



# Taking Britain further

Heathrow's plan for connecting the UK to growth

 #BritainsHeathrow

**Heathrow**

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## 7 Our vision for a world class hub - Daylight



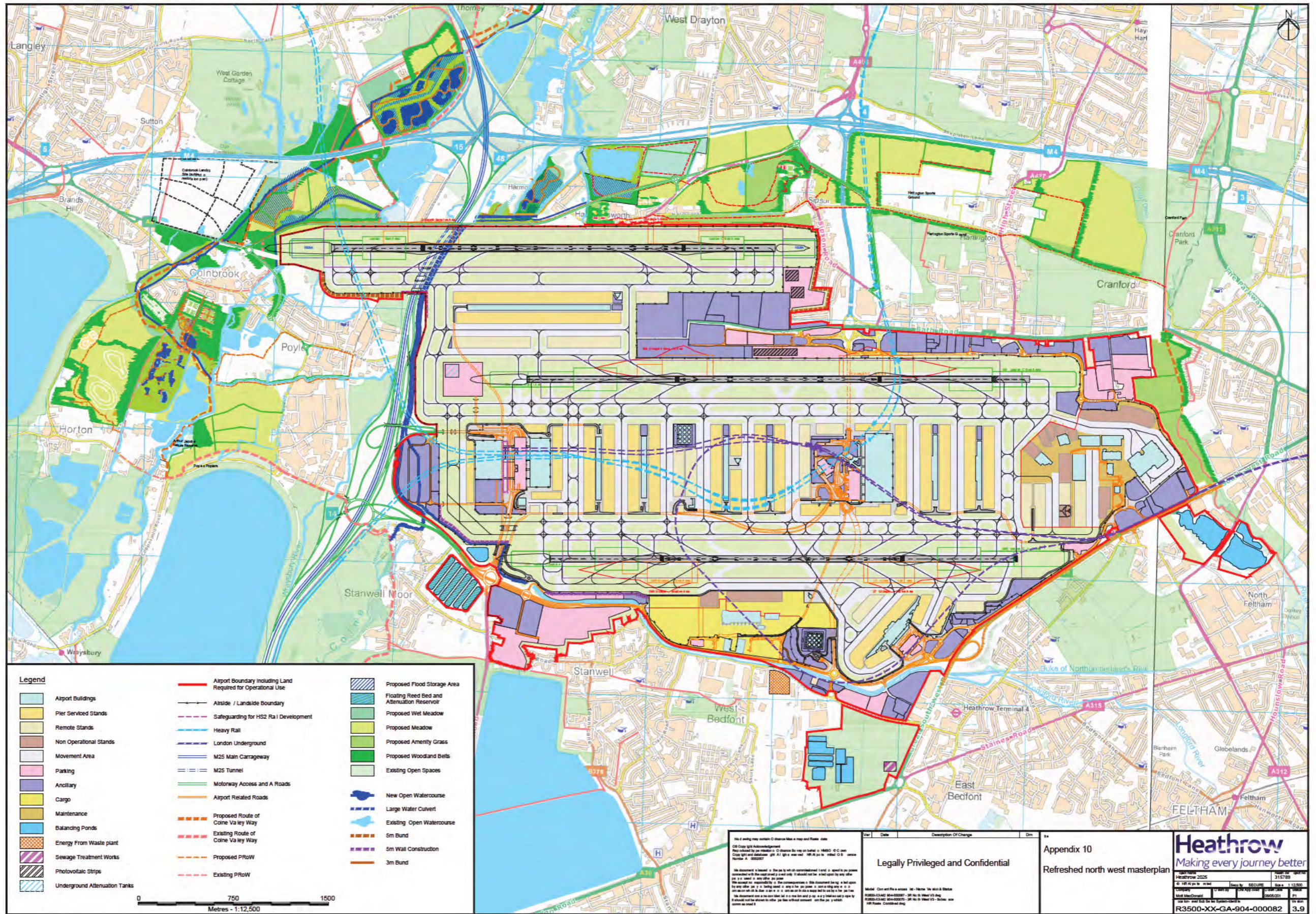
8 Our vision for a world class hub - Dusk



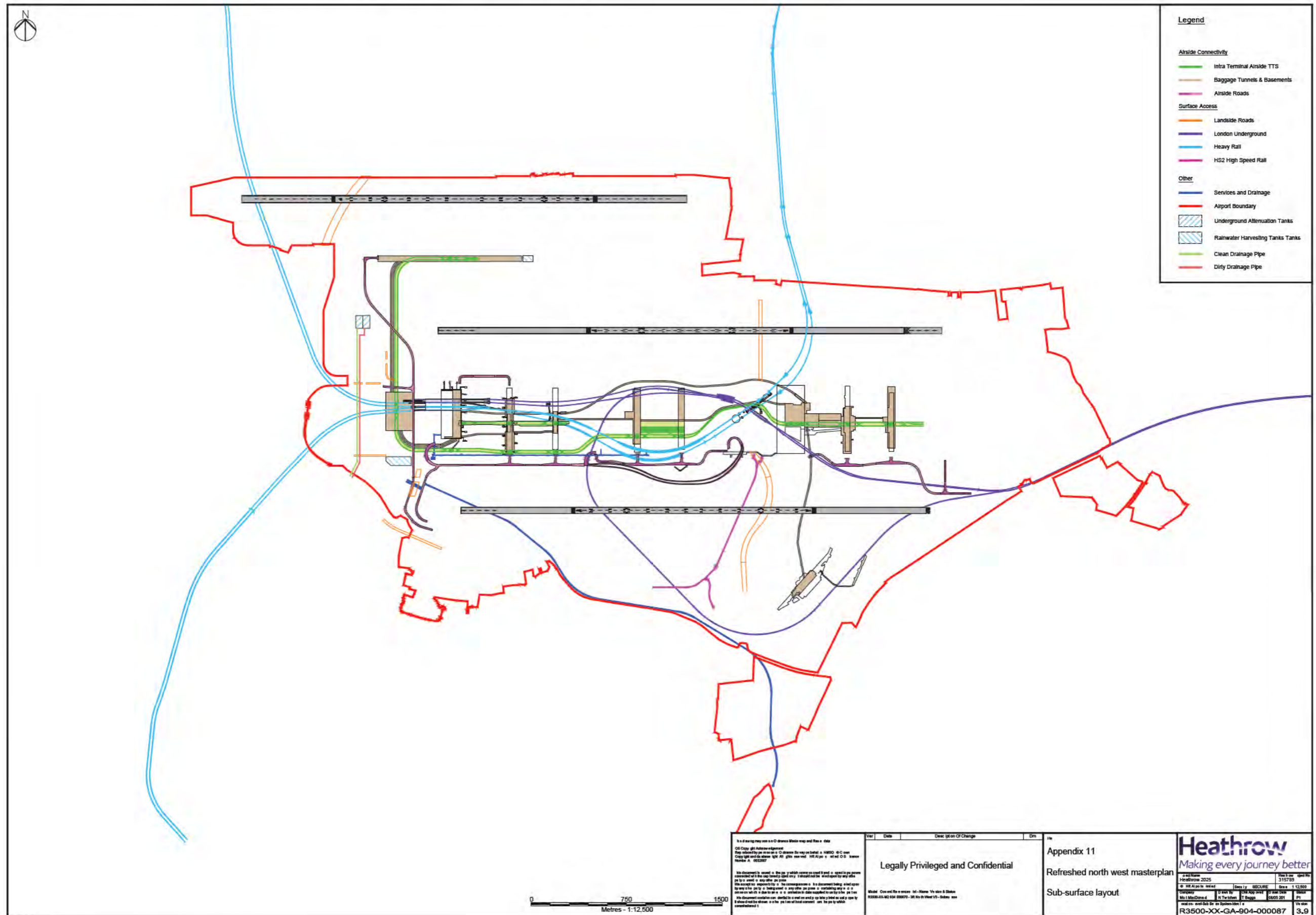
## 9 Our vision for a world class hub- Integrated Transport hub



# 10 Refreshed north west masterplan



# 11 Refreshed north west masterplan: Sub-surface layout



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	<p>Legally Privileged and Confidential</p>				
<p>Appendix 11 Refreshed north west masterplan Sub-surface layout</p>					
<p><b>Heathrow</b> Making every journey better</p>					
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# 12a Refreshed north west masterplan: Minimum connection time summary – Intra-terminal

## Refreshed north west masterplan Minimum connection time summary Intra-terminal metrics

### Assumptions - Passengers

Assumptions for passengers are based on the following:
 

- All passengers are assumed to be walking.
- The TTS at the ramp is assumed to be increased by a factor of 25% due to high ramp and the edge of the platform.
- Assumptions for TTS to include transfer via the 7m height.
- Vertical profile of the pier is assumed to be the same as T2 (i.e. TTS at basement level).
- Assumptions for the distance between the arrival and departure from the same pier.

Disembarking	
Overall	6 min
Doors open	3 min
Passenger flow	3 min
Walk speed	1 m/s
Escalator (assumed 0.8 m/s)	0.83 min
TTS Platform	
Waiting time (worst case scenario)	2 min
Doors open	5 sec
Walking time to platform	0.5 min
Time to board (assume 350m)	1 min
TTS average speed (prn +25%)	7.3 m/s
Boarding Card Check	
Boarding Card Queue	1 min
Boarding Card Process	0.1 min
Security Screening	
Security Screening Queue	5 min
Security Screening Total Time in Process	2.0 min

30° lean against the platform edge of 0.4 m/s

> 26.25 km/h

### Assumptions - Bags

Assumptions for bags are based on the following:
 

- All transfer bags are short connects and arrive and depart on the same pier.
- It is assumed that all cargo processors and satellites have a quick break-up, making them easy to handle.
- Assumptions for the pier and processing are based on the headstand facility for short connect and late bags.
- All inter-terminal bag transfers via core processor to core processor.
- All short connect bags travel via automated systems, except around T4.
- All short connect bags go through HBS at satellite of departure.

Unloading	
Overall	7 min
Cargo Doors open	3 min
ULDs Off-Loaded	4 min
Break-Down	
Time taken to break-down ULD	12 min
In-Process	
HBS and In-System Time	600 secs
Delivery to Aircraft (tug and dolly)	4.2 m/s
Delivery to Aircraft (automation)	10 m/s
Make-Up	
Time taken to make-up ULD	30 secs
Loading	
Overall	7.0 min
ULDs loaded	4 min
Cargo Doors closed	3.0 min

2 mins per ULD Assumes transfer bed in first ones off

Equates to 19kph

Website at 10 or 14m/s

2 mins per ULD Assumes transfer bed in last ones on

### 3 W - PASSENGERS

T2 Concourse E Concourses A via Concourse C	Time (s)	Time (min)
Disembarking	360	6.0
Arrival to Conc E TTS Platform (walking)	5 m	5.8
Arrival Gate to Conc E TTS Platform (escalator)	3 levels	1.7
TTS Wait	120	2.0
TTS Doors opening	5	0.1
TTS Platform dwell	30	0.5
TTS Travel Conc E C D + Pl form dwelling	1 pier	1.5
TTS Travel between Conc D - Conc C	1000 m	2.3
TTS Platform dwell	30	0.5
TTS Travel Conc C + form wing Conc B	2 piers	1.5
TTS Doors opening	5	0.1
Conc TTS Platform to Conc TTS Security (escalator)	2 levels	1.7
Conc TTS Platform to Conc TTS Security (walking)	50 m	0.8
Boarding Card Queue	60	1.0
Boarding Card Process	6	0.1
Security Screening Queue	300	5.0
Security Screening Process	120	2.0
Conc A Security Screening (escalator)	1 level	0.8
Conc A Security Screening (walking)	1 m	0.1
Buffer*	300	5.0
<b>TOTAL</b>		<b>43.7</b>

\* 10 mins buffer between passenger and gate and checks off.

### 3R NW - BAGS

T2 Concourse E Concourses A via Concourse C	Time (s)	Time (min)
Unloading	420	7.0
ULD break-down area (t+d)	60	1.0
ULD break-down	720	12.0
Bag transfer from Conc E to Conc C (auto)	150 m	2.5
Bag transfer from Conc C to Conc A (auto)	80 m	1.3
HBS and In-System Time	600	10.0
Loading	120	2.0
Buffer*	300	5.0
<b>TOTAL</b>		<b>40.8</b>

\* 10 mins buffer between bag and gate and checks off.

T (V-Pe) - T4 North Pier	Time (s)	Time (min)
Disembarking (End of Victor Pier)	360	6.0
Arrival to Conc T Security (walking)	780 m	19.0
Boarding Card Queue	60	1.0
Boarding Card Process	6	0.1
Security Screening Queue	300	5.0
Security Screening Process	120.0	2.0
Security Screening Gate (escalator)	1 level	0.8
Security Screening Gate (walking)	490 m	8.2
Buffer*	300	5.0
<b>TOTAL</b>		<b>41.1</b>

T5 Concourse F Concourse H	Time (s)	Time (min)
Disembarking	360	6.0
Arrival Gate to Conc F TTS Platform (walking)	250 m	4.2
Arrival Gate to Conc F TTS Platform (escalator)	2 levels	1.7
TTS Wait	120	2.0
TTS Doors opening	5	0.1
TTS Platform dwell	30	0.5
TTS Travel between Conc F Conc H + Platform dwelling	2 piers	1.5
TTS Platform dwell	5	0.1
Conc H TTS Platform to Conc H Security (escalators)	4 levels	3.3
Conc H TTS Platform to Conc H Security (walking)	50 m	0.8
Boarding Card Queue	60	1.0
Boarding Card Process	6	0.1
Conc H Security Screening Queue	300	5.0
Conc H Security Screening Process	120	2.0
Conc H Security Screening Gate (escalator)	1 level	0.8
Conc H Security Screening Gate (walking)	250 m	4.2
Buffer*	300	5.0
<b>TOTAL</b>		<b>38.3</b>

T6 Concourse K - Concourse J	Time (s)	Time (min)
Disembarking	360	6.0
Arrival Gate to Conc K TTS Platform (walking)	550 m	9.2
Arrival Gate to Conc K TTS Platform (escalator)	2 levels	1.7
TTS Wait	120	2.0
TTS Doors opening	5	0.1
TTS Platform dwell	30	0.5
TTS Travel Conc K - Conc J	0 piers	0.0
TTS Platform dwell	1700 m	23.3
TTS Doors opening	5	0.1
Conc J TTS Platform to Conc J Security (escalators)	4 levels	3.3
Conc J TTS Platform to Conc J Security (walking)	100 m	1.7
Boarding Card Queue	60	1.0
Boarding Card Process	6	0.1
Conc J Security Screening Queue	300	5.0
Conc J Security Screening Process	120	2.0
Conc J Security Screening Gate (escalator)	1 level	0.8
Conc J Security Screening Gate (walking)	150 m	2.5
Buffer*	300	5.0
<b>TOTAL</b>		<b>44.8</b>

T (V-Pe) - T4 North Pier	Time (s)	Time (min)
Unloading	420	7.0
ULD break-down area (t+d)	750 m	12.5
ULD break-down	720	12.0
Bag transfer from Conc F to Conc H (auto)	500 m	8.3
Delivery ULD to aircraft (t+d)	119	2.0
Loading	120	2.0
Buffer*	300	5.0
<b>TOTAL</b>		<b>41.0</b>

T5 Concourse F Concourse H	Time (s)	Time (min)
Unloading	420	7.0
ULD break-down area (t+d)	240 m	4.0
ULD break-down	720	12.0
Bag transfer from Conc F to Conc H (auto)	750 m	12.5
HBS and In-System Time	600	10.0
Loading	120	2.0
Buffer*	300	5.0
<b>TOTAL</b>		<b>38.2</b>

T6 Concourse K - Concourse J	Time (s)	Time (min)
Unloading	420	7.0
ULD break-down area (t+d)	650 m	10.8
ULD break-down	720	12.0
Bag transfer from Conc K to Conc J (auto)	1400 m	23.3
HBS and In-System Time	600	10.0
Loading	120	2.0
Buffer*	300	5.0
<b>TOTAL</b>		<b>40.9</b>

# 12b Refreshed north west masterplan: Minimum connection time summary – Inter-terminal

## Refreshed north west masterplan: Minimum connection time summary

### Inter-terminal metrics

#### Assumptions

- Assume all transfer passengers are short connects and arrive and depart on pier-served stands
- Assume passengers are transferring between international services therefore no immigration processes are considered
- No travellers are taken into consideration hence all horizontal transitions within a terminal are assumed to be covered by walking
- The TTS average speed between satellites is assumed to be increased by a factor of 25% due to higher speed and the reduced proportion of acceleration/deceleration times
- Vertical profiles for T6 are assumed to be the same as in T2 (i.e. TTS at basement level)
- Airside coach maximum speed is 5 mph (8 km/h) in apron roads; 20 mph (32.2 km/h) in airside roads; and 30 mph (48.3 km/h) inside the cargo tunnels
- Assume a factor of -25% to be applied to the maximum coach speed to account for apron circulation, and acceleration/deceleration at intersections and junctions
- Assume airside coach travel only stops at main processors between terminal pairs
- TTS connecting T2 and T5 stops at all concourses

Disembarking	
Overall	6 min
Doors open	3 min
Passengers disembark	3 min
Passenger flow	
Walking speed	1 m/s
Escalator speed (assumed 10m per level)	0.83 min/level
TTS Platform	
Waiting time (worst case scenario)	2 min
Doors open	5 sec
Dwelling time at the platform	0.5 min
Travel time between satellites (same apron)	1 min
TTS average speed between aprons (+25%) T2&T5	7.3 m/s
TTS average speed between aprons (+50%) T6	8.8 m/s
Airside coach	
Waiting time (worst case scenario)	10 min
Boarding	2 min
Deboarding	1 min
Average speed (airside roads)	7.2 km/h
Average speed (tunnels)	10.7 km/h
Boarding Card Presentation.	
Boarding Card Queue	1 min
Boarding Card Process	0.1 min
Security Screening	
Security Screening queue	5 min
Security Screening process	2.0 min

>> Assume 30° elevation angle and speed of 0.4 m/s

>> 26.25 km/h

>> 25.8kph

>> 38.6kph

#### 3R NW PASSENGERS

T2 - T5 (Concourse A - Concourse H via Concourse C)	Time (s)	Time (min)
Disembarking	360	6.0
Arrival Gate to T2C TTS Platform (walking)	230 m	3.8
Arrival Gate to T2C TTS Platform (escalator)	3 levels	2.5
TTS Wait	120	2.0
TTS Doors opening	5	0.1
TTS Platform dwell	30	0.5
TTS Travel Conc A - Conc C + Platform dwelling	2 piers	180
TTS Travel between Conc C - Conc D + Platform dwelling	1000 m	167
TTS Travel between Conc D - Conc E + Platform dwelling	1 piers	90
TTS Travel between Conc E - Conc F + Platform dwelling	650 m	119
TTS Travel Conc F - Conc H + Platform dwelling	2 piers	150
TTS Doors opening	5	0.1
Conc H TTS Platform to Conc H Security (escalator)	4 levels	200
Conc H TTS Platform to Conc H Security (walking)	200 m	3.3
Conc H Boarding Card Queue	60	1.0
Conc H Boarding Card Process	6	0.1
Conc H Security Screening queue	300	5.0
Conc H Security Screening process	120	2.0
Conc H Security to Conc H Departure Gate (escalator)	1 levels	50
Conc H Security to Conc H Departure Gate (walking)	250 m	4.2
<b>Buffer *</b>	300	5.0
<b>TOTAL</b>		<b>51.5</b>

\* Includes 5min buffer between pax reaching gate and checks off.

#### 3R NW BAGS

T2 - T5 (Concourse A - Concourse H via Concourse C)	Time (s)	Time (min)
Unloading	420	7.0
ULD to break-down area (t + d)	230 m	55
ULD break-down	720	12.0
Bag transfer from Conc A to Conc C (auto)	650 m	65
Bag transfer from Conc C to Conc H (auto)	2900 m	290
HBS and In-System Time	600	10.0
Loading	120	2.0
<b>Buffer *</b>	300	5.0
<b>TOTAL</b>		<b>42.8</b>

\* Includes 5min buffer between bags being loaded and checks off.

#### Assumptions - Bags

- Assume all transfer bags are short connects and arrive and depart on pier-served stands
- It is assumed that all core processors and satellites have adequate break-up, make-up and HBS facilities for short connecting bags
- Assumes all piers and processors have head of stand delivery facilities for short connect and late bags, except T4
- All inter-terminal bag transfers go via core processor to core processor
- All short-connect bags travel via automated systems, except around T4
- All short connect bags go through HBS at satellite of departure

Unloading	
Overall	7 min
Cargo Doors open	3 min
ULDs Off-Loaded	4 min
Break-Down	
Time taken to break-down ULD	12 min
In-Process	
HBS and In-System Time	600 secs
Delivery to Aircraft (tug and dolly)	4.2 m/s
Delivery to Aircraft (automation)	10 m/s
Make-Up	
Time taken to make-up ULD	30 secs
Loading	
Overall	7.0 min
ULDs loaded	4 min
Cargo Doors closed	3.0 min

2 mins per ULD. Assumes transfer bags contained in first ones off

Equates to 15kph

Website states 10 or 14m/s

2 mins per ULD. Assumes transfer bags contained in last ones on

T2 - T6 (Conc A - Conc K via Conc C, Conc H and Conc J)	Time (s)	Time (min)
Disembarking	360	6.0
Arrival Gate to Conc A TTS Platform (walking)	230 m	3.8
Arrival Gate to Conc A TTS Platform (escalator)	3 levels	2.5
TTS Wait	120	2.0
TTS Doors opening	5	0.1
TTS Platform dwell	30	0.5
TTS Travel Conc A - Conc C + Platform dwelling	2 piers	180
TTS Travel between Conc C - Conc D + Platform dwelling	1000 m	167
TTS Travel between Conc D - Conc E + Platform dwelling	1 piers	90
TTS Travel between Conc E - Conc F + Platform dwelling	650 m	119
TTS Travel Conc F - Conc H + Platform dwelling	2 piers	180
TTS Travel between Conc H - Conc J + Platform dwelling	700 m	126
TTS Travel between Conc J - Conc K	1700 m	194
TTS Doors opening	5	0.1
Conc K TTS Platform to Conc K Security (escalator)	2 levels	100
Conc K TTS Platform to Conc K Security (walking)	50 m	0.8
Conc K Boarding Card Queue	60	1.0
Conc K Boarding Card Process	6	0.1
Conc K Security Screening queue	300	5.0
Conc K Security Screening process	120	2.0
Conc K Security to Conc K Departure Gate (escalator)	1 levels	50
Conc K Security to Conc K Departure Gate (walking)	650 m	10.8
<b>Buffer *</b>	300	5.0
<b>TOTAL</b>		<b>59.9</b>

T5 - T6 (Conc F - Conc K via Conc H and Conc J)	Time (s)	Time (min)
Disembarking	360	6.0
Arrival Gate to Conc F TTS Platform (walking)	450 m	7.5
Arrival Gate to Conc F TTS Platform (escalator)	3 levels	2.5
TTS Wait	120	2.0
TTS Doors opening	5	0.1
TTS Platform dwell	30	0.5
TTS Travel between Conc F - Conc H + Platform dwelling	2 piers	180
TTS Travel between Conc H - Conc J + Platform dwelling	700 m	126
TTS Travel between Conc J - Conc K	1700 m	194
TTS Doors opening	5	0.1
Conc K TTS Platform to Conc K Security (escalator)	2 levels	100
Conc K TTS Platform to Conc K Security (walking)	50 m	0.8
Conc K Boarding Card Queue	60	1.0
Conc K Boarding Card Process	6	0.1
Conc K Security Screening queue	300	5.0
Conc K Security Screening process	120	2.0
Conc K Security to Departure Gate (escalator)	1 levels	50
Conc K Security to Departure Gate (walking)	650 m	10.8
<b>Buffer *</b>	300	5.0
<b>TOTAL</b>		<b>54.3</b>

T2 - T6 (Conc A - Conc K via Conc C, Conc H and Conc J)	Time (s)	Time (min)
Unloading	420	7.0
ULD to break-down area (t + d)	230 m	55
ULD break-down	720	12.0
Bag transfer from Conc A to Conc C (auto)	650 m	65
Bag transfer from Conc C to Conc H (auto)	2900 m	290
Bag transfer from Conc H to Conc J (auto)	650 m	65
Bag transfer from Conc J to Conc K (auto)	1600 m	160
HBS and In-System Time	600	10.0
Loading	120	2.0
<b>Buffer *</b>	300	5.0
<b>TOTAL</b>		<b>46.6</b>

T5 - T6 (Conc F - Conc K via Conc H and Conc J)	Time (s)	Time (min)
Unloading	420	7.0
ULD to break-down area (t + d)	450 m	107
ULD break-down	720	12.0
Bag transfer from Conc F to Conc H (auto)	750 m	75
Bag transfer from Conc H to Conc J (auto)	850 m	85
Bag transfer from Conc J to Conc K (auto)	1600 m	160
HBS and In-System Time	600	10.0
Loading	120	2.0
<b>Buffer *</b>	300	5.0
<b>TOTAL</b>		<b>49.1</b>

# 13 Refreshed north west masterplan: Terminal and apron sizing summary

## Refreshed north west masterplan terminal and apron sizing - 3R MAX Schedule

### Terminal size limits (pax)

	Peak below the minimum value
	Peak between minimum and maximum values
	Peak above maximum value

T4	Existing	
Total Size (No. of bays)	Min	Max*
Departures Hourly Capacity	1650	2350
Arrivals Hourly Capacity	1800	2500

\* Maximum limit is the upper referral value as in "ACL LHR Start of Season Report - Winter 2012"

T5	Existing	Expanded Terminal Building								Max Size	
		27		29		30		31		32	
Total Size (No. of bays)	21**	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max*
Departures Hourly Capacity	5700	6800	7800	7200	8300	7500	8600	7700	8900	8000	10100
Arrivals Hourly Capacity	4500	6000	9500	6500	11500	7000	12500	7000	13500	7500	14500

\* Maximum limit is +15% of minimum as it considers potential technology advancements (e.g. check-in, security, etc.)

\*\* A 10% discomfort factor is added to the maximum departures value as the departures peak exceeds capacity for less than 1h.

In case the peak exceeds capacity for more than 1 hour, the discomfort factor would be 5%.

T2	Existing	Expanded Terminal Building								Max Size	
		35		45		55		60 (O1)*		67 (O2)*	
Total Size (No. of bays)	21	Min	Max	Min	Max	Min	Max	Min	Max**	Min	Max**
Departures Hourly Capacity	3350	5300	6100	7100	7200	8700	8900	10200	11700	10800	12400
Arrivals Hourly Capacity	3400	4900		7300	9700	9700	14600		10700		12600

\* OPTION 1 - Maximum T2 expansion is 60 bays; OPTION 2 - Maximum T2 expansion is 67 bays

\*\* Maximum limit is +15% of minimum as it considers potential technology advancements (e.g. check-in, security, etc.)

For arrivals the minimum capacity is assumed as the only reference value

T6	Existing	
Total Size (No. of bays)	35	
Departures Hourly Capacity	5300	6100
Arrivals Hourly Capacity	4900	

Model Output	
(current run)	
Max Departures Hourly Peak	1,855
Max Arrivals Hourly Peak	2,155

Model Output	
(current run)	
Max Departures Hourly Peak	5,603
Max Arrivals Hourly Peak	3,860

Model Output		
(current run)		
O1	Max Departures Hourly Peak	9,816
O2	Max Departures Hourly Peak	
O1	Max Arrivals Hourly Peak	9,153
O2	Max Arrivals Hourly Peak	

Model Output	
(current run)	
Max Departures Hourly Peak	5,633
Max Arrivals Hourly Peak	5,851

Model Output	
(current run)	
A4 - Stand Frontage Demand	1,286
A5 - Stand Frontage Demand	4,630
A2 - Stand Frontage Demand	9,084
A6 - Stand Frontage Demand	4,425

\* Stand demand frontage includes +10% added to the baseline (lubrication) and +5% (equipment)

### Apron size limits

Stand frontage measurements from available CAD drawings

3R NW v3	Measured stand frontage	
A4	1768	
A5	5149	4630
A2	8517	9036
A6	5220	

\* T2 and T5 are assumed to share the bank of remote stands

### MPPA per terminal

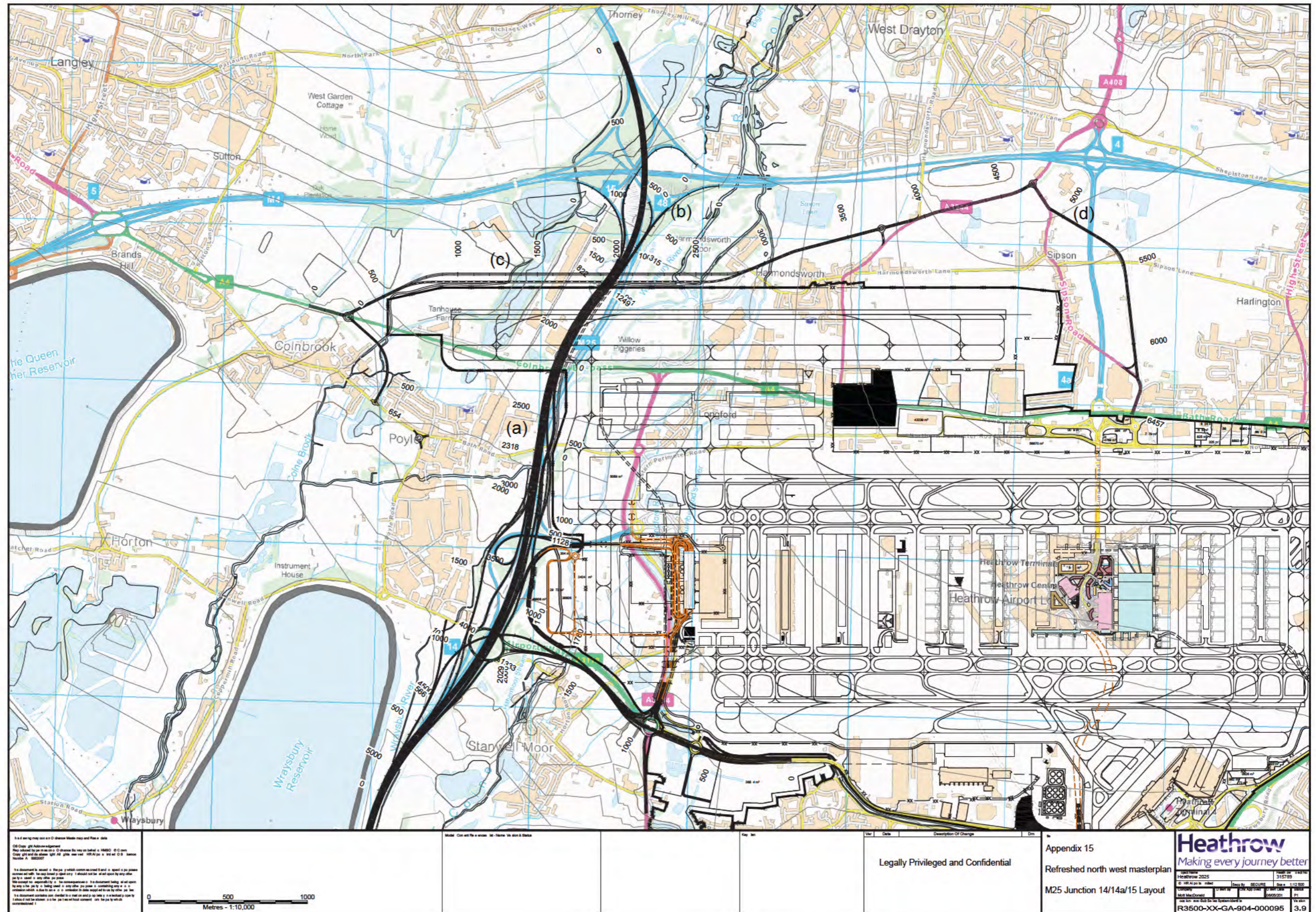
3R NW v3	MPPA Model Output*	MPPA Expected
T2	59.90	55
T4	8.90	10
T5	27.12	30
T6	34.28	35

\* For each terminal, daily passenger volumes are multiplied by a ratio of 345 to obtain the annual throughput then reduced by 9.1% to relate it to a baseline scenario (130 MPPA)

# 14 Cost Plan Summary

Description	Total £
<b>Environmental</b>	<b>679,000,000</b>
Ecology	13,700,000
<b>Landscape</b>	<b>154,800,000</b>
Habitat Reprovision	29,700,000
Landscape	125,100,000
<b>Surface Water Flood Mitigation (Includes Previous Ponds)</b>	<b>305,100,000</b>
Surface Water Flood Mitigation (Includes Previous Ponds)	134,700,000
Culverts	31,900,000
Waterways	85,800,000
De Icing Pads	32,900,000
Sundries	19,800,000
<b>Listed Building Decants / Relocations</b>	<b>51,000,000</b>
Listed Building Decants / Relocations	24,000,000
Archaeology	27,000,000
<b>Energy / Water / Waste (Sustainability)</b>	<b>43,900,000</b>
<b>Noise Mitigation</b>	<b>110,500,000</b>
Noise Bunds	86,600,000
Local Road Resurfacing	16,200,000
Acoustic fence	7,700,000
<b>Community</b>	<b>2,883,700,000</b>
<b>Residential Property Compulsory Purchase</b>	<b>300,000,000</b>
Commercial Property Compulsory Purchase	1,740,000,000
Noise insulation provisions	250,000,000
Noise compensation provisions	Incl above
CIL	59,700,000
<b>Land Purchase</b>	<b>455,000,000</b>
<b>Other Community</b>	<b>79,000,000</b>
<b>Surface Access</b>	<b>891,550,000</b>
<b>Roads / Highways</b>	<b>350,800,000</b>
Roads / Highways / Collector & Distributor roads	216,400,000
Western airport access road tunnels	134,400,000
<b>Motorways</b>	<b>480,000,000</b>
Motorways	283,000,000
Tunnels	194,000,000
Sundries	3,000,000
<b>Rail Scheme Contributions</b>	<b>60,750,000</b>
West Station Fit Out	60,750,000
Southern Rail Connection	-
<b>Airport Infrastructure</b>	<b>11,138,000,000</b>
<b>Decants / Demolitions</b>	<b>341,000,000</b>
Site Clearance	121,000,000
Decants / Demolitions	220,000,000
<b>Enabling Works</b>	<b>221,000,000</b>
Earthworks	46,000,000
Site Levelling and Soil Remediation / Stabilisation	175,000,000
<b>Terminals and Satellites</b>	<b>4,663,000,000</b>
Terminal Basement	320,000,000
Terminal Superstructure	603,000,000
Terminal Fit Out	1,143,000,000
Satellite Basement	176,000,000
Satellite Superstructure	533,000,000
Satellite Fit Out	368,000,000
VCC, Airbridge, PCA, nodes and fixed links to new stands	294,000,000
Western Campus; TTS Stations TSA, B & C	287,000,000
TZE Satellite	939,000,000
<b>Baggage and TTS</b>	<b>2,617,000,000</b>
Baggage Tunnels Civils	158,000,000
Baggage Equipment Terminal	386,000,000
Baggage Equipment Satellite	555,000,000
Baggage Tunnels Fit Out	377,000,000
TTS Tunnels Civils	470,000,000
TTS Station Fit Out	139,000,000
TTS Tunnels Fit Out & Rolling Stock	180,000,000
TTS Maintenance Base Substructure	133,000,000
TTS Maintenance Base Fit Out	42,000,000
TZE baggage	177,000,000
<b>Airfield</b>	<b>1,979,000,000</b>
Runways and Taxiways	591,000,000
Stands and Aprons	17,000,000
Contact Stands to satellites	127,000,000
Remote Stands	102,000,000
Airside Roads & Tunnels	429,000,000
Balancing Ponds	168,000,000
Land Use Plan	125,000,000
Fuel Farms	136,000,000
Control Tower	102,000,000
Navigational Equipment / Lighting	64,000,000
Airfield Noise Mitigation	93,000,000
Site Security Fence	7,000,000
Control Posts	18,000,000
<b>Landside Infrastructure</b>	<b>1,112,000,000</b>
Car Parking	645,000,000
Energy and Infrastructure	120,000,000
Utilities	222,000,000
Landside connectivity systems	125,000,000
<b>Development Process Costs</b>	<b>205,000,000</b>
Consents	175,000,000
Operational Readiness	25,000,000
Aerodrome Manual	5,000,000
<b>Grand Total</b>	<b>£15,592,000,000</b>

# 15 Refreshed north west masterplan: M25 Junction 14/14a/15 Layout



It is not being intended to construct the proposed layout in its entirety. It is intended to provide a framework for the future development of the site. The layout is subject to the requirements of the relevant planning authorities. The layout is subject to the requirements of the relevant planning authorities. The layout is subject to the requirements of the relevant planning authorities.

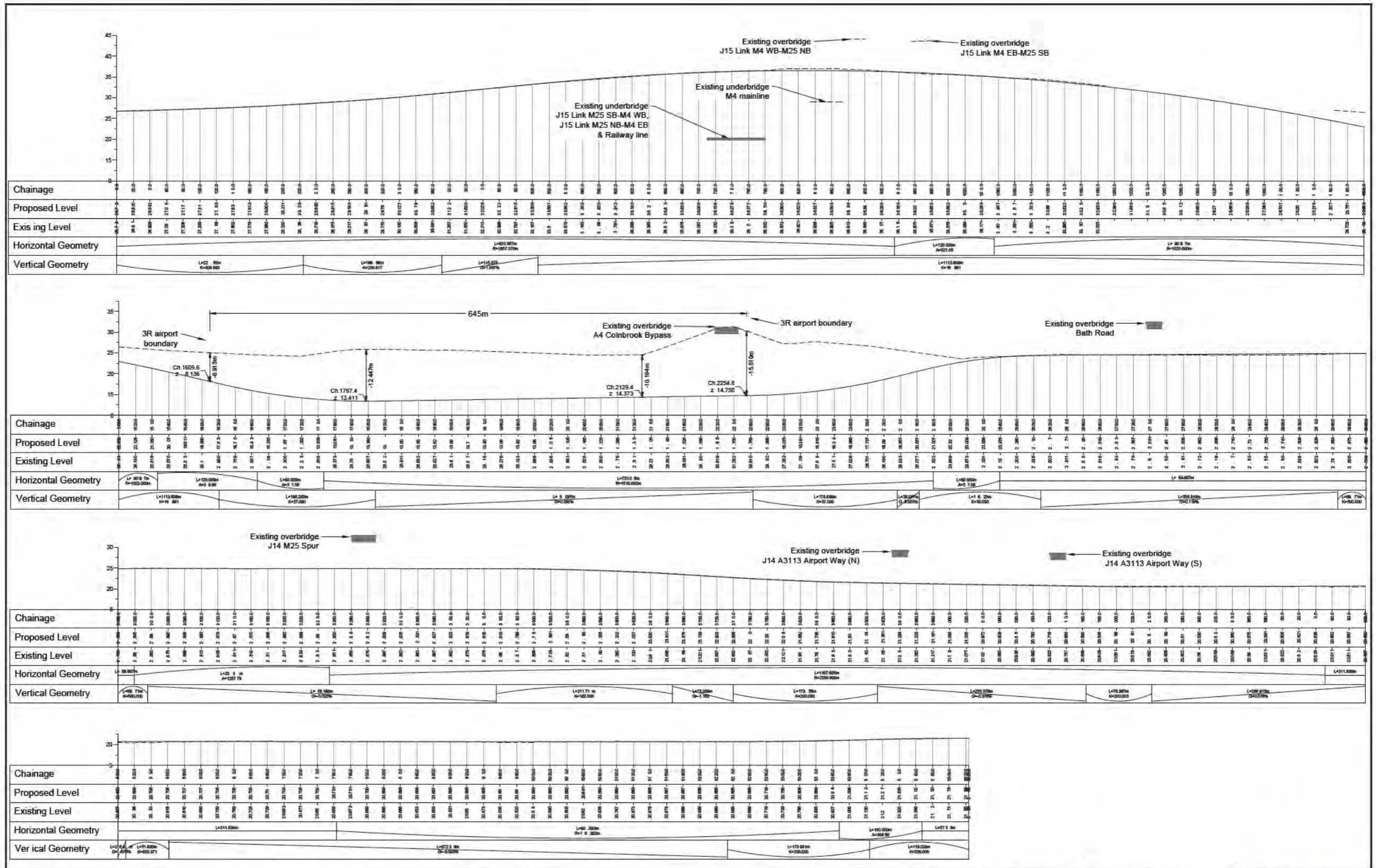
Var	Date	Description Of Change	Dr

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Appendix 15  
Refreshed north west masterplan  
M25 Junction 14/14a/15 Layout

<b>Heathrow</b> Making every journey better	
Heathrow 2025	315785
315785	315785
315785	315785
315785	315785
R3600-XX-GA-904-000095	3.9
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# 15a Refreshed north west masterplan: M25 profile



15a Refreshed north west masterplan: M25 profile

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Model	Created	By	Checked	Date	Description of Change	Drawn

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Appendix 15a  
Refreshed north west masterplan  
M25 Profile

**Heathrow**  
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Heathrow 2025

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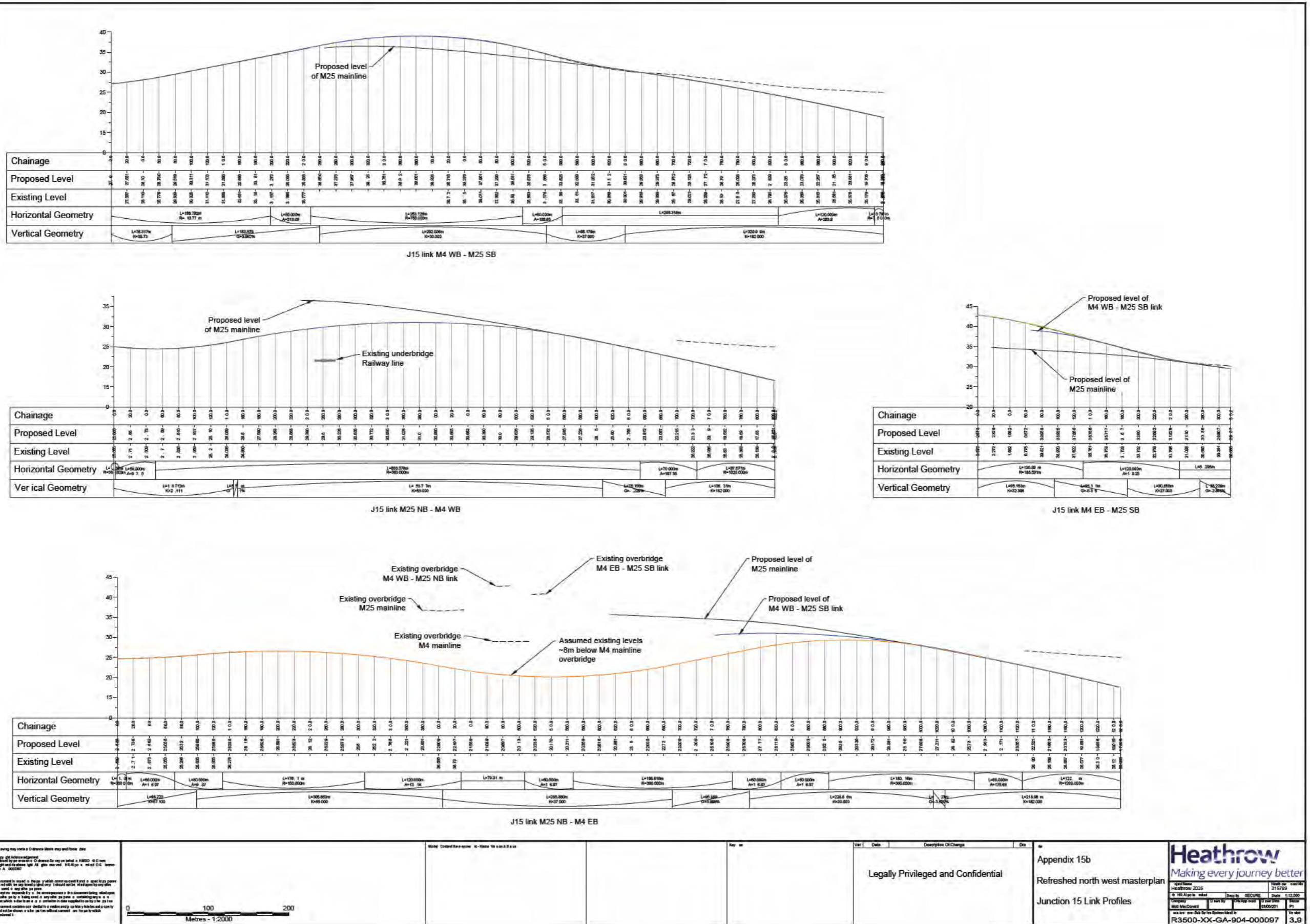
Project: R3500-XX-GA-904-000096

Version: 3.9

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# 15b Refreshed north west masterplan: Junction 15 link profiles



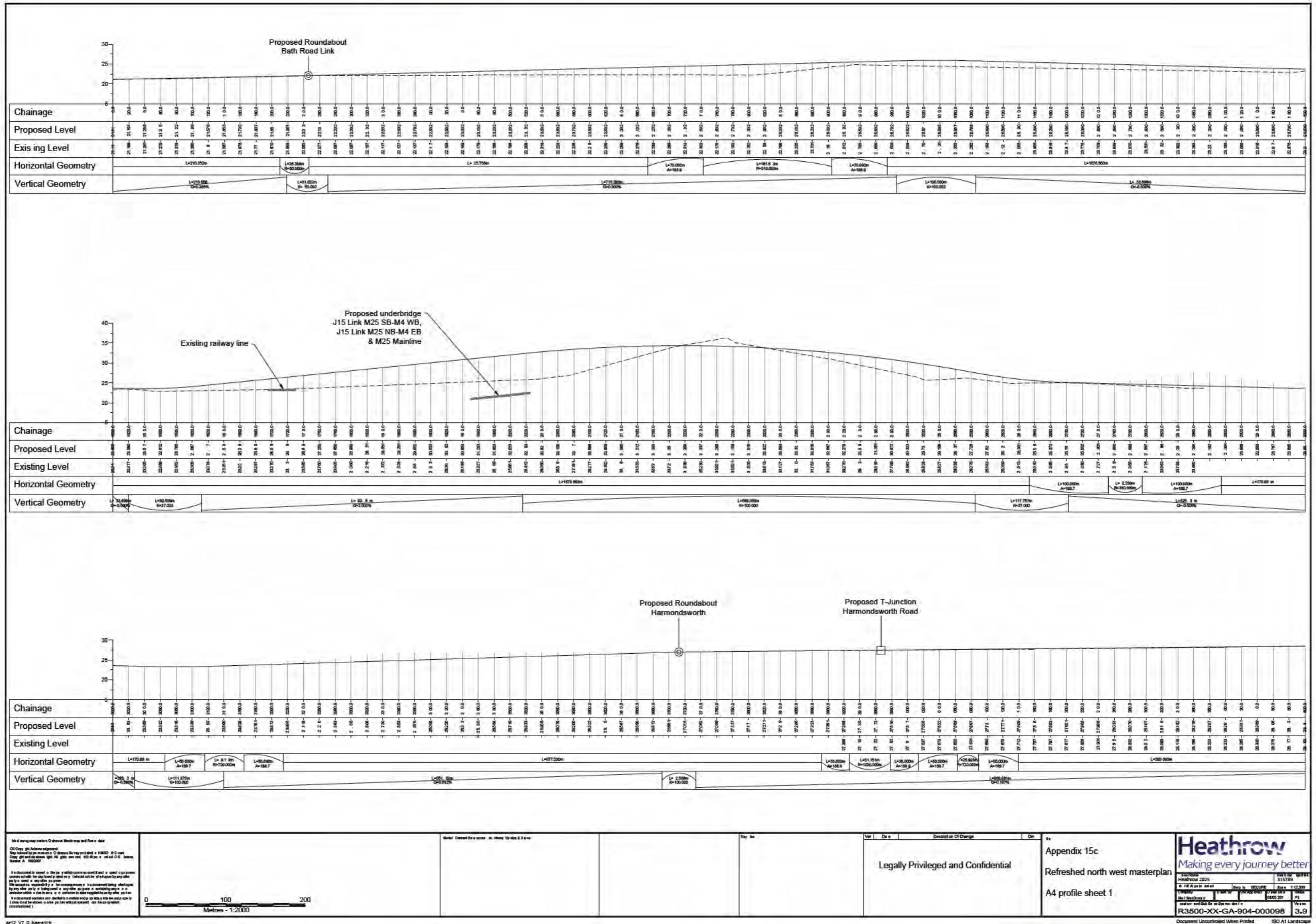
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Appendix 15b  
Refreshed north west masterplan  
Junction 15 Link Profiles

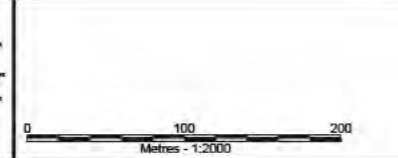
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3.9

# 15c Refreshed north west masterplan: A4 profile sheet 1



Heathrow Airport Limited  
 Heathrow Airport  
 Uxbridge, Middlesex, UK  
 Heathrow Airport Limited  
 Uxbridge, Middlesex, UK  
 Heathrow Airport Limited  
 Uxbridge, Middlesex, UK



Model: Concept for a new...  
 Date: 15/03/2014  
 Author: [Name]  
 Checked: [Name]

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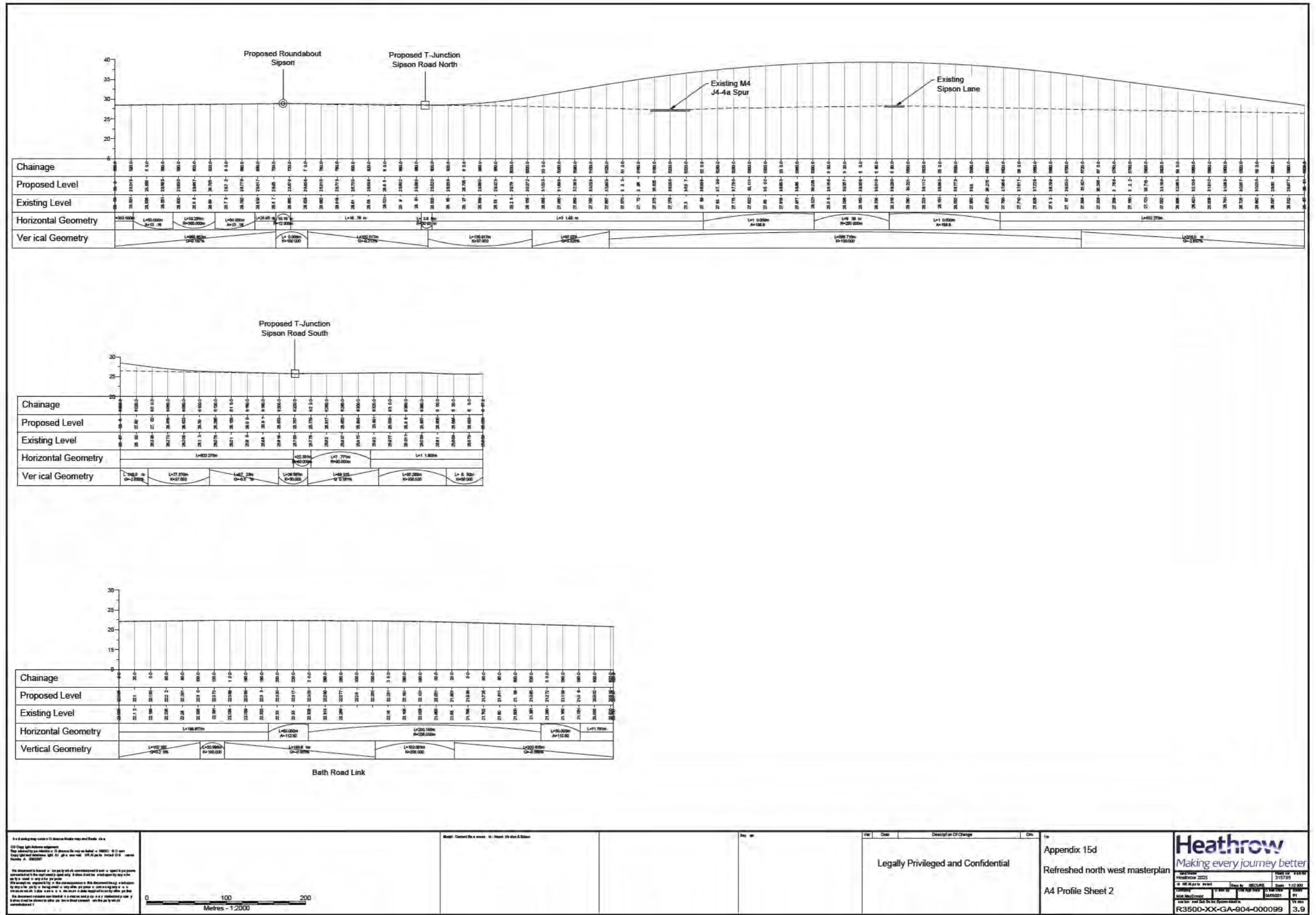
Appendix 15c  
 Refreshed north west masterplan  
 A4 profile sheet 1

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# 15d Refreshed north west masterplan: A4 profile sheet 2



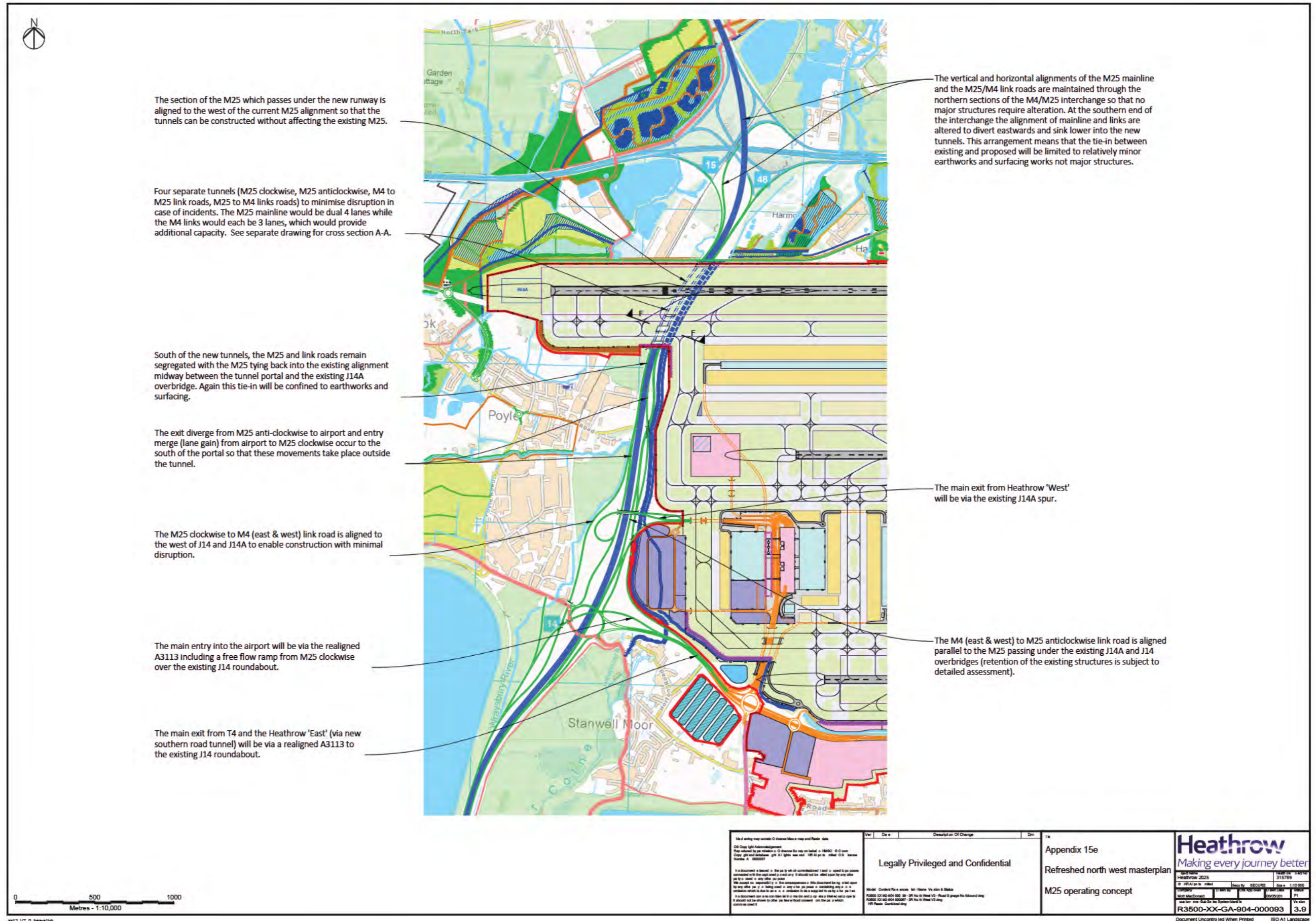
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Appendix 15d  
Refreshed north west masterplan  
A4 Profile Sheet 2

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3.9

# 15e Refreshed north west masterplan: M25 operating concept



The section of the M25 which passes under the new runway is aligned to the west of the current M25 alignment so that the tunnels can be constructed without affecting the existing M25.

Four separate tunnels (M25 clockwise, M25 anticlockwise, M4 to M25 link roads, M25 to M4 link roads) to minimise disruption in case of incidents. The M25 mainline would be dual 4 lanes while the M4 links would each be 3 lanes, which would provide additional capacity. See separate drawing for cross section A-A.

South of the new tunnels, the M25 and link roads remain segregated with the M25 tying back into the existing alignment midway between the tunnel portal and the existing J14A overbridge. Again this tie-in will be confined to earthworks and surfacing.

The exit diverge from M25 anti-clockwise to airport and entry merge (lane gain) from airport to M25 clockwise occur to the south of the portal so that these movements take place outside the tunnel.

The M25 clockwise to M4 (east & west) link road is aligned to the west of J14 and J14A to enable construction with minimal disruption.

The main entry into the airport will be via the realigned A3113 including a free flow ramp from M25 clockwise over the existing J14 roundabout.

The main exit from T4 and the Heathrow 'East' (via new southern road tunnel) will be via a realigned A3113 to the existing J14 roundabout.

The vertical and horizontal alignments of the M25 mainline and the M25/M4 link roads are maintained through the northern sections of the M4/M25 interchange so that no major structures require alteration. At the southern end of the interchange the alignment of mainline and links are altered to divert eastwards and sink lower into the new tunnels. This arrangement means that the tie-in between existing and proposed will be limited to relatively minor earthworks and surfacing works not major structures.

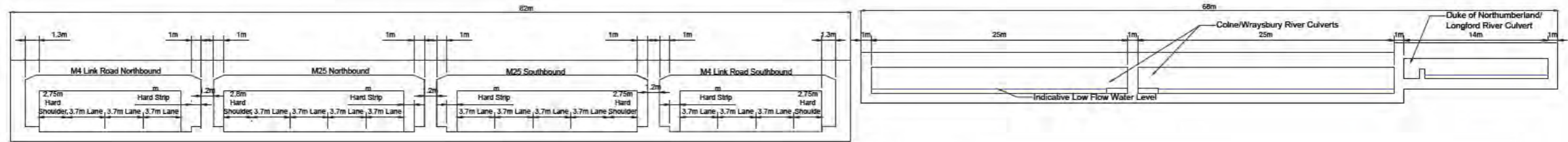
The main exit from Heathrow 'West' will be via the existing J14A spur.

The M4 (east & west) to M25 anticlockwise link road is aligned parallel to the M25 passing under the existing J14A and J14 overbridges (retention of the existing structures is subject to detailed assessment).

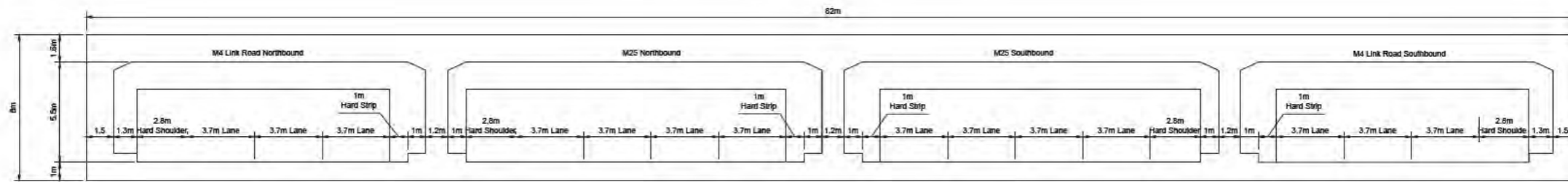
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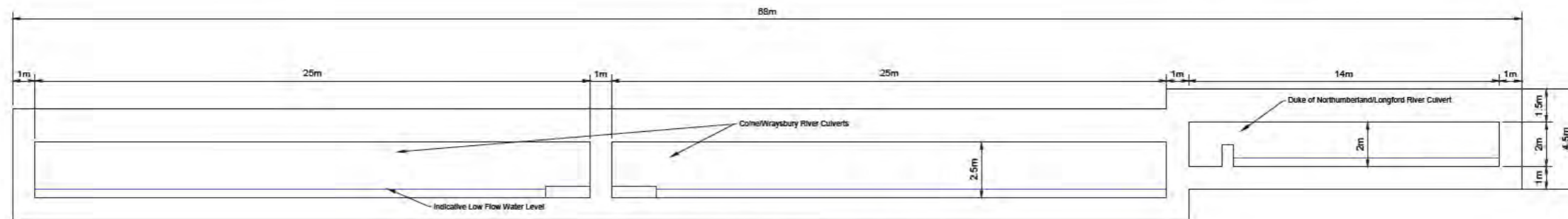
# 15f Refreshed north west masterplan: M25 and rivers cross sections



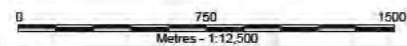
Cross Section Through M25 Corridor and River Diversion Culverts  
Scale 1:200



Cross Section Through M25 Corridor  
Scale 1:125

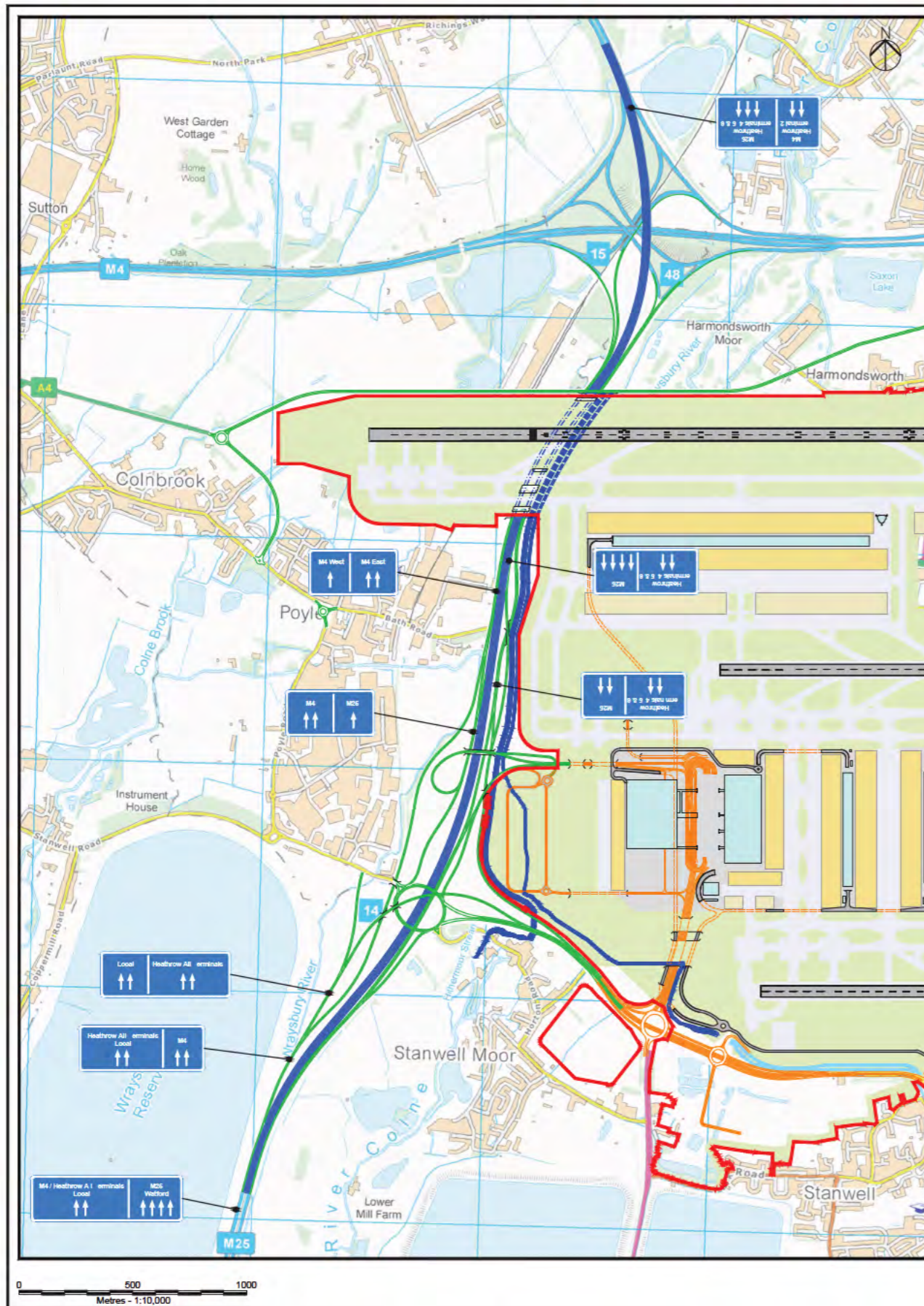


Cross Section Through River Diversion Culverts  
Scale 1:125



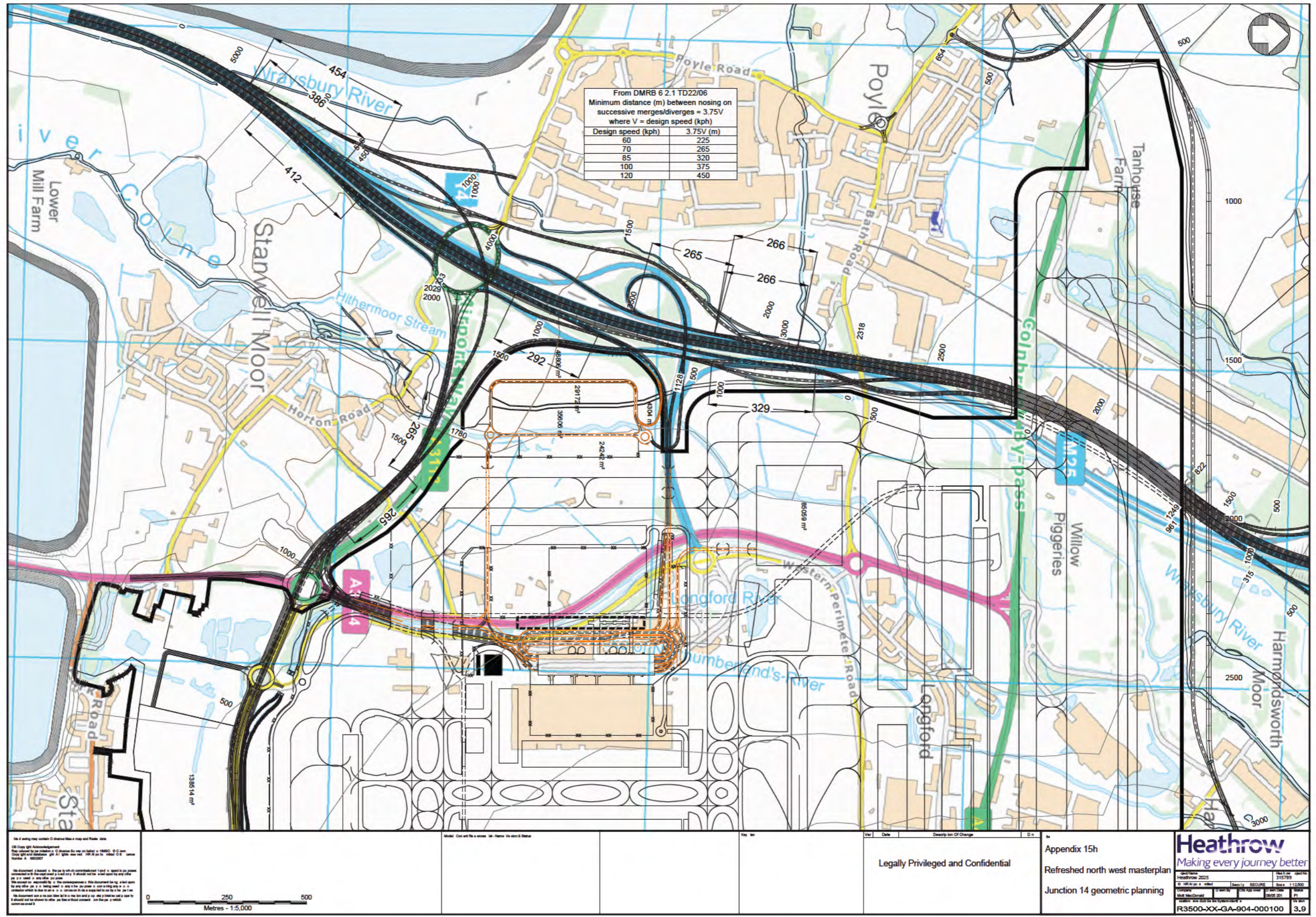
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# 15g Refreshed north west masterplan: M25 signage proposals

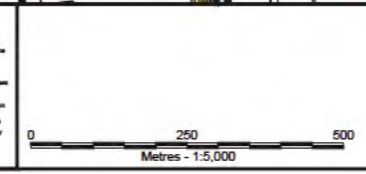


<p>1:10,000 scale map only for use in conjunction with the Heathrow 2025 Masterplan. This document is subject to the usual conditions of use. It is not to be used for any other purpose without the written consent of Heathrow Airport Limited. © Heathrow Airport Limited 2014. All rights reserved.</p>	<p>Legally Privileged and Confidential</p>	<p>Appendix 15g Refreshed north west masterplan M25 signage proposals</p>	<p><b>Heathrow</b> Making every journey better</p> <p>Heathrow 2025 315789</p> <p>Model: Content File a name: 41-Name: V0 2014 01 01 R3500-XX-GA-904-000092 R3500-XX-GA-904-000092-18 No. 18 West V3 - Road 2 page No 18 road map 18 No. 18 West V3 map 18 No. 18 West V3 map</p>
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# 15h Refreshed north west masterplan: Junction 14 geometric planning



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Var	Date	Description of Change	Dr	By

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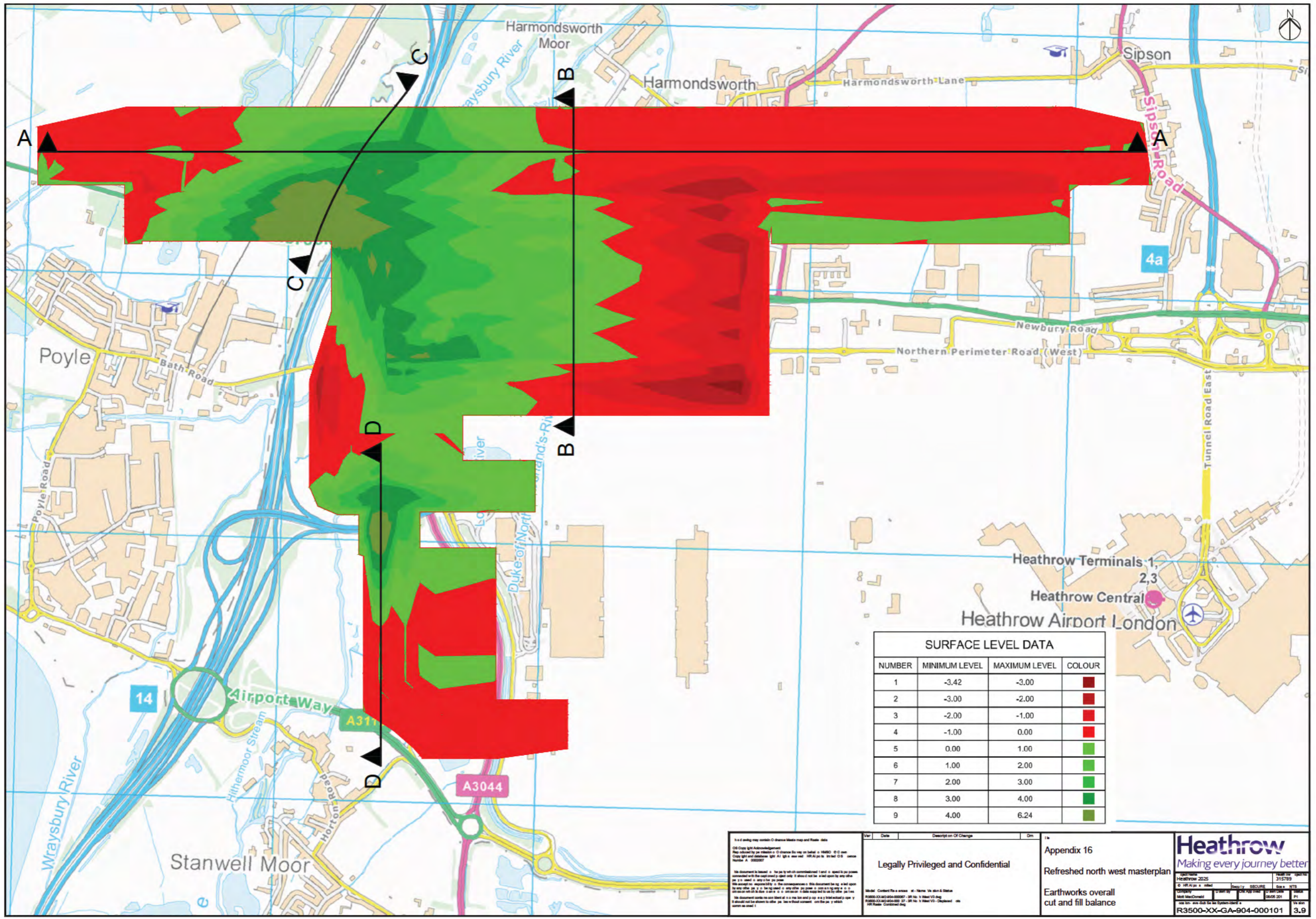
Appendix 15h  
 Refreshed north west masterplan  
 Junction 14 geometric planning

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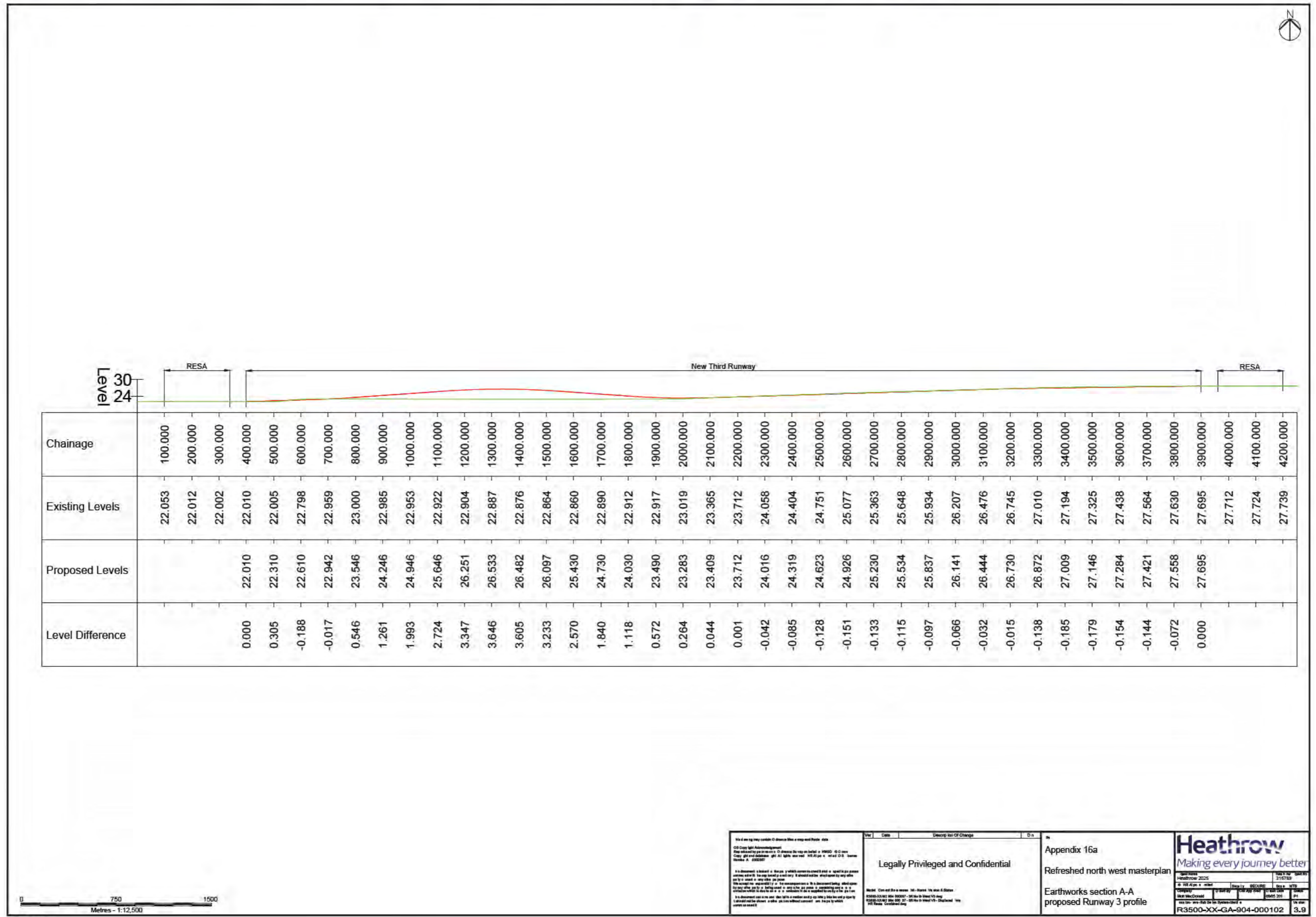
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Client	Heathrow Airport Limited	Date	11/2014
Contract	R3500-XX-GA-904-000100	Scale	As Shown
Drawn		Checked	

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# 16 Refreshed north west masterplan: Earthworks overall cut and fill balance



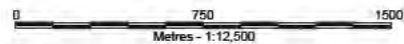
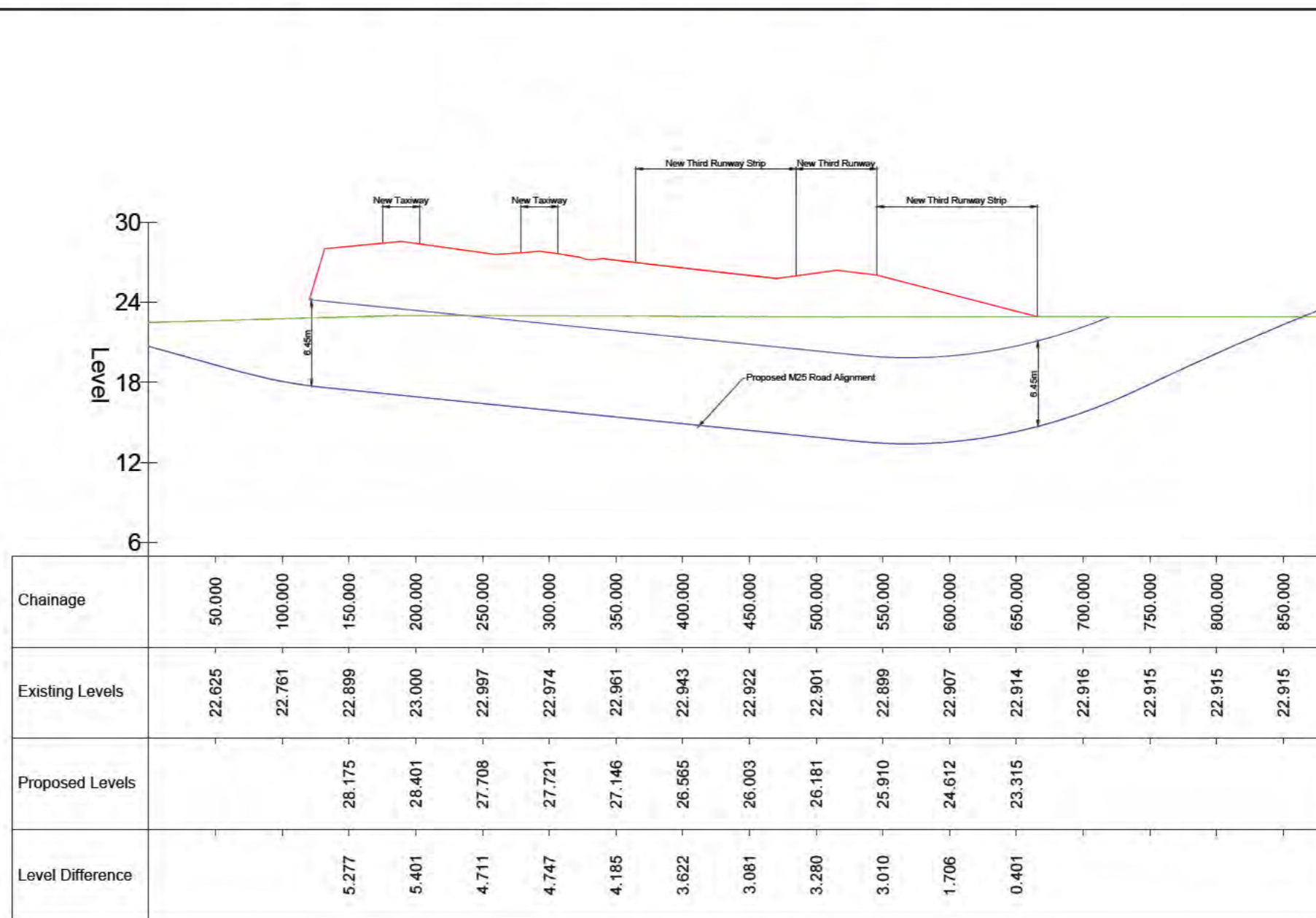
# 16a Refreshed north west masterplan: Earthworks section A-A proposed Runway 3 profile



2212\_V7\_0\_base.rvt

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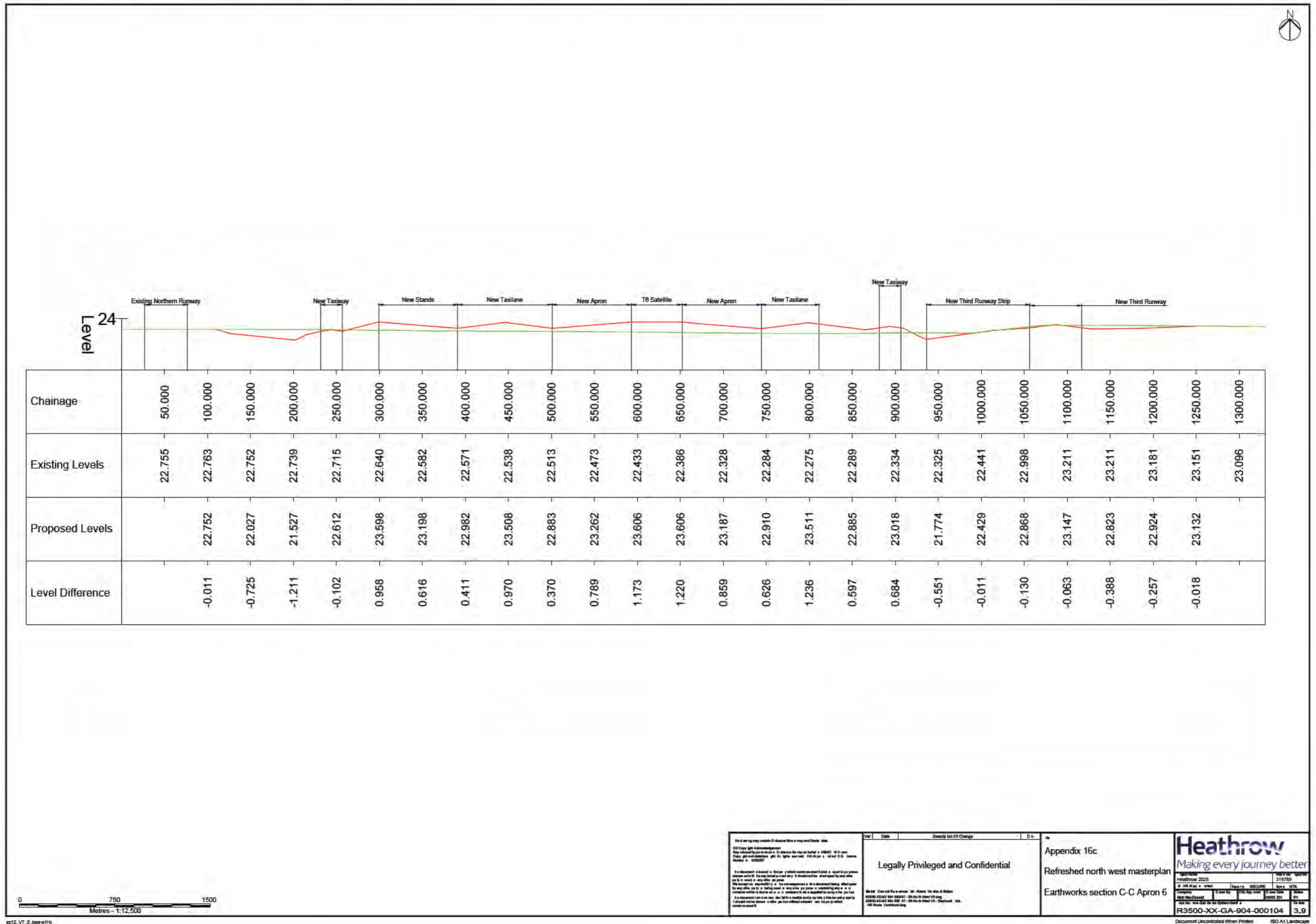
# 16b Refreshed north west masterplan: Earthworks section B-B M25 alignment



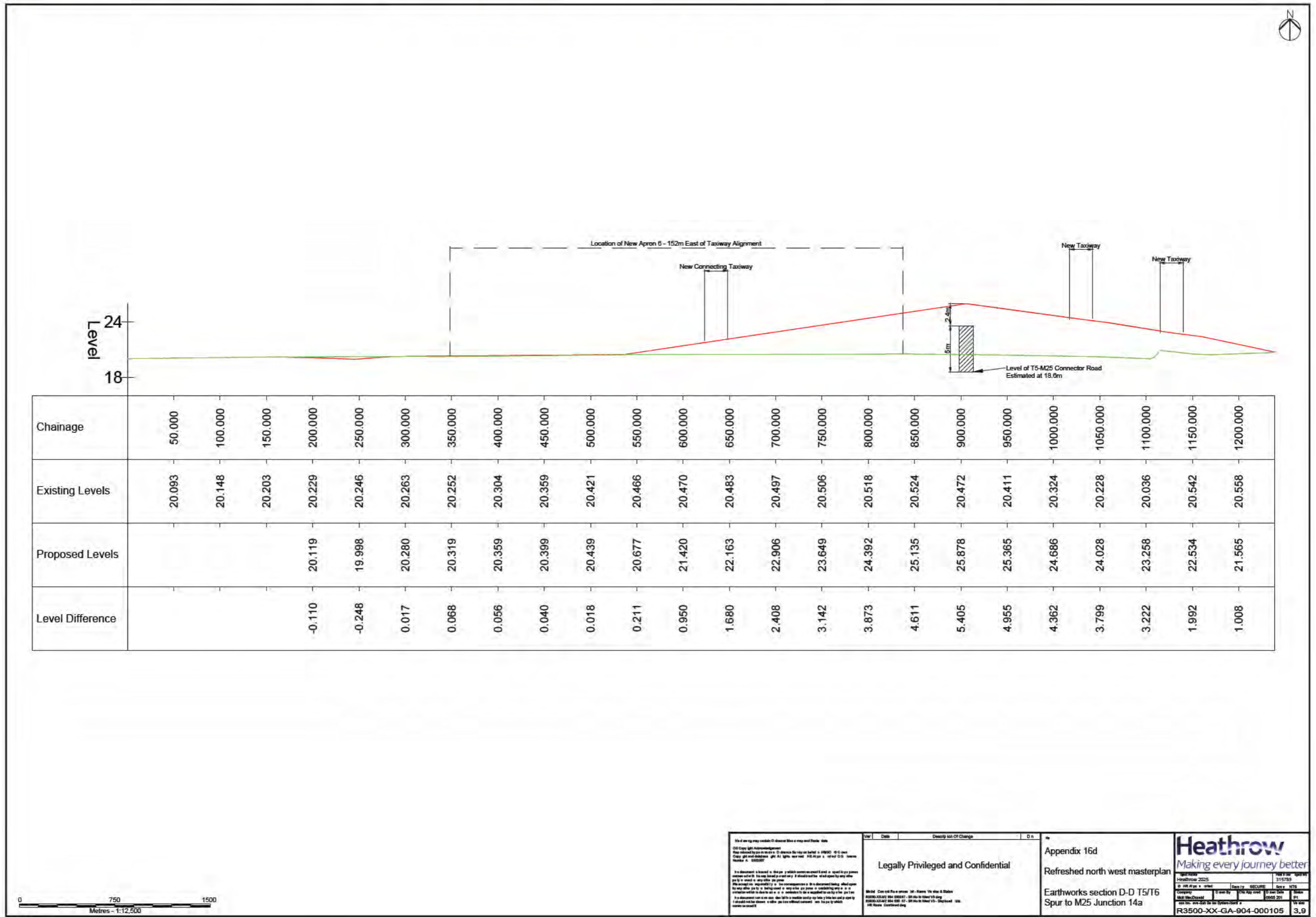
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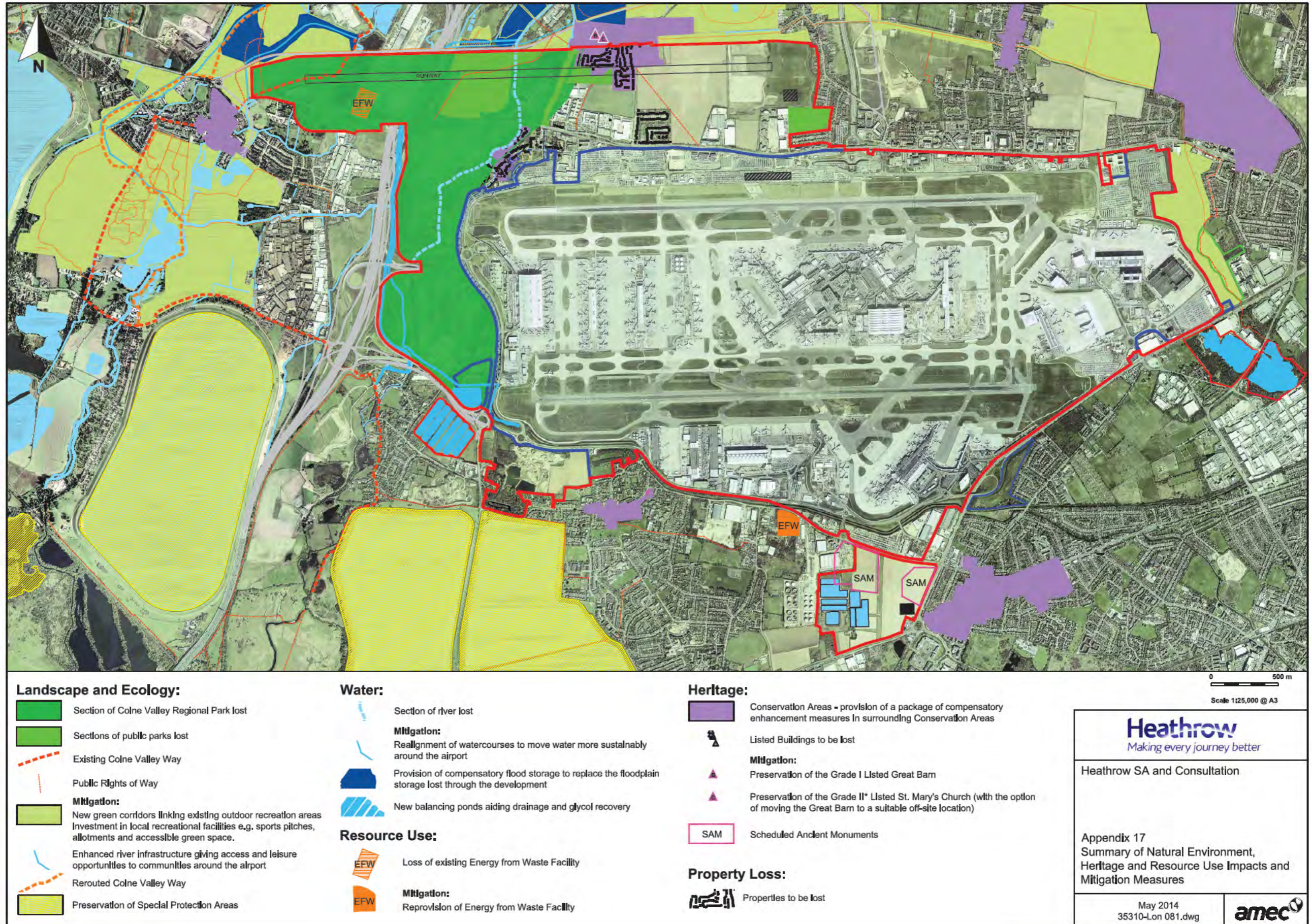
# 16c Refreshed north west masterplan: Earthworks section C-C Apron 6



# 16d Refreshed north west masterplan: Earthworks section D-D T5/T6 Spur to M25 Junction 14a



# 17 Summary of key mitigation measures



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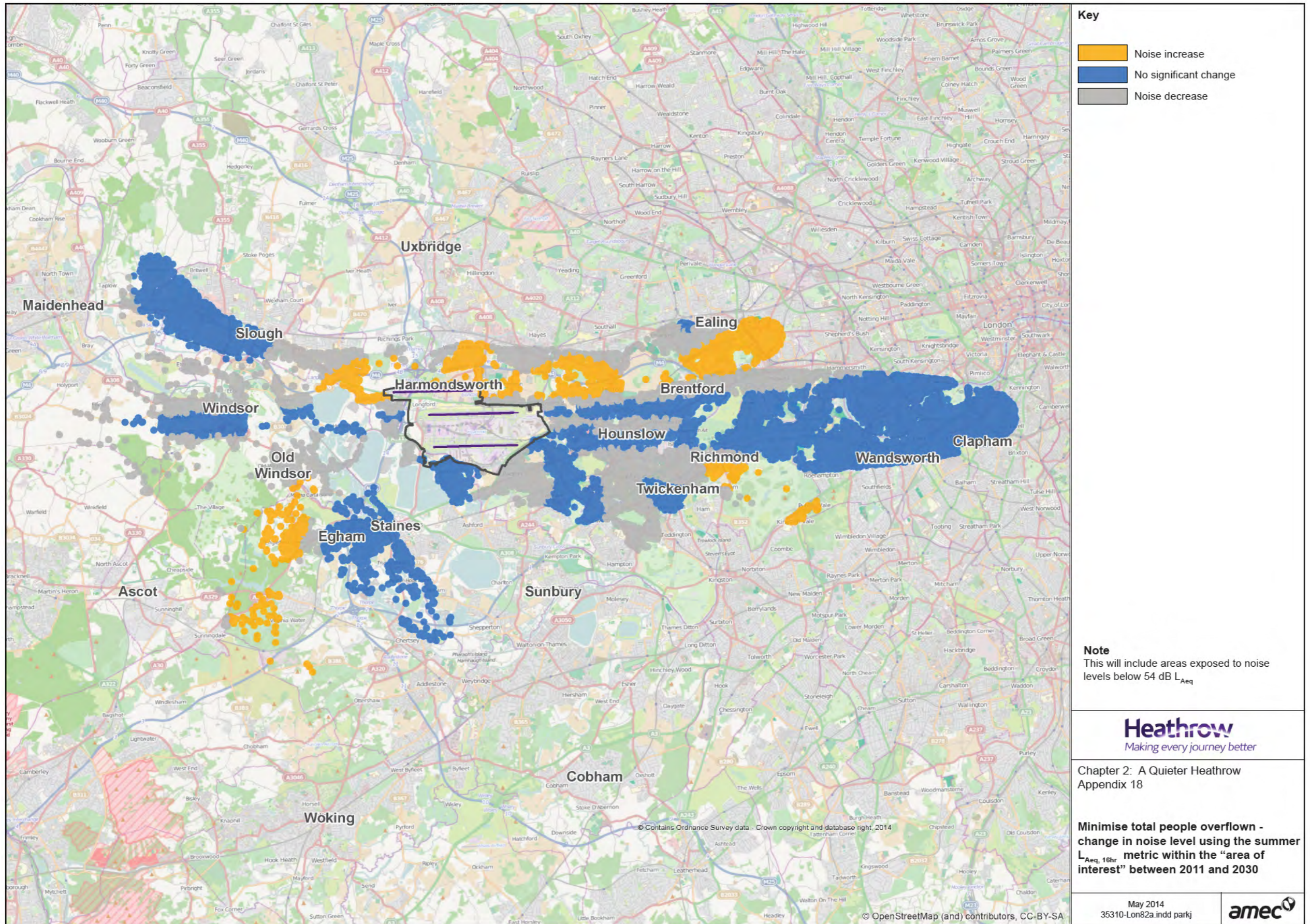
Heathrow SA and Consultation

Appendix 17  
Summary of Natural Environment,  
Heritage and Resource Use Impacts and  
Mitigation Measures

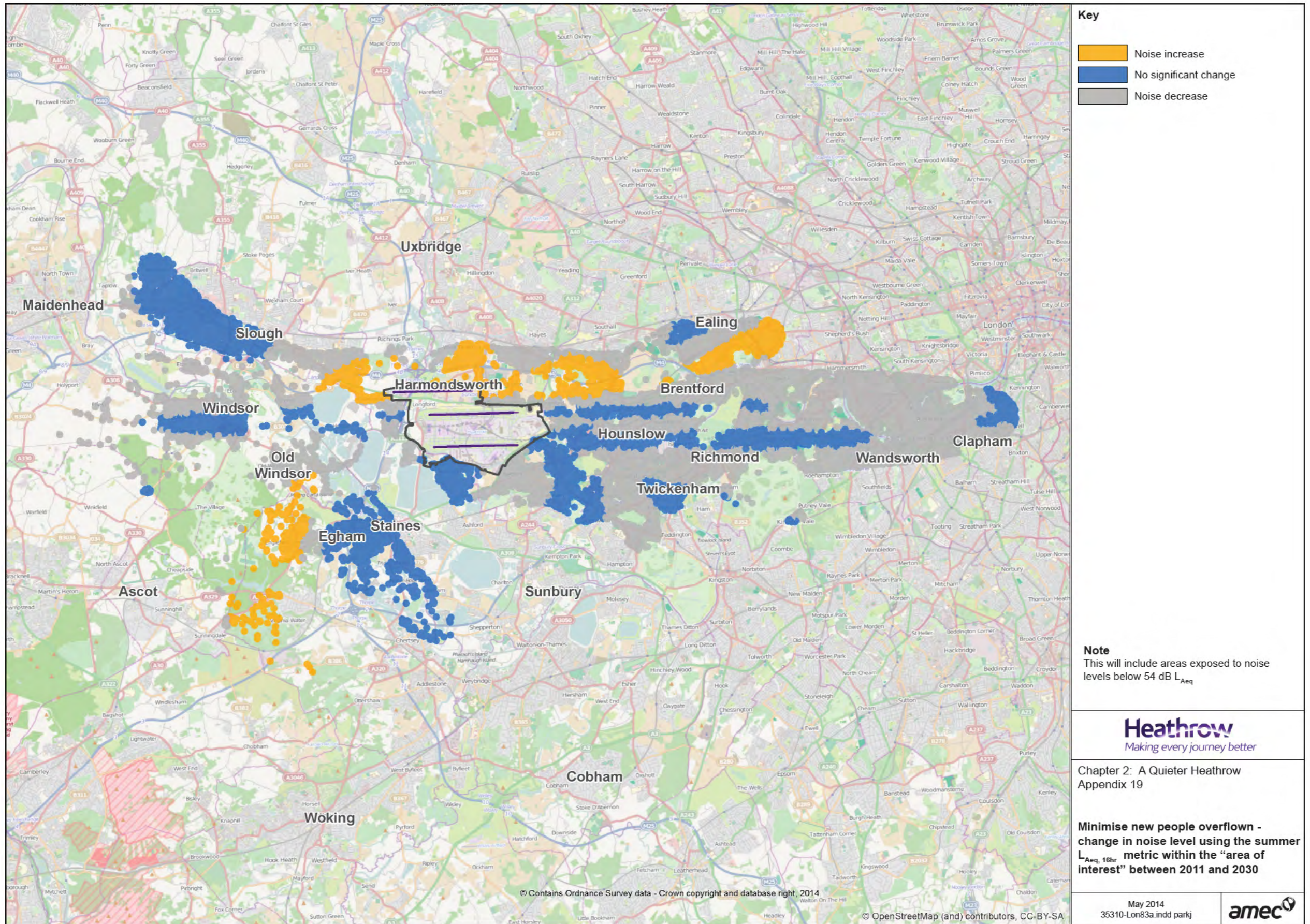
May 2014  
35310-Lon 081.dwg



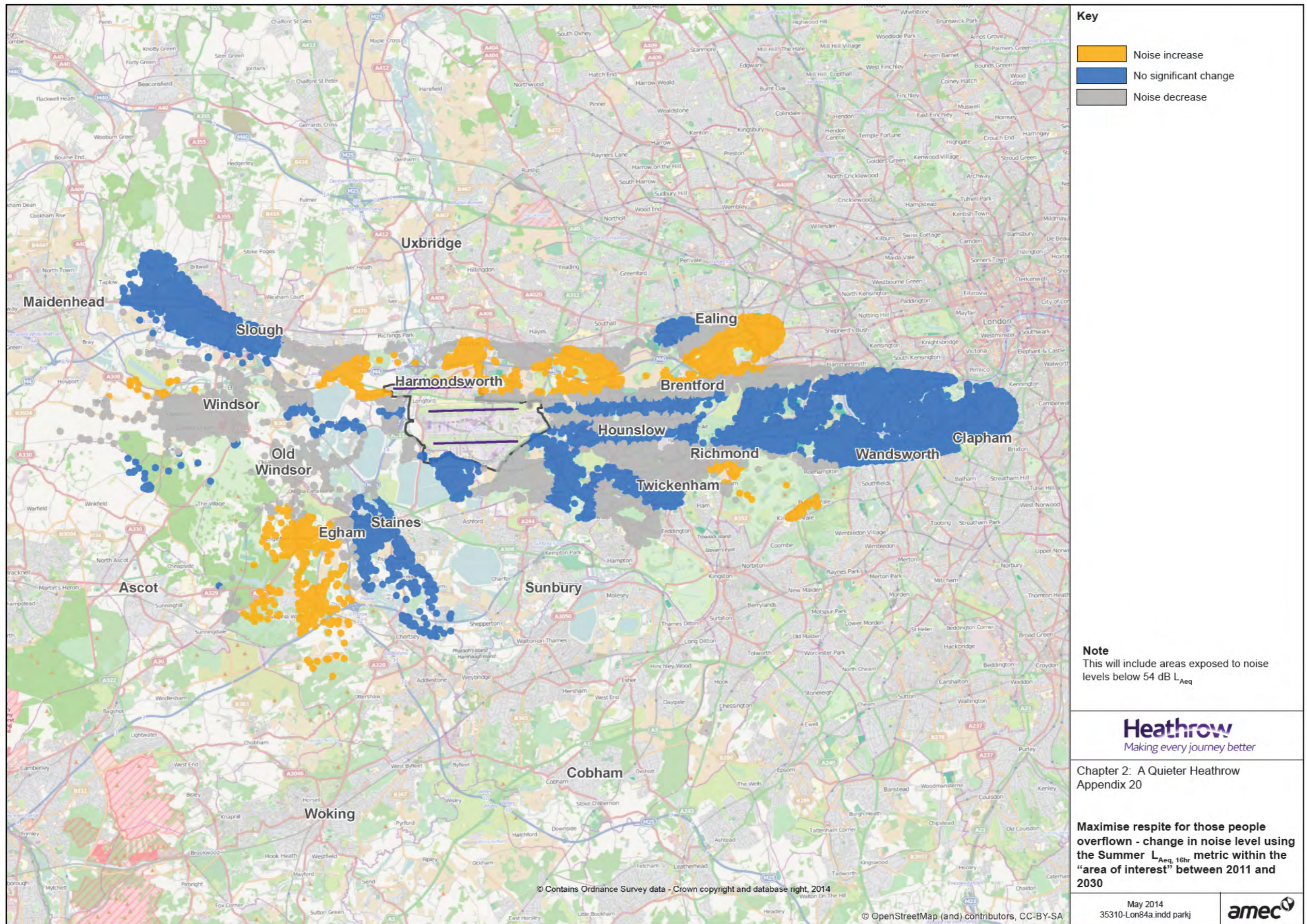
# 18 Minimise total people overflown - change in noise level using the summer LAeq, 16hr metric within the "area of interest" between 2011 and 2030



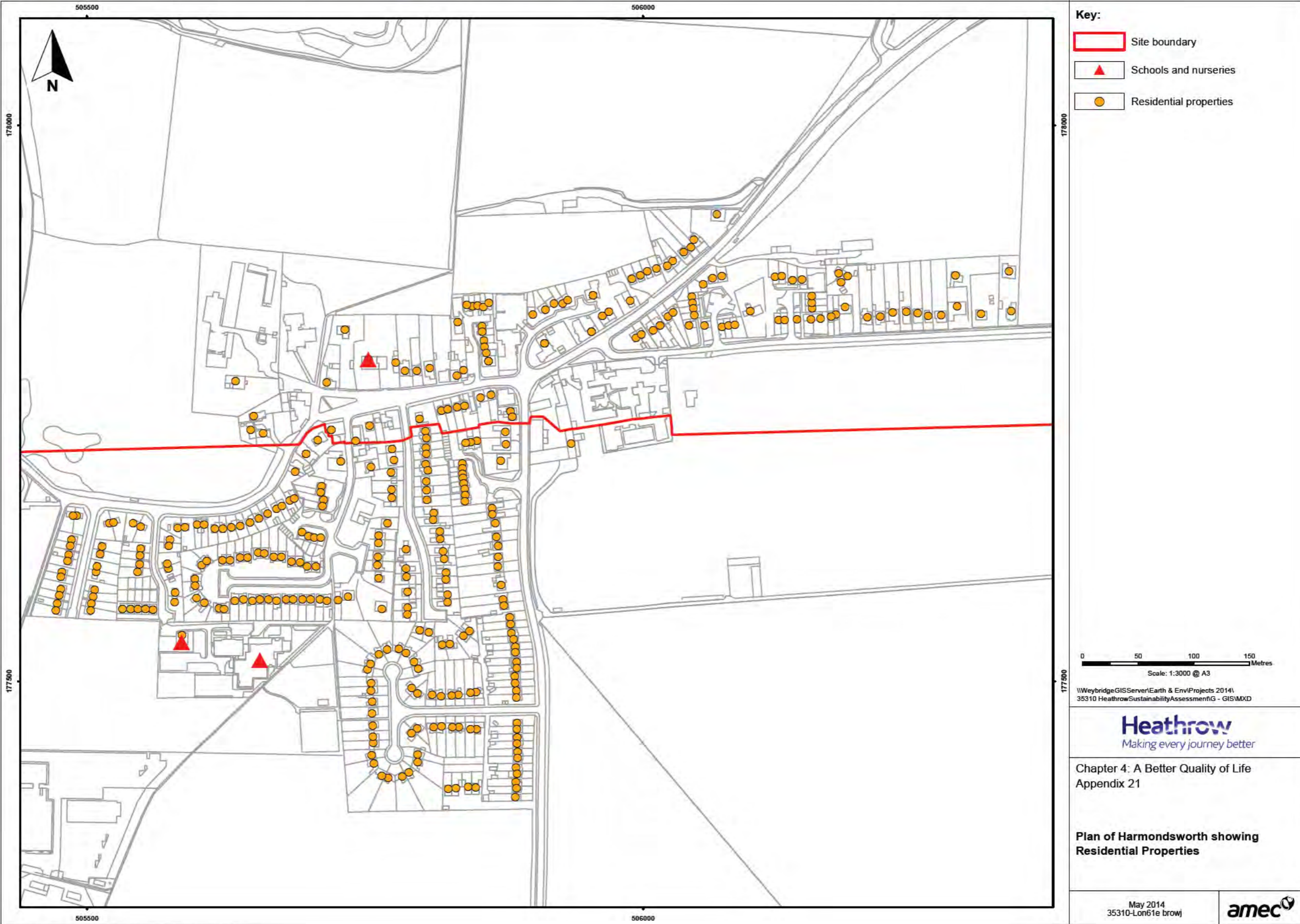
# 19 Minimise new people overflown - change in noise level using the summer LAeq, 16hr metric within the "area of interest" between 2011 and 2030



## 20 Maximise respite for those people overflowed - change in noise level using the Summer LAeq, 16hr metric within the "area of interest" between 2011 and 2030

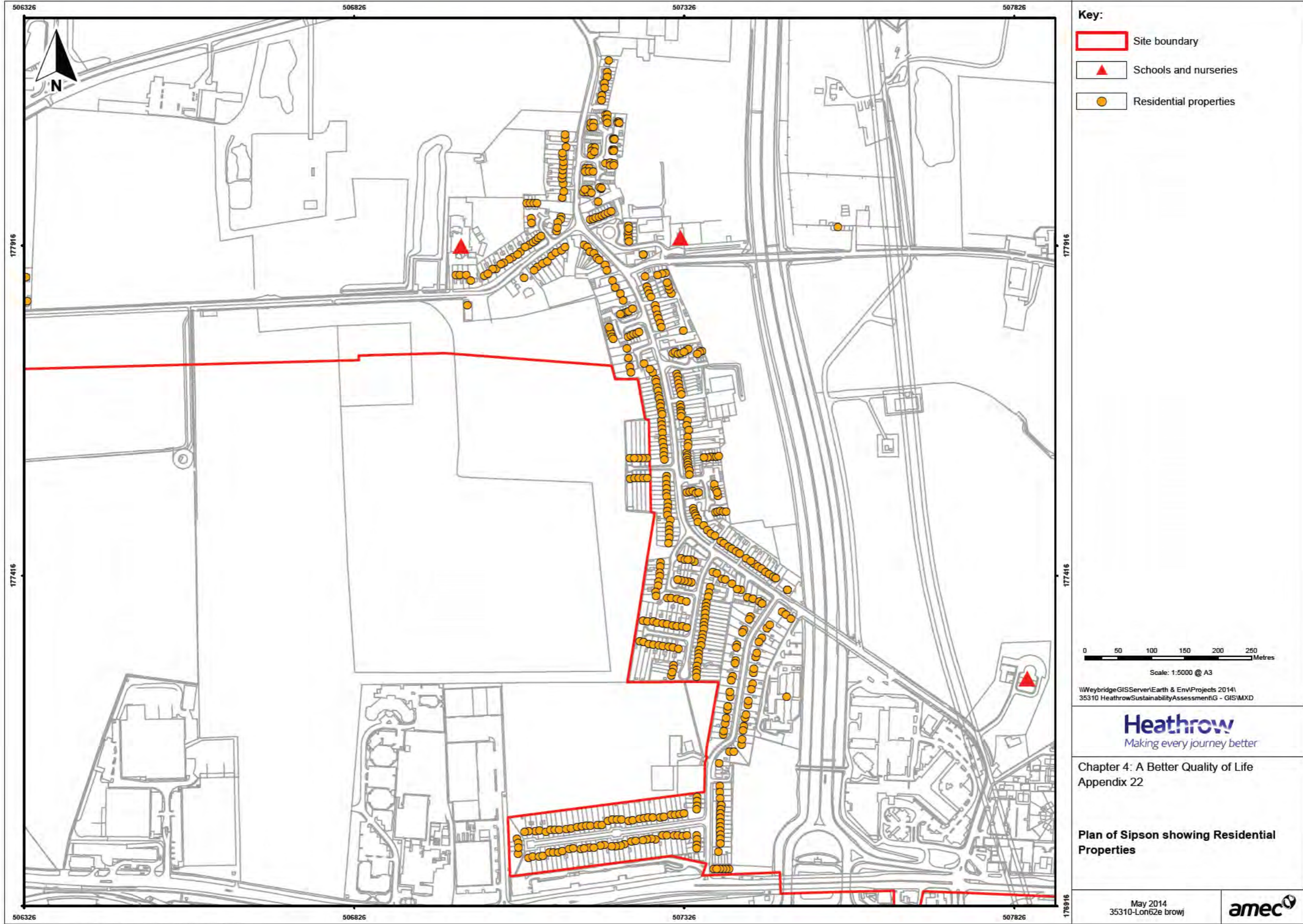


# 21 Plan of Harmondsworth showing Residential Properties



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# 22 Plan of Sipson showing Residential Properties



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## 23 Illustrative Landscape Masterplan



### Key



Site boundary

1

Drawing notes (see below)

1. Diverted river channel with waterside planting.
2. Flood storage area managed for biodiversity. Footpaths provide public access.
3. Diverted river and Colne Valley Way through enhanced existing woodland.
4. Flood storage area with wet meadow and footpath access.
5. New river channel and park enhancements.
6. Food growing area and allotments.
7. Visitor centre, sports pitches, play areas and formal gardens.
8. Mountain bike trail.

9. Landforms, pasture and hedgerows.
10. Wildlife ponds and wetland habitats with educational visitor centre, boardwalks and dipping platforms.
11. Natural swimming pond.
12. Enhanced Poyle Channel with new riverside planting and footpath.
13. Riding stables and cross country course through meadows.
14. Flood storage area with ponds, wetland and boardwalks for public access.
15. Flood storage area with wet meadow habitat.
16. Children's play area.
17. Allotments.
18. Community centre, sports pitches, play area and formal gardens at Sipson.
19. New footpaths and biodiversity enhancements.
20. River Crane corridor access and biodiversity enhancements.

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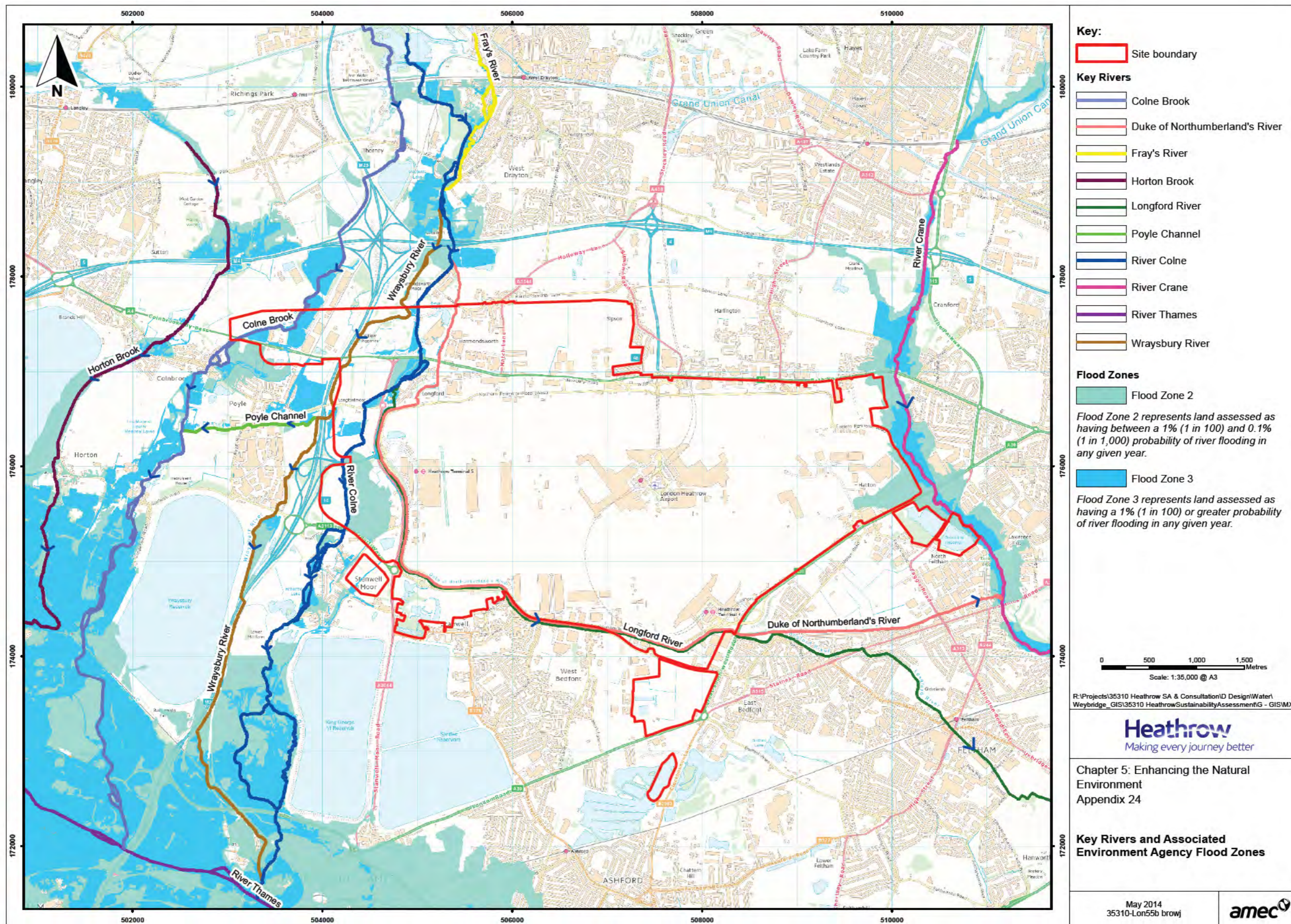
Chapter 5: Enhancing the Natural Environment  
Appendix 23

**Illustrative Landscape Masterplan**

May 2014  
35310-Lon63-D.indd colsh

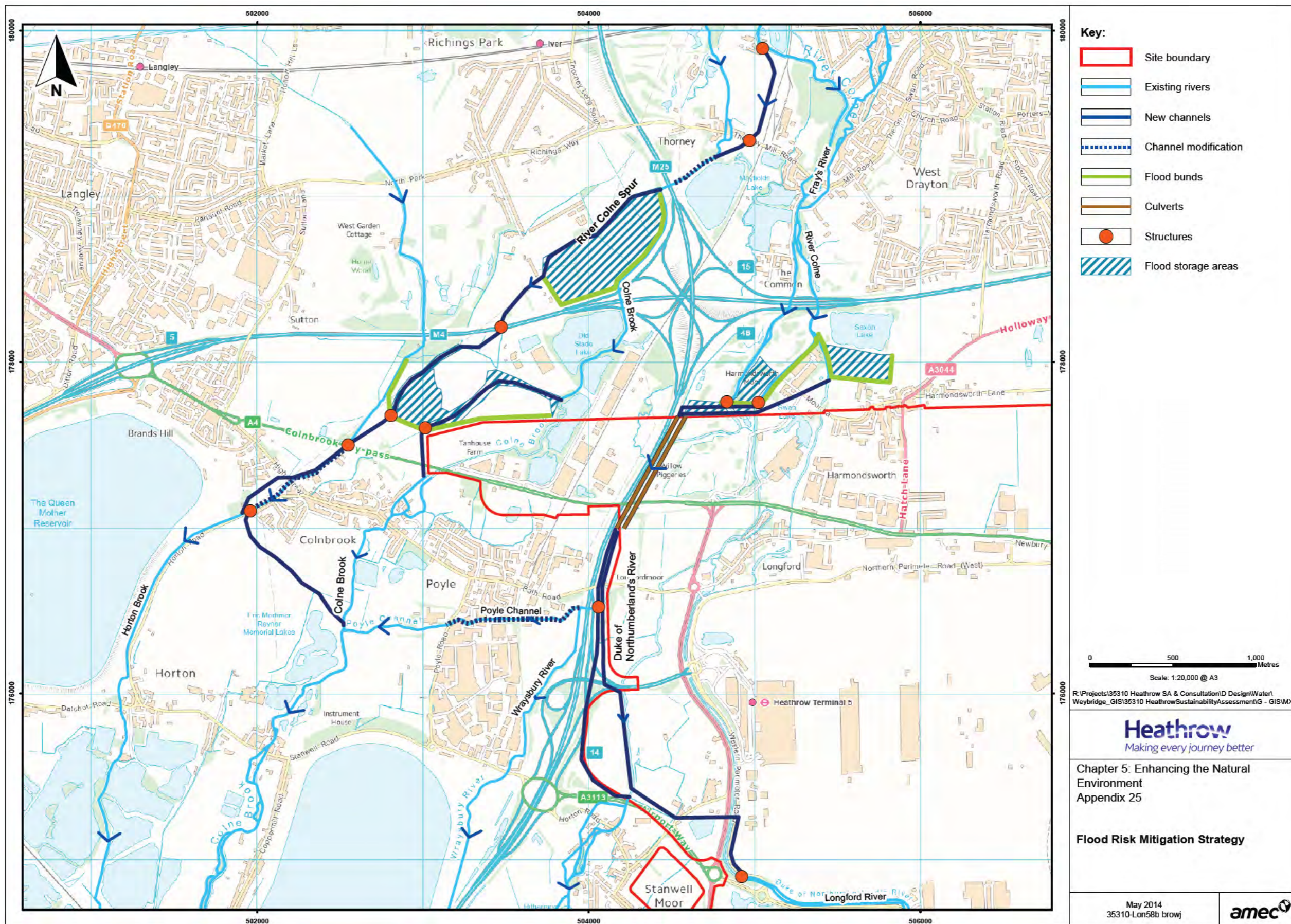


# 24 Key Rivers and Associated Environment Agency Flood Zones



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# 25 Flood Risk Mitigation Strategy



**Key:**

- Site boundary
- Existing rivers
- New channels
- Channel modification
- Flood bunds
- Culverts
- Structures
- Flood storage areas

0 500 1,000 Metres  
 Scale: 1:20,000 @ A3  
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Chapter 5: Enhancing the Natural Environment  
 Appendix 25

**Flood Risk Mitigation Strategy**

May 2014  
 35310-Lon58b browj **amec**

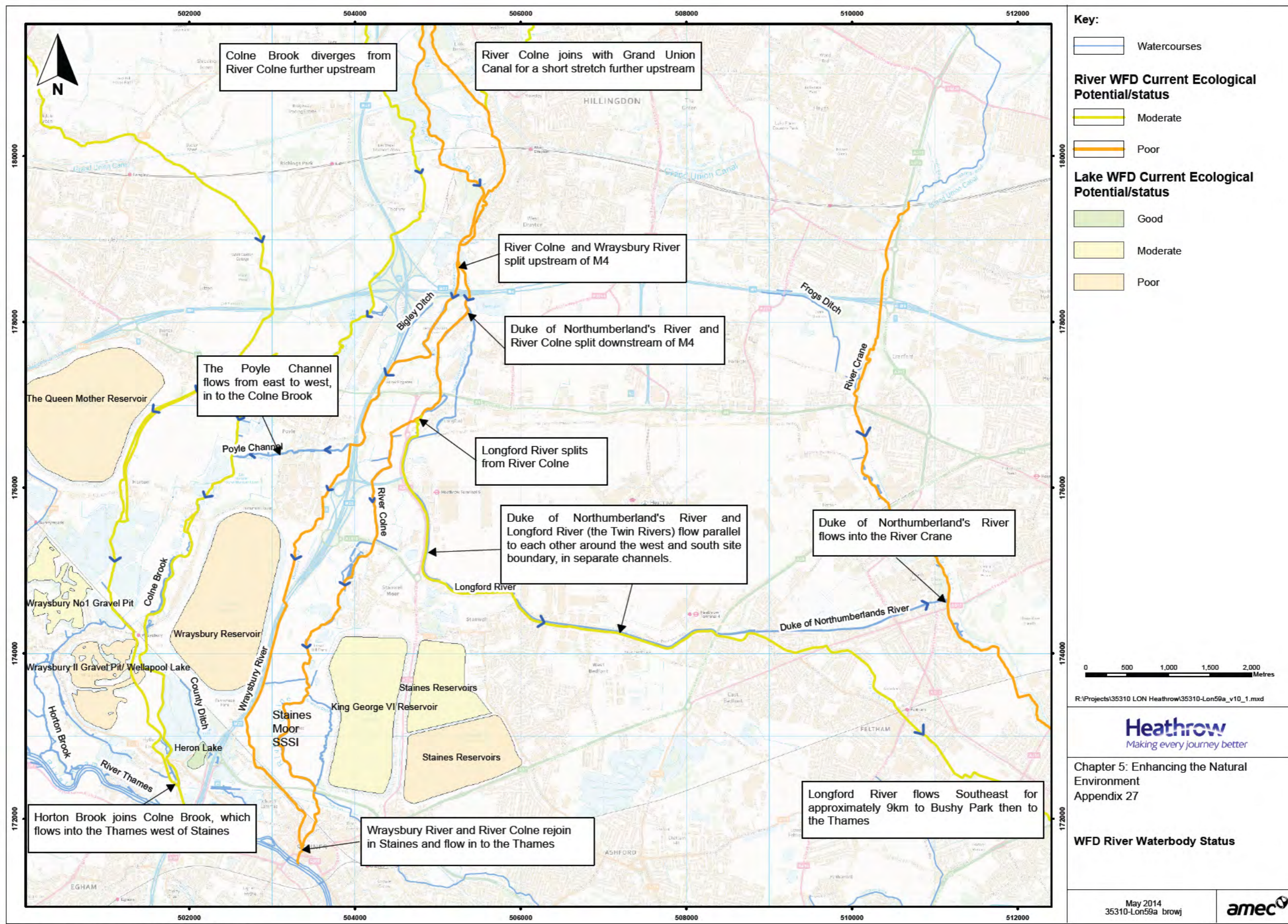
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# 26 Illustrative Sections through Enhanced New Areas of Colne Valley Park

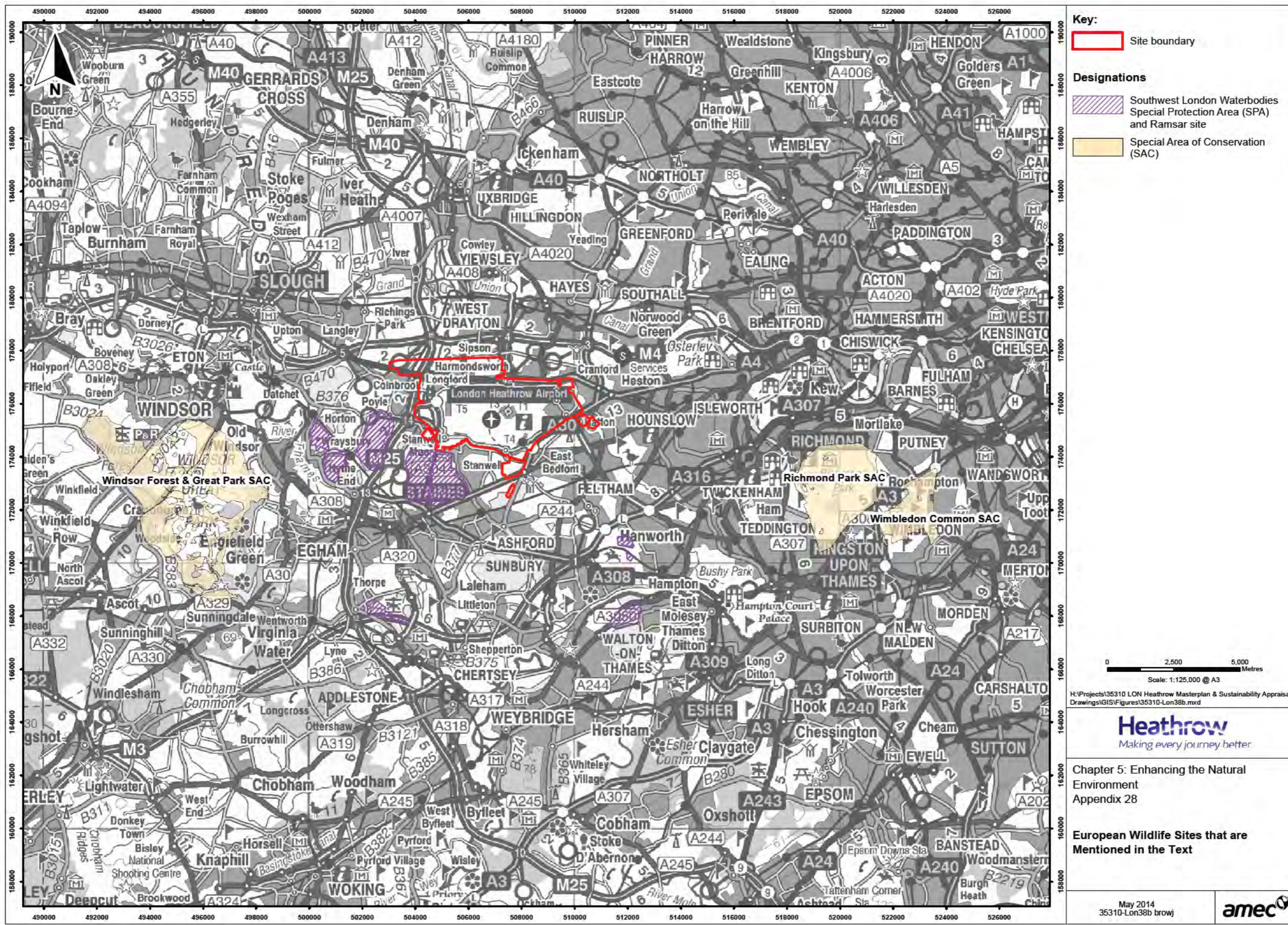


<b>Heathrow</b> <i>Making every journey better</i>	
Chapter 5: Enhancing the Natural Environment Appendix 26	
<b>Illustrative Sections through Enhanced New Areas of Colne Valley Park</b>	
May 2014 35310-Lon70a.indd parkj	<b>amec</b>

# 27 WFD River Waterbody Status

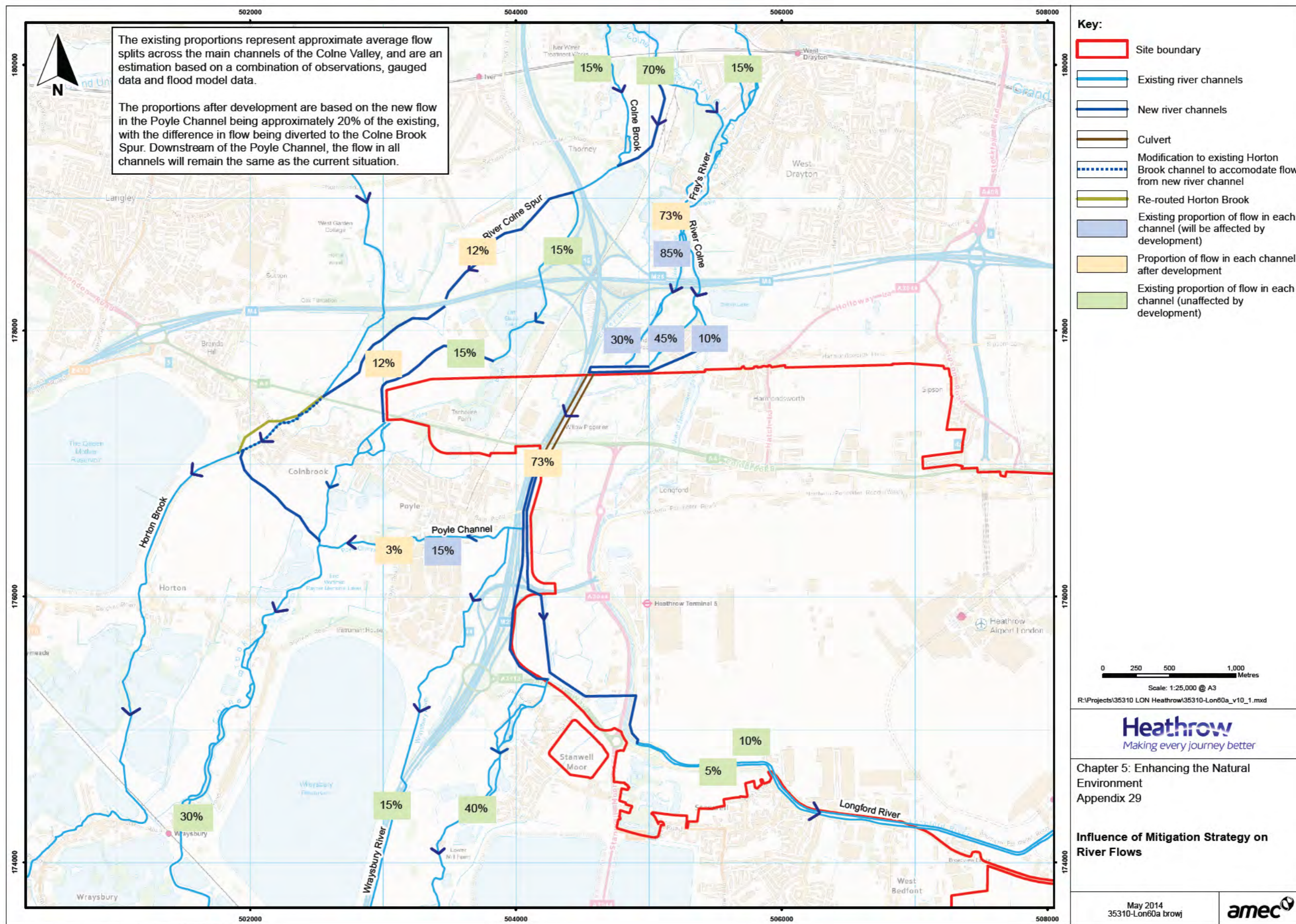


# 28 European Wildlife Sites



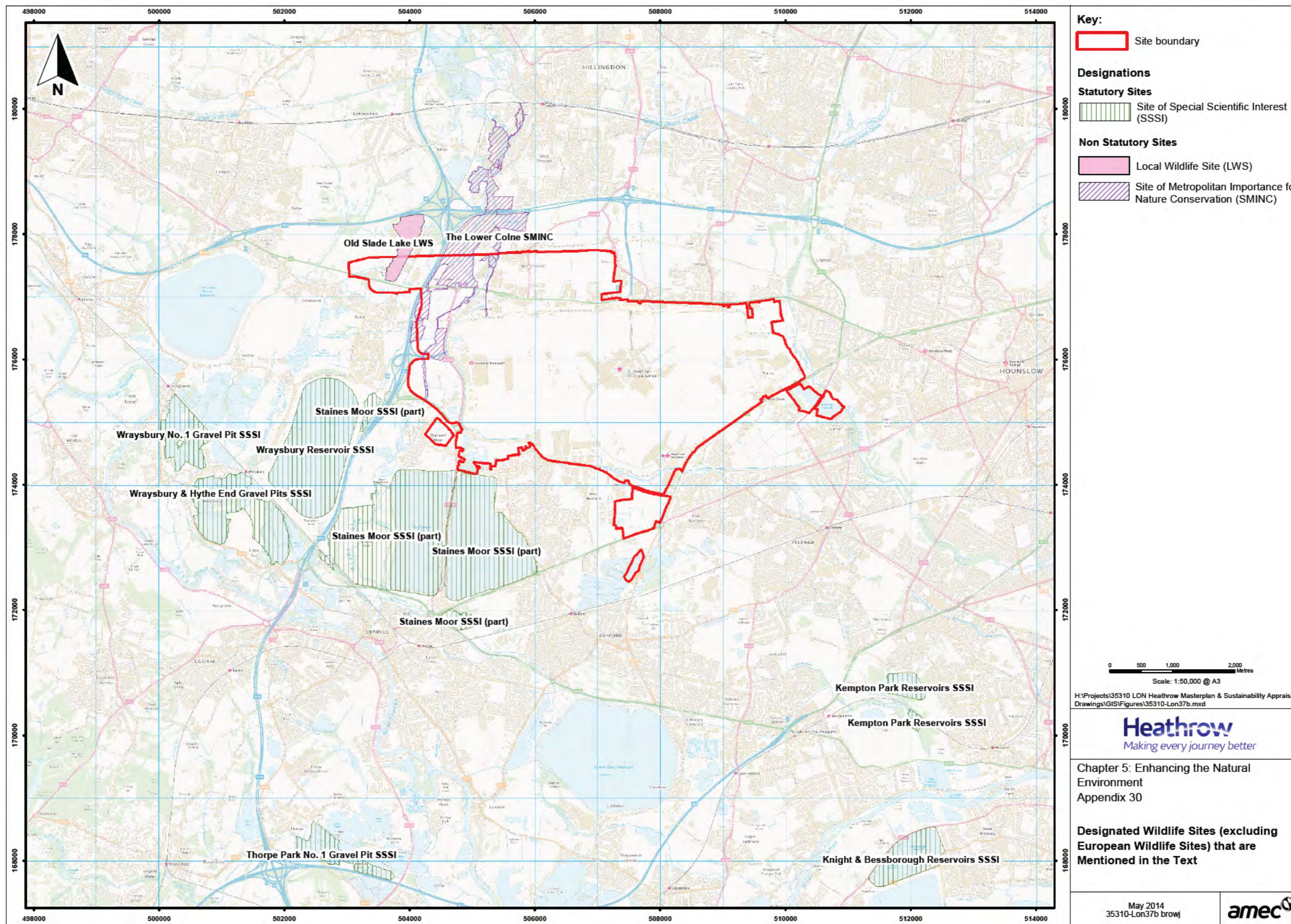
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# 29 Influence of Mitigation Strategy on River Flows



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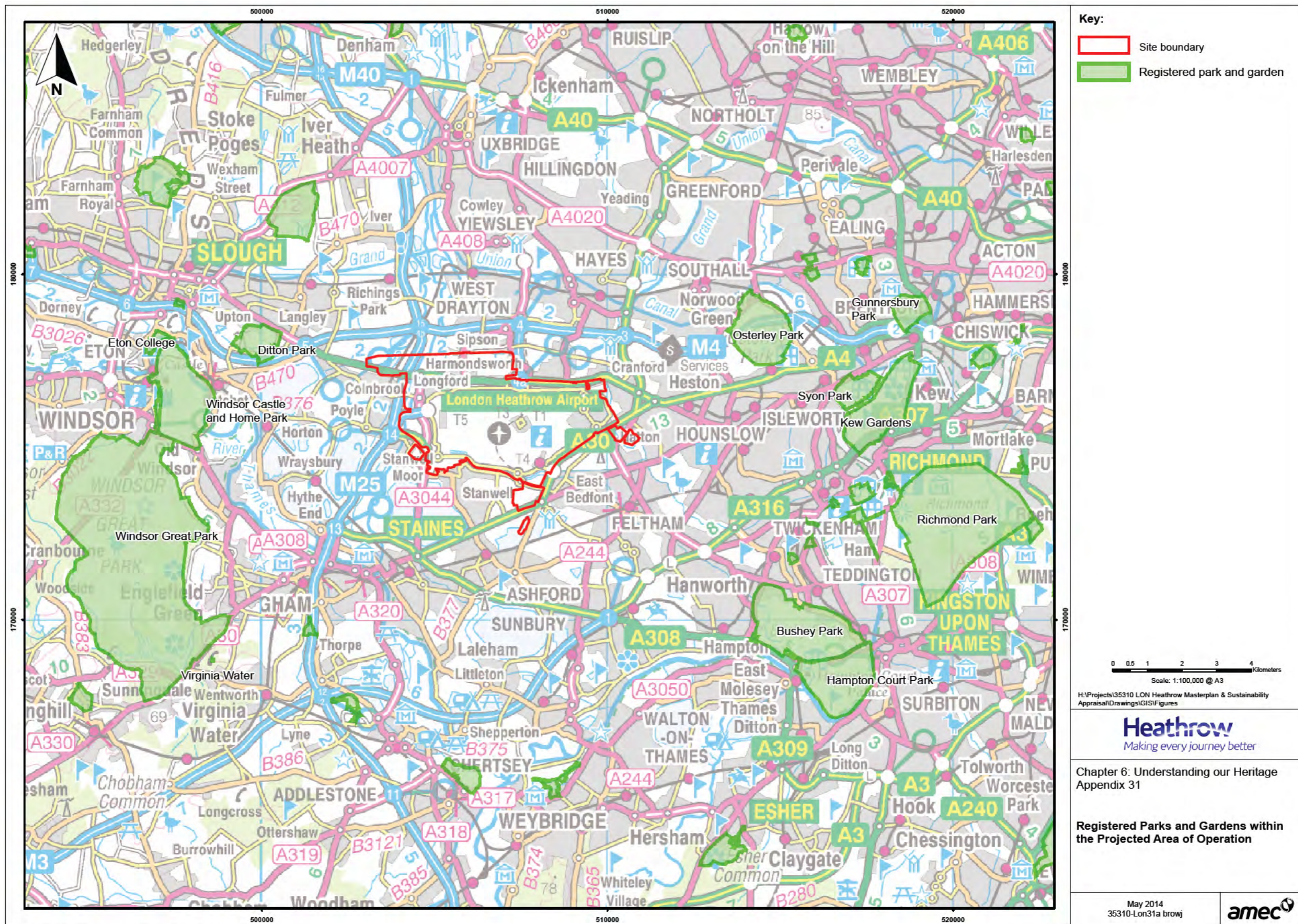
# 30 Designated Wildlife Sites



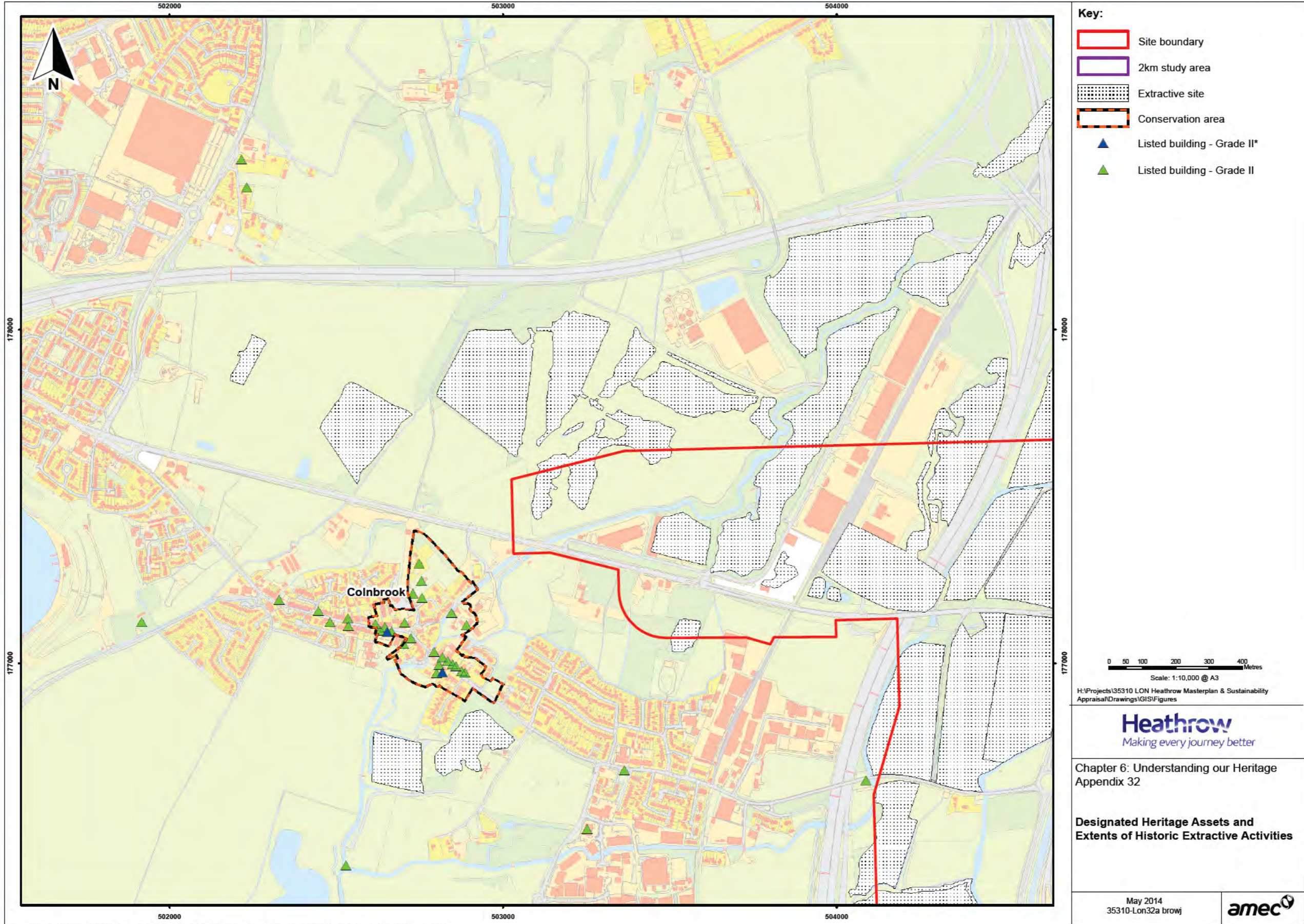
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# 31 Registered Parks and Gardens within the Projected Area of Operation

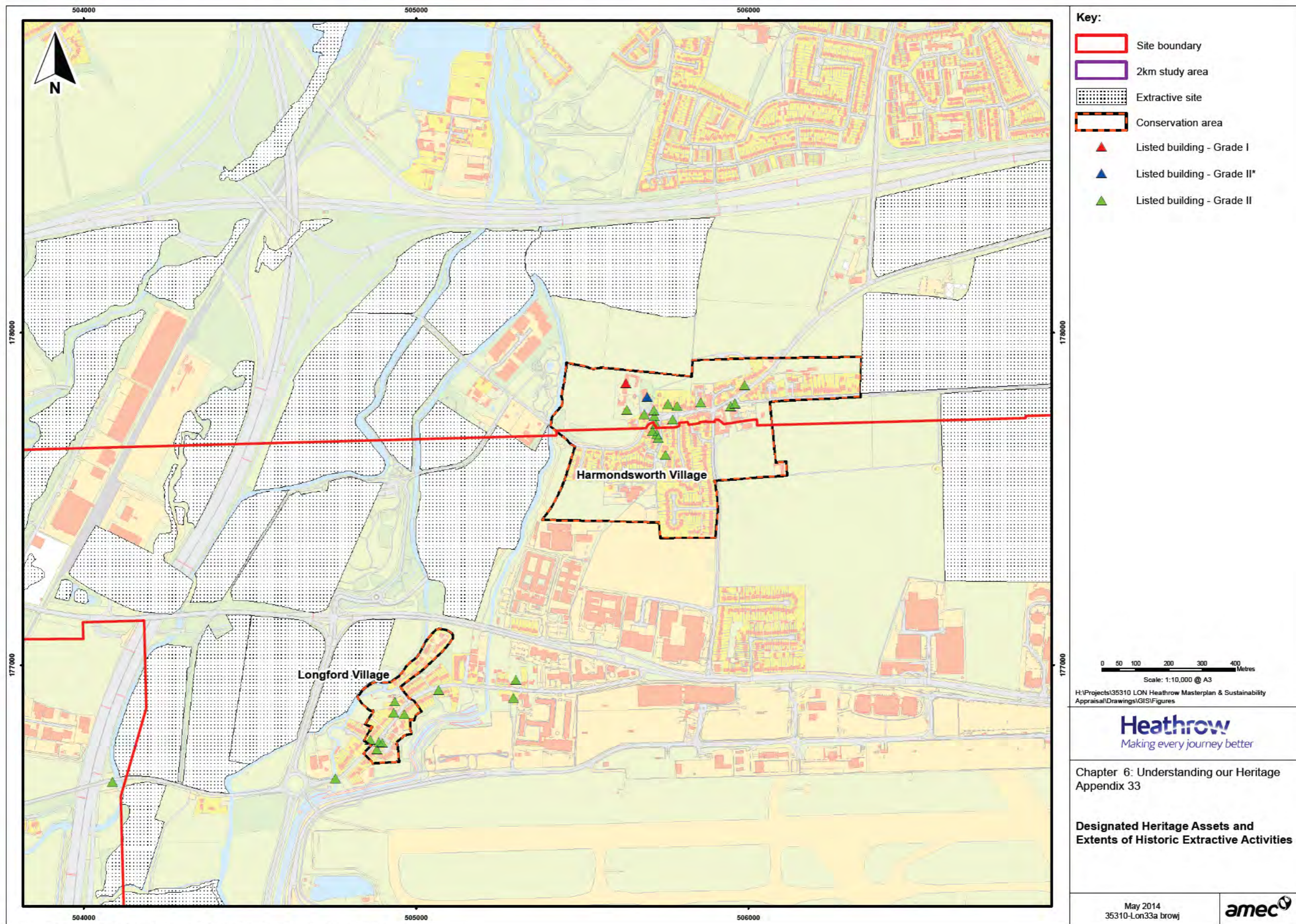


# 32 Designated Heritage Assets and Extents of Historic Extractive Activities



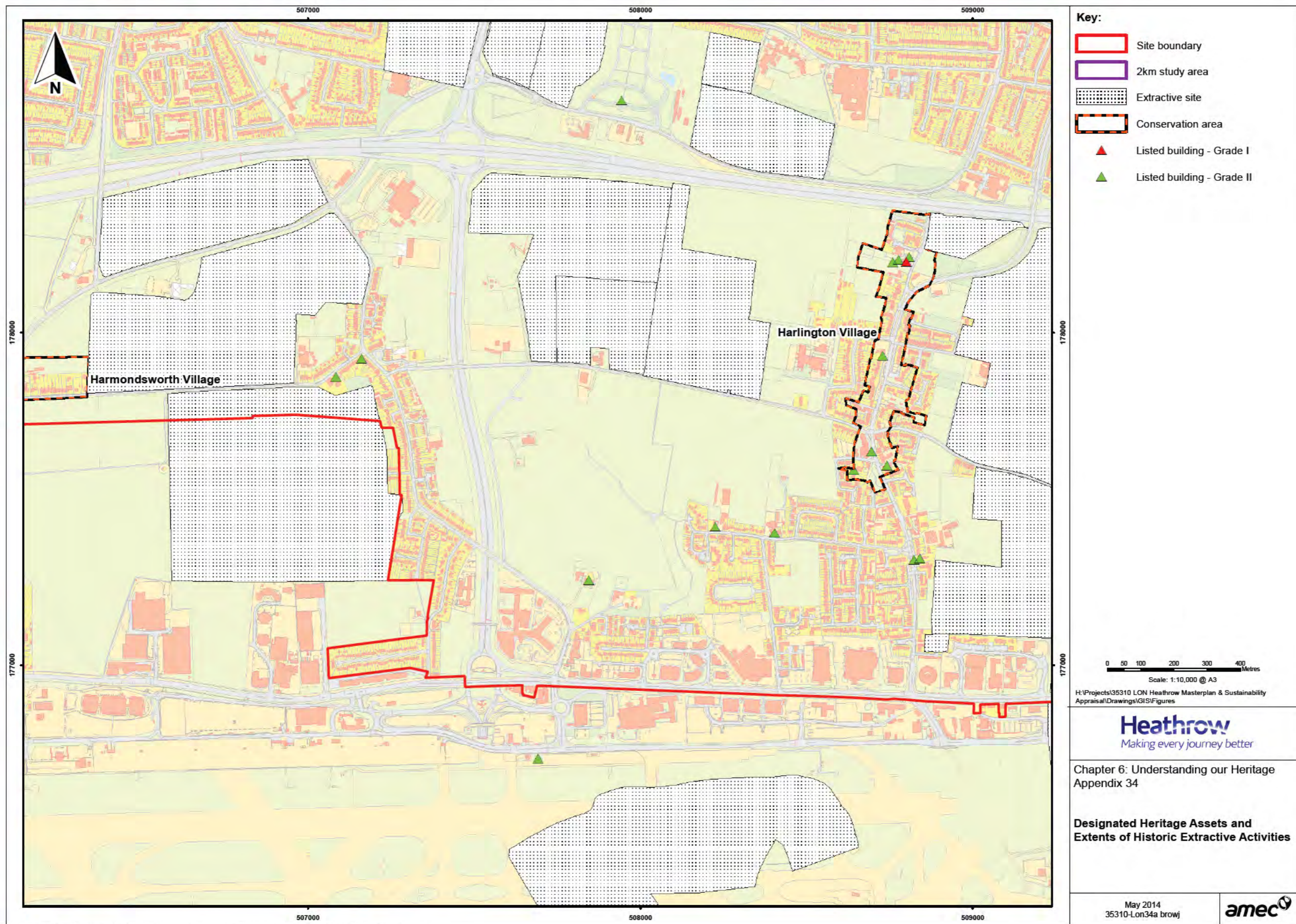
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### 33 Designated Heritage Assets and Extents of Historic Extractive Activities



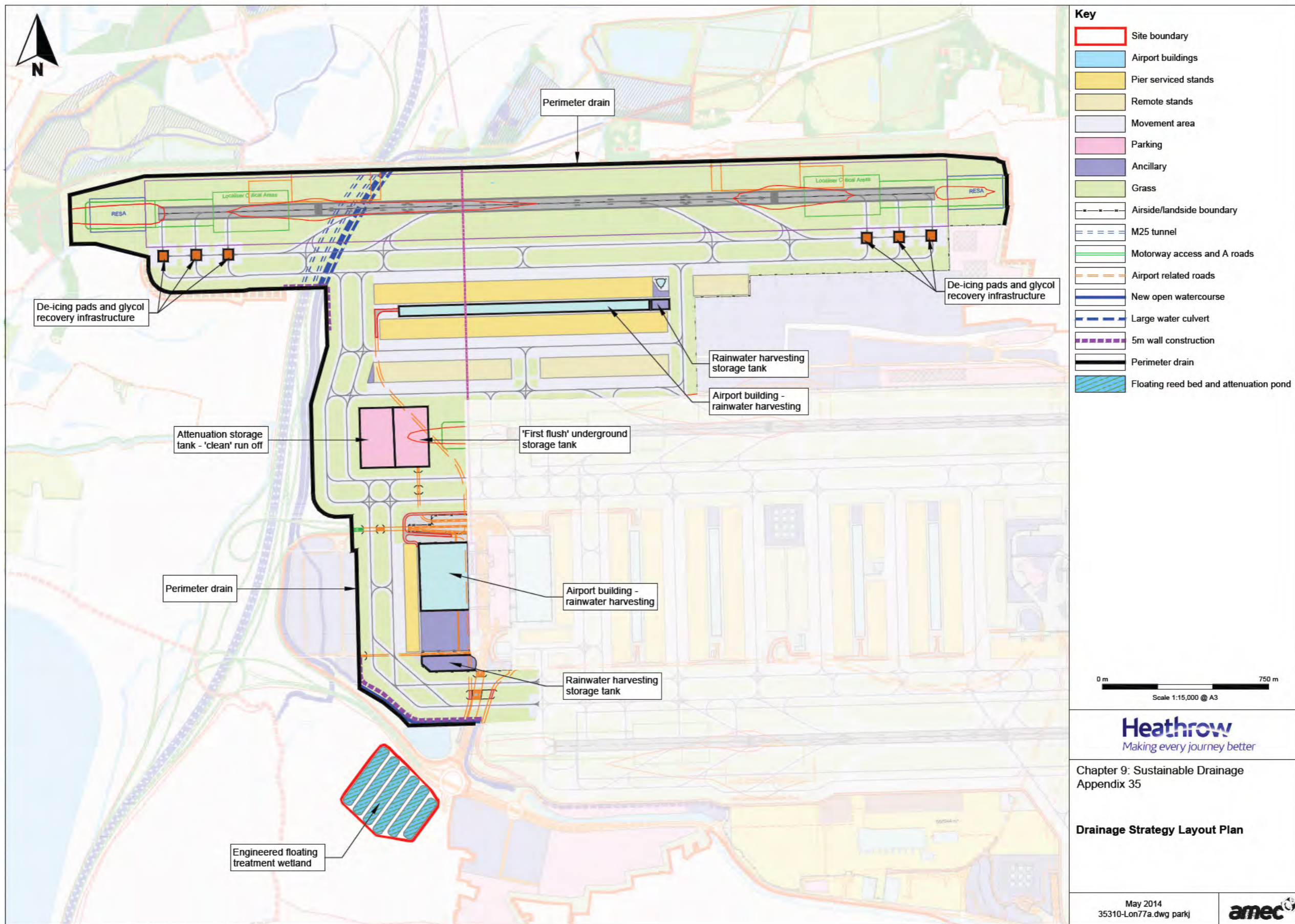
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# 34 Designated Heritage Assets and Extents of Historic Extractive Activities



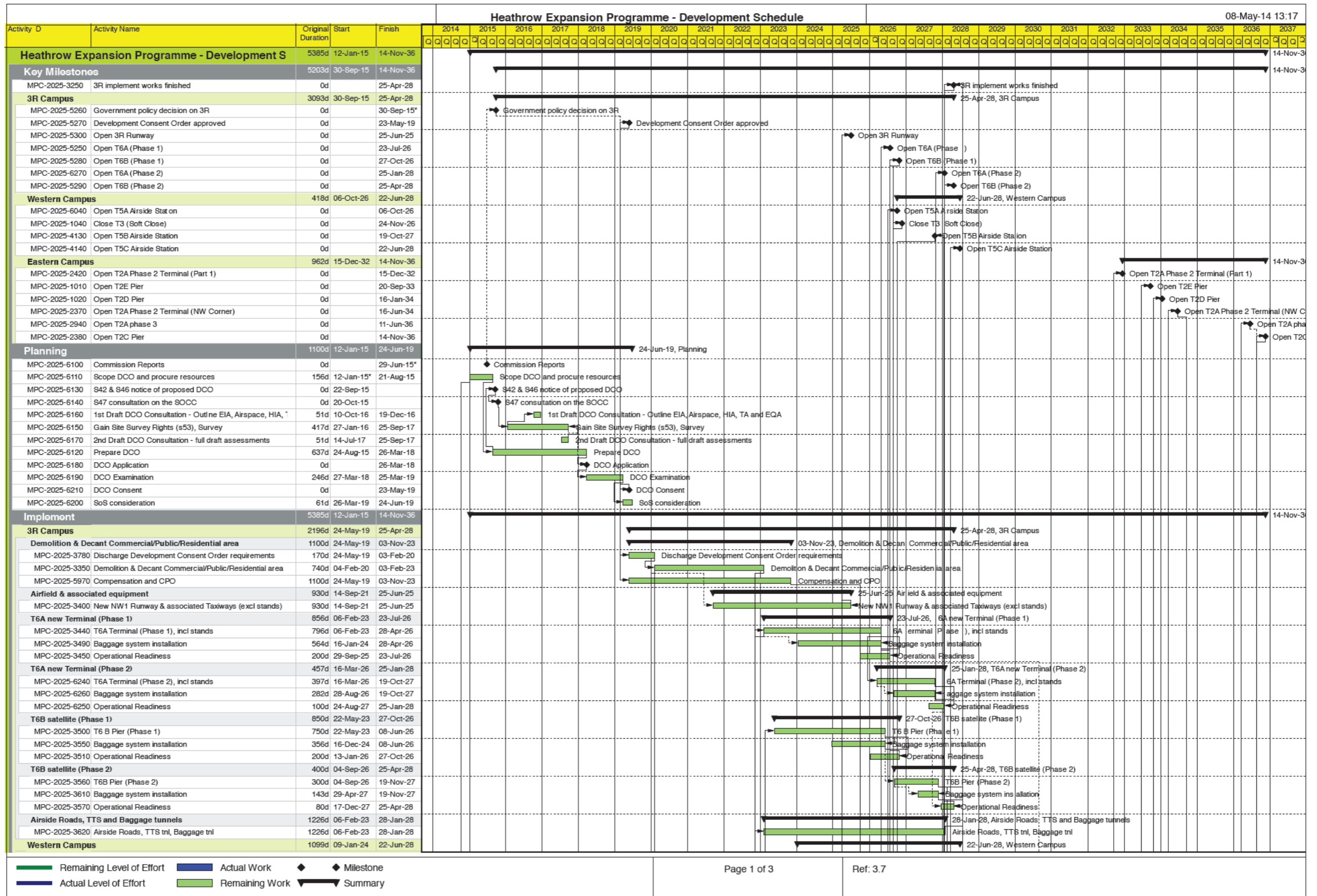
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# 35 Drainage Strategy Layout Plan

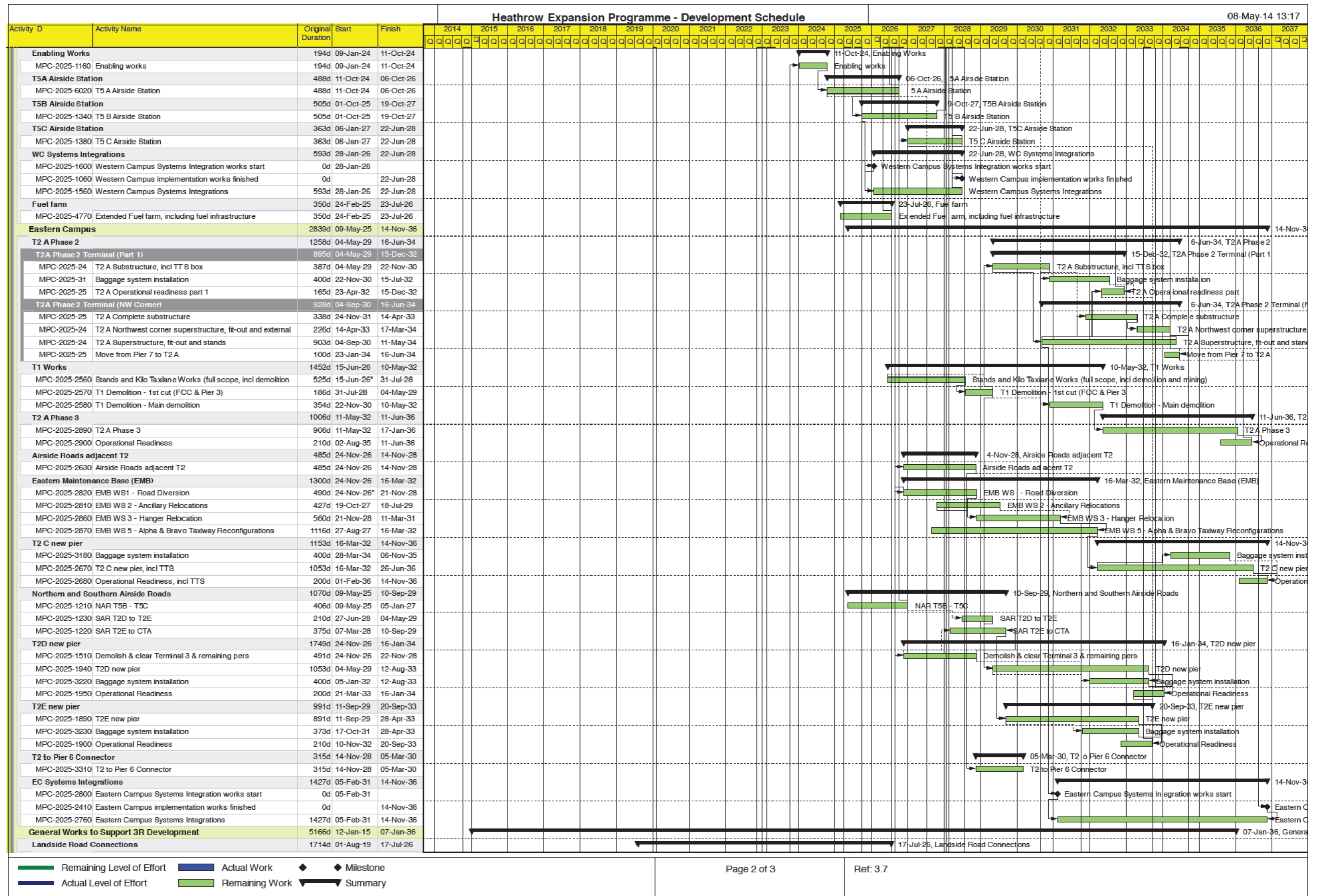


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# 36 Construction Schedule



# 36 Construction Schedule



# 36 Construction Schedule

Activity D		Activity Name	Original Duration	Start	Finish	Heathrow Expansion Programme - Development Schedule																																08-May-14 13:17
						2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037									
		Southern Perimeter Road tunnel	862d	01-Aug-19	03-Feb-23											03-Feb-23, Southern Perimeter Road tunnel																						
	MPC-2025-44	Southern Perimeter Road temporary diversion	174d	01-Aug-19	17-Apr-20																																	
	MPC-2025-53	Southern Perimeter Road tunnel	688d	20-Apr-20	03-Feb-23																																	
		South CTA Landside Road Connections	850d	19-Aug-19	03-Feb-23																																	
	MPC-2025-45	South CTA Road tunnel	850d	19-Aug-19	03-Feb-23																																	
		M25 Landside Road diversion	922d	07-Apr-20	08-Jan-24																																	
	MPC-2025-38	M25/M4 Road diversion	922d	07-Apr-20	08-Jan-24																																	
		Bath Road (A4) Landside Road diversion	753d	30-Apr-20	22-May-23																																	
	MPC-2025-53	Bath Road (A4) Landside Road diversion	753d	30-Apr-20	22-May-23																																	
		T5 Landside Road Connections	625d	09-Jan-24	17-Jul-26																																	
	MPC-2025-18	T5 Landside Road Connections	625d	09-Jan-24	17-Jul-26																																	
		Heathrow Land-use Plan (HLUP)	1000d	02-Apr-24	25-Apr-28																																	
	MPC-2025-1880	Heathrow Land-use Plan implementation works Start	0d		02-Apr-24*																																	
	MPC-2025-1090	Heathrow Land-use Plan implementation works finished	0d		25-Apr-28																																	
	MPC-2025-1840	Heathrow Land-use works	1000d	03-Apr-24	25-Apr-28																																	
		Rail Station Boxes	700d	16-Mar-22	17-Jan-25																																	
	MPC-2025-6030	Rail Station Boxes	700d	16-Mar-22	17-Jan-25*																																	
		Heathrow East commercial zone development	3177d	06-Feb-23	07-Jan-36																																	
		Heathrow East commercial zone development- Phase 1	1097d	06-Feb-23	16-Jul-27																																	
	MPC-2025-16	Hotel Building (by others)	500d	12-Jun-25	23-Jun-27																																	
	MPC-2025-29	Heathrow East commercial zone development- Phase 1	1097d	06-Feb-23	16-Jul-27																																	
		Heathrow East commercial zone development- Phase 2	984d	06-Jan-32	07-Jan-36																																	
	MPC-2025-30	Heathrow East commercial zone development- Phase 2	984d	06-Jan-32	07-Jan-36																																	
		Southern Fuel Farm	739d	23-Nov-23	24-Nov-26																																	
	MPC-2025-6060	Southern Fuel Farm	739d	23-Nov-23	24-Nov-26																																	
		Balancing ponds & external Ancillary buildings	696d	22-Feb-22	06-Dec-24																																	
	MPC-2025-3120	Balancing ponds & external Ancillary buildings	696d	22-Feb-22	06-Dec-24																																	
		Airside Pax Connectivity	2076d	20-Jan-25	24-Jun-33																																	
		TTS & Tunnels development between T2D and T2A	1278d	12-Apr-28	24-Jun-33																																	
	MPC-2025-53	TTS & Baggage extension between T2D and T2A	1278d	12-Apr-28	24-Jun-33																																	
	MPC-2025-54	Baggage system installations	376d	05-Dec-31	24-Jun-33																																	
		TTS & Tunnels development between T5C and T2D	1038d	06-Apr-29	24-Jun-33																																	
	MPC-2025-56	TTS & Baggage between T5C and T2D	1038d	06-Apr-29	24-Jun-33																																	
	MPC-2025-57	Baggage system installations	376d	05-Dec-31	24-Jun-33																																	
		TTS & Tunnels development between T5A and T5C	547d	20-Jan-25	08-Apr-27																																	
	MPC-2025-60	TTS between T5A and T5C	547d	20-Jan-25	08-Apr-27																																	
		Landside PAX Connectivity	1874d	27-Oct-26	16-Jun-34																																	
	MPC-2025-1620	Landside PAX Connectivity (PRT)	1874d	27-Oct-26	16-Jun-34																																	
		Baggage Connectivity	2797d	06-Feb-23	16-Jun-34																																	
	MPC-2025-1700	Baggage Tunnels and fit out- 3R/Western Campus	1186d	06-Feb-23	19-Nov-27																																	
	MPC-2025-6230	Baggage Tunnels and fit out- Eastern Campus	871d	22-Nov-30	16-Jun-34																																	
		Alteration to Existing Runways and Taxiways	975d	08-Dec-22	24-Nov-26																																	
	MPC-2025-6070	Alteration to existing runways and taxiways	975d	08-Dec-22	24-Nov-26																																	
		Sustainability	3275d	12-Jan-15	25-Apr-28																																	
	MPC-2025-1750	Energy Sustainability	3275d	12-Jan-15	25-Apr-28																																	
	MPC-2025-1760	Water Sustainability	3275d	12-Jan-15	25-Apr-28																																	
	MPC-2025-1770	Waste Sustainability	3275d	12-Jan-15	25-Apr-28																																	

█ Remaining Level of Effort   
 █ Actual Work   
 ◆ Milestone   
 ◆ Milestone  
█ Actual Level of Effort   
 █ Remaining Work   
 ▼ Summary





