

S.R. 66 STORM SEWER TUNNEL

In
Evansville, Indiana

S.R. 66 (Diamond Avenue) Storm Sewer Tunnel

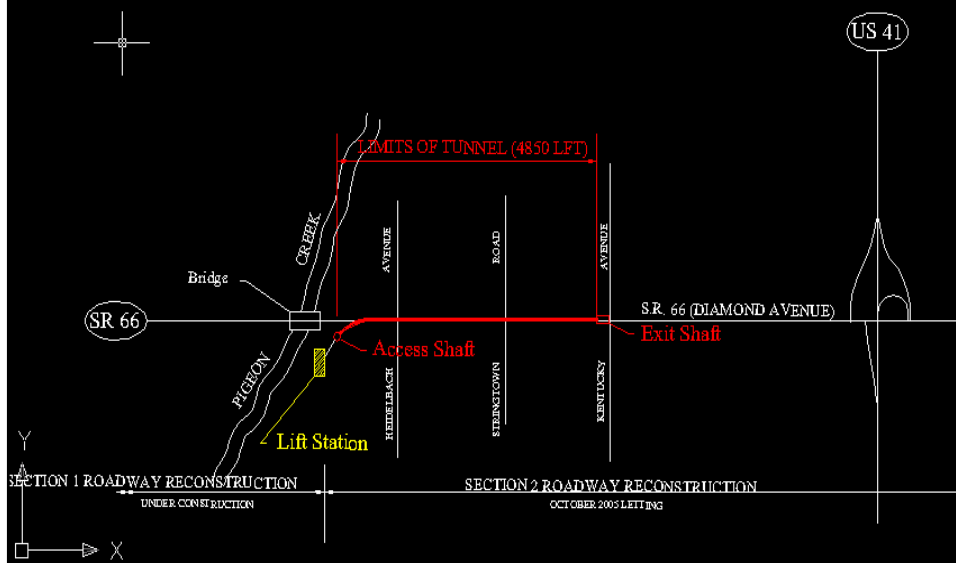
- Project No. STP-006-7(018)
- Contract R-26480
- Des. No. 0200534
- October 2003 Letting
- Completed September 2004

PROJECT TEAM

- FHWA – Washington D.C. and Indiana Offices
- INDOT – Design, Materials and Tests, Vincennes District
- Woolpert, Inc. – Prime Consultant
- Lyman Henn, Inc. – Tunnel Design Consultant
- Earth Exploration, Inc. – Geotechnical Consultant
- Affholder, Inc. – Prime Tunnel Contractor

TUNNEL LOCATION

Evansville, Indiana



Typical Section of Diamond Avenue



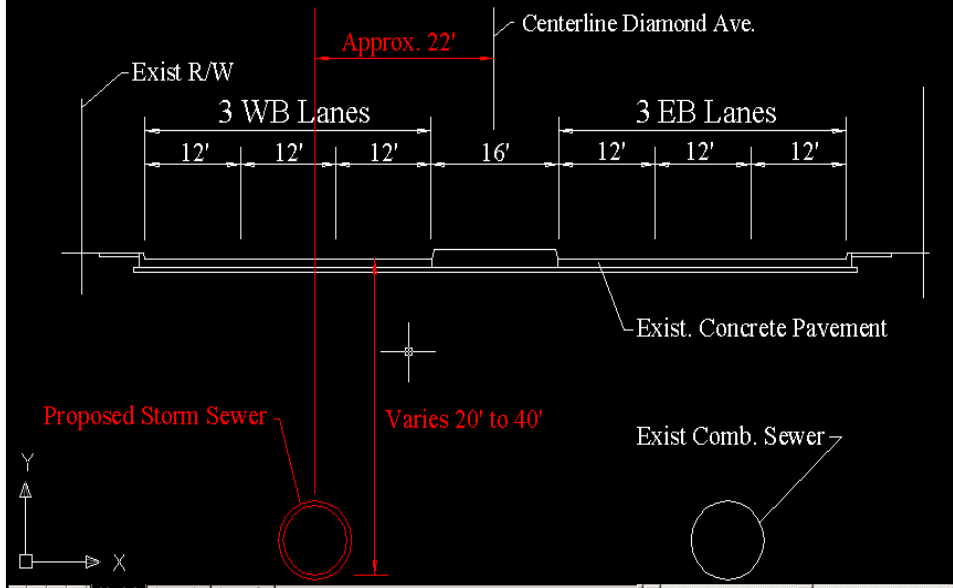
Typical Section of Diamond Avenue



Typical Section of Diamond Avenue

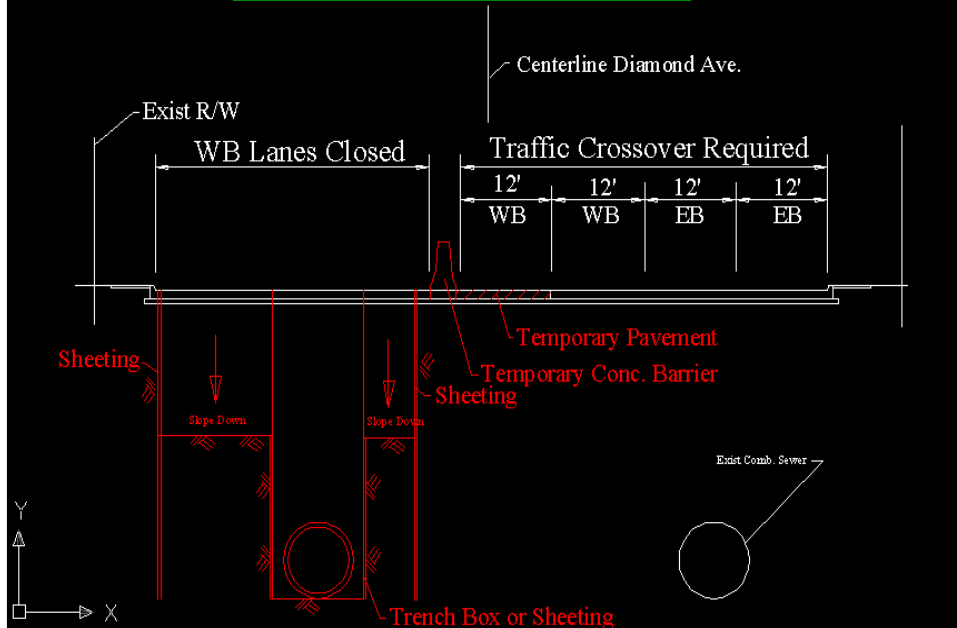


Cross Section of Diamond Avenue Showing Storm Sewer Location



WHY TUNNELING?

Typical Open Cut Construction



Cost Estimate for Open Cut

- Construction Cost = \$9.5 Million
- User Costs = \$5 Million
- Utility Relocation Costs = \$0.5 Million

TOTAL OPEN CUT COST = \$15 Million

Cost Estimate for Tunneling

Based on \$1,500 per linear foot estimated from previous tunnel project in Evansville times 4,850 linear feet of tunnel.

TOTAL TUNNEL COST = \$7.3 Million

Estimated Cost Savings

Open Cut = \$15 Million

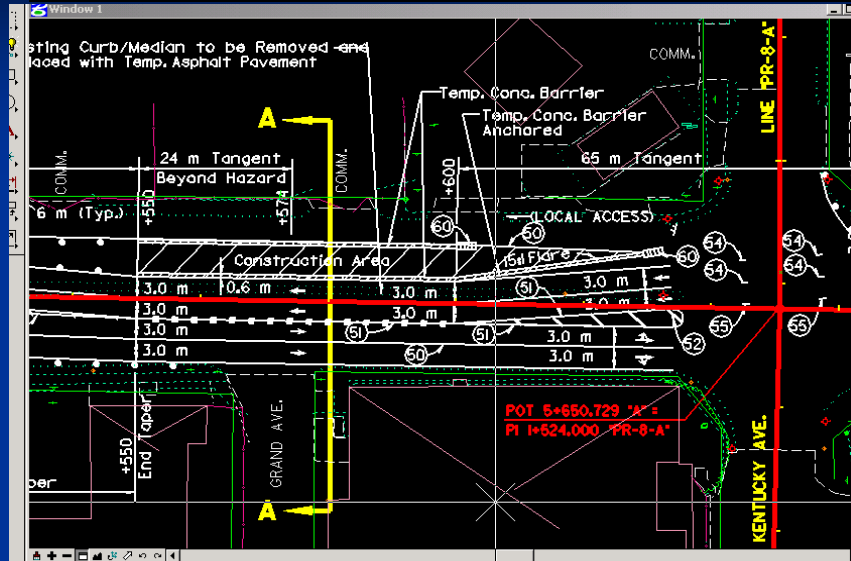
Tunneling = \$7.3 Million

Estimated Savings = \$7.7 Million

Design Issues

- Traffic Impacts
- Subsidence
- Alignment
- Manholes
- Utilities

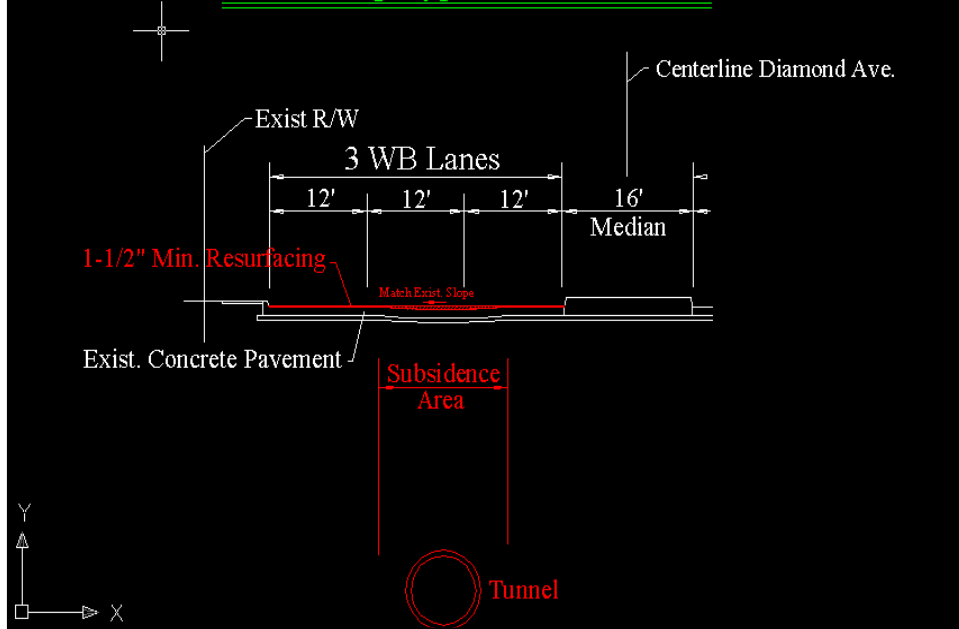
Traffic Maintenance at Exit Shaft



Settlement Monitoring

- Structure Monitoring Points (at pedestrian bridge)
- Monitoring Points and Monitoring Arrays (along centerline of tunnel)
- Utility Monitoring (above critical utility facilities)

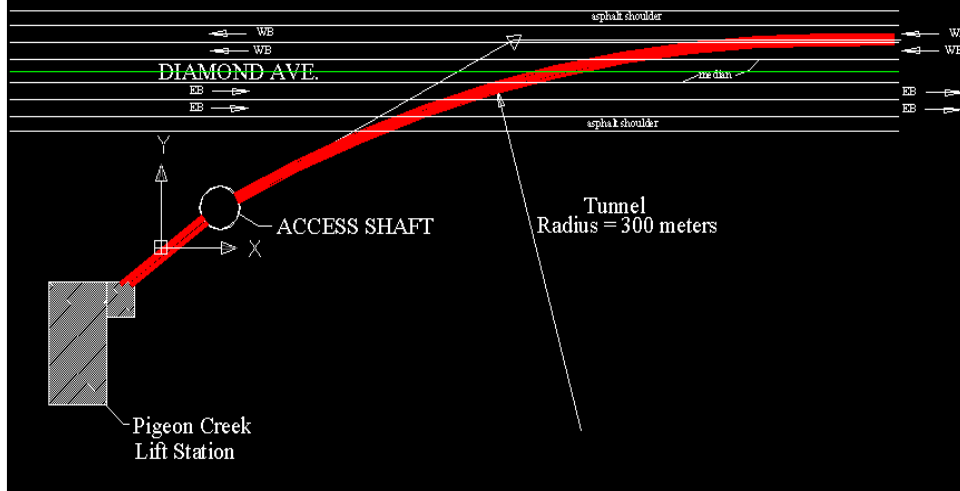
Resurfacing Typical Cross Section



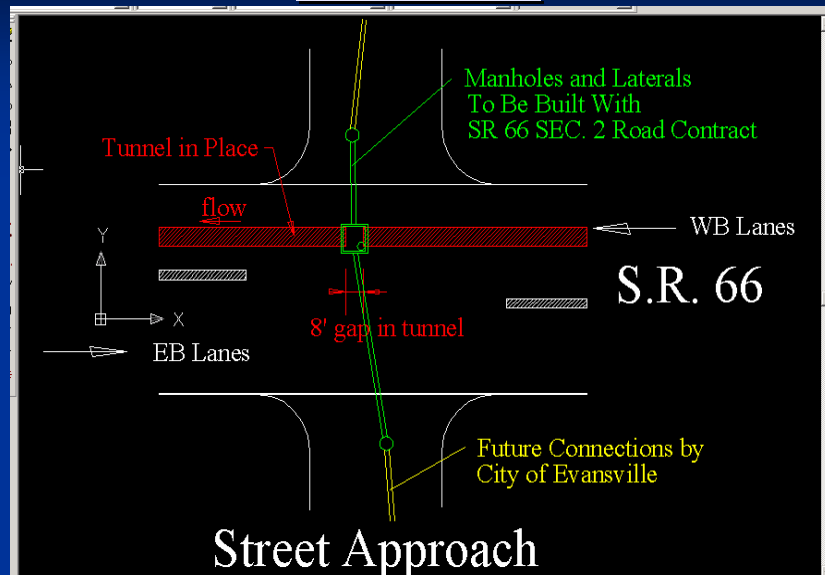
Pedestrian Bridge



TUNNEL HORIZONTAL CURVE



Manholes



Utilities

- SBC – not affected.
- Vectren Power – two street lights were relocated for staging area.
- Vectren Gas – three crossing locations where settlement of cast iron pipe was a concern.
- Evansville Water – water mains were located above potential tunnel conflicts.
- Evansville Sewer – combined sewer at Evans Street had to be relocated.

October 2003 Letting

Affholder, Inc. of Missouri awarded contract with a bid of \$6.95 Million.

Reality Check

(Actual Tunnel Costs)

- Construction Costs = \$ 7.5 Million
- User Costs = \$ 1.2 Million
- Utility Relocation Costs = \$ 0.8 Million

TOTAL TUNNEL COST = \$9.5 MILLION

(Savings of \$ 5.5 Million over Open Cut)

July 2004 Site Visit



July 2004 Site Visit



July 2004 Site Visit



July 2004 Site Visit

