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7 LINK-BY-LINK DESCRIPTION

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7.1.1 This section of the EDR describes, on a link-by-link basis, the Scheme as it is proposed to be implemented. The description is undertaken commencing at junction 12 and proceeding eastwards. In siting some elements of the Scheme, DMRB (Ref 17) standards are used which are based upon imperial measurements. In such cases, the measurement is given in imperial measurements with metric measurements also provided.

7.2 Junction 12 to junction 11

Existing

7.2.1 The M4 between junction 12 (Theale) and junction 11 (Three Mile Cross) is 7,312m long with three running lanes in each direction. There is also a hard shoulder on the nearside of each carriageway and lighting columns to the central reserve. The general landform through this link is rural and wetlands, with industrial areas around both junctions. A detailed description of the surrounding landscape, the settlements served by this link and any relevant local landscape designations is provided in chapter 4 of this EDR.

7.2.2 Junction 12 is formed as a gyratory, elevated above the main carriageway of the motorway on two overbridges: Theale Interchange West and Theale Interchange East. Both overbridges take the same form: a three-span structure with the piers situated to both verges. No work is anticipated to either overbridge. The slip roads linking junction 12 to the M4 take a similar form. There is a two-lane slip road merging to a single lane slip on to the eastbound carriageway of the M4. The westbound carriageway off slip consists of a single lane slip road which expands firstly into two lanes and then further into four lanes once it reaches junction 12.

7.2.3 Immediately at the end of the eastbound slip road, situated on a slight crest in the motorway, is the Theale railway underbridge which carries the M4 over the western Region mainline railway. This structure is not affected by the Scheme.

7.2.4 The motorway then follows a downward gradient towards the next three structures, which are Holy Brook underbridge, River Kennet underbridge and Wellmans Farm access underbridge. These are situated 200m, 300m and 400m respectively further along the carriageway from Theale railway underbridge. These structures are not expected to be affected by the Scheme.

7.2.5 Further on from Wellmans Farm access underbridge is the Reading MSA, which is located on both sides of the motorway. The merge and diverge slips for the MSA are all single lane roads. The motorway through this area is on a slight downward gradient.

7.2.6 Burghfield Road overbridge, a two-span bridge structure, spans over the eastbound merge and westbound diverge slip roads for the Reading MSA. This structure is not affected by the Scheme.

7.2.7 Further along the motorway, situated on a slight crest is Mortimer Line railway underbridge. From a road user point of view, this structure takes on much the same form as Theale railway underbridge. This structure will also not be affected by the Scheme.

7.2.8 Poundgreen Road overbridge, located east of Mortimer Line railway underbridge is a four-span structure and is situated in a slight dip in the motorway. This structure will not be affected by the Scheme~~.~~ with the exception of minor structural modifications to the central reserve pier related to the proposed central reserve concrete barrier..

7.2.9 The M4 then continues uninterrupted through to junction 11. The eastbound diverge consists of two lanes separated by a ghost island, which expands out to four lanes on reaching the gyratory. The westbound merge consists of two lanes which reduce to one lane as it joins the M4. ~~junction~~Junction 11 is a gyratory, elevated above the main carriageway of the motorway on four overbridges. These overbridges are described as part of the junction 11 to junction 10 link.

Proposed works on the motorway

Lane configuration

7.2.10 Junction 12 (Theale) is at the western end on the Scheme. Lane provision on the M4 through the junction is not affected by the Scheme. It will remain as three lanes and a hard shoulder in each direction. The eastbound entry slip road merges with the M4 in a lane gain configuration to create a fourth lane on the motorway. Similarly, but in the opposite direction, the westbound exit slip road results in a lane drop.

7.2.11 ALR will be provided for the entire length of this section, with the existing three lanes and the hard shoulder converted to create four running lanes with no hard shoulder. Slightly reduced lane widths will be used on the River Kennet underbridge where the available width for each carriageway is 200mm less than that required for full lane widths. Two ~~ERAs~~EAs are to be provided on the eastbound carriageway and three on the westbound carriageway. There are no existing POPs on this section, and no new ones are proposed.

7.2.12 TJR will be implemented at the Reading MSA ~~and at junction 11 (Three Mile Cross). This will require reconfiguration of the slip roads at these junctions.~~

7.2.13 Junction 11 (Winnersh) will retain its existing provision of three lanes and a hard shoulder in each direction. Slip roads will be configured to create lane gain or lane drop as appropriate.

Offside and central reserve works

~~7.2.13~~ For much of the length of the scheme it will be necessary to widen the existing carriageway by 200mm to 500mm. This will be done within the existing central reserve. ~~Other features of the Scheme in the central reserve and offside lanes are:~~

~~a)~~7.2.14 ~~a~~A hard surface and RCB will be installed for the full length of the central reserve. This will benefit road worker safety by minimising the requirement for future

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RCB repair and maintenance work~~; and~~ .

~~b) new lighting will be provided for the whole length of this section. Lighting Columns will be mounted on top of the new concrete barrier to carry LED luminaires 12m above the carriageway.~~

Nearside and verge works

~~7.2.14~~7.2.15 Where necessary the existing hard shoulder will be strengthened to enable it to carry motorway traffic. Other features of the Scheme in the verges and nearside lanes are:

a) underground ducts will be installed in the verge to carry the cables required for the new signals and other technology;

b) new steel safety barriers will be installed around hazards in the verge such as bridges, gantries and large signs;

c) drainage will be modified and improved as required to accommodate ALR and to suit the new gantries, ~~ERAs~~EAs and other features;

d) ~~new~~retained verge lighting will ~~be provided only~~remain at the junction slip roads; and

e) existing environmental barriers will be retained or replaced. In some locations it will be necessary to take down the existing barriers during construction either to relocate them or to create temporary working space.

Carriageway resurfacing

~~7.2.15~~7.2.16 Low-noise surfacing will be provided throughout the Scheme as part of the works.

Gantries

7.2.17 The number of gantries outlined in each of the following sections are determined to be between two junctions based on the link associated with them in the (at the time of writing) latest gantry schedule for the M4 SMP. The point at which the links are separated from one another varies slightly; but is always between the centre point of the mainline carriageway within the junction and the eastbound entry slip road datum point or westbound exit slip road datum point (whichever is further east). Junction 12 to junction 11 also includes gantries downstream of the eastbound exit slip road datum point.

~~7.2.16~~7.2.18 There will be 19 gantries between junction 12 and junction 11~~;~~. 16 ~~of these will be~~ cantilever type structures and three ~~will be~~ super-span portals. The super-span portals will display information to both eastbound and westbound carriageways. In total ~~there will be~~ 11 gantries ~~facing the~~will face eastbound traffic ~~on each carriageway, and~~

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11 westbound traffic. The location of the gantries is shown on the Scheme plans in Annex F of this EDR.

~~7.2.17~~7.2.19 Gantries on the eastbound carriageway:

a) one gateway gantry positioned shortly after the junction 12 entry slip road. This gantry will carry a single MS4 and a set of four AMIs, one positioned over each lane, to display lane availability and speed limits;

b) one Intermediate gantry similar to the gateway but positioned half-way along the section;

c) six additional MS4s positioned over the nearside lane at regular intervals;

d) two ADSs positioned at 2/3 mile (1.07km) and 1/3 mile (0.54km) in advance of junction 11 showing the exit destination of Basingstoke and Reading (C&S~~&C~~); and

e) one final direction sign on the approach to junction 11, showing exit destination as above, and M4 through traffic destinations of Greater London and Reading (E). This will carry a set of five AMIs, one positioned over each lane.

~~7.2.18~~7.2.20 Gantries on the westbound carriageway:

a) one gateway gantry similar to eastbound gateway but positioned downstream of the junction 11 entry slip road. This gantry will carry a single MS4 and a set of four AMIs, one positioned over each lane, to display lane availability and speed limits;

b) two intermediate gantries, one similar to and on a shared structure with the eastbound intermediate gantry and one prior to junction 12 with four AMIs ~~but no variable message signal;~~and a single MS4;

c) five additional MS4s positioned over the nearside lane at regular intervals;

d) two ADSs positioned at 1 mile (1.61km) and ½ mile (0.815km) in advance of junction 12 showing the exit destinations of Reading (W) and Theale; and

e) one final direction sign on approach to junction 12, showing exit destination as above and M4 through traffic destinations of the South West, Bristol and Newbury.

Proposed land-take

Table ~~13~~14 Schedule of proposed land-take between junctions 12 and 11

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Category	Quantity (ha)	Comments
Temporary land-take	2.57	Associated with Construction Compound 2 (see 8.2.11)
Temporary land-take	2.70	Associated with Construction Compound 3 (see 8.2.11)
Temporary land-take	0.21	Total quantity of temporary land-take required between junctions 12 and 11 aside from that associated with construction compounds or third party (other) land.
Third Party (other) (Temporary)	1.15	For necessary improvements to access to Reading MSA which will be maintained at all times.

7.3 Junction 11 to junction 10

Existing

7.3.1 The M4 between junction 11 (Three Mile Cross) and junction 10 (Winnersh) is 8,730m long with three running lanes in each direction. There is also a hard shoulder on the nearside of each carriageway and lighting to the central reserve. The general landform through this link is residential to the north of the carriageways and rural to the south. A detailed description of the surrounding landscape, the settlements served by this link and any relevant local landscape designations is provided in chapter 4 of this EDR.

7.3.2 Junction 11 is formed of a gyratory, elevated above the main carriageway of the motorway on four overbridges. There are two overbridges to each side of the junction. Both pairs of overbridges take the same form. The inner structures on the gyratory consist of three-spans supported by bank seats to each verge embankment and piers to each verge, while the outer structures are single-spans supported on full height abutments to each verge. No work is anticipated to any of these overbridges. The eastbound merge consists of two lanes, which reduces to one lane as it joins the M4 while the westbound diverge has two lanes separated by a ghost island which expands out to four lanes on reaching the gyratory.

7.3.3 After the junction 11 slip roads, the M4 continues past Shinfield Footbridge, gradually rising up to Shinfield Road overbridge which carries the A327 over the motorway and has four spans with bank seat supports on the verge embankments and piers to verges and the central reserve. The proposed Scheme will not affect this structure. ~~There are proposals being promoted by a third party~~Immediately to ~~construct a new~~the east the

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M4 continues under the recently constructed Shinfield Eastern Bypass overbridge ~~adjacent to this structure to carry the proposed Reading Eastern Relief Road. This overbridge will take the form of a three~~, a single-span structure with ~~bank seat~~full-height abutments. ~~The Scheme~~ This structure will not ~~affect this structure~~be affected by the scheme with the exception of minor structural modificatiosns to the central reserve pier related to the proposed central reserve concrete barrier.

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7.3.4 Further east, situated in a slight dip in the M4 is Cutbush Lane overbridge. This structure has a single-span supported by full height abutments, which carries Cutbush Lane over the M4. No works are anticipated to this structure.

7.3.5 The M4 then levels out before passing over the River Loddon underbridge. The Scheme will not affect this structure.

7.3.6 Further on, the M4 rises over Mill Lane underbridge which has a single-span over Mill Lane and is supported on full height embankments. The Scheme will not affect this structure.

7.3.7 Midway between Mill Lane underbridge and the next structure, King Street Lane underbridge, an environmental barrier is located on both verges. This barrier continues over the next structure, with the barrier on the westbound verge ending a few hundred metres after the structure, whilst the barrier to the eastbound verge ends just before the start of the junction 10 slip roads.

7.3.8 King Street Lane underbridge is situated approximately 800m after Mill Lane underbridge. The M4 slightly crests over this structure. The structure takes the form of a single-span deck supported by full height abutments to either side of King Street Lane. No works are anticipated to this structure.

7.3.9 The M4 then follows a slight downward gradient for 875m to the next structure, Reading Road underbridge. This structure carries the M4 over the A329 (Reading Road) and takes the form of a single-span deck supported by full height abutments. Over the structure, steel parapets are present to both verges and there is an environmental barrier on the eastbound verge. The Scheme will not affect this structure.

7.3.10 The downward gradient steepens slightly before the M4 reaches the Southern Region Winnersh underbridge. This structure supports the M4 over the Southern Region railway line. Steel parapets are present to both verges and there is an environmental barrier on the eastbound verge over this structure. No works are anticipated to this structure.

7.3.11 The M4 then continues for 200m on a downward gradient to the slip roads for junction 10. The eastbound diverge has one lane which expands to two lanes, while the westbound merge is constantly two lanes through the junction and as it joins the M4. junction 10 is an interchange between the M4 and the A329(M). The overbridges through this junction are described as part of junction 10 to junction 8/9 in chapter 4 of this EDR.

Proposed works on the motorway

Lane configuration

7.3.12 ALR will be provided for the entire length of this section between the junctions, with the existing three lanes and the hard shoulder converted to create four running lanes with no hard shoulder. Three ~~ERAs~~EAs are to be provided on each carriageway. One ~~ERA~~EA in each direction will incorporate a new POP. The existing POPs, one to each carriageway, will be removed.

7.3.13 ~~TJR will be implemented at junction 11 (Three Mile Cross) this will require reconfiguration of the slip roads. TJR is not proposed at junction 10 (Winnersh). As the motorway passes through this junction it will retain its~~Junctions 11 and 10 (Winnersh) will retain their current provision of three lanes and a hard shoulder in each direction. Slip roads will be configured to create lane gain or lane drop as appropriate.

Offside and central reserve works

7.3.14 Work in the central reserve and offside lanes in this link is the same in all material respects to the work proposed for the link from junction 12 to junction 11. It includes widening the existing carriageway by 200mm to 500mm and in the central reserve: provision of a hard surface, construction of RCB, and modifications to the drainage system ~~and replacement road lighting.~~

Nearside and verge works

7.3.15 Work in the central reserve and offside lanes in this link is the same in all material respects to the work proposed for the section from junction 12 to junction 11. Where necessary, the existing hard shoulder will be strengthened to enable it to carry motorway traffic. Other verge features included in the Scheme are: underground ducts to carry power and communication cables, steel safety barriers around hazards, drainage modifications, ~~lighting (at junction slip roads only),~~ environmental barriers and replacement planting.

7.3.16 Where the motorway passes over Mill Lane, to the northwest of Sindlesham, there will be ~~200m~~310m of new ~~2m~~3.5m (2m over the structure) high noise fence in the northern verge and ~~50m~~347m of new 3.5m (2m over the structure) high noise fence in the southern verge.

Carriageway resurfacing

7.3.17 Low-noise surfacing will be provided throughout the Scheme as part of the works.

Gantries

7.3.18 There will be ~~24~~23 gantries between junction 11 and junction 10. 20 of these will be various cantilever type structures and ~~four~~three will be super-span portals~~. Three of the super-span portals~~ that will display information to both eastbound and westbound carriageways~~.~~). In total, there will be ~~14~~13 gantries facing the eastbound traffic and 13 facing the westbound traffic. The location of the gantries is shown on the Scheme plans in Annex F of this EDR.

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7.3.19 Gantries on the eastbound carriageway:

a) one gateway gantry positioned shortly after the junction 11 entry slip road. This gantry will carry a single MS4 and a set of four AMIs, one positioned over each lane, to display lane availability and speed limits;

b) one intermediate gantry similar to the gateway, but positioned half way along the section;

c) ~~nine~~eight additional ~~VMSs (one MS3 and eight~~ MS4s~~)~~ positioned over the nearside lane at regular intervals;

d) two ADSs positioned at 1 ¼ mile (~~1.61km~~2.01km) and ½ mile (0.81km) in advance of junction 10 showing the exit destinations of Reading (E) Bracknell and Wokingham; and

e) one final direction sign on approach to junction 10, showing exit destination as above and M4 through traffic destinations of Greater London and Maidenhead. This will carry a set of four AMIs, one positioned over each lane.

7.3.20 Gantries on the westbound carriageway:

a) one gateway gantry positioned on the junction 10 entry slip road from the A329(M) southbound. This gantry will carry a single MS4, to display lane availability and speed limits;

~~a)~~b) one gateway gantry positioned downstream of junction 10 entry slip road~~.~~ from the A329(M) northbound. This gantry will carry a single MS4 and a set of four AMIs, one positioned over each lane, to display lane availability and speed limits;

~~b)~~c) one intermediate ~~gantry~~gantries, similar to the gateway, but positioned ~~half way~~at equal intervals along the section. This gantry will carry four AMIs and a single MS4;

~~c)~~d) ~~eight~~seven additional MS4s positioned over the nearside lane at regular intervals;

~~d)~~e) two ADSs positioned at 2/3 mile (1.07km) and 1/3 mile (0.54km) in advance of junction 11 showing the exit destinations of Basingstoke and Reading (S&C); and

~~e)~~f) one final direction sign on approach to junction ~~8/9~~11, showing exit destination as above and M4 through traffic destinations of the South West, Bristol and Reading (W). This gantry will also carry a set of four AMIs, one over each lane.

Proposed land-take

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Table 1 Schedule of proposed land-take between junctions 11 and 10

Category	Quantity (ha)	Comments
Permanent land-take	0.08	Access for transmission station
Temporary land-take	0.88	Total quantity of temporary land-take required between junctions 11 and 10 aside from that associated with third party (other) land
Third party (other) (Temporary)	0.23	Short-term possession in relation to railway underbridge

7.4 Junction 10 to junction 8/9

Existing

7.4.1 The M4 between junction 10 (Winnersh) and junction 8/9 (Holyport) has three running lanes in each direction. There is also a hard shoulder on the nearside of each carriageway, but there is no lighting between these junctions. The general landform through this link is rural. A detailed description of the surrounding landscape, the settlements served by this link and any relevant local landscape designations is provided in chapter 4 of this EDR.

7.4.2 Junction 10 is an interchange between the M4 and the A329(M), with the A329(M) crossing the M4 on a two-span overbridge supported by full height abutments and a pier to the central reserve. The junction 10 link road overbridges take the same form, this being a four-span structure supported by bank seats to each motorway embankment and piers to each verge and the central reserve The eastbound merge consists of two lanes which reduce to one lane as it joins the M4, while the westbound diverge remains as two lanes throughout the junction.

7.4.3 The M4 rises gradually out of junction 10, and 500m after the slip road ends it reaches Bill Hill overbridge. Bill Hill overbridge carries the A321 over the M4 and takes the form of a four span. This structure will not be affected by scheme with the ~~Scheme~~exception of minor structural modifications to the central reserve pier related to the proposed central reserve concrete barrier.

7.4.4 Following Bill Hill overbridge, the M4 gradually rises up before taking a downward gradient to Straight Mile overbridge. Straight Mile Road is carried over the M4 by this four span structure. ~~No works are anticipated to this structure.~~This structure will not be affected by scheme with the exception of minor structural modifications to the central reserve pier related to the proposed central reserve concrete barrier.

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7.4.5 The M4 then follows a slight rise and crests prior to Billingbear Farm overbridge, which is situated on a slight downward gradient. This structure has three-spans. ~~The Scheme will not affect this structure.~~This structure will not be affected by scheme with the exception of minor structural modifications to the central reserve pier related to the proposed central reserve concrete barrier.

7.4.6 Hammonds Wood is situated on the same downward slope. This structure has four spans and carries the B3018 over the M4. ~~It~~This structure will not be affected by scheme with the ~~Scheme~~exception of minor structural modifications to the central reserve pier related to the proposed central reserve concrete barrier.

7.4.7 Further along the M4, Beenhams overbridge is situated on a very slight downward gradient. This structure ~~also~~ has four spans and will not be affected by scheme with the ~~Scheme~~exception of minor structural modifications to the central reserve pier related to the proposed central reserve concrete barrier.

7.4.8 The M4 then gradually rises before cresting at Littlefield Green overbridge. This structure carries the B3024 over the M4 and takes the form of a four-span deck. ~~The Scheme will not affect this structure.~~This structure will not be affected by scheme with the exception of minor structural modifications to the central reserve pier related to the proposed central reserve concrete barrier.

7.4.9 Paley Street Farm overbridge is situated on a slight downward slope. The structure has three-spans. No works are anticipated to this structure.

7.4.10 The M4 follows the same downward gradient to Stud Green Access overbridge. This structure takes the same form as the previous overbridge and carries Thrift Lane over the M4. The Scheme will not affect this structure.

7.4.11 The M4 then continues uninterrupted on a slight downward gradient to junction 8/9. The eastbound diverge has one lane which expands to three lanes on reaching the junction, while the westbound merge has two lanes which reduces to one lane as it joins the M4. junction 8/9 itself is a gyratory, elevated above the main carriageway of the motorway on two overbridges. These overbridges are described as part of the junction 8/9 to junction 7 link in chapter 4 of this EDR.

Proposed works on the motorway

Lane configuration

7.4.12 ALR will be provided for the entire length of this section between the junctions, with the existing three lanes and the hard shoulder converted to create four running lanes with no hard shoulder. Four ~~ERAs~~EAs are to be provided on each carriageway. One ~~ERA~~EA in each direction will incorporate a new POP. The existing POPs, one to each carriageway, will be removed.~~The existing POPs, one to each carriageway, will be removed.~~

~~7.4.13 TJR will be implemented at junction 8/9 (Holyport), but not at junction 10 (A329(M) Winnersh Interchange). The lane configuration for this section of motorway will be the~~

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~~same in all material respects to that for junction 12 to junction 11, i.e. lane gain/lane drop at the western end and four through lanes in each direction at the eastern end.~~

7.4.13 Junction 10 and 8/9 will retain their current provision of three lanes and a hard shoulder in each direction. Slip roads will be configured to create lane gain or lane drop as appropriate.

Offside and central reserve works

7.4.14 Work in the central reserve and offside lanes in this link is the same in all material respects to the work proposed for the section from junction 12 to junction 11 ~~except that no road lighting is proposed.~~. It includes widening the existing carriageway of the M4 by 200mm to 500mm and in the central reserve: provision of a hard surface, construction of RCB and modifications to the drainage system.

Nearside and verge works

7.4.15 Work in the central reserve and offside lanes in this link is the same in all material respects to the work proposed for the section from junction 12 to junction 11.

Carriageway resurfacing

7.4.16 Low-noise surfacing will be provided throughout the Scheme as part of the works.

Gantries

~~7.4.17~~ There will be 30 gantries between junction 10 and junction 8/9. 27 of these will be various cantilever type structures and three will be super-span portals~~. Two of the super-span portals will display~~ (each displaying information to both eastbound and westbound carriageways~~.~~). In total there will be 16 gantries facing ~~the~~westbound traffic ~~on each carriageway. The location of the gantries is shown on the Scheme plans in Annex I of this EDR.~~

7.4.17 ~~Gantries on the~~, and 17 facing eastbound traffic. The location of the gantries is shown on the Scheme plans in Annex F of this EDR.

7.4.18 Gantries on the eastbound carriageway:

~~7.4.18~~ one gateway gantry positioned shortly after the junction ~~carriageway:~~

a) ~~one gateway gantry positioned shortly after the junction~~ 10 entry slip road. This gantry will carry a single MS4 and a set of four AMIs, one positioned over each lane, to display lane availability and speed limits;

b) two intermediate gantries, similar to the gateway, but positioned at roughly equal intervals along the section~~;~~. These gantries will carry four AMIs and a single MS4;

c) ten additional VMSs (two MS3s and eight MS4s) positioned over the nearside lane at regular intervals;

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d) two ADSs positioned at 1 mile (1.61km) and ½ mile (0.81km) in advance of junction 8/9 showing the exit destination of High Wycombe and Maidenhead; ~~and~~

e) one final direction sign on approach to junction 8/9 showing exit destination as above and M4 through traffic destinations of Greater London and Slough (W). This gantry will also carry a set of four AMIs, one over each lane~~.~~;

f) and one super-span portal gantry that crosses the eastbound carriageway but provides no signage to this carriageway. This gantry is positioned 60m downstream of the previous gantry.

7.4.19 Gantries on the westbound carriageway:

a) one gateway gantry similar to eastbound gateway, but positioned downstream of the junction 8/9 entry slip road;

b) two intermediate gantries similar to the gateway, but positioned at roughly equal intervals along the section~~;~~. These gantries will carry four AMIs and a single MS4;

c) ten additional MS4s positioned over the nearside lane at regular intervals;

d) two ADSs positioned at 1 mile (1.61km) and ½ mile (0.81km) in advance of junction 10 showing the exit destinations of Reading (E), Bracknell and Wokingham; and

e) one final direction sign on approach to junction 10, showing exit destination as above and M4 through traffic destinations of the South West Wales, Bristol and Reading (S, W & C).

Proposed land-take

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Table ~~15~~16 Schedule of proposed land-take between junctions 10 and 8/9

Category	Quantity (ha)	Comments
Temporary land-take	7.44	Land associated with Construction Compound 4 (see 8.2.11)

7.5 Junction 8/9 to junction 7

Existing

7.5.1 The M4 between junction 8/9 (Holyport) and junction 7 (Huntercombe) has three running lanes in each direction. There is also a hard shoulder on the nearside of each carriageway, but each hard shoulder has intermittent breaks, or discontinuities, as described below. The main carriageway lighting columns are located in the central

reserve. The general landform through this link is rural with isolated residential and industrial areas. A detailed description of the surrounding landscape, the settlements served by this link and any relevant local landscape designations is provided in chapter 4 of this EDR.

7.5.2 Junction 8/9 is formed as a gyratory, elevated above the main carriageway of the motorway. There is a two-lane slip road merging to a single lane slip on to the eastbound carriageway of the M4, and a similar slip off the carriageway up to junction 8/9 on the westbound carriageway.

7.5.3 Ascot Road overbridge (Figure 24) is located after the end of the slip road tapers on a slight upward gradient. Ascot Road overbridge is currently a four span overbridge which carries the A330 over the M4 and, in conjunction with the A308(M), connects junction 8/9 of the M4 with the villages and towns to the south of the M4. The hard shoulder of the M4 is discontinuous under the bridge therefore a replacement bridge needs to be constructed to enable ALR. To the north of the M4 at this location is industrial land which is slightly elevated above the line of the motorway. The land falls away to the south on which there is residential housing. To the east, the motorway passes over the A308 Windsor Road on a three-span underbridge. Neither the structure of this bridge nor Windsor Road under the bridge is affected by the Scheme. The motorway then continues on an elevated section to The Cut underbridge which is unaffected by the Scheme. There is a POP on the westbound carriageway between the two underbridges.

7.5.4 The M4 continues to rise up before dipping down towards the next structure encountered, Monkey Island overbridge, which is currently a four-span bridge which is shown in Figure 25. The road over this bridge is a local unclassified road, connecting the village of Bray with a number of dwellings and several hotels and other businesses. The carriageways narrow at this point and the hard shoulder is discontinuous as the motorway passes under the bridge therefore a replacement bridge needs to be constructed to enable ALR. Immediately after the Monkey Island overbridge the hard shoulder resumes for some 300m, before ending again prior to the Thames Bray underbridge.

7.5.5 The Thames Bray underbridge has three-spans and also carries footways/ cycleways over the river, one on each side of the motorway. This bridge needs widening to enable ALR. Close to the northern boundary at this location is a high pressure gas pipeline owned by National Grid Gas.

7.5.6 After Bray Bridge, the motorway level falls to the next major structure to the east which is Marsh Lane overbridge, see Figure 26. This is currently another four- span overbridge, again with a short discontinuity in the M4 hard shoulder therefore a replacement bridge needs to be constructed to enable ALR. Marsh Lane is an unclassified road linking Dorney and Dorney Reach to the south with the A4, Bath Road, to the north. The M4 then crosses over the Jubilee River (a hydraulic channel constructed to take overflow from the River Thames and so alleviate flooding to areas

in and around the towns of Maidenhead, Windsor, and Eton). The bridge over the Jubilee River is not affected by the Scheme.

7.5.7 Continuing eastwards from the Jubilee River, the M4 reaches Lake End Road overbridge, currently another four-span bridge over the motorway with short discontinuities in the hard shoulder. The discontinuities necessitate construction of a replacement bridge to enable ALR. Lake End Road, or the B3026, is roughly parallel to Marsh Lane and also links Dorney to the A4. The M4, as it passes under Lake End Road overbridge, has arrived at the start of the slip roads to and from junction 7.

7.5.8 Junction 7, at Huntercombe, is a trumpet-shaped junction at the end of a 1km long dual two-lane road which links the M4 to the A4 Bath Road between Maidenhead and Slough. The link road, known as the Huntercombe Spur, starts at a roundabout on the A4, heads south, crosses over the M4 on the Huntercombe Spur overbridge, currently a four-span structure similar to those at Marsh Lane and Lake End Road and then swings all the way round to the west and then back north to form the "loop" of the trumpet shape. One lane of the westbound slip road onto the M4 is currently hatched over with white road markings so that the merge on to the motorway operates as a single lane merge. The eastbound slip road off the M4 has two lanes which curve to the north before merging into the link road to the A4.

7.5.9 The hard shoulder below the Huntercombe Spur overbridge is discontinuous therefore a replacement bridge needs to be constructed to enable ALR. The works associated with the bridge are described as part of the junction 7 to junction 6 link in chapter 4 of this EDR.

Proposed works on the motorway

Lane configuration

7.5.10 ALR will be provided for the entire length of this section~~, with~~ between the junctions as well as through junction 7 where the existing three lanes and the hard shoulder will be converted to create four running lanes with no hard shoulder. ~~Two ERAs~~This will require reconfiguration of the slip roads at junction 7. Two EAs are to be provided on the eastbound carriageway and one on the westbound side. None of these are suitably located for a POP so the existing POP (westbound) will be removed and not replaced.

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~~7.5.11 TJR will be implemented at junction 8/9 (Holyport) and junction 7 (Huntercombe). This will require reconfiguration of the slip roads at these junctions.~~

7.5.11 Junction 8/9 will retain its current provision of three lanes and a hard shoulder in each direction. Slip roads will be configured to create lane gain or lane drop as appropriate.

Offside and central reserve works

7.5.12 Work in the central reserve and offside lanes in this link is the same in all material respects to the work proposed for the section from junction 12 to junction 11. It includes widening the existing carriageway by 200mm to 500mm and in the central reserve: provision of a hard surface, construction of RCB, and modifications to the drainage

system ~~and replacement road lighting.~~

~~7.5.13 New lighting will be provided for the whole length of this section. Lighting columns will be mounted on top of the new concrete barrier to carry LED luminaires 12m above the carriageway.~~

Nearside and verge works

~~7.5.14~~7.5.13 Work in the central reserve and offside lanes in this link is the same in all material respects to the work proposed for the section from junction 12 to junction 11.

Carriageway resurfacing

~~7.5.15~~7.5.14 Low-noise surfacing will be provided throughout the Scheme as part of the works.

Gantries

~~7.5.16~~7.1.1 There will be ~~21~~17 gantries between junction 8/9 and junction 7. Of these, 16 will be cantilever type gantries and one will be a super-span portal gantry facing traffic on both carriageways. In total, ten gantries will be on the eastbound carriageway and ~~11~~8 on the westbound carriageway. ~~These will all be cantilever type structures. The location of the gantries is shown on the Scheme plans in Annex F of this EDR.~~

~~7.5.17~~7.1.1 ~~Gantries on the eastbound carriageway:~~

~~7.5.15 one gateway gantry positioned shortly after the junction~~ The location of the gantries is shown on the Scheme plans in Annex F of this EDR.

7.5.16 Gantries on the eastbound carriageway:

a) one gateway gantry positioned shortly after the junction 8/9 entry slip road. This gantry will carry a single MS4 and a set of four AMIs, one positioned over each lane, to display lane availability and speed limits;

b) six additional MS4s positioned over the nearside lane at regular intervals;

c) two ADSs positioned at 1 mile (1.61km) and ½ mile (0.81km) in advance of junction 7 showing the exit destination of Slough (W); and

d) one final direction sign on approach to junction 7, showing exit destination as above and M4 through traffic destinations of Greater London and Slough (C).

~~7.5.18~~7.5.17 Gantries on the westbound carriageway:

a) one gateway gantry positioned upstream of the junction 7 exit slip road. ~~one gateway gantry positioned downstream of the junction 7 entry slip road.~~ This gantry will carry a single MS4 and a set of four AMIs, one positioned over each lane, to display lane availability and speed limits;

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b) one gateway gantry positioned downstream of the junction 7 entry slip road. This gantry will carry a single MS4 and a set of four AMIs, one positioned over each lane, to display lane availability and speed limits;

~~b)~~c) ~~seven~~two additional ~~VMSs (five MS4s~~MS4 and two MS3s~~)~~ will be positioned over the nearside lane at regular intervals;

~~c)~~d) two ADSs positioned at 1 mile (1.61km) and ½ mile (0.81km) in advance of junction 8/9 showing the exit destinations of High Wycombe and Maidenhead; and

~~d)~~e) one final direction sign on approach to junction 8/9, showing exit destination as above and M4 through traffic destinations of South West, Reading and Bracknell. This gantry will carry a single MS4.

Proposed works on Ascot Road

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~~7.5.19~~7.5.18 As evidenced by the discontinuities in the hard shoulder under Ascot Road (Figure ~~24~~23), the existing bridge spans can only accommodate three lanes on each carriageway of the motorway and are not adequate for four-lane ALR. A longer span replacement bridge is therefore required.

Figure 1 View of the existing Ascot Road Bridge

~~7.5.20~~7.5.19 An online replacement option for this bridge was considered. However, heavy traffic usage of the A330 Ascot Road and the unsuitability of the existing Holyport Road and Windsor Road mean that there is no suitable diversion for traffic on Ascot Road during construction works.

~~7.5.21~~7.5.20 As such, the proposed structure will be constructed adjacent to the existing bridge. This will allow pedestrians and traffic to continue to use the existing bridge while the new bridge is being constructed. However, some occasional signal controlled, single-lane TM will be required during the works. On completion of the new bridge, traffic will be diverted onto it and the old bridge will then be demolished.

~~7.5.22~~7.5.21 The side road in the vicinity of the existing bridge will be re-aligned to the east

of its current position. The new alignment has been developed to provide a large horizontal curve on the southern side of the road to aid forward visibility. An alignment on the western side of Ascot Road would result in a tighter horizontal curve approaching the southern tie-in. Re-aligning the road on the western side would also impact on residential property and the communications masts on the southern side of the motorway. The eastern re-alignment requires the construction of a ~~170m~~65m long (approximately) reinforced concrete retaining wall~~, up to 6m high, on~~ at the ~~north-eastern side~~back of the ~~new bridge to minimise impact on~~verge and an outer sheet pile wall approximately 140m long running adjacent ~~industrial premises~~to the highway boundary.

~~7.5.23~~7.5.22 The proposed structure is a single-span bridge. The level of the finished carriageway over the proposed bridge will be approximately 1.~~4m~~8m higher than the existing overbridge, due to the change in form and span of the proposed structure. The carriageway widths of the new bridge will not change from those existing. An overbridge general arrangement drawing is included in Annex F of this EDR.

7.5.23 Access to a new Scottish and Southern Energy sub-station to the northwest of the bridge will also be incorporated into the design.

7.5.24 It is anticipated that the construction works for this bridge will take 18 months to complete. This includes a three month allowance to divert existing underground services from the old bridge to the new bridge.

Proposed works at Monkey Island overbridge

7.5.25 Monkey Island overbridge (Figure ~~25~~24) is another of the existing bridges over the M4 which cannot accommodate four-lane ALR. A longer span replacement bridge is therefore required.

Figure 2 View of the existing Monkey Island Bridge

7.5.26 Monkey Island Lane is a no through-road to vehicular traffic to the south with the road continuing as a bridleway. It provides the only vehicular access to a number of residential and business properties south of the M4. There is therefore no suitable diversion for Monkey Island Lane so the new bridge will be built to the western side of

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the existing bridge to enable the latter to remain in use until the new bridge has been completed. Realignment of Monkey Island Lane to the west is preferable to an eastward alignment because it moves the road away from adjacent residential properties.

7.5.27 The proposed structure is a ~~single~~three-span bridge~~.~~, with the back-spans carrying Monkey Island Lane over two existing flood relief culverts. The level of the finished carriageway over the proposed bridge will be approximately 1.~~4m~~3m higher than the existing overbridge, due to the change in form and span of the proposed structure. The carriageway widths of the new bridge will not change from those existing. An overbridge general arrangement drawing is included in Annex F of this EDR.

~~7.5.28 Behind the abutments of the existing structure at this location, in the north and south verges of the M4, are flood relief culverts which provide alleviation of excessive retention of water by the approach embankments to Monkey Island overbridge in flood conditions. These culverts are likely to need extending as part of the works to replace the overbridge at this location.~~

~~7.5.29~~7.5.28 It is anticipated that the construction works for this bridge will take 14 months to complete. This includes a three ~~-~~month allowance to divert existing underground services from the old bridge to the new bridge.

Proposed work at Thames Bray underbridge

~~7.5.30~~7.5.29 The Thames Bray underbridge has insufficient width to accommodate ALR and therefore requires widening. Both symmetrical and asymmetrical widening have been considered, but asymmetrical widening to the north has been selected as the preferred solution as explained in chapter 5 of this EDR.

~~7.5.31~~7.5.30 To accommodate the asymmetric widening to the north of the existing bridge, the central alignment of the M4 motorway over the bridge will be moved to the north by up to 4m. The route of the motorway will tie back into the existing alignment within 400m either side of the bridge. Embankment widening options depend on the findings of the geotechnical investigation and site constraints but, will be designed to avoid impact on the nearby gas main and to minimise land-take requirements.

~~7.5.32~~7.5.31 The proposal includes the introduction of two additional girders on the north side of the bridge supporting an additional width of deck equal to 7.8m. The preferred installation option is to lift the girders in short lengths using a 200tonne crane positioned at carriageway level on the widened embankments. The first section would cantilever out from the abutment on both sides followed by a second intermediate section and third central section. An underbridge general arrangement drawing is included in Annex F of this EDR.

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Figure 253 View of Thames Bray underbridge from south-east embankment

~~7.5.33~~7.5.32 Initial access for construction works to the north-east side will be via Marsh Lane on the east bank of the River Thames. However, this access is not suitable for heavy construction plant so, the main construction access will be gained from the motorway by tracking down the embankment. Access will be gained to the north- west side of the bridge via the access track from Monkey Island Lane.

~~7.5.34~~7.5.33 During construction works, there is sufficient width on the carriageway at this location to allow the introduction of a temporary vehicle restraint in conjunction with narrow running lanes and a safe working zone of 1.2m. Consequently, three lanes of traffic can be maintained in both directions for the duration of the works apart from during short closures for lifting operations.

~~7.5.35~~7.5.34 The river will remain open to navigation for most of the construction period. However, it will need to be closed for the duration of the actual beam lifts. There are also three footpaths/cycleways to consider:

a) the footpath/cycleway over the river on the south side of the M4 is not affected by asymmetric widening and will be kept open;

b) the footpath/cycleway over the river on the north side of the M4 will be closed for the duration of the works. A signed diversion will be provided via Monkey Island Lane to the west and Marsh Lane to the east; and

c) the tow-path under the bridge on the east side of the river will be isolated from the works and kept open during construction. However, like the river navigation route, short-term closures will be required during the beam lifts.

~~7.5.36~~7.5.35 It is anticipated that the construction works for this bridge will take 27 months to complete.

Proposed works at Marsh Lane and Lake End Road overbridges

~~7.5.37~~7.5.36 The existing bridges carrying Marsh Lane and Lake End Road over the M4 can each only accommodate three lanes on each carriageway of the motorway and are not

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adequate for four-lane ALR. A longer span replacement bridge is therefore required.

Figure 4 View of the existing Marsh Lane bridge

Figure 5 View of Existing Lake End Road bridge

~~7.5.38~~7.5.37 .The original proposals for Marsh Lane and Lake End Road overbridges were online replacement for both and this was based on the assumption that each of the side roads can be temporarily closed for the duration of the construction with one being the diversion for the other. Responses from local residents and Dorney rowing lake during the consultation period noted that the proposed diversion route for the closure of Lake End Road overbridge was not suitable for buses or boat trailers. An issue was also raised regarding pedestrian access to Dorney County Combined School from the north side of the M4 in the event of any closure of Marsh Lane overbridge. As a consequence of these consultation responses the proposals for these bridges have been amended to maintain suitable access for buses and boat trailers. The Agency is investigating the need to provide transport for pupils of Dorney School during the closure of Marsh Lane overbridge. The indicative construction sequence will be as

follows:

a) build new Lake End Road overbridge to the west of the existing bridge;

b) demolish old Lake End Road overbridge;

c) divert traffic from Marsh Lane to Lake End Road;

d) demolish and re-build Marsh Lane Road overbridge; and

e) re-open Marsh Lane to traffic.

7.5.38 ~~The proposed structures are both single-span bridges.~~Lake End Road will be constructed as a two-span bridge. The level of the finished carriageway over the proposed ~~bridges~~bridge will be approximately 1.~~2m~~6m higher than ~~the~~ existing ~~overbridges~~, due to the change in form and span of the proposed ~~structures.~~structure. The northern span will carry Lake End Road over existing utilities.

7.5.39 Marsh Lane will be a single-span bridge. The level of the finished carriageway over the proposed bridge will be approximately 1.7m higher than the existing overbridge, due to the change in form and span of the proposed structure. The carriageway widths of the new bridges will not change from those existing.

~~7.5.39~~7.5.40 For details see the overbridge general arrangement drawings in Annex F of this EDR.

~~7.5.40~~7.5.41 The diversion route for vehicles during closure of Marsh Lane overbridge will be via the B3026 Lake End Road and the A4 Bath Road. The Agency is investigating the need to provide transport for pupils of Dorney School during the closure of Marsh Lane overbridge.

~~7.5.41~~7.5.42 It is anticipated that the construction works for each bridge will take 12 months to complete. The indicative programme for the works (see Annex B) assumes that work at Lake End Road will be completed first and work at Marsh Lane will then follow.

Proposed land-take

Table ~~16~~17 Schedule of proposed land-take between junctions 8/9 and 7

Category	Quantity (ha)	Comments
Permanent land-take	0.70	Associated with rebuilding of Ascot Road overbridge (both north and south of the M4)
Permanent land-take	0.26	Associated with rebuilding of Monkey Island Lane overbridge

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Category	Quantity (ha)	Comments
Permanent land-take	2.23	Required between Monkey Island Lane and the Thames Bray underbridge
Permanent land-take	0.64	Required for the rebuilding of Marsh Lane overbridge
Permanent land-take	1.01	Required for the rebuilding of Lake End Road overbridge
Temporary land-take	6.15	Associated with Construction Compound 5 (see 8.2.11)
Temporary land-take	6.01	Total quantity of temporary land-take required between junctions 8/9 and 7 aside from that associated with construction compounds and third party (other) land. Includes unoccupied building at the western extent of the Priors Way Industrial Estate and small parcels of agricultural land.
Third party (other)	1.18	Associated with work to Thames Bray underbridge

7.6 Junction 7 to junction 6

Existing

7.6.1 The M4 between junction 7 (Huntercombe) and junction 6 (Chalvey) has three running lanes in each direction. There is also a hard shoulder on the nearside of each carriageway, but each hard shoulder has discontinuities, as described below. The main carriageway lighting columns are located in the central reserve. The general landform through this link is residential. A detailed description of the surrounding landscape, the settlements served by this link and any relevant local landscape designations is provided in chapter 4 of this EDR.

7.6.2 Junction 7, at Huntercombe, is a trumpet-shaped junction as described in section 7.5.8. The westbound diverge is contained to one lane as it loops off the M4 with the second lane of the slip road hatched out until the link road straightens out. The eastbound merge is formed of two lanes as it leaves the junction 7 link road but, then reduces to one lane as it joins the M4.

7.6.3 The surrounding landform to Huntercombe Spur overbridge is mainly rural with the exception of the area to the north-east, which is residential and the structure can be seen from these houses. The structure has four spans supported by buried abutments in the verge embankment and piers to each verge and the central reserve. Both hard shoulders are currently discontinuous under the structure therefore it will be replaced under the Scheme.

7.6.4 Further along the M4 situated on a very slight downward gradient is Oldway Lane overbridge. This structure carries an accommodation access track over the M4. The track is a bridleway connecting to another track parallel to the westbound carriageway. The surrounding landform is primarily rural with the exception of the area to the north-east corner which has residential properties within 100m. The structure also has four spans supported by buried abutments in the verge embankments and piers to the verges and central reserve. The verge piers force discontinuities in the M4 hard shoulder, meaning a longer span replacement bridge is required at this location.

7.6.5 There is an environmental bund to the eastbound verge located between Oldway Lane overbridge and the next structure, Wood Lane overbridge. The bund has a length of approximately 1,100m. This bund will be retained unaltered.

7.6.6 Wood Lane overbridge is situated on a very slight downward gradient. The structure carries Wood Lane, an unclassified local road, and provides the sole access for a number of residential properties and a water treatment works. The structure has four spans supported by buried abutments in the verge embankments and piers to the verges and central reserve. The piers force discontinuities in the M4 hard shoulder meaning a longer span replacement bridge is required at this location.

7.6.7 There is also an environmental bund located to the parkland to the north of the M4 between Wood Lane overbridge and junction 6. This bund will be retained unaltered.

7.6.8 Further along the M4 to the east and situated on a very slight downward gradient, is Chalvey culvert. This culvert carries a drainage channel through the motorway embankment below the M4 and the slip roads at junction 6. The structure is formed from a 3.5m span concrete box culvert with a height of approximately 2.5m.

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7.6.9 Due to proposed slip road re-alignment and widening, the culvert will require extensions to both ends. This extension will take the form of the existing concrete box culvert.

7.6.10 The eastbound diverge to junction 6 has one lane which expands to three lanes on reaching the junction, while the westbound merge has two lanes which reduces to one lane as it joins the M4. There is environmental barrier along the full length of the verge on the eastbound diverge. Junction 6 is a gyratory, situated beneath the M4. The main carriageway of the motorway is carried over the junction by two underbridges. These underbridges are described as part of the junction 6 to junction 5 link in chapter 4 of this EDR.

Proposed works on the motorway

Lane configuration

~~7.6.11 Lane provision will be the same in all material respects to the link from junction 8/9 to junction 7 - ALR in each direction with TJR at the junction at each end of the link.~~

7.6.11 ALR will be provided for the entire length of this section between the junctions as well as through junction 7 (Huntercombe), with the existing three lanes and the hard shoulder converted to create four running lanes with no hard shoulder. This will require reconfiguration of the slip roads at junction 7.Junction 6 will retain its provision of three lanes and a hard shoulder in each direction. Slip roads will be configured to create lane gain or lane drop as appropriate.

7.6.12 One ~~ERA~~EA will be provided on each carriageway. There are no existing POPs on this link and no new ones are proposed.

Offside and central reserve works

7.6.13 Work in the central reserve and offside lanes in this link is the same in all material respects to the work proposed for the link from junction 12 to junction 11~~.~~ except that this section will have street lighting installed.

Nearside and verge works

7.6.14 Work in the central reserve and offside lanes in this link is the same in all material respects to the work proposed for the link from junction 12 to junction 11.

7.6.15 The one material difference is that there will be ~~790m~~550m of new ~~2m~~3.5m high noise barrier from Wood Lane overbridge to junction 6 to help shield the residential properties north of the motorway, such as those on Mitchel Close and Cooper Way.

Carriageway resurfacing

7.6.16 Low-noise surfacing will be provided throughout the Scheme as part of the works.

Gantries

7.6.17 There will be nine gantries between junction 7 and junction 6. Eight of these will be cantilever type structures and one will be a super-span portal. The super-span portal will display information to both eastbound and westbound carriageways. In total, there will be five gantries facing the traffic on each carriageway. There will also be a new gantry on the link road between junction 7 and the A4 Bath Road, this will be a cantilever structure over the southbound carriageway~~.~~ and will carry a single MS4 and a set of three AMIs, one positioned over each lane. The location of the gantries is shown on the Scheme plans in Annex ~~f~~F of this EDR.

7.6.18 Gantries on the eastbound carriageway:

a) one gateway gantry positioned shortly after the junction 7 entry slip road. This super-span portal gantry will carry a single MS4 and a set of four AMIs, one positioned over each lane, to display lane availability and speed limits. This gantry will also carry the 2/3 mile (1.073km) ADS for junction 6;

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b) two additional MS4s positioned over the nearside lane at regular intervals;

c) one ADS positioned at 1/3 mile (0.536km) in advance of junction 6 showing the exit destinations of Slough (C) and Windsor; and

d) one final direction sign on approach to junction 6, showing exit destination as above and M4 through traffic destinations of Greater London and Slough (E).

7.6.19 Gantries on the westbound carriageway:

a) one gateway gantry positioned downstream of junction 6 entry slip road. This gantry will carry a single MS4 and a set of four AMIs, one positioned over each lane, to display lane availability and speed limits;

b) one additional MS4 positioned over the nearside lane on the super-span gantry;

c) two ADSs positioned at 2/3 mile (1.073km) and 1/3 mile (0.536km) in advance of junction 7 showing the exit destination of Slough (W); and

d) one final direction sign on approach to junction 7, showing the exit destination as above and M4 through traffic destinations of the South West, Reading and Maidenhead. This gantry will carry four AMIs.

Proposed works on Huntercombe Spur overbridge (Junction 7)

7.6.20 As evidenced by the discontinuities in the hard shoulder under Huntercombe Spur (Figure ~~29~~28), the existing bridge spans can only accommodate three lanes on each carriageway of the motorway and are not adequate for four-lane ALR. A longer span replacement bridge is therefore required.

Figure ~~28~~28 View of the existing Huntercombe Spur bridge

~~7.6.21 Offline replacement has been selected for this bridge for~~This bridge will be replaced by an online single-span structure. To facilitate the ~~reasons explained in chapter 5~~movement of ~~this EDR. This allows the junction to remain open~~ traffic during construction~~. The new~~ of the online structure, a temporary offline bridge will be built ~~as~~

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~~two separate structures in the following sequence:~~

~~e) construct the new southbound bridge to the eastern side of the existing bridge;~~

~~f) divert northbound and southbound traffic onto the new bridge with one lane in each direction;~~

~~g) demolish the existing bridge;~~

~~h) construct the new northbound bridge on the site of the old bridge; and~~

~~i) open both new bridges to two lanes of traffic in each direction.~~

7.6.21 ~~This will result in a realignment of the bridge~~ to the east~~.~~ of the main structure.

7.6.22 ~~The~~ The level of the finished carriageway over the proposed bridge will be approximately 1.~~2m~~4m higher than the existing overbridge, due to the form and span of the proposed structure. The link road and approach embankments will, therefore, need realigning. ~~A short length of retaining wall will be constructed to ensure that this work does not encroach on the allotments or residential areas northeast of the junction.~~

~~7.6.23~~7.6.22 The new ~~bridges will each be three-span bridges as described in section 6.3. The new decks will be some 3m wider than the existing~~ bridge ~~so that each bridge~~ will ~~be able to~~ carry ~~two lanes~~a single lane and ~~a~~ hard shoulder ~~for the spur~~ in each direction. An overbridge general arrangement drawing is included in Annex F of this EDR.

~~7.6.24~~7.6.23 It is anticipated that the construction works for the ~~two bridges~~bridge and the link road will take about 26 months.

Proposed works on Oldway Lane overbridge

~~7.6.25~~7.6.24 Oldway Lane overbridge (Figure ~~30~~29) is another of the existing bridges over M4 which cannot accommodate four-lane ALR. A longer span replacement bridge is therefore required.

Figure ~~29~~29 View of the existing Oldway Lane bridge

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~~7.6.26~~7.6.25 Oldway Lane carries only the occasional motorised vehicle. It operates mainly as a bridleway. A power to close the bridleway temporarily to facilitate demolition and construction works will be included in the DCO. Diversion routes will need to be agreed with the local authority but there are possible routes over both Wood Lane and Lake End Road overbridges.

~~7.6.27~~7.6.26 Once the diversion is in place, the existing bridge will be demolished and a new structure built in its place. The level of the finished route over the proposed bridge will be approximately ~~1.1m~~0.8m higher than the existing overbridge, due to the change in form and span of the proposed structure. The track or bridleway width will be approximately 0.5m narrower than the existing bridge. For details see the overbridge drawings in Annex F of the EDR.

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~~7.6.28~~7.6.27 It is anticipated that the construction works for this bridge will take eight months to complete.

Proposed works on Wood Lane overbridge

~~7.6.29~~7.6.28 The existing bridge carrying Wood Lane over the M4 (Figure ~~31~~30) can only accommodate three lanes on each carriageway of the motorway and is not adequate for four-lane ALR. A longer span replacement bridge is therefore required.

Figure ~~30~~30 View of the existing Wood Lane bridge

~~7.6.30~~7.6.29 For the reasons explained in chapter 5 of this EDR, offline construction has been selected as the preferred option for this structure.

~~7.6.31~~7.6.30 The new bridge will be built to the east of the existing bridge. This will move the road away from the residential properties near the southwest corner of the bridge and allows an improvement of the alignment of the tight 180 degree bend to the south of the M4. ~~However, this will require the introduction of a 220m long (approximately) concrete faced retaining wall on the north eastern side of the new bridge approach embankment to avoid impact on adjacent retail premises (an Asda superstore).~~

~~7.6.32~~7.6.31 The proposed new structure is a ~~single~~two-span bridge (see section 6.3). The level of the finished carriageway over the proposed bridge will be approximately ~~1.4m~~2.0m higher than the existing overbridge, due to the change in form and span of the proposed structure. An overbridge general arrangement drawing is included in Annex F of this EDR.

~~7.6.33~~7.6.32 The construction works for this bridge are anticipated to take 20 months to complete. This includes five months to divert underground utilities from old bridge to new.

Proposed works at Chalvey culvert

~~7.6.34~~7.6.33 The Chalvey culvert (Figure ~~32~~31) carries the M4 over the Chalvey Ditch, which is to the west of junction 6. The culvert is a 3.66m span reinforced concrete box structure and has insufficient width to carry the widened junction 6 slip roads on both sides of the carriageway.

~~7.6.35 The proposed symmetrical 4m widening solution will match the form of the existing culvert with precast or in-situ reinforced concrete construction.~~

7.6.34 To accommodate the new carriageway alignment it is proposed to extend the structure by 4.65m at the southern end and 4.11m at the northern end.

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Figure ~~31~~31 View of the southern of Chalvey culvert

Proposed land-take

Table ~~17~~18 Schedule of proposed land-take between junctions 7 and 6

Category	Quantity (ha)	Comments
Permanent land-take	0.24	Associated with junction 7 Huntercombe Spur
Permanent land-take	0.01	Associated with Wood Lane overbridge
Temporary land-take	3.06	Associated with Construction Compound 6 (see 8.2.11)
Temporary land-take	9.31	Total quantity of temporary land-take required between junctions 7 and 6 aside from that associated with construction compounds

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7.7 Junction 6 to junction 5

Existing

7.7.1 The M4 between junction 6 (Chalvey) and junction 5 (Langley) has three running lanes in each direction. There is also a hard shoulder on the nearside of each carriageway but each hard shoulder has discontinuities, as described below. The main carriageway lighting columns are located in the central reserve. The general landform through this link is residential with isolated areas of parkland.

7.7.2 Junction 6 is formed of a gyratory, situated beneath the M4. The main carriageway of the motorway is carried over the junction by two bridges: Chalvey Interchange West overbridge and Chalvey Interchange East overbridge. Both bridges take the same form; three-spans supported by bank seats to each verge embankment and piers to each verge. There is an environmental barrier to the eastbound verge within the junction. No work is anticipated to either of these bridges. The eastbound merge consists of two lanes which reduces to one lane as it joins the M4, while the westbound diverge has one lane which expands to three lanes on reaching the gyratory. There is an environmental barrier to the full length of verge to the eastbound merge and it continues along the main carriageway verge.

7.7.3 Windsor Branch Railway underbridge is located at the end of the slip roads to junction 6. The M4 slightly crests over the structure to allow sufficient clearance over the Slough to Windsor and Eton Branch railway line. The bridge comprises two separate but similar five-span structures; one carrying the eastbound carriageway and the other carrying the westbound carriageway. Over the structure there is an environmental barrier mounted on the north side and a pedestrian guardrail mounted on the south side. Both of these barriers are protected by high containment road restraint barriers to each verge. ~~The bridge has insufficient width to accommodate the proposed alignment at junction 6 and will therefore require widening.~~

7.7.4 Further along the M4, situated on a slight downward gradient is the Prince of Wales underbridge. The structure has four spans and carries the M4 over the A332. The Scheme will not affect this structure.

7.7.5 The downward gradient continues through to Water and Gas Main subway. The subway has a cross-section of ~~2.5m~~3.35m and provides a passage for utilities to cross beneath the M4. The subway is accessible to maintainers through access chamber lids that are located adjacent to the carriageway in the verge. The carriageway over this structure has three lanes in each direction and a discontinuous hard shoulder due to the proximity of the subway to Datchet Road overbridge. Due to the requirement for four lanes in each direction over this structure, the subway will require extending at both ends to move the access chamber lids away from the proposed alignment.

7.7.6 Datchet Road overbridge is the next bridge to the east. This structure carries the B376 Datchet Road, an all-purpose urban single carriageway, linking the towns of Slough to the north and Datchet to the south. The surrounding landform consists of residential properties to the north and to the south. The existing approaches to the overbridge on the B376 are at an incline to reach the necessary clearance over the M4. The structure has four spans supported by bank seats to the verge embankments and piers to the verges and central reserve. The verge piers force discontinuities in the M4 hard shoulder meaning that a longer span replacement bridge is required at this location.

7.7.7 The M4 continues on a slight downward slope to the Recreation Ground overbridge. This four-span structure carries a single carriageway which connects Upton Court Road and the track to Upton Court Park with the main road between Datchet and

Slough. The carriageway over the structure is gated and believed to be used occasionally by the park staff as well as being a public right of way used for access to the motocross club to the north of the structure. The ~~surroundinglandforms~~surrounding land form is rural to the north and residential to the south-west. The verge bridge piers force discontinuities in the M4 hard shoulder meaning that a longer span replacement bridge is required at this location.

7.7.8 Beyond the Recreation Ground overbridge, Water Main subway is located on a section of level carriageway. This subway is of the same construction and diameter as Water and Gas Main subway, with the exception that the access chamber covers are located within the hard shoulders. This subway will, therefore, also require an extension to both ends to move the access chamber lids into the proposed verge.

7.7.9 The M4 remains level on the approach to Riding Court Road overbridge. This four-span structure carries Riding Court Road, an all-purpose urban single carriageway, linking the B470 London Road to the south with Slough via the A4 London Road to the north. The surrounding landform is a mixture of residential and rural. The verge piers force discontinuities in the M4 hard shoulder meaning that a longer span replacement bridge is required at this location.

7.7.10 Between Riding Court Road overbridge and junction 5, the M4 is constricted by the presence of Riding Court Road to the north and Major's Farm Road to the south.

7.7.11 Further along the M4 from Riding Court Road overbridge is Ashley's Arch culvert. This is a 7.6m wide box structure ~~is~~carrying a 1.~~5m~~35m internal diameter concrete pipe ~~and allows a drainage channel to cross~~ beneath the M4. There is a discontinuous hard shoulder to the eastbound carriageway over this structure, meaning that the structure will require extending to the north to allow sufficient space for the proposed road layout.

7.7.12 The M4 then continues under Hams Farm footbridge on an upward gradient through to junction 5. The eastbound diverge has one lane which expands to four lanes on reaching the junction, while the westbound merge has two lanes which reduces to one lane as it joins the M4. Junction 5 is a gyratory, situated beneath the M4. The main carriageway of the motorway is carried over the junction by two bridges and a subway. These bridges are described as part of the junction 5 to junction 4b link in section 7.8.

Proposed works on the motorway

Lane configuration

7.7.13 ~~Lane~~ALR will be provided for the entire length of this section between the junctions, with the existing three lanes and the hard shoulder converted to create four running lanes with no hard shoulder.

~~7.7.13~~7.7.14 Junctions 5 and 6 will retain their current provision ~~will be similar to the previous links - ALR~~ of three lanes and a hard shoulder in each direction ~~with TJR at the junction at each end of the link.~~ . Slip roads will be configured to create lane gain or lane drop as appropriate.

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7.7.147.7.15 Four ERAsEAs will be provided, two on each carriageway. The western-most ERAEA on the eastbound carriageway will incorporate a new POP which will replace the only existing POP on this link.

Offside and central reserve works

7.7.157.7.16 Work in the central reserve and offside lanes in this link is the same in all material respects to the work proposed for the previous sectionslink from junction 12 to junction 11 except that this section will have street lighting installed.

Nearside and verge works

7.7.16 Work in the central reservenearside and offside lanesverge in this link is the same in all material respects to the work proposed for the previous sections.

7.7.17 The main differences are except that:

j) a new 2m high noise barrier will be constructed in both verges over the widened Windsor Branch Railway underbridge. This will mitigate the noise impact to properties on Spackmans Way to the north and Willowbrook to the south; and

a)7.7.17 a further 150m184m length of 2.4m5m high noise barrier in the southern verge west of Datchet Road overbridge will provide shielding forbe provided to shield properties on the Myrke.

Carriageway resurfacing

7.7.18 Low-noise surfacing will be provided throughout the Scheme as part of the works.

Gantries

7.7.19 There will be 17 16 gantries between junction 6 and junction 5. One will be a super-span portal and the others 16 gantries will all be various cantilever type structures. The super-span portal will display information to both eastbound and westbound carriageways. In total there will be nine gantries facing the traffic on eachthe eastbound carriageway., and nine gantries facing traffic on the westbound carriageway. The location of the gantries is shown on the Scheme plans in ES Volume 2Annex F.

7.7.20 Gantries on the eastbound carriageway:

a) one gateway gantry positioned shortly after the junction 6 entry slip road. This gantry will carry a single MS4 and a set of four AMIs, one positioned over each lane, to display lane availability and speed limits;

b) five additional MS4s positioned over the nearside lane at regular intervals;

c) two ADSs positioned at 1mile (1.61km) and 1/3 mile (0.54km) in advance of junction 5 showing the exit destinations of Langley, Colnbrook, Eton and Datchet. The 1 mile ADS carries an additional MS4; and

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d) one final direction sign will be on the immediate approach to junction ~~7~~5, showing exit ~~destination~~destinations as above and M4 through traffic destinations of ~~Greater~~ London and Heathrow. This gantry will also carry a set of four AMIs.

7.7.21 Gantries on the westbound carriageway:

a) one gateway gantry positioned downstream of the junction 5 entry slip road. This gantry will carry a single MS4 and a set of four AMIs, one positioned over each lane, to display lane availability and speed limits;

b) five additional MS4s positioned over the nearside lane at regular intervals;

c) two ADSs positioned at 2/3 mile (1.07km) and 1/3mile (0.54km) in advance of junction 6 showing the exit destinations of Slough (C) and ~~Windsor~~Winsor; and

d) one final direction sign on the approach to junction 6, showing exit destination as above and M4 through traffic destinations of the South West, Reading and Slough (W).

Proposed works at Railway culvert

7.7.22 A Railway culvert carries a drainage watercourse below the M4 mainline and junction 6 westbound off and eastbound on slip roads. The culvert has an abutment to abutment span of 4.5m and has an internal height of 2.1m. The carriageway above is on a high embankment and it is proposed to maintain the embankment slope above the culvert after the carriageway widening. To accommodate this the culvert is proposed to be widened by 7.6m to the north. The widening will take a similar structural form of the existing culvert and will maintain the existing internal headroom.

Figure 32 View of Railway culvert from the North

Proposed works at Windsor Branch railway bridge

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Figure ~~32~~33 View of Windsor Branch Railway Bridge from the South

~~7.7.22 The existing Windsor Branch railway bridge (Figure 33) has insufficient width to accommodate TJR at junction 6 and therefore requires widening. Asymmetric widening to the south by 8.85m is the preferred solution as explained in chapter 5~~Realignment ~~this EDR.~~

~~7.7.23 To accommodate the asymmetric widening, the~~ the central ~~alignment of~~reserve on the ~~M4~~ motorway ~~over the bridge~~ will require the slab supporting the existing central reserve to be ~~moved to the south by almost 6m. The route of the motorway~~reconstructed. The new central reserve slab will ~~tie back into the existing alignment within 400m either side of the bridge. Embankment widening options are currently under review, but may incorporate~~ need to be able to support a reinforced ~~and steepened side slopes to minimise the requirement for permanent land-take.~~

~~7.7.24 The proposed form of bridge widening will match the existing bridge and will consist of five spans constructed from precast~~ concrete ~~beams~~barrier and any accidental vehicle loads applied to it. This can be achieved by spanning a simply supported ~~on~~ reinforced concrete ~~piers and bank seats.~~

~~7.7.25 During construction works, a safe working zone of 1.2m and three narrow running lanes of traffic can be maintained in both directions for the duration of the works apart from during short closures for activities such as beam lifting.~~

~~7.7.26~~7.7.23 slab between the edges of the two existing decks. Two new central reserve approach slabs will also be constructed along each abutment to suit the proposed central reserve deck slabs. It is anticipated that the construction works for this bridge will take 27 months to complete.

Proposed works at Gas and Water Main culvert

~~7.7.27~~7.7.24 The Gas and Water Main subway culvert carries two water mains and a

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~~water~~gas main under the M4 immediately west of Datchet Road overbridge. The subway is a ~~3.35m~~4.57m span reinforced concrete box with access chambers at each end currently located in the existing hard shoulders. Consultation with National Grid has confirmed the gas main has been abandoned, although it is unclear whether the hazardous installation consent has been revoked. The water main remains in use.

~~7.7.28~~7.7.25 Maintenance and inspection of the existing structure are difficult and require confined-spaces trained diving teams and night time lane closures. ~~Subject to agreement with Thames Water, the preferred option is to infill the structure and eliminate the need for any further maintenance. Alternatively, the structure will require widening by approximately 3.1m at each end so that the access chambers can be moved into the verge and behind the safety barrier. This latter option is assessed by the EIA as a worst case scenario.~~ Upon request by Thames Water similar access arrangements into the subway will be reinstated and to accommodate this, the subway will be widened by 1.35m to the west and 2.0m to the east (within the 3.1m worst case scenario considered by the Environmental Statement). To avoid any damage to the assets the span of the widening on the west side will be limited to 1.45m. The existing manhole chambers will be removed and the openings permanently sealed with reinforced concrete cover slabs on top.

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Proposed works on Datchet Road

~~7.7.29~~7.7.26 As evidenced by the discontinuities in the hard shoulder under Datchet Road (Figure 34), the existing bridge spans can only accommodate three lanes on each carriageway of the motorway and is not adequate for four-lane ALR. A longer span replacement bridge is therefore required.

Figure 6 View of the existing Datchet Road bridge

~~7.7.30~~7.7.27 Offline replacement has been selected as explained in chapter 5 of this EDR. The proposed structure will be constructed adjacent to the existing bridge. This will allow pedestrians and traffic to continue to use the existing bridge while the new bridge is being constructed. However, some signal controlled single-lane TM will be required

on occasion during the works. On completion of the new bridge, traffic will be diverted onto it and the old bridge will be demolished.

~~7.7.31~~7.7.28 The side road in the vicinity of the existing bridge is re-aligned to the east of its current position as shown in the overbridge general arrangement drawings in Annex F of this EDR. This will move the road away from the residential properties south of the motorway, on The Myrke.

~~7.7.32~~7.7.29 The proposed structure is a ~~three~~two-span bridge. The level of the finished carriageway over the proposed bridge will be approximately 1.~~4m~~6m higher than the existing overbridge, due to the change in form and span of the proposed structure. The carriageway and footway widths of the new bridge will be similar to those existing.

~~7.7.33~~ It is anticipated that the construction works for this bridge will take 22 months to complete. This includes a five month allowance to divert existing underground services from the old bridge to the new bridge.

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Proposed works on the Recreation Ground overbridge

~~7.7.34~~7.7.30 The existing Recreation Ground overbridge (Figure 35) can only accommodate three lanes on each carriageway of the motorway and is not adequate for four- lane ALR. A longer span replacement bridge is therefore required.

Figure ~~34~~35 View of the existing Recreation Ground bridge

~~7.7.35~~7.7.31 A power to close the road over the bridge temporarily for the duration of the construction will be included in the DCO. A possible vehicular diversion route for the bridge would be via Datchet Road and Upton Court Road but details will need to be agreed with the local authority.

~~7.7.36~~7.7.32 The proposed structure is a single-span bridge. The level of the finished carriageway over the proposed bridge will be approximately 1.~~1m~~6m higher than the existing overbridge it replaces, due to the change in form and span of the proposed structure. The carriageway and ~~footpath~~footway widths ~~of~~on the new bridges will not change from those existing. ~~A 60m~~The footpath has been relocated from the south

side of the bridge to the north side. An uncontrolled pedestrian crossing point will be provided on the north side of the structure. A 20m length (approximately) of retaining wall will be constructed to ensure that the raised approach embankment does not encroach on the adjacent allotments. An overbridge general arrangement drawing is included in Annex F of this EDR.

~~7.7.37~~7.7.33 It is anticipated that the construction works will take eight months to complete.

Proposed works at Water Main culvert

~~7.7.38~~7.7.34 The Water Main culvert carries a water main under the M4 about 250m east of Recreation Ground overbridge, close to the Slough Road allotments. The culvert is a ~~2.75m~~3.35m span reinforced concrete box with access chambers at each end currently located in the existing hard shoulders.

7.7.35 Maintenance and inspection of the existing structure are difficult and require confined-spaces trained diving teams and night time lane closures. ~~Subject to agreement with~~ Upon request by Thames Water~~, the preferred option is to infill~~ similar access arrangements into the subway will be reinstated and to accommodate this, the ~~structure and thereby eliminate~~subway will need to be widened by 2m to the ~~need for any further maintenance. Alternatively,~~west and 3.8m to the ~~structure will require widening by approximately 2.1m at each end so that the access~~ east. The existing manhole chambers ~~can be moved into the verge and behind the safety barrier. will be~~ removed and the openings permanently sealed with reinforced concrete cover slabs on top.

~~7.7.39~~7.7.36 Working space for this activity will require temporary land acquisition at each end of the structure. At the southern end this would encroach temporarily on the Slough Road allotments.

Proposed works on Riding Court Road overbridge

~~7.7.40~~7.7.37 Riding Court Road overbridge (Figure 36) is another of the existing bridges over the M4 which cannot accommodate four-lane ALR. A longer span replacement bridge is therefore required.

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Figure ~~35~~36 View of the existing Riding Court bridge

~~7.7.41~~7.7.38 An offline bridge replacement for Riding Court Bridge has been selected for the reasons provided in chapter 5. The side road will be re-aligned to the west of its current position to achieve an improved horizontal alignment and to minimise impact on residential properties south of the motorway on London Road.

~~7.7.42~~7.7.39 The proposed structure is a single-span bridge. ~~The level of the finished carriageway will be approximately 1.4m~~The level of the finished carriageway will be approximately 1. 7m higher than the existing overbridge, due to the change in form and span of the proposed structure. The carriageway ~~widths of~~width on the new bridge will not change from ~~those~~ existing. An overbridge general arrangement drawing is included in Annex F of this EDR.

~~7.7.43~~7.7.40 It is anticipated that the construction works for this bridge will take 16 months to complete.

Proposed works at Ashley's Arch culvert

~~7.7.44~~7.7.41 Ashley's Arch culvert consists of two structures: a 1.~~5m~~35m internal diameter concrete pipe and a ~~6.1m~~7.6m wide reinforced concrete box culvert. The concrete pipe section has insufficient length to carry the widened eastbound carriageway and will require lengthening by approximately 1.~~5m~~25m to the north. The reinforced concrete culvert ~~is not affected~~will also be extended by a similar length to take the ~~Scheme.~~load arising from soil surcharge and applicable live load surcharge of the pipe.

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Proposed land-take

Table ~~18~~19 Schedule of proposed land-take between junctions 6 and 5

Category	Quantity (ha)	Comments
Permanent land-take	0.40	Associated with rebuilding of Datchet Road overbridge
Permanent land-take	0.24	Associated with rebuilding of Riding Court Road overbridge
Temporary land-take	1.35	Associated with Construction Compound 7 (see 8.2.11)
Temporary land-take	2.02	Associated with Construction Compound 8 (see 8.2.11)
Temporary land-take	8.11	Total quantity of temporary land-take required between junctions 6 and 5 aside from that associated with third party (other) land
Third party (other)	0.28	Associated with work to Windsor Branch Railway underbridge

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7.8 Junction 5 to junction 4b

Existing

7.8.1 The M4 between junction 5 (Langley) and junction 4b (M25) has four running lanes in each direction. There is also a hard shoulder on the nearside of each carriageway but each hard shoulder has discontinuities, as described below. The main carriageway lighting columns are located in the central reserve. The general landform through this link is residential and industrial around junction 5 and rural towards junction 4b.

7.8.2 Junction 5 (Langley) is formed of a gyratory, situated beneath the M4. The main carriageway of the motorway is carried over the junction by two underbridges and a subway. Both underbridges take the same form; three-spans supported by bank seats to each verge embankment and piers to each verge. The subway provides a route for the pedestrians to pass over the gyratory, but under the M4. The structure takes the form of a 2.4m span reinforced concrete box. There are elevated walkways leading away from the subway in both directions to spiral ramps down to pavement level at both sides of the gyratory. Over the structures, the carriageway is three lanes wide with no hard shoulder. ~~The~~No works are proposed to the Langley interchange underbridges and subway ~~will therefore require widening in order to provide four lanes~~as a part of ~~traffic in each direction through the junction~~this scheme. The eastbound merge consists of two lanes which reduces to one lane as it joins the M4, while the westbound

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diverge has one lane which expands to three lanes on reaching the gyratory.

7.8.3 The M4 follows a slight downward gradient away from junction. Sutton Lane overbridge is located immediately at the end of the junction 5 slip roads and carries Sutton Lane over the M4 on a four-span structure. This structure will not be affected by the Scheme.

7.8.4 The M4 levels out as it approaches Old Slade Lane overbridge. The structure is located at the start of the junction 4b slip road where the surrounding landform is mainly rural. The overbridge carries an accommodation track over the M4 to provide access for farm use, local pedestrians, dog walkers and cyclists as part of the Colne Valley Trail. The structure is formed from three-spans supported by bank seats to the verge embankments and piers to the verges. The piers force discontinuities in the M4 hard shoulder meaning that a longer span replacement bridge is required at this location.

7.8.5 The eastbound diverge to junction 4b has one lane which expands to two lanes, while the westbound merge remains as two lanes through the junction and as it joins the M4. The main carriageway of the M4 continues on a slight upward gradient through to junction 4b. Junction 4b itself is an interchange between the M4 and the M25. The overbridges through this junction are described as part of junction 4b to junction 4 in section 7.9.

Proposed works on the motorway

Lane configuration

7.8.6 ~~In the eastbound direction, TJR is provided at junction 5. The eastbound entry slip road from junction 5 merges into the left hand lane so that, at Sutton Lane overbridge, immediately downstream of the merge, the M4 will have four driving lanes and no hard shoulder. After~~Junctions 5 will retain its current provision of three lanes and a hard shoulder in each direction. Traveling eastbound, after passing under Sutton Lane, the existing M4 carriageway widens to four lanes and a hard shoulder. At this point, the four new driving lanes will be slewed left so that the existing hard shoulder becomes the new near side lane. This will generate space on the right hand side of the carriageway to develop a fifth driving lane. This section of five-lane ALR will then continue eastwards to junction 4b, where the two left hand lanes will peel off to tie in with the existing two-lane slip road to the M25. The remaining three lanes will continue as currently existing through junction 4b. Junction 4b will not have TJR.

7.8.7 In the westbound direction, TJR will not be implemented at junction 4b. The westbound slip road from the M25 to M4 will be configured to create a lane gain so that there will be four driving lanes from junction 4b to junction 5. This link already has four lanes and a hard shoulder and the existing hard shoulder will be retained as far as the junction 5 exit slip road. ~~TJR will be provided at junction 5.~~

7.8.8 One ~~ERA~~EA will be provided on the eastbound carriageway. This ~~ERA~~EA will not incorporate a new POP ~~which will replace the existing eastbound POP.~~. The westbound carriageway on this section will retain its hard shoulder and ~~its~~ existing ~~ERA~~POP.

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Offside and central reserve works

7.8.9 Work in the central reserve and offside lanes in this link is the same in all material respects to the work proposed for the ~~section~~link from junction 12 to junction 11 except that this section will have street lighting installed.

Nearside and verge works

7.8.10 Work in the central reserve and offside lanes in this link is the same in all material respects to the work proposed for the section from junction 12 to junction 11.

~~7.8.11 For 500m of the elevated section over junction 5 there will be new 2m high noise fencing in each verge of the motorway. This will benefit residential properties on both sides of the motorway, including those at Grampian Way, Ditton Road, Welland Close and Tweed Road.~~

Carriageway resurfacing

~~7.8.12~~7.8.11 Low-noise surfacing will be provided throughout the Scheme as part of the works.

Gantries

~~7.8.13~~7.8.12 There will be ~~11~~13 gantries between junction 5 and junction 4b. ~~Four~~Three will be super-~~ ~~~~span portals~~, two single-span portals and the other ~~seven~~eight will all be various cantilever type structures. ~~Three~~Two of the super-span portals will display information to both eastbound and westbound carriageways~~.~~, and one only to eastbound traffic. In total, there will be ~~seven~~ten gantries facing the traffic on ~~each~~the westbound carriageway, and five on the eastbound carriageway. The location of the gantries is shown on the Scheme plans in Annex F of this EDR.

~~7.8.14~~7.8.13 Gantries on the eastbound carriageway:

a) one gateway gantry positioned shortly after the junction 5 entry slip road. This gantry will carry a single MS4 and a set of five AMIs, one positioned over each lane, to display lane availability and speed limits;

b) ~~two intermediate gantries similar to the gateway gantry, but positioned half-way along and at the end of the section. The second of these two gantries~~one ADS at 1/3 mile (0.54km). The 1/3 mile ADS will also carry a single MS4 and a set of five AMIs, one positioned over each lane;

c) one additional MS3 positioned over the nearside lane;

~~b)~~d) one confirmatory gantry; this gantry is an existing structure which also spans the junction 4b westbound slip road off the M4. This gantry will also carry route confirmation signs for the slip road~~;~~. This gantry will carry a single MS4 and a set of five AMIs, one positioned over each lane; and

~~c) one additional MS3 positioned over the nearside lane;~~

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d) one ADS positioned in advance of junction 4b showing the exit destinations of M25, Watford, Oxford, Heathrow (Terminal 4, 5 & Cargo) and Gatwick; and

e) two further direction signs at 1/3 mile (0.54km) andone final gantry on the approach to junction 4b, showing the exit destination as above and M4 through traffic destinations of Greater London and Heathrow.

7.8.157.8.14 Gantries on the westbound carriageway:

a) one 1 ½ mile ADS positioned on the westbound junction 4b entry slip road, and another on the M4 mainline through junction 4b;

f)a) one gateway gantry positioned downstream of junction 4b entry slip road. This gantry will carry a single MS4 and a set of four AMIs, one positioned over each lane, to display lane availability and speed limits;

b) twoThis gantry will carry a single MS4 and a set of four AMIs, one positioned over each lane, to display lane availability and speed limits;

c) one additional MS4sMS4 positioned over the nearside lane at regular intervals;

a)d) one additional MS4 within junction 4b and one additional MS4 within junction 5;

b)e) two ADSs positioned at 2/3 mile (1.07km) and 1/3 mile (0.54km) in advance of junction 5 showing the exit destinations of Langley, Colnbrook and Datchet; and

c)f) one final direction sign on the approach to junction 5, showing the exit destination as above and M4 through traffic destinations of the South West, Reading and Slough (W & C).

Proposed works at Langley Interchange bridges

7.8.16 The bridges at Langley Interchange (junction 5) (see Figures 37 and 38) carry the M4 over the junction's roundabout on the A4. There are four existing structures, one for each carriageway over each side of the roundabout, with a narrow separation along the central reserve between each pair of eastbound and westbound bridges. Each bridge is only three lanes wide and will need to be widened by 4.5m to accommodate ALR through the junction.

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Figure 36 Discontinuous hard-shoulder at Langley Interchange

7.8.17 The separation of the bridges along the central reserve and the proximity of the existing slip roads preclude the option of asymmetric widening of the motorway. The proposed solution is therefore to widen each of the four structures by 4.5m outward from the motorway, leaving the central reserve unchanged. An overbridge general arrangement drawing is included in Annex F of this EDR.

7.8.18 Each of the bridges has three spans formed by concrete box girders. These box girders cannot easily be widened so the preferred solution is to widen the bridges using steel girders and a concrete deck slab.

Figure 37 Typical view of Langley Interchange bridges

7.8.19 During construction works, narrow lanes will be required on the M4 at this location to allow a safe working zone of 1.2m and three lanes of traffic to be maintained in both directions for the duration of the works (apart from during short closures for activities such as beam lifting).

~~7.8.20 Similarly, the three lanes of the roundabout and the footpaths under the bridge will be kept operational for the bulk of the construction period with only short term closures anticipated.~~

~~7.8.21 It is anticipated that the construction works for this bridge will take 14 months to complete.~~

~~Proposed works at Langley Interchange subway~~

~~Figure 38 Langley Interchange subway~~

~~7.8.22 The Langley Interchange subway (Figure 39) will require symmetric widening by 3.2m at each end to accommodate ALR through to junction 5. Symmetric rather than asymmetric widening is forced by the chosen option for the Langley Interchange bridges. The length of widening is constrained by the proximity of the footbridges over the roundabout at each end of the subway.~~

~~7.8.23 It is proposed to construct a reinforced concrete frame enclosing the existing wing walls. The temporary works required to retain the existing carriageway during the works could be provided by sheet piling or soil nailing.~~

~~7.8.24 The footways would need to be closed for the duration of the widening works and a temporary diversion would be signed and fenced via the interchange underbridges.~~

g) one confirmatory gantry which spans the junction 5 westbound off slip road. This gantry will carry route confirmation signs for the slip road with five AMIs and a single MS4.

Proposed works on Old Slade Lane overbridge

~~7.8.25~~7.8.15 The existing Old Slade Lane bridge (Figure 40) over the M4 can only accommodate three lanes on each carriageway of the motorway and is not adequate for four-lane ALR. A longer span replacement bridge is therefore required.

~~7.8.26~~7.8.16 A power to close the road and bridleway over the bridge temporarily for the duration of the construction will be required. A possible vehicular diversion route for the bridge would be via the A4 Colnbrook Bypass, Sutton Lane and North Park. Details will be agreed with the local authority.

Figure 7 View of the existing Old Slade Lane bridge

~~7.8.27~~7.8.17 The proposed structure is a single-span bridge. ~~The level of the finished carriageway will be approximately 1.1m~~The level of the finished carriageway will be approximately 1.0m higher than the existing overbridge, due to the change in form and span of the proposed structure. The carriageway widths of the new bridge will not change from those existing. An overbridge general arrangement drawing is included in Annex F of this EDR.

~~7.8.28~~7.8.18 It is anticipated that the construction works will take 12 months to complete.

Proposed land-take

Table 2 Schedule of proposed land-take between junctions 5 and 4b

Category	Quantity (ha)	Comments
Temporary land-take	3.40	Associated with Construction Compound 9 (see 8.2.11)
Temporary land-take	1.99	Total quantity of temporary land-take required between junctions 5 and 4b aside from that associated with construction compounds

7.9 Junction 4b to junction 4

Existing

7.9.1 The M4 between junction 4b (M25) and junction 4 (Heathrow) has four running lanes in each direction. There is also a hard shoulder on the nearside of each carriageway and lighting to both the central reserve and the verge. The general landform through this link is residential.

7.9.2 Junction 4b is an interchange between the M4 and the M25. Two of the junction 4b link roads pass over the M4 on viaducts, whilst the M4 passes over the other two link roads and Staines Branch Railway Line via the use of three single-span underbridges: Staines Branch Line West underbridge, Staines Branch Line underbridge and Staines Branch Line East underbridge. None of these structures will be affected by the Scheme. The eastbound merge and westbound diverge take the same form, which is two lanes separated by a ghost island.

7.9.3 Wraysbury River underbridge and River Colne underbridge are located within junction 4b and carry the M4 over the Wraysbury River and River Colne respectively. These bridges will not be affected by the Scheme.

7.9.4 Towards the end of the junction 4b slip roads, the main carriageway separates, forming a wide central reserve that is covered by dense vegetation. An environmental barrier has also been placed on the central reserve and the eastbound verge.

7.9.5 The M4 then passes under Little Benty North and South footbridges, before arriving at Harmondsworth Road North and South overbridges. Harmondsworth Road North overbridge has three-spans and is supported by bank seats to the verge embankments and piers to the verges. There is environmental barrier to the eastbound verge adjacent to the abutment. Harmondsworth Road South overbridge is a single-span deck on full-height abutments. Both structures carry Harmondsworth Road over the M4 and neither will be affected by the Scheme.

7.9.6 Further along the M4 situated on a slight incline is Sipson Road subway. This subway takes the form of a 3m spanning concrete box and provides pedestrian access under the M4 junction 4 slip roads. 850m over the structure there is environmental barrier to the eastbound verge and a steel parapet to westbound verge. Due to the proposed realignment and widening of the junction 4 slip roads, the subway will need to be widened at ~~both ends.~~the north end.

7.9.7 Holloway Lane underbridge is located further along the M4. The structure carries the M4 main carriageway and junction 4 slip roads over the A408. This structure has four spans. There are steel parapets to the motorway verges and an environmental barrier on the eastbound slip road verge. No works are proposed to this structure.

7.9.8 The eastbound diverge to junction 4 has two lanes which expand to four lanes on reaching the junction, while the westbound merge has three lanes which reduce to one lane as it joins the M4. There is also environmental barrier to the verge of the eastbound diverge. Junction 4 is a gyratory, situated beneath the M4. The main carriageway of the motorway is carried over the junction by two underbridges. These underbridges are described as part of the junction 4 to junction 3 link in section 7.10.

Proposed works on the motorway

Lane configuration

7.9.9 ALR, with five lanes in each direction, will be provided for the entire length of this link, with the existing four lanes and the hard shoulder converted to create five running lanes with no hard shoulder. Two ~~ERAs~~EAs are to be provided, one on each carriageway. The westbound ~~ERA~~EA will incorporate a new POP. The existing POP, on the westbound carriageway, will be removed.

7.9.10 TJR will not be provided at junction 4b (M25); as the M4 passes through junction 4b it will consist of three lanes and a hard shoulder in each direction. The slip roads to and from junction 4b will be configured as a double lane gain (eastbound) and double lane drop (westbound) to create the five lanes described above.

7.9.11 At junction 4 (Heathrow) a single lane drop (eastbound) and lane gain (westbound) will reduce the motorway back to four lanes each direction to provide TJR.

Offside and central reserve works

7.9.12 Work in the central reserve and offside lanes in this link is the same in all material respects to the work proposed for the section from junction 12 to junction 11~~.~~ except that this section will have street lighting installed.

Nearside and verge works

7.9.13 Work in the central reserve and offside lanes in this link is the same in all material respects to the work proposed for the section junction 12 to junction 11.

Carriageway resurfacing

7.9.14 Low-noise surfacing will be provided throughout the Scheme as part of the works.

Gantries

~~7.9.15~~ There will be ~~16~~14 gantries between junction 4b and junction 4, ~~eight~~ with seven facing traffic on ~~each~~the eastbound carriageway~~. These~~, and seven facing traffic on the westbound carriageway. There will be ~~a mix of six new cantilever structures, five new~~eight single-span portal gantries and ~~five re-used existing portal~~ six cantilever gantries. The location of the gantries is shown on the Scheme plans in Annex F of this EDR.

~~7.9.16~~7.9.15 Gantries on the eastbound carriageway:

a) one gateway gantry positioned shortly after junction 4b entry slip road. This gantry will carry a single MS4 and a set of five AMIs, one positioned over each lane, to display lane availability and speed limits;

b) one intermediate signal gantry similar to the gateway gantry positioned roughly half-way along the section. This gantry will carry a single MS4 and a set of five AMIs, one positioned over each lane;

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c) one additional MS4 positioned over the nearside lane within junction 4b;

d) ~~three~~two additional ADSs positioned at 1 mile (1.61km~~), ¾ mile (1.21km) and 1/4mile (0.40km) in advance of junction 4 showing)~~ (one on the ~~exit destinations of Heathrow (Terminals 1, 2 & 3) and Uxbridge. The ¾ mile (1.22km) sign will be located over the~~ M25 slip road ~~from M25. The ¼ mile (0.40km) gantry will also include direction signs for~~ and another on the M4 ~~through traffic;~~ mainline within junction 4b);

e) one final direction sign on the approach to junction 4, showing exit destinations as above and M4 through traffic destinations of Central London and Hounslow; and

f) one gantry with a route confirmation sign over the junction 4 slip road and an MS4 variable message sign over the M4.

~~7.9.17~~7.9.16 Gantries on the westbound carriageway:

a) one gateway gantry positioned downstream of the junction 4 entry slip road. This gantry will carry a single MS4 and a set of five AMIs, one positioned over each lane, to display lane availability and speed limits;

b) ~~two~~one intermediate signal gantries similar to the gateway gantry positioned roughly half-way along the section ~~and one over the junction 4b exit. The latter will include route confirmation signs for the slip road;~~ . This gantry will carry a single MS4 and a set of five AMIs;

c) one additional MS3 positioned over the nearside lane within junction 4;

d) ~~three~~two ADSs ~~positioned~~ at 1 mile (1.61km~~), ¾ mile (1.21km) and 1/4 mile (0.40km) in advance of~~) (one on the westbound junction 4 ~~showing the exit destinations via M25(S) of Heathrow (Terminals 4 & 5) and Gatwick, and via M25(N) of Watford and Oxford. The ¾ mile (1.21km) sign will be located over the~~ slip road ~~from the Heathrow Spur at junction 4. The ¼ mile (0.40km) gantry will also include direction signs for M4 through traffic; and~~ and another on the M4 mainline within junction 4)

e) one final direction sign on the approach to junction 4b, showing exit destinations ~~as above~~ and M4 through traffic destinations ~~of the South West, Reading and Slough.~~;

~~7.9.18 On the Heathrow spur road, to the south of junction 4, there will be a further three gantries. Two of these will re-use the existing gantries over the northbound carriageway to display appropriate lane destinations. A new MS3 cantilever gantry will be positioned over the northbound carriageway to inform drivers of conditions on the smart motorway ahead.~~

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f) one gantry with a route confirmation sign over the junction 4b slip road and an MS4 over the M4 and five AMIs.

7.9.17

Proposed works at Sipson Road subway

~~7.9.19~~7.9.18 Sipson Road subway (Figure ~~41~~38) creates a pedestrian route under the M4. It requires extending by ~~approximately 5m~~1.2m to the north to accommodate ALR through junction 4.

Figure 8 Sipson Road subway from the north

~~7.9.20 Asymmetric widening to the south side has been selected as the preferred option for the reasons explained in chapter 5 of this EDR.~~

~~7.9.21 The extension will be designed to span the existing reinforced concrete approach walls. The extended deck slab would be cast continuous with the existing deck and will be constructed at a level to match the headroom of the existing structure. The extension will be designed to avoid impact on the adjacent gas supply facility.~~

~~7.9.22 Some footway closures are anticipated to construct the widening and a diversion~~

~~is available via Holloway Lane to the east.~~

7.9.19 A retaining beam will be introduced on the northern side of the M4, which spans over the subway, and which would carry the parapet and environmental barrier that are proposed on the main carriageway at this location.

Proposed land-take

Table 3 Schedule of proposed land-take between junctions 4b and 4

Category	Quantity (ha)	Comments
Temporary land-take	0.27	Total quantity of temporary land-take required between junctions 4b and 4.

7.10 Junction 4 to junction 3

Existing

7.10.1 The M4 between junction 4 (Heathrow) and junction 3 (Hayes) is 3,000m long with three running lanes in each direction. There is also a hard shoulder on the nearside of each carriageway and lighting columns to the central reserve. The general landform through this link is residential.

7.10.2 Junction 4 is formed of a gyratory situated beneath the M4. The main carriageway of the motorway is carried over the junction by two underbridges: Airport Interchange West overbridge and Airport Interchange East overbridge. Both underbridges take the same form; three-spans supported by bank seats to each verge embankment and piers to each verge. The carriageways over the structures are three lanes wide with a hard shoulder. There is no work anticipated to either of these structures. The eastbound merge consists of two lanes which reduces to one lane as it joins the M4, while the westbound diverge has one lane which expands to three lanes on reaching the gyratory.

7.10.3 The M4 follows a downward gradient away from junction 4. After 1,400m the gradient almost levels out as it traverses over St. Peters subway. No works are anticipated to this structure.

7.10.4 Harlington overbridge is located a further 325m along the M4 at a similar gradient to the previous structure. This structure is supported by piers to both verges and carries the A437 High Street over the M4. The Scheme will not affect this structure.

7.10.5 Further along the M4, Fuller subway is situated on a similar gradient to the previous two structures. No works are anticipated to this structure.

7.10.6 St. Dunstan's subway is located 525m from the previous subway on a slightly upward gradient. This structure will not be affected by the Scheme.

7.10.7 The eastbound diverge to junction 3 has one lane which expands to three lanes on

reaching the junction, while the westbound merge has two lanes which reduce to one lane as it joins the M4. Junction 3 is a gyratory, situated beneath the M4. The main carriageway of the motorway is carried over the junction by Cranford Park Avenue underbridge. This structure will not be affected by the Scheme.

Proposed works on the motorway

Lane configuration

7.10.8 TJR will be implemented at junction 4 (Heathrow). This will require reconfiguration of the slip roads at the junction.

7.10.9 ALR will be provided for the entire length of this link, with the existing three lanes and the hard shoulder converted to create four running lanes with no hard shoulder. ~~Two ERAs~~Three EAs are to be provided, two on eastbound carriageway and one on westbound carriageway. One EA in each carriageway~~:~~ will include a POP. There are two existing POPs on this section both of which will be removed. ~~No new POPs are proposed.~~

7.10.10 Junction 3 (Hayes) is at the western end of the Scheme. Lane provision on the M4 through the junction is not affected by the Scheme. It will remain as three lanes and a hard shoulder in each direction. The westbound entry slip road merges with the M4 in a lane gain configuration to create a fourth lane on the motorway. Similarly, but in the opposite direction, the eastbound exit slip road results in a lane drop.

Offside and central reserve works

7.10.11 Work in the central reserve and offside lanes in this link is the same in all material respects to the work proposed for the section from junction 11 to junction 12~~.~~ except that this section will have street lighting installed.

Nearside and verge works

7.10.12 Work in the central reserve and offside lanes in this link is the same in all material respects to the work proposed for the section from junction 11 to junction 12.

Carriageway resurfacing

7.10.13 Low-noise surfacing will be provided throughout the Scheme as part of the works.

Gantries

7.10.14 There will be 11 gantries between junction 4 and junction 3. Ten will be cantilever structures and one a super-span portal. The super-span portal will carry information for traffic on both carriageways giving a total of six gantries facing the traffic on each carriageway. The location of the gantries is shown on the Scheme plans in ~~ES Volume 2~~Annex F. Gantry provision on this section is summarised below.

7.10.15 Gantries on the eastbound carriageway:

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a) one gateway gantry positioned shortly after the junction 4 entry slip road. This gantry will carry a single MS4 and a set of four AMIs, one positioned over each lane, to display lane availability and speed limits;

b) two additional MS4s positioned over the nearside lane within junctions ~~4b~~4 and 3;

c) ~~two ADSs~~one ADS positioned at ½ mile (0.81km) ~~and ¼ mile (0.40km)~~ in advance of junction 3 showing the exit destinations of Heathrow, Harrow and Hounslow. ~~The ¼ mile (0.40km)~~

~~c)~~d) One intermediate gantry ~~will also include~~which includes a set of four AMIs; and

~~d)~~e) one final direction sign on the approach to junction 3, showing exit destinations as above, and M4 through traffic destinations of Central London and Ealing.

7.10.16 Gantries on the westbound carriageway:

~~e) two additional MS4s positioned over the nearside lane within junctions 4b and 3;~~

a) one gateway gantry positioned downstream of the junction 4 entry slip road. This gantry will carry a single MS4 and a set of four AMIs, one positioned over each lane, to display lane availability and speed limits;

b) two additional MS4s positioned over the nearside lane within junctions 3 and ~~4b~~4;

c) ~~two ADSs~~one ADS positioned at ½ mile (0.81km) ~~and ¼ mile (0.40km)~~ in advance of junction 4 showing the exit destinations of Heathrow (Terminals ~~1,~~ 2 & 3) and Uxbridge~~. The ¼ mile (0.40km);~~

~~c)~~d) one intermediate gantry ~~will also a set of~~carrying four AMIs, positioned over each lane; and

e) one final direction sign on the approach to junction 4, showing exit destinations ~~as above~~ and M4 through traffic destinations of the ~~South~~ West~~,~~ and Reading ~~and Heathrow (Terminals 4 & 5).~~ .

~~a)~~ **Proposed land-take**

~~**Proposed land-take**~~

Table 4 Schedule of proposed land-take between junctions 4 and 3

Category	Quantity (ha)	Comments
Temporary land-take	2.08	Associated with Construction Compound 11 (see 8.2.11)

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7.11 Visual appearance

General

7.11.1 As the Scheme is the improvement of an existing road, with no verge widening or installation of types of infrastructure that are not already present along the Scheme, the visual appearance of the motorway will not change significantly from the existing appearance. It is considered that the replacement bridges, number of gantries and changes to vegetation will be the main alterations to the visual appearance for both the road users and adjacent residents.

7.11.2 The replacement bridges will be of standard form as used elsewhere on the SRN but, will be up to ~~1.5m~~2.0m higher than existing with thicker decks for single-span bridges. Oldway Lane overbridge will be replaced by a footbridge rather than a vehicular bridge. None of the replacement bridges will be of elaborate visual appearance.

7.11.3 There will be more gantries along the Scheme. Currently there are 33 gantries between junction 12 and junction 3, equivalent to one gantry every c.1515m. The ~~Preliminary Design~~current design of the Scheme requires a total of ~~162~~156 gantries, this equates to a gantry every c.~~310m~~320m.

7.11.4 Vegetation clearance will be required around areas of bridgeworks and drainage works in the verge. This may involve removing mature vegetation and although there will be replacement planting, it will take some time for the vegetation to reach the same level of maturity.

Landscape and visual impact assessment

7.11.5 The landscape and visual implications of the Scheme are assessed in the ES. The assessment considers how the Scheme will alter the character of the landscape, as well as the views of the landscape afforded to people - visual amenity considerations. These two separate but related issues form the basis of landscape and visual impact assessment ("LVIA").

7.11.6 The receptors affected by the visual impacts of the Scheme are properties and public vantage points with the North Wessex AONB and the Thames Valley landscape. They will be impacted by both temporary and permanent effects.

7.11.7 Temporary disruption to landscape character and views will primarily result from activities such as use of plant and vehicles, creation of compounds, and material stockpiles, during construction. This will be mitigated by construction best practice to minimise disruption, e.g. protection of existing vegetation to be retained and targeted use of hoarding to screen construction sites. This will be secured in the CEMP.

7.11.8 Permanent impacts may include deterioration in landscape character and views, primarily resulting from vegetation clearance and the introduction of new operational infrastructure. This will be mitigated as far as possible by replacement planting.

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7.12 Environmental Masterplan

7.12.1 The vegetation clearance and Environmental Masterplan drawings for the Scheme are included in Annex ~~F~~A of this EDR. These provide an indication of how the land cleared of vegetation for temporary construction works will be replanted following construction, and incorporates mitigation measures identified as part of the EIA process. Environmental enhancement is also incorporated in appropriate circumstances. Proposed planting will mainly consist of native tree and shrub species appropriate to the nature of the soil and the pre-existing vegetation composition. In the medium to long-term, this planting will mature to provide habitats and visual screening which will replace the vegetation removed.

7.12.2 The Environmental Masterplan will be developed further during the detailed design phase of the scheme. It currently includes the elements described below.

Nature conservation mitigation areas

7.12.3 The Environmental Masterplan incorporates replacement habitat for affected protected and notable species where required, including:

a) appropriate receptor sites for amphibians and reptiles;

b) reinstatement of the affected verges includes reseeding with a wildflower seed mix;

c) native tree planting (particularly on the borders of any Local Wildlife Sites and Local Nature Reserves), with an emphasis on fruit bearing varieties in areas identified as supporting badgers;

d) installation of otter ledges on culverts or under bridges where no ledge is currently present;

e) provision of bat boxes; and

f) otter and badger resistant fencing.

Landscape planting

7.12.4 The planting design would take into account Highways Agency required minimum planting distances from the carriageway, with shrubs not less than 3m, and trees not less than 5m. The planting areas would maintain safe sightlines at road bends and junctions, and would avoid obscuring signs and signals. Tall growing species would not be planted under power lines, and tree and shrub planting would generally avoid underground services. Planting would perform visual screening, landscape integration, nature conservation/biodiversity, public amenity and noise screening. Plant stock would be preferably of local or regional provenance. As a minimum, plant stock would be from the UK.

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7.12.5 Landscape mitigation would restore lost vegetation where practicable and link with remaining hedges and trees on the highway boundary, screening the traffic from nearby properties but also leaving open countryside views from the road at appropriate

locations.

Vertical noise barriers

7.12.6 Vertical barriers are proposed in several areas to mitigate noise impacts as set out in the Environmental Statement. The locations of these are indicated in the Environmental Masterplan.

7.13 Access

Overview

7.13.1 No new motorway junctions are created or existing junctions decommissioned as part of the Scheme. No restrictions, that might limit the direction of travel, are being introduced at any of the junctions.

7.13.2 Traffic on the local road network using the overbridges may be disrupted during construction works. Disruption would include the need to adhere to diversion routes. This disruption will only be temporary until the construction work for each particular bridge is complete.

During construction

Traffic management on the motorway

~~7.13.3~~ TM will be required along the Scheme to provide the necessary work space required for the contractor, while maintaining safe conditions for drivers and construction workers. ~~A Contractor has not been appointed to the Scheme yet so precise TM measures are not known.~~ A draft TM Plan ~~is~~was included as an appendix to the ES~~.~~ in the original application for DCO. This has been updated regularly as construction progressed..

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~~7.13.4~~ Typically, TM would comprise narrow lanes with a speed restriction of 50mph separated from the working areas by a temporary barrier and a safety zone. For most of the construction period for each link, three lanes in each direction will be kept open for traffic. During the verge work phase (see chapter 8 and Construction: Programme in Annex B) the three lanes will be positioned over existing lanes 3, 2 and part of lane 1. During the central reserve works phase, the three lanes will be positioned over the existing hard-shoulder, lane 1 and part of lane 2. Similar arrangements will be used to maintain four lanes during works between junction 4b and junction 4.

~~7.13.5~~7.13.3 Further short-term TM measures and lane closures will be required for some operations. Bridge demolition and gantry erection will require full overnight road closures. Construction of bridge piers in the central reserve will require additional working space typically leaving only two lanes in each direction open for traffic. Periods of two lane operation will be limited to weekends and nights wherever practicable.

~~7.13.6~~7.13.4 Where motorway closures are required, diversions will be signed along the existing strategic diversion routes utilising adjacent local authority roads.

~~7.13.7~~7.13.5 It is anticipated that speed enforcement measures will be required to ensure road user and road worker safety. This is likely to be in the form of temporary CCTV and average speed check ("SPECS"). The SPECS cameras will be required in each TM section, whilst temporary CCTV cameras will be installed approximately every 500m to ensure the efficient identification of breakdowns and management of incidents.

Traffic management on side roads

~~7.13.8~~ TM on side roads will depend on the alignment of the new overbridge being constructed. For online reconstructions, the side road will be closed for the duration of the bridge and side road construction, and a temporary diversion route will be in place. For offline reconstructions, localised TM, such as signal controlled one way working and speed restrictions, will be required for defined periods during construction. ~~See Tables 22 and 23 for further detail.~~

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~~**Table 22 Temporary diversions for online overbridge construction**~~

~~Overbridge~~	~~Location~~	~~Indicative programme~~	~~Diversion route~~
~~Marsh Lane~~	~~J8/9 – J7~~	~~Mar. 2019 to Mar. 2020~~	~~Bath Road (A4) and Lake End Road~~
~~Oldway Lane~~	~~J7 – J6~~	~~May 2019 to Feb. 2020~~	~~Using existing public rights of way and Wood Lane bridge to cross M4~~
~~Recreation Ground~~	~~J6 – J5~~	~~July 2018 to Feb. 2019~~	~~Datchet Road and Upton Court Road~~
~~Old Slade Lane~~	~~J5 – J4b~~	~~July 2018 to Apr. 2019~~	~~Colnbrook Bypass/Sutton Lane and North Park~~

~~**Table 23 Traffic management for offline overbridge construction**~~

~~Overbridge~~	~~Location~~	~~Indicative programme~~	~~Traffic management~~
~~Ascot Road~~	~~J8/9 – J7~~	~~Apr. 2018 to Oct. 2019~~	~~Signal controlled, alternating, one-way traffic ("shuttle way working") for tie-in and overlapping works~~
~~Monkey Island Lane~~	~~J8/9 – J7~~	~~Feb. 2018 to Aug. 2019~~	~~Shuttle way working using signal control for tie-in and overlapping works~~

Overbridge	Location	Indicative programme	Traffic management
Lake End Road	J8/9 – J7	Feb. 2018 to Mar. 2019	Shuttle way working using signal control for tie-in and overlapping works
Huntercombe Spur	J7	Feb. 2018 to Mar. 2020	Shuttle way working and phased construction
Wood Lane	J7 – J6	Feb. 2018 to Jan. 2020	Shuttle way working using signal control for tie-in and overlapping works
Datchet Road	J6 – J5	July 2018 to July 2020	Shuttle way working using signal control for tie-in and overlapping works
Riding Court Road	J6 – J5	Mar. 2019 to Aug. 2020	Shuttle way working using signal control for tie-in and overlapping works

Non-motorway users

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7.13.97.13.6 Severance issues caused by the Scheme for non-motorway users are outlined below and discussed in chapter 13 Effects on all Travellers of the ES.

7.13.107.13.7 Users of walking and cycling routes in the vicinity of the Scheme may experience

adverse effects as a result of the construction works although appropriate mitigation measures (e.g. diversion routes, signage and information to be provided to nearby residents prior to rebuilding) will be implemented by the Contractor.

Junction 8/9 to junction 7

7.13.117.13.8 Reconstruction of Ascot Road overbridge will have an impact on movements between communities to the north and south of the M4 and vice versa. Communities to the south are likely to experience a greater impact given that Maidenhead is an important centre of employment and service centre. The bridge is proposed to be constructed offline, allowing traffic and pedestrians to continue to use the existing bridge whilst the new bridge is constructed. Some TM measures will be required during some sections of the works, which may result in slight delays for traffic using the bridge. The Priors Way Industrial Estate is accessed from Windsor Road. Reconstruction of the overbridge is likely to involve temporary land-take comprising part of the Industrial Estate nearest the A330. Other occupiers of the Industrial Estate are unlikely to be subject to significant effects. This is fully assessed in the ES.

~~7.13.12~~7.13.9 Monkey Island overbridge provides access from the village of Bray to the north of the M4 to residential properties and facilities to the south of the M4 including the Monkey Island Hotel. Monkey Island Lane is a no-through-road with a section to the south of the M4 comprising a bridleway; this forms part of the route of National Cycle Route 4. Online construction of the overbridge would not be practical as both local residents and users of the Monkey Island Hotel would be unable to access premises south of the M4, meaning that an offline construction solution is required. As such, the new bridge will be built offline to the western side of the existing bridge to enable the latter to remain in use until the new bridge is completed.

~~7.13.13~~7.13.10 Marsh Lane overbridge connects Bath Road to the north with the villages of Dorney, Eton Wick and Eton to the south of the M4. The route also provides access to Eton Dorney Lake. Users of this route may experience slightly lengthened journey times during the construction period. Lake End Road to the east provides an alternative route. Marsh Lane overbridge is proposed to be constructed online, with Lake End Road overbridge providing a suitable diversion during the construction period.

~~7.13.14~~7.13.11 Lake End Road provides an alternative route to that of Marsh Lane, connecting Bath Road to the north of the M4 with the villages of Dorney, Eton Wick and Eton to the south of the motorway. Lake End Road overbridge is proposed to be constructed offline to maintain suitable access to Dorney rowing lake and Dorney School.

~~7.13.15~~7.13.12 The Thames Bray underbridge will be widened. This may have implications for walkers, cyclists and boat users along this stretch of the River Thames during the widening works. Cycle routes pass on either side of the M4 in this location prior to heading north/south along the riverbank. Users of the Thames Path may experience an impact should the bridge widening works require any temporary diversion of the footpath. Businesses that may experience an effect as a result of the widening of the Thames Bray underbridge include the Amerden Caravan Park to the east of the Thames – the site may experience a reduction in visitor numbers during the course of the construction period. Ongoing consultation with landowners and occupiers, for example owners of the Amerden Caravan Park, is being undertaken; potential mitigation measures may include the phasing of construction to avoid peak holiday periods. There will also be a need to for a number of closures of the waterway to river traffic to allow beam lifts.

~~7.13.16~~7.13.13 Alterations are proposed to the Huntercombe Spur overbridge at junction 7 of the M4. Proposals for the westbound slip lane have been realigned to avoid land-take of residential properties in this area.

Junction 7 to junction 6

~~7.13.17~~7.13.14 Possible temporary community severance impacts may occur as a result of the rebuilding of the Oldway Lane and Wood Lane overbridges. With appropriate diversion routes, signage and information to be provided prior to rebuilding

taking place, the severance is not considered to be significant.

~~7.13.18~~7.13.15 Alterations are proposed to the Huntercombe Spur overbridge eastbound. There is not anticipated to be any effect on local residents in terms of land-take; principal effects therefore relate to loss of amenity as described earlier.

~~7.13.19~~7.13.16 The Oldway Lane overbridge is used by pedestrians, cyclists and equestrians to link residential areas on the outskirts of Slough (notably the Cippenham area) with recreational activities along the Jubilee River. The Jubilee River Cycle Path and walking routes pass along the towpath of the river from where links can be made with Eton Dorney rowing lake, NCN4 and the Thames Path. The rebuilding of the Oldway Lane overbridge could therefore have an adverse effect on recreational users in the short-term as the crossing would be temporarily severed during reconstruction of the pedestrian bridge. Alternative access could be provided for the residents of Cippenham to the Jubilee River via the Wood Lane overbridge; however this requires a considerable increase in length of journey and the use of on-road sections for cyclists in particular.

~~7.13.20~~7.13.17 Wood Lane overbridge provides a link across the M4 for 16 properties on Wood Lane, together with access to the Thames Water's Slough sewage treatment plant. The route to the south of Wood Lane connects with a walking/cycling path along the banks of the Jubilee River. The overbridge is proposed to be reconstructed offline, to the east of the existing bridge to enable the latter to remain open during the construction period.

Junction 6 to junction 5

~~7.13.21~~7.13.18 Datchet Road overbridge is proposed to be rebuilt offline to the east of its current location. The Order limits pass in the immediate vicinity of properties in Datchet Meadows and continue through an area of greenfield land to the west of Upton Park. There is a motocross site to the north of the M4 in this location, which may experience impacts as a result of the construction works, although these would be temporary in nature. Due to the overbridge being constructed offline, there are no community severance issues.

~~7.13.22~~7.13.19 The Recreation Ground overbridge provides a pedestrian and cycle link from Datchet Road to the Upton Park area. It provides properties in the Upton Court Road area with the opportunity to link in with the wider Jubilee River walking and cycling network. The motocross site located in the immediate vicinity of the Recreation Ground overbridge to the north of the M4. As the overbridge will be rebuilt online, use of the motocross site and the walking/cycling route north to Upton Park Road may be affected by construction works. The Myrke allotment site is to the east of the Recreation Ground overbridge and part of the allotment site is within the Order limits as part of the temporary land-take required for the purposes of motorway relocating Thames Water's access chambers. The access road to the allotment sites is also within the Order limits. There may be a temporary adverse impact on users of the allotments as a result of the construction of the Scheme in terms of access to the site, general amenity of the area

and notably for users of those allotments whose plots may be required as part of temporary land-take for the Scheme.

~~7.13.23~~7.13.20 Riding Court Road overbridge provides a link between the town of Datchet and the area of Langley on the outskirts of Slough. It provides access, in particular, for employees from the Datchet area and other residential areas to the south of the M4 travelling to businesses in either the Riding Court Farm development or the Computer Associates Technologies business to the north of the M4. Employees from the Datchet area travelling to either of these locations (and vice versa) would experience a longer journey times travelling along alternative routes such as Slough Road and London Road to the west; or the B470 and London Road to the east. Access into the Riding Court farm development itself may be improved as a result of the Scheme. A planning application currently with Royal Borough of Windsor and Maidenhead to develop a sand and gravel extraction site in the vicinity of Riding Court Farm has been identified; the form of replacement of Riding Court Road overbridge has been altered in line with this development and also to eliminate the need for a long vehicular diversion and to make the diversion of statutory undertakers' apparatus easier.

~~7.13.24~~7.13.21 Between junction 6 and the Windsor Branch Railway underbridge, the Order limits for the Scheme include the Jubilee River towpath and cycle route on the northern bank. There may therefore be a slight adverse effect on users of this route during the construction period.

~~7.13.25~~ ~~The~~No widening is required to the Windsor Branch Railway ~~underbridge is proposed to be widened~~. Cycle and walking routes pass along either side of the railway line in this location, under the M4. The Order limits for the Scheme include the Jubilee River towpath and cycle route on the northern bank. ~~There is likely to be a slight adverse impact on users of these routes at certain times as the underbridge widening work takes place.~~

Junction 5 to junction 4b

~~7.13.26~~7.13.22 Within this link, the Old Slade Lane overbridge is proposed to be rebuilt. During the course of construction an alternative access could be provided from the Colnbrook Bypass to the south, although this may result in lengthened journey times. From the south of the M4 there is a walking and cycling route that passes to the west of the lakes in the vicinity of the Lakeside Business Park, connecting with the village of Colnbrook. There is also a fishing business to the south of the M4. Users of this route would experience a minor adverse effect.

During operation and maintenance

~~7.13.27~~7.13.23 No new junctions are created nor are existing junctions decommissioned as part of the Scheme. No restrictions, that may limit the direction of travel, are being introduced at any of the junctions.

~~7.13.28~~7.13.24 Access to the motorway will be improved at junctions 12, 11, 10, 8/9, 6,

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5, 4b and 3 through the implementation of a dedicated on-slip, i.e. the slip road becomes lane 1. This will eliminate the need for traffic to filter into a running lane to join the motorway, which reduces the need for traffic to change lanes and thereby reduces potential delay on approach roads and improves traffic flow on the motorway.

Emergency services

~~7.13.29~~7.13.25 The Contractor will ensure that access for emergency vehicles in maintained throughout the construction period. Prior to carriageway closures for bridge works the Contractor will liaise with the emergency services, the Agency and relevant local authorities so appropriate diversion routes, or alternative arrangements, for emergency vehicles can be agreed. This will be secured in the CEMP.

7.13.26 Access for emergency services during incident management is discussed in section 9.4.

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