APPENDIX F
SOLUTION REVIEW & VALIDATION EVENT SEPT21

Solution Review and Validation Event

A46 Coventry Junctions Walsgrave

8th September 2021

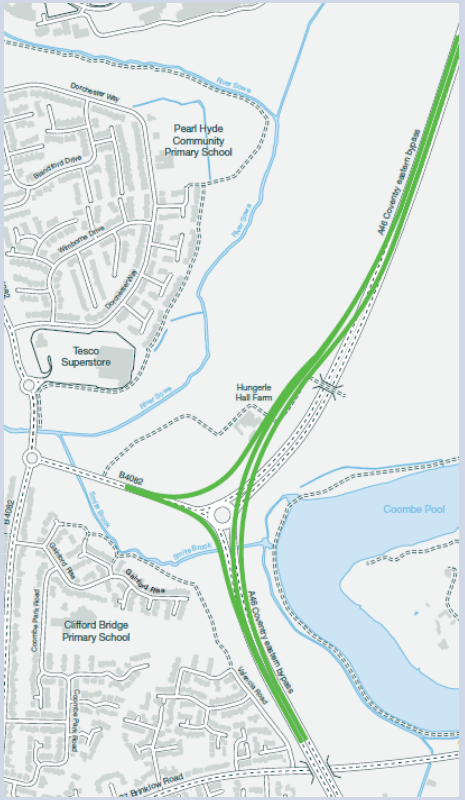
Introduction/Purpose

To review and test proposed solutions for process and technical quality prior to non-statutory consultation. Output from this session should provide a recommendation to CBR for the public consultation with appropriate actions.

The event should test how the proposed solutions respond to the following areas:

- RIS commitment, HE strategic objectives and affordability
- HE ‘good road design’
- Operational performance
    - Traffic/ Economic Impacts
    - Environmental Impacts
- Whole life safety
- Accordance with NN NPS
- Delivery timetable

Option Overview

Option 6	Option 7	Option 8	Option 11
			

RIS Commitment/Strategic Objectives

RIS 2 Statement A46 Coventry Junctions – grade separation of the Binley and Walsgrave roundabouts on the A46 near Coventry, upgrading the trunk sections of the A45/A46 between the M6 and M40 to a consistent standard.

Mini-CBR (24th May 2020) – Advised to conduct assessment of Option 11 following non-viable status of Options 6, 7 and 8.

Affordability – Current available funding for scheme approx £70m.

Change Control – Change request form (CRF) will be required to deliver Option 11 due to the cost of the scheme. CBR/IDC process included in programme.

Option	RIS Compliant?
6	Yes
7	No
8	No
11	Yes

Option	Affordable (£70m)?
6	£215m
7	£52m
8	£99m
11	£121m

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Operational Performance – Environment

Surveys

- Completed: Phase 1 Habitat, Badgers, Aquatics, Barn owls, Bat Roost & Bat Activity
- Upcoming: Final Bat Activity (end September)

Key activities completed

- Phase 1 Habitat Survey Report(EAR Appendix)
- Environmental Scoping Report
- Air Quality Modelling
- Noise Modelling

PCF products underway / upcoming

- Habitat Regulations Assessment
- Environmental Assessment Report
- EIA Screen (Determination)

Emerging Assessment	Option 6	Option 7	Option 8	Option 11
Air Quality				
Noise & Vibration	HHF+ Housing west of R.Sowe			
Cultural Heritage			Loss of HHF Grade II	
Landscape & Visual	Sowe Valley amenity			
Biodiversity			Landtake from SSSI	
Geology & Soils				
Material Assets & Waste				
Population and Human Health				
Road Drainage & Water Environment	Flood impact on R.Sowe			
Climate				

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Unmitigable show stoppers | Significant impacts but can be mitigated | None or moderate impacts easily mitigated

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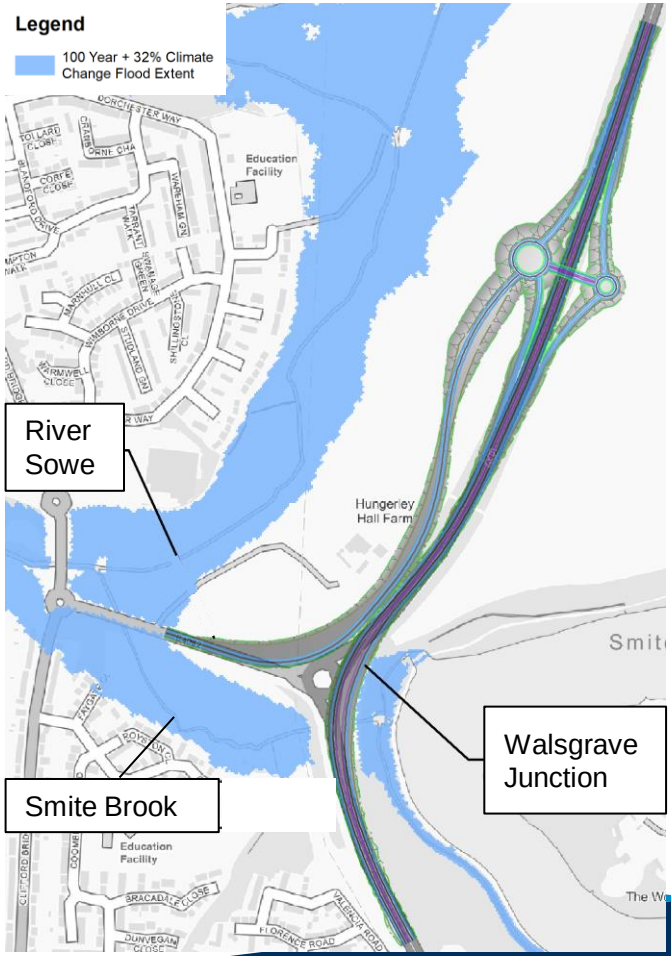
Operational Performance – Flooding

Baseline Model Update

- Existing EA Model not updated for 11 years and not focussed on A46 site
- Survey collected and used to improve model along Smite Brook
- Updates have increase baseline flood levels and extents
- Model reviewed by EA - only minor comments
- Climate change (CC) allowance reduced from initial runs
- "Evidence Review Request" process underway for EA to adopt model
- ERR required to discuss existing B4082 flood risk with Coventry

Flood Risk Modelling

	Option 6	Option 7 & 8	Option 11
Flood Impact	B4082 floods in 1:2 event Big loss of floodplain storage and large offsite impacts on R. Sowe	Min road level 73.9m AOD only just above 1:100+CC flood level. Risk of flooding from east	Min. road level at 74.2m AOD (0.4m freeboard above 1:100+CC)
Potential Mitigation	Realignment of B4082 & re-engineering of river channel with big secondary env. impacts	Provide bunding on eastern edge of A46 at 74.2m AOD	No mitigation required



Whole Life Safety

- Whole life safety considered in highway design through:
  - *Design of the options in accordance with Standards and identification of departures*
  - *SES and Consultee discussions - guided alignment design, particularly B4082 connector road*
  - *Technical Notes exploring specific challenges*
  - *Buildability advice from contractor applying lessons from Binley*
  - *CDM Design Review undertaken*
- Signed off PCF Safety Products:
  - *Health and Safety Maturity Matrix Action Plan*
  - *Health and Safety Risk Potential Assessment*
- PCF Safety Products to be completed when preferred option confirmed:
  - *Safety Plan*
  - *Maintenance & Repair Statement*
  - *Departure from Standards Checklist*
- PCF Safety Products to be completed at project close:
  - *Risk Register (live document)*
  - *Preconstruction Information*
  - *Health & Safety File*

NN NPS Accordance (by exception)

Conflicts with policy with no opportunity for mitigation	Conflicts with policy but can be mitigated	Complies with policy or confidence mitigation removes risk of non-compliance

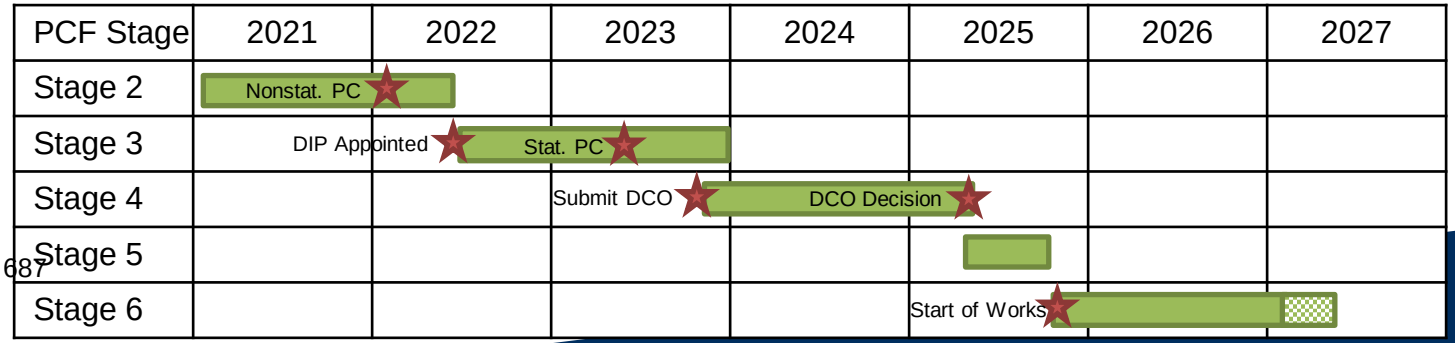
Topic	Option 6	Option 7	Option 8	Option 11
Safety		Concerns on slip road config. & risk of A46 tailbacks. Significant departures	Concerns on slip road config. & risk of A46 tailbacks. Significant departures	
Internationally designated sites, SSSI and NNR	Alignment is further from SSSI than existing roads	Indirect impacts on SSSI due to proximity. Loss of screening vegetation unlikely to impact on qualifying feature	Some permanent landtake from SSSI. Loss of screening vegetation unlikely to impact on qualifying feature	Indirect impacts on SSSI due to proximity. Loss of screening vegetation unlikely to impact on qualifying feature
Irreplaceable habitats (ancient woodland & veteran trees)	Alignment largely through arable farm land. Some loss of trees around HHF. Risk of loss of veteran trees adjacent to River Sowe.	Limited vegetation loss adjacent to SSSI with limited footprint for mitigation measures. No ancient woodland and potential temporary effect on SSSI woodland.	No ancient woodland but mature tree loss adjacent to and in SSSI, with limited footprint for mitigation measures	Limited vegetation loss adjacent to SSSI with limited footprint for mitigation measures. No ancient woodland and potential temporary effect on SSSI woodland.
Protection of other habitats and species (Biodiversity)	Vegetation loss and severance of habitats affecting protected species	Vegetation loss along existing highway boundaries.	Vegetation loss along existing highway boundaries & within SSSI. Loss of main badger sett & bat roosts in trees & HHF	Vegetation loss along existing highway boundary. Direct impact on badgers likely requiring new main sett
Flood risk	Significant increase in flood risk. Costly mitigation measures with secondary environmental impacts.	Flood modelling shows no flood risk impact on or off site as a result of this option.	Risk of A46 flooding mitigated if bunding east of A46 maintained at 75.0m AOD	Site is not located in flood zone 2 or 3 and would not result in flood impact.
The historic environment	Change in Coombe Abbey Park & Garden(GII*) & HHF setting due to elevated jct. No direct impact.		Demolition of Grade II listed Hungerley Hall Farm	Closer B4082 impacts setting of Hungerley Hall Farmhouse
Land use: Green Belt	Scheme extents are within Green Belt, but unlikely to be classed as inappropriate development	Scheme extents are within Green Belt, but unlikely to be classed as inappropriate development	Scheme extents are within Green Belt, but unlikely to be classed as inappropriate development	Scheme extents are within Green Belt, but unlikely to be classed as inappropriate development
Land use: open space / sports and recreational buildings & land				
Noise and vibration	B4082 150m from houses west of R.Sowe. 11dB inc at rear of HHF. Many residential & 2 non-residential properties significantly affected. Disproportionate mitigation.	3dB inc @ HHF (A46 10mm closer) North end Morrisons estate closer to B4082. Mitigatable. Significant impacts on HHF difficult to mitigate.	North end of Morrisons estate closer to B4082 and A46. Mitigatable	Moderate(~3dB) increase at HHF. Risk of qualifying for noise insulation. Would need mitigation solution agreeing with Historic England & Local Authority
Water quality and resources	Minor changes to culverts crossing Smite Brook. Widening of R.Sowe for flood risk mitigation will need further mitigation		Scheme requires works to Smite Brook and edge of Coombe Pool SSSI	

Delivery Timetable / Programme

Delivery Plan Commitment - A46 Coventry Junctions – 'Open for traffic RP3'

Programmed start of works : October 2025

Option	Option 6	Option 7	Option 8	Option 11
Build Period	90 weeks	73 weeks	67 weeks	68 weeks
Open to Traffic	July 2027	March 2027	January 2027	February 2027
Buildability Challenges	• Mainly offline • Several phases to maintain HHF access • Assumes advance works for STW sewer diversion • Annual R.Sowe flood risk • Significant fill import	• All works online • Limited landtake • Maintaining flood bunding to the east	• Landtake SSSI impact • Demolition of HHF • Limited space to build new accom. overbridge • Maintaining flood bunding to the east	• 2 short A46 sections require limited overnight closures • Online junction improvement but space for offline working • Pinchpoint of B4082 & A46 adjacent to HHF • Significant fill import



NH ‘good road design’

Highway design developed to sufficient technical detail for Public Consultation and Stage 2 assessment:

- Departures from Standards
  - *Key departures identified / departure checklist completed*
  - *Safety concerns discussed and resolved with SES*
- Determination of Land Take
  - *Focus on fit to landscape & minimising environmental impact*
  - *Coombe Pool SSSI & Hungerley Hall Farm key considerations*
  - *Avoidance of floodplain*
  - *Construction space / temporary land take allowance*
- Coordination with Statutory Undertakers for diversions
  - *Stage 1 diversion of 132kV overhead line designed out*
  - *No diversions for Option 11 (protection measures only)*
- Work with expected DIP for early buildability optimisation
  - *Vertical alignments optimised to reduce disruption & landtake*
  - *Construction phasing*

	Option 6	Option 7	Option 8	Option 11
Departures	• Mainline radius • B4082 radii • Weaving length • Diverge layouts • B4082 radii • SSD relaxations	• Mainline radius relaxations • Weaving length • N/B diverge layout	• Mainline radius & SSD relaxations • Weaving length • N/B Diverge layout, radius & SSD	• Mainline radius • B4082 radii • Weaving length • Diverge layouts
C3 Quote (£)	2,322,118	57,300	123,711	30,000 §
Build Period (weeks)	90 *	73	67	68

* *Assumes advance sewer diversion*

§ *Protection measures only*

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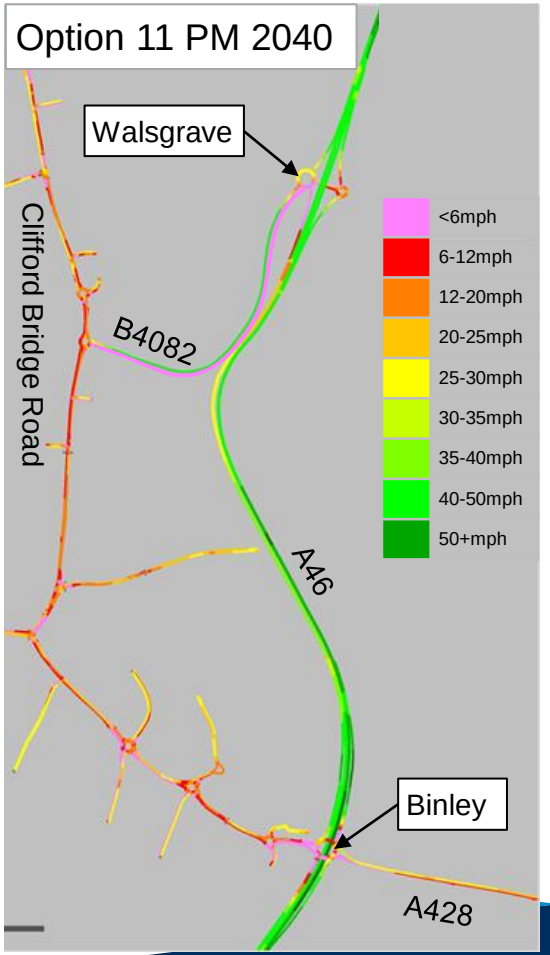
Operational Performance – Traffic

- New traffic model developed with Binley project for Stage 2:
  - Strategic model (CoSTM) developed for forecasts & economics
  - Microsimulation model developed to understand local road impacts
- Products complete: Transport Data & Modelling Packages (no change with Option 11)
- Products being updated with Option 11:
  - Appraisal Spec. Rpt, Transport Forecasting Package, Econ. App. Package, ComMA
- Discussions with Local Authorities (CCiC/WCC)
  - Concerns over extent of VISSIM model and Options 7 & 8 rerouting

		Options 6 & 11	Options 7 & 8
Opening Year (2025)	A46	Operates efficiently with release of Walsgrave capacity constraint	
	Local Roads	No significant effects	Rerouting leads to worse congestion on A428 & Clifford Bridge Rd.
Design Year (2040)	A46	Operates efficiently. Local road tailbacks cause slow N/B traffic approaching Option 11 in PM peak	Local road tailbacks to A46 between Binley & Walsgrave -> congestion
	Local Roads	Release A46 traffic -> more local road congestion -> PM peak queues on B4082 & N/B offslip.	A428 & Clifford Bridge Road operating above capacity lead to tailbacks on A46



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Operational Performance –Economics

- Previously reported Stage 1 PVBs based on CASM traffic model (red/amber assurance rating)
- Stage 2 benefits are indicative figures ahead of Economic Appraisal Package, and include for:
  - TUBA – Time savings, vehicle operating costs, tolls and indirect taxation
  - WITA – Increased output and labour supply impact (pre-masking)
  - Emerging data suggests final benefits will increase slightly (accident & environment awaited)
- Stage 2 costs supplied by NH Commercial Services including land costs by VOA

Early Indicative Figures	Option 6	Option 7	Option 8	Option 11
PVB (Present Value Benefits)	£163M	£144M	£158M	£162M
PVC* (Present Value Costs)	£115M	£32M	£48M	£60M
BCR (Benefit / Cost Ratio)	Med	High	High	High

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* Present Value Costs are discounted so differ from P70 costs listed on Slide 4

Conclusion

1. **Decision** – Acceptance of the process and quality of the solution assessment.
2. **Decision** – Acceptance that results of option assessment can be taken to non-statutory consultation. (CBR and IDC also dependent)
3. **Decision** - Acceptance that Option 11 is a viable solution based on information provided.
4. **Notification** – Option 6, 7 and 8 are deemed non-viable solutions.
5. **Action** – Obtain agreement through CBR and IDC to increase funding to meet option 11 cost.

Category	Option 6	Option 7	Option 8	Option 11
RIS Compliance (change control inc programme & forecast)				
Affordability (Stage 1 costs)				
Highway Design				
Op Performance - Strategic				
Op Performance - Local Road				
Economics				
Environment - Historic				
Environment - Noise/Vibration				
Environment - Other				
Flooding Impact				
Road Safety				

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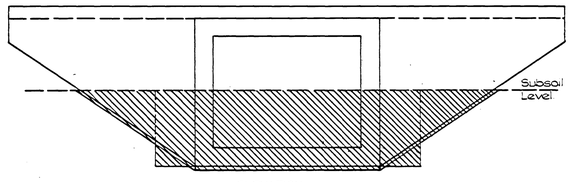
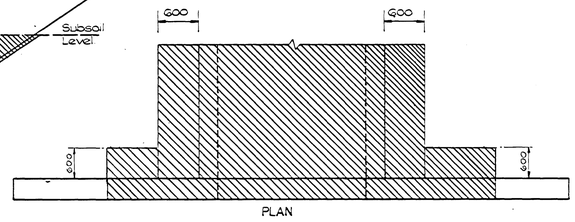
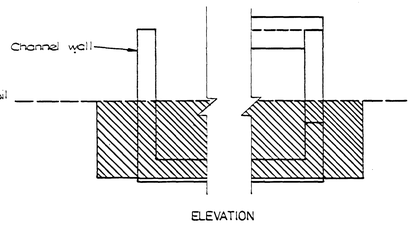
APPENDIX G
CULVERT AS-BUILT DRAWINGS AND EXISTING STRUCTURES

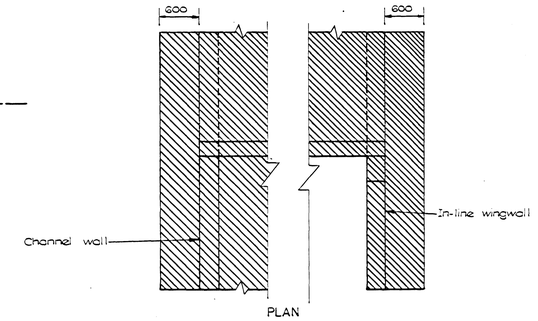
11349/10-22





EXCAVATION

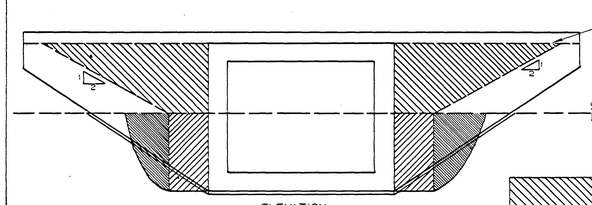


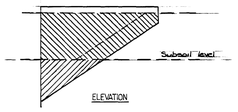


EXCAVATION

KEY

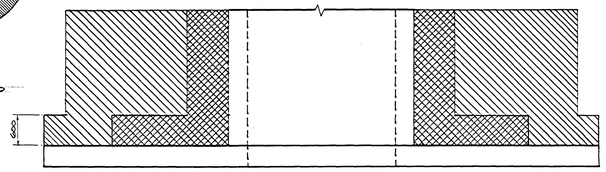
Excavation required for bridgeworks and measured in bridgeworks bill.





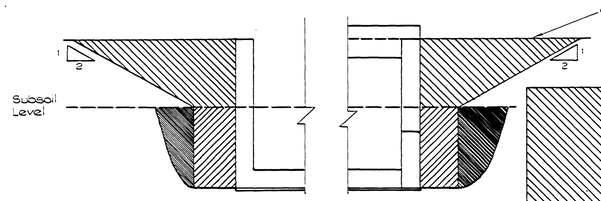
GENERAL DETAIL OF CANTILEVER WING WALL

Upper limit of granular backfill to be top surface of culvert roof slab

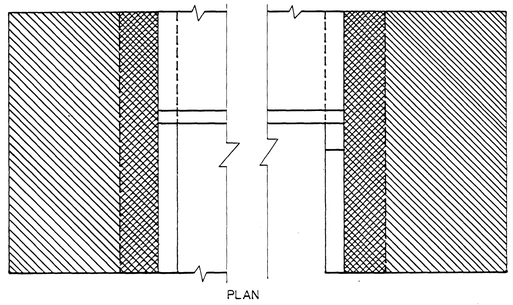


NOTE:
1. THIS DRAWING SHOWS THE MINIMUM REQUIREMENTS FOR BACKFILLING TO STRUCTURES AND HAS BEEN USED FOR THE PURPOSE OF MEASUREMENT
2. THE CONTRACTOR SHALL ALLOW FOR ANY BENCHING NECESSARY TO ENSURE THAT THE BACKFILL IS COMPACTED IN ACCORDANCE WITH THE SPECIFICATION

BACKFILL



Upper level of granular back fill to be 300 mm below top of wingwalls and channel walls, (300 mm top soil)



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2. THE CONTRACTOR SHALL ALLOW FOR ANY BENCHING NECESSARY TO ENSURE THAT THE BACKFILL IS COMPACTED IN ACCORDANCE WITH THE SPECIFICATION

BACKFILL

KEY

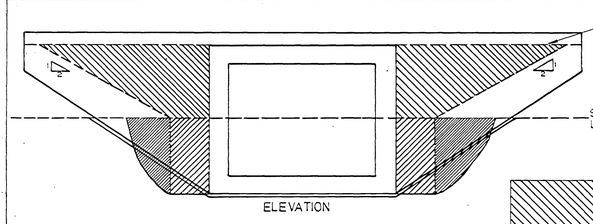
Areas backfilled with granular material to Clause 615 and defined in the bridgeworks bill as adjacent to structure

Areas backfilled with granular material to Clause 615 and defined in the bridgeworks bill as around foundation.

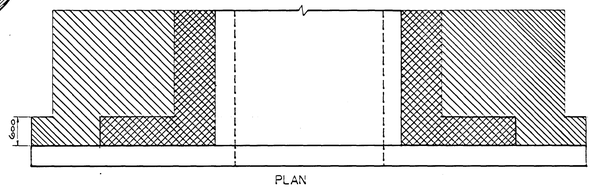
Excess excavation behind an earth retaining structure shall be backfilled with granular material to Clause 615 at the contractors expense.

Note for Backfilling and Compaction.

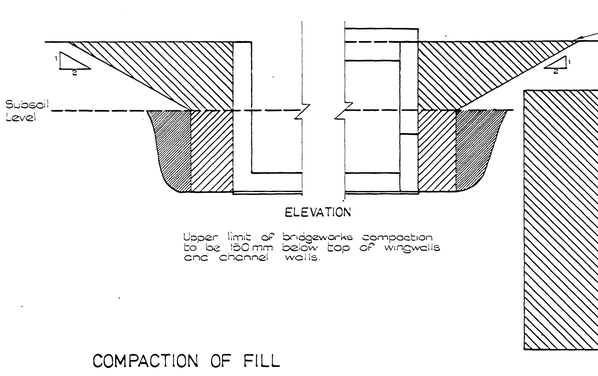
Where a capping layer is provided the underside of the capping layer shall replace earthworks outline as the limit for backfilling and compaction.



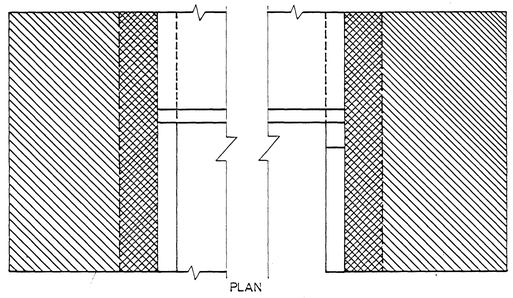
Upper limit of bridgeworks compaction to be top surface of culvert roof slab. Only light compaction equipment to be used for compacting the construction traffic protective layer over the structure.



COMPACTION OF FILL



Upper limit of bridgeworks compaction to be 150 mm below top of wingwalls and channel walls.



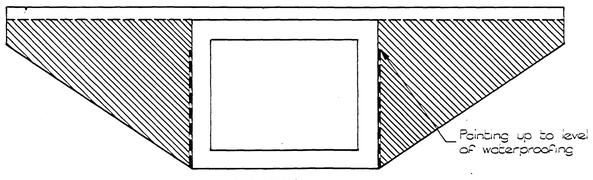
COMPACTION OF FILL

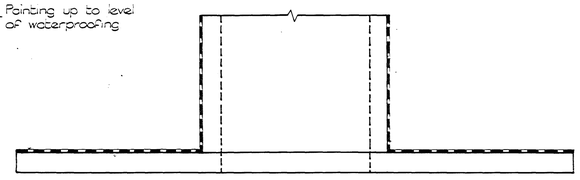
KEY

Areas of compaction measured in the bridgeworks bill as adjacent to structure

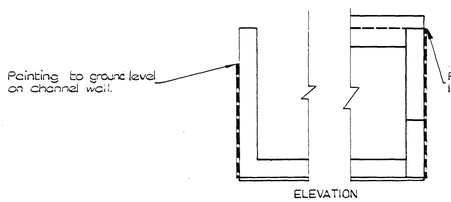
Areas of compaction measured in the bridgeworks bill as around foundation.

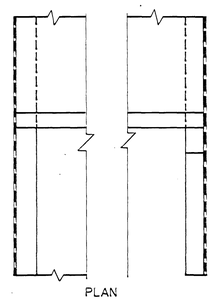
Areas behind an earth retaining structure, due to excess excavation shall be compacted at the contractors expense





DETAILS OF PAINTING





DETAILS OF PAINTING

KEY

Elevation of areas to be painted with bitumen in accordance with specification Clause 2006.5.

Section through areas to be painted.

DEPARTMENT OF TRANSPORT WEST MIDLANDS REGIONAL OFFICE	A46 COVENTRY EASTERN BYPASS
Consulting Engineers OVE ARUP & PARTNERS WARWICK	DIAGRAMATIC DETAILS OF LIMITS OF EXCAVATION, BACKFILL, COMPACTION OF FILL & PAINTING TO STRUCTURES 1,4,5 & 8.

Mark	Date	Amendment	By

Drawn/Traced S.W. J.M.A.	Approval issue JULY 1986	Scale: N.T.S.
Checked T.J.R.	Tender issue JAN 1987	Sheet No.
Approved	Works issue JUNE 1987	Drawing No. 11349/10/22

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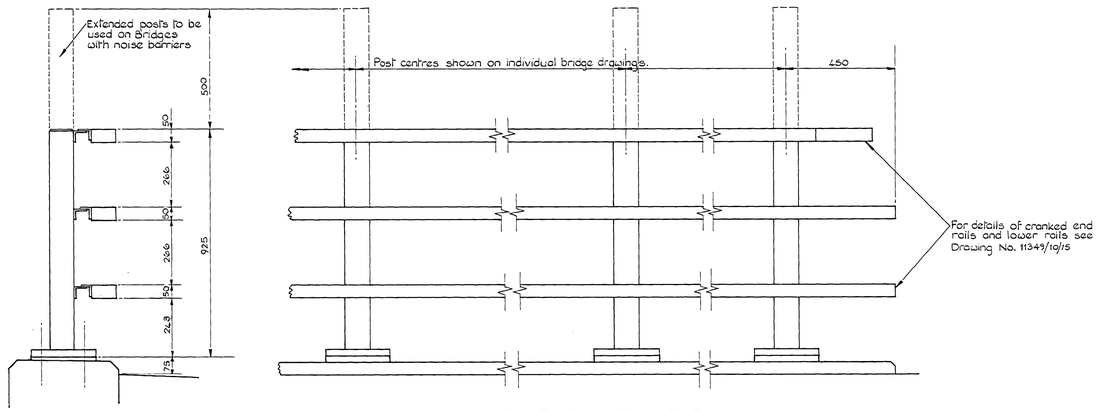
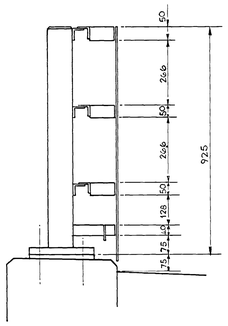
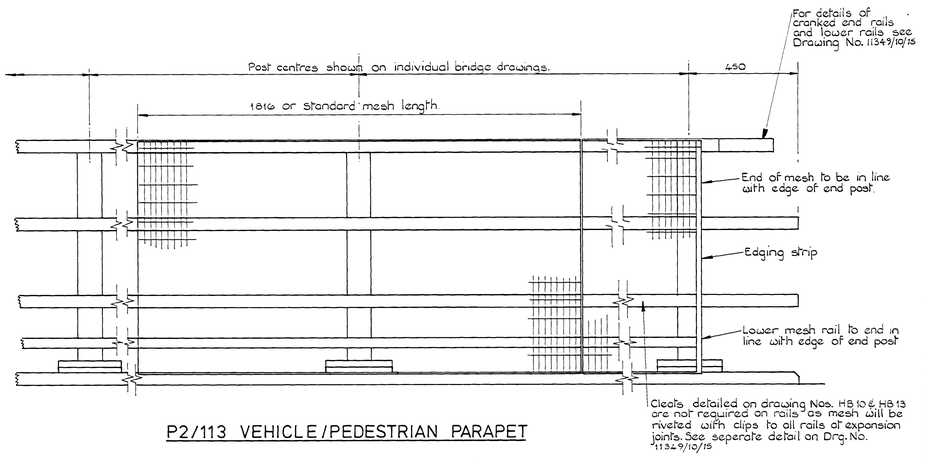
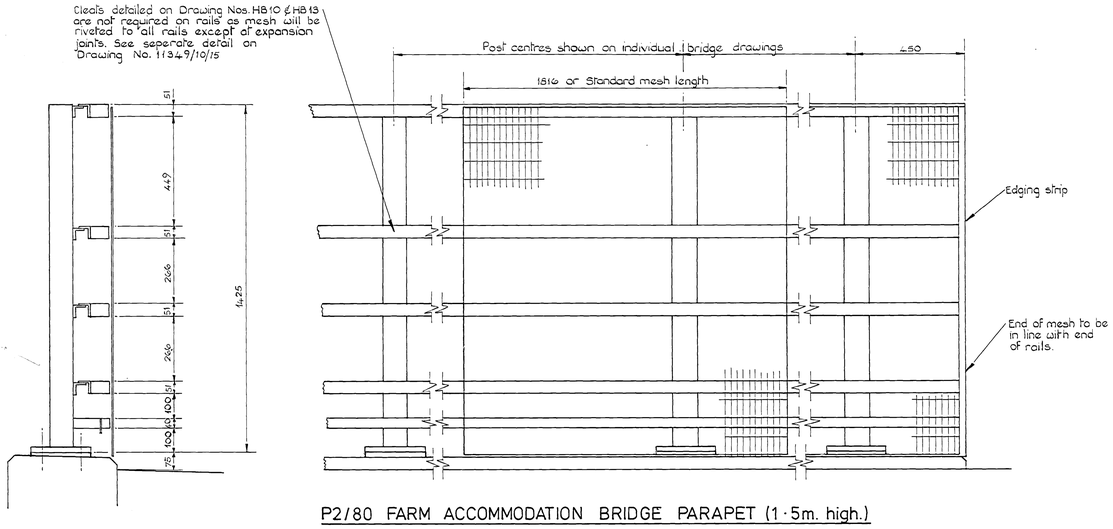


P1/113 VEHICLE PARAPET.

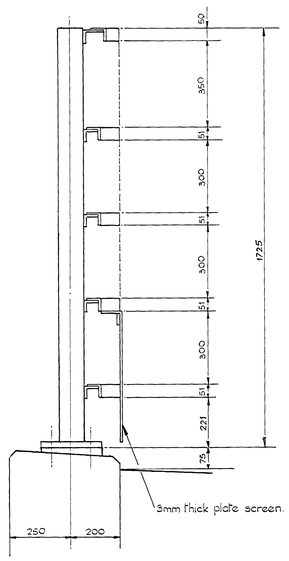


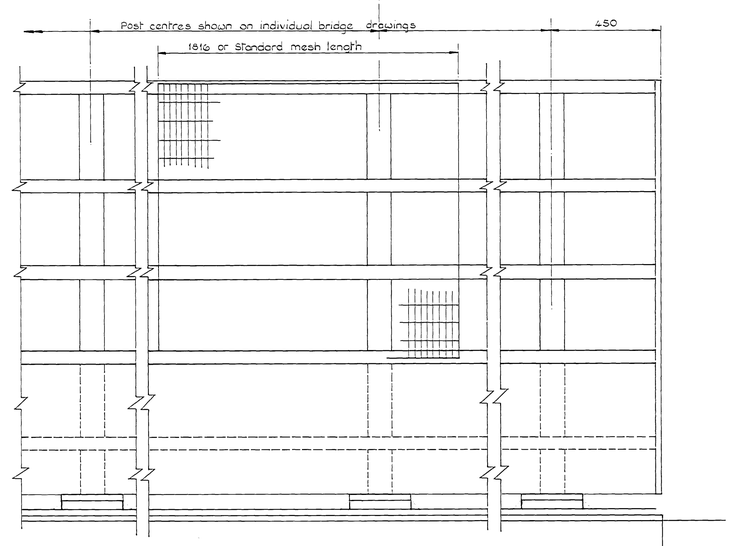


P2/113 VEHICLE/PEDESTRIAN PARAPET



P2/80 FARM ACCOMMODATION BRIDGE PARAPET (1·5m. high.)





P2/80 FARM ACCOMMODATION BRIDGE PARAPET. (1·8m. high.)

No.	Bridge	Parapet Type	Approx. Length (m) Left Side	Approx. Length (m) * Right Side	Vertical Alignment: Horizontal	Vertical Alignment: Grade	Vertical Alignment: Vertical curve	Horizontal Alignment: Straight	Horizontal Alignment: Curved	Number of movement joints per side of deck.	Parapet Joint Movement: Expansion joint	Parapet Joint Movement: Contraction (incl. shrinkage & creep) mm	Gap Setting at 4°C See Drg. No. 11349/10/15	Remarks
1	Fruit Farm Underpass	P4 Left P2/113 Right	19·462	19·220		✓		✓		0	—	—	—	
3	A427 Brinklow Road Underbridge	P2/113 Extended posts on Left side	57·924	54·600		✓		✓		1	18	22	20	2·0m high noise barrier on Left side only
4	Smite Brook (Main Line) Box Culvert	P4	5·490	5·490	✓			✓		0	—	—	—	
5	Smite Brook (Link) Box Culvert	P2/113	8·460	8·460	✓			✓		0	—	—	—	
6	Hungerley Hall Farm Accomm. Overbridge.	P2/80 (1·5m. high)	62·200	62·200			✓	✓		4	10	20	15	2 joints per bay over expansion joint
7	Walsgrave Hill Farm Accomm. Overbridge	P2/80 (1·8m. high)	57·200	57·200			✓	✓		2	11	26	20	
8	Withybrook Box Culvert	P4	7·200	7·200	✓			✓		0	—	—	—	
9A	A46 Link Underbridge	P1/113	72·195	74·190		✓		✓		2	11	28	20	

* Viewed in direction of increasing chainage.

NOTES

1. This drawing to be read in conjunction with Drawing Number 11349/10/15
2. Parapets shall comply with the details shown on the Drawings listed below unless the details conflict with the details given on this drawing, in which case this drawing takes precedence. British Steel Corporation Drawing Nos:- HBP1 - P1/113 Vehicle Parapet, HBP6 - P4 Pedestrian Parapet, HBP10 - Farm Accommodation Bridge Parapet, HBP13 - P2/113 Vehicle Pedestrian Parapet, HBP15 - P5/113 Vehicle Pedestrian Parapet, HBEJ/2 - Expansion Joint for 100 x 50 rail., HB/EJ/5 - Expansion Joint for 76 x 51 Rail.
3. For spacing of posts, slope of rails and position of expansion joints see specific bridge drawing.
4. Rail to post fixing angle to be set to suit the slope of the rails.
5. For slopes of 1 in 4·0 or less the base plate may be fixed horizontally to the post.
6. For slopes greater than 1 in 40 the base plate is to be fixed at the required angle.
7. The fabricator is to position all site joints other than expansion joints to suit his own requirements. No site joints to be made less than 300mm from a post.
8. Electrodes to be in accordance with B.S. 639.
9. Steelwork including mesh is to be hot-dipped galvanised in accordance with Specification Clause 1902.
10. The fabricator shall make provision for venting and subsequent plugging of all hollow sections.
11. Mortar packing under base plates is to be 1:2 cement sand mortar.
12. All main longitudinal site joints are to be welded or bolted and joints protected in accordance with specification clause 1903.
13. The fabrication procedure shall be subject to the Engineers approval and the manufacturer is to allow for any erection trials which may be required.
14. All full strength butt welds shall be non-destructively tested by a method approved by the Engineer. All other welds will be checked for dimensions except that representative welds selected by the Engineer shall be non-destructively tested.
15. For parapets with noise barriers attached see Drawing No. 11349/10/16
16. Posts shall be anchored to the concrete using 'V & G parapet rail Anchorage' system manufactured by Varley and Gulliver Ltd. of 51-70, Alfred Street, Birmingham, B12 6JR., or similar approved. Appropriate anchorages are to be made to suit parapet type.
17. Removable folding wedges shall be used to bring the parapet to the correct level before packing under the base with mortar.
18. Washers shall be made of stainless steel sherardised mild steel or neoprene.
19. All holding down bolts to be stainless steel I.S.O. grade A4-80 wrapped in P.T.F.E. tape. Nuts shall be stainless steel I.S.O. grade A4-80.

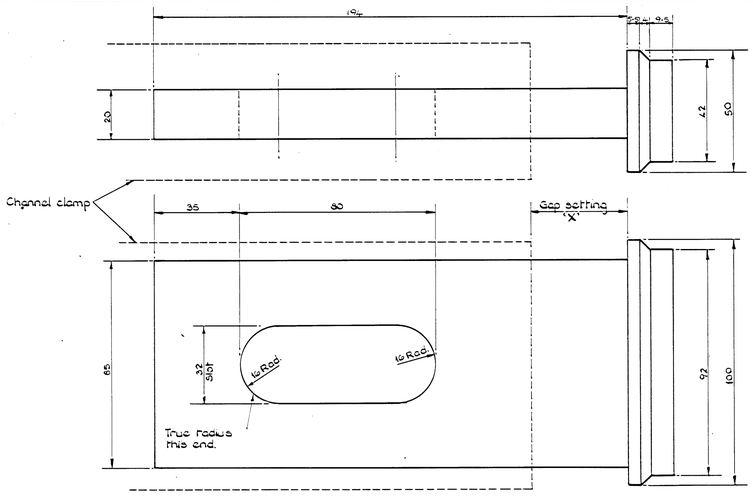
DEPARTMENT OF TRANSPORT WEST MIDLANDS REGIONAL OFFICE	A46 COVENTRY EASTERN BYPASS	STEEL PARAPET STANDARD DETAILS. SHEET 1.	
CONSULTING ENGINEERS OVE ARUP & PARTNERS WARWICK			

Mark	Date	Amendment	By
A	JAN'89	AS BUILT	M.B.P.

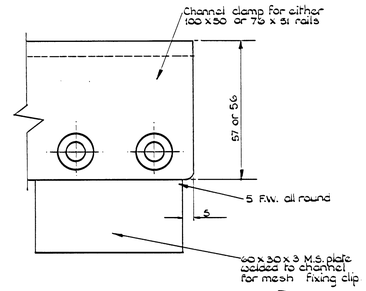
Drawn/Traced: S.W. J.M.A.	Approval Issue: JULY 1986	Scale: 1:10
Checked: R.V.C.H.	Tender Issue: JAN 1987	Sheet No.
Approved	Works Issue: JUNE 1987	Drawing No. 11349/10/14A

DM11

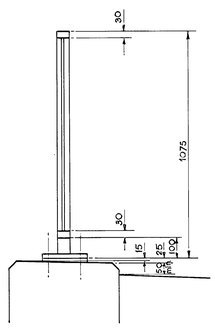
11349/10-15

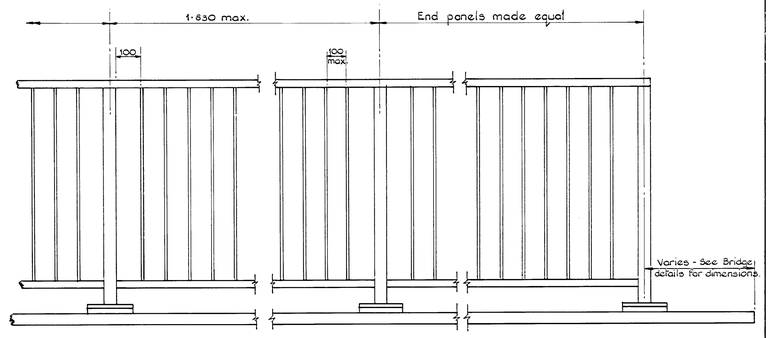


DETAIL SHOWING INCREASE IN SIZE AND REVISED POSITION OF SLOT REQUIRED IN SPIGOT END FOR 100x50x3·2 R.H.S. RAIL EXPANSION JOINT SHOWN ON DRG. No. HBP/EJ/2.

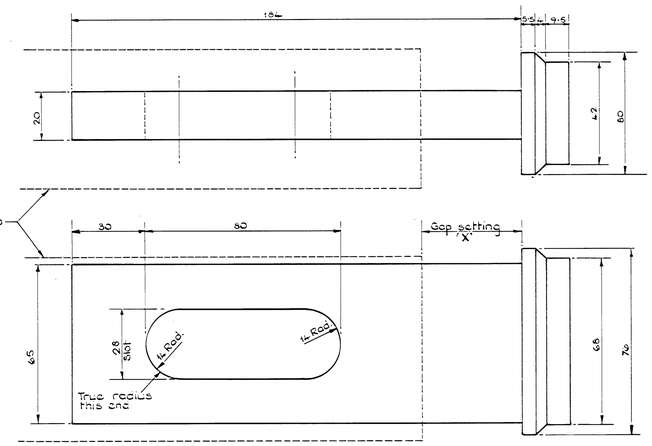


CHANNEL CLAMP FOR EXPANSION JOINTS SHOWING MESH FIXING PLATE

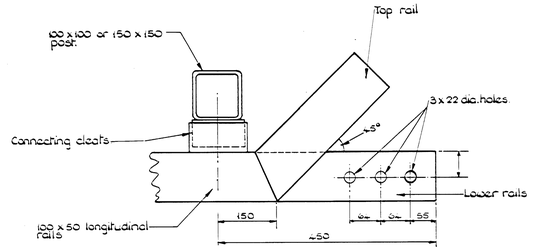




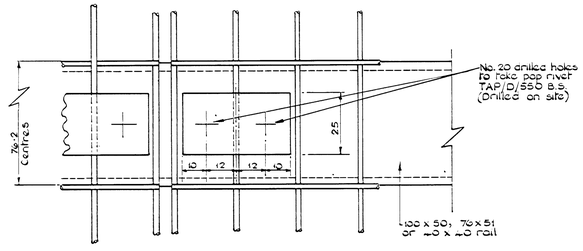
P4 PEDESTRIAN PARAPET
SCALE 1:10



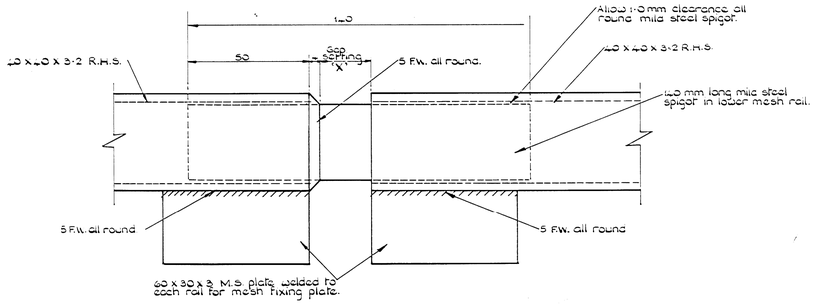
DETAIL SHOWING INCREASE IN SIZE AND REVISED POSITION OF SLOT REQUIRED IN SPIGOT END FOR 76·2x50·8x3·2 R.H.S. RAIL EXPANSION JOINT SHOWN ON DRG. No. HBP/EJ/5.



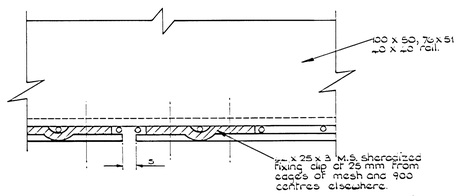
DETAIL SHOWING CRANKED END RAIL AND LOWER RAILS WITH HOLES USED FOR FIXING SAFETY FENCE CONNECTING BRACKET
SCALE 1:5.



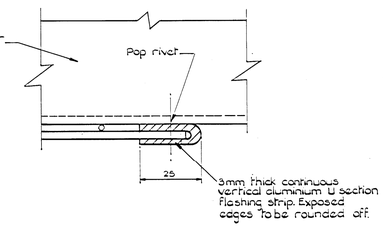
ELEVATION OF LONGITUDINAL MAIN RAIL SHOWING MESH FIXING CLIP



EXPANSION JOINT FOR LOWER MESH RAIL ON P2/113



PLAN SHOWING MESH FIXING CLIP



VERTICAL MESH EDGING STRIP

NOTES

1. This drawing to be read in conjunction with Drawing No. 11349/10/14 and British Steel Corporation Drawing Nos. HBP/EJ/2 and 5.
2. For details of Safety Fence Connecting Bracket see Drawing No. SG.1020.10/B-GA10.

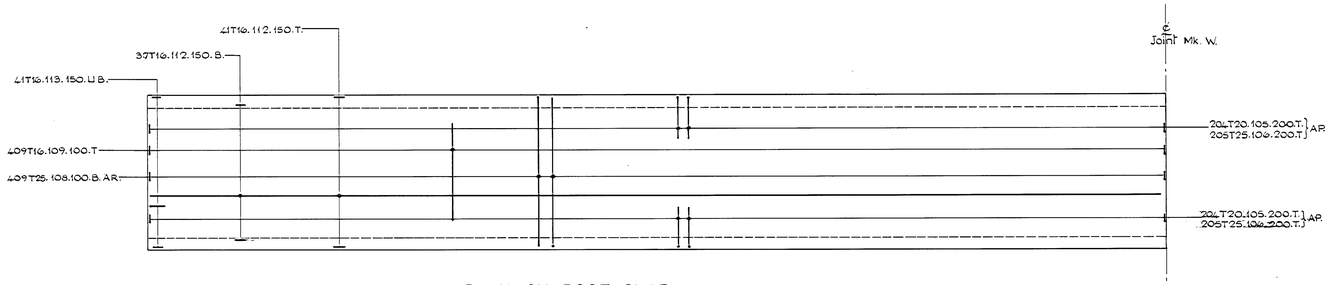
DEPARTMENT OF TRANSPORT WEST MIDLANDS REGIONAL OFFICE	A46 COVENTRY EASTERN BYPASS	STEEL PARAPET STANDARD DETAILS. SHEET 2.
Consulting Engineers OVE ARUP & PARTNERS WARWICK		

Mark	Date	Amendment	By
A		Height of P4 parapet amended to 1075 from 930	JC
B	JUNE '90	AS BUILT	

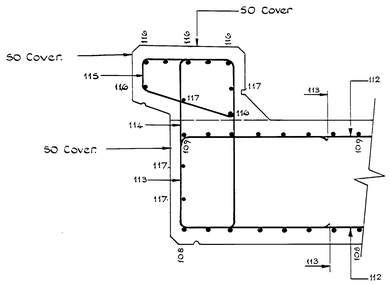
Drawn/Traced S.W. J.M.A.	Approval Issue JULY 1986	Scale: FULL SIZE EXCEPT WHERE SHOWN
Checked R.V.C.H.	Tender Issue JAN 1987	Sheet No.
Approved	Works Issue JUNE 1987	Drawing No. 11349/10/15B

695

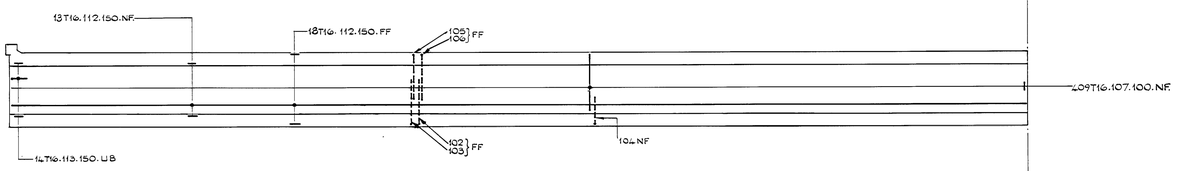
11349/10-4/2



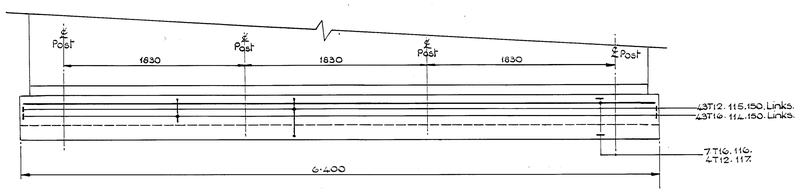
PLAN ON ROOF SLAB.
SCALE 1:100.



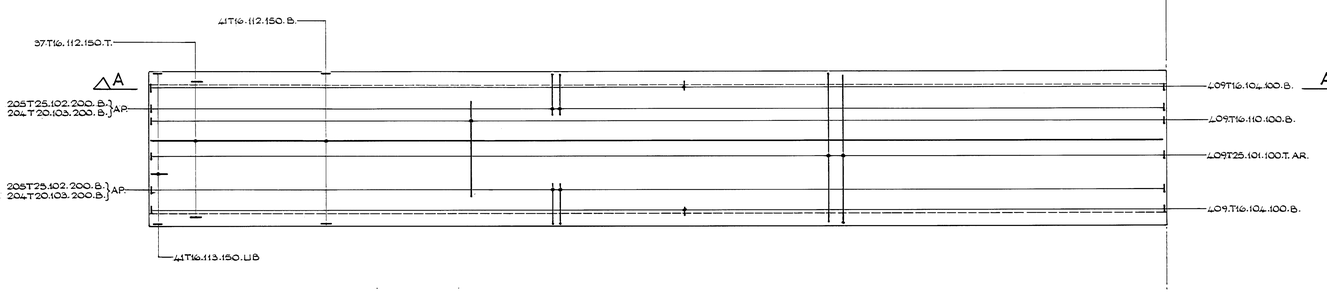
SECTION THROUGH BOX END. (NORTH WEST)
SCALE 1:10



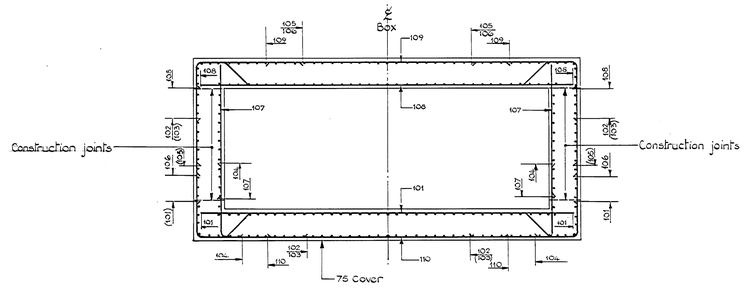
SECTION A-A
2 NO. WALLS THUS, 2 NO. WALLS OPPOSITE HAND
SCALE 1:100



PLAN ON WEST BOX END.
EAST END SIMILAR.
SCALE 1:25.



PLAN ON BASE SLAB
SCALE 1:100.
OTHER HALF OF BOX SIMILAR



TYPICAL SECTION
SCALE 1:40.

LAYOUT DRAWING Nº 11349/10-4/1
ASSOCIATED REINFORCEMENT DRGS.-
BENDING SCHEDULE PAGE Nºs : 002/01
CONCRETE GRADE : 30/20
NOMINAL COVER TO REINFORCEMENT: 45mm. (unless otherwise stated)
REINFORCEMENT TYPES :
R - MILD STEEL TO B.S.4449
T - HIGH YIELD STEEL, TYPE 2 DEFORMED, TO B.S.4449. B.S.4461

ABBREVIATIONS
T - TOP
B - BOTTOM
A.P. - ALTERNATELY PLACED
A.R. - ALTERNATELY REVERSED
A.S. - ALTERNATELY STAGGERED
N.F. - NEAR FACE
F.F. - FAR FACE

1. Steel reinforcement details exclude all supporting steel and spacers. No construction joints to be formed on exposed surfaces except where shown.
2. Bars Mk 112 are scheduled in 12 m. lengths which are to be cut as necessary on site. An allowance of 10% has been made for laps. (Min. lap 550 mm.).

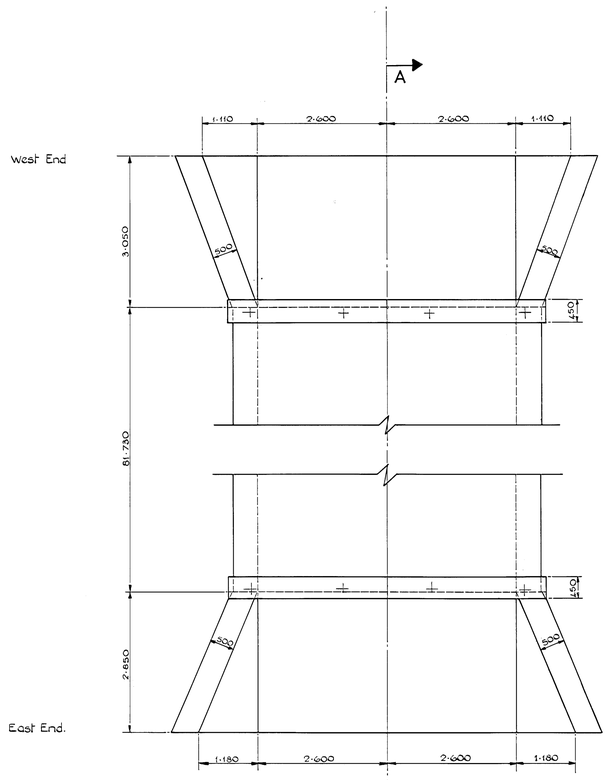
DEPARTMENT OF TRANSPORT WEST MIDLANDS REGIONAL OFFICE	A46 COVENTRY EASTERN BYPASS	SMITE BROOK MAIN LINE CULVERT	Mark	Date	Amendment	By
CONSULTING ENGINEERS OVE ARUP & PARTNERS WARWICK		STRUCTURE No. 4	A	16-6-87	Amendments to typical section, notes and Bars Mk. 108 and 112.	G.M.
			B	JUNE '90	AS BUILT	
		BOX REINFORCEMENT				

Drawn/Traced	Approval Issue	Scale:
S.R.D. J.M.A.	JULY 1986	AS SHOWN
Checked	**Tender Issue**	**Sheet No.**
R.V.C.H.	JANUARY 1987	
Approved	**Works Issue**	**Drawing No.**
A.J.G.	JUNE 1987	11349/10-4/2B

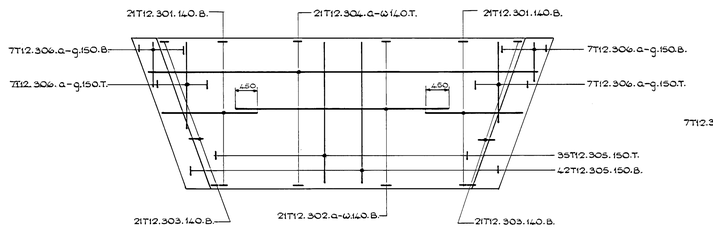
DM11

696

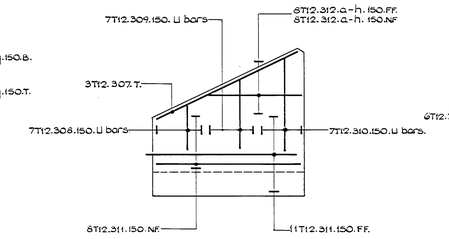
11349/10-4/3



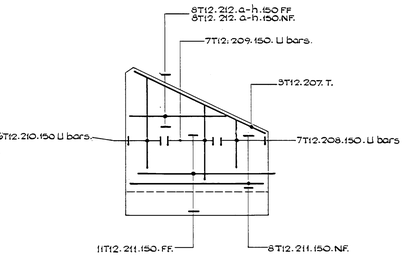
PLAN.
SCALE 1:50



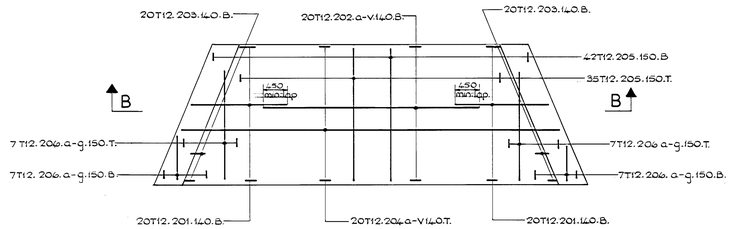
PLAN ON WEST CHANNEL BASE.
SCALE 1:50.



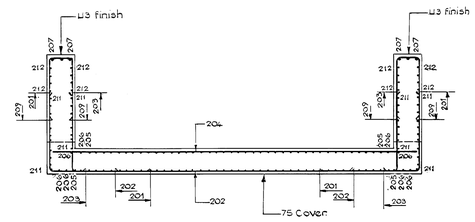
ELEVATION ON N.W. CHANNEL WALL
S.W. CHANNEL WALL SIMILAR BUT OPPOSITE HAND.
SCALE 1:50.



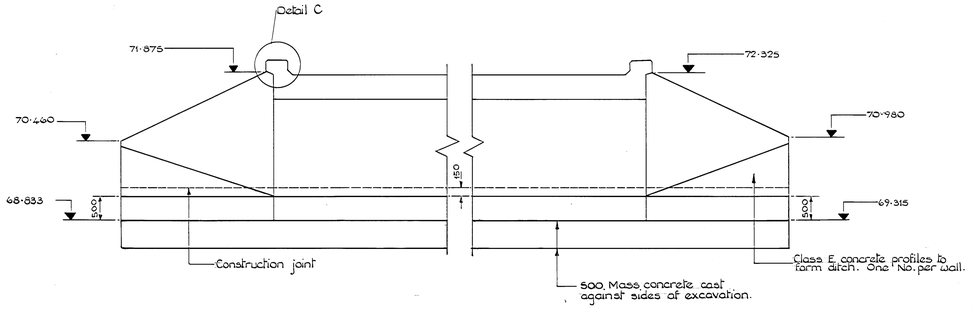
ELEVATION ON N.E. CHANNEL WALL
S.E. CHANNEL WALL SIMILAR BUT OPPOSITE HAND.
SCALE 1:50



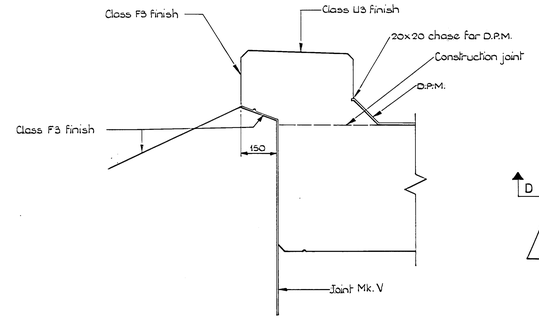
PLAN ON EAST CHANNEL BASE
SCALE 1:50



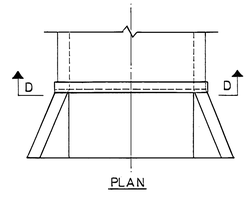
SECTION B - B
SCALE 1:50



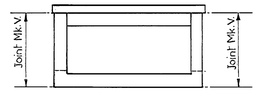
SECTION A - A
SCALE 1:50



DETAIL C
SCALE 1:10



PLAN



SECTION D - D

END OF BOX JOINT MK. V.
NOT TO SCALE

NOTES

1. This drawing to be read in conjunction with Drawing Nos. 11349/10-4/1 & 4/2.
2. Standard drawings applicable to this drawing:- See Bridgeworks Book 3.
3. Classes of finish to concrete surfaces:-

Type	Buried	Exposed
Formed	F1	F2
Unformed	U1	U2

Except where otherwise shown

4. Mass concrete base to be Class E. Where ground below foundation level is unsuitable the depth of blinding concrete is to be increased down to a suitable foundation level as directed by the Engineer.
5. All exposed edges to have 25mm x 25mm chamfers unless otherwise shown.
6. No construction joints to be formed on exposed surfaces except where shown.
7. No backfilling shall commence until the R.C. box is fully constructed.
8. Steel reinforcement details exclude all supporting steel and spacers.

LAYOUT DRAWING Nº : SEE ABOVE NOTES.
ASSOCIATED REINFORCEMENT DRGS. :—
BENDING SCHEDULE PAGE Nºs : 003/01 - 04
CONCRETE GRADE : 30/20
NOMINAL COVER TO REINFORCEMENT: 45mm. (unless otherwise stated)
REINFORCEMENT TYPES :
R - MILD STEEL TO B.S.4449
T - HIGH YIELD STEEL, TYPE 2 DEFORMED, TO B.S.4449. B.S.4461

ABBREVIATIONS
T - TOP
B - BOTTOM
A.P. - ALTERNATELY PLACED
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A.S. - ALTERNATELY STAGGERED
N.F. - NEAR FACE
F.F. - FAR FACE

DEPARTMENT OF TRANSPORT
WEST MIDLANDS REGIONAL OFFICE

CONSULTING ENGINEERS
OVE ARUP & PARTNERS
WARWICK

A46 COVENTRY EASTERN BYPASS

SMITE BROOK MAIN LINE CULVERT

STRUCTURE No. 4

CHANNEL DIMENSIONS & REINFORCEMENT

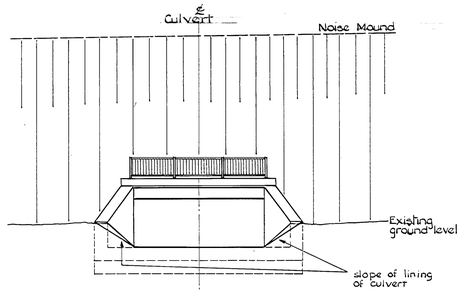
Mark	Date	Amendment	By
A	17.6.87	Bar mks. 202, 204, 302, & 304.	G.M.
B	JUNE '90	AS BUILT	

Drawn/Traced	Approval Issue	Scale:
M.D.J. J.M.A.	JULY 1986	AS SHOWN
Checked	**Tender Issue**	**Sheet No.**
R.V.C.H.	JANUARY 1987	
Approved	**Works Issue**	**Drawing No.**
A.J.G.	JUNE 1987	11349/10-4/3B

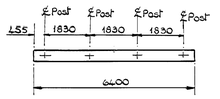
697

DM11

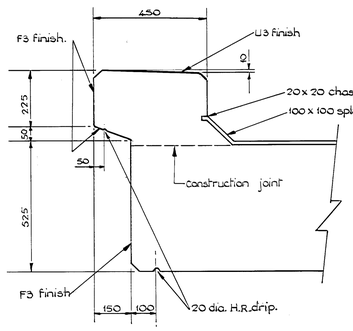
11349/10-4/1



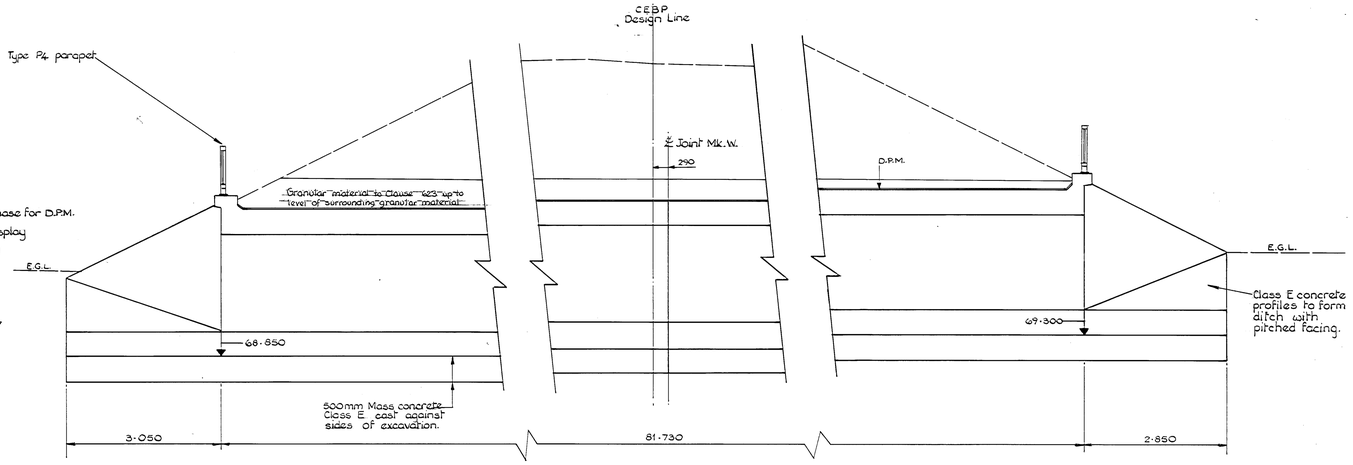
VIEW ON A – A
SCALE 1:100



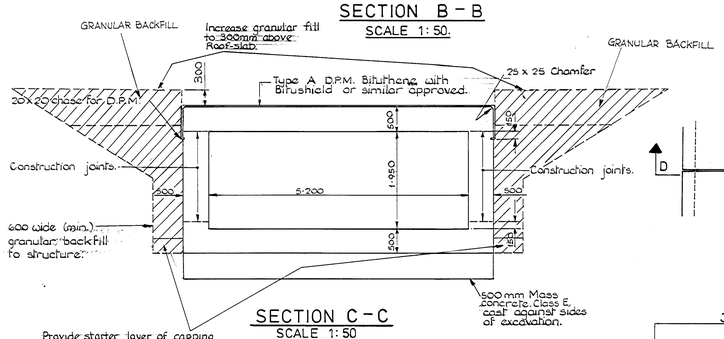
PLAN - PARAPET PLINTH.
SCALE 1:100



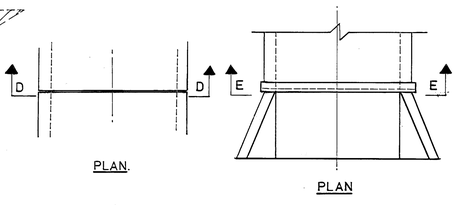
TYPICAL SECTION THROUGH BOX END
SCALE 1:10

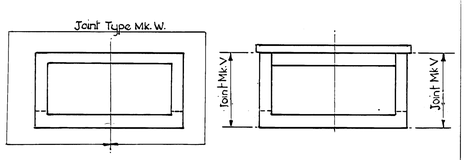


SECTION B – B
SCALE 1:50.



SECTION C – C
SCALE 1:50

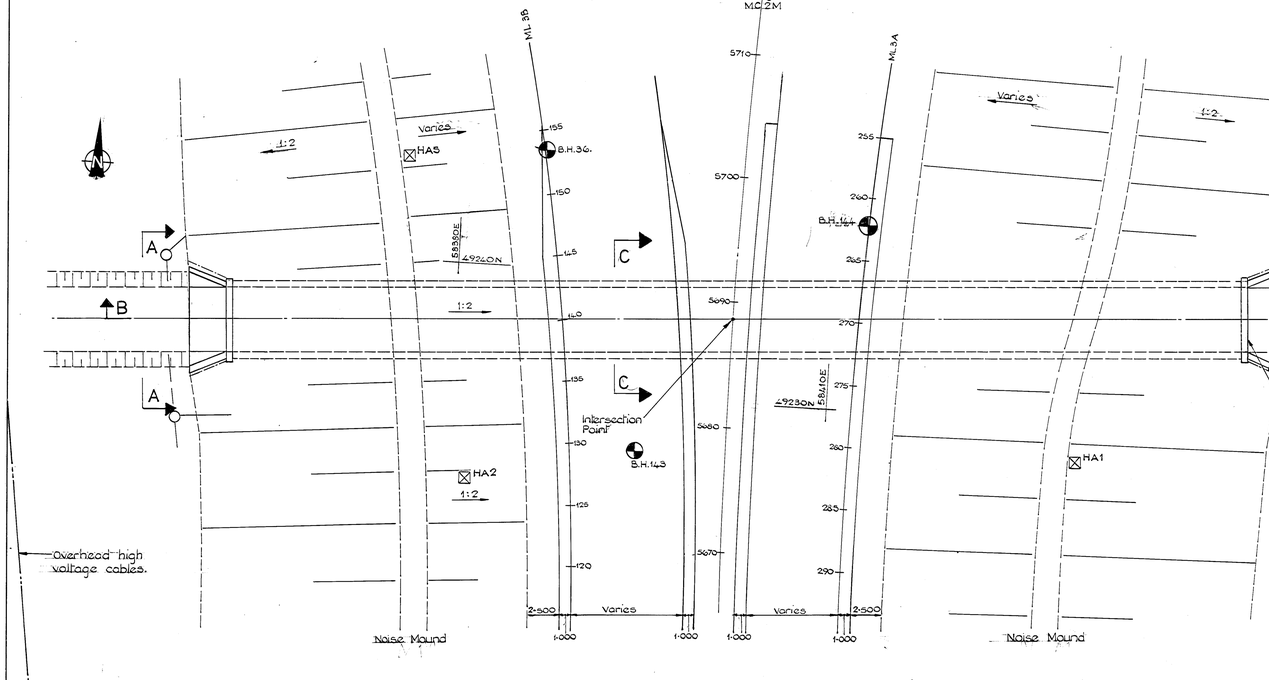




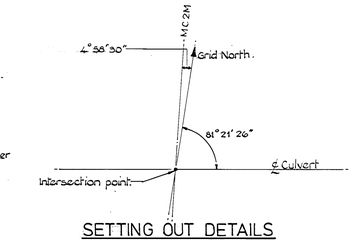
SECTION D – D
℄ JOINT MK. W.

SECTION E – E
END OF BOX JOINT MK. V.

JOINT DETAILS
NOT TO SCALE

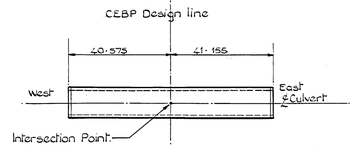


PLAN
SCALE 1:200



SETTING OUT DETAILS

Intersection Point Data :–
CEBP Design line chainage 5688·636. MC2M.
Coordinates 5810·156E, 4923ô·728N.
CEBP Design line bearing 355°01'30"
Culvert ℄ bearing 81°21'26"



PLAN ON CULVERT.
SCALE 1:1000

CARRIAGEWAY LEVELS				
Chainage MC2M	L.H. Channel	L.H. Inner Channel	R.H. Inner Channel	R.H. Channel
5670	74·691	75·029	75·303	74·901
5680	74·622	74·836	75·055	74·707
5690	74·383	74·657	74·811	74·514
5700	74·202	74·471	74·596	74·331

NOTES

1. This drawing to be read in conjunction with Drawing Nos. 11349/10-4/2 & 3.
2. Standard drawings applicable to this drawing; see Bridgeworks Book 3.
3. All levels are above O.D. (Newlyn)
4. Boreholes are shown thus ⊕ and positions are approximate.
5. Concrete to be Class 30/20 unless otherwise stated.
6. Class of finish to concrete surfaces :–

Type	Buried	Exposed
Formed	F1	F2
Unformed	U1	U2

Except where otherwise stated.

7. Where ground below foundation level is unsuitable the depth of blinding concrete is to be increased down to a suitable foundation level as directed by the Engineer.
8. All exposed edges to have 25mm x 25mm chamfers unless otherwise shown.
9. No construction joints to be formed on exposed surfaces except where shown.
10. No backfilling shall commence until the R.C. box is fully constructed. Backfilling shall be brought up equally on both sides of the box.
11. For details of typical ditch lining see Roadworks Standard Drawings.

DEPARTMENT OF TRANSPORT
WEST MIDLANDS REGIONAL OFFICE

CONSULTING ENGINEERS
OVE ARUP & PARTNERS
WARWICK

A46 COVENTRY EASTERN BYPASS

SMITE BROOK MAIN LINE CULVERT
STRUCTURE No. 4.
GENERAL ARRANGEMENT & DIMENSIONS

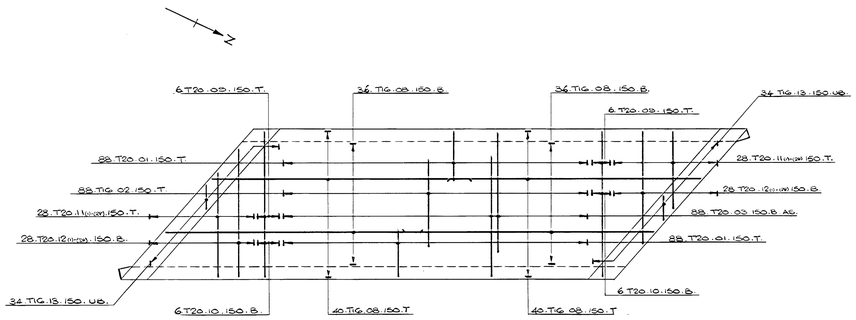
Mark	Date	Amendment	By
A	JAN 89	AS BUILT	M.B.P.

Drawn/Traced	Approval Issue	Scale:
S.R.D. J.M.A.	JULY 1986	AS SHOWN
Checked	Tender Issue	Sheet No.
R.V.C.H.	JANUARY 1987	
Approved	Works Issue	Drawing No.
	JUNE 1987	11349/10-4/1A

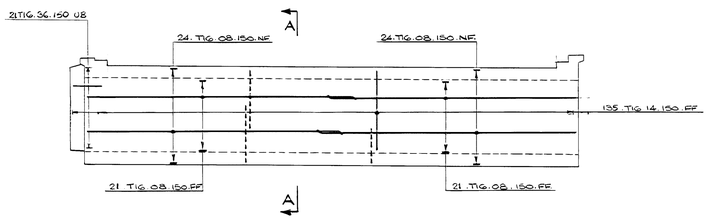
DM11

698

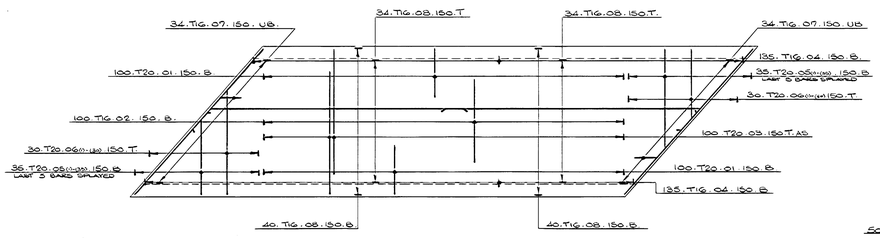
11349/10-5/2



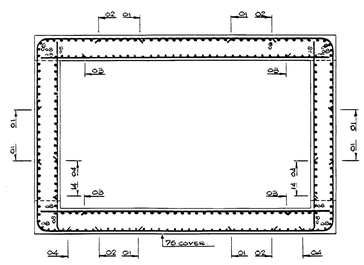
PLAN ON TOP SLAB
1:100



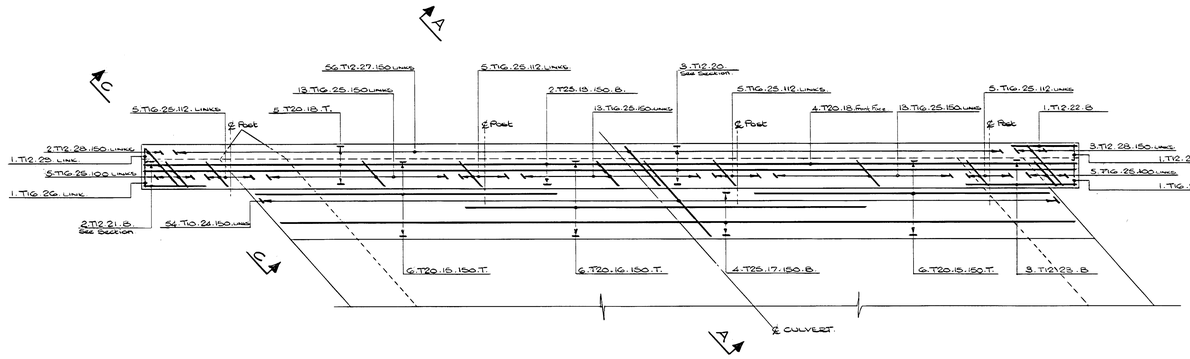
ELEVATION ON WEST WALL
VIEWED FROM OUTSIDE 1:100



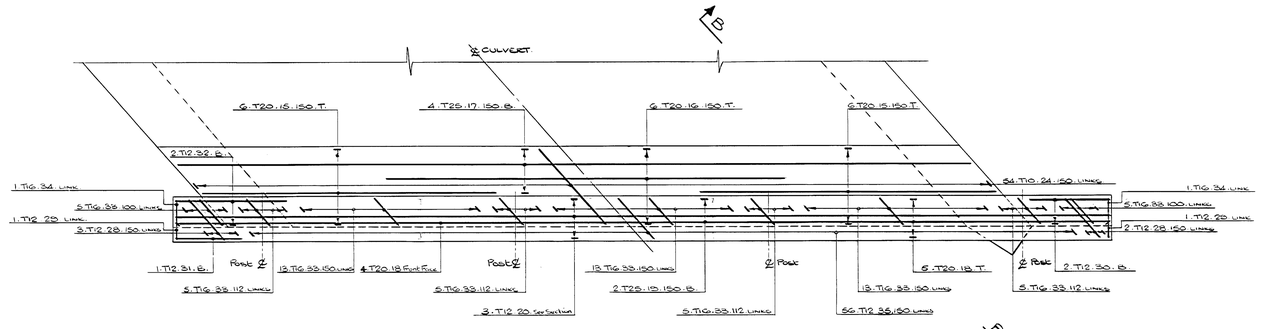
PLAN ON BASE SLAB
1:100



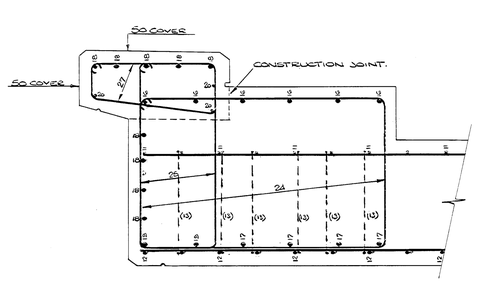
SECTION A-A
1:50



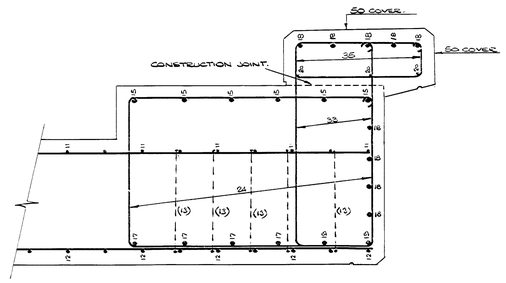
PLAN ON SOUTH PARAPET
1:25



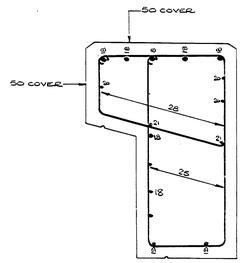
PLAN ON NORTH PARAPET
1:25



SECTION A-A
1:10



SECTION B-B
1:10



SECTION C-C
1:10

NOTES:-

1. CONCRETE GRADE TO BE 30/20 WITH SULPHATE RESISTING CEMENT CLASS 2 EXCEPT CONCRETE IN PARAPET PLINTH TO BE 50/20.
2. STEEL REINFORCEMENT DETAILS EXCLUDE ALL SUPPORTING STEEL AND SPACERS.
3. NO CONSTRUCTION JOINTS TO BE FORMED ON EXPOSED SURFACES EXCEPT WHERE SHOWN.

LAYOUT DRAWING Nº ; 11349/10-5/1
ASSOCIATED REINFORCEMENT DRGS.; —
BENDING SCHEDULE PAGE Nºs ; 002/01-05
CONCRETE GRADE ; SEE NOTES
NOMINAL COVER TO REINFORCEMENT ; 45mm (unless otherwise stated)
REINFORCEMENT TYPES ;
R - MILD STEEL TO B.S.4449
T - HIGH YIELD STEEL, TYPE 2 DEFORMED, TO B.S.4449, B.S.4461

ABBREVIATIONS
T - TOP
B - BOTTOM
A.P. - ALTERNATELY PLACED
A.R. - ALTERNATELY REVERSED
A.S. - ALTERNATELY STAGGERED
N.F. - NEAR FACE
F.F. - FAR FACE

DEPARTMENT OF TRANSPORT WEST MIDLANDS REGIONAL OFFICE	A46 COVENTRY EASTERN BYPASS	SMITE BROOK LINK CULVERT STRUCTURE No. 5 BOX REINFORCEMENT	

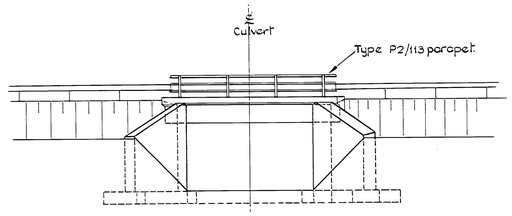
CONSULTING ENGINEERS
OVE ARUP & PARTNERS
WARWICK

Mark	Date	Amendment	By
A	Aug. 87	Bar Mks 9, 10, 13, 14, 18, 21	GM
B	JUNE '90	AS BUILT	

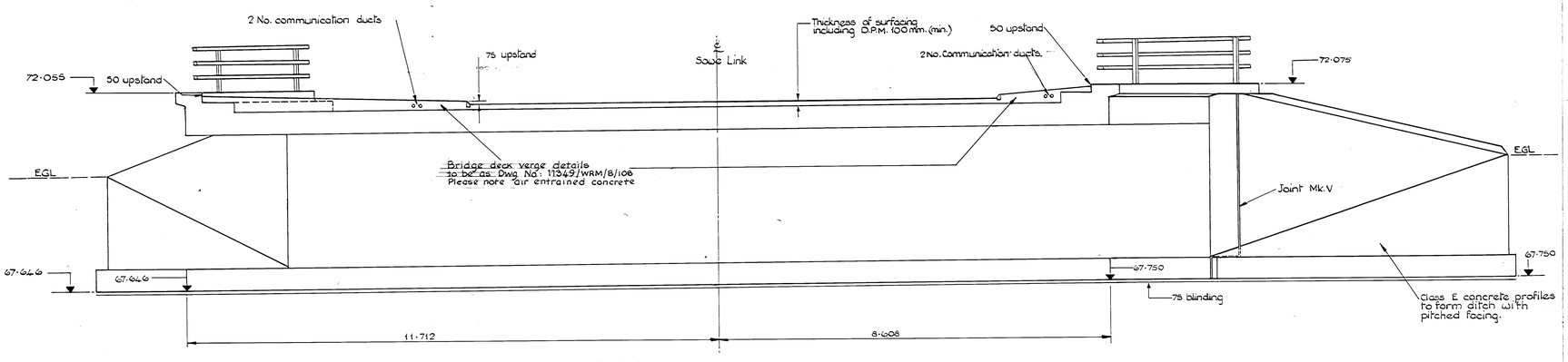
Drawn/Traced	Approval Issue JULY 1986	Scale: AS SHOWN
Checked R.V.C.H.	Tender Issue JANUARY 1987	Sheet No.
Approved	Works Issue JUNE 1987	Drawing No. 11349/10-5/2B

DM1

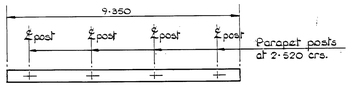
11349/10-5/1



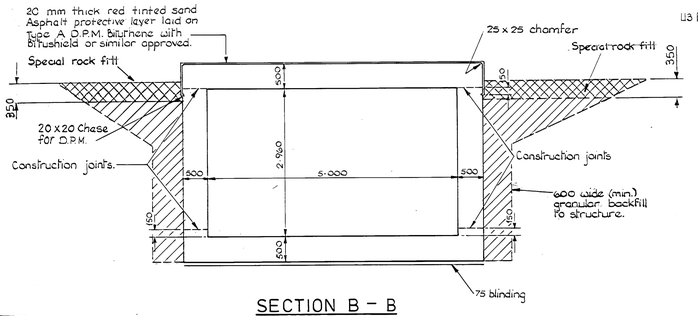
ELEVATION ON C – C
SCALE 1:100



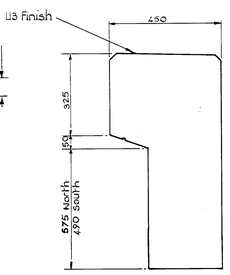
SECTION A – A
SCALE 1:50



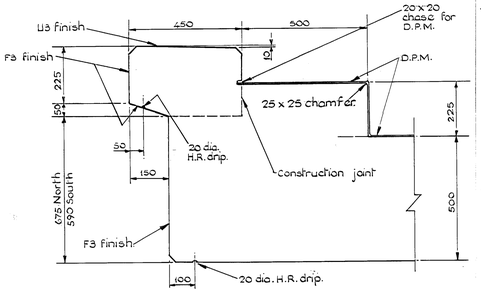
PLAN – PARAPET PLINTH
SCALE 1:100



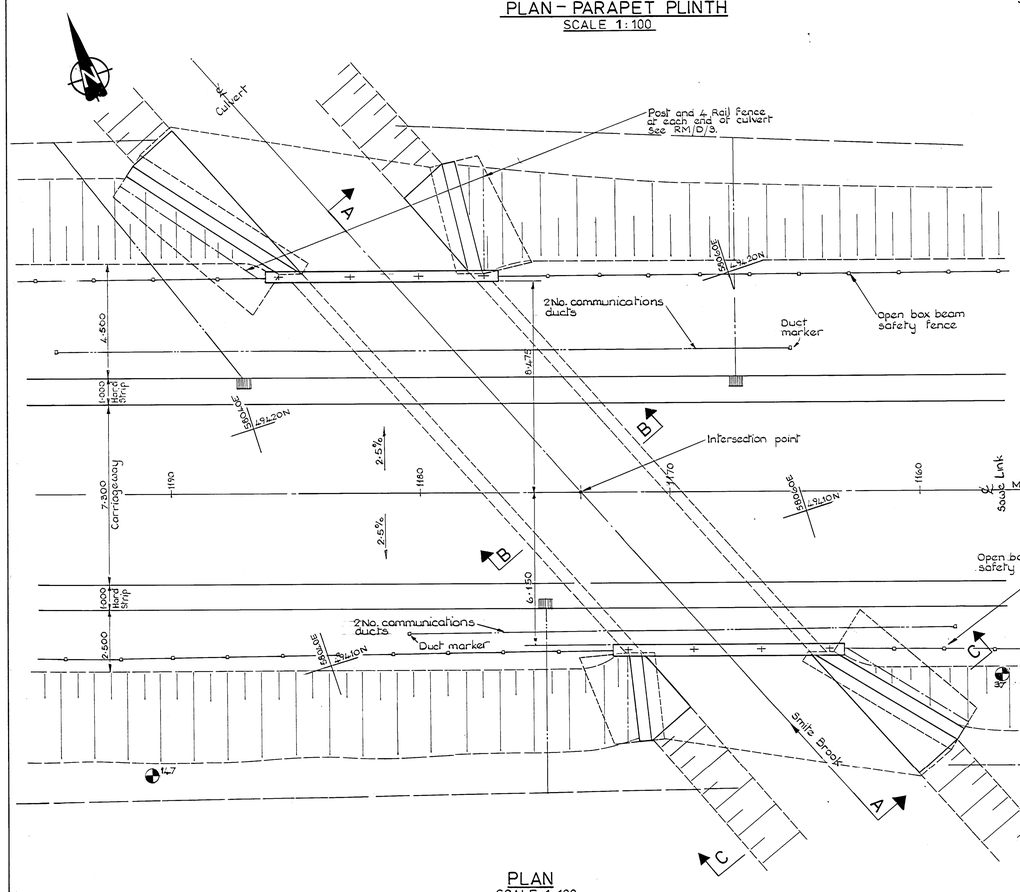
SECTION B – B
SCALE 1:50



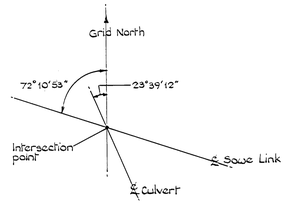
SECTION THROUGH PLINTH ENDS
SCALE 1:10



TYPICAL SECTION THROUGH PARAPET
SCALE 1:10

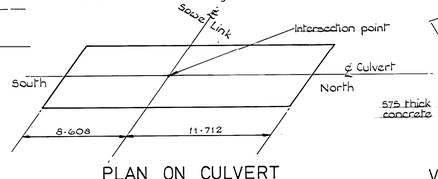


PLAN
SCALE 1:100

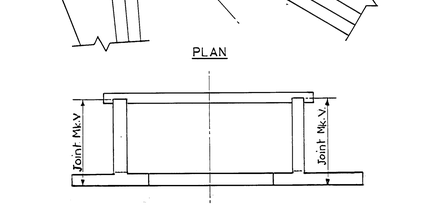


SETTING OUT DETAILS.

Intersection Point Data:–
C.E.B.P. ℄ Chainage, 1173·671, MC85.
Coordinates :– "580951·694 E, 294193·484 N.
C.E.B.P Bearing, 267°49'7·4"
Smite Brook Culvert Bearing, 336° 20' 46"

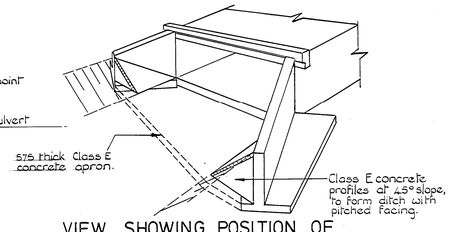


PLAN ON CULVERT
SCALE 1:200



SECTION D – D
END OF BOX JOINT MK. V.

JOINT DETAILS
NOT TO SCALE.



VIEW SHOWING POSITION OF CHANNEL PROFILES
NOT TO SCALE

CARRIAGEWAY LEVELS			
Chainage	L.H. Channel	℄	R.H. Channel
1150	71·604	71·920	71·604
1160	71·608	71·924	71·608
1170	71·615	71·931	71·615
1180	71·624	71·940	71·624
1190	71·634	71·950	71·634

NOTES

1. This drawing to be read in conjunction with Drawing Nos. 11349/10-5/2 — 5/4
2. Standard drawings applicable to this drawing :– See Bridgeworks Book 3.
3. All levels are above O.D. (Newlyn).
4. Boreholes are shown thus ◔ and positions are approximate.
5. Class of finish to concrete surfaces

Type	Buried	Exposed
Formed	F1	F2
Unformed	U1	U2

Except where otherwise stated.

6. Concrete blinding layer to be Class E concrete. Where ground below foundation level is unsuitable the depth of blinding concrete is to be increased down to a suitable foundation level as directed by the Engineer.
7. All exposed edges to have 25 mm. x 25 mm. chamfers unless otherwise shown.
8. No construction joints to be formed on exposed surfaces except where shown.
9. No backfilling shall commence until the R.C. box is fully constructed. Backfilling shall be brought up equally on both sides of the box.
10. For details of typical ditch lining see Roadworks Standard Drawings.

DEPARTMENT OF TRANSPORT
WEST MIDLANDS REGIONAL OFFICE

CONSULTING ENGINEERS
OVE ARUP & PARTNERS
WARWICK

A46 COVENTRY EASTERN BYPASS

SMITE BROOK LINK CULVERT
STRUCTURE No. 5
GENERAL ARRANGEMENT & DIMENSIONS

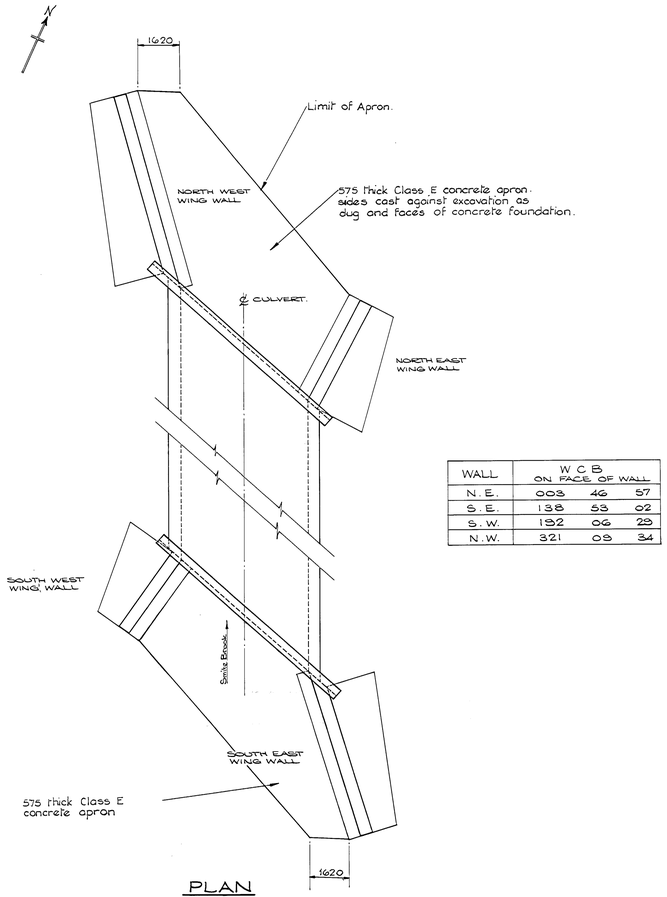
Mark	Date	Amendment	By
A	JAN 89	AS BUILT	M.B.P.

Drawn/Traced J.B.T. J.M.A.	Approval Issue JULY 1986	Scale: AS SHOWN
Checked R.V.C.H.	Tender Issue JANUARY 1987	Sheet No.
Approved	Works Issue JUNE 1987	Drawing No. 11349/10-5/1A

DM11

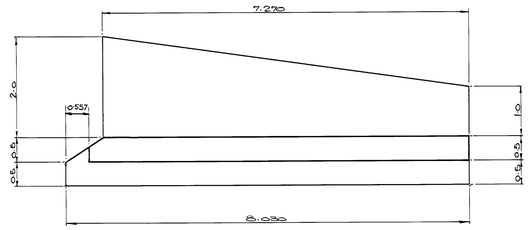
700

11349/10-5/3

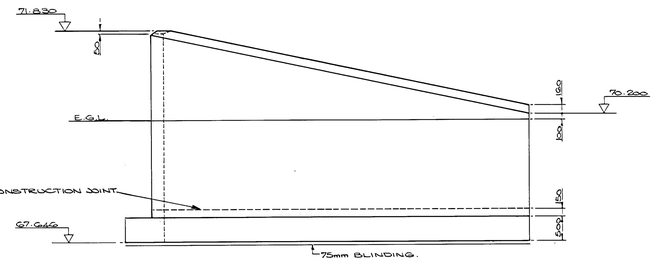


WALL	W.C.B. ON FACE OF WALL		
N.E.	003	46	57
S.E.	138	53	02
S.W.	192	06	29
N.W.	321	09	34

PLAN
SCALE 1:100

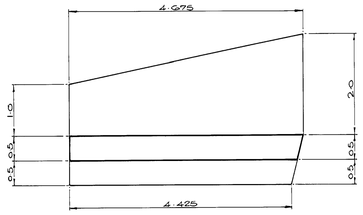


PLAN

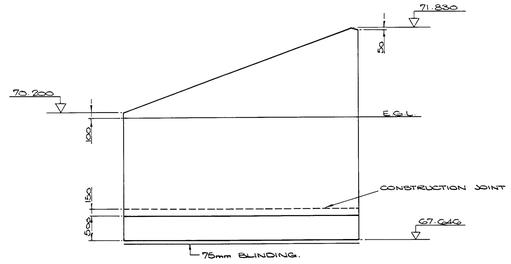


ELEVATION

NORTH WEST WING WALL
SCALE 1:50

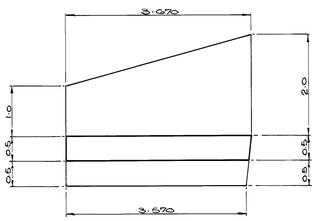


PLAN

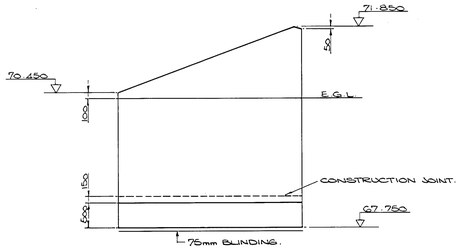


ELEVATION

NORTH EAST WING WALL
SCALE 1:50

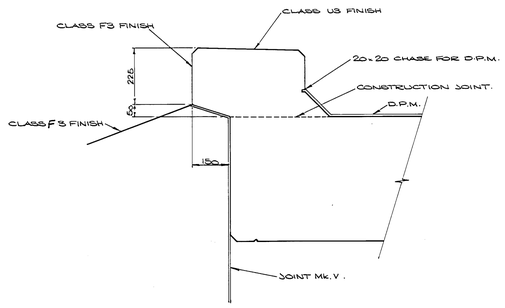


PLAN

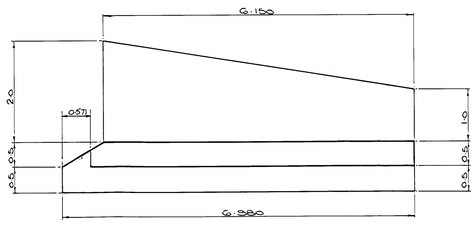


ELEVATION

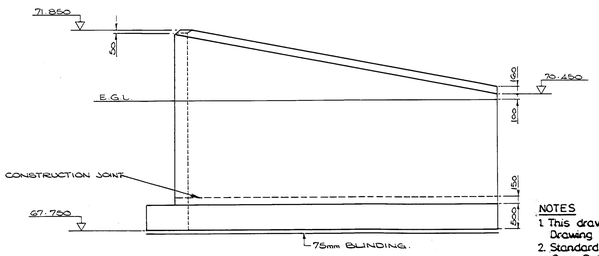
SOUTH WEST WING WALL
SCALE 1:50



BOX - WING WALL JOINT DETAIL
SECTION SQUARE TO BOX END
SCALE 1:10



PLAN



ELEVATION

SOUTH EAST WING WALL
SCALE 1:50

NOTES

1. This drawing to be read in conjunction with Drawing Nos. 11349/10-5/1, 5/2 & 5/4.
2. Standard drawings applicable to this drawing:- See Bridgeworks Book 3.
3. All levels are above O.D. (Newlyn)
4. Class of finish to concrete surfaces :-

Type	Buried	Exposed
Formed	F1	F2
Unformed	U1	U2

Except where otherwise stated.

5. Concrete blinding layer to be Class E concrete. Where ground below foundation level is unsuitable the depth of blinding concrete is to be increased down to a suitable foundation level as directed by the Engineer.
6. All exposed edges to have 25 mm. x 25 mm. chamfers unless otherwise shown.
7. No construction joints to be formed on exposed surfaces except where shown.

DEPARTMENT OF TRANSPORT
WEST MIDLANDS REGIONAL OFFICE

CONSULTING ENGINEERS
OVE ARUP & PARTNERS
WARWICK

A46 COVENTRY EASTERN BYPASS

SMITE BROOK LINK CULVERT
STRUCTURE No. 5
WING WALL DIMENSIONS

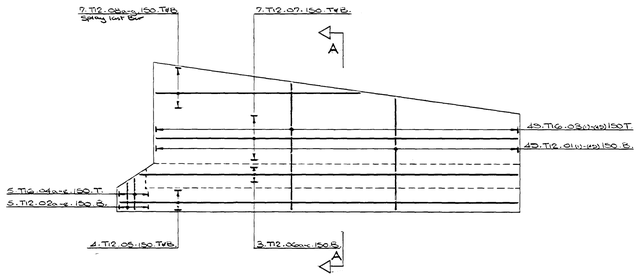
Mark	Date	Amendment	By
A	JUNE '90	AS BUILT	

Drawn/Traced: CB
Checked: R.V.C.H.
Approved:
Approval Issue: JULY 1986
Tender Issue: JANUARY 1987
Works Issue: JUNE 1987
Scale: AS SHOWN
Sheet No.
Drawing No. 11349/10-5/3A.

DM1

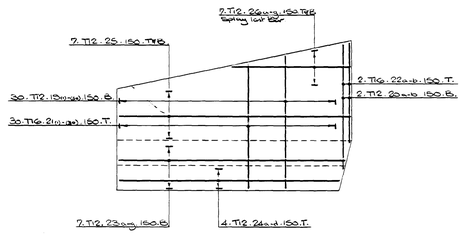
701

11349/10-5/4



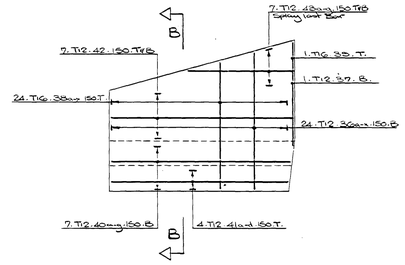
PLAN ON N.W. BASE

1 : 50



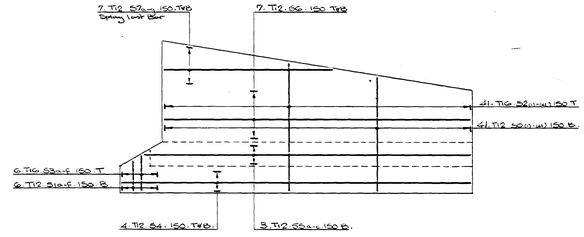
PLAN ON N.E. BASE

1 : 50



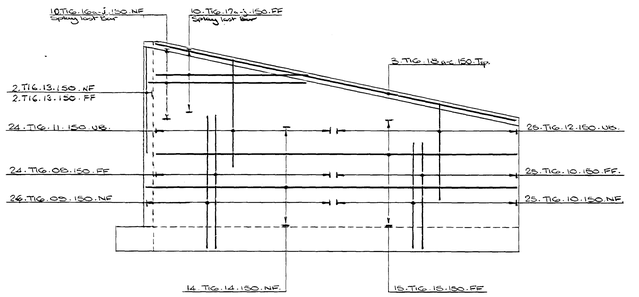
PLAN ON S.W. BASE

1 : 50



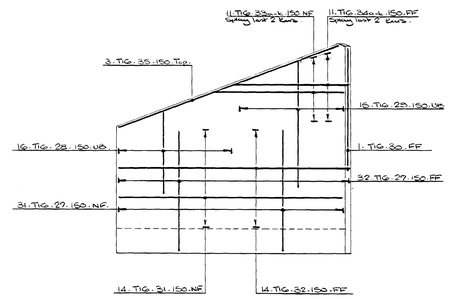
PLAN ON S.E. BASE

1 : 50



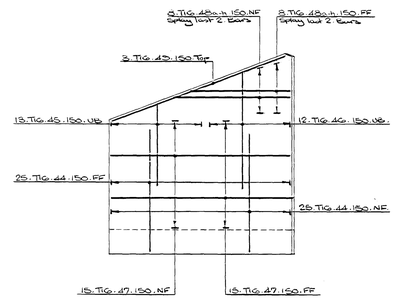
ELEVATION ON N.W. WING WALL

1 : 50



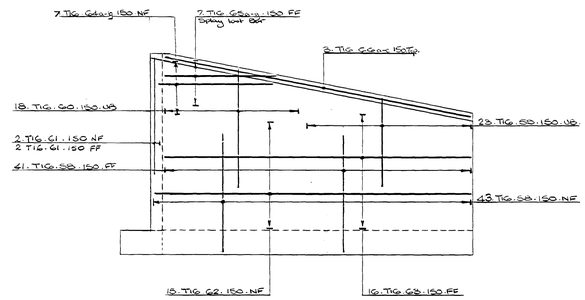
ELEVATION ON N.E. WING WALL

1 : 50



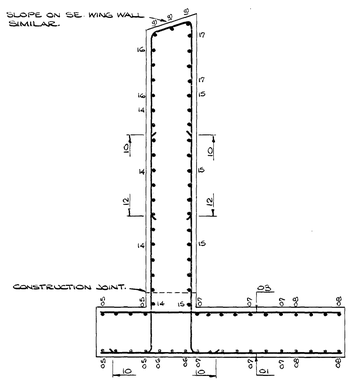
ELEVATION ON S.W. WING WALL

1 : 50



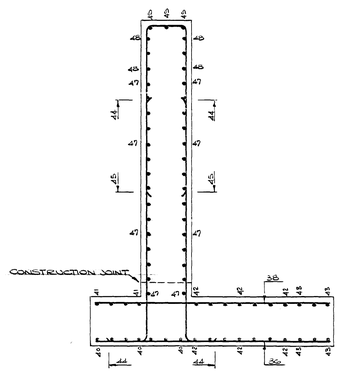
ELEVATION ON S.E. WING WALL

1 : 50



SECTION A-A

1 : 25



SECTION B-B

1 : 25

NOTES :-

1. NO CONSTRUCTION JOINTS TO BE FORMED ON EXPOSED SURFACES, EXCEPT WHERE SHOWN
2. STEEL REINFORCEMENT DETAILS EXCLUDE ALL SUPPORTING STEEL AND SPACERS.
3. CONCRETE TO BE CLASS 30/20 WITH SULPHATE RESISTING CEMENT CLASS 2.

LAYOUT DRAWING Nº ; 11349/10-5/1
ASSOCIATED REINFORCEMENT DRGS. ; —
BENDING SCHEDULE PAGE Nºs ; 004/01-18
CONCRETE GRADE : SEE NOTE 3.
NOMINAL COVER TO REINFORCEMENT: 45mm (unless otherwise stated)
REINFORCEMENT TYPES :
R - MILD STEEL TO B.S.4449
T - HIGH YIELD STEEL, TYPE 2 DEFORMED, TO B.S.4449. B.S.4461

ABBREVIATIONS
T - TOP
B - BOTTOM
A.P. - ALTERNATELY PLACED
A.R. - ALTERNATELY REVERSED
A.S. - ALTERNATELY STAGGERED
N.F. - NEAR FACE
F.F. - FAR FACE

DEPARTMENT OF TRANSPORT
WEST MIDLANDS REGIONAL OFFICE

CONSULTING ENGINEERS
OVE ARUP & PARTNERS
WARWICK

A46 COVENTRY EASTERN BYPASS

SMITE BROOK LINK CULVERT
STRUCTURE No. 5
WING WALL REINFORCEMENT DETAILS

Mark	Date	Amendment	By
A	Aug. 87	Bar Mks 16 & 64	GM
B	JUNE 90	AS BUILT	

Drawn/Traced
Approval Issue JULY 1986
Scale: AS SHOWN
Checked R.V.C.H.
Tender Issue JANUARY 1987
Sheet No.
Approved
Works Issue JUNE 1987
Drawing No. 11349/10-5/4B

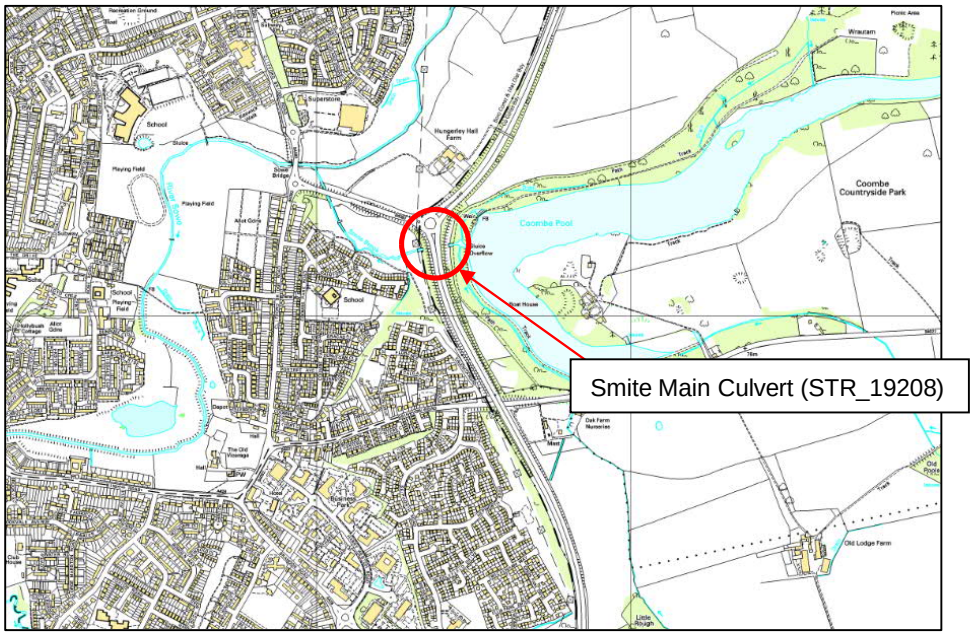
DWG

Existing Structures

Existing Smite Main Culvert (STR_19208)

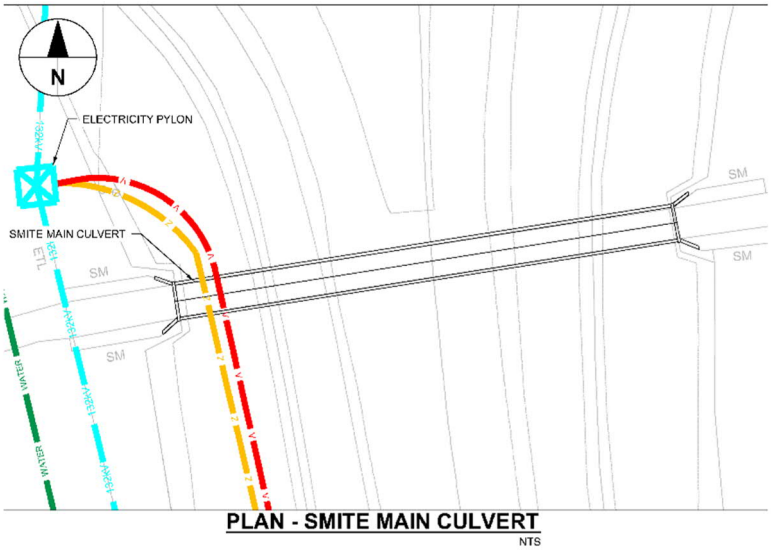
Site Description

Smite Main Culvert is situated approximately 50m to the south of the existing junction with B4082 road and the A46 Coventry Eastern Bypass. It carries the A46 Coventry Eastern Bypass over Smite Brook. OS Grid Reference: SP383792.



Existing Structure

Smite main culvert was constructed circa 1989. The structure comprises a single span insitu reinforced concrete box culvert measuring 5.20m by 1.95m internally. The overall length (based on asbuilt information) is 81.73m. Splayed wingwalls are provided at either side of the headwalls.



The structure is founded on a reinforced concrete slab foundation. P4 pedestrian parapets are provided at each elevation and timber post and rail fencing is also installed along both elevations, either side of the structure.

The most recent Principal Inspection (2019) indicates that the structure is in good condition, with no major structural defects. Structural capacity to be taken as 45 units of HB + HA loading. Without access to a previous assessment report or Approval in Principal, headline capacity has been taken from IAMIS's load management page.

Existing Utilities

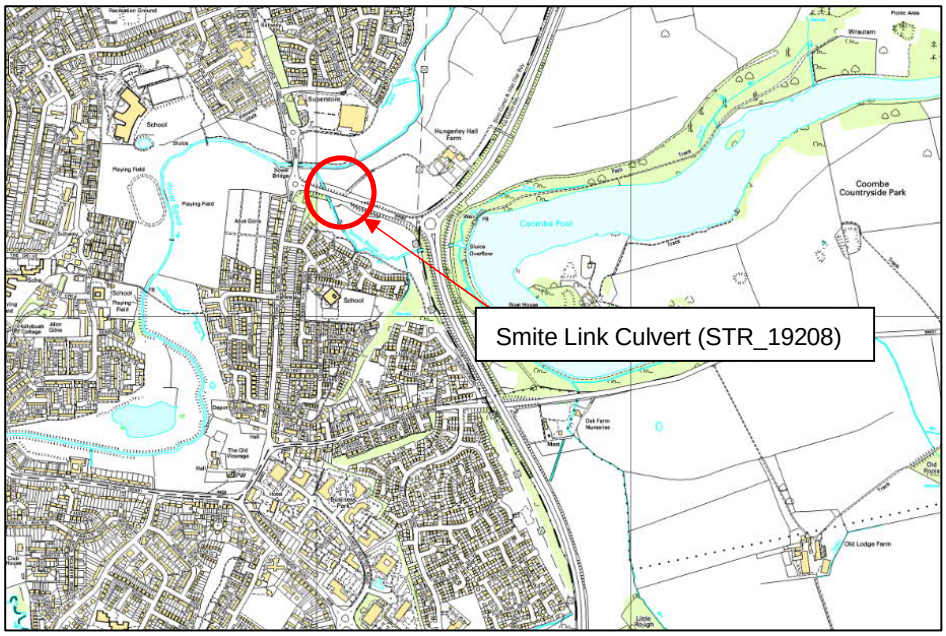
The structure is local to multiple utilities;

- 2No. Buried telecoms (Vodaphone, Surf Telecoms), in the verge over the structure.
- Electricity pylon (16.8m) and associated OH 132kV line.
- BT ducts (26.0m)
- Water mains (27.0m)

Existing Smite Link Culvert (STR_19208)

Site Description

Smite Link Culvert is situated approximately 320m to the west of the existing junction with B4082 road and the A46 Coventry Eastern Bypass. It carries the B4082 over Smite Brook. OS Grid Reference: SP380793.



Existing Structure

Smite link culvert was constructed circa 1989, there are no available records of the structure having a different identification, thus it currently shares the same structure key as Smite Main Culvert. The structure comprises a single span insitu reinforced concrete box measuring 5.00m by 2.96m internally. The structure has a square length of 20.32m and a skew length of 17.7m (from asbuilt information). Wingwalls are provided at either side of the headwalls. The structure is founded on a reinforced concrete slab foundation. Vehicular parapets are provided at each elevation transitioning to open box beam vehicle restraint systems. Timber fences run along the back of the wingwalls.

PLAN - SMITE LINK CULVERT
NTS

There is no inspection information available, therefore condition is unknown. Structural capacity is assumed to be 45 units of HB + HA loading as per the adjacent Smite Brook Main culvert.

Utilities

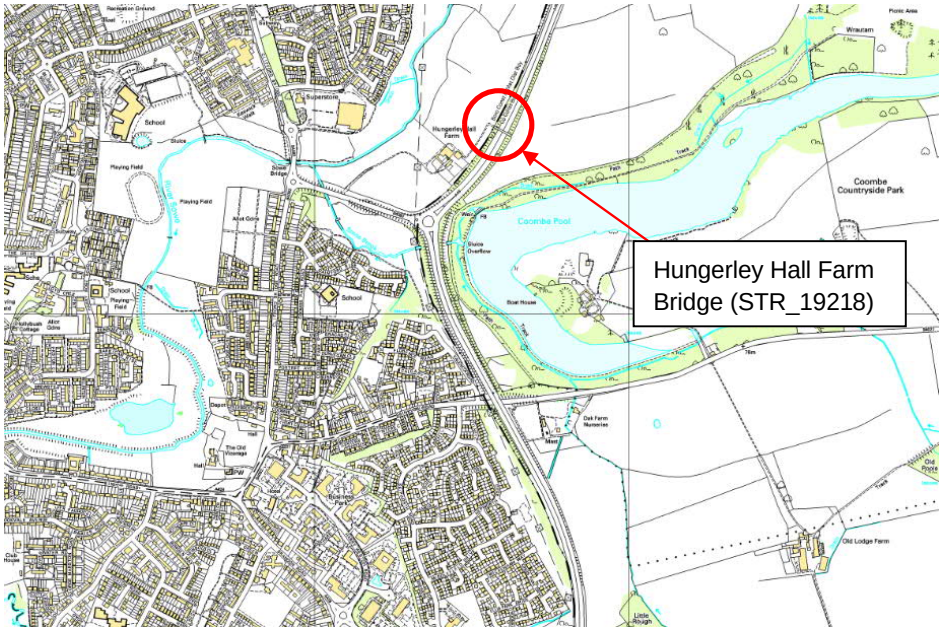
The structure is local to the following utilities;

- Water main (7.0m).
- BT ducts (30.0m)

Existing Hungerley Hall Farm Bridge (STR_19218)

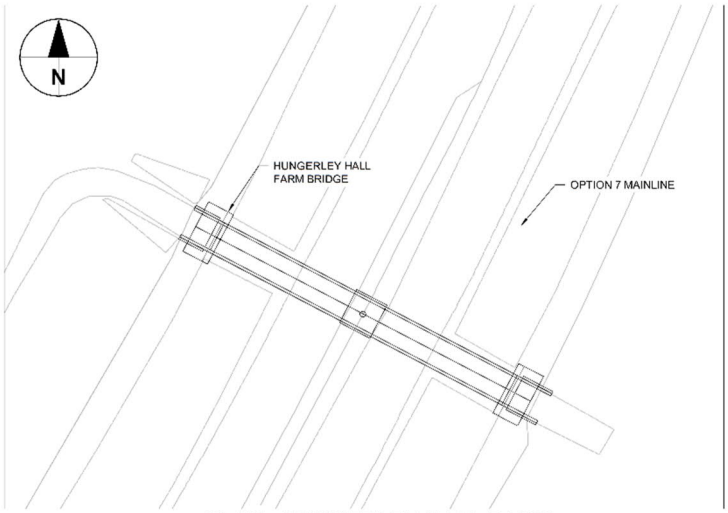
Site Description

Hungerley Hall Farm Bridge is situated approximately 340m to the north of the existing junction with B4082 road and the A46 Coventry Eastern Bypass. It carries a local road over the A46 Coventry Eastern Bypass. OS Grid Reference: SP386795.



Existing Structure

The structure was constructed circa 1989 and comprises a two-span 63m, continuous insitu post-tensioned voided spine beam. This is supported on bank seats with a single concrete column at mid span. The abutments are supported on spread footings. 1.5m high P2 parapets are provided at the north and south edgebeam. The structure articulates on 2No. bearings at each abutment, with elastomer rail joints at both the east and west abutment.



PLAN - HUNGERLEY HALL FARM
NTS

The most recent Principal Inspection (2019) states that the structure is in Good condition, with no major structural defects. Structural capacity is 45 units of HA + 25 HB loading according to the IAMIS database.

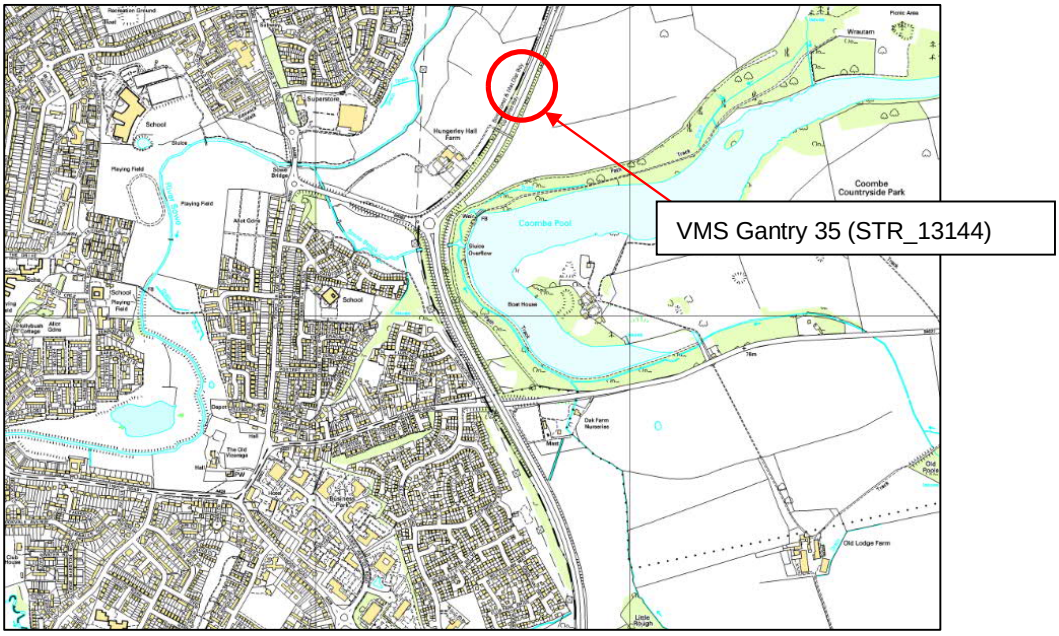
Utilities

The structure is not local to any utilities.

Existing VMS Gantry No.35 (STR_13144)

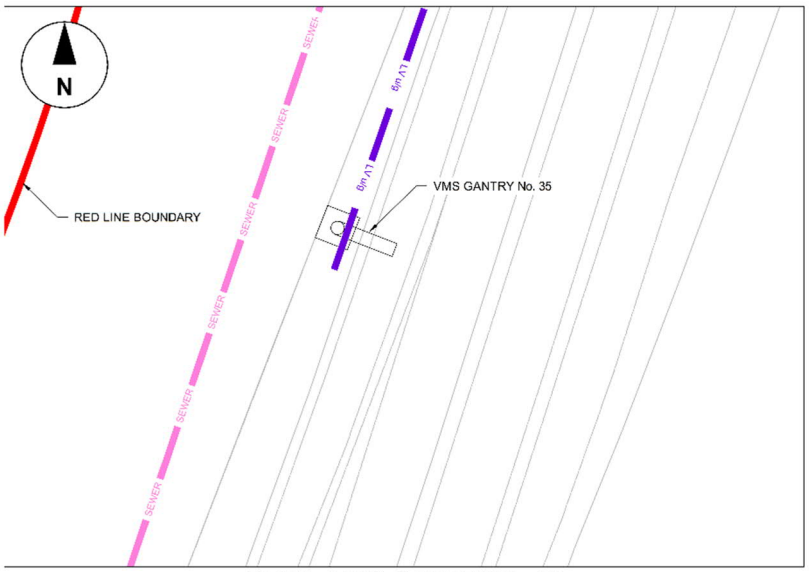
Site Description

VMS Gantry No.35 is situated approximately 1.2km to the north east of the existing junction with B4082 road and the A46 Coventry Eastern Bypass. OS Grid Reference: SP388801.



Existing Structure

The structure is a steel cantilever gantry, which spans over the verge of the northbound carriageway of the A46 Coventry Eastern Bypass Road between M6 Junction 2 and Walsgrave Island.



PLAN - VMS GANTRY No.35
NTS

The column of the gantry comprises of a steel tubular section. Steel ladders are fixed to the column to provide access to the gantry walkway. The cantilever arm is fixed to the column, which is in the form of steel frame. An inspection walkway and vehicle matrix signal (VMS) is fixed to the cantilevered arm. The column is fixed to a reinforced concrete foundation plinth using a bolted plate connection. The structural form is a fully fixed frame.
The most recent General Inspection (2018) indicates that the structure is in good condition, with no major structural defects.

Existing Utilities

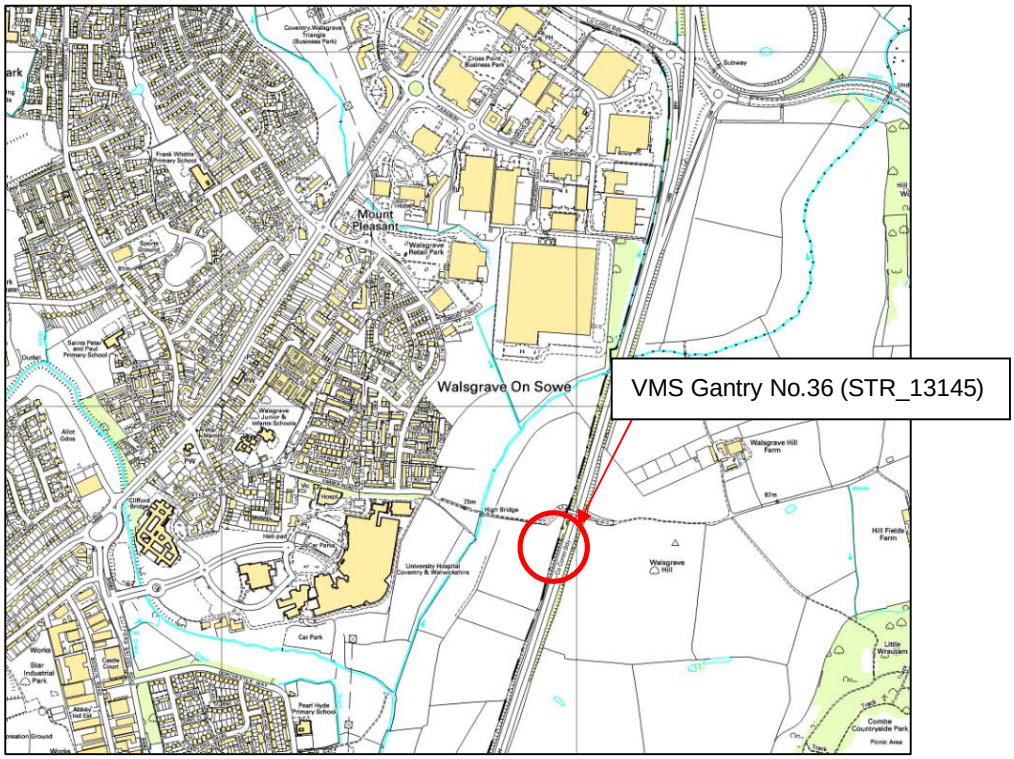
The structure is local to multiple utilities;

- Buried telecoms low voltage services in the verge over the foundation.
- Water sewer (approx. 10m to the west)

Existing VMS Gantry No.36 (STR_13145)

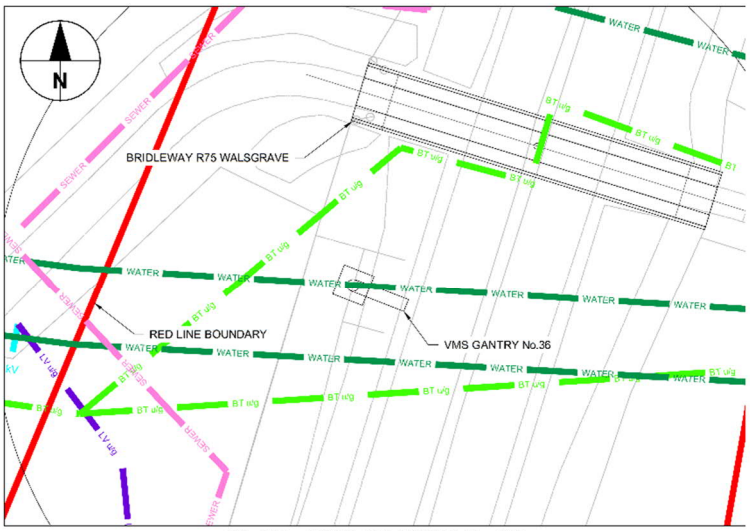
Site Description

VMS Gantry No.36 is situated approximately 1.5km to the north-east of the existing junction with B4082 road and the A46 Coventry Eastern Bypass. OS Grid Reference: SP389806.



Existing Structure

The structure is a steel cantilever gantry, which spans over the verge on the northbound carriageway of the A46 Trunk Road between M6 Junction 2 and Walsgrave Island. The column of the gantry comprises of a steel tubular section. Steel ladders are fixed to the column to provide access to the gantry walkway. The cantilever arm is fixed to the column, which is in the form of steel frame. An inspection walkway and vehicle matrix signal (VMS) are fixed to the cantilevered arm.



PLAN - VMS GANTRY No.36
NTS

The column is fixed to a reinforced concrete foundation plinth using a bolted plate connection. The most recent General Inspection (2020) indicates that the structure is in good condition, with no major structural defects.

Existing Utilities

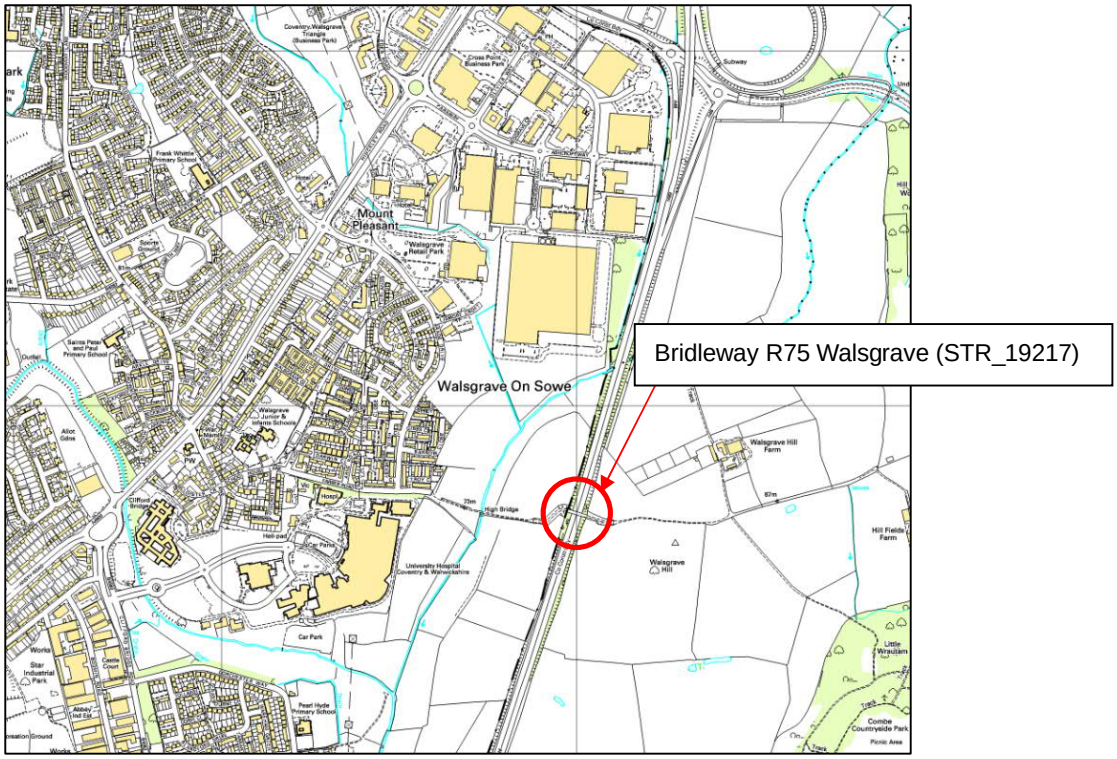
The structure is local to multiple utilities;

- BT ducts (9.0m)
- Water mains (1.0m)

Existing Bridleway R75 Walsgrave (STR_19217)

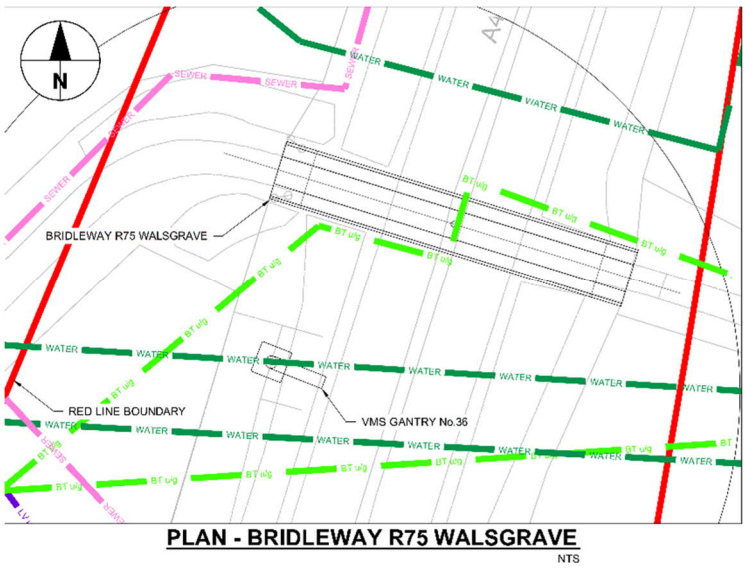
Site Description

Bridleway R75 Walsgrave is situated approximately 1.5km to the north-east of the existing junction with B4082 road and the A46 Coventry Eastern Bypass. It carries a local farm access road over both carriageways of the A46 Coventry Eastern Bypass. OS Grid Reference: SP390806.



Existing Structure

The structure comprises a two span insitu post-tensioned concrete deck, simply supported on reinforced concrete abutments with through-walls at either end , and an integral reinforced concrete pier as the intermediate support. The supports are founded on reinforced concrete spread footings. There are 2No. bearings to each abutment, with elastomer on rail movement joints at each abutment. Vehicular parapets are affixed to both edgebeam.



The most recent General Inspection (2019) indicates that the structure is in good condition, with no major structural defects.

Existing Utilities

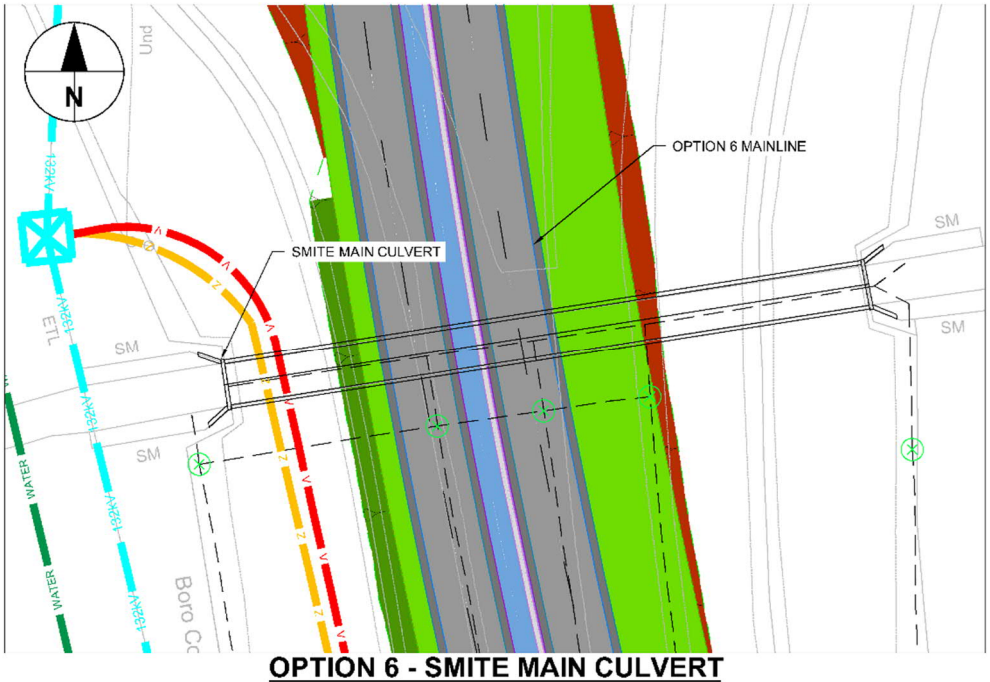
The structure is local to multiple utilities;

- Buried BT ducts - under the carriageway below.
- Water sewer (9.0m)
- Water mains (9.0m)

Option 6

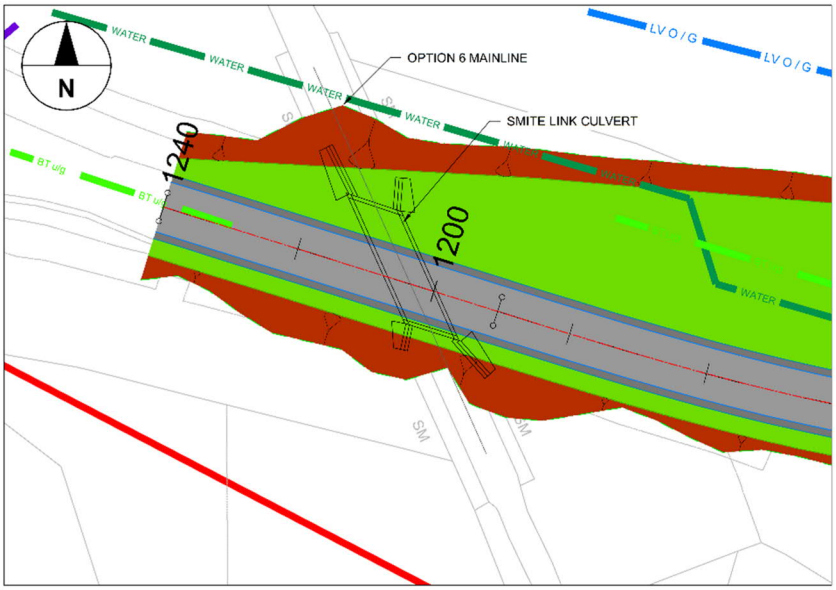
Smite Main Culvert

No structural adjustments should be required for this structure. The proposed mainline is at a higher level than the existing, resulting in a maximum fill depth increase of 0.55m minimum - 1.7m maximum. An assessment might be required to determine the capacity to support the proposed fill.



OPTION 6 - SMITE MAIN CULVERT
NTS

Smite Link Culvert



OPTION 6 - SMITE LINK CULVERT
NTS

The proposed Option 6 mainline increases the verge width to both ends of the structure, resulting in the need for a horizontal extension. The northern end would require an extension of approximately 7.1m along the skew of the structure. The southern end would need an extension of approximately 2.75m, also along the skew. No vertical extension is required in either case.

A solution could comprise of an insitu reinforced concrete box extension of the existing structure. A new headwall with wingwalls and parapet would need be provided to the western end with replacement timber post and rail fence or similar along the wingwalls. The extensions would ideally be dowelled into the existing structure. A local assessment of the existing structure to determine capacity to handle the dowelled extension would likely be required.

The construction will be constrained by Smite brook, and therefore the possibility of diverting the watercourse will need to be considered. The construction of this solution would be online.

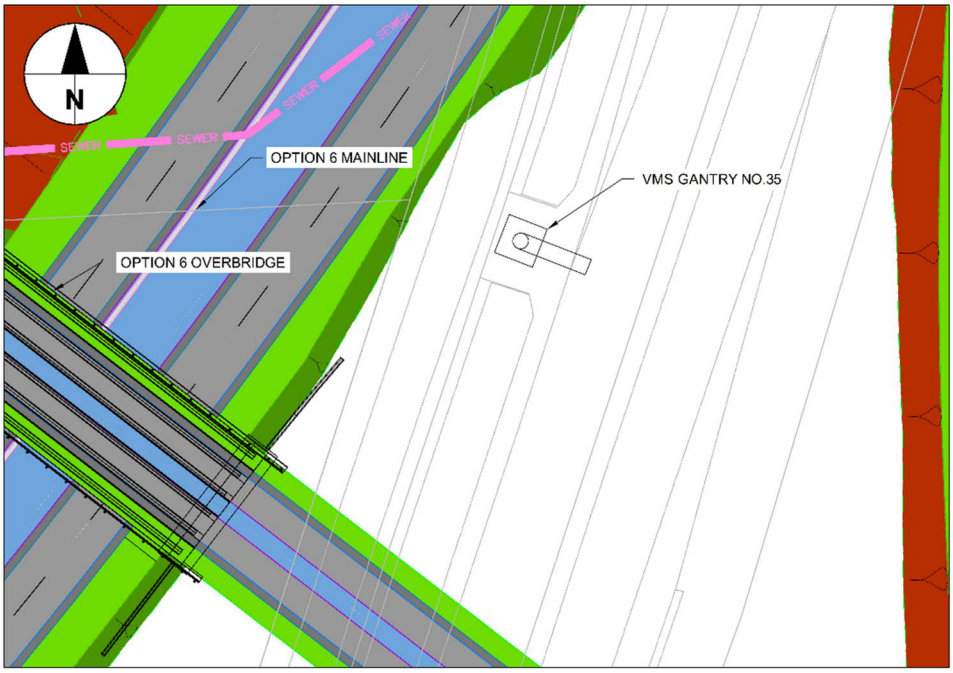
Hungerley Hall Farm

The proposed Option 6 alignment realigns the A46 Coventry Eastern Bypass to a different location. Thereby making the existing farm access overbridge redundant

Access for Hungerley Hall Farm can be provided through an access track from the eastern dumbbell roundabout, to the farm and adjacent owned land.

VMS Gantry No.35

The proposed Option 6 alignment realigns the A46 Coventry Eastern Bypass, requiring the removal of the structure. Requirement for the provision of a replacement gantry may need be determined at a later stage.



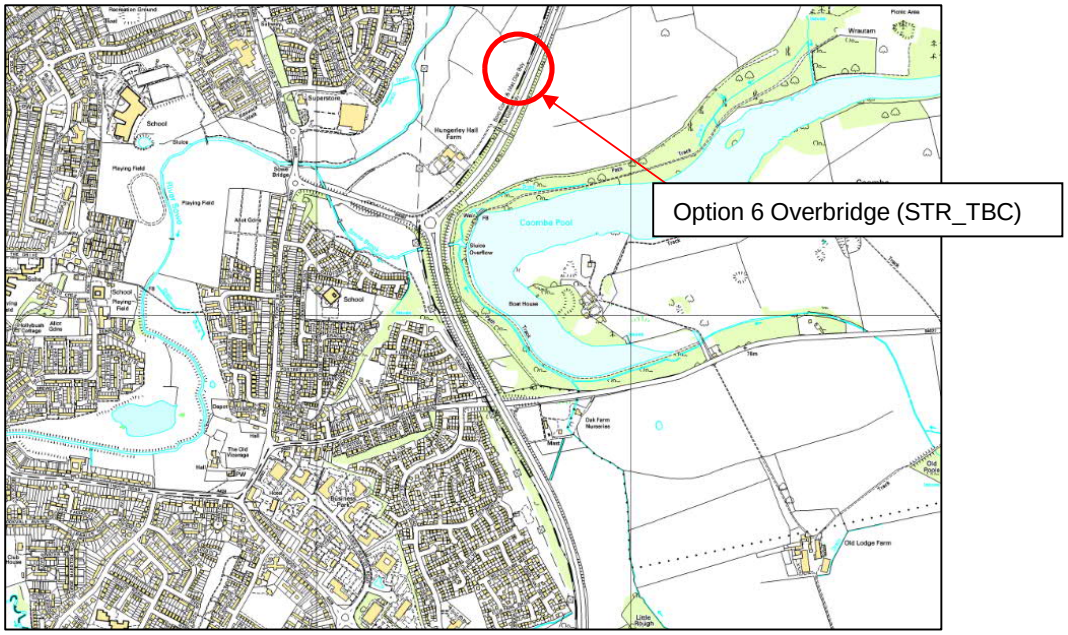
OPTION 6 - VMS Gantry NO.35
NTS

VMS Gantry No.36

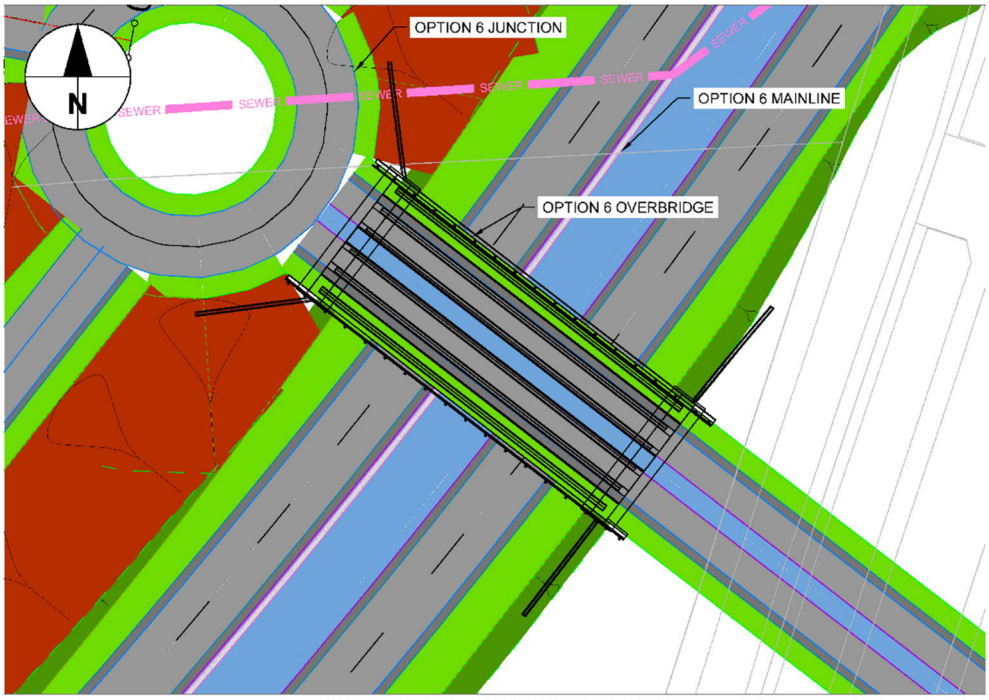
The proposed mainline does not impact the structure, it is expected that the gantry can be retained without any modifications.

Option 6 Overbridge

Option 6 Overbridge is likely to be situated at a new dumbbell junction approximately 950m to the north of the existing junction with B4082 road and the A46 Coventry Eastern Bypass. It will carry the junction road over both carriageways of the realigned A46 Coventry Eastern Bypass. Estimated OS Grid Reference: SP387801.



The single span overbridge could be composed of a reinforced concrete and steel composite deck, square to the realigned A46 Coventry Eastern Bypass. The proposed structure can be integral with reinforced concrete abutments at either end of the deck, likely to be founded on reinforced concrete spread footings. The structure will have a clear span of 40.50m. Splayed wingwalls at both the east and west end, to retain the junction and adjacent earthworks will be needed. Three pairs of girders and a 0.25m thick reinforced concrete slab make up the deck construction, with bracing between girders.



OPTION 6 - OVERBRIDGE
NTS

The overall width of the cross section is 17.80m. with 2.50m wide verges either side, continuing around the junction. The structure would carry the proposed A46 junction road, comprising 2No. 4.65m wide carriageways, separated by a 2.5m central reserve. Vehicular parapets, preferably with mesh facing, would be affixed to both edge beams.

Under the structure, the realigned A46 Coventry Eastern Bypass consists of a varying width verge (5.30 – 7.70m) alongside the northbound carriageway and a varying width verge (4.89m-4.50m) along the southbound carriageway. The dual carriageways are 7.30m wide, with 1.0m hard strips either side. An 8.90m wide central reserve separates the northbound and southbound carriageways.

A minimum of 5.30m plus sag curve needs be provided beneath the structure as per Section 4 of CD 127.

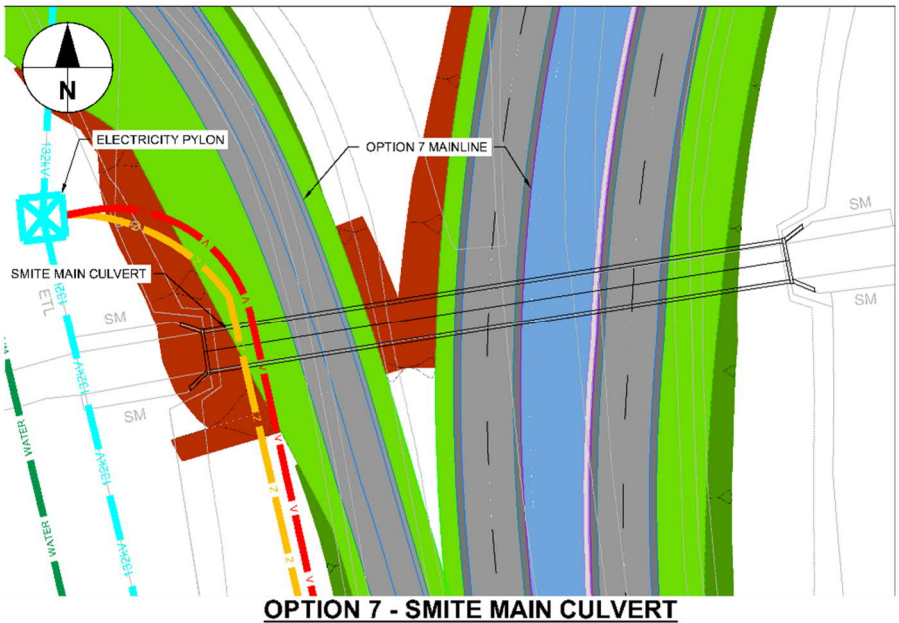
Provision for future utilities could be provided in both verges of the structure. The proposed structure is local to one existing service; a water sewer which would be blocked by the north-western wingwall, a diversion or local solution will be needed.

Bridleway R75 Walsgrave

The proposed changes from the Option 6 mainline do not affect the structure, therefore it is assumed that the structure and associated farm access route will be retained.

Option 7

Smite Main Culvert



OPTION 7 - SMITE MAIN CULVERT
NTS

The proposed alignment for Option 7 widens the west verge, therefore requiring extension of culvert at the west side. The eastern end of the structure will not require any amendments.

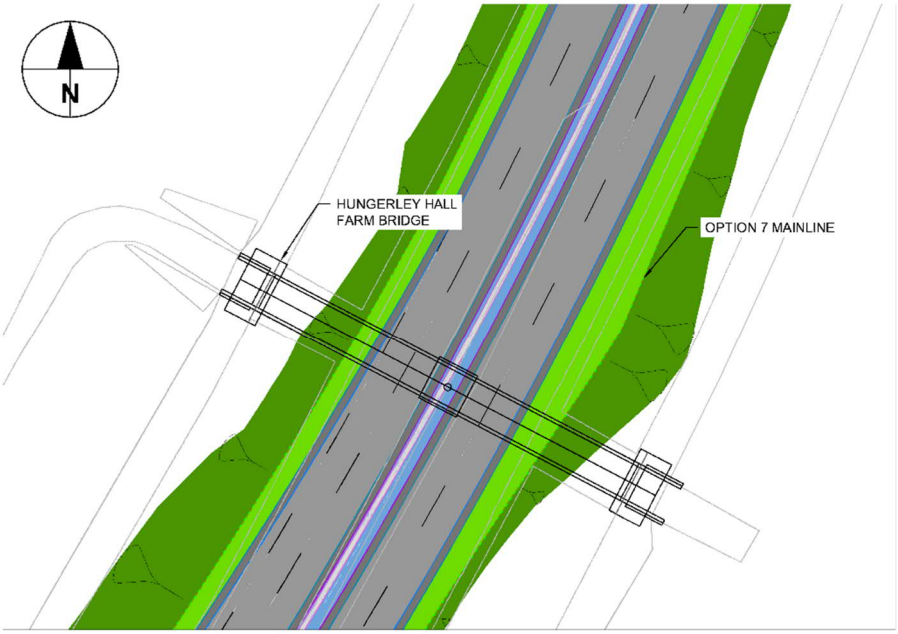
A vertical extension could comprise of a L-shaped retaining wall approx. 1.6m high and 6.2m long in front of the existing west headwall. The retaining wall could either doweled into the existing structure or freestanding.

This vertical extension would most likely need to be constructed online, which would increase associated costs with traffic management and would introduce hazards to the working conditions by working alongside live traffic, the adjacent overhead cables and pylon.

Smite Link Culvert

The proposed changes from the Option 7 mainline do not affect the structure. It is assumed that the structure can be retained with no necessary modifications.

Hungerley Hall Farm



OPTION 7 - HUNGERLEY HALL FARM
NTS

No structural adjustments required for this structure. The proposed mainline is in cutting, resulting in maximum vertical level changes of -0.9m over the structure. This is not expected to impact the existing structure therefore it is assumed that the structure and associated farm access track can be retained with no necessary modifications.

VMS Gantry No.35

The proposed changes from the Option 7 mainline do not affect the structure. It is assumed that the structure can be retained with no necessary modifications.

VMS Gantry No.36

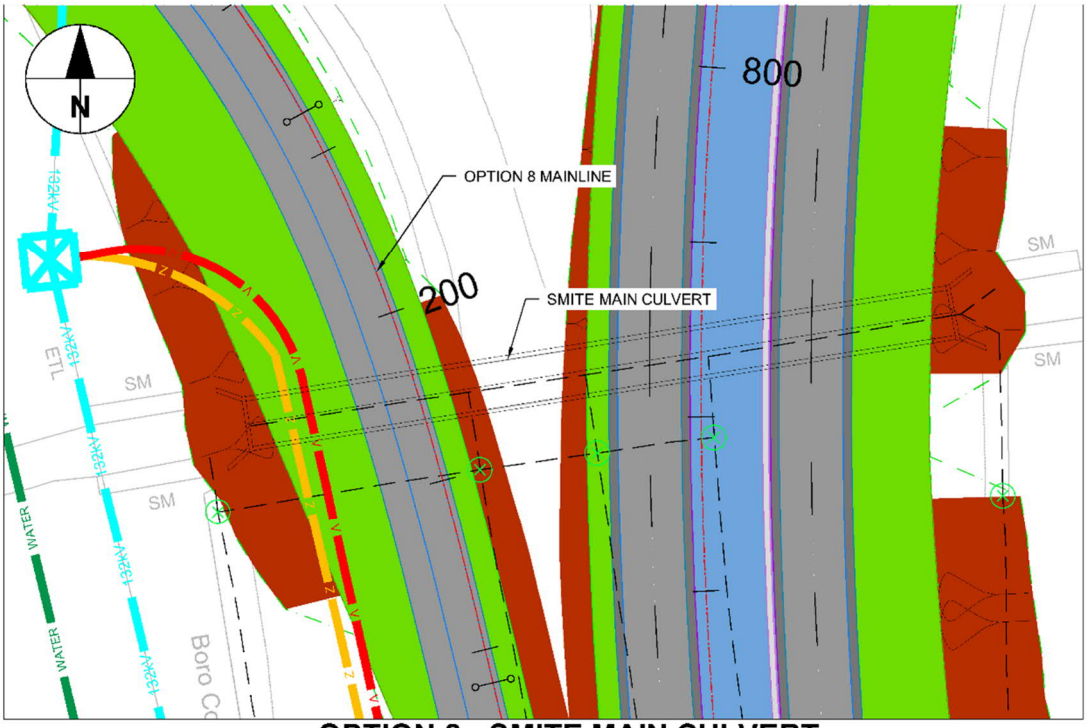
The proposed changes from the Option 7 mainline do not affect the structure. It is assumed that the structure can be retained with no necessary modifications.

Bridleway R75 Walsgrave

The proposed changes from the Option 7 mainline do not affect the structure. It is assumed that the structure and associated farm access track can be retained with no necessary modifications.

Option 8

Smite Main Culvert



OPTION 8 - SMITE MAIN CULVERT
NTS

The proposed alignment for Option 8 widens both the east and the west verge. Requiring both ends of the culvert to be extended.

A solution could comprise of an insitu RC box extension of approximately 3m to the eastern side of the structure, with new headwall with wingwalls. Similar to other Options, an extension of the existing cross section, in the form of inverted T reinforced concrete abutments with a reinforced concrete top slab. A new headwall with wingwalls and parapet would need be provided to the western end with timber post and rail fencing or similar installed along the wingwalls.

The western side of the structural may see an insitu RC box extension of approximately 4.5m.

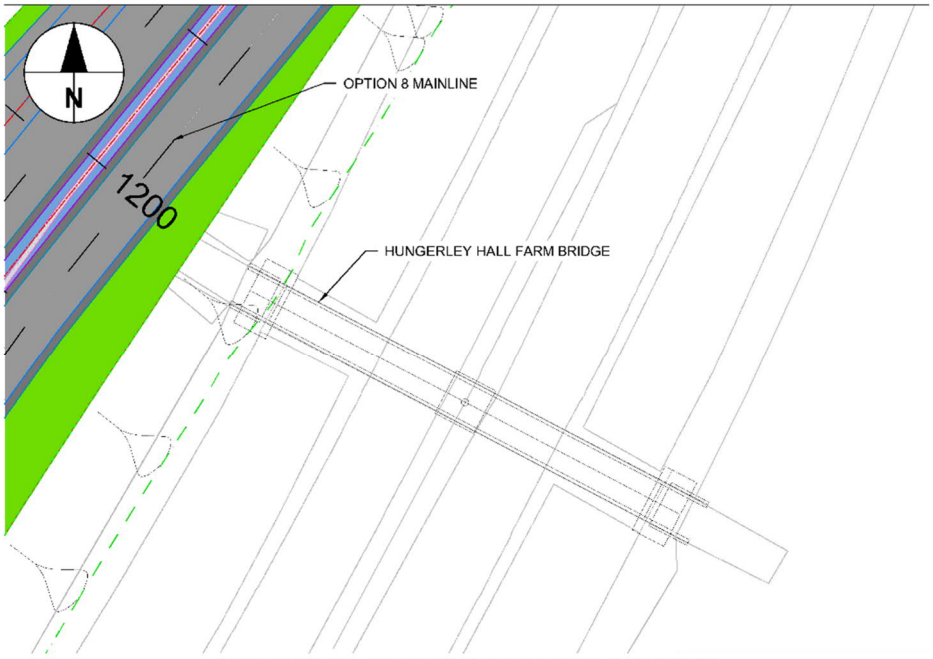
These potential solutions would require the full design of both extensions to the current structure, as well as a local assessment of the existing structure to assess the whether a dowelled connection is feasible.

The extensions would likely need to be constructed online, which would increase associated costs with traffic management and introduce hazards to the working conditions by working alongside live traffic, the adjacent overhead cables and pylon.

Smite Link Culvert

The proposed changes from the Option 8 mainline do not affect the structure. It is assumed that the structure can be retained with no necessary modifications.

Hungerley Hall Farm

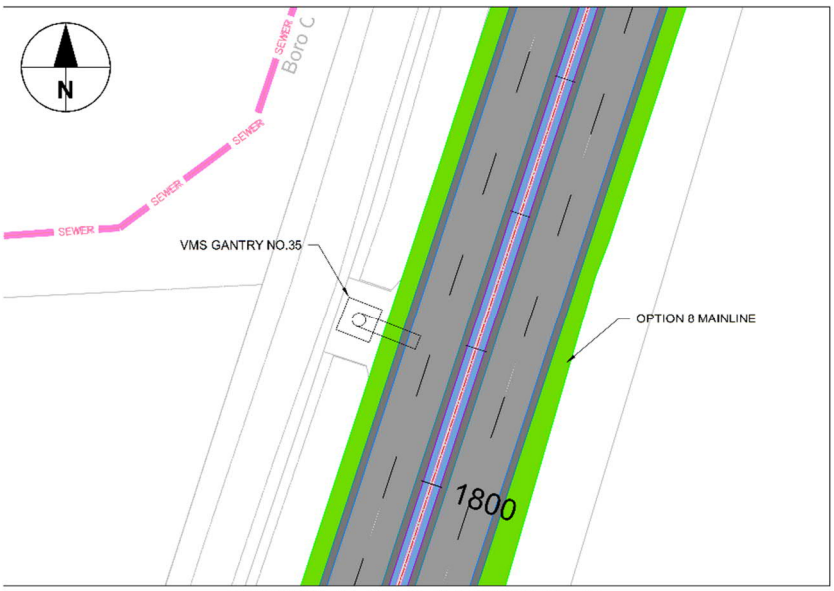


OPTION 8 - HUNGERLEY HALL FARM
NTS

The existing A46 Coventry Eastern Bypass will be realigned, likely resulting in Hungerley Hall Farm Bridge being made redundant. However, the land owner will still need access to their land. A new accommodation bridge could be constructed in close proximity to the existing Hungerley Hall farm. For details see Option 8 Accommodation Bridge.

VMS Gantry No.35

At the structure, the proposed alignment will have tied in with the existing mainline. Therefore, it is assumed that the structure can be retained with no necessary modifications.



OPTION 8 - VMS GANTRY No.35
NTS

VMS Gantry No.36

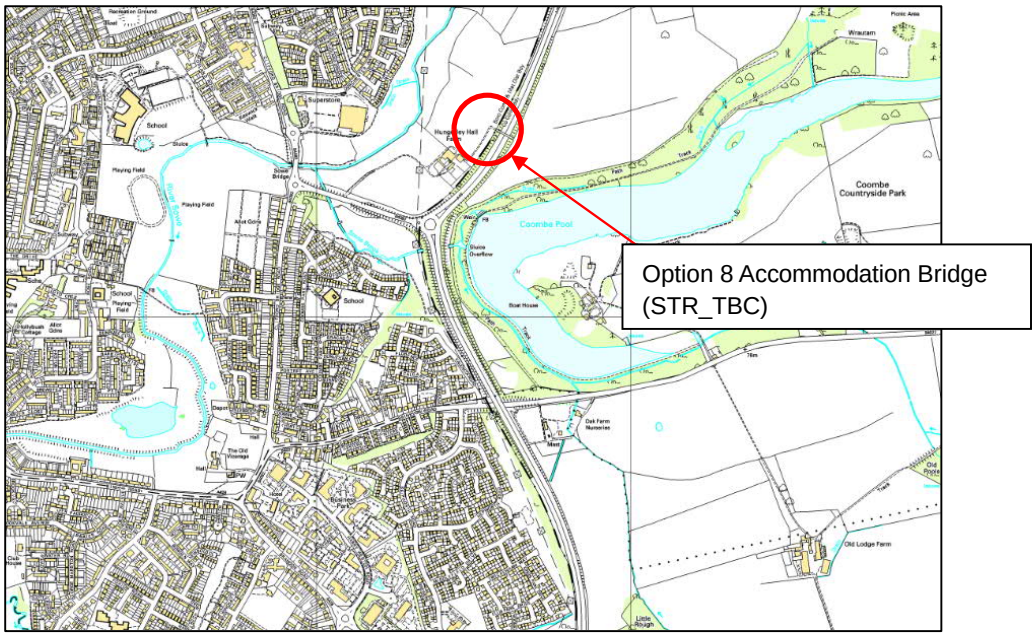
The proposed changes from the Option 8 mainline do not affect the structure. It is assumed that the structure can be retained with no necessary modifications.

Bridleway R75 Walsgrave

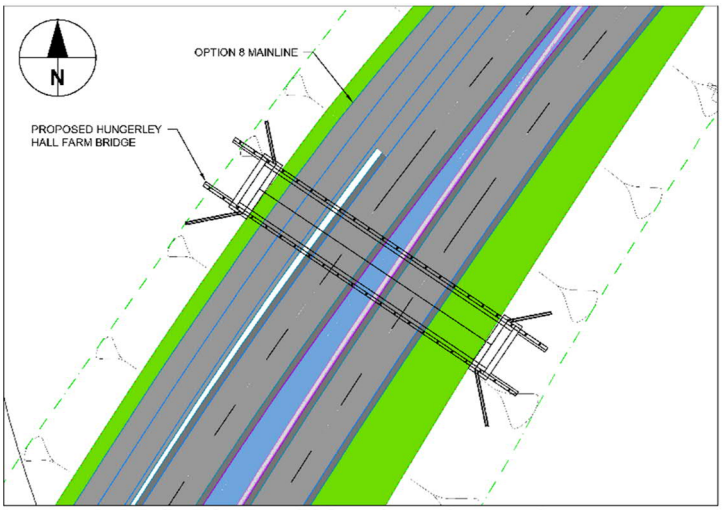
The proposed changes from the Option 8 mainline do not affect the structure. It is assumed that the structure and associated farm access track can be retained with no necessary modifications.

Option 8 Accommodation Bridge

Option 8 Accommodation Bridge is likely to be situated at a new location approximately 80m to the south-west of the existing Hungerley Hall Farm Bridge. It will carry a local farm access road over both carriageways of the realigned A46 Coventry Eastern Bypass. Estimated OS Grid Reference: SP385795.



The single span structure bridge could comprise of a reinforced concrete & steel composite deck, square to the realigned A46 Coventry Eastern Bypass. The proposed structure can be integral with reinforced concrete abutments at either end of the deck, likely to be founded on reinforced concrete spread footings. The structure will have a clear span of 45.50m. Splayed wingwalls at both the east and west end, to retain the adjacent earthworks will be required.



OPTION 8 - ACCOMMODATION BRIDGE
NTS

Two pairs of girders and a 0.25m thick reinforced concrete slab could make up the deck construction, with bracing between girders.

The overall width of the cross section above the structure is 9.50m. Over the structure, 0.60m wide verges run either side and the proposed farm access track for Hungerley Hall Farm, would comprise 2No. 3.65m wide carriageways without hard strips. 1.80m high vehicular parapets, preferably with mesh facing, would be affixed to both edge beams.

Under the structure, the realigned A46 Coventry Eastern Bypass consists of a 2.50m wide verge alongside both the northbound on-slip. The on slip consists of 2No 3.5m wide lanes, with a separation between the on slip and northbound carriageway. The dual carriageways are 7.30m wide, with 1.0m hard strips either side. A varying width central reserve separates the northbound and southbound carriageways.

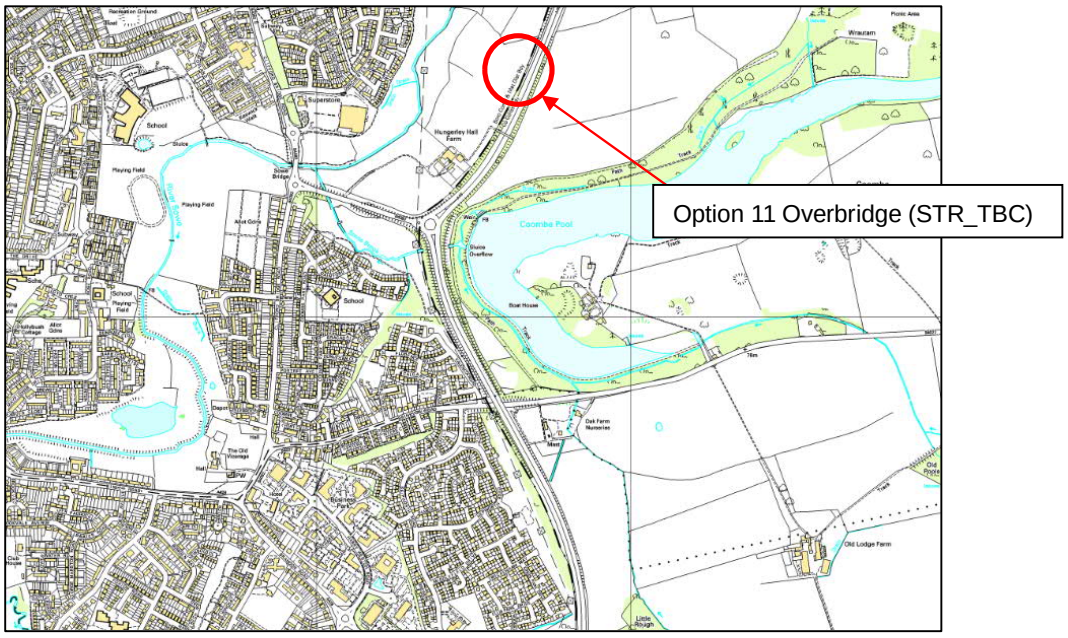
A minimum of 5.30m plus sag curve needs be provided beneath the structure as per Section 4 of CD 127.

The proposed structure is not local to any existing services.

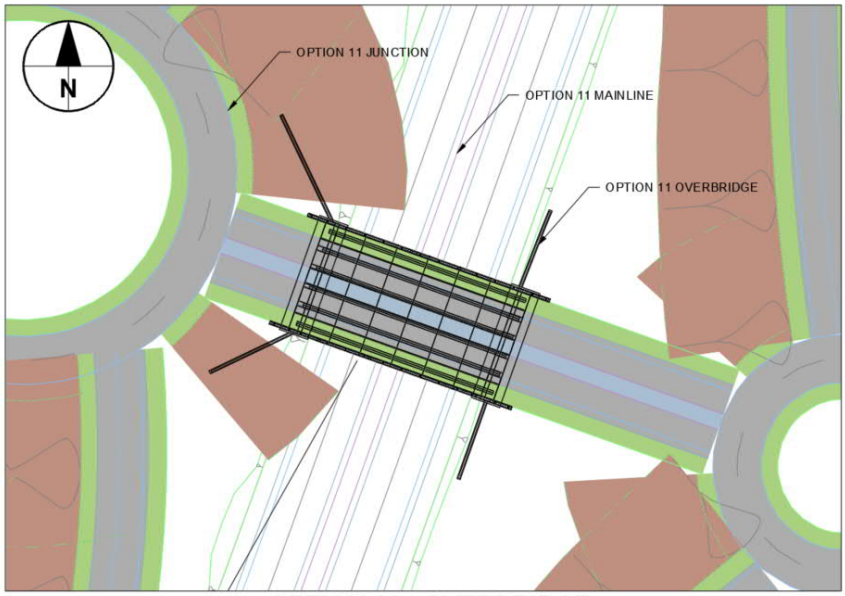
Option 11

Option 11 Overbridge

Option 11 Overbridge is likely to be situated at a new dumbbell junction approximately 760m to the north east of the existing junction with B4082 road and the A46 Coventry Eastern Bypass. It will carry the junction road over both carriageways of the realigned A46 Coventry Eastern Bypass. Estimated OS Grid Reference: SP387799.



The single span overbridge could be composed of a reinforced concrete and steel composite deck, square to the realigned A46 Coventry Eastern Bypass. The proposed structure can be integral with reinforced concrete abutments at either end of the deck, likely to be founded on reinforced concrete spread footings. The structure will have a clear span of 28.90m. Splayed wingwalls at both the east and west end, to retain the junction and adjacent earthworks will be needed. Three pairs of girders and a 0.25m thick reinforced concrete slab make up the deck construction, with bracing between girders.



OPTION 11 - OVERBRIDGE
NTS

The overall width of the cross section is 17.80m. with 2.50m wide verges either side, continuing around the junction. The structure would carry the proposed A46 junction road, comprising 2No. 3.65m wide carriageways with a single hard strip at each verge, separated by a 2.5m central reserve. Vehicular parapets, preferably with mesh facing, would be affixed to both edge beams.

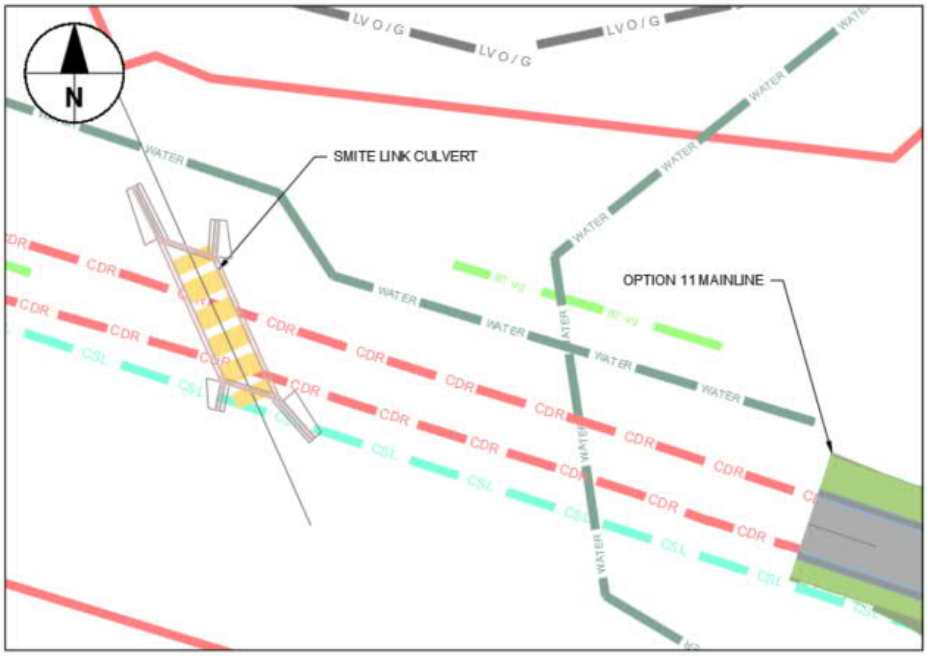
Under the structure, the realigned A46 Coventry Eastern Bypass consists of a 2.50m width verge alongside the northbound carriageway and a varying width verge (1.34m-1.7m) along the southbound carriageway. The dual carriageways are 7.30m wide, with 1.0m hard strips either side. A 2.50m wide central reserve separates the northbound and southbound carriageways.

A minimum of 5.30m plus sag curve needs be provided beneath the structure as per Section 4 of CD 127.

Provision for future utilities could be provided in both verges of the structure. The proposed structure is not local to any existing services.

Smite Link Culvert

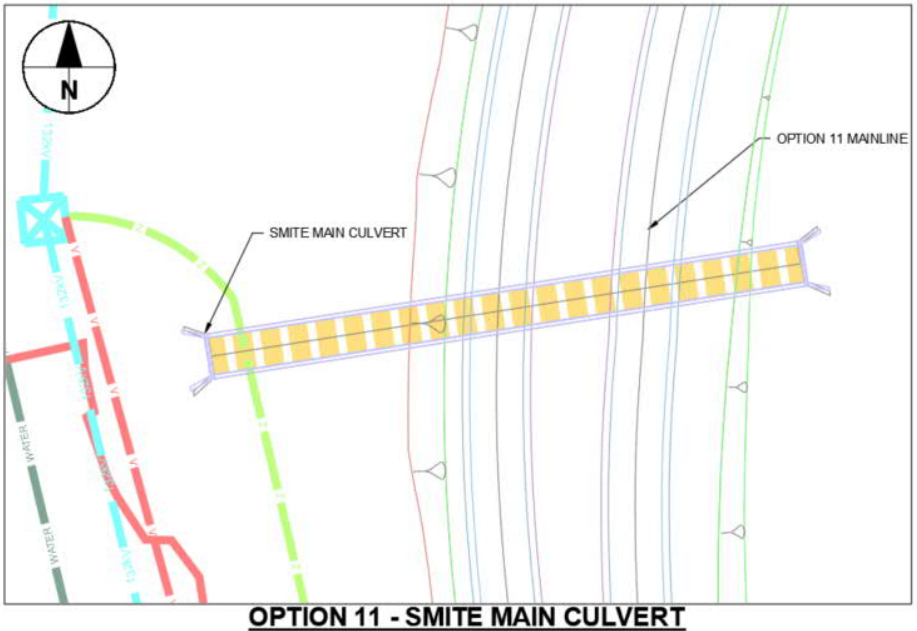
The proposed changes from the Option 8 mainline do not affect the structure. It is assumed that the structure can be retained with no necessary modifications.



OPTION 11 - SMITE LINK CULVERT
NTS

Smite Main Culvert

No structural adjustments should be required for this structure. The proposed mainline is at a different level than the existing, resulting in a maximum fill depth increase of 1.7m maximum and a decrease of 2.0m. An assessment may be required to determine the capacity to support the proposed fill.



OPTION 11 - SMITE MAIN CULVERT
NTS

VMS Gantry No.35

The proposed Option 6 alignment realigns the A46 Coventry Eastern Bypass, requiring the removal of the structure. Requirement for the provision of a replacement gantry may need be determined at a later stage

VMS Gantry No.36

The proposed changes from the Option 11 mainline do not affect the structure. It is assumed that the structure can be retained with no necessary modifications.

Bridleway R75 Walsgrave

The proposed changes from the Option 11 mainline do not affect the structure. It is assumed that the structure and associated farm access track can be retained with no necessary modifications

Accommodation Bridge – Options

APPENDIX H
ENVIRONMENTAL CONSTRAINTS MAP

NOTES
1: Listed buildings at Hungerley Hall Farm are represented in accordance with the Historic England GIS Data. However, the asset description indicates that Asset 1265694 Hungerley Hall Farmhouse is incorrectly located. It's correct location is SP 38425 79476, c.40m to the south.
2: Environmental information search data provided by Warwickshire Biological Records Centre.
3: Paths and Public Rights of Way have been digitised from OS 1:25,000 Scale Maps.

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION BOX

IT IS ASSUMED THAT ALL WORKS ON THIS DRAWING WILL BE CARRIED OUT BY A COMPETENT CONTRACTOR WORKING, WHERE APPROPRIATE, TO AN APPROPRIATE METHOD STATEMENT.

THIS DRAWING IS TO BE USED ONLY FOR THE PURPOSE OF ISSUE THAT IT WAS ISSUED FOR AND IS SUBJECT TO AMENDMENT.

EXCEPTIONAL RISKS RELATING TO THE WORKS ASSOCIATED WITH THIS DRAWING ARE IDENTIFIED BELOW.

LEGEND

- Proposed Scheme Boundary (Combined)
- 1km Study Area
- Local Authority Boundary

Cultural Heritage[1]
- Listed Building - Grade I
- Listed Building - Grade II
- Listed Building - Grade II*
- Scheduled Monument
- Registered Parks and Gardens
- Country Park

Geology and Soils
- Historic Landfill Site

Nature Conservation
- Site of Special Scientific Interest (SSSI)
- Local Nature Reserve (LNR)
- Ancient Woodland
- Local Wildlife Site[2] (LWS)
- Local Wildlife Site[2] - Potential Site

Noise Receptors
- Community Facility
- Educational Building
- Medical Facility
- Residential Building Group
- Noise Important Area

Paths and Public Rights of Way (PRoW)[3]
- Path
- PRoW - Footpath
- PRoW - Bridleway
- Recreational Route

Water Environment
- Main River
- Ordinary Watercourse
- Flood Zone 3
- Flood Zone 2

FIRST ISSUE	AB / HY	22/09/21	P01
REVISION DETAILS	By / Check	Date	Suffix

Purpose of issue
SUITABLE FOR INFORMATION

Client
Highways England
The Cube
199 Wharfeside Street
Birmingham
B1 1RN

Working on behalf of highways england

Project Title
A46 COVENTRY JUNCTIONS
WALSGRAVE
PCF STAGE 2

Drawing Title
ENVIRONMENTAL ASSESSMENT REPORT
FIGURE 2.2
ENVIRONMENTAL CONSTRAINTS

Designed	Drawn	Checked	Approved	Date
AB	AB	HVN	JW	22/09/2021

Internal Project No. 60638418	Suitability S2
Scale @ A3 1:17,500	Discipline LE - Environmental Coordination

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Drawing Number	Originator	Volume	Rev
Work Package ID HE604820	-ACM	-EGN-	P01
Location WAL_SW_000_Z	-MP	-LE -0010 (Type / Role / Number)	

Plot Date: Wednesday, 22 September 2021 11:29:59
File Name: \\ra.aecomnet.com\lls\EMEA\Croydon-UKCRD1\DCS\Projects\OI\60638418_WalsgraveStage2\900_CAD_GIS\920_GIS\02_Maps\EARUA46W_EAR_Fig2.2_EnvConstraints_2021-09-22_AB.mxd

APPENDIX I
BENEFITS REGISTER

Appraisal Summary Table DS6DM

Date produced:	17/12/2021

Name of scheme:	A46 Coventry Junctions Upgrade - Walsgrave
Description of scheme:	Road Investment Strategy 2 Statement - A46 Coventry Junctions – grade separation of the Binley and Walsgrave roundabouts on the A46 near Coventry, upgrading the trunk sections of the A45/A46 between the M6 and M40 to a consistent standard. Highways England Delivery Plan - Provide access along the A46 to further residential developments and key employment sites near Binley and Walsgrave. A phased delivery approach is being taken; Binley junction first followed later by Walsgrave junction.

Contact:	
Name	Steven Wood
Organisation	AECOM
Role	Consultant

Impacts		Summary of key impacts	Assessment			
			Quantitative	Qualitative	Monetary	Distributional
					£m (NPV)	7-pt scale/ vulnerable grp
Economy	Business users & transport providers	Option 6 will save travellers an average of 1.8mins (SB)/0.8mins (NB) between Toll Bar and the M6/M69 junction in the Opening Year. In the Design Year the average time saving is 2.4mins (SB)/1.3mins (NB). This contributes to total Travel Time Benefits for Business Users of £111.1million.	**Value of journey time changes (£m)** £105.596 **Net journey time changes (£m)** 0 to 2min: £67.4 / 2 to 5min: £36.3 / > 5min: £1.8	N/A	£117.3	N/A
	Reliability impact on Business users	The scheme will reduce the variability of journey times along the A46 between Toll Bar and the M6/M69 junction.	N/A	N/A	£11.4	
	Regeneration	The area is not identified as in need of regeneration. The scheme would not impact on regeneration.	N/A	N/A	N/A	
	Wider Impacts	Two Wider Impacts were calculated. Increased Output reflects the additional benefits that a transport scheme can give to businesses under conditions of imperfect competition. For Option 6 this was calculated as £11.9million. Labour Supply Impacts reflects the additional benefits that a transport scheme can supply due to increased employment. For Option 6 this was calculated as £2.1million.	N/A	N/A	£13.9	
Environmental	Noise	Option 6 results in the greatest number of significant adverse effects of all the options under consideration, which are predicted to result from this option moving traffic closer to residential areas both to the southwest and northwest of the junction , as well as towards Hungerley Hall Farm. Option 6 would result in the potential for one property (Hungerley Hall Farm) to qualify for noise insulation works under the Noise Insulation Regulations. No residential properties are predicted to experience levels in excess of 80dB LAeq16hr. Noise mitigation options, in the form of noise barriers, may be feasible to reduce the noise impacts identified; however, these have not been included in the traffic noise predictions. Sleep Disturbance: -£0.41million; Amenity: -£0.77million; AMI: -£0.01million; Stroke: -£0.13million; Dementia: -£0.19million	Households increased daytime noise forecast year: 707 Households decreased daytime noise forecast year:84 Households increased night-time noise forecast year: 294 Households decreased night-time noise forecast year: 45	N/A	-£1.5	Income Quintile 1 - Moderate Adverse; Income Quintile 2 - Moderate Adverse; Income Quintile 3 - Moderate Beneficial; Income Quintile 4 - Large Adverse; Income Quintile 5 - Moderate Beneficial
	Air Quality	There are no predicted exceedances near the affected road network either with or without the scheme in the opening year. The scheme has a negative impact on regional NOx and PM2.5 emissions. NOx emissions: -£1.6million; PM2.5 emissions: -£2.4million	Emissions NOx:+431 tonnes PM2.5: +73 tonnes	N/A	-£3.9	Income Quintile 1 - Neutral; Income Quintile 2 - Neutral; Income Quintile 3 - Neutral; Income Quintile 4 - Neutral; Income Quintile 5 - Neutral
	Greenhouse gases	There is predicted to be an increase in emissions due to an increase in vehicle kilometres.	Change in non-traded carbon over 60y (CO2e): 488,830 Change in traded carbon over 60y (CO2e): 5,278	N/A	-£21.4	
	Landscape	Option 6 has a significantly larger footprint than the three other options and this is reflected in increased scale and extent of effects on landscape character and visual amenity at all stages of the assessment. Compared to the other options there would be greater change in both landscape character and visual amenity within the study area at all stages as a result of the realigned A46, the B4082 access and the elevated dumbbell roundabouts junction. Effects of slight significance in year 1 would persist and remain slight at year 15 and beyond, unlike other options which achieve a neutral effect by year 15	No significant adverse effects to landscape character have been identified in relation to Option 6.	N/A	N/A	
	Townscape	Option 6 would result in local adverse effects to the immediate townscape as a result of the scale and extent of the highway elements, visible from the urban area and as a result of modification of buffer land to the urban edge. As option 6 will create a larger junction than other options the effects on townscape will be greater. However, as intervisibility is limited and the urban edge is already highway influenced there would be no significant effects to the wider townscape character of the eastern edge of Coventry.	No significant adverse effects to townscape character have been identified in relation to Option 6.	N/A	N/A	
	Historic Environment	Option 6 will result in adverse impacts to a group of three Grade II listed buildings at Hunglerley Hall Farm. It will impact the Grade II* Registered Park and Garden and Conservation Area at Coombe Abbey, through tree removal at the boundary however the impact is generally slight, and can be mitigated effectively with new planting. Option 6 also has the potential for the new 'dumbbell' junction to be visible from within the park which is an added potential impact. Further assessment would be required to determine the degree of impact resulting from such views, including assessment of the impact of night-time lighting. Option 6 also impacts upon the setting of the Grade II listed Walsgrave Hill Farm, but suitable mitigation options in the form of landscape planting may be available to mitigate the visual intrusion. This option could result in the removal of as yet unrecorded archaeological assets.	Significant Adverse Effects to the historic environment have been identified in relation to Option 6.	N/A	N/A	
	Biodiversity	Option 6 is predicted to have adverse effects on priority woodland habitat within Coombe Pool SSSI and have temporary, recoverable impacts on a root protection zone in the SSSI. Option 6 would have negligible impact on woodland from increased N deposition. Option 6 would have a moderate adverse effect on sites of Local and County value in the River Sowe by moving the A46 alignment very close to the river, with loss of habitat in a Local ecosite and risk of operational impact on wildlife (otter, barn owl, bats, badger) from severance and the increased risk of mortality. In addition Option 6 would remove a farm accommodation overbridge which is the only traffic-free crossing for wildlife for many kilometres of A46 around Coventry - the existing road is a barrier between Coombe Country Park and the River Sowe valley a key wildlife corridor. Option 6 would island a veteran tree, although it could be retained within the construction area, other mature trees would be lost. None of the options would achieve no net loss without significant additional landtake and offsite enhancement provision, after any bespoke compensation for impacts in the SSSI.	Option 6 has Adverse Effects that are significant for one or more receptors, including at least some Moderate Adverse effects. Option 6 has a moderate adverse effect for severance.	N/A	N/A	
	Water Environment	During operation of the chosen option mitigation will have been constructed to ensure routine road runoff discharges are attenuated and there will be no adverse effects on the flooding potential of the receiving watercourses. This will be with attenuation ponds and swales, both of which provide water quality benefits. It is assumed that all mitigation as required by the DMRB assessment process would be carried out - water quality, hydromorphology, and attenuation of flows using SuDS solutions. A hydraulic model has been developed which shows that appropriate flood mitigation would need to be incorporated for option 6. Mitigation required for option 6 is significant in terms of costs and would likely impact upon other environmental disciplines.	Neutral	N/A	N/A	
Social	Commuting and Other users	Option 6 will save travellers an average of 1.8mins (SB)/0.8mins (NB) between Toll Bar and the M6/M69 junction in the Opening Year. In the Design Year the average time saving is 2.4mins (SB)/1.3mins (NB). This contributes to total Travel Time Benefits for Commuting and Other Users of £53.8million.	**Value of journey time changes (£m)** £39.668 **Net journey time changes (£m)** 0 to 2min: £15.9 / 2 to 5min: £18.2 / > 5min: £5.6	Analysis perfomed on HBW AM and PM trips only. The user benefits signficantly favour the more deprived quintiles.	£37.2	Income Quintile 1 - Large Beneficial ; Income Quintile 2 - Large Beneficial ; Income Quintile 3 - Large Beneficial ; Income Quintile 4 - Slight Beneficial;
	Reliability impact on Commuting and Other users	The scheme will reduce the variability of journey times along the A46 between Toll Bar and the M6/M69 junction.	N/A	N/A	£12.8	
	Physical activity	No material impact.	N/A	Scheme is part of a strategic road network upgrade, with	N/A	
	Journey quality	There is predicted to be a slight improvement to traveller stress.	N/A	Traveller stress is espected to reduce due to improvements in	N/A	
	Accidents	The scheme improves safety at Walsgrave junction. It also generates induced long-distance traffic. Overall, across the 60-year appraisal period it is predicted that there will be an increase of 171 accidents across the road network. There are corresponding increases in Fatal Casualties (6), Serious Casualties (27), and Slight Casualties (225) over the same period.	N/A	Within the Area of Impact accident forecasts show limited change: 82% of links show an absolute change of <5%, 91% of links show an absolute change of <10%. 58% of links show an increase in forecast accidents, 42% a	-£8.3	Income Quintile 1 - Slight Adverse; Income Quintile 2 - Slight Adverse; Income Quintile 3 - Slight Adverse; Income Quintile 4 - Slight Adverse; Income Quintile 5 - Slight Adverse
	Security	Not Assessed: The scheme does not involve changes to public transport or facilities, nor is it expected to have any significant impact on pedestrian security.	N/A	N/A	N/A	N/A
	Access to services	Not Assessed: The scheme does not involve changes to public transport or facilities.	N/A	N/A	N/A	N/A
	Affordability	Data not available	N/A	Analysis performed on HBW AM and PM trips only. The increases in costs are concentrated in the highest quintiles. All quintiles show cost increases.	N/A	Income Quintile 1 - Slight Adverse; Income Quintile 2 - Moderate Adverse; Income Quintile 3 - Moderate Adverse; Income Quintile 4 - Large Adverse; Income Quintile 5 - Moderate Adverse
	Severance	Walsgrave: No impact.	N/A	Walsgrave: No pedestrian crossing facilities and none planned under the scheme.	N/A	Income Quintile 1 - Neutral; Income Quintile 2 - Neutral; Income Quintile 3 - Neutral; Income Quintile 4 - Neutral; Income Quintile 5 - Neutral
	Option and non-use values	The scheme is unlikely to substantially change the availability of transport services in the study area.	N/A	N/A	N/A	
Public Accounts	Cost to Broad Transport Budget	Construction: £77.4million; Preparation: £12.2million; Supervision: £2.2million; Land and Compensation: £23.6million	N/A	N/A	£115.4	
	Indirect Tax Revenues	Operation: -£9.4million Quoted as Costs not as Benefits	N/A	N/A	-£9.4	

Appraisal Summary Table DS7DM

Date produced:	17/12/2021

Name of scheme:	A46 Coventry Junctions Upgrade - Walsgrave
Description of scheme:	Road Investment Strategy 2 Statement - A46 Coventry Junctions – grade separation of the Binley and Walsgrave roundabouts on the A46 near Coventry, upgrading the trunk sections of the A45/A46 between the M6 and M40 to a consistent standard. Highways England Delivery Plan - Provide access along the A46 to further residential developments and key employment sites near Binley and Walsgrave. A phased delivery approach is being taken; Binley junction first followed later by Walsgrave junction.

Contact:	
Name	Steven Wood
Organisation	AECOM
Role	Consultant

Impacts		Summary of key impacts	Assessment			
			Quantitative	Qualitative	Monetary	Distributional
					£m (NPV)	7-pt scale/ vulnerable grp
Economy	Business users & transport providers	Option 7 will save travellers an average of 1.8mins (SB)/0.5mins (NB) between Toll Bar and the M6/M69 junction in the Opening Year. In the Design Year the average time saving is 2.4mins (SB)/1.1mins (NB). This contributes to total Travel Time Benefits for Business Users of £89.2million.	**Value of journey time changes (£m)** £81.116 **Net journey time changes (£m)** 0 to 2min: £44.3 / 2 to 5min: £36.0 / > 5min: £0.9	N/A	£95.5	N/A
	Reliability impact on Business users	The scheme will reduce the variability of journey times along the A46 between Toll Bar and the M6/M69 junction.	N/A	N/A	£11.4	
	Regeneration	The area is not identified as in need of regeneration. The scheme would not impact on regeneration.	N/A	N/A	N/A	
	Wider Impacts	Two Wider Impacts were calculated. Increased Output reflects the additional benefits that a transport scheme can give to businesses under conditions of imperfect competition. For Option 7 this was calculated as £9.7million. Labour Supply Impacts reflects the additional benefits that a transport scheme can supply due to increased employment. For Option 7 this was calculated as £1.9million.	N/A	N/A	£11.6	
Environmental	Noise	Option 7 is predcted to result in fewer significant adverse effects than Option 6, with these being focussed to the south west of the scheme due to the proposed freeflow link from the A46 northbound to the Clifford Bridge Road junction. Option 7 would result in the potential for two properties to qualify for noise insulation works under the Noise Insulation Regulations (Hungerley Hall Farmhouse and 3 Valencia Road). No residential properties are predicted to experience levels in excess of 80dB LAeq16hr. Noise mitigation options, in the form of noise barriers, may be feasible to reduce the noise impacts identified; however, these have not been included in the traffic noise predictions. Sleep Disturbance: -£0.10million; Amenity: -£0.14million; AMI: £0.01million; Stroke: -£0.03million; Dementia: -£0.04million	Households increased daytime noise forecast year: 245 Households decreased daytime noise forecast year:69 Households increased night-time noise forecast year: 115 Households decreased night-time noise forecast year: 25	N/A	-£0.3	Income Quintile 1 - Moderate Adverse; Income Quintile 2 - Moderate Adverse; Income Quintile 3 - Moderate Beneficial; Income Quintile 4 - Large Adverse; Income Quintile 5 - Slight Adverse
	Air Quality	There are no predicted exceedances near the affected road network either with or without the scheme in the opening year. The scheme has a negative impact on regional NOx and PM2.5 emissions. NOx emissions: -£1.5million; PM2.5 emissions: -£2.1million	Emissions NOx:+394 tonnes PM2.5: +66 tonnes	N/A	-£3.6	Income Quintile 1 - Neutral; Income Quintile 2 - Neutral; Income Quintile 3 - Neutral; Income Quintile 4 - Neutral; Income Quintile 5 - Neutral
	Greenhouse gases	There is predicted to be an increase in emissions due to an increase in vehicle kilometres.	Change in non-traded carbon over 60y (CO2e): 454,096 Change in traded carbon over 60y (CO2e): 4,672	N/A	-£19.8	
	Landscape	Option 7 is, in landscape and visual terms, a minor change to the existing junction with minimal loss of vegetation and the greatest effects on landscape character and visual amenity derived from the temporary construction compound. On completion in year 1 effects would be slight and by year 15 any effects on landscape character and visual amenity would be similar to the baseline, hence neutral.	No significant adverse effects to landscape character have been identified in relation to Option 7	N/A	N/A	
	Townscape	As described for landscape, effects to the immediate townscape from Option 7 would be very localised and erosion of the urban edge buffer would be effectively neutral compared to a DM scheme. There would be no significant effects to the wider townscape character of the eastern edge of Coventry.	No significant adverse effects to townscape character have been identified in relation to Option 7.	N/A	N/A	
	Historic Environment	Option 7 is the least impactful to cultural heritage assets within and in the vicinity of the scheme. It will impact the Grade II* Registered Park and Garden and Conservation Area at Coombe Abbey, through tree removal at the boundary however the impact is generally slight, and can be mitigated effectively with new planting. All options could result in the removal of as yet unrecorded archaeological assets.	Slight	N/A	N/A	
	Biodiversity	Option 7 has the potential for adverse effects on priority woodland habitat within Coombe Pool SSSI and temporary, recoverable impacts on a root protection zone in the SSSI. Option 7 has the lowest landtake overall, but is second only to Option 8 for increased N deposition in the woodland. None of the options would achieve no net loss without significant additional landtake and offsite enhancement provision, after any bespoke compensation for impacts in the SSSI.	All options have Adverse Effects that are significant for one or more receptors, including at least some Moderate Adverse effects.	N/A	N/A	
	Water Environment	During operation of the chosen option mitigation will have been constructed to ensure routine road runoff discharges are attenuated and there will be no adverse effects on the flooding potential of the receiving watercourses. This will be with attenuation ponds and swales, both of which provide water quality benefits. It is assumed that all mitigation as required by the DMRB assessment process would be carried out - water quality, hydromorphology, and attenuation of flows using SuDS solutions. There is potential for enhancement should the existing priority outfalls be mitigated as part of the Scheme if required. A hydraulic model has been developed which shows that option 7 would result in negligible increase in fluvial flood risk on or off-site.	Neutral	N/A	N/A	
Social	Commuting and Other users	Option 7 will save travellers an average of 1.8mins (SB)/0.5mins (NB) between Toll Bar and the M6/M69 junction in the Opening Year. In the Design Year the average time saving is 2.4mins (SB)/1.1mins (NB). This contributes to total Travel Time Benefits for Commuting and Other Users of £53.7million.	**Value of journey time changes (£m)** £11.813 **Net journey time changes (£m)** 0 to 2min: -£9.0 / 2 to 5min: £22.0 / > 5min: -£1.2	Analysis perfomed on HBW AM and PM trips only. The user benefits signficantly favour the more deprived quintiles.	£41.0	Income Quintile 1 - Large Beneficial ; Income Quintile 2 - Large Beneficial ; Income Quintile 3 - Moderate Beneficial; Income Quintile 4 - Slight Beneficial;
	Reliability impact on Commuting and Other users	The scheme will reduce the variability of journey times along the A46 between Toll Bar and the M6/M69 junction.	N/A	N/A	£12.8	
	Physical activity	No material impact.	N/A	Scheme is part of a strategic road network upgrade, with	N/A	
	Journey quality	There is predicted to be a slight improvement to traveller stress.	N/A	Traveller stress is espected to reduce due to improvements in	N/A	
	Accidents	The scheme improves safety at Walsgrave junction. It also generates induced long-distance traffic. Overall, across the 60-year appraisal period it is predicted that there will be an increase of 112 accidents across the road network. There are corresponding increases in Fatal Casualties (5), Serious Casualties (16), and Slight Casualties (148) over the same period.	N/A	Within the Area of Impact accident forecasts show limited change: 79% of links show an absolute change of <5%, 88% of links show an absolute change of <10%. 55% of links show an increase in forecast accidents, 45% a	-£5.6	Income Quintile 1 - Slight Adverse; Income Quintile 2 - Slight Adverse; Income Quintile 3 - Slight Adverse; Income Quintile 4 - Slight Adverse; Income Quintile 5 - Slight Adverse
	Security	Not Assessed: The scheme does not involve changes to public transport or facilities, nor is it expected to have any significant impact on pedestrian security.	N/A	N/A	N/A	N/A
	Access to services	Not Assessed: The scheme does not involve changes to public transport or facilities.	N/A	Slight negative impact as removal of southbound right-turn	N/A	Income Quintile 1 - Slight Adverse; Income Quintile 2 - Slight Adverse; Income Quintile 3 - Slight Adverse;
	Affordability	Data not available	N/A	Analysis perfomed on HBW AM and PM trips only. The increases in costs are concentrated in the highest quintiles. The lowest quintile shows a cost decrease, the other quintiles show cost increases.	N/A	Income Quintile 1 - Large Beneficial ; Income Quintile 2 - Moderate Adverse; Income Quintile 3 - Moderate Adverse; Income Quintile 4 - Large Adverse; Income Quintile 5 - Moderate Adverse
	Severance	Walsgrave: No impact.	N/A	Walsgrave: No pedestrian crossing facilities and none planned under the scheme.	N/A	Income Quintile 1 - Neutral; Income Quintile 2 - Neutral; Income Quintile 3 - Neutral; Income Quintile 4 - Neutral; Income Quintile 5 - Neutral
	Option and non-use values	The scheme is unlikely to substantially change the availability of transport services in the study area.	N/A	N/A	N/A	
Public Accounts	Cost to Broad Transport Budget	Construction: £21.0million; Preparation: £6.4million; Supervision: £1.5million; Land and Compensation: £0.2million	N/A	N/A	£29.1	
	Indirect Tax Revenues	Operation: -£8.3million Quoted as Costs not as Benefits	N/A	N/A	-£8.3	

Appraisal Summary Table DS8DM

Date produced:	17/12/2021

Name of scheme:	A46 Coventry Junctions Upgrade - Walsgrave
Description of scheme:	Road Investment Strategy 2 Statement - A46 Coventry Junctions – grade separation of the Binley and Walsgrave roundabouts on the A46 near Coventry, upgrading the trunk sections of the A45/A46 between the M6 and M40 to a consistent standard. Highways England Delivery Plan - Provide access along the A46 to further residential developments and key employment sites near Binley and Walsgrave. A phased delivery approach is being taken; Binley junction first followed later by Walsgrave junction.

Contact:	
Name	Steven Wood
Organisation	AECOM
Role	Consultant

Impacts		Summary of key impacts	Assessment			
			Quantitative	Qualitative	Monetary	Distributional
					£m (NPV)	7-pt scale/ vulnerable grp
Economy	Business users & transport providers	Option 8 will save travellers an average of 1.9mins (SB)/0.7mins (NB) between Toll Bar and the M6/M69 junction in the Opening Year. In the Design Year the average time saving is 2.5mins (SB)/1.2mins (NB). This contributes to total Travel Time Benefits for Business Users of £101.0million.	**Value of journey time changes (£m)** £89.709 **Net journey time changes (£m)** 0 to 2min: £48.9 / 2 to 5min: £40.2 / > 5min: £0.6	N/A	£107.6	N/A
	Reliability impact on Business users	The scheme will reduce the variability of journey times along the A46 between Toll Bar and the M6/M69 junction.	N/A	N/A	£11.4	
	Regeneration	The area is not identified as in need of regeneration. The scheme would not impact on regeneration.	N/A	N/A	N/A	
	Wider Impacts	Two Wider Impacts were calculated. Increased Output reflects the additional benefits that a transport scheme can give to businesses under conditions of imperfect competition. For Option 8 this was calculated as £10.8million. Labour Supply Impacts reflects the additional benefits that a transport scheme can supply due to increased employment. For Option 8 this was calculated as £2.1million.	N/A	N/A	£12.9	
Environmental	Noise	Option 8 is predicted to result in fewer significant adverse effects than Option 6, with these being focussed to the south west of the scheme due to the proposed freeflow link from the A46 northbound to the Clifford Bridge Road junction. Option 8 would result in the potential for four properties to qualify for noise insulation works under the Noise Insulation Regulations (the most of all the options), (Valencia Road, Sevilla Close and Florence Road). No residential properties are predicted to experience levels in excess of 80dB LAeq16hr. Noise mitigation options, in the form of noise barriers, may be feasible to reduce the noise impacts identified; however, these have not been included in the traffic noise predictions. Sleep Disturbance: -£0.23million; Amenity: -£0.40million; AMI: -£0.00million; Stroke: -£0.07million; Dementia: -£0.10million	Households increased daytime noise forecast year: 510 Households decreased daytime noise forecast year:55 Households increased night-time noise forecast year: 196 Households decreased night-time noise forecast year: 21	N/A	-£0.8	Income Quintile 1 - Moderate Adverse; Income Quintile 2 - Slight Adverse; Income Quintile 3 - Moderate Adverse; Income Quintile 4 - Moderate Adverse; Income Quintile 5 - Moderate Adverse
	Air Quality	There are no predicted exceedances near the affected road network either with or without the scheme in the opening year. The scheme has a negative impact on regional NOx and PM2.5 emissions. NOx emissions: -£1.6million; PM2.5 emissions: -£2.2million	Emissions NOx:+425 tonnes PM2.5: +70 tonnes	N/A	-£3.8	Income Quintile 1 - Neutral; Income Quintile 2 - Neutral; Income Quintile 3 - Neutral; Income Quintile 4 - Neutral; Income Quintile 5 - Neutral
	Greenhouse gases	There is predicted to be an increase in emissions due to an increase in vehicle kilometres.	Change in non-traded carbon over 60y (CO2e): 490,777 Change in traded carbon over 60y (CO2e): 4,976	N/A	-£21.4	
	Landscape	Option 8 is a slightly more intrusive and extensive version of Option 7, still involving a relatively minor change to the existing junction with minimal loss of vegetation and the greatest effects on landscape character and visual amenity derived from the temporary construction compound. On completion in year 1 effects would be slight and by year 15 any effects on landscape character and visual amenity would be similar to the baseline, hence neutral.	No significant adverse effects to landscape character have been identified in relation to Option 8.	N/A	N/A	
	Townscape	As described for landscape, effects to the immediate townscape from Option 8 would be very localised and erosion of the urban edge buffer would be effectively neutral compared to a DM scheme. There would be no significant effects to the wider townscape character of the eastern edge of Coventry.	No significant adverse effects to townscape character have been identified in relation to Option 8.	N/A	N/A	
	Historic Environment	Option 8 will result in adverse impacts to a group of three Grade II listed buildings at Hunglerley Hall Farm, requiring the demolition of one of the listed buildings which is a large adverse impact. This would require listed building consent which may not be granted, resulting in risk to the project. It will impact the Grade II* Registered Park and Garden and Conservation Area at Coombe Abbey, through tree removal at the boundary however the impact is generally slight, and can be mitigated effectively with new planting. All options could result in the removal of as yet unrecorded archaeological assets.	Significant Adverse Effects to historic environment have been identified. Option 8 is the most impactful with a very large adverse effect that cannot be mitigated.	N/A	N/A	
	Biodiversity	Option 8 has the potential for adverse effects on priority woodland habitat within Coombe Pool SSSI. Option 8 would take woodland from within the SSSI boundary. It would also lead to a significant increase in N-deposition of up to 1.7kgN/ha/yr, which would need further investigation as to effect on vegetation. Effects of Option 8 on the SSSI would be moderate (significant) and require bespoke compensation. Option 8 would also have temporary, recoverable impacts on a root protection zone in the SSSI. None of the options would achieve no net loss without significant additional landtake and offsite enhancement provision, after any bespoke compensation for impacts in the SSSI.	Option 8 has Adverse Effects significant for one or more receptors, including at least some Moderate Adverse effects. Option 8 has most effect due to loss of woodland in Coomb Pool SSSI.	N/A	N/A	
	Water Environment	During operation of the chosen option mitigation will have been constructed to ensure routine road runoff discharges are attenuated and there will be no adverse effects on the flooding potential of the receiving watercourses. This will be with attenuation ponds and swales, both of which provide water quality benefits. It is assumed that all mitigation as required by the DMRB assessment process would be carried out - water quality, hydromorphology, and attenuation of flows using SuDS solutions. There is potential for enhancement should the existing priority outfalls be mitigated as part of the Scheme if required. A hydraulic model has been developed which shows that appropriate flood mitigation would need to be incorporated for option 8. Option 8 includes a deep cutting which may interact with groundwater, based on BGS boreholes.	Neutral	N/A	N/A	
Social	Commuting and Other users	Option 8 will save travellers an average of 1.9mins (SB)/0.7mins (NB) between Toll Bar and the M6/M69 junction in the Opening Year. In the Design Year the average time saving is 2.5mins (SB)/1.2mins (NB). This contributes to total Travel Time Benefits for Commuting and Other Users of £56.2million.	**Value of journey time changes (£m)** £11.673 **Net journey time changes (£m)** 0 to 2min: -£11.1 / 2 to 5min: £22.0 / > 5min: £0.8	Analysis perfomed on HBW AM and PM trips only. The user benefits signficantly favour the more deprived quintiles.	£40.8	Income Quintile 1 - Large Beneficial ; Income Quintile 2 - Large Beneficial ; Income Quintile 3 - Moderate Beneficial; Income Quintile 4 - Slight Beneficial;
	Reliability impact on Commuting and Other users	The scheme will reduce the variability of journey times along the A46 between Toll Bar and the M6/M69 junction.	N/A	N/A	£12.8	
	Physical activity	No material impact.	N/A	Scheme is part of a strategic road network upgrade, with	N/A	
	Journey quality	There is predicted to be a slight improvement to traveller stress.	N/A	Traveller stress is espected to reduce due to improvements in	N/A	
	Accidents	The scheme improves safety at Walsgrave junction. It also generates induced long-distance traffic. Overall, across the 60-year appraisal period it is predicted that there will be an increase of 118 accidents across the road network. There are corresponding increases in Fatal Casualties (5), Serious Casualties (17), and Slight Casualties (158) over the same period.	N/A	Within the Area of Impact accident forecasts show limited change: 77% of links show an absolute change of <5%, 90% of links show an absolute change of <10%. 55% of links show an increase in forecast accidents, 45% a	-£5.9	Income Quintile 1 - Slight Adverse; Income Quintile 2 - Slight Adverse; Income Quintile 3 - Slight Adverse; Income Quintile 4 - Slight Adverse; Income Quintile 5 - Slight Adverse
	Security	Not Assessed: The scheme does not involve changes to public transport or facilities, nor is it expected to have any significant impact on pedestrian security.	N/A	N/A	N/A	N/A
	Access to services	Not Assessed: The scheme does not involve changes to public transport or facilities.	N/A	Slight negative impact as removal of southbound right-turn	N/A	Income Quintile 1 - Slight Adverse; Income Quintile 2 - Slight Adverse; Income Quintile 3 - Slight Adverse;
	Affordability	Data not available	N/A	Analysis perfomed on HBW AM and PM trips only. The increases in costs are concentrated in the highest quintiles. The lowest quintile shows a cost decrease, the other quintiles show cost increases.	N/A	Income Quintile 1 - Large Beneficial ; Income Quintile 2 - Slight Adverse; Income Quintile 3 - Moderate Adverse; Income Quintile 4 - Large Adverse; Income Quintile 5 - Slight Adverse
	Severance	Walsgrave: No impact.	N/A	Walsgrave: No pedestrian crossing facilities and none planned under the scheme.	N/A	Income Quintile 1 - Neutral; Income Quintile 2 - Neutral; Income Quintile 3 - Neutral; Income Quintile 4 - Neutral; Income Quintile 5 - Neutral
	Option and non-use values	The scheme is unlikely to substantially change the availability of transport services in the study area.	N/A	N/A	N/A	
Public Accounts	Cost to Broad Transport Budget	Construction: £39.8million; Preparation: £9.7million; Supervision: £1.7million; Land and Compensation: £3.3million	N/A	N/A	£54.5	
	Indirect Tax Revenues	Operation: -£9.9million Quoted as Costs not as Benefits	N/A	N/A	-£9.9	

Appraisal Summary Table DS11DN

Date produced:	17/12/2021

Name of scheme:	A46 Coventry Junctions Upgrade - Walsgrave
Description of scheme:	Road Investment Strategy 2 Statement - A46 Coventry Junctions – grade separation of the Binley and Walsgrave roundabouts on the A46 near Coventry, upgrading the trunk sections of the A45/A46 between the M6 and M40 to a consistent standard. Highways England Delivery Plan - Provide access along the A46 to further residential developments and key employment sites near Binley and Walsgrave. A phased delivery approach is being taken; Binley junction first followed later by Walsgrave junction.

Contact:	
Name	Steven Wood
Organisation	AECOM
Role	Consultant

Impacts		Summary of key impacts	Assessment			
			Quantitative	Qualitative	Monetary	Distributional
					£m (NPV)	7-pt scale/ vulnerable grp
Economy	Business users & transport providers	Option 11 will, in combination with the improvements at Binley, save travellers an average of 1.5mins (SB)/0.9mins (NB) between Toll Bar and the M6/M69 junction in the Opening Year. In the Design Year the average time saving is 2.5mins (SB)/1.8mins (NB). This contributes to total Travel Time Benefits for Business Users of £144.1million.	**Value of journey time changes (£m)** £150.281 **Net journey time changes (£m)** 0 to 2min: £102.2 / 2 to 5min: £48.1 / > 5min: N/A	N/A	£149.2	N/A
	Reliability impact on Business users	The scheme will reduce the variability of journey times along the A46 between Toll Bar and the M6/M69 junction.	N/A	N/A	£11.4	
	Regeneration	The area is not identified as in need of regeneration. The scheme would not impact on regeneration.	N/A	N/A	N/A	
	Wider Impacts	Two Wider Impacts were calculated. Increased Output reflects the additional benefits that a transport scheme can give to businesses under conditions of imperfect competition. For Option 11, combined with the Binley improvements, this was calculated as £15.2million. Labour Supply Impacts reflects the additional benefits that a transport scheme can supply due to increased employment. For Option 11, combined with the Binley improvements, this was calculated as £2.4million.	N/A	N/A	£17.5	
Environmental	Noise	Option 11 is predicted to result in the least number of significant adverse effects as a result of the operation of the scheme. Only one property - Hungerley Hall Farmhouse, predicted to experience a signifcant adverse operational noise effect due to this option resulting in both the A46 and B4082 moving closer to this property. Option 11 would result in the potential for one property (Hungerley Hall Farmhouse) to qualify for noise insulation works under the Noise Insulation Regulations. No residential properties are predicted to experience levels in excess of 80dB LAeq16hr. Noise mitigation options, in the form of noise barriers, may be feasible to reduce the noise impacts identified; however, these have not been included in the traffic noise predictions. Sleep Disturbance: -£0.07million; Amenity: £0.03million; AMI: £0.02million; Stroke: -£0.00million; Dementia: -£0.00million	Households increased daytime noise forecast year: 145 Households decreased daytime noise forecast year:117 Households increased night-time noise forecast year: 79 Households decreased night-time noise forecast year: 28	N/A	£0.0	Income Quintile 1 - Neutral; Income Quintile 2 - Large Adverse; Income Quintile 3 - Moderate Adverse; Income Quintile 4 - Moderate Adverse; Income Quintile 5 - Slight Adverse
	Air Quality	There are no predicted exceedances near the affected road network either with or without the scheme in the opening year. The scheme has a negative impact on regional NOx and PM2.5 emissions. NOx emissions: -£1.4million; PM2.5 emissions: -£2.7million	Emissions NOx:+386 tonnes PM2.5: +84 tonnes	N/A	-£4.1	Income Quintile 1 - Neutral; Income Quintile 2 - Neutral; Income Quintile 3 - Neutral; Income Quintile 4 - Neutral; Income Quintile 5 - Neutral
	Greenhouse gases	There is predicted to be an increase in emissions due to an increase in vehicle kilometres.	Change in non-traded carbon over 60y (CO2e): 492,633 Change in traded carbon over 60y (CO2e): 5,496	N/A	-£21.7	
	Landscape	Option 11 is a less intrusive version of Option 6. It reduces the magnitude and significance of effects at all stages and has a lesser effect on landscape character than Option 6, albeit both are slight significance in year 1. Option 11 becomes neutral by year 15 as a result of greater landscape integration. Option 11 is worse than options 7 and 8. Under a DN option there are no adverse effects on landscape character.	No significant adverse effects to landscape character have been identified in relation to Option 11 or a DN option.	N/A	N/A	
	Townscape	As described for landscape, effects to the immediate townscape from Option 11 would be localised but include some erosion of the urban edge buffer . There would be no significant effects to the wider townscape character of the eastern edge of Coventry. Under a DN option there are no adverse effects on townscape character.	No significant adverse effects to townscape character have been identified in relation to Option 11 or a DN option.	N/A	N/A	
	Historic Environment	Option 11 will result in adverse impacts to a group of three Grade II listed buildings at Hunglerley Hall Farm. It will impact the Grade II* Registered Park and Garden and Conservation Area at Coombe Abbey, through tree removal at the boundary however the impact is generally slight, and can be mitigated effectively with new planting. Option 11 also has the potential for the new 'dumbbell' junction to be visible from within the park which is an added potential impact. Further assessment would be required to determine the degree of impact resulting from such views, including assessment of the impact of night-time lighting. Option 11 also impacts upon the setting of the Grade II listed Walsgrave Hill Farm, but suitable mitigation options in the form of landscape planting may be available to mitigate the visual intrusion. All options could result in the removal of as yet unrecorded archaeological assets.	Significant Adverse Effects to historic environment have been identified in relation to Option 11.	N/A	N/A	
	Biodiversity	Option 11 has the potential for adverse effects on priority woodland habitat within Coombe Pool SSSI and temporary, recoverable impacts on a root protection zone in the SSSI. Option 11 would have negligible impact on woodland from increased N deposition. In addition Option 11 would remove a farm accommodation overbridge which is the only traffic-free crossing for wildlife for many kilometres of A46 around Coventry - the existing road is a barrier between Coombe Country Park and the River Sowe valley a key wildlife corridor. Option 11 has the least impact of the four options, but the loss of an overbridge would increase severance for wildlife. None of the options would achieve no net loss without significant additional landtake and offsite enhancement provision, after any bespoke compensation for impacts in the SSSI.	Option 11 would have Adverse Effects that are significant for one or more receptors, including at least some Moderate Adverse effects.	N/A	N/A	
	Water Environment	During operation of the chosen option mitigation will have been constructed to ensure routine road runoff discharges are attenuated and there will be no adverse effects on the flooding potential of the receiving watercourses. This will be with attenuation ponds and swales, both of which provide water quality benefits. It is assumed that all mitigation as required by the DMRB assessment process would be carried out - water quality, hydromorphology, and attenuation of flows using SuDS solutions. A hydraulic model has been developed which shows that option 11 would result in negligible increase in fluvial flood risk on or off-site. Option 11 has a cutting which has a base of the cutting 2m higher than option 8 and is less likely to interact with groundwater, based on BGS boreholes.	Neutral	N/A	N/A	
Social	Commuting and Other users	Option 11 will, in combination with the improvements at Binley, save travellers an average of 1.5mins (SB)/0.9mins (NB) between Toll Bar and the M6/M69 junction in the Opening Year. In the Design Year the average time saving is 2.5mins (SB)/1.8mins (NB). This contributes to total Travel Time Benefits for Commuting and Other Users of £65.2million.	**Value of journey time changes (£m)** £50.063 **Net journey time changes (£m)** 0 to 2min: £26.2 / 2 to 5min: £27.0 / > 5min: -£3.2	Analysis perfomed on HBW AM and PM trips only. The user benefits signficantly favour the more deprived quintiles.	£45.2	Income Quintile 1 - Large Beneficial ; Income Quintile 2 - Large Beneficial ; Income Quintile 3 - Large Beneficial ; Income Quintile 4 - Slight Beneficial;
	Reliability impact on Commuting and Other users	The scheme will reduce the variability of journey times along the A46 between Toll Bar and the M6/M69 junction.	N/A	N/A	£12.8	
	Physical activity	No material impact.	N/A	Scheme is part of a strategic road network upgrade, with	N/A	
	Journey quality	There is predicted to be a slight improvement to traveller stress.	N/A	Traveller stress is espected to reduce due to improvements in	N/A	
	Accidents	The scheme improves safety at both Binley and Walsgrave junctions. It also generates induced long-distance traffic. Overall, across the 60-year appraisal period it is predicted that there will be an increase of 77 accidents across the road network. There are corresponding increases in Fatal Casualties (6), Serious Casualties (22), and Slight Casualties (95) over the same period.	N/A	Within the Area of Impact accident forecasts show limited change: 83% of links show an absolute change of <5%, 92% of links show an absolute change of <10%. 57% of links show an increase in forecast accidents, 43% a	-£6.1	Income Quintile 1 - Slight Adverse; Income Quintile 2 - Slight Adverse; Income Quintile 3 - Slight Adverse; Income Quintile 4 - Slight Adverse; Income Quintile 5 - Slight Adverse
	Security	Not Assessed: The scheme does not involve changes to public transport or facilities, nor is it expected to have any significant impact on pedestrian security.	N/A	N/A	N/A	N/A
	Access to services	Not Assessed: The scheme does not involve changes to public transport or facilities.	N/A	N/A	N/A	N/A
	Affordability	Data not available	N/A	Analysis performed on HBW AM and PM trips only. The increases in costs are concentrated in the highest quintiles. The lowest quintile shows a cost decrease, the other quintiles show cost increases.	N/A	Income Quintile 1 - Large Beneficial ; Income Quintile 2 - Slight Adverse; Income Quintile 3 - Moderate Adverse; Income Quintile 4 - Large Adverse; Income Quintile 5 - Large Adverse
	Severance	Binley: No impact. Walsgrave: No impact.	N/A	Binley: The proposed scheme retains the existing pedestrian crossing facilities. Although the removal of through traffic on the A46 due to the scheme will be of some benefit to pedestrians	N/A	Income Quintile 1 - Neutral; Income Quintile 2 - Neutral; Income Quintile 3 - Neutral; Income Quintile 4 - Neutral; Income Quintile 5 - Neutral
	Option and non-use values	The scheme is unlikely to substantially change the availability of transport services in the study area.	N/A	N/A	N/A	
Public Accounts	Cost to Broad Transport Budget	Construction: £85.0million; Preparation: £15.0million; Supervision: £3.1million; Land and Compensation: £7.7million	N/A	N/A	£110.8	
	Indirect Tax Revenues	Operation: -£9.8million Quoted as Costs not as Benefits	N/A	N/A	-£9.8	

Appraisal Summary Table DS11DM

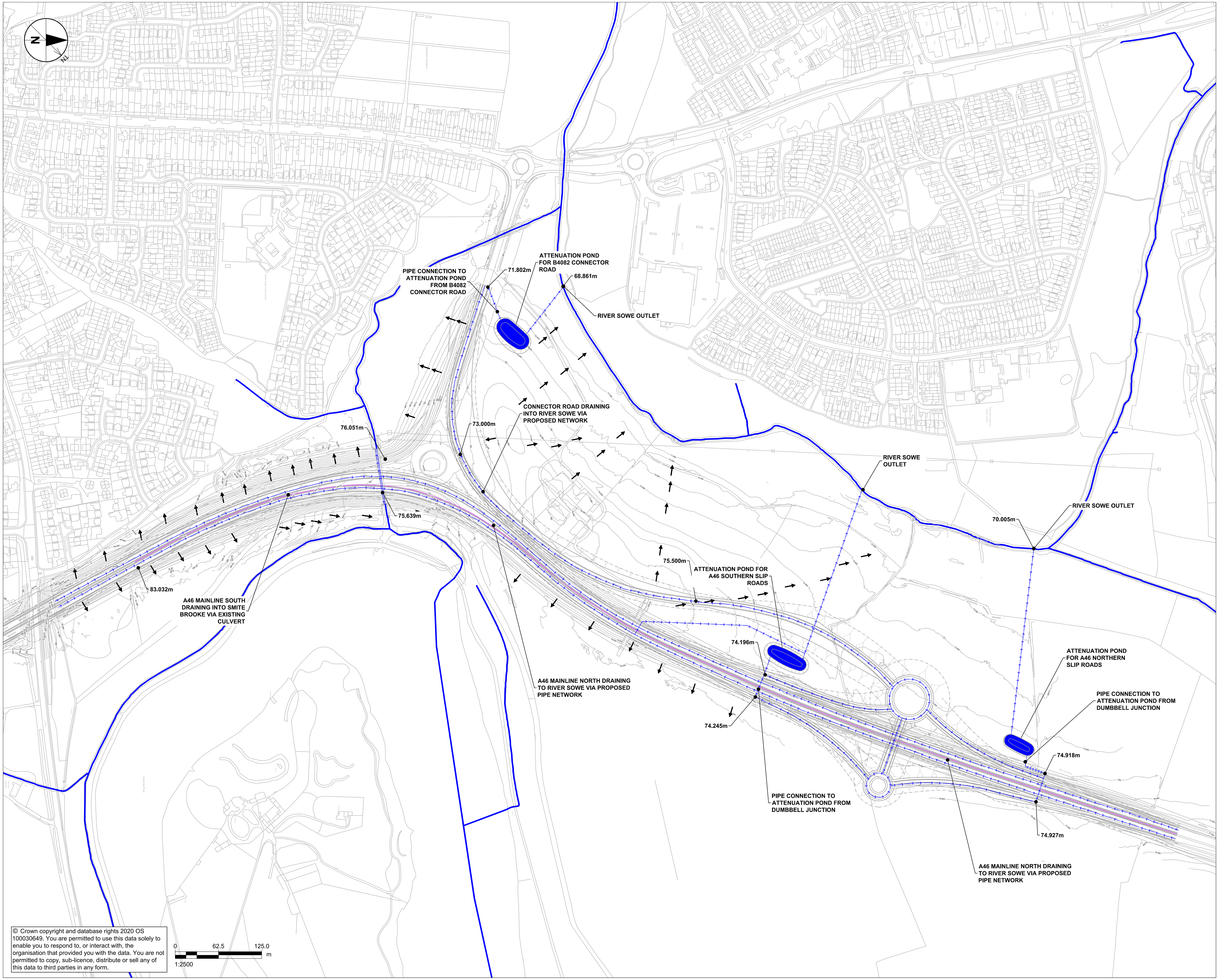
Date produced:	17/12/2021

Name of scheme:	A46 Coventry Junctions Upgrade - Walsgrave
Description of scheme:	Road Investment Strategy 2 Statement - A46 Coventry Junctions – grade separation of the Binley and Walsgrave roundabouts on the A46 near Coventry, upgrading the trunk sections of the A45/A46 between the M6 and M40 to a consistent standard. Highways England Delivery Plan - Provide access along the A46 to further residential developments and key employment sites near Binley and Walsgrave. A phased delivery approach is being taken; Binley junction first followed later by Walsgrave junction.

Contact:	
Name	Steven Wood
Organisation	AECOM
Role	Consultant

Impacts		Summary of key impacts	Assessment			
			Quantitative	Qualitative	Monetary	Distributional
					£m (NPV)	7-pt scale/ vulnerable grp
Economy	Business users & transport providers	Option 11 will save travellers an average of 1.6mins (SB)/0.6mins (NB) between Toll Bar and the M6/M69 junction in the Opening Year. In the Design Year the average time saving is 2.2mins (SB)/1.1mins (NB). This contributes to total Travel Time Benefits for Business Users of £109.6million.	**Value of journey time changes (£m)** £106.136 **Net journey time changes (£m)** 0 to 2min: £72.4 / 2 to 5min: £33.2 / > 5min: £0.6	N/A	£115.8	N/A
	Reliability impact on Business users	The scheme will reduce the variability of journey times along the A46 between Toll Bar and the M6/M69 junction.	N/A	N/A	£11.4	
	Regeneration	The area is not identified as in need of regeneration. The scheme would not impact on regeneration.	N/A	N/A	N/A	
	Wider Impacts	Two Wider Impacts were calculated. Increased Output reflects the additional benefits that a transport scheme can give to businesses under conditions of imperfect competition. For Option 11 this was calculated as £11.7million. Labour Supply Impacts reflects the additional benefits that a transport scheme can supply due to increased employment. For Option 11 this was calculated as £2.1million.	N/A	N/A	£13.8	
Environmental	Noise	Option 11 is predicted to result in the least number of significant adverse effects as a result of the operation of the scheme. Only one property - Hungerley Hall Farmhouse, predicted to experience a signifcant adverse operational noise effect due to this option resulting in both the A46 and B4082 moving closer to this property. Option 11 would result in the potential for one property (Hungerley Hall Farmhouse) to qualify for noise insulation works under the Noise Insulation Regulations. No residential properties are predicted to experience levels in excess of 80dB LAeq16hr. Noise mitigation options, in the form of noise barriers, may be feasible to reduce the noise impacts identified; however, these have not been included in the traffic noise predictions. Sleep Disturbance: -£0.12million; Amenity: -£0.00million; AMI: £0.03million; Stroke: -£0.01million; Dementia: -£0.01million	Households increased daytime noise forecast year: 204 Households decreased daytime noise forecast year:119 Households increased night-time noise forecast year: 96 Households decreased night-time noise forecast year: 32	N/A	-£0.1	Income Quintile 1 - Neutral; Income Quintile 2 - Moderate Adverse; Income Quintile 3 - Moderate Beneficial; Income Quintile 4 - Large Adverse; Income Quintile 5 - Moderate Beneficial
	Air Quality	There are no predicted exceedances near the affected road network either with or without the scheme in the opening year. The scheme has a negative impact on regional NOx and PM2.5 emissions. NOx emissions: -£1.6million; PM2.5 emissions: -£2.3million	Emissions NOx:+429 tonnes PM2.5: +72 tonnes	N/A	-£3.9	Income Quintile 1 - Neutral; Income Quintile 2 - Neutral; Income Quintile 3 - Neutral; Income Quintile 4 - Neutral; Income Quintile 5 - Neutral
	Greenhouse gases	There is predicted to be an increase in emissions due to an increase in vehicle kilometres.	Change in non-traded carbon over 60y (CO2e): 522,060 Change in traded carbon over 60y (CO2e): 5,136	N/A	-£22.9	
	Landscape	Option 11 is a less intrusive version of Option 6. It reduces the magnitude and significance of effects at all stages and has a lesser effect on landscape character than Option 6, albeit both are slight significance in year 1 but Option 11 becomes neutral by year 15 as a result of greater landscape integration.	No significant adverse effects to landscape character have been identified in relation to Option 11.	N/A	N/A	
	Townscape	As described for landscape, effects to the immediate townscape from Option 11 would be localised but include some erosion of the urban edge buffer as described for Option 6 but of lesser magnitude. There would be no significant effects to the wider townscape character of the eastern edge of Coventry.	No significant adverse effects to townscape character have been identified in relation to Option 11.	N/A	N/A	
	Historic Environment	Option 11 will result in adverse impacts to a group of three Grade II listed buildings at Hunglerley Hall Farm. It will impact the Grade II* Registered Park and Garden and Conservation Area at Coombe Abbey, through tree removal at the boundary however the impact is generally slight, and can be mitigated effectively with new planting. Option 11 also has the potential for the new 'dumbbell' junction to be visible from within the park which is an added potential impact. Further assessment would be required to determine the degree of impact resulting from such views, including assessment of the impact of night-time lighting. Option 11 also impacts upon the setting of the Grade II listed Walsgrave Hill Farm, but suitable mitigation options in the form of landscape planting may be available to mitigate the visual intrusion. All options could result in the removal of as yet unrecorded archaeological assets.	Significant Adverse Effects to historic environment have been identified in relation to Option 11.	N/A	N/A	
	Biodiversity	Option 11 has the potential for adverse effects on priority woodland habitat within Coombe Pool SSSI and temporary, recoverable impacts on a root protection zone in the SSSI. Option 11 would have negligible impact on woodland from increased N deposition. In addition Option 11 would remove a farm accommodation overbridge which is the only traffic-free crossing for wildlife for many kilometres of A46 around Coventry - the existing road is a barrier between Coombe Country Park and the River Sowe valley a key wildlife corridor. Option 11 has the least impact of the four options, but the loss of an overbridge would increase severance for wildlife. None of the options would achieve no net loss without significant additional landtake and offsite enhancement provision, after any bespoke compensation for impacts in the SSSI.	Option 11 would have Adverse Effects that are significant for one or more receptors, including at least some Moderate Adverse effects.	N/A	N/A	
	Water Environment	During operation of the chosen option mitigation will have been constructed to ensure routine road runoff discharges are attenuated and there will be no adverse effects on the flooding potential of the receiving watercourses. This will be with attenuation ponds and swales, both of which provide water quality benefits. It is assumed that all mitigation as required by the DMRB assessment process would be carried out - water quality, hydromorphology, and attenuation of flows using SuDS solutions. A hydraulic model has been developed which shows that option 11 would result in negligible increase in fluvial flood risk on or off-site. Option 11 has a cutting which has a base of the cutting 2m higher than option 8 and is less likely to interact with groundwater, based on BGS boreholes.	Neutral	N/A	N/A	
Social	Commuting and Other users	Option 11 will save travellers an average of 1.6mins (SB)/0.6mins (NB) between Toll Bar and the M6/M69 junction in the Opening Year. In the Design Year the average time saving is 2.2mins (SB)/1.1mins (NB). This contributes to total Travel Time Benefits for Commuting and Other Users of £53.2million.	**Value of journey time changes (£m)** £9.697 **Net journey time changes (£m)** 0 to 2min: -£11.3 / 2 to 5min: £21.7 / > 5min: -£0.8	Analysis perfomed on HBW AM and PM trips only. The user benefits signficantly favour the more deprived quintiles.	£38.3	Income Quintile 1 - Large Beneficial ; Income Quintile 2 - Large Beneficial ; Income Quintile 3 - Large Beneficial ; Income Quintile 4 - Slight Beneficial;
	Reliability impact on Commuting and Other users	The scheme will reduce the variability of journey times along the A46 between Toll Bar and the M6/M69 junction.	N/A	N/A	£12.8	
	Physical activity	No material impact.	N/A	Scheme is part of a strategic road network upgrade, with	N/A	
	Journey quality	There is predicted to be a slight improvement to traveller stress.	N/A	Traveller stress is espected to reduce due to improvements in	N/A	
	Accidents	The scheme improves safety at Walsgrave junction. It also generates induced long-distance traffic. Overall, across the 60-year appraisal period it is predicted that there will be an increase of 145 accidents across the road network. There are corresponding increases in Fatal Casualties (6), Serious Casualties (23), and Slight Casualties (191) over the same period.	N/A	Within the Area of Impact accident forecasts show limited change: 81% of links show an absolute change of <5%, 92% of links show an absolute change of <10%. 59% of links show an increase in forecast accidents, 41% a	-£7.4	Income Quintile 1 - Slight Adverse; Income Quintile 2 - Slight Adverse; Income Quintile 3 - Slight Adverse; Income Quintile 4 - Slight Adverse; Income Quintile 5 - Slight Adverse
	Security	Not Assessed: The scheme does not involve changes to public transport or facilities, nor is it expected to have any significant impact on pedestrian security.	N/A	N/A	N/A	N/A
	Access to services	Not Assessed: The scheme does not involve changes to public transport or facilities.	N/A	N/A	N/A	N/A
	Affordability	Data not available	N/A	Analysis performed on HBW AM and PM trips only. The increases in costs are concentrated in the highest quintiles. All quintiles show cost increases.	N/A	Income Quintile 1 - Slight Adverse; Income Quintile 2 - Slight Adverse; Income Quintile 3 - Moderate Adverse; Income Quintile 4 - Large Adverse; Income Quintile 5 - Large Adverse
	Severance	Walsgrave: No impact.	N/A	Walsgrave: No pedestrian crossing facilities and none planned under the scheme.	N/A	Income Quintile 1 - Neutral; Income Quintile 2 - Neutral; Income Quintile 3 - Neutral; Income Quintile 4 - Neutral; Income Quintile 5 - Neutral
	Option and non-use values	The scheme is unlikely to substantially change the availability of transport services in the study area.	N/A	N/A	N/A	
Public Accounts	Cost to Broad Transport Budget	Construction: £43.1million; Preparation: £10.2million; Supervision: £1.6million; Land and Compensation: £5.5million	N/A	N/A	£60.3	
	Indirect Tax Revenues	Operation: -£8.3million Quoted as Costs not as Benefits	N/A	N/A	-£8.3	

APPENDIX J
ATTENUATION PONDS DRAWING



Plot Date : 17 November 2021 15:49:00
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SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION BOX

IT IS ASSUMED THAT ALL WORKS ON THIS DRAWING WILL BE CARRIED OUT BY A COMPETENT CONTRACTOR WORKING, WHERE APPROPRIATE, TO AN APPROPRIATE METHOD STATEMENT.

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EXCEPTIONAL RISKS RELATING TO THE WORKS ASSOCIATED WITH THIS DRAWING ARE IDENTIFIED BELOW.

CONSTRUCTION

MAINTENANCE / OPERATION / DECOMMISSIONING / DEMOLITION

NOTES

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5. PIPE NETWORK DESIGN HAS NOT BEEN UNDERTAKEN AT THIS STAGE. CATCHMENT ANALYSIS HAS BEEN CARRIED OUT FOR ATTENUATION POND SIZING ONLY. EXISTING / PROPOSED PIPE NETWORK SHOWN IS INDICATIVE.
6. NO INVERT OR COVER LEVEL INFORMATION FOR THE EXISTING PIPE NETWORK HAS BEEN RECEIVED IN PCF STAGE 2. LOCATIONS WHERE THE NEW PIPE NETWORK WILL CROSS OR BE SITUATED IN CLOSE PROXIMITY WILL REQUIRE TO BE INVESTIGATED IN PCF STAGE 3.

KEY

DIRECTION OF OVERLAND SURFACE FLOW

FLOW DIRECTION

WATERCOURSE

REVISION DETAILS	By / Check	Date	Suffix
FIRST ISSUE	TO / TO	06/09/21	P01
DRAWING NOTES UPDATED	DI / CG	17/11/21	P02

Purpose of issue

SUITABLE FOR INFORMATION

Client

Highways England
The Cube
199 Wharfside Street
Birmingham

B1 1RN

national highways

Project Title

A46 COVENTRY JUNCTIONS WALSGRAVE PCF STAGE 2

Drawing Title

WALSGRAVE PCF STAGE 2 OPTION 11 PROPOSED DRAINAGE

Designed	Drawn	Checked	Approved	Date
TO	DI	JN	CG	17/11/21

Internal Project No.	Suitability
60638418	S2
Scale @ A1	**Discipline**
1:2500	Civil - Drainage

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4 Bedford Park
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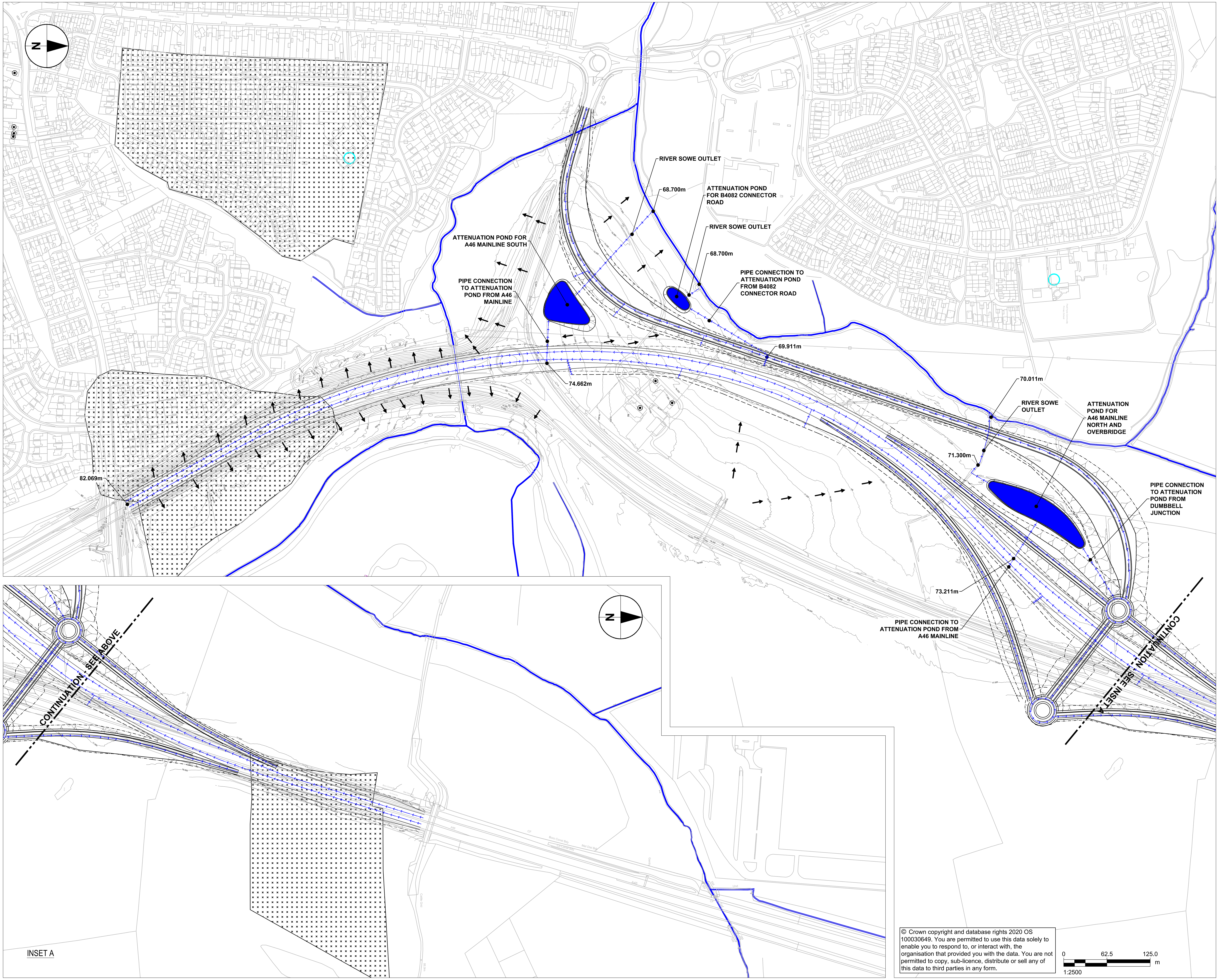
AECOM Infrastructure & Environment UK Limited
Registered in England Registered number: 880328
Registered office: Midpoint, Alencon Link, Basingstoke, Hampshire RG21 7PP

Drawing Number

Work Package ID / Location	Originator	Volume	Type	Role	Number	Rev
HE604820 WAL_SW_OP11_Z	ACM	HDG	DR	CD	0001	P02



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KEY

- PROPOSED EARTHWORKS CUT OFF DITCHES
- DIRECTION OF OVERLAND SURFACE FLOW
- FLOW DIRECTION
- WATERCOURSE

REVISION DETAILS	By / Check	Date	Suffix
FIRST ISSUE	DI / CG	17/11/21	P01

Purpose of issue

SUITABLE FOR INFORMATION

Client

Highways England
The Cube
199 Wharfside Street
Birmingham

B1 1RN

national highways

Project Title

A46 COVENTRY JUNCTIONS WALSGRAVE PCF STAGE 2

Drawing Title

WALSGRAVE PCF STAGE 2 OPTION 6 PROPOSED DRAINAGE

Designed	Drawn	Checked	Approved	Date
TO	DI	JN	CG	17/11/21

Internal Project No.	Suitability
60638418	S2
Scale @ A1	Discipline
1:2500	Civil - Drainage

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Drawing Number

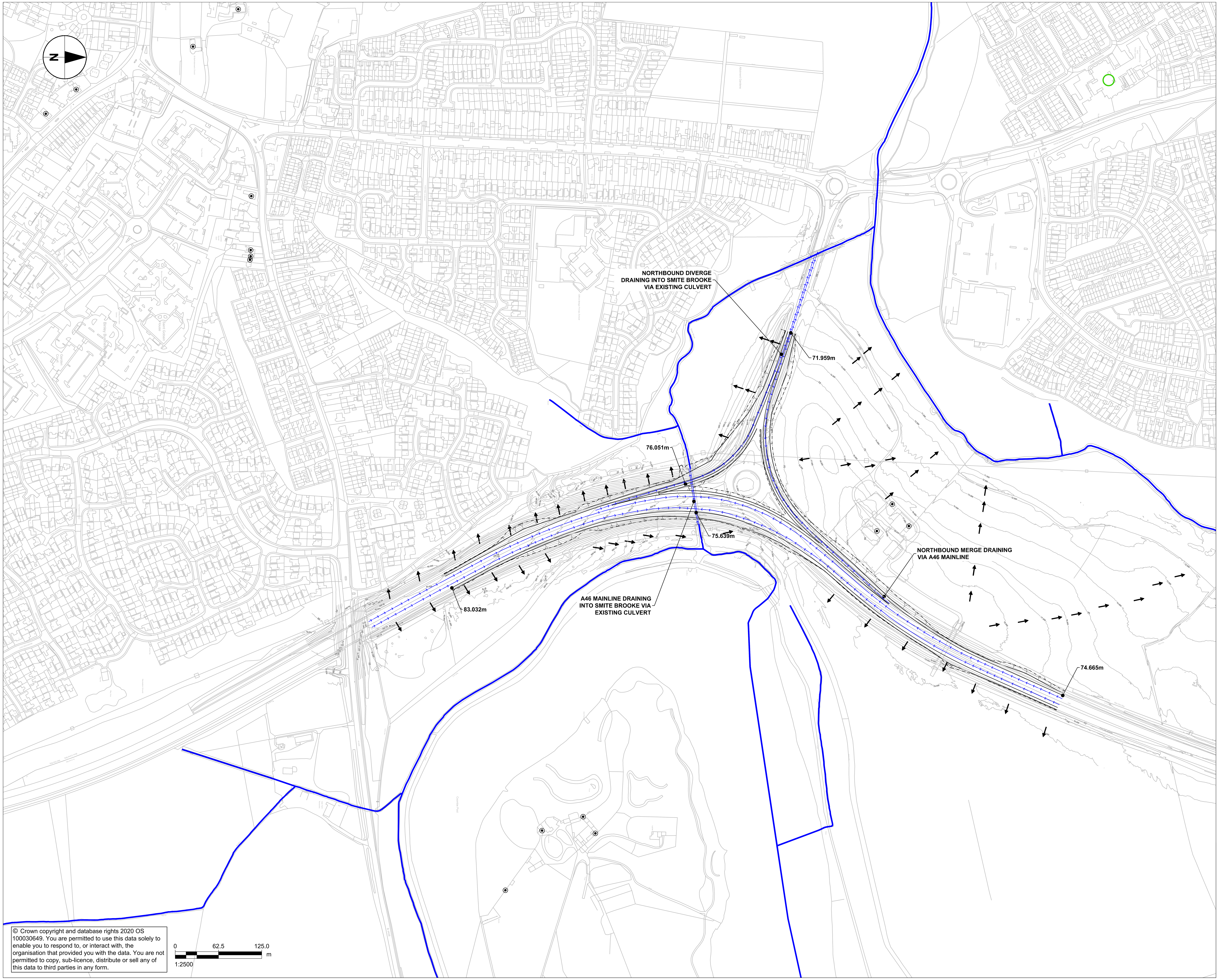
Work Package ID / Originator / Volume / Location / Type / Role / Number

HE604820 -ACM -HDG - WAL_SW_OP6_Z -DR -CD-0001

Rev

P01

Plot Date : 17 November 2021 15:35:26



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KEY

- DIRECTION OF OVERLAND SURFACE FLOW
- FLOW DIRECTION
- WATERCOURSE

REVISION DETAILS	By / Check	Date	Suffix
FIRST ISSUE	DI / CG	17/11/21	P01

Purpose of issue

SUITABLE FOR INFORMATION

Client

Highways England
The Cube
199 Wharfside Street
Birmingham
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national highways

Project Title

A46 COVENTRY JUNCTIONS WALSGRAVE PCF STAGE 2

Drawing Title

WALSGRAVE PCF STAGE 2 OPTION 7 PROPOSED DRAINAGE

Designed	Drawn	Checked	Approved	Date
TO	DI	JN	CG	17/11/21

Internal Project No.	Suitability
60638418	S2
Scale @ A1: 1:2500	Discipline: Civil - Drainage

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Drawing Number: Work Package ID HE604820 - Originator ACM - Volume HDG - Location WAL_SW_OP7_Z - Type DR - Role CD - Number 0002

Rev: P01

Plot Date : 17 November 2021 16:42:43
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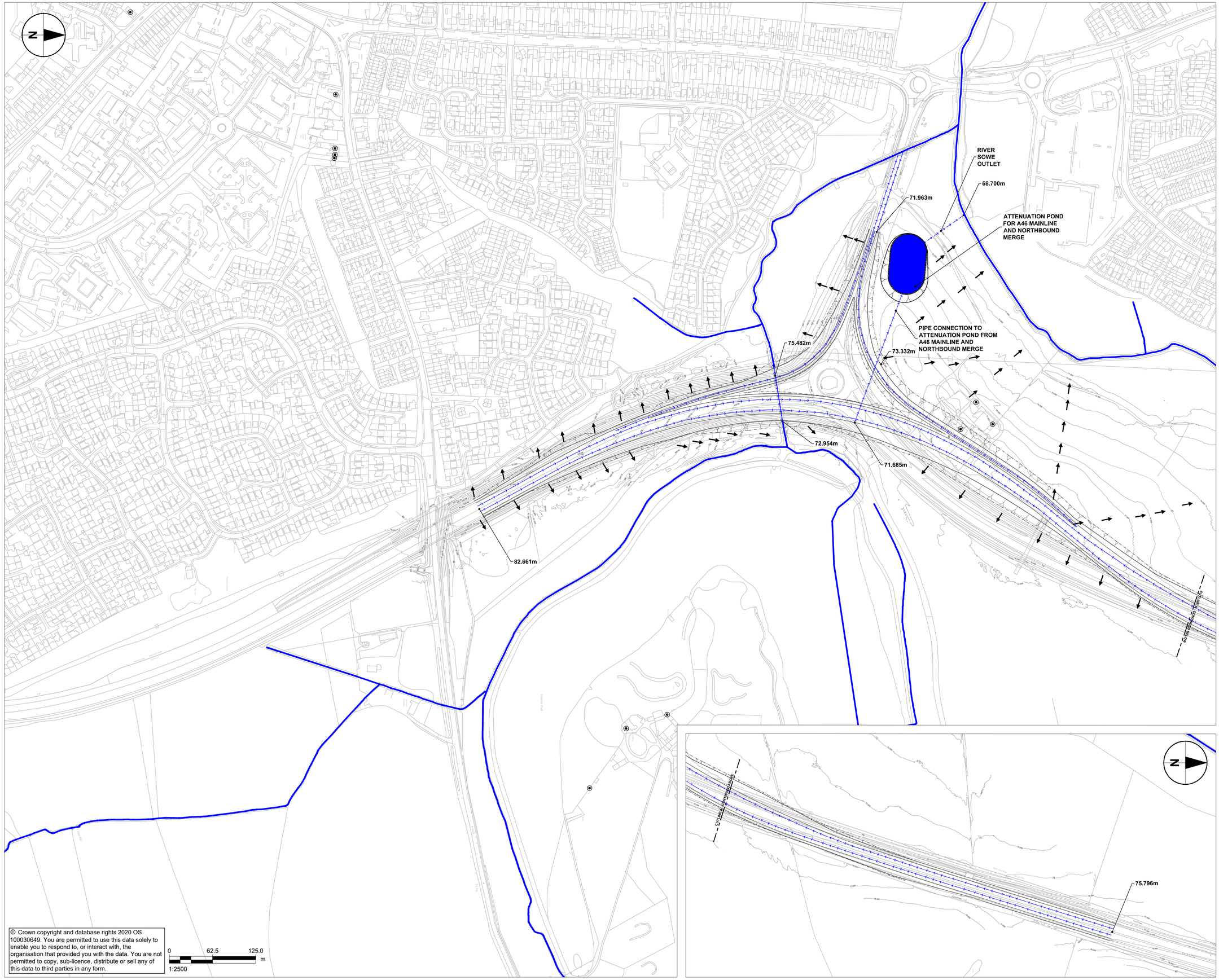

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1:2500

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KEY

DIRECTION OF OVERLAND SURFACE FLOW

FLOW DIRECTION

WATERCOURSE

FIRST ISSUE	DI / CG		17/11/21	P01
REVISION DETAILS	By / Check		Date	Suffix

Purpose of issue

SUITABLE FOR INFORMATION

Client

Highways England
The Cube
199 Wharfside Street
Birmingham

B1 1RN

national highways

Project Title

A46 COVENTRY JUNCTIONS WALSGRAVE PCF STAGE 2

Drawing Title

WALSGRAVE PCF STAGE 2 OPTION 8 PROPOSED DRAINAGE

Designed	Drawn	Checked	Approved	Date
TO	DI	JN	CG	17/11/21

Internal Project No.	Suitability
60638418	S2
Scale @ A1	Discipline
1:2500	Civil - Drainage

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Drawing Number
Work Package ID | Originator | Volume | Location | Type | Role | Number
HE604820 -ACM -HDG- WAL_SW_OP8_Z -DR-CD-0002

Rev P01

Plot Date: 17 November 2021 16:46:27
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