

Bechtel/Parsons Brinckerhoff Responds to “Big Dig” Tunnel Leak Allegations

The Big Dig is safe and sound.

Recent news stories have vastly exaggerated the impact and significance of tunnel leaks in the Central Artery/Tunnel Project. A number of public figures have also rushed to judgment. As a result, unjustified fears have been raised about the safety of the tunnels. Concerns that the public will be stuck with years of costly repairs are also unwarranted. In fact:

- All the experts agree: The Big Dig is structurally safe and sound.
- The tunnels already meet industry norms for water intrusion, even before they are finished.
- The program to seal leaks will be completed within months, not years, generally at the contractors' expense and without jeopardizing the project's budget.

It comes as no revelation to engineers that water is entering the tunnels: they are still under construction and partially open to the weather. For instance, water flows into the tunnels down traffic ramps that are still uncovered. Some roof sections have yet to be installed. There are open holes where beams that used to support the old elevated artery once stood. Manholes and utility conduits are not yet sealed. Covering or sealing such pathways is a scheduled part of finishing the project.

In the meantime, water entering the tunnel is readily managed by permanently installed drains and pumps. The volume is decreasing as work progresses.

All tunnels built below the water table will have some seeps and leaks. That's true of subways and highway tunnels in Boston, New York, London, and elsewhere. We have reduced these leaks by waterproofing portions of the tunnel floors, walls, roofs, and joints. As the project gained experience with local conditions and material performance, waterproofing designs were upgraded over time – but never found defective, as falsely reported.

No waterproofing system is perfect. Chasing water that inevitably seeps through walls and joints is a normal part of construction. We take this job seriously in order to prevent corrosion problems. The spots where water enters are systematically located and sealed, one at a time, by the contractors responsible for each of the various sections of the tunnels or utilities. The work will generally be done at their expense to meet work specifications.

This process was anticipated and built into design, budget, and schedule. It will take months to complete, not years. Any residual seepage will be handled by a normal maintenance program as with all tunnels.

According to the Federal Highway Administration's tunnel maintenance manual, typical tunnel designs assume a continuing trickle equal to about one ordinary garden hose for each linear mile of tunnel. The Big Dig's tunnels already meet this norm for fully finished tunnels, even though they are not yet complete. Ultimately, we expect the Big Dig tunnels to perform better than industry norms.

These anticipated leaks and seeps are not unusual in tunnel construction and have nothing in common with the leak that interfered with traffic on September 15, 2004. That was a localized incident. Improper construction of a single wall bay allowed substantial quantities of water to enter the tunnel. We and the state are still investigating why the construction error happened and why it wasn't corrected earlier.

While it seriously delayed rush hour traffic, the September leak in no way threatened the integrity of the tunnel. Initial repairs were quickly completed and engineers have agreed on a permanent solution. The cost of any repairs will be assumed by the responsible parties, not by the project or the public.

Fortunately, this type of issue is rare. The wall bay in question was one of many thousands of tunnel wall bays in the Big Dig. The breach, while disruptive, involved a few square feet out of 3.2 million square feet of tunnel walls.

Nevertheless, to eliminate the possibility that similar issues might arise elsewhere, project teams are conducting extensive physical inspections and a thorough review of records. Four other wall bays may also need remedial work and will be repaired, again at no cost to the public or to the project.

Nothing about any of these leaks represents a threat to the integrity of the Big Dig tunnels. An independent expert hired by the Commonwealth has stated without reservation that the tunnels are safe and structurally sound. We strongly share this assessment.

The people of Massachusetts can drive the Big Dig tunnels with assurance. The Central Artery/Tunnel Project represents an extraordinary engineering and construction achievement, and an outstanding contribution to Boston's civic infrastructure.

Facts and Allegations

In the interests of correcting the many false or misleading allegations in media reports and public statements, Bechtel/Parsons Brinckerhoff (B/PB) offers the following facts:

Allegation: It is unacceptable that the completed tunnels continue to leak.

Fact: Although the state has opened several tunnels to traffic, construction is not yet finished.

- The project is not scheduled for substantial completion until September 2005.
- Drivers can use I-90 and northbound I-93 tunnels safely in the meantime.
- Until construction is finished, the tunnels remain partially open to the weather and may take in water through:
 - uncovered ramps
 - unfinished roofs
 - openings around beams that held up the old artery
 - unsealed utility conduits
- A program to locate and seal normal wall and roof leaks and seeps is making substantial progress, and should be substantially complete by next summer, along with the rest of the project.
- This waterproofing program will be accomplished largely at the contractors' expense and does not jeopardize the project's budget.
- All tunnels below the water table have some residual seepage that must be handled through normal maintenance programs. The Big Dig tunnels will have such a program in place.

Allegation: Water entering the tunnels makes them unsafe or structurally unsound.

Fact: Experts agree the tunnels are both safe and sound.

- The inflow is readily managed by permanent pumps and drains that catch and divert the water safely.
- Today the water flow has been reduced to the equivalent of six garden hoses – already meeting industry norms for water flow in tunnels, as published by the Federal Highway Administration.
- Water inflows during construction were expected and will diminish once tunnels are complete and they are fully closed to the weather.
- Project officials, an independent expert hired by the state, and our engineers confirm the tunnels are safe and sound.

Allegation: Fixing the tunnel leaks will take up to a decade.

Fact: Proper repairs will take months, not years, to complete.

- Much of the water inflow will end when construction is complete and tunnel openings are sealed.
- The grouting program to seal water leaks is also part of the construction schedule and should be substantially complete, along with the rest of the project, by the summer of 2005. It has already achieved a substantial reduction in leaks.
- The I-93 wall breach was quickly repaired; project engineers and an independent expert hired by the state have agreed on a permanent solution that can be implemented within weeks. Inspecting and making any necessary repairs to the few additional suspect panels should take a few months at most.
- The opened tunnels are perfectly safe to use even while these repairs progress.

Allegation: The September 2004 wall breach was indicative of tunnel leak problems.

Fact: The problems appear to be very limited in number and do not affect public safety or tunnel integrity.

- The September breach was a localized incident entirely unrelated to the normal leaks and seeps experienced by all tunnels below the water table.
- The September incident in no way compromised the structural integrity of the tunnels, as confirmed by the state's independent expert.
- It was caused by poor construction on one wall bay out of many thousands throughout the tunnels.
- The breach measured only a few square feet out of 3.2 *million* square feet of wall space.
- The project is conducting extensive physical inspections and a thorough review of records to identify any similar problems. To date, we have identified only four wall bays that may need remedial work – all less serious than the one that failed in September 2004.

Allegation: B/PB failed to correct wall construction problems, leading to the breach.

Fact: We and the state are still aggressively investigating why the construction defects went uncorrected, and we welcome an objective determination of the facts. The responsible parties, not the public, will pay for repairs.

Allegation: B/PB allowed poor waterproofing to go uncorrected.

Fact: B/PB took the lead in addressing waterproofing issues.

- B/PB identified issues with the performance of waterproofing systems. We created a task team with state officials in March 1997 to address those issues aggressively.

- As a result, the project took several actions to correct the problems. Among the most important:
 - The project made contractors strictly meet contract specs and adhere to waterproofing manufacturer written requirements.
 - The project eliminated waterproofing systems that contractors had difficulty implementing properly in the field.
- This task force led to significant improvement in the installation of waterproofing, reflected in the fact the tunnels today meet industry norms, published by the Federal Highway Administration, even before completion.
- The project will hold contractors accountable for the quality of their work – and for grouting and sealing leaks at their expense.

Allegation: B/PB has not acknowledged the extent of the leak problem.

Fact: The state has been kept fully apprised of waterproofing issues as they arose.

- From the very beginning, the state chose a state-of-the-art construction method known as “slurry walls” to make it possible to build tunnels within the extremely tight space constraints posed by the existing artery, adjacent buildings, utilities, the subway system, and other obstacles. Concrete walls built this way inevitably leak more than tunnels that are built and sealed in broadly cut trenches.
- State experts joined B/PB engineers on the Waterproofing Task Force that recommended tough measures to ensure high quality waterproofing throughout the project.
- The Waterproofing Task Force report from 1997, which The Boston Globe cited in claiming that “The Big Dig's tunnel leak problem is far more costly and extensive than Massachusetts Turnpike officials and private contractors have acknowledged,” is not confidential and was made available to the state Inspector General’s office a year ago.
- As noted, the leak problem is well under control, and does not jeopardize the project’s budget.