New Tyne Tunnel – Structures

1. Existing structures possibly affected by the works – All ownership of structures is to be confirmed

Ref	Name of structure / Location	Ownership / Maintenance	Description	Highway loading	Information available	Effect of works on structure	AIP
E1a	Metro Bridge over A19 (North Side)	NEXUS	Steel through plate girder. 2 spans		No information	Impact protection to existing columns will be required, since carriageway beneath may need to be wider than at present, and the existing columns are not strong enough to resist impact.	
E1	Riverside railway bridge over A19 Used for pedestrians/cyclists	NTMBC	Steel through plate girder. 2 spans		Drawings obtained from NTMBC	Forms part of the national cycle network. It is used for occasional vehicle access. Impact protection to existing columns will be required, since carriageway beneath will be wider than at present, and the existing columns are not strong enough to resist impact.	
E2	South approach retaining walls – open cut	TT	Possibly cantilever walls or trough structure		No structural drawings found with TT or STMBC	Parts of the **side walls** will be **demolished** to accommodate the widened approach carriageway. Part of the open cut will be covered over. Cut and cover tunnel will be constructed behind existing wall.	
E3	South approach retaining walls – sun visor	TT	Precast props across retained cut on north side		North side (only) sun visor drawings from TT.	The sun visor at the south approach may act as a prop to the cut retaining walls. Assume that the structure is similar to the north approach sun visor. The sun visor structure will be covered over. See proposed new structure P4	
E4	St Paul's Bridge. (Howard Street)	STMBC	RC slab single span. Pinned portal. Founded on piles		Drawings obtained from STMBC	**To be demolished and replaced** for widening of cutting. See proposed structure P5. **Note hinges at base of abutments therefore restraint to be provided during demolition.**	
E5	Mineral line railway bridge. Over tunnel roundabout	Bridge ownership in dispute between Railtrack and Shell. Shell maintain tracks etc.	RC box girder.6 spans 1300 dia columns.		Drawings obtained from STMBC.	Appears to be in good condition. The new slip roads to replace the roundabout will be threaded between the piers of the bridge. The columns have been checked for vehicle collision impact loads. No impact protection is required. Effect of loading ground adjacent to columns should be assessed	

E6	Metro bridge (South side) over A19	NEXUS	Steel through plate girder. 2 spans		No information available from NEXUS or Railtrack similar to N1	Impact protection to columns will be required. An additional lane on the A19 may be fitted in below the bridge. by narrowing of footway. Modifications to the north east wingwall to suit the new alignment will be required.	
E7 E8 E9	Tunnel roundabout structures. Southern half of tunnel roundabout carriageway is on structures	STMBC	3 types of structure RC slabs on piles Raft structure Composite deck	HA + HB	Drawings obtained from STMBC.STMBC inspection reports when published (Spring 2000)	Inspection and assessment being carried out by S Tyneside. Water ingress at movement joints has caused damage to structure. Further investigation of state of concrete required. Assessment report is being produced. These will need to be modified/extended to support the new road arrangement.	
E10	River Don A185 Viaduct	STMBC	RC slab /Composite deck. 9 spans. Simply supported.	HA + HB	Drawings obtained from STMBC	This will need to be modified to accommodate the new alignment, with the north end span being widened.	
E11	River Don culvert under Metro line	NEXUS	Twin bore concrete culvert		Drawings obtained from STMBC	Options will not affect structure.	
E12	Bilton Hall Bridge	Autolink	3 span precast concrete beams.	HA + 22 units HB	Drawings and assessment / inspection reports obtained from AUTO	Structure damaged by fire in 1993 and 1998. Extensive investigation and subsequently repairs carried out. The structure may be required to accommodate an additional lane of the A19.	
E13	Piled carriageway – A19 southern approaches to tunnel roundabout	Autolink	RC slabs on piles		Drawings obtained from AUTO	The A19 carriage way between the Tunnel roundabout and Bilton Hall Bridge is founded on small diameter piles.	

Maintenance / Ownership authorities

STMBC	**- South Tyneside Metropolitan Borough Council**
NTMBC	**- North Tyneside Metropolitan Borough Council**
NEXUS	**- Tyne and Wear Metro authority**
AUTO	**- Autolink A19 DBFO Maintaining authority**
RAIL	**- Railtrack**
TT	**- Tyne Tunnels (PTA)**
SHELL	**- Shell UK Jarrow Terminal**

2. Proposed new structures

Ref	Name / location of structure	Illustrative Description of proposed structure	Method of construction	AIP
P1	Not used			
P2a P2 b P2c	North approach retained open cut.	Secant piled wall as continuation of cut and cover section. Permanent propping may be included where clearances to carriageway permit.	Cutting will pass very close to realigned Howdon by-pass. The difference in levels will require a high retaining structure. One carriageway of the by pass will have to be closed during construction. Substation for tunnel plant will be incorporated in a recess in this wall. The crossover over the existing tunnel is a shallow cut which, with L shaped walls.	
P3	Not used			
P4	South approach retaining wall modifications.	Part of existing open cut will be roofed over. New sun visor structure may be required.	Precast units placed on existing walls. New lengths of wall to replace existing sections which have to be demolished will be required.	
P5	Replacement for St Paul's Bridge. (Howard Street diversion)	Single square span continuous highway bridge with 2 metre footpaths each side.	Bridge will be supported on the cut and cover tunnel on one side and a new abutment behind the existing wall on the other. See existing structure E4.	
P6	South approach loop access bridge.	Four span three lane highway bridge. Grade separated carriageway.	The new bridge will span across the existing tunnel access and south side inspection area. It will serve as access the tunnel from Howard Street and access to Howard Street area from A19 Northbound.	

P7 P8	Retaining walls to retain Epinoy Walk and Mineral line Railway embankment for southern approach loop	Movements to be limited to minimise effect on railway embankment and houses.	Retaining walls may be up to 6.5m high. Movement of rail embankment to be minimised.
P9	Retaining wall / Wing wall associated with existing bridge E9	Wing wall renewal / modifications to retain metro embankment adjacent to existing structure E9. Movements to be limited to minimise effect on railway embankment.	Retaining walls may be up to 5m high. Movement of rail embankment to be minimised.
P1 0 P1 1 P1 2	New piled stretches of carriageway at tunnel roundabout	New highway piled structure for southern approach / A185 roundabout associated with existing E7, E8 and E9.	Piled structures, including short span bridges spanning over existing services, modification to existing piled structures, and widening of end of existing River Don Bridge.