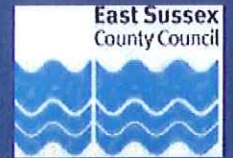


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**East Sussex County Council  
Transport and Environment**

**Bexhill to Hastings Link Road  
S03 Woodsgate Park Overbridge  
Approval in Principle**

**Doc. Ref: JB-B1297000-PH2/1600.06a/0003  
Revision 0  
September 2012**

**Document control sheet**

Client:	East Sussex County Council	Transport and Environment
Project:	Bexhill to Hastings Link Road	Job No: B1297000
Document Title:	S03 Woodsgate Park AIP	

	Originator	Checked by	Reviewed by	Approved by
<b>ORIGINAL</b>	NAME P Goodchild	NAME P Blackie	NAME P Blackie	NAME S Guruparan
DATE 3 Sept 2012	SIGNATURE 	SIGNATURE 	SIGNATURE 	SIGNATURE 
<b>Document Status: Issued for Approval</b>				

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## 1. HIGHWAY DETAILS

### 1.1 Type of highway

Over - Woodsgate Park single carriageway urban highway 6.100m width + 2 x 2.000m footways and a 1.000m wide raised area to accommodate a badger crossing alongside the north parapet.

Under - Bexhill to Hastings Link Road - single carriageway urban all purpose road, approximately 7.300m wide with 2.500m ( min ) verge on east and west sides.

### 1.2 Permitted traffic speed

Over: 30 mph

Under: 30 mph

### 1.3 Existing restrictions

The existing bridge is a single span steel beam and brick jack arch deck on brick abutments. The clear span between abutments is approximately 8.2m. The clear width between existing brick parapets is 12.5m. The bridge deck and East abutment are to be demolished.

## 2. SITE DETAILS

### 2.1 Obstacles crossed

Single carriageway urban highway over Bexhill to Hastings Link Road with Egerton Stream storm overflow pipe culvert under western verge of BHLR

## 3. PROPOSED STRUCTURE

### 3.1 Description of structure

Single span simply supported bridge on abutments with 2.000m wide verges, 6.100m wide carriageway and 1.000m wide raised adjacent to the north parapet. Overall deck width approximately 12.300m square. The existing mass brick West Abutment And wing walls are to be retained as part of the new bridge.

The structure is located at OS grid reference is 573939.400E, 108529.000N

### 3.2 Structural type

The structural type will be a single span simply supported bridge of steel/concrete composite construction, consisting of 7 longitudinal painted steel girders with an insitu reinforced concrete deck slab supported on bearings at the abutments. The girders are of constant depth and will be braced together with transverse bracing sets at the supports and at intermediate locations.

The superstructure will include provision of a badger tunnel adjacent to the North parapet

The East Abutment and wing walls will be brick clad reinforced concrete.

The existing masonry West Abutment is to be retained. A new reinforced concrete bearing shelf will be cast on top of the existing masonry which will be removed down to a suitable level.

### 3.3 Foundation type

The East Abutment and its wingwalls will be founded on reinforced concrete spread footings.

The existing mass gravity West Abutment is founded on spread footings. Strengthening works for the abutment toe are proposed if necessary.

### 3.4 Span arrangements

Clear square span	14.0 m
Skew angle	zero

### 3.5 Articulation arrangements

The deck is supported on bearings on each support with fixity being provided at the east abutment by a fixed bearing. Horizontal restraint will be provided by a guide bearing located at the West Abutment. The remaining bearings on each support will be free sliding bearings which will allow for all round movement and rotation.

An expansion joint will be provided in the carriageway construction at the West Abutment. A buried joint will be provided in the carriageway construction at the East Abutment.

### 3.6 Types of road restraint systems

Parapets on the bridge deck will provide normal containment level N2, a working width not greater than W4 and minimum height of 1.0m. Parapets will be of reinforced concrete construction with steeple copings and brickwork facing to both sides.

### 3.7 Proposed arrangements for maintenance and inspection

#### 3.7.1 Traffic management

Traffic management will be required on the link road to enable inspection and maintenance of the deck soffit, bearings, abutment and wing wall faces and external parapet faces

#### 3.7.2 Access

The road side faces of the parapets will be accessible for inspection and maintenance from the BHLR verges.

Access to other deck elements and pier bearings can be from a mobile access platform sited on the carriageway under the bridge.

The interior faces of the piped badger passage in the bridge deck and the buried passages under the approaches will not be accessible for inspection other than by CCTV or similar techniques.

Personnel access to the structure is via the Bexhill to Hastings Link Road under and Woodsgate Park over.

Bearings at the abutments will be set on plinths as necessary to provide 600mm minimum clearance between the beam soffit and bearing shelves for inspection and maintenance purposes.

Jacking points will be provided between all permanent bearing positions. The bridge will be designed to carry full HA design load during bearing replacement.

### 3.8.1 Materials and finishes

Refers to new construction only and not to elements of the existing structure retained in new works

Concrete	Element	Limiting Exposure Class	
C40/50	Deck slab	top	XC3
		soffit	XD1
C40/50	Parapets including copings	XD3	
C40/50	Abutment and wing walls	XD3	
C40/50	Foundations	XD3	

**Reinforcement** All reinforcement to be grade 500B or 500C deformed bars to BS 4449:2005.

**Structural steelwork** Generally Grade S355 J2 +N to EN 10025 except as follows:

Grade S355 K2 +N to specific bottom flange areas as noted on the drawings.

**Parapets** Reinforced concrete  
Brick facing; reclaimed bricks from existing structure or similar

**Fill**  
East Abutment and wing walls  
West Abutment and wing walls  
Class 6N or 6P in accordance with the SHW Compact lightweight expanded clay aggregate fill replacement of existing embankment fill.

#### Concrete finishes

Top of deck slab and bearing shelf floor U4 to receive bridge deck waterproofing

Hidden and buried surfaces F1 / U1

Deck soffit between main beams Permanent formwork (GRP)

Deck soffit ( elsewhere ) F2

Parapet, exposed faces F3

#### Protection

The top deck surface between parapet interfaces will be protected with a proprietary spray applied bridge deck waterproofing system to SHW CI 2003.

All accessible concrete surfaces greater than 150mm below finished ground level to receive waterproofing to below ground concrete surfaces in accordance with the SHW CI 2004.

### 3.8.2 Sustainability issues

Re-use of masonry units from the existing bridge is proposed where possible where these can be recovered in a usable condition.

### 3.9 Risks and hazards considered

Future excavation for maintenance or replacement of Egerton Brook storm by-pass pipe culvert under the western verge of BHLR may compromise stability of the bridge west abutment.

Standard construction methods are anticipated with normally associated risks and hazards. A design hazard log and risk assessment process is active for the scheme.

### 3.10 Estimated cost of proposed structure together with other structural forms considered and the reasons for their rejection including comparative whole-life costs with dates of estimates.

Other structural forms were discussed and appraised in Amey report number 262701/012 'Bexhill to Hastings Link Road, Preliminary Design, Structures Options Report' and the addendum to it numbered 262701/060

### 3.11 Proposed arrangements for construction

#### 3.11.1 Traffic management

Full road closure required during construction. All vehicular and pedestrian traffic will be diverted along Buxton Drive, the A269 Ninfield Road and London Road to the north or Down Road, King Offa Way and London Road to the south. Construction of Woodsgate Park and Ninfield Road bridges to be phased such that at least one bridge is open to vehicular and pedestrian traffic at all times.

#### 3.11.2 Service diversions

Existing low voltage and high voltage electric cables, and fibre optic telecom cables will be provided for by ducts in footways of the new structure. Details of the works/diversions of the services are being undertaken directly by the contractor and are not itemised.

The existing Egerton Stream culvert beneath the eastern zone of the highway corridor and behind the eastern wing walls of the bridge is to be replaced as part of the scheme.

#### 3.11.3 Interface with existing structures

The existing structure will be demolished except for its West Abutment which is to be retained and re-used. The existing embankment fill to the West Abutment and wing walls will be removed and replaced with lightweight expanded clay aggregate fill to reduce lateral earth pressures. The existing bearing shelf will be removed and replaced with a new reinforced concrete bearing shelf incorporating bearing plinths. Local modification of the brick abutment may be required to accommodate the depth of the new bearing shelf.

#### 4. DESIGN CRITERIA

##### 4.1 Live loading , headroom

##### 4.1.1 Loading relating to normal traffic under AW regulations and C&U regulations

Full HA loading in accordance with BD 37/01

##### 4.1.2 Loading relating to General Order traffic under STGO regulations

30 units of HB loading in accordance with BD 37/01

##### 4.1.3 Footway or footbridge live loading

Footway loading in accordance with BD 37/01.

##### 4.1.4 Loading relating to Special Order Traffic, provision for exceptional abnormal loads or indivisible loads, including location of vehicle track on deck cross-section

None

##### 4.1.5 Any special loading not covered above

Vehicle collision loading (BD 60/04)

##### 4.1.6 Heavy or high load route requirements and arrangements being made to preserve the route, including any provision for future heavier loads or future widening.

No provision required for heavy or high loads

##### 4.1.7 Minimum headroom provided

A minimum headroom of 5.3m will be provided to the BHLR after allowing for deflections arising from dead load, live load and settlement.

##### 4.1.8 Authorities consulted and any special conditions required

###### Authority consulted

East Sussex CC

###### Special requirement

None

A badger passage will be provided within the bridge deck with pipe passages connecting to the cutting/embankment slopes from the wing walls near each corner of the site

## 4.2 List of relevant documents from the TAS

Refer to Appendix A

### 4.2.1 Additional relevant standards

BS 8500; Part 1; 2006	Concrete; Complementary British Standard to BS EN 206-1; Method of specifying and guidance for the specifier
BS 8500; Part 2; 2006	Concrete; Complementary British Standard to BS EN 206-1; Specification for constituent materials and concrete
BS 6779; Part 2; 1991	Specification for vehicle containment parapets of concrete construction
CHE Memorandum 227/08	The Impregnation Of Reinforced and Prestressed Concrete Highway Structures Using Hydrophobic Pore Lining Impregnants
MCDHW, Volume 1	Specification for Highway Works 1998, including amendments to November 2009
MCDHW, Volume 2	Notes for Guidance on the Specification for Highway Works 1998, including amendments to November 2009
MCDHW, Volume 3	Highway Construction Details 1991, including amendments to November 2008

### 4.3 Proposed Departures from Standards given in 4.2 and 4.2.1

Departure D3: Verges over/under Structures

See Appendix E

### 4.4 Proposed methods for dealing with aspects not covered by Standards in 4.2 and 4.2.1

Not applicable



## 5. STRUCTURAL ANALYSIS

### 5.1 Methods of analysis proposed for superstructure, substructure and foundations

The deck is to be analysed by plane linear elastic grillage analysis using LUSAS or SUPERSTRESS software for vertical loads, assuming simple supports. Deck analysis to cover all temporary and permanent stages of construction including the effects of formwork used for deck cantilever construction but excluding beam lifting condition.

Analysis of deck slab for local effects to be carried out using a metre strip or Pucher chart method assuming that the slab is one way spanning and continuous over main girders.

The East Abutment and wing walls are to be analysed assuming that vertical load carrying elements cantilever from foundations.

The stability of the modified existing West Abutment and wing walls will be analysed statically as a mass gravity wall using manual methods.

### 5.2 Description and diagram of idealised structure to be used for analysis.

See Appendix D

### 5.3 Assumptions intended for calculation of structural element stiffness

Element stiffness for composite steel / concrete members will be determined in accordance with BS5400; Part 3-2000 as implemented by BD 13/06, Part 4-1990 as implemented by BD 24/92 and Part 5-2005 as implemented by BD 16/82.

Element stiffness for concrete members will be determined in accordance with BS5400; Part 4; 1990; Clause 4.4 using full elastic uncracked member cross sections ignoring.

Global member stiffness for analysis will be determined as either composite or non-composite as appropriate to the construction or permanent stage under consideration.

Model layout will be based on the recommendations given in 'Bridge Deck Behaviour, Second Edition' by E.C. Hambly.

### 5.4 Proposed earth pressure coefficients ( $k_a$ , $k_0$ , or $k_p$ ) to be used in the design of earth retaining elements

For the analysis of earth retaining elements,  $k_a$  will be used for stability calculations and  $k_0$  for structural element design (calculated in accordance with BD 30/87).

For the 6N/6P backfill to the east abutment, a representative peak angle of friction of  $36^\circ$  will be used, for which  $k_a = 0.26$ ;  $k_p = 3.85$  and  $k_0 = 0.41$ .

For the 6T backfill to the west abutment, a representative peak angle of friction of  $37^\circ$  will be used, for which  $k_a = 0.25$ ;  $k_p = 4.02$  and  $k_0 = 0.40$ .

## 6. GEOTECHNICAL CONDITIONS

- 6.1 Acceptance of recommendations of Section 8 of the Geotechnical Report to be used in the design and reasons for any proposed changes.**

Section 2 of the Geotechnical Report has not been completed at this stage.

- 6.2 Geotechnical Report Highway Structure Summary Information**

A draft Geotechnical Report Highway Structure Summary sheet based on the information available in Part 1 of the Geotechnical Report is attached in Appendix C. A full Geotechnical Report Highway Structure Summary sheet and extracts from the completed Geotechnical Report Section 2 will be produced following development of the Geotechnical Report.

- 6.3 Differential settlement to be allowed for in the design of the structure.**

25mm between adjacent supports:  
20mm between structure and approach embankment (within 10 metres of the interface)

- 6.4 If the Geotechnical Report is not yet available, state when the results are expected and list the sources of information used to justify the preliminary choice of foundations.**

The preliminary choice of foundation is discussed in the draft Geotechnical Report Highway Structure Summary sheet contained in Appendix C. Part 2 of the Geotechnical Report, including Section 2 Highway Structures, is expected to be completed in Phase 2 of the project.

## 7. CHECKING

- 7.1 Proposed category of structure**

Category 2

- 7.2 If Category 3, name of proposed Independent checkers.**

Not applicable

- 7.3 Erection proposals or temporary works for which an independent check will be required, listing parts of the structure affected with reasons for recommending an independent check.**

None

**8. DRAWINGS AND DOCUMENTS****8.1 List of drawings and documents accompanying the submission.**

Appendix A TAS dated February 2009


Appendix B	<u>Drawing No</u>	<u>Title</u>
	B1297000-PH1/1600.01a/9031	Woodsgate Park Overbridge General Arrangement

Appendix C Geotechnical Information

Appendix D Idealised Structure

Appendix E Departures from Standards

9 THE ABOVE IS SUBMITTED FOR ACCEPTANCE

9.1 Submission by designer 

Signed  
Name: P Goodchild  
Position: Structures team leader, Jacobs  
Engineering Qualifications: BSc, CEng, MICE, MIStructE

Date 3 September 2012

9.2 Endorsement by contractor

Signed 

Name: S. LAPTHORN  
Engineering qualifications: MEng (Hons), CEng MICE  
Position: Design Co-ordinator, Hochtief Vinci Joint Venture  
Date: 10/09/12

10. THE ABOVE IS REJECTED/AGREED SUBJECT TO THE AMENDMENTS AND CONDITIONS SHOWN BELOW.

Reviewed .....

Name:.....

Engineering qualifications.....

Date: .....

Signed .....

Name:.....

TAA  
Engineering qualifications.....

Date: .....

## Appendix A List of Relevant Documents

Schedule of Design Documents Relating to Highway Bridges and Structures; February 2009

### **British Standards**

BS 5268; Part 2; 2002	Structural Use of Timber
BS 5400	Steel concrete and composite bridges
Part 1; 1988	General Statement (see BD 15 )
Part 2; 1978	Specification for loads (see BD 14)
Part 3; 2000	CP for design of steel bridges (see BD 13 )
Part 4; 1990	CP for design of concrete bridges (see BD 24 )
Part 5; 1979	CP for design of composite bridges (see BD 16)
Part 9; 1983	Bridge bearings (see BD 20)
Part 10; 1980	CP for fatigue (see BD 9)
BS 5628; Part 1; 1992	Unreinforced Masonry
BS 5930; 1999	Site Investigations
BS 6031; 1981	Earthworks
BS 8002; 1994	Earth retaining structures
BS 8004; 1986	Foundations
<del>BS 8118; 1991</del>	<del>The structural use of aluminium</del>
BS EN 1317-1-1998; Road Restraint Systems – Part 1	Terminology and general criteria for test methods
BS EN 1317-2-1998; Road Restraint Systems – Part 2	Performance classes, impact test acceptance criteria and test methods for safety barriers
BS EN 1317-3-2000; Road Restraint Systems – Part 3	Performance classes, impact test acceptance criteria and test methods for crash cushions
DD ENV 1317-4-2002; Road Restraint Systems – Part 4	Terminals and transitions
BS EN 14388; 2005	Road traffic noise reducing devices – Specification

### **Miscellaneous**

~~Circular Roads No 61/72 – Routes for heavy and high abnormal loads.~~

~~Railway Group Approved Code of Practice GC/RC5510: Recommendations for the Design of Bridges (2000) (for full list of other Network Rail Standards, refer to RSSB, Railway Safety and Standards Board)~~

~~Simplified Tables of External Loads on Buried Pipelines ( 1986 )~~

Traffic Management Act 2004

***The Manual of Contract Documents for Highway Works (MCDHW)***

- Volume 1: Specification for Highway Works 1998, including amendments to November 2007
- Volume 2: Notes for Guidance on the Specification for Highway Works 1998, including amendments to November 2007
- Volume 3: Highway Construction Details 1991, including amendments to May 2007

***The Design Manual for Roads and Bridges (DMRB)***

- Bridges and Structures ( BA Series ) *Reproduced on following pages*
- Bridges and Structures ( BD Series ) *Reproduced on following pages*
- Bridges and Structures, Technical Memoranda ( BE Series ) *Reproduced on following pages*

***Traffic Engineering and Control, Standards ( TD Series )***

- TD 9/93 Road layout and geometry. Highway link design
- TD 19/06 Requirement of Road Restraint Systems & correction No. 1
- TD 27/05 Cross Sections and headroom
- TD 36/93 Subways for pedestrians and cyclists, layout and dimensions

***Highways, Advice Notes ( HA Series )***

- HA 59/92 Mitigating Against Effects on Badgers
- HA 80/99 Nature Conservation Advice in Relation to Bats
- HA 84/01 (1) Nature Conservation and Biodiversity
- HA 97/04 Nature Conservation Management Advice in Relation to Dormice
- HA 98/04 Nature Conservation Management Advice in Relation to Amphibians

***Highways, Standards (HD Series )***

- HD 22/08 Managing Geotechnical Risk

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	<b>ADVICE NOTES - BRIDGES AND STRUCTURES (BA SERIES)</b>
BA-9/84	The Use of BS-5400: Part 10: 1980. Code of Practice for Fatigue Amendment No. 1
BA-16/97	The Assessment of Highway Bridges and Structures. Amendment No. 1 Amendment No. 2
BA 19/85	The Use of BS 5400: Part 3: 1982
BA 24/87	Early Thermal Cracking of Concrete Amendment No. 1
BA 26/94	Expansion Joints for Use in Highway Bridge Decks
BA 28/92	Evaluation of Maintenance Costs in Comparing Alternative Designs for Highway Structures
BA-30/94	Strengthening of Concrete Highway Structures Using Externally Bonded Plates
BA-34/90	Technical Requirements for the Assessment and Strengthening Programme for Highway Structures
BA-35/90	Inspection and Repair of Concrete Highway Structures
BA 36/90	The Use of Permanent Formwork
BA-37/92	Priority Ranking of Existing Parapets
BA-38/93	Assessment of the Fatigue Life of Corroded or Damaged Reinforcing Bars
BA-39/93	Assessment of Reinforced Concrete Half-joints
BA-40/93	Tack Welding of Reinforcing Bars
BA 41/98	The Design and Appearance of Bridges
BA-42/96	The Design of Integral Bridges [Incorporating Amendment No. 1 dated May 2003]
BA-43/94	Strengthening, Repair and Monitoring of Post-tensioned Concrete Bridge Decks
BA-44/96	Assessment of Concrete Highway Bridge and Structures
BA 47/99	Waterproofing and Surfacing Concrete Bridge Decks
BA-50/93	Post-tensioned Concrete Bridges: Planning, Organisation and Methods for Carrying Out Special Inspections
BA-51/95	The Assessment of Concrete Structures Affected by Steel Corrosion
BA-52/94	The Assessment of Concrete Highway Structures Affected by Alkali Silica Reaction
BA 53/94	Bracing Systems and the Use of U-Frames in Steel Highway Bridges
BA-54/94	Load Testing for Bridge Assessment
BA-55/06	The Assessment of Bridge Substructures and Foundations, Retaining Walls and Buried Structures
BA-56/96	The Assessment of Steel Highway Bridges and Structures
BA 57/01	Design for Durability
BA-58/94	Design of Bridges and Concrete Structures with External Unbonded Prestressing
BA-59/94	Design of Highway Bridges for Hydraulic Action
BA-61/96	The Assessment of Composite Highway Bridges
BA-67/96	Enclosure of Bridges
BA-68/97	Crib Retaining Walls
BA-72/03	Maintenance of Road Tunnels

**ADVICE NOTES - BRIDGES AND STRUCTURES (BA SERIES)**

BA-74/06	Assessment of Scour at Highway Bridges
BA-80/99	Use of Rock Bolts
BA-82/00	Formation of Continuity Joints in Bridge Decks
BA-83/02	Cathodic Protection for Use in Reinforced Concrete Highway Structures
BA-84/02	Use of Stainless Steel Reinforcement in Highway Structures
BA-85/04	Coatings for Concrete Highway Structures & Ancillary Structures
BA-86/06	Advice Notes on the Non-Destructive Testing of Highway Structures
BA-87/04	Management of Corrugated Steel Buried Structures
BA-88/04	Management of Buried Concrete Box Structures
BA-92/07	The Use of Recycled Concrete Aggregates in Structural Concrete
BA-93/09	Structural Assessment of Bridges with Deck Hinges

**STANDARDS - BRIDGES AND STRUCTURES (BD SERIES)**

BD 2/05	Technical Approval of Highway Structures
BD-7/01	Weathering Steel for Highway Structures
BD 9/81	Implementation of BS 5400: Part 10: 1980. Code of Practice for Fatigue
BD-10/97	Design of Highway Structures in Areas of Mining Subsidence
BD-12/04	Design of Corrugated Steel Buried Structures with Spans Greater than 0.9 Metres and up to 8.0 Metres
BD-13/06	Design of Steel Bridges. Use of BS 5400: Part 3: 2000
BD 15/92	General Principles for the Design and Construction of Bridges. Use of BS 5400: Part 1: 1988
BD 16/82	Design of Composite Bridges. Use of BS 5400: Part 5: 1979 Amendment No. 1
BD 20/92	Bridge Bearings. Use of BS 5400: Part 9: 1983
BD-24/01	The Assessment of Highway Bridges and Structures
BD 24/92	Design of Concrete Bridges. Use of BS 5400: Part 4: 1990
BD-27/86	Materials for the Repair of Concrete Highway Structures
BD 28/87	Early Thermal Cracking of Concrete Amendment No. 1
BD-29/04	Design Criteria for Footbridges
BD 30/87	Backfilled Retaining Walls and Bridge Abutments
BD-34/01	The Design of Buried Concrete Box and Portal Frame Structures
BD 33/94	Expansion Joints for Use in Highway Bridge Decks
BD-34/90	Technical Requirements for the Assessment and Strengthening Programme for Highway Structures
BD-35/06	Quality Assurance Scheme for Paints and Similar Protective Coatings
BD 36/92	Evaluation of Maintenance Costs in Comparing Alternative Designs for Highway Structures
BD 37/01	Loads for Highway Bridges



**STANDARDS - BRIDGES AND STRUCTURES (BD SERIES)**

BD 41/97	Reinforced Clay Brickwork Retaining Walls of Pocket Type and Grouted Cavity type Construction Use of BS 5628: Part 2: 1995
BD 42/00	Design of Embedded Retaining Walls and Bridge Abutments
BD 43/03	The Impregnation of Reinforced and Prestressed Concrete Highway Structures using Hydrophobic Pore-Lining Impregnants
BD 44/95	The Assessment of Concrete Highway Bridges and Structures
BD 45/93	Identification Marking of Highway Structures
BD 46/92	Technical Requirements for the Assessment and Strengthening Programme for Highway Structures [Stage 2—Modern Short-Span Bridges]
BD 47/99	Waterproofing and Surfacing of Concrete Bridge Decks
BD 48/93	The Assessment and Strengthening of Highway Bridge Supports
BD 49/01	Design Rules for Aerodynamic Effects on Bridges
BD 50/92	Technical Requirements for the Assessment and Strengthening Programme for Highway Structures Stage 3—Long-Span Bridges
BD 51/98	Portal and Cantilever Signs/Signal Gantries
BD 53/95	Inspection and Records for Road Tunnels
BD 54/93	Post-tensioned Concrete Bridges, Prioritisation of Special Inspections
BD 56/96	The Assessment of Steel Highway Bridges and Structures
BD 57/01	Design for Durability
BD 58/94	The Design of Concrete Highway Bridges and Structures with External and Unbonded Prestressing Design of Highway Bridges for Vehicle Collision Loads
BD 60/04	Design of Highway Bridges for Vehicle Collision Loads
BD 61/96	The Assessment of Composite Highway Bridges
BD 62/07	As-Built, Operational and Maintenance Records for Highway Structures
BD 63/07	Inspection of Highway Structures
BD 65/97	Design Criteria for Collision Protector Beams
BD 67/96	Enclosure of Bridges
BD 68/97	Crib Retaining Walls
BD 70/03	Strengthened/Reinforced Soils and Other Fills for Retaining Walls and Bridge Abutments Use of BS8006: 1995, incorporating Amendment No. 1 (Issue 2 March 1999)
BD 74/00	Foundations
BD 78/99	Design of Road Tunnels
BD 79/06	The Management of sub-Standard Highway Structures
BD 81/02	Use of Compressive Membrane Action in Bridge Decks
BD 82/00	Design of Buried Rigid Pipes
BD 84/02	Strengthening of Concrete Bridge Supports Vehicle Impact Using Fibre Reinforced Polymers
BD 85/08	Strengthening Highway Structures Using Externally Bonded Fibre Reinforced Polymer
BD 86/07	The Assessment of Highway Bridges and Structures For The Effects of Special Types General Order (STGO) and Special Order (SO) Vehicles
BD 87/05	Maintenance Painting of Steelwork

**STANDARDS - BRIDGES AND STRUCTURES (BD SERIES)**

BD 89/03	<del>The Conservation of Highway Structures</del>
BD 90/05	<del>Design of FRP Bridges and Highway Structures</del>
BD 91/04	<del>Unreinforced Masonry Arch Bridges</del>
BD 94/07	<del>Design of Minor Structures</del>
BD 95/07	<del>Treatment of Existing Structures on Highway widening Schemes</del>

**TECHNICAL MEMORANDA - BRIDGES (BE SERIES)**

BE 13	<del>Fatigue Risk in Bailey Bridges</del>
BE 23	<del>Shear Key Decks Amendment No. 1 to Annex</del>
BE 5/75	<del>Rules for the Design and Use of Freyssinet Concrete Hinges in Highway Structures</del>
BE 7/04	<del>Departmental Standard (Interim) Motorway Sign/Signal Gantries</del>

**INTERIM ADVICE NOTES (IAN)**

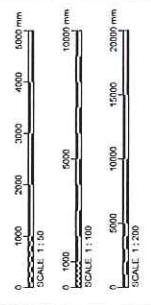
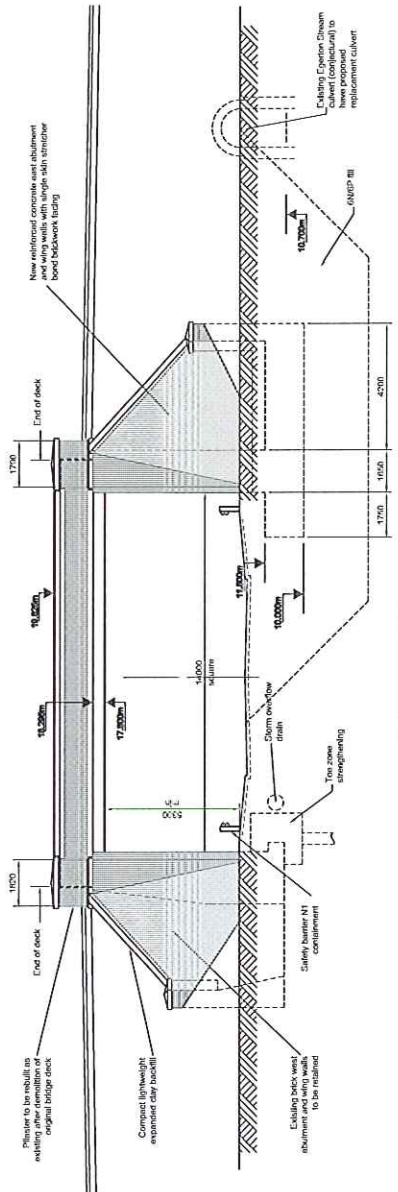
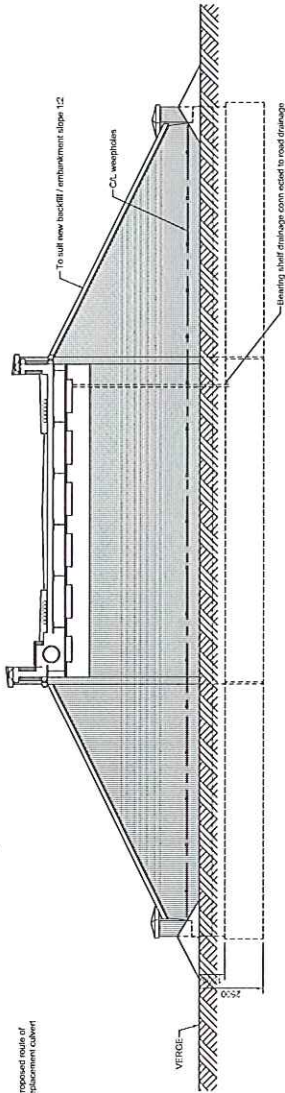
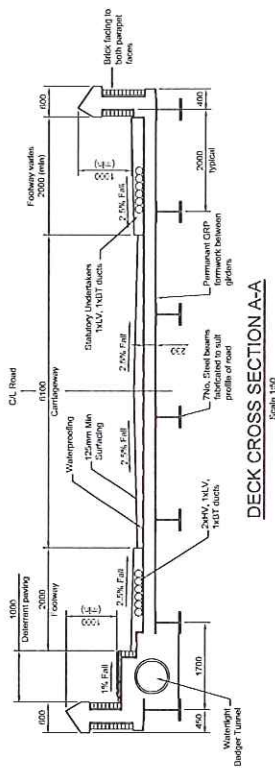
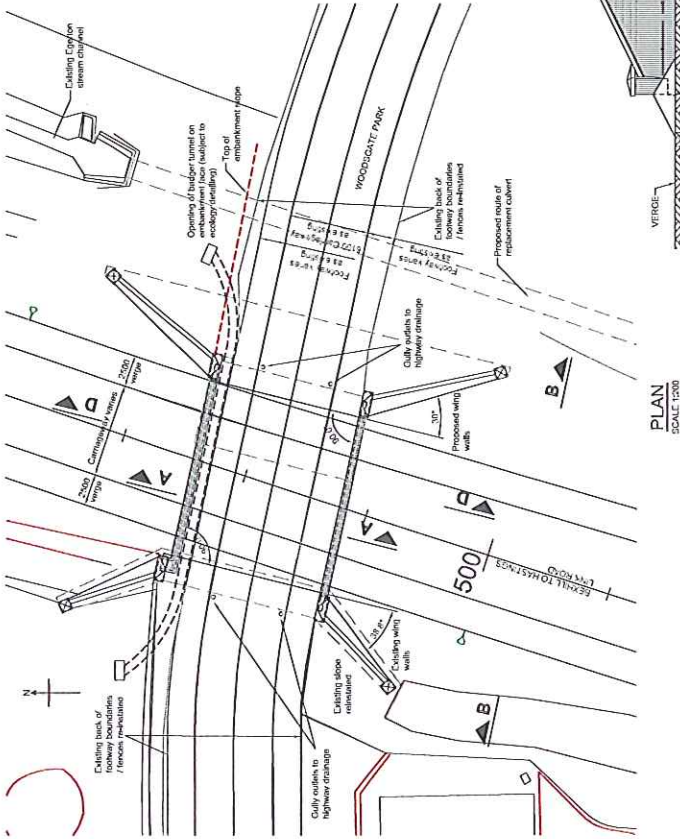
IAN 117/08 Rev 1	<del>Certification of combined kerb and drainage products</del>
IAN 116/08	<del>Nature conservation advice in relation to bats</del>
IAN 104/07	<del>The Anchorage of Reinforcement and Fixings in Hardened Concrete</del>
IAN 97/07	<del>Assessment and upgrading of existing parapets</del>
IAN 96/07r1	<del>Guidance on implementing Results of Research on Bridge Deck Waterproofing</del>
IAN 95/07	<del>Revised Guidance Regarding the Use of BS8500(2006) For the Design and Construction of Structures Using Concrete</del>
IAN 91/07	<del>Interim Advice on the identification of "Particularly at Risk" supports</del>
IAN 70/06	<del>Implementation of New Reinforcement Standards</del>
IAN 69/05	<del>Design for Maintenance</del>
IAN 48/03	<del>Measures To Minimise The Risk of Sulphate Attack (Including Thaumasite) - New Construction and Structures Under Construction</del>
IAN 47/02	<del>Post-Tensioned Grouted Duct concrete Bridges</del>
IAN 41/02	<del>European Cement Standards</del>
IAN 05/96	<del>BD 24/92 The Design of Concrete Highway Bridges and Structures. Use of BS 5400: Part 4:1990</del>
IAN 04/96	<del>BD 44/95 The Assessment of Concrete Highway Bridges and Structures</del>
IAN 03/96	<del>BA 50/93 Post-Tensioned concrete Bridges</del>

## Appendix B Drawings

Drawing No  
B1297000-PH2/1600.01a/9031

Title  
S03 Woodsgate Park overbridge  
AIP General Arrangement

**Notes**  
1. All dimensions in millimetres unless noted otherwise.  
2. All levels in metres A.O.D. (Above Ordnance Datum - Newlyn).



U	120622	120622	USA	18	18	18	18	18	18	18	18	18	18	18	18		
Year	Rev.	Date	Project / location		Sheet	Checked	Drawn	Issue	Author								
<b>JACOBS</b> A strategic business   Client & Contract Management   Construction   Environmental   Infrastructure   Professional Services   Risk Management   Technology   Utilities   Water													Client <b>HOCHTIEFVINCI JOINT VENTURE</b> EAST SUSSEX COUNTY COUNCIL BEXHILL TO HASTINGS LINK ROAD WoodsGate Park OVERBRIDGE GENERAL ARRANGEMENT			Drawing status <b>FOR APPROVAL</b>	Drawing number <b>B1297000-PHZ/1600.01A9031_0</b>
This drawing is not to be used in whole or part other than for the intended purpose and project as defined on this drawing. Refer to the contract for full terms and conditions.													Drawing issued by Jacobs				

## Appendix C Geotechnical Information

<b>STRUCTURE NAME</b>		<b>CHAINAGE and OS Grid Reference</b>		
S03 - Woodsgate Park Overbridge		Ch 520	OS: 573943E,108529N	
<b>Rev: 1</b>		<b>DESIGN LIFE: 120 years</b>		
<b>SOILS/GEOLOGY</b>		<b>RELEVANT TRIAL HOLES:</b>		
		BH1, BH2, BH3, BH4 (ESCC Investigation, 1992)		
<b>Strata</b>		<b>Typical depths</b>		
Made Ground Alluvium Tunbridge Wells Sand Formation		18.65 to 11.25m OD 11.25 to 8.75m OD Below 8.75m OD		
<b>PREVIOUS GROUND HISTORY</b>		Railway cutting, brownfield site		
<b>CONTAMINATED GROUND RISK ASSESSMENT REQUIRED</b>				TBC
<b>GROUNDWATER</b>				
Groundwater strike was recorded at 8.35m OD (10.30m bgl) in BH1 and BH2 within the Tunbridge Wells Sand Formation. In BH3 and BH4 groundwater strike was recorded at 11.20m OD (7.5m bgl) within the Alluvium layer. No rise was recorded in any of the boreholes. No monitoring results are available. Allowing for seasonal fluctuations, the preliminary design groundwater level is assumed to be at 10.20m OD (6.5m bgl).				
<b>EARTH PRESSURE VALUE <math>K_0^*</math> <math>K_a^*</math> <math>K_p^*</math></b>				
Refer to section 5.4 of the AIP.				
<b>TYPE OF FOUNDATION</b>		Spread footing for East Abutment. Toe strengthening works in the front of the existing West Abutment will be founded on piles.		
<b>BEARING CAPACITY</b>		Spread footing for East abutment.		
Structure Element	Founding Stratum	Founding Level (m OD)	Footing Size	Allowable Bearing Pressure (kN/m <sup>2</sup> )
East Abutment and wingwall	Fill (6N)	10.0	12.0 x 7.60m (abutment) 9.80 x 7.60 (wingwalls)	200

<b>PILE DESIGN:</b> Toe strengthening works in the front of the existing west abutment.					
Structure Element	Founding Stratum	Toe Level (mOD)	Pile dia (m)	Pile length (m)	Pile working Load (kN)
West abutment and wingwall	Tunbridge Wells Sand Formation	5.0	0.45	5.0	TBC
<p>Note: Pile lengths and toe levels are approximate – pile cap elevations to be confirmed.</p> <p>Pile type: CFA / Bored</p> <p>Criteria for selecting pile toe level: Pile capacity</p> <p>Allowance for negative skin friction within design:</p>					
<b>SETTLEMENT</b>					
Differential settlement to be allowed for between adjacent supports: 25mm					
Differential settlement to be allowed between structure and approach embankment: 20mm (within 10m of the interface between structures and approach embankment)					
<b>CHEMICAL ANALYSIS</b>					
<b>Buried Concrete classification:</b>					
The results of chemical tests on soil samples taken within the urban areas indicate pH values ranging between 3.68 and 10.5 and sulfates (2:1 Water Extract) values of between 10 mg/l and 1150 mg/l. The recommended Design Sulfate and Concrete Classification based on BRE Special Digest 1 (2005) are DS-2 and AC4z respectively.					

**NOTES**

1. Elevation was not shown on the borehole logs. The levels have been estimated from the ESCC long section drawing (No. 262701\090047 Fieldwork Location Plan and Geological Long Section Sheet 1 of 4).
2. The ground sequence at the site is Made Ground, Alluvium and Tunbridge Wells Sand. Based on the foundation level (10m OD), the structure is likely to be founded on the soft Alluvium. Made Ground and Alluvium are not recommended as a bearing stratum due to its unpredictable bearing behaviour and poses a risk of differential settlement taking place. The maximum thickness of Made Ground is 7.4m and the maximum thickness of Alluvium is 2.3m.
3. It is recommended that the foundations of the structure is founded on the Stiff to very stiff /very dense interbedded sands, silts and clays of the Tunbridge Wells Sand at a minimum level of 8.75m OD.
4. The soft Alluvium beneath the foundation will need to be excavated and replaced with suitable structural fill material. The depth of excavation is likely to be 1.5m below formation level. Due to likelihood of encountering groundwater, the recommended backfill material is Class 6A below groundwater level and Class 6N/6P above the groundwater level
5. The excavated foundation will need to be inspected for the presence of any widened fissures.

**EAST SUSSEX COUNTY COUNCIL**  
Highways & Transportation - Soils and Materials Group

Borehole No. BH1  
Job No. CW1257  
Sheet 1 of 2

Dates		Coordinates		Site		
13/01/92 - 14/01/92		E N		BEXHILL NORTHERN APPROACH ROAD		
Method		Ground Level		Client		
Shell & Auger.		mOD		DESIGN AND CONSTRUCTION		
Depth m	Sample/Test	Field Records	Level mOD	Depth m (Thick)	Description	Legend
				(0.50)	ROAD PAVEMENT CONSTRUCTION	
				0.50	Firm mottled brown/grey sandy clay with granite chips	
1.00 - 1.50	U 1 (26 BLOWS)			(0.30)		
1.00 - 1.50	J 2			0.80		
1.50 - 2.00	SPT N(0)	0,0/0,0,0,0				
1.50 - 2.00	SJ 3					
1.50 - 2.00	B 4					
2.50 - 3.00	U 5 (30 BLOWS)					
2.50 - 3.00	J 6					
3.00 - 3.50	SPT N(9)	1,1/2,2,2,3		(4.60)	Firm to stiff orange brown clayey silt with fragments of sandstone, siltstone, chalk and brick	
3.00 - 3.50	SJ 7					
3.00 - 3.50	B 8				(FILL)	
4.00 - 4.50	U 9 (44 BLOWS)					
4.00 - 4.50	J 10					
4.50 - 5.00	SPT N(8)	1,2/2,2,2,2				
4.50 - 5.00	SJ 11					
4.50 - 5.00	B 12					
		13/01/92:DRY				
		14/01/92:DRY				
5.50 - 6.00	U 13 (31 BLOWS)			5.40		
5.50 - 6.00	J 14					
6.00 - 6.50	SPT N(15)	1,2/3,3,4,5		(1.50)	Firm to stiff grey mottled black slightly organic silty clay with some flint pebbles and fragments of rotting wood	
6.00 - 6.50	SJ 15				(FILL)	
6.00 - 6.50	B 16					
7.00 - 7.50	U 17 (40 BLOWS)			6.90		
7.00 - 7.50	J 18					
7.50 - 8.00	SPT N(4)	1,1/1,1,1,1		(2.30)	Firm to stiff olive grey mottled black slightly organic silty CLAY with fragments of rotted wood and black amorphous silty PEAT layers	
7.50 - 8.00	SJ 19				(ALLUVIUM)	
7.50 - 8.00	B 20					
8.50 - 9.00	U 21 (14 BLOWS)					
8.50 - 9.00	J 22					
9.00 - 9.50	SPT N(40)	1,2/5,8,12,15		9.20		
9.00 - 9.50	SJ 23					
9.00 - 9.50	B 24					
9.50 - 10.00	U 25 (98 BLOWS)			(1.00)	Very stiff thickly laminated light grey SILT with occasional orange ironstaining	
9.50 - 10.00	J 26				(TUNBRIDGE WELLS SAND)	
10.00 - 10.50	U (FAILED)	NO PENETRATION				
Remarks Casing to 7.5m						Scale 1:50
						Logged by NAA



**EAST SUSSEX COUNTY COUNCIL**  
Highways & Transportation - Soils and Materials Group

Borehole No. BH1  
Job No. CW1257  
Sheet 2 of 2

Dates 13/01/92 - 14/01/92		Coordinates E N		Site BEKHILL NORTHERN APPROACH ROAD		
Method Shell & Auger.		Ground Level mOD		Client DESIGN AND CONSTRUCTION		
Depth m	Sample/Test	Field Records	Level mOD	Depth m (Thick)	Description	Legend
10.50 - 11.00 10.50 - 11.00 10.50 - 11.00	SJ 27 SPT N(420*) B 28	STRIKE at 10.3m 70,/,.,.,		10.20	(Continued)	***
				(2.30)	Very dense light grey fine SAND with clayey SILT laminations and occasional orange ironstaining	
12.00 - 12.50 12.00 - 12.50	SPT N(242*) SJ 29	40,30/,.,.,  14/01/92:10.0		12.50	(TUNBRIDGE WELLS SAND)	

Remarks Casing to 7.5m  
No penetration and no recovery from U100 at 10.0m  
SPT's at 10.5m and 12.0m failed to reach test depth

Scale 1:50  
Logged by NAA  
281092/1102

See key sheet for symbols and abbreviations

**EAST SUSSEX COUNTY COUNCIL**  
Highways & Transportation - Soils and Materials Group

Borehole No. **BH2**  
Job No. **CH1257**  
Sheet **1 of 2**

Dates		Coordinates			Site	
15/01/92 - 16/01/92		E N			BEXHILL NORTHERN APPROACH ROAD	
Method		Ground Level			Client	
Shell & Auger.		mOD			DESIGN AND CONSTRUCTION	
Depth m	Sample/Test	Field Records	Level mOD	Depth m (Thick)	Description	Legend
				(0.50)	ROAD PAVEMENT CONSTRUCTION	
				0.50	CHALK rubble with flints	
				(0.40)	(FILL)	
1.00 - 1.50 1.00 - 1.50	U 1 (34 BLOWS) J 2			0.90		
1.50 - 2.00 1.50 - 2.00 1.50 - 2.00	SPT N(6) SJ 3 B 4	2,2/2,2,1,1				
2.50 - 3.00 2.50 - 3.00	U 5 (34 BLOWS) J 6			(3.40)	Firm to stiff brown slightly clayey silt with siltstone fragments and orange ironstaining	
3.00 - 3.50 3.00 - 3.50 3.00 - 3.50	SPT N(14) SJ 7 B 8	2,2/3,3,4,4			(FILL)	
4.00 - 4.50 4.00 - 4.50	U 9 (39 BLOWS) J 10			4.30		
4.50 - 5.00 4.50 - 5.00	U 11 (73 BLOWS) J 12					
5.00 - 5.50 5.00 - 5.50 5.00 - 5.50	SPT N(12) SJ 13 B 14	2,3/3,2,4,3			Firm grey silty clay and silt with occasional brick fragments and orange ironstaining	
6.00 - 6.50 6.00 - 6.50	U 15 (43 BLOWS) J 16			(3.10)	(FILL)	
6.50 - 7.00 6.50 - 7.00 6.50 - 7.00	SPT N(9) SJ 17 B 18	2,1/3,1,2,3				
7.50 - 8.00 7.50 - 8.00	U 19 (16 BLOWS) J 20	15/01/92:DRY 16/01/92:DRY		7.40		
8.00 - 8.50 8.00 - 8.50 8.00 - 8.50	SPT N(2) SJ 21 B 22	0,1/0,1,0,1				
9.00 - 9.50 9.00 - 9.50	U 23 (54 BLOWS) J 24			(2.00)	Soft dark grey/black clayey organic SILT with decomposing wood and plant material	
					(ALLUVIUM)	
9.50 - 10.00 9.50 - 10.00	U 25 (149 BLOWS) J 26			9.40 (0.50)	Firm pale grey/brown clayey SILT	
Remarks Casing to 10.5m						Scale 1:50
						Logged by NAA
See key sheet for symbols and abbreviations						281092/1617

**EAST SUSSEX COUNTY COUNCIL**  
Highways & Transportation - Soils and Materials Group

Borehole No. **BH2**  
Job No. **CH1257**  
Sheet **2 of 2**

Dates 15/01/92 - 16/01/92		Coordinates E N		Site BEXHILL NORTHERN APPROACH ROAD		
Method Shell & Auger.		Ground Level mOD		Client DESIGN AND CONSTRUCTION		
Depth m	Sample/Test	Field Records	Level mOD	Depth m (Thick)	Description	Legend
10.50 - 11.00 10.50 - 11.00 10.50 - 11.00	SJ 27 SPT N(64*) B 28	STRIKE at 10.3m 19, 14/18, 25, 7,		(1.90)	(Continued)  Very dense light grey very fine SAND with occasional orange ironstaining  (TUNBRIDGE WELLS SAND)	
12.00 - 12.50 12.00 - 12.50	U 29 (161 BLOWS) J 30			11.80		
12.50 - 13.00 12.50 - 13.00 12.50 - 13.00	SPT N(58*) SJ 31 B 32	5, 5/12, 21, 17,		(2.70)	Very stiff grey clayey SILT with siltstone fragments  (TUNBRIDGE WELLS SAND)	
14.00 - 14.50 14.00 - 14.50 14.00 - 14.50	SPT N(173*) SJ 33 B 34	37, 17/,,,  16/01/92:10.8		14.50		

Remarks Casing to 10.5m  
SPT at 14.0m failed to reach test depth

Scale  
1:50

Logged  
by  
HAA

**EAST SUSSEX COUNTY COUNCIL**  
Highways & Transportation - Soils and Materials Group

Borehole No. **BH3**  
Job No. **CM1257**  
Sheet **1 of 2**

Dates		Coordinates			Site	
22/01/92 - 24/01/92		E N			BEXHILL NORTHERN APPROACH ROAD	
Method		Ground Level			Client	
Shell & Auger		mOD			DESIGN AND CONSTRUCTION	
Depth m	Sampl/Test	Field Records	Level mOD	Depth m (Thick)	Description	Legend
				(0.50)	ROAD PAVEMENT CONSTRUCTION	
				0.50		
				(0.40)	Firm brown silty clay with flints (FILL)	
1.00 - 1.50	U 1 (26 BLOWS)			0.90		
1.00 - 1.50	J 2					
1.50 - 2.00	SPT N(4)	1,1/1,1,1,1		(1.80)	Soft light grey slightly clayey silt with fragments of siltstone, flint and organic material and occasional orange ironstaining (FILL)	
1.50 - 2.00	SJ 3					
1.50 - 2.00	B 4					
2.50 - 3.00	U 5 (34 BLOWS)			2.70		
2.50 - 3.00	J 6					
3.00 - 3.50	SPT N(7)	3,2/1,2,3,1		(2.60)	Firm laminated mottled grey light grey/brown mudstone and silt with brick fragments and occasional orange ironstaining (FILL)	
3.00 - 3.50	SJ 7					
3.00 - 3.50	B 8					
4.00 - 4.50	U 9 (24 BLOWS)			5.30		
4.00 - 4.50	J 10					
4.50 - 5.00	SPT N(6)	2,1/2,1,2,1		(1.50)	Firm orange clayey silt and fine SAND with fragments of blast furnace slag (FILL)	
4.50 - 5.00	SJ 11					
4.50 - 5.00	B 12					
5.50 - 6.00	U 13 (19 BLOWS)			6.80		
5.50 - 6.00	J 14					
6.00 - 6.50	SPT N(7)	1,1/1,1,3,2		(1.60)	Very soft black/dark brown slightly fibrous clayey PEAT (ALLUVIUM)	
6.00 - 6.50	SJ 15					
6.00 - 6.50	B 16					
7.00 - 7.50	U 17 (29 BLOWS)			8.40		
7.00 - 7.50	J 18					
7.50 - 8.00	SPT N(0)	0,0/0,0,0,0				
7.50 - 8.00	SJ 19	STRIKE at 7.5m				
7.50 - 8.00	B 20					
		22/01/92:6.0				
		23/01/92:7.9				
8.50 - 9.00	U 21 (125 BLOWS)					
8.50 - 9.00	J 22					
9.00 - 9.50	SPT N(31)	4,6/8,9,6,8				
9.00 - 9.50	SJ 23					
9.00 - 9.50	B 24					
9.50 - 10.00	SPT N(9)	1,2/2,3,2,2				
9.50 - 10.00	SJ 25					
9.50 - 10.00	B 26					
10.00 - 10.50	U 27 (166 BLOWS)				Very stiff interbedded grey slightly clayey SILT and fine SAND (TUNBRIDGE WELLS SAND)	
Remarks Casing to 12.0m						Scale 1:50
						Logged by NAA

281092/1109

**EAST SUSSEX COUNTY COUNCIL**  
Highways & Transportation - Soils and Materials Group

Borehole No. BH3  
Job No. CH1257  
Sheet 2 of 2

Dates		Coordinates			Site	
22/01/92 - 24/01/92		E N			BEXHILL NORTHERN APPROACH ROAD	
Method		Ground Level			Client	
Shell & Auger.		mOD			DESIGN AND CONSTRUCTION	
Depth m	Sample/Test	Field Records	Level mOD	Depth m (Thick)	Description	Legend
10.00 - 10.50	J 28				(Continued)	
10.50 - 11.00	SPT N(32)	4,6/6,8,6,12				
10.50 - 11.00	SJ 29					
10.50 - 11.00	B 30					
11.00 - 11.50	SPT N(86*)	5,10/16,26,8,				
11.00 - 11.50	U 31 (163 BLOWS)					
11.00 - 11.50	J 32					
11.50 - 12.00	SJ 33					
11.50 - 12.00	B 34					
12.00 - 12.50	SPT N(185*)	10,16/34,,,				
12.00 - 12.50	SJ 35					
12.00 - 12.50	B 36					
12.50 - 13.00	SPT N(*)	20,30/,,,				
12.50 - 13.00	SJ 37			(B.60)		
12.50 - 13.00	B 38					
13.00 - 13.50	SPT N(*)	22,28/			Very stiff interbedded grey slightly clayey SILT and fine SAND	
13.00 - 13.50	SJ 39	23/01/92:8.0				
13.00 - 13.50	B 40					
13.50 - 14.00	SPT N(*)	24/01/92:8.0			(TUNBRIDGE WELLS SAND)	
13.50 - 14.00	SJ 41	22,28/,,,				
13.50 - 14.00	B 42					
14.00 - 14.50	SPT N(*)	28,22/,,,				
14.00 - 14.50	SJ 43					
14.00 - 14.50	B 44					
14.50 - 15.00	SPT N(50)	11,11/				
14.50 - 15.00	SJ 45	14,15,18,3				
14.50 - 15.00	B 46					
15.00 - 15.50	SPT N(70*)	10,18/				
15.00 - 15.50	SJ 47	18,22,10,				
15.00 - 15.50	B 48					
15.50 - 16.00	SPT N(75*)	12,15/18,27,5,				
15.50 - 16.00	SJ 49					
15.50 - 16.00	B 50					
16.00 - 16.50	SPT N(71*)	10,14/				
16.00 - 16.50	SJ 51	15,23,12,				
16.00 - 16.50	B 52					
16.50 - 17.00	SPT N(97*)	14,17/20,26,4,				
16.50 - 17.00	SJ 53					
16.50 - 17.00	B 54			17.00		
		24/01/92:8.0				
Remarks Casing to 12.0m SPT's at 12.5m, 13.0m, 13.5m and 14.0m failed to reach test depth						Scale 1:50
						Logged by HAA
See key sheet for symbols and abbreviations						281092/1110

**EAST SUSSEX COUNTY COUNCIL**  
Highways & Transportation - Soils and Materials Group

Borehole No. BH4  
Job No. CW1257  
Sheet 1 of 2

Dates		Coordinates		Site		
20/01/92 - 21/01/92		E N		BEXHILL NORTHERN APPROACH ROAD		
Method		Ground Level		Client		
Shell & Auger.		mOD		DESIGN AND CONSTRUCTION		
Depth m	Sample/Test	Field Records	Level mOD	Depth m (thick)	Description	Legend
				(0.30)	ROAD PAVEMENT CONSTRUCTION	
				0.30		
				(0.60)	Brick and flint fragments in silty clay matrix (FILL)	
				0.90		
1.00 - 1.50	U 1 (35 BLOWS)					
1.00 - 1.50	J 2					
1.50 - 2.00	SPT N(10)	1,1/2,2,3,3				
1.50 - 2.00	SJ 3					
1.50 - 2.00	B 4					
2.50 - 3.00	U 5 (44 BLOWS)					
2.50 - 3.00	J 6					
3.00 - 3.50	SPT N(10)	2,3/2,2,3,3				
3.00 - 3.50	SJ 7					
3.00 - 3.50	B 8					
4.00 - 4.50	U 9 (52 BLOWS)	0.2m RECOVERED		(6.00)	Firm light grey clayey silt with fragments of siltstone brick and flint with occasional orange ironstaining (FILL)	
4.00 - 4.50	J 10					
4.50 - 5.00	SPT N(11)	1,3/2,2,3,4				
4.50 - 5.00	SJ 11					
4.50 - 5.00	B 12					
5.50 - 6.00	U 13 (30 BLOWS)					
5.50 - 6.00	J 14					
6.00 - 6.50	SPT N(5)	1,1/1,1,2,1				
6.00 - 6.50	SJ 15					
6.00 - 6.50	B 16					
		20/01/92:DRY				
		21/01/92:DRY				
7.00 - 7.50	U 17 (30 BLOWS)			6.90		
7.00 - 7.50	J 18					
7.50 - 8.00	SPT N(4)	1,1/1,1,1,1				
7.50 - 8.00	SJ 19	STRIKE at 7.5m		(1.80)	Soft dark brown/black slightly fibrous silty PEAT with rotting wood (ALLUVIUM)	
7.50 - 8.00	B 20					
8.50 - 9.00	U 21 (40 BLOWS)			8.70		
8.50 - 9.00	J 22					
9.00 - 9.50	U 23 (136 BLOWS)			(0.70)	Stiff to very stiff light grey very silty CLAY with occasional orange ironstaining	
9.00 - 9.50	J 24					
9.50 - 10.00	SPT N(173*)	20,30/,,,		9.40		
9.50 - 10.00	SJ 25					
9.50 - 10.00	B 26					
Remarks: Casing to 9.0m SPT at 9.5m failed to reach test depth						Scale: 1:50
						Logged by: NAA
See key sheet for symbols and abbreviations						281092/1111

**EAST SUSSEX COUNTY COUNCIL**  
Highways & Transportation - Soils and Materials Group

Borehole No. **BH4**  
Job No. **CH1257**  
Sheet **2 of 2**

Dates 20/01/92 - 21/01/92		Coordinates E N			Site BEXHILL NORTHERN APPROACH ROAD	
Method Shell & Auger.		Ground Level mOD			Client DESIGN AND CONSTRUCTION	
Depth m	Sample/Test	Field Records	Level mOD	Depth m (Thick)	Description	Legend
11.00 - 11.50 11.00 - 11.50 11.00 - 11.50	SPT N(50) SJ 27 B 28	6, 8/ 12, 14, 14, 10			(Continued)	
12.50 - 13.00 12.50 - 13.00 12.50 - 13.00	SPT N(150*) SJ 29 B 30	10, 40, ...		(5.10)	Interbedded very stiff light grey slightly clayey SILT and very dense light grey fine SAND with siltstone fragments  (TUNBRIDGE WELLS SAND)	
14.00 - 14.50 14.00 - 14.50 14.00 - 14.50	SPT N(300*) SJ 31 B 32	50, /, ...  21/01/92:10.0		14.50		

Remarks Casing to 9.0m  
SPT's at 12.5m and 14.0m failed to reach test depth

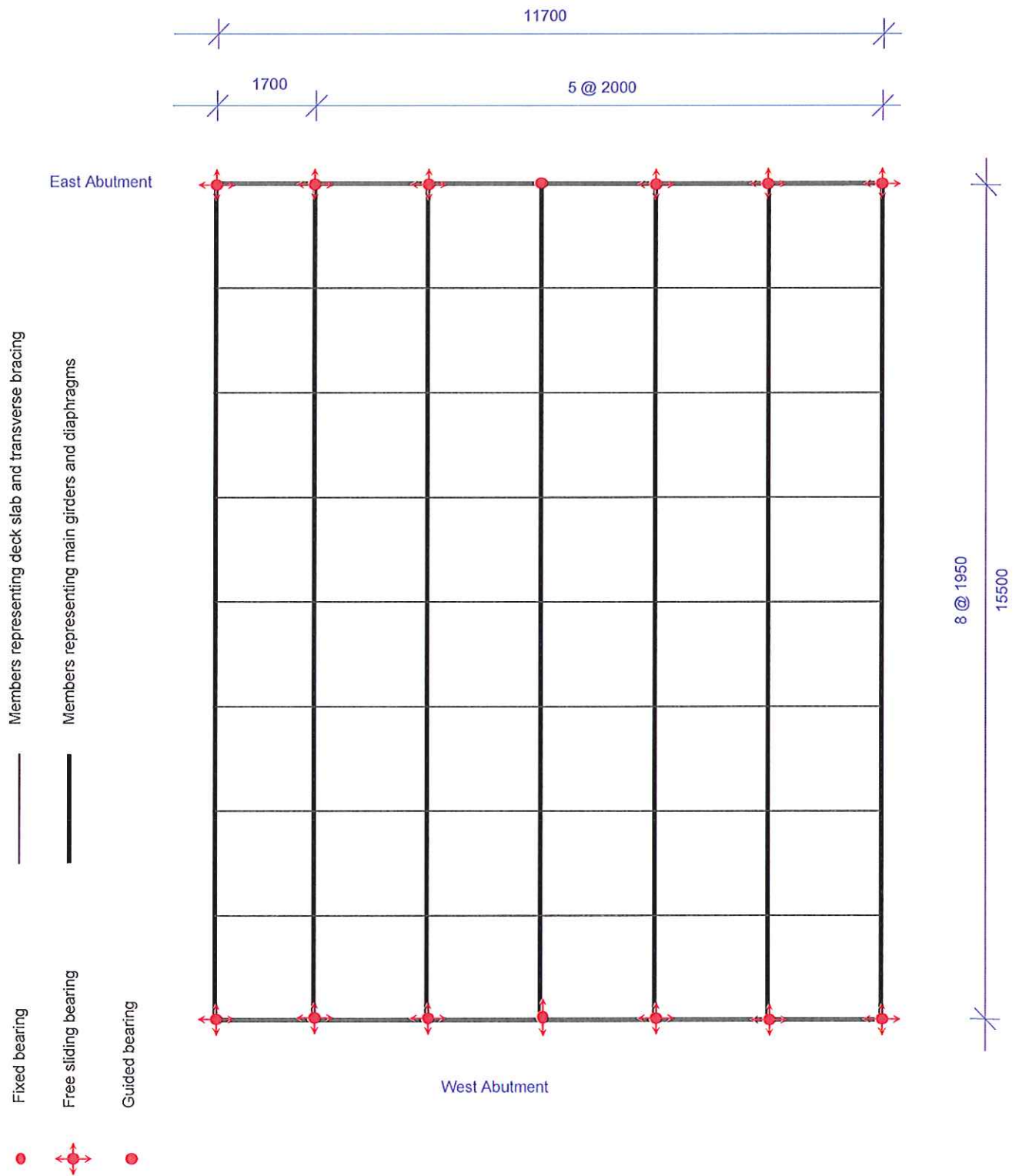
Scale  
1:50

Logged by  
NAA

281092/1112

See key sheet for symbols and abbreviations

# Appendix D Idealised Structure





## Appendix E Departures from Standards

### Departure D3: Verges over/under Structures

#### Nature of Departure

A standard verge width of 2.5m has been applied along the scheme mainline. Where the mainline crosses over an underbridge, or under an overbridge, it has been decided to reduce the verge width to provide associated cost savings on structure construction. Verge widths will also be reduced on sideroads and accommodation works structures. The verges will be reduced to the minimum allowed, while ensuring necessary Stopping Sight Distance is maintained. The verge width will be tapered to the reduced width over an acceptable distance. Where verge widening has been provided around bends to maintain SSD these verges will not be minimised.

#### Reason for Departure

This departure is sought to minimise construction costs for the structures by minimising the necessary deck width. This departure is requested as the DMRB Standards require the verge width to be continuous and maintained over/under all structures. This leads to excessive structure widths which are uneconomical.

#### Mitigation Factors

There are no pedestrian facilities over any of the mainline structures so verge reduction will not impact NMUs in the majority of cases. On the accommodation overbridges, there will only be a minor usage, and the likelihood of NMUs coming into conflict with farm vehicles is minimal. In addition, these departures are only requested over short distances over/under structures.

#### Implications for Safety

Though a reduced verge width will mean vehicles running closer to either the abutments or parapets, a safe minimum required width will be provided. Where deemed necessary as a result of the RRRAP assessment, vehicle barriers will be installed to reroute any errant vehicles away from the parapets or abutments.

