
PEDESTRIAN HEART GAS MAIN

Background Information

1. The Pedestrian Heart is an ambitious town centre redesign project with the main elements of the project being:
 - Re-organisation of traffic management throughout all of the town centre:
 - Widening and reconfiguring parts of the inner ring road and roundabout:
 - Re-routing Darlington's bus services and relocating town centre bus stops:
 - Re-designing and re-engineering the historic core of the town centre with significant changes to levels (going from three levels to two levels):
 - Architectural designed repaving for most of the other primary shopping streets in the town centre.
2. In order to deliver the project the Council appointed consultants to devise the plan to re-organise the traffic, including buses (Sir Colin Buchanan and Partners and subsequently Faber Maunsell) and a lead consultant to design and administer the re-design, re-engineering and repaving of the town centre (Gillespies – lead consultant, architects with Faber Maunsell, consulting engineers; Kinslers, quantity surveyors and Equation for lighting). The Council has had a client team in place from 2002 to oversee the project, develop the necessary briefs and organise the tendering and ordering of work (when appropriate). A summary of the organisations and responsibilities will be found at the end of this report before the appendices.
3. As is the case with other town centres that have been in existence for many years there is a myriad of underground services, both live and redundant within the ground, other underground structures and the possibility of archaeology. There are plans attached to this report that show the complexity of the services.
4. The Council and the Regional Development Agency, ONE, are the joint funders of the project.
5. The design consultants were appointed in 2003 in accord with their submitted tender and the Council and ONE brief (appended 001). During confirmation of their appointment in October 2003 Gillespies' appointment was extended to include for contract administration and completion of design services. Subsequent to this original appointment their role was extended to include contract project manager of the construction works, this became necessary when the New Engineering Contract was chosen for the main works.
6. The construction works are being undertaken under the terms of a New Engineering Contract (Option D). The NEC forms of contract are very different to the old types of engineering contract and are designed to focus on partnership working to deliver a project rather than contracts based almost entirely on giving instruction (and claims). Of course

instructions are still given and the contractor has to be supplied with the information necessary to construct the works. Option D does have Bills of Quantities that are primarily used to compare tenders, once the contractor has been appointed the contract moves to a target cost and the contractor gets paid based on the actual costs incurred.

7. For the purposes of gas main review the form of construction contract is of limited concern but the NEC contract does bring the contractor onto the team at a stage before the final design has been completed. It is considered that by doing so the contractor can add their expertise with the aim of ensuring that the most cost effective way of undertaking the works is agreed. This is referred to as early contractor involvement (ECI).

Information and Analysis

8. The following table summarises the timetable for the processes of appointing the design consultant and the contractor.

Date	Process	Doc Ref
mid June 2003	Advertise for Expressions of Interest (EoI) for design consultant	appended 002
7 July 2003	EoI returned	
21 July 2003	Tender Panel select shortlist. DBC Brief provided to all the short-listed consultants	Min TP/22/Ju/03
5 Sept 2003	Selected tenderers interviewed	
16 Sept 2003	Tender Panel accept tender from Gillespies	Min TP45/Sep/03
9 June 2004	Official Journal of the European Union contract notice inviting EoI for the works contract	
20 July 2004	Tender Panel open EoI	Min TP29/Aug/04
26 August 2004	Tender Panel select shortlist for works tender	
20 June 2005	Tender Panel open tenders for works contract	
12 July 2005	Tender Panel accept tender from Birse Civils Limited for the main works contract	Min TP16/Jul/05

9. The following section of this report identifies references to underground services and surveys taken from relevant Minutes, contract documents, reports and correspondence. The review of the documentation has been time consuming and whilst everything that is relevant is believed to have been reviewed there cannot, at this stage, be a guarantee that nothing has been missed. There is further work to do to ensure that nothing has been missed.
10. The relevant parts of the documents have been abstracted (and where appropriate the full documents) and are appended to this report.
11. The designer of any works that are going to involve underground work requires information from the utility companies and there is a statutory process that requires the utilities to provide the information requested. The vast majority of projects go no further than this when assessing underground services. For a small minority of projects non-intrusive surveys will be commissioned using technology such as ground penetrating radar. Gillespies and Birse used both methods to obtain information to help inform the design process and to

assist the contractor. Finally there is a third method that is rarely used for projects and that is to do trial trenches, these are rarely used as they are disruptive and the information obtained from them is only as good as to what can be seen in the hole.

12. In the weeks following the discovery of the gas main the focus of all involved was to identify a solution to the problem, establish the likely implications for the programme and to get an estimate of likely costs and as a result the information so far presented to Members has been based on the recollections of people involved in the project. It was not possible to undertake a review of all the records and documents, which has been time consuming and has involved not just the Council but the consultants and the contractor, prior to earlier reports. The recollections of people are not the same as is recorded in minutes and documents. This report sets out the information taken from records and not the recollection of people.
13. The review of the documentation has shown that trial trenches and trial holes are referred to and the terms have been used in an interchangeable manner. Trial trenches would normally describe an investigative hole to locate services across a wide width. Trial holes would normally describe the need for a specific location to be excavated for a variety of purposes including for ground investigation purposes (this was the case in the town centre where, for example, holes were needed to establish the bearing strength of the subsoil referred to later as CBR – California Bearing Ratio). Trial holes were also required at some specific locations in the town centre where new street furniture and signs were proposed.
14. There are standard clauses in the Bills of Quantities referring to the precautions that Birse CL would need to adopt when undertaking work underground (**see appendix docs 003a and b**). It is not clear how relevant these clauses are in the light of survey information that was supplied to Birse CL and this is an area that would require more work before being able to come to any conclusions.
15. A topographical and underground services survey was commissioned by Gillespies from Aedas Land Surveying, Aedas appointed 40Seven Ltd to do the underground survey work and 40Seven Ltd are attending the meeting of the Review Group to give a presentation and on site demonstration of the current technology used for underground survey. The survey results are available as three plans and are **attached**.
16. The table below summarises survey and other information relating to the gas main and other utility services.

Date	Summary	Doc Ref No
29 Aug 2003	Tender of Gillespies page 14 Cost Control states ‘Costs can be seriously affected by the following broad elements which will be recognised during the design process:- Unknown risks, underground services mains, etc.’	appended 004
9 Oct 2003	Gillespies brief for mapping and utility survey issued and required for the central area, including Prospect Place, Prebend Row, High Row and West Row, a detailed survey. The detailed survey to include: ‘Depth of each utility, sewer and service (<i>sic</i>) water drain.’	appended 005

Date	Summary	Doc Ref No
10 Oct 2003	Letter from Gillespies to Transco asking for 'all relevant information that you have on service provision, with details of location in plan form and any information that you may have on service depths'.	appended 006
8 Jan 2004	Minute from progress meeting; '1.7 TW explained that survey company Aedas, were much cheaper than other quotes but seemed thorough and suitable to appoint' 1.8 HA agreed, Gillespies should proceed and appoint Aedas to conduct survey.....'	appended 006a
12 Jan 2004	Letter from Gillespies appointing Aedas Land Surveying to undertake mapping and utilities survey referring to Gillespies specification dated 9 October 2003.	appended 007
15 Mar 2004	E-mail from Aedas stating: 'Where depths have been possible and we are confident to report them, depths have been shown.' <i>[Note the 12 inch gas main did not have a depth and is recorded on the Aedas survey plan as being 'taken from records'.]</i>	appended 008
8 April 2004	Minute from progress meeting; report from Gillespies 'Revised Topo/services survey received. Only minor info required on Services depths.'	appended 009
12 Jan 2005	Minute from pre tender meeting with Birse Civils Ltd; report from Gillespies 'advised that non-intrusive survey completed re stats <i>[statutory undertakers]</i> and that any related costs re: movement etc. must be contained £6million scheme budget'. 'Trial holes would be completed as part of the ECI as would full site survey...'	appended 010
18 Jan 2005	Notes from pre tender ECI workshops identified six key risks including: a) Costs and delays of stats. Minimise risk and uncertainty (<i>of stats</i>) by <ul style="list-style-type: none"> • Trials trenches to establish service locations/conditions as far as possible' 	appended 011
20 Jan 2005	Minute from progress meeting; report from Gillespies 'During 3 month ECI the stat service location and condition of the pipes is critical as could result in delays and increased costs once on site.'	appended 012

Date	Summary	Doc Ref No
	Action: Gillespies to arrange tarmac cores and enquire re: service location.	
17 Feb 2005	Minute from progress meeting: Last meeting action 'AG [Gillespies] advised trial trench (Prospect Place, Tubwell Row, Blackwellgate) locations to be determined (from AEDAS survey & utility companies plans) and carried out to provide guide/locate significant services. Further survey work to be completed through ECI.'	appended 013
17 Feb 2005	Minute from progress meeting: 'AG [Gillespies] advised C3 notices to be issued to stat undertakers (C3 is an approximate quote for stat diversions which will result in a quicker response and as such be included within the tender. A C4 notice is a more detailed response which takes longer to process).'	appended 013
13 April 2005	Transco identify need to divert small section of 300mm diameter ductile iron gas pipe close to Binns but did not identify any other issues and specifically the need to divert or renew the 12inch Gas main.	appended 014
21 April 2005	Minute from progress meeting; 'C3 responses – approximately ½ of the C3 notices returned with most advising there is no issue. Transco have previously advised (as part of the statutory process in Planning) that they have no issues, however, Gillespies have just received notification of a requirement for a diversion in the Blackwellgate area (costing approx. £18,000). Action: AG to progress remainder of notices	appended 015
21 April 2005	Minute from progress meeting; ' Statutory Services – Team discussed options for statutory services. Need to hold meetings with them to ensure no major delays/costs associated with works on site. Action: Gillespies to set up a programme of meetings ahead of contractor selection. Minute then goes on to state; 'Agreed would form part of the ECI process with main discussions between contractor and service provider.' Gillespies advise that this has happened.	appended 015

Gillespies have supplied the following information but it has not been possible in the time available to include copies of all the source documents with this report.

Date	Summary	Doc Ref No
16 June 2005	Birse quality submission risk register Item 1; 'Action to Reduce Risk Rating – During ECI period meet stats, carry out Ground Penetrating Radar survey and dig trial holes to identify'	
19 July 2005	Email from Birse to Gillespies asks when information will be available; 'stats drawings for advanced trial hole works' Gillespies confirm that the drawing would be handed over at Team building workshop.	appended 015a
25 July 2005	Team building workshop attended by DBC, Birse and consultant team Report Risk item 13; 'Uncharted services Mitigation/Action – Early trial holes – review of radar survey.'	appended 015b
5 August 2005	Action Log Item 26; 'Trial Holes' Action 'Birse to progress' Gillespies issued this action log on 9 th of August 2005 and have subsequently reissued the logs through out August 2005 and beyond.	Abstracts of the log are below
18 August 2005	Progress meeting minute; 'Trial Trenches – refer action Action- Birse to progress as part of signage services work.	appended 015c
2 September 2005	Birse Risk Register identifies; 'Poor/unforeseen ground conditions' and 'Uncharted services' Comment/Action; 'Early trial holes and CBRs' and Early Trial Holes- review of radar survey.'	
5 September 2005	Action Log Item 20 'Trial Holes' progress update; 'GD (of Birse) has confirmed that trial holes have started at signage works and temporary works locations. More extensive works in core area to be carried out once traffic removed from centre of town. HA (of DBC) to enter works into street works register' This action register was updated routinely including on 5 th of October 2005.	Abstracts of the log are copied below

The following are the relevant abstracts from the Action Register

Strategic Project Management						Issued: 5th September 2005
Pedestrian Heart Action Register - Open						
Project Name						
Status						
R - Red Urgent action to be carried out immediately						
A - Amber Action to be carried out ASAP but not urgent						
G - Green Ongoing actions						
C - Closed Action resolved and to be moved to the 'closed log'						
Ref No	Date Raised	Action Description	Action Owner	Target Date	Action Status	Progress Update
20		Trial holes.	TB (Birse)		AMBER	GD has confirmed that trial holes have started at signage and temporary works locations. More extensive works in core to be carried out once traffic removed from centre of town. HA to enter dates into the street works register.

Strategic Project Management						Issued: 5th October 2005
Pedestrian Heart Action Register - Open						
Project Name						
Status						
R - Red Urgent action to be carried out immediately						
A - Amber Action to be carried out ASAP but not urgent						
G - Green Ongoing actions						
C - Closed Action resolved and to be moved to the 'closed log'						
Ref No	Date Raised	Action Description	Action Owner	Target Date	Action Status	Progress Update
20		Trial holes.	TB		RED	GD has confirmed that trial holes have started at signage and temporary works locations. More extensive works in core will be carried out now traffic has been removed from centre of town. Fabers to advise where CBR trial holes should be made (especially at Blackwellgate and Bondgate) and HA to enter dates into the street works register.

17. What is clear from the review of documents is that there were decisions taken to dig trial trenches and trial holes. It is clear that the design and construction team fully understood that attempting to establish the depth of services was considered crucial. However neither surveys nor any other investigation identified the depth of the 12 inch gas main that was too shallow or in a different location and it has had to be diverted.
18. Gillespies identified in early 2005 the need to have trial trenches, specific locations were referred to (Prospect Place, Tubwell Row and Blackwellgate). A quote for trial trenches was obtained but due to what was considered to be a high cost it was decided to wait until the ECI period. Gillespies placed an action on Birse to carry out trial holes, especially in the core area when traffic had been removed. Birse were aware from the start of their involvement and through their Quality Submission Risk Register component of the contract that site investigations to try to confirm services locations and depth should be carried out.
19. The next stage of events is perhaps better known. On the 31 January 2006 a 12 inch cast iron gas main (that was installed by the Council in 1900) was hit by a mechanical excavator, the pipe being unexpectedly part embedded in the concrete foundations of the road (that was part of the A1 prior to the motorway being opened).
20. The gas supply owners have changed in recent times and the gas distribution network in the north has been sold from Transco to Northern Gas Networks (NGN) who employ United Utilities (UU) to manage the network and who then employ Balfour Beatty to undertake major works on the network.
21. A meeting with United Utilities on 10 February was held to explore options for a solution to the problem created by the pipe being very shallow. UU strongly suggested that the design of the pedestrian heart works be redesigned rather than divert the gas pipe. This was explored and Gillespies advised that re-design of the paving works would be extensive and require drainage to be introduced near to buildings with backfalls from buildings with significant cost implications. Subsequently it was also found that in any event the 12 inch gas pipe was not in the location under West Row as shown on plans and would have been an obstruction to the planters and water feature on High Row. Given that the pipe would need to be replaced within 25 years and it is expected that the current pedestrian heart works will have a life of around 100 years it was clear that diverting and replacing the pipe was the best option.
22. At the meeting (minute of meeting **appended doc 016**) it was established that:
 - The pipe had a very low risk score and would not be replaced for 24/25 years:
 - The pipe must be replaced with a same diameter polyethylene pipe:
 - That NGN/UU would not be able to contribute to the cost as the replacement was so far outside the current five year programme.
23. With a great deal of co-operation from United Utilities and Balfour Beatty and many ideas for streamlining the work from everyone involved a major diversion that would normally take at least six months to design and complete was designed and finished in just 3½ months.

24. However even completing the work in an accelerated period of time has caused significant delay to the pedestrian heart works as the gas main impacted on key parts of the programme of works on the critical path.
25. The full cost of the diversion is not yet known but the pipe diversion has been completed in line with the cost that was projected when Council approved the funding for the work. It must be remembered that the cost of diverting the 12 inch gas pipe has been unavoidable, if the depth of the pipe had been identified earlier there would have been a very large cost to divert it, almost certainly greater than the cost with having a civil engineering contractor already on site. Note the cost of diverting just ten metres of the ductile iron pipe in front of Binns (referred to earlier) was £18,200. It is likely that the cost of diverting the gas main ahead of the main programme would have been in the order of £500,000.

Legal Implications

26. This report has been considered by the Legal Services Manager for legal implications in accordance with the Council's approved procedures. In his view Members ought to be aware of the current on going legal relationship between the Council and some of the parties and the possibility that there may be litigation in regard to the subject matter of the review at some point in the future.

Section 17 of the Crime and Disorder Act 1998

27. The contents of this report have been considered in the context of the requirements placed on the Council by Section 17 of the Crime and Disorder Act 1998, namely, the duty on the Council to exercise its functions with due regard to the likely effect of the exercise of those functions on, and the need to do all that it reasonably can to prevent, crime and disorder in its area. It is not considered that the contents of this report have any such effect.

Conclusion

28. This report provides information relevant to the gas main that is based on factual recorded records and documents to assist the Members of the review.

John Buxton
Director of Development and Environment

Background Papers

All the papers used to inform the report are attached.

John Buxton : Extension 2501
jdb/pw

Pedestrian Heart Organisations and Responsibilities

Summary

Sponsor/Client

Darlington Borough Council

Inner Ring Road

Design: Faber Maunsell and Gillespies (landscaping)

Works: Hall Construction Ltd

Town Centre

Traffic changes

Design: Faber Maunsell

Works: Birse Civils Ltd

Core Works

Design and Lead Consultant: Gillespies

Engineers: Faber Maunsell

Quantity Surveyors: Kinsler & Partners

Public Lighting: Equation

Works: Birse CL

Responsibilities

Core Works

Sponsor/Client:

Responsibility:

1. To ensure the project meets the aspirations of the brief
2. To lead co-ordination and ensure liaison on all matters relating to funding
3. Overall control of the public realm project
4. To advise on future developments within the town centre

Design:

Responsibility:

To provide a complete Urban Design service embracing all aspects of the skills to be considered that include:

1. All aspects of Urban Design process
2. Landscaping
3. Engineering services – all aspects
4. Management of the design process
5. Traffic and transport design services
6. Public lighting design
7. Appointment of artist(s) for public art elements

8. Consultation: both consultation with individual property occupiers on their servicing and other needs; and general consultation with the public and other interest groups
9. Quantity surveying services
10. Project control/administration
11. Production information, Bills of Quantities, Tender Action and Contract Preparation
12. Appointment of other consultants [if and when required]
13. Site supervision/contract administration

Works:

Responsibility:

As New Engineering Contract