ACROW BRIDGES

181 New Road, Parsippany, New Jersey 07054-5625, United States of America

TEMPORARY DETOUR BRIDGES MAY BE RIGHT FOR YOUR PROJECT

ECONOMIC OVERVIEW

Reducing traffic disruptions caused by roadside construction and improving public safety are two goals set by the Accelerated Construction Technology Transfer (ACTT) initiative. Sponsored by the Federal Highway Administration (FHWA) and the American Association of State Highway and Transportation Officials' (AASHTO) Technology Implementation Group (TIG), this initiative promotes the use of innovative technologies and techniques to accelerate major highway projects. The use of Acrow temporary bridges is one cost effective technique to accelerate the construction of highway projects and to maintain proper traffic flow. In fact, former New Jersey Commissioner, Weinstein, mentioned that maintaining traffic during construction was the most important facet of a project. Below are examples on how Acrow Corporation can help your project through the use of temporary bridges.

1. Acrow Temporary Bridges Promote Safety

All lanes on a construction project remain open and predictable when an Acrow Bridge is used. This results in the elimination of hazards that negatively impact the safety of construction workers and the public. Phased construction results in shifting lanes or lane width reductions which are the cause of many accidents on construction sites.

2. The Flow of Commerce Continues

Virtually every type of business, in addition to individuals, is hampered by long detours, lane closures, and road closures. Long detours, lane and road closures contribute significantly to the expense of moving goods. Companies pass along these costs, which result in higher prices for goods. The increase in expenses is due to added fuel expenses, driver labor, and missed opportunities for trucking and freight companies. Oregon DOT recognized the cost savings about four years back when using a temporary bridge on an Interstate Highway. Their estimate was that the trucking industry would see its costs go up by $38,000 per day, which over the life of the contract added up to ten's of millions of dollars. Take this analysis, update it to 2009, and apply it to the many urban/suburban areas of the United States where traffic volumes are greater than those in Oregon. The costs for transportation will be approximately 4 times greater at $152,000 per day. This figure does not include all of the other

industries or lost opportunities or the indirect add - on costs due to employees being late or note being able to get to their jobs. When all factors are taken into account the costs attributed to not maintaining an efficient flow of traffic in and around construction sites can run into the millions of dollars per day, which will also result in a reduction of the collection of tax revenues. The “domino” effect is of a mammoth magnitude.

3. Temporary Bridges Help the Environment

Vehicles that idle for extended periods of time exhaust more pollutants. Temporary bridges prevent lengthy idling time by allowing traffic to flow smoothly and consistently at normal speed levels, which result in lower air pollution rates. Normal speed flows of traffic that result from the use of temporary detour bridges also result in less fuel being used by the various vehicles on the highway and less dependence on foreign sources of oil.

4. Construction time is decreased

When a contractor is required to maintain traffic on a bridge that is being rehabilitated or replaced by means of “phasing” the traffic, a portion of their schedule is set aside just for moving the barriers, attenuators, lighting, signs, equipment and other items. Contractors are keenly aware that by rerouting the traffic onto a temporary structure, they can place their full work force and concentration on the bridge that requires replacing. In Pennsylvania along the Interstate system, contractors have reduced their construction schedules by a year when using a temporary bridge. This not only saves the State money through a Value Engineering program, but it also mitigates the safety, commerce, and environmental issues.

Based on the examples above, some means of maintaining traffic flow is essential. The options for accomplishing maintenance of traffic include the use of a temporary bridge to carry the public safely across the gap. Other options exist, such as phasing construction in such a way as to maintain all lanes of traffic. The example we will display below will be based around the use of a temporary crossing.

To assist you with your analysis of whether to utilize a temporary crossing, Acrow provides three comprehensive costs analyses for the use of an Acrow Bridge. Example 1-A and B are for the same crossing; however, the variable is that 1-A is being rented and 1-B is being purchased. An important facet of purchasing a bridge is that the costs of the bridge can be amortized over several projects, which results in significant costs savings for the owner. Other issues such as Right of Way, easements, detour road costs, are included.

You can compare the costs that you derive for the temporary detour bridge and detour roadway to the cumulative costs for phased construction or detouring traffic. These cumulative costs include lost productivity of drivers and

workers, fuel costs, the longer construction times, costs of signs, traffic lights, attenuators, barriers, and other safety devices, detour road improvements such as re-paving, striping, etc., and other items that reflect the actual costs involved with phasing traffic. There are also those indirect costs that need to be assessed such as future litigation for personal injury and property claims that are a result of phasing traffic or detouring traffic through a community, and the safety of workers and motorist along with environmental issues.

EXAMPLE 1-A:

Overview

The project requires a temporary detour bridge to maintain two lanes of traffic. The highway is an Interstate roadway and both lanes of traffic will be traveling in the same direction. This application calls for the detour bridge and its approach roads to fit on the median and between the existing two bridge structures. Right of Way and easement issues are not applicable since the bridge is being placed between the existing structures on land owned by the State. The traffic on the detour bridge will be reversed after the first existing bridge has been rehabilitated. It is estimated that the bridge is needed for 12 months. The design loads are AASHTO HS25-44 (41 m. tonne) and a few of the State's permit (P type) trucks. These vehicles are to be able to freely cross the structure with minimal oversight. Since the bridge is on an Interstate Highway, additional design controls will be used to ensure an adequate fatigue life and appropriate deflection. The width of the bridge between curbs is 36 feet (11 meters). The lane widths are 11 feet (3.35 meters). To the right, there is a safety shoulder of 10 feet (3.05 meters) and to the left a safety shoulder of 4 feet (1.21 meters). Half "Jersey" type barriers will be used across the span to protect the public. The half Jersey barriers will interface with full Jersey barriers on the approaches.

The existing bridges are comprised of one single clear span with a length of 70 feet (21.3 meters). To minimize the concrete abutment for the detour bridge by getting the abutments further up the river banks, the detour bridge will be longer than the existing bridges. The simple clear span for the detour bridge will be 110 feet (33.3 meters). Stream permits may be needed; however, permits may be minimized due to the detour bridge being longer than the existing bridges and stream encroachment being non-existent.

Costs Items ** :

1.	12 month rental of Acrow Bridge	$240,000.00
2.	Trucking charges to project site (mid - America)	$35,000.00
3.	Trucking charges to return	$39,000.00
4.	Engineering services for superstructure	$35,000.00
5.	Engineering services for substructures	$30,000.00
6.	Construction of Abutments	$55,000.00
7.	¾ mile of approach roads	$(Add in).00
8.	Assembly of superstructure - 7 days - (140 t)	$56,500.00
9.	Disassembly of superstructure - 7 days	$56,500.00
10.	Approach road removal	$(Add in).00
11.	Reclamation of detour road	$115,000.00

GRAND TOTAL FOR USE OF RENTAL DETOUR BRIDGE $662,000.00

EXAMPLE 1-B:

This alternative is the same as 1-A except that the Acrow Bridge is being purchased with the plan to reuse it and amortize its costs over several projects.

GRAND TOTAL FOR USE OF PURCHASED DETOUR BRIDGE$+254,000.00

Note: Add the $254,000.00 to the rental price above for the Grand Total of the detour bridge when purchased, which equals $916,000.00 for the entire detour. The bridge purchase represents $529,000.00 USD and it is this value that will be amortized over several projects.

EXAMPLE TWO:

Overview

The project requires a temporary detour bridge to maintain two lanes of traffic and a pedestrian walkway on one side. The highway is a secondary roadway. Traffic lanes will travel in opposite directions. This application calls for the detour bridge and its approach roads to be placed on an alignment next to the existing bridge. It is estimated that the bridge is needed for 8 months. The design loads are AASHTO HS20-44 (33 m. tonne) and pedestrian on the cantilevered sidewalk. The width of the bridge between curbs is 24 feet (7.34 meters). The lane widths are 12 feet (3.67 meters) with no shoulders. The pedestrian walkway is 5 feet wide (1.5 meters). Standard steel box or "W" shaped guide rail will be used.

The existing bridge is comprised of one single clear span with a length of 110 feet (33.5 meters). To minimize the concrete abutment for the detour bridge by getting the abutments further up the river banks, the detour bridge will be longer than the existing bridges. The simple clear span for the detour bridge will be 150 feet (45.72 meters).

Costs Items ** :

1.	8 month rental of Acrow Bridge	$190,000.00
2.	Trucking charges to project site (mid - America)	$44,000.00
3.	Trucking charges to return	$48,000.00
4.	Engineering services for superstructure	$18,000.00
5.	Engineering services for substructures	$15,000.00
6.	Abutments	$22,000.00
7.	3/8 mile of approach roads	$(Add In).00
8.	Assembly of superstructure - 8 days - (150 t)	$64,000.00
9.	Disassembly of superstructure - 8 days	$64,000.00
10.	Approach road removal	$(Add in).00
11.	Reclamation of detour road	$72,000.00

GRAND TOTAL FOR USE OF DETOUR BRIDGE $537,000.00

** The cost figures used in Examples 1A, 1B, and 2 are approximate and were established using the 2008 RS Means® Heavy Construction Data System.

TWO CASE HISTORIES

Las Vegas, NV

In Las Vegas, the crews widened US Highway 95 to 10 lanes between several interchanges including Valley View Boulevard. The highway expansion caused major reconstruction of the interchanges on a route that is used by approximately 180,000 vehicles a day. The Nevada Department of Transportation chose to use a temporary bridge as a construction bypass to diminish motorists' frustrations with the project, decrease construction time to build a new bridge across Highway 95, alleviate environmental damage from traffic congestion, and to ensure local economies were not affected.

To ensure the bridge was installed on time, the Nevada Department of Transportation contract with MMC incorporated liquidated damages of $5,000 for every 15 minutes highway 95 remained closed and $4,000 per hour that the Valley View exit remained closed after the deadline. Highway 95 remained open and transportation officials were pleased with their first attempt at using a temporary bridge bypass.

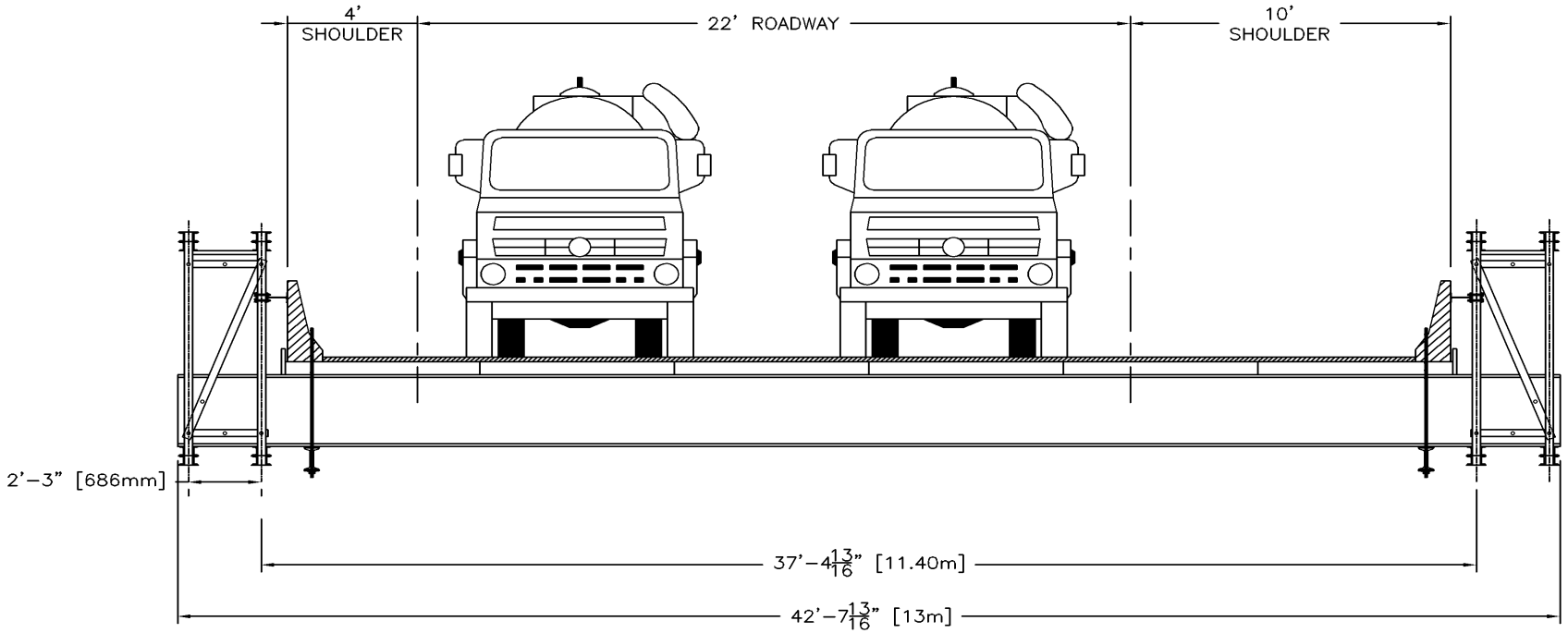
I-81 Project

The Pennsylvania Department of Transportation needed to rehabilitate two bridges on Interstate 81. I - 81 is a vital transportation route between Harrisburg, PA and Allentown, PA with approximately 26,000 cars and over 6,500 trucks traveling on this major thoroughfare daily.

Acrow Corporation designed this particular detour bridge specifically for I - 81 as a temporary measure to handle traffic while the highway bridges were improved. The 80' (24.4 meter) x 36' (11 meter) two-lane bridge saved overhead costs for the PADOT because it reduced the project time from two years to one year, enabled workers to work on both bridges simultaneously thus decreasing waiting times for crews, and increased safety for workers and traffic by keeping the traffic flowing smoothly and predictably through the project site.

ACROW 700XS BRIDGE ON INTERSTATE HIGHWAY 81
PENNSYLVANIA DEPT. OF TRANS.
NEAR HARRISBURG, PENNSYLVANIA

ACROW 700XS BRIDGE ON INTERSTATE HIGHWAY 95
CONNECTICUT DEPT. OF TRANS.
NEAR NEW YORK CITY, NEW YORK



INTERSTATE HIGHWAY ACROW DETOUR BRIDGE

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ACROW 700XS PANEL BRIDGE
CROSS SECTION VIEW
OF DSR2 36FT ROADWAY BRIDGE

DRAWN BY RJ	DATE MARCH 6, 2009	CONTRACT NO.	
CHECKED BY WTK	SCALE: N.T.S.		
APPROVED BY WTK		DRAWING NO. PROPOSAL	REV.
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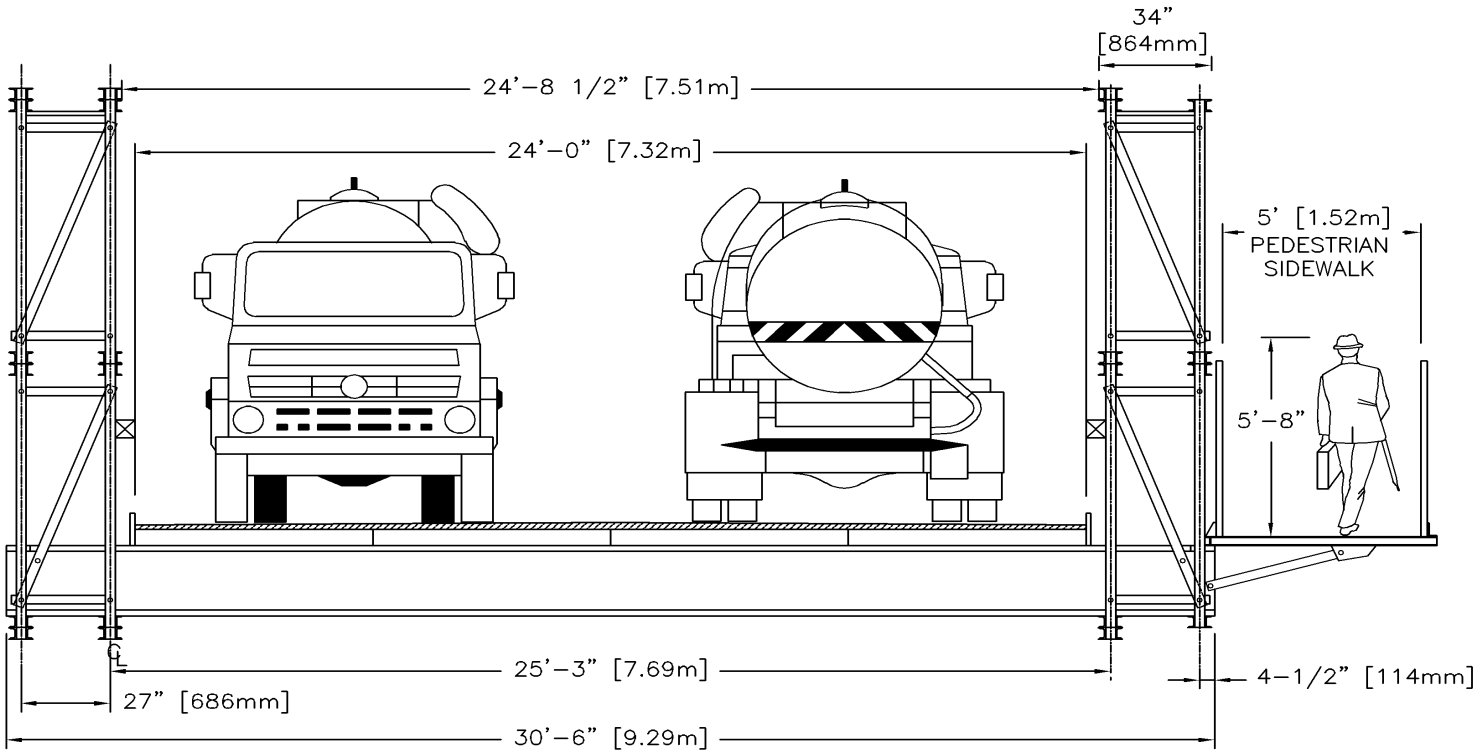

STATE HIGHWAY ACROW DETOUR BRIDGE

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ACROW 700XS PANEL BRIDGE
CROSS SECTION VIEW
OF DDR2 24FT ROADWAY BRIDGE

DRAWN BY RJ	DATE MARCH 6, 2009	CONTRACT NO.	
CHECKED BY WTK	SCALE: N.T.S.		
APPROVED BY WTK		DRAWING NO. PROPOSAL	REV.
		SHT 1 OF 1	