Owen Street Relief Road

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BAM Nuttall Ltd
Design/Construct Contractor
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Tipton

A town that had a Problem
The Solution
Former policeman identified congestion problem back in 1940s

Reg had his tunnel vision 60 years ago

A former Tipton police officer whose job was to write reports on accident blackspots said he first asked for a tunnel to be built in Owen Street 60 years ago.

Motorists have to stop and wait at a level crossing there for long periods when barriers go down as more than one train goes by. A tunnel is currently under construction to alleviate the problem.

Reginald Till, now 84, of Branch Urban Centre, Tipton, said: "I am 84 now but I was in the police force when the blackspot was put on the map. In those days there would have been a road like this running under the railway embankment with a tunnel under it. From A to B, no idea what was there until it was opened.

"In those days we used to have to put up with the noise and the fumes from the trains passing by, but now it is all quiet and peaceful."
OWEN STREET, TIPTON - CLOSURE OF LEVEL CROSSING
Based on original prepared for others investigating level crossing closure
Eastern Approach and Casting basin
Western Approach
Parties and Stakeholders

• Employer – Sandwell Borough Council
  – Employer’s Representative – Mott MacDonald

• Contractor – BAM Nuttall Ltd
  – Designer – Halcrow

• Secondary Funder and principle TAA – Network Rail

• Other Stakeholders
  – British Waterways, Centro, London Midland, Utilities
Contract Particulars

- ECC2, Option A – Lump Sum Price with Activity Schedule
- £18m contract
- 131 week programme, commenced August 2007
- Multi-disciplinary project involving
  - 350m highways
  - 5no major Structures
  - Retaining walls – Auger bored piling
  - Rail works – Track, S & T, OHLE
  - Mine workings
  - Geotechnical works – tension piles, PCCD piles
  - Earthworks – 50,000cu.m.
    - Contaminated ground to licensed tip
    - Inert/non-contaminated ground to Tibbington
- Design Interface with 7 designers
Phase 1 – Enabling Works

• Watery Lane Bridge
• New commuter car park
• High Pressure gas main diversion
• 1800mm dia sewer diversion

Plus SI works and Design
Watery Lane
New car park
Phase 2 – The main works

- Piling works for approach ramp walls
- Casting basin
- Jacking Base
- Underbridge structure
- Western Approach works (Reception pit)
- Rail works (OHLE and S and T)
- Preparations for the box jack
• Commencement July 2008 with Rail possessions

• Must be complete by 9th April 2009
Piling Works

Entry portal piles
Piling
Casting basin
Casting basin
Casting Base
Casting Base

[Image of a construction site with machinery and workers]
Jacking base
Jacking base

Casting bed ropes
Jacking base
Jacking base
Underbridge Structure

- 54m long x 15m wide x 9m high
- 2,130m³ or 5,500t
- High accuracy on the sides
- Various cast in items for jacking operation
  - Network of pipes for lubrication and grouting
  - Macalloy bars
  - Thrust plates
  - ADS letter boxes
Underbridge Structure
Constructing the Tunnel Shield
Railworks

S and T cable bridge
Western Approach
Box jacking equipment

Jacking rigs, jacks and power pack
Anti-Drag System
ADS Anchorage

- Base of underbridge
- Jacking base
- 15mm SOFFIT PLATES INCORPORATING CUTTING EDGE

Dimensions:
- 350
- 950
- 350
- 15
ADS System laid out
ADS Ropes – uniform and tight
Network Rail QSRA and Readiness review

- New procedures after high profile over-runs (Rugby)
- Detailed hour by hour programme
- Each activity analysed
- Probability of occurrence assessed
- 19.5 hours of Time Risk Allowance
- Monte Carlo analysis
- >95% probability of success
The box in readiness
The Possession Weekend

• Rail Blockade for 101 Hours

• From 00:30hrs, Friday 10 April 2009
• To 05:00hrs, Tuesday 14 April 2009
General sequence

- Handover and Isolation
- Remove tracks and upper ballast
- Remove entry portal and phase 1 excavation
- Box Jack and phase 2 excavation
- Backfill and grout, install robust kerbs
- Reinstall ballast and tracks
- Re-energise and handback
Track removal

Start T+4hrs
Phase 1 excavation

Start +10hrs
Phase 1 excavation
Entry portal removal

Start T+10hrs
Box Jacking

Essential to carry out 4 operations together:

- Excavating at the tunnel shield (at the front)
- Jacking the box (at the back)
- Lubricating the base and walls (the sides)
- Surveying the line and level

Start T+22hrs
BBC news
Time lapse
Backfill

Start T+59hrs
Place Robust Kerb
Relay Tracks

Start T+79hrs
Reporting on progress

- Part of QSRA procedures
- Regular 4 hour meetings
- As-built update of programme every 2 hours
- TRA expended at each stage
- NWR reported into centre
Facts and Figures

• Slide length – 59.4m
• Slide time – 33 hrs 45 minutes (1.76m/hr)
• Maximum Thrust applied – 2,209t
• Maximum Pressure – 340bar
• Final position – 41mm off-line, 62mm low
Facts and Figures

- Total volume excavated – 6,540cu.m.
- Backfill volume placed – 390cu.m.
- Grease used for base lubrication – 5t
- Bentonite for wall lubrication – 50cu.m.
- Grout injected to fill voids – 28t (23cu.m.)
- Total length steel wire ropes – 37,632m
- Number of personnel who worked during the possession - 296
Remaining Works to completion

- Retaining walls – lined and brickwork
- Highways works
- Subway refurbishment
- Tibbington Open Space
- Removal of Level Crossing
Opening Ceremony –
January 2010
Any Questions?