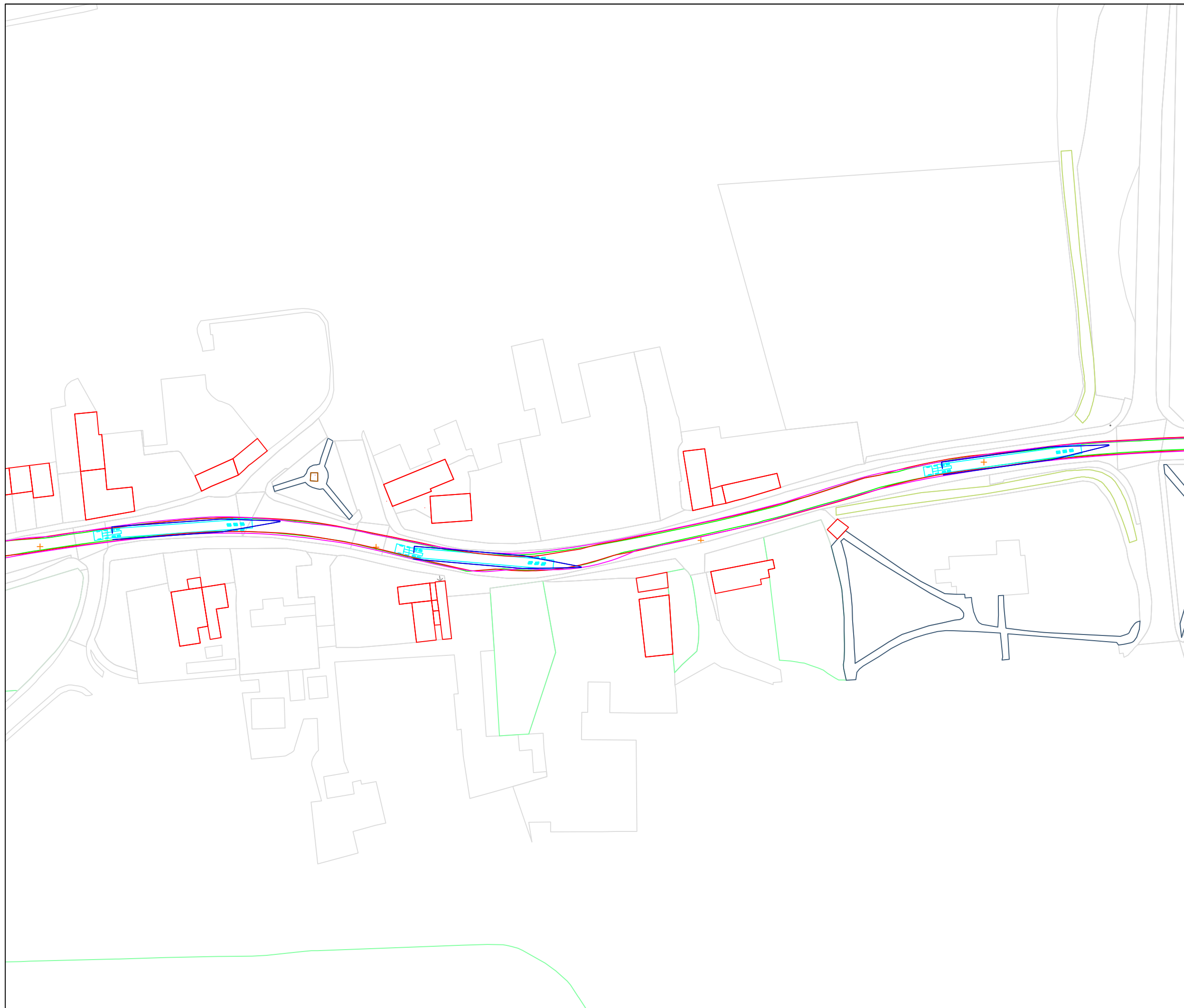
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Client: EDF-ER

Site/Project: PARK SPRING
ROUTE: A1 - A635 - A6195

Title: PP2 - GRADUAL S-BEND
MARR VILLAGE

Drawn: T STRANGE	Checked: R HUNTER
Designed: R HUNTER	Approved: L MORTIMER
Date: 22/05/2013	Scale: A3 Sheet:
Project Number: PARK SPRING	Drawing Number: PSR002
	Revision: 1



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Site/Project:

PARK SPRING
ROUTE: A1 - A635 - A6195

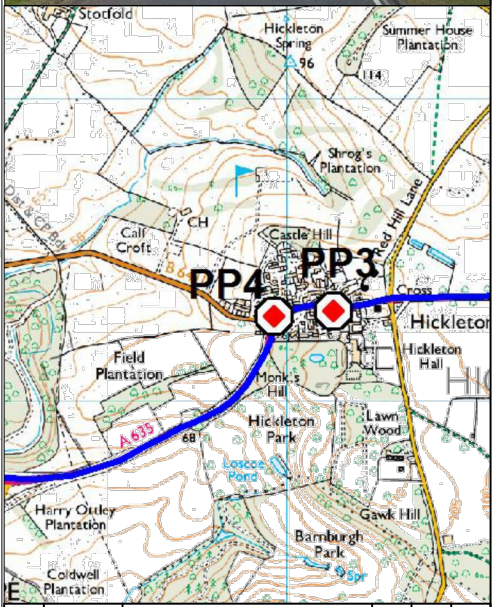
Title:

PP3 - RIGHT HAND BEND HICKLETON

Drawn: T STRANGE	Checked: R HUNTER
Designed: R HUNTER	Approved: L MORTIMER
Date: 22/05/2013	Scale: A3 Sheet:
Project Number:	Drawing Number: Revision:

Date: 12/09/2019	Scale:	AS	Sheet:
Project Number:	Drawing Number:		Revision:
PARK SPRING	PSR003		1

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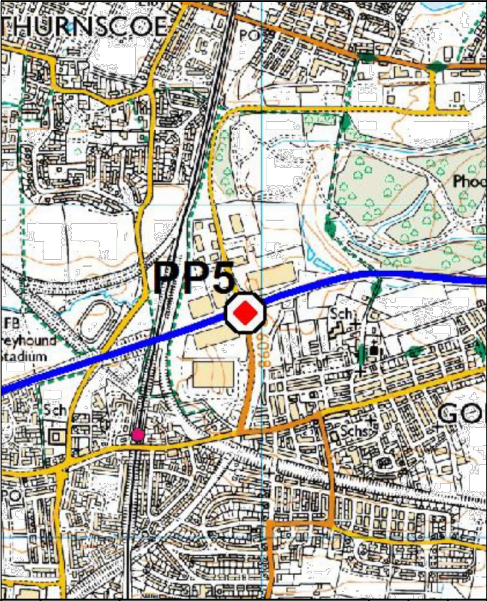
Client: EDF-ER

Site/Project: PARK SPRING
ROUTE: A1 - A635 - A6195

Title: PP4 - LEFT HAND BEND
HICKLETON

Drawn: T STRANGE	Checked: R HUNTER
Designed: R HUNTER	Approved: L MORTIMER
Date: 22/05/2013	Scale: A3 Sheet:

Project Number: PARK SPRING	Drawing Number: PSR004	Revision: 1
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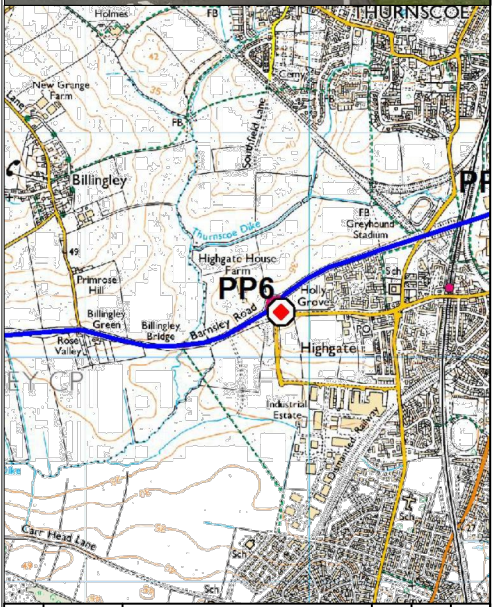
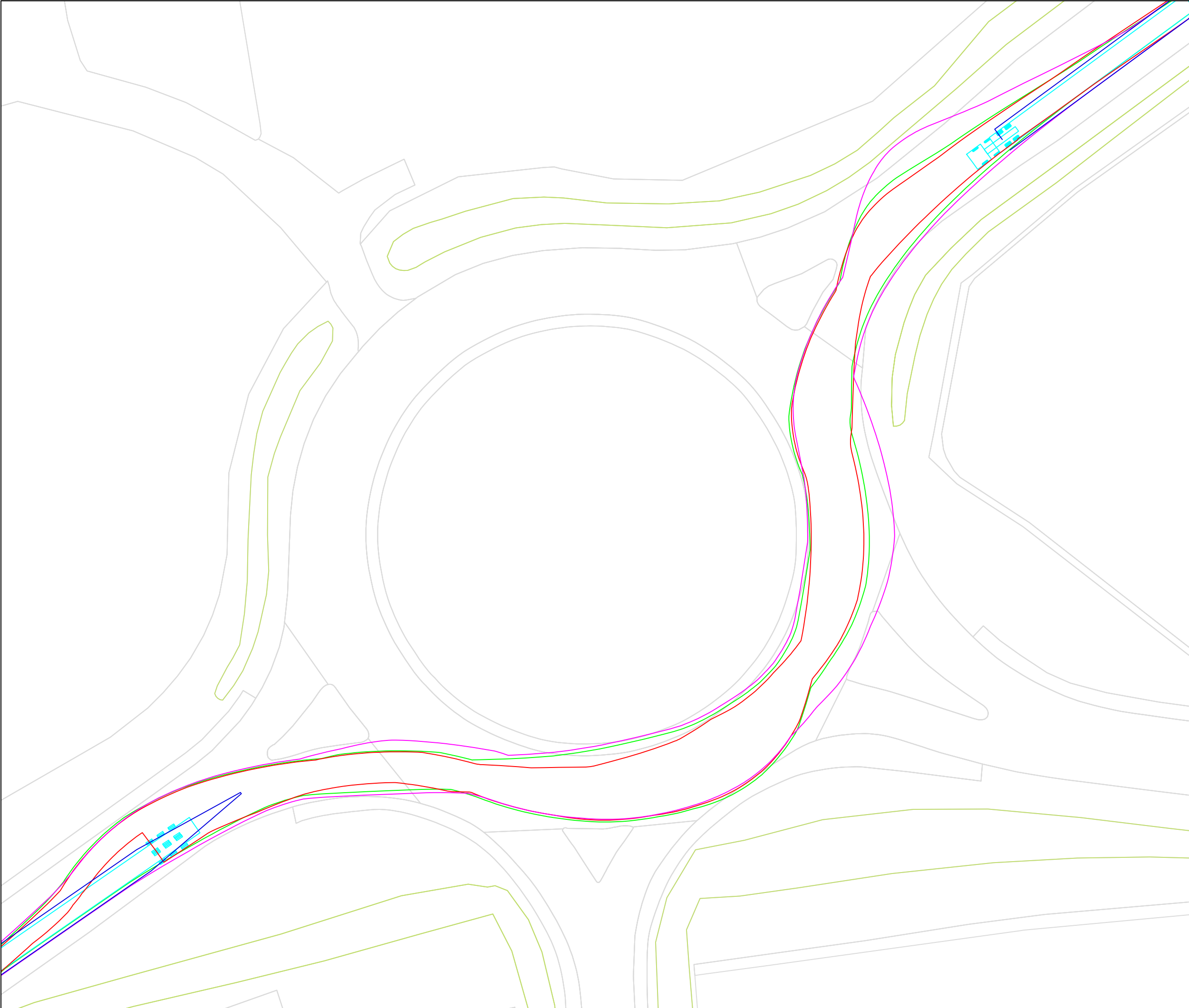
Client: EDF-ER

Site/Project: PARK SPRING
ROUTE: A1 - A635 - A6195

Title: PP5 - ROUNDABOUT
GOLDTHORPE

Drawn: T STRANGE	Checked: R HUNTER
Designed: R HUNTER	Approved: L MORTIMER
Date: 22/05/2013	Scale: A3 Sheet:

Project Number:	Drawing Number:	Revision:
PARK SPRING	PSR005	1



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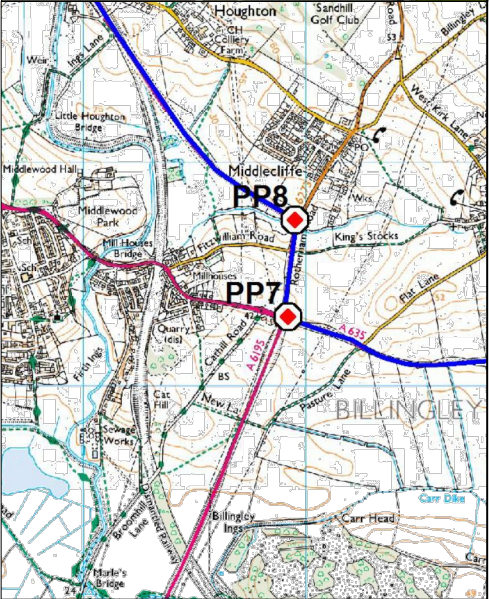
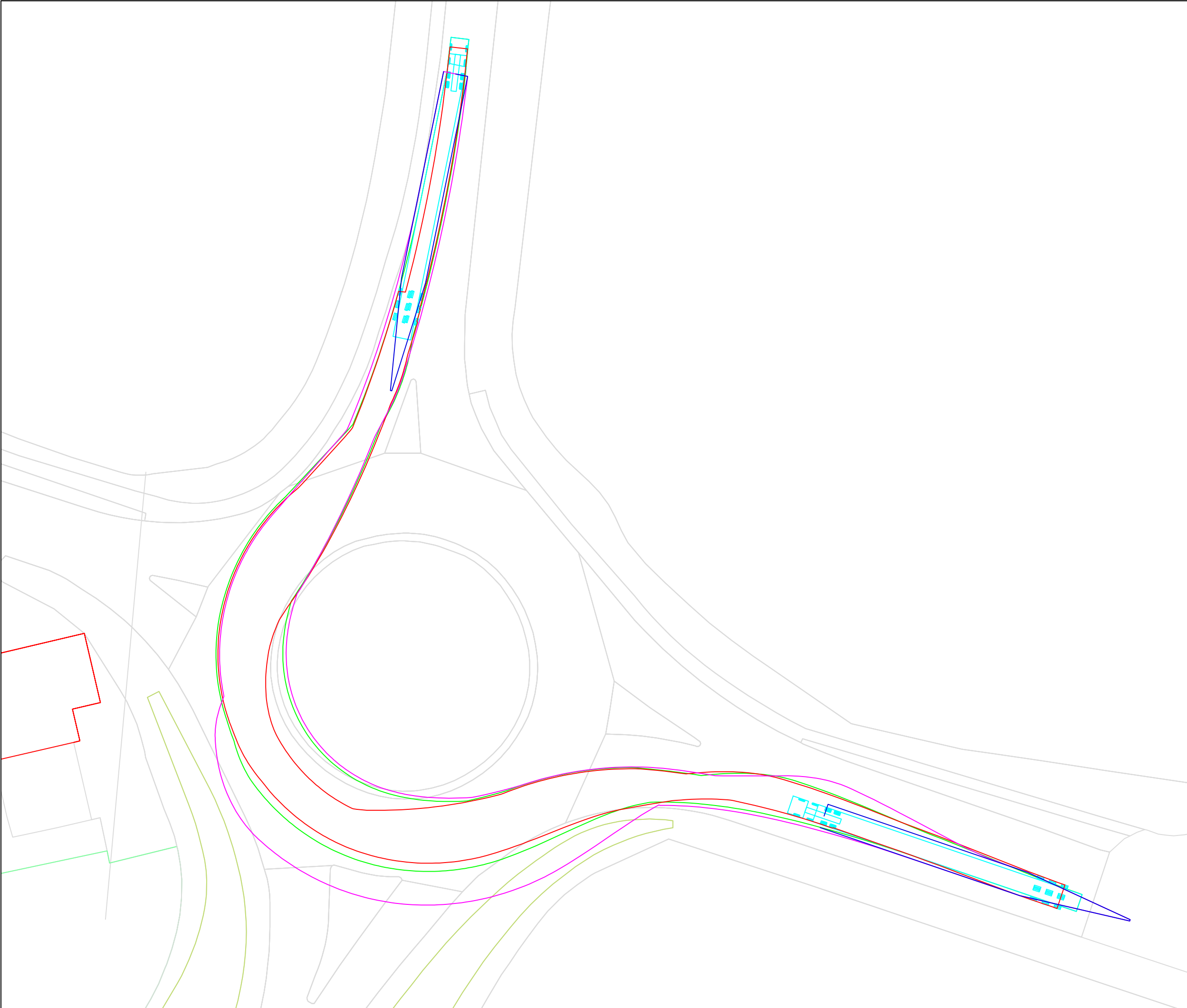
PARK SPRING
ROUTE: A1 - A635 - A6195

Title:

PP6 - ROUNDABOUT
HIGHGATE

Drawn:	T STRANGE	Checked:	R HUNTER
Designed:	R HUNTER	Approved:	L MORTIMER
Date:	22/05/2013	Scale:	A3
Sheet:		Revision:	
Project Number:	PARK SPRING	Drawing Number:	PSR006
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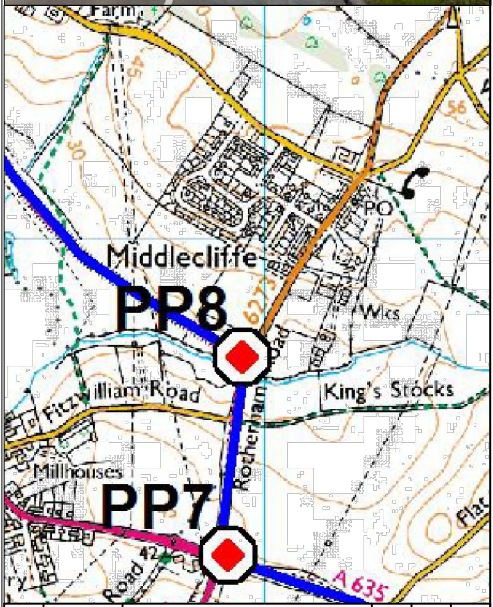
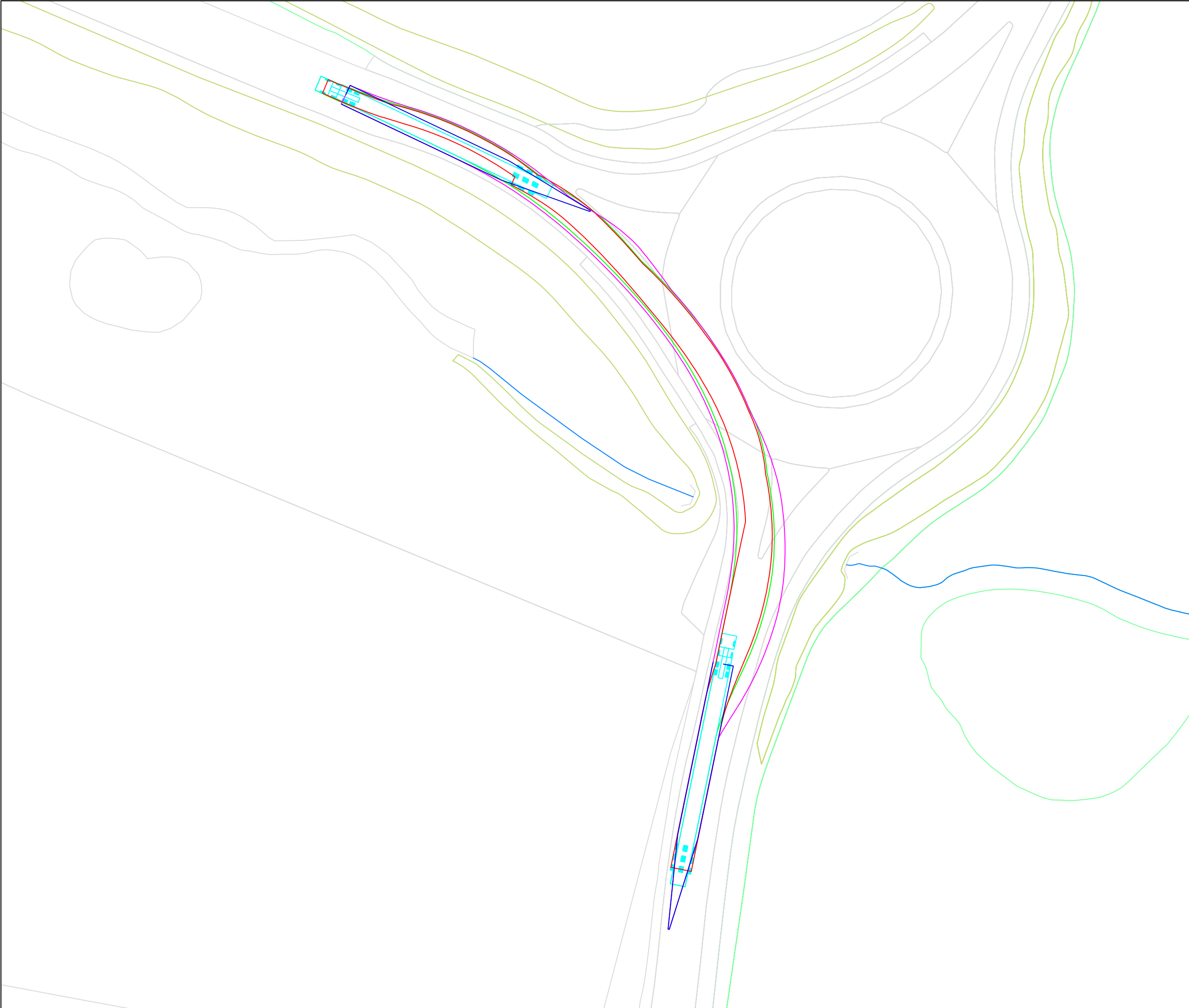
Tel: 44-(0)191-226-2000
Fax: 44-(0)191-226-2104

Client: **EDF-ER**

Site/Project: **PARK SPRING
ROUTE: A1 - A635 - A6195**

Title: **PP7A - ROUNDABOUT
SOUTH OF MIDDLECLIFFE
THIRD EXIT**

Drawn: T STRANGE	Checked: R HUNTER
Designed: R HUNTER	Approved: L MORTIMER
Date: 22/05/2013	Scale: A3 Sheet:
Project Number: PARK SPRING	Drawing Number: PSR007
	Revision: 1



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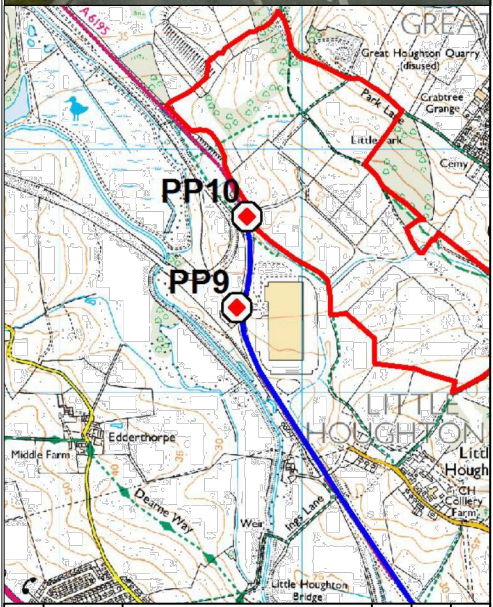
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Client: EDF-ER

Site/Project: PARK SPRING
ROUTE: A1 - A635 - A6195

Title: PP8 - FIRST EXIT
ROUND ABOUT ON A6195

Drawn:	R HUNTER	Checked:	T STRANGE
Designed:	R HUNTER	Approved:	L MORTIMER
Date:	23/05/2013	Scale:	A3
Sheet:		Project Number:	PARK SPRING
Sheet:		Drawing Number:	PSR008
Sheet:		Revision:	1



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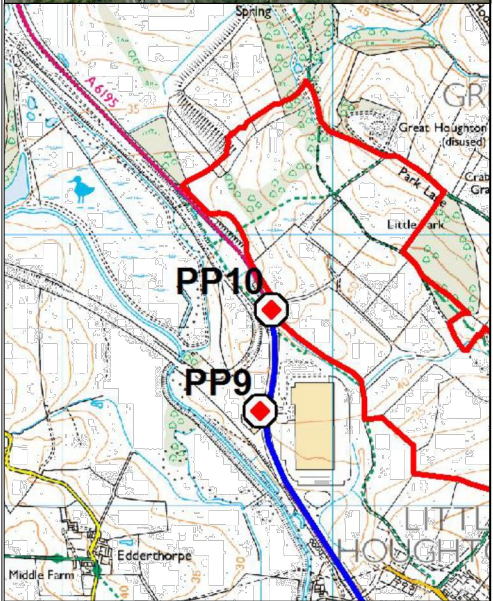
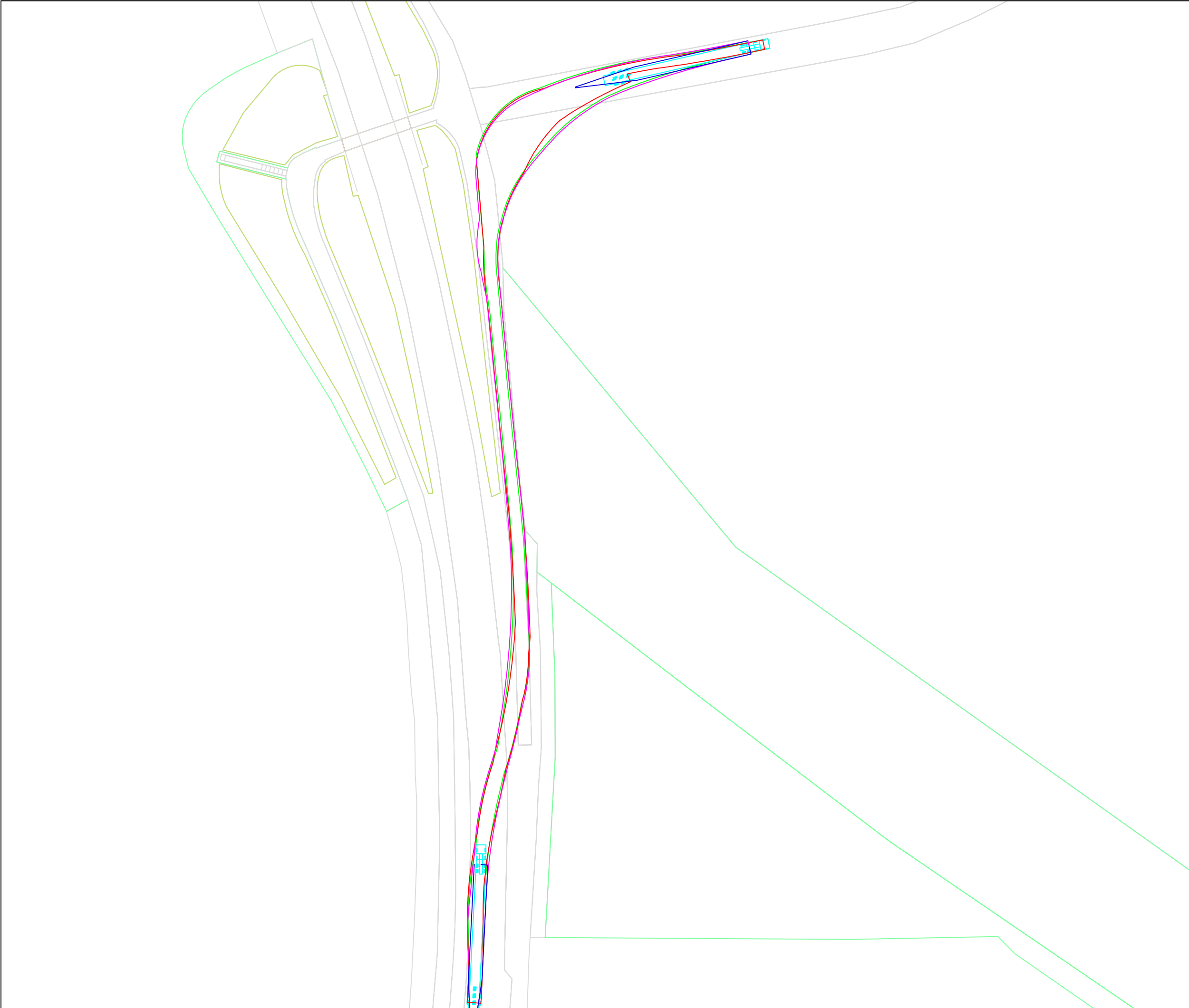
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Fax: 44-(0)191-226-2104

Client: EDF-ER

Site/Project: PARK SPRING
ROUTE: A1 - A635 - A6195

Title: PP9 - ROUNDABOUT
WEST OF LITTLE HOUGHTON

Drawn: T STRANGE		Checked: R HUNTER	
Designed: R HUNTER		Approved: L MORTIMER	
Date: 22/05/2013	Scale:	A3	Sheet:
Project Number:		Drawing Number:	Revision:
PARK SPRING		PSR009	1
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Rev	Date	Description	By	Chk	App
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BASED ON NOOTEBOOM TELE-PX, 46M BLADE
WHEEL OUTLINE: — BODY OUTLINE: — LOAD OUTLINE: —

**PARSONS
BRINCKERHOFF**

Amber Court
William Armstrong Drive
Newcastle upon Tyne NE4 7YQ

Tel: 44-(0)191-226-2000
Fax: 44-(0)191-226-2104

Client:

EDF-ER

Site/Project:

PARK SPRING
ROUTE: A1 - A635 - A6195

Title:

PP10 - RIGHT HAND TURN
TO SITE ENTRANCE

Drawn:	T STRANGE	Checked:	R HUNTER
Designed:	R HUNTER	Approved:	L MORTIMER
Date:	28/05/2013	Scale:	A3
Sheet:		Project Number:	PARK SPRING
Sheet:		Drawing Number:	PSR010
Sheet:		Revision:	1

14.1 TECHNICAL ISSUES - TELEVISION STUDY

EDF Energy

**Park Spring
Wind Farm Development**

Emley Moor TV Transmitter

TV Risk Assessment

ADMINISTRATION PAGE

Job Reference:	6551I (Update to 6551F)
Date:	23 December, 2010
Prepared for:	EDF Energy
Author:	Janetos Georgopoulos Kai Frolic [May 2013 Update] Kai Frolic [July 2013 Update]
Telephone:	01787 319001
Email:	jan@pagerpower.co.uk

Reviewed By:	Kai Frolic
Date:	24 December, 2010
Telephone:	01787 319001
Email:	kai@pagerpower.co.uk

Issue	Date	Detail of Changes
1	24 December, 2010	Initial Issue
2	May, 2013	Update with new layout
3	July, 2013	Update with new site name

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*Pager Power Limited, New Mill, Bakers Court, Gt Cornard, Sudbury, Suffolk
CO100GG T:01787 319001 F:01787 319007 E:info@pagerpower.co.uk
W:www.pagerpower.co.uk*

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1 INTRODUCTION

1.1 Site Details

The Park Spring site is located approximately 31km south - southeast of the city of Leeds, South Yorkshire, England.

The current turbine layout is comprised of 3 wind turbines, each having a hub height of 80m above ground level (agl), a rotor diameter of 92m, resulting in a maximum tip height of 126m agl (table 1).

Turbine	Eastings	Northings	Hub Height	Rotor Diameter	Tip Height
1	441723	407313	80m	92m	126m
2	441849	406942	80m	92m	126m
3	441973	406667	80m	92m	126m

Table 1 Wind Farm Details (Coordinates in British National Grid, OSGB36 datum)

The developer wishes to understand the risk posed by the proposed development to local TV reception. Pager Power Ltd has been retained to conduct a TV Risk Assessment to investigate the potential risk.

TV interference modelling was undertaken using Pager Power's in house Sightlines software.

2 TV INTERFERENCE ANALYSIS

2.1 Overview

Pager Power Ltd has developed an effective modelling method for mapping likely television interference from wind farms.

The likelihood of television interference is determined by considering the strength of the direct, or carrier, signal in comparison to the reflected, or interfering, signal. The Carrier to Interference Ratio (CI Ratio) quantifies the relative strength of the direct and reflected signals and is normally expressed in decibels (dB). A high Carrier to Interference ratio means interference is less likely. A low Carrier to Interference ratio means that interference is more likely.

Pager Power's methodology for the assessment of interference effects was developed based on evaluation of the predicted Carrier to Interference Ratio (CIR). Whilst this parameter is related to analogue services, the interference mechanisms for digital transmissions are similar to those for analogue transmissions. The main difference is the manner in which the interference is manifested on the TV screen. Analogue signals may suffer degradation that reduces the signal quality by causing various effects such as ghosting or flickering. Digital transmissions tend to be robust to small amounts of interference, but are drastically affected by more severe interference. Even though the digital switchover has taken place over all of the UK, the interference zones modelled here are, to the best of Pager Power's knowledge, equally applicable to digital transmissions as analogue transmissions.

To achieve good quality reception an aerial must receive a strong Carrier signal but weak Interference signals. The standard characterisation of this condition is the Carrier to Interference Ratio, (CIR). The CIR is interpreted as follows:

Colour	CIR (dB)	Interference Level	Likelihood of Interference
Red	<5	High	Likely
Yellow	5 – 15	Medium	Possible
None	>15	Low	Unlikely

Table 2 Interpreting the CIR

2.2 Local Terrestrial Television services

Television services in the vicinity of the wind development are likely to be provided by Emley Moor Transmitter. The published National Grid coordinates are SE222128 and the antenna height 567m above ordnance datum (aod).

Emley Moor Transmitter group provides TV services for most of Yorkshire.

The digital switchover for Emley Moor Transmitter and its relays has been completed.

Emley Moor Transmitter Digital Services¹

Service	Channel	Offset	ERP (kW)
BBC A	47	0	174
D3&4	44	0	
BBC B	41	+	
SDN	51	0	
Arqiva A	52	0	
Arqiva B	48	0	

Table 3 Emley Moor Digital TV services

2.3 Interference Modelling

TV interference modelling analysis was undertaken at the average channel frequency of 681 MHz for a 400km² square area in the vicinity of the proposed wind turbine for Emley Moor transmitter. The area is defined by the following corners:

Location	Eastings NGR	Northings NGR
Southwest	430000	400000
Northeast	450000	420000

Table 4 Area assessed

An interference pattern chart and map for Emley Moor transmitter are displayed in the pages that follow.

¹ Source: Ofcom, 2011, Digital Switchover Transmitter Details, Yorkshire Region, Issue 2.0

2.4 Predicted Emley Moor Interference Pattern Chart

Interference Chart 1
Emley Moor Television Transmitter
 for
Park Spring Wind Farm
 20 x 20km Area
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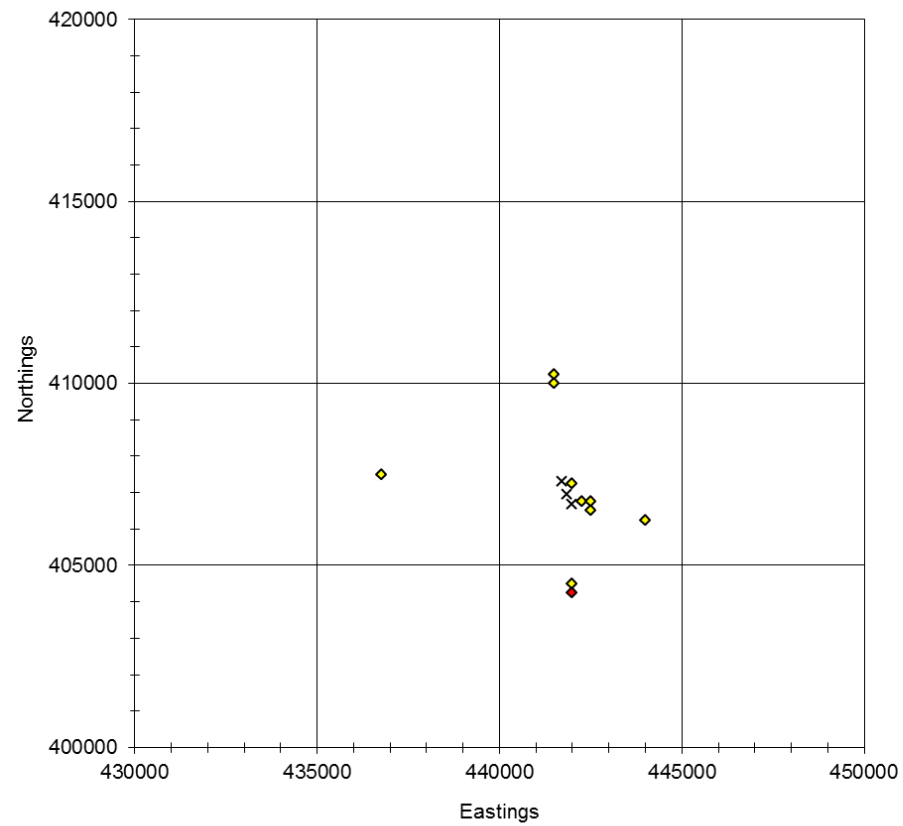
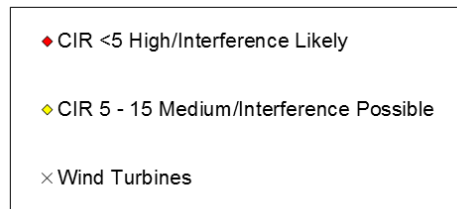


Figure 1 Predicted Emley Moor Interference Pattern chart

2.5 Predicted Emley Moor Interference Pattern Map



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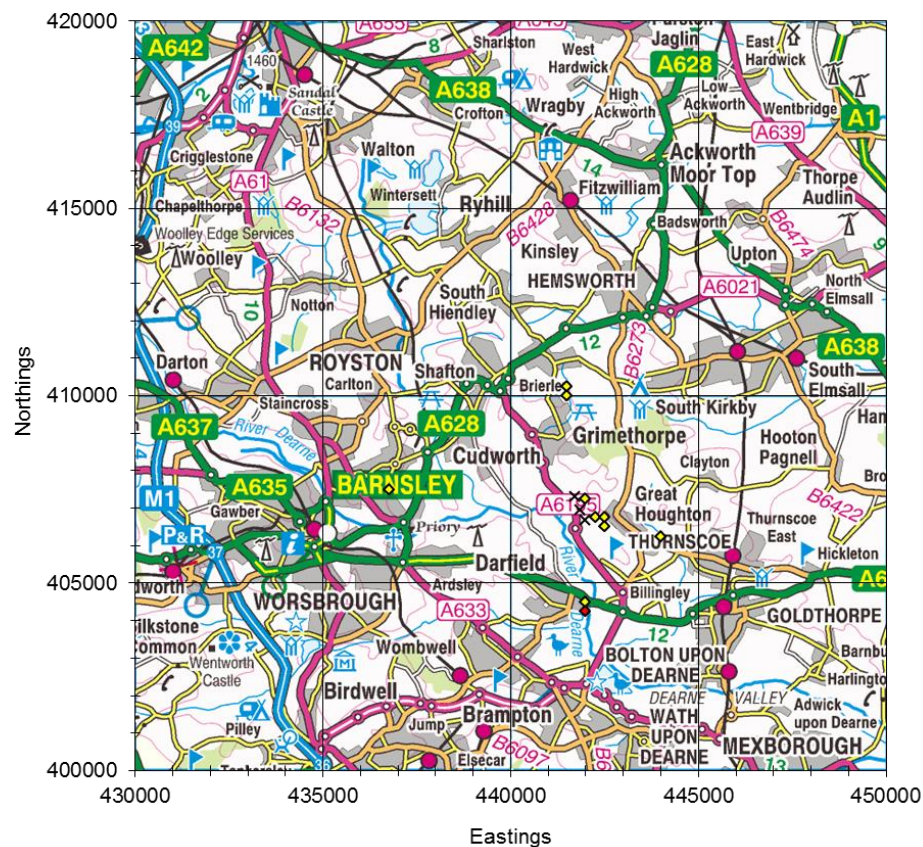
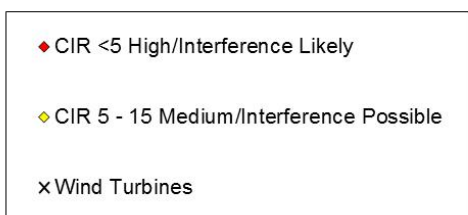


Figure 2 Predicted Emley Moor Interference Pattern map

2.6 Interference Quantification Assessment

Based on the predicted interference model:

- Isolated points with medium CIR are shown on either side of the village of Great Houghton. It is considered unlikely that this will lead to interference at homes in the area;
- Isolated points with medium and high CIR are shown to the east of Darfield, this does not appear to be in a populated area and would not be expected to cause real interference. This is because sporadic points of interference shown by the model are often unlikely to cause a real issue, and because these areas are not in the forward scatter region², which is particularly significant for digital transmissions;
- Other isolated points of interference are shown to the north and to the west of the development. These are sporadic points of interference outside the forward scatter region considered insignificant and are not expected to cause real interference.

In Pager Power's experience it is considered unlikely there will be any interference. If effects do occur these are likely to be for a small number of isolated cases.

2.7 Mitigation

If effects were to occur, the most appropriate mitigation is likely to be upgrading the receiving equipment or installation of satellite TV at affected homes.

² The forward scatter region is the area in the wind turbine's shadow when viewed from the transmitter, i.e. the area of Great Houghton.

3 CONCLUSIONS

3.1 Report Findings

The proposed Park Spring Wind Farm has been analysed and the effects it will have on the TV reception on a 400km² area have been predicted based on Pager Power's extensive experience of electromagnetic propagation.

For the analysis the Emley Moor TV transmitter television transmitter has been considered and an interference map and chart have been created. The map and chart are a good guide to where interference is likely. They can only ever be used as a guide, because of local interference and propagation effects near the receiver and because of the sampling and data resolutions available.

It is expected that the television reception of those that directly receive signal from Emley Moor are unlikely to suffer from interference as can be seen from Chart and Map 1.

If effects do occur these are likely to be for a small number of isolated cases. The most appropriate mitigation would most likely be upgrading the receiving equipment or installation of satellite TV at affected homes.

The overall interference risk is assessed as **Very Low**.