

**HIGHWAY CONSTRUCTION FACTORS GROUP  
ATTACHMENT 14  
1977 OVERLAY INSPECTION REPORT FROM BRIDGE 9340**

**BRIDGE 9340 COLLAPSE MINNEAPOLIS, MN.;8/1/2007  
HWY-07-MH024**

BR. 9340 ~ 9340A

BR 9340  
FOLDER 9 OF 13

Foundation  
3  
BAT

BRIDGE  
CONSTRUCTION



8695001

ROUTE SLIP

DATE 1 2

TO:	NAME	ORG/RTG SYMBOL
TO:	Mr. Keith Benthin Bridge Engineer	(61)
TO:	Mun. Dept. of Transportation	

- |  |  |
|--|--|
| <input type="checkbox"/> PER YOUR REQUEST                | <input type="checkbox"/> FOR YOUR SIGNATURE          |
| <input checked="" type="checkbox"/> FOR YOUR INFORMATION | <input type="checkbox"/> COMMENT                     |
| <input type="checkbox"/> PER OUR CONVERSATION            | <input type="checkbox"/> TAKE APPROPRIATE ACTION     |
| <input type="checkbox"/> NOTE AND RETURN                 | <input type="checkbox"/> PLEASE ANSWER               |
| <input type="checkbox"/> DISCUSS WITH ME                 | <input type="checkbox"/> PREPARE REPLY FOR SIGNATURE |
| <input type="checkbox"/> FOR YOUR APPROVAL               | OF _____   |

REMARKS:

As discussed

✓ RRN  
File

Br 9340

FROM:	TELEPHONE NO.	ORG/RTG SYMBOL
By Guyana		FHWA

(1) *Carls*  
*McCutcheon*  
*Boyers*  
*YVE*

~~INTERMEDIATE AND FINAL INSPECTION REPORT~~  
CONSTRUCTION QUALITY INSPECTION REPORT

③ *File*

(Check appropriate box)

INTERMEDIATE INSPECTION

FINAL INSPECTION

REGION NO.	REPORT NO.	COUNTY	DIVISION
5	4	Hennepin	Minnesota

IN COMPANY WITH  
D. Bigley, Mn/DOT Project Supervisor  
D. Nordby, Mn/DOT Prov. Inspector

DATE OF INSPECTION	INSPECTION MADE BY	PROJECT NO.
8/3/77	F. P. Orloski, Asst. Area Engineer <i>FPO</i> J. W. McCutcheon, Asst. Bridge Engineer <i>JW</i>	I-IG-IR 35W-3(182)

QUALITY OF WORK*	PROGRESS OF WORK	TIME ELAPSED	WORK COMPLETED
Satisfactory	Unsatisfactory	85 %	35 %

Contract #16539  
Contractor: Denton Construction Company  
Contract Amount: \$827,364.00

This project provides for bridge deck restoration and overlay of bridges on I-35W over the Mississippi River in Minneapolis.

This inspection consisted of reviewing the contractor's operation of placing low slump concrete in the northbound lanes of Bridge 9340 between the hours of 8:00 and 10:00 PM.

The contractor's method of placing low slump concrete was adequate but could be improved. One Concrete Mobile machine with a capacity of 8 CY was producing concrete for the overlay by loading up with water, aggregate, and cement under the structure and transporting the material to the work site. This process was slow because concrete was not being supplied at an adequate rate to keep the Bidwell finishing machine in continuous operation. The contractor's men and equipment were at a standstill for about 15 minute periods waiting for concrete. The use of additional Concrete Mobile machines or a change in method of supplying concrete was discussed with the project engineer. He said that the contractor has been using 2 Concrete Mobile machines on most of the job and that his operation has been continuous. The second machine was being used on another project at the time of this inspection. The contractor has been placing only 12-14 foot wide overlays because of working area restrictions caused by high traffic volumes and narrow shoulders.

*JW*  
The work site where the overlay was being placed contained several areas of Type I removal below the rebars and one area of Type II removal that was full depth. The specifications call for overlays on Type I removal areas below the rebars to be vibrated before the concrete is set-up and all Type III removal areas shall have full depth patches of special mix concrete and cured until it has reached 45% of its strength. These specifications were not being followed very closely at the time of this inspection. The Type I removals were not always being vibrated and the full depth removal was not patched. This was discussed with the project supervisor who said the full depth patch was not necessary at this location and that it was difficult to enforce vibrating Type I removals. This was discussed further with the project supervisor to gain more insight into his reasoning for allowing this work to continue. It was concluded that the contractor's operation should not be stopped because these areas were small and that they would be "chained" later on and repaired if necessary at the contractor's

expense. This was also discussed with the project supervisor and resident engineer on August 5, and August 9, 1977. They agreed that the inspector should have been enforcing the specifications more closely and that this was the only full depth patch that was not placed according to specifications. What happened was that the contractor patched all of these areas several days prior to the overlay and he inadvertently forgot this one patch probably because his equipment was parked over it. The project supervisor assured that all other Type III removals had been patched prior to overlaying. The overlay of this one area was not observed but the project inspector said the contractor placed the overlay concrete in the hole and vibrated it several hours prior to placement of the 2" overlay. The contractor will not be paid for this patch with either type of concrete. This area should have adequate strength and will be inspected later on.

The contractor's method of placing the overlay created some unnecessary problems. The most evident problem was when the Concrete Mobile machine was driving over the scarified surface. This created the problem of oil and lubricating fluids dripping on the concrete in advance of the overlay. This meant that the contractor had to remove these oil drippings before the overlay could be placed. This was being done by a laborer who wiped the oil spot off the concrete and later air dried it with a compressor. This procedure was adequate, but it is not certain whether it was being followed at all times.

→ The tining of the concrete was adequate, but it was not very consistent. It varied considerably with changes in the slump, speed of the finishing machine, method being used, and contractor's overlay procedure. One problem noted during the inspection was that the operator of the tining rake was not applying even pressure while dragging the rake across the concrete. He was lifting the rake up before he completed dragging it fully across the surface. In certain areas, the tining was not the minimum 1/8 inch deep. The dragging of an artificial grass longitudinally to produce micro texture was adequate, but again was not consistent. The minimum 4-foot wide grass was in contact with the surface, but it was not producing enough texture. This was brought to the attention of the project inspector who immediately informed the contractor. The contractor then placed some weight which consisted of scrap wood on top of the drag to try to achieve more texture. This procedure worked to a limited extent and was being continued throughout the rest of the operation.

Curing compound was being applied immediately after the tining was completed. Wet burlap was then being placed after the overlay was hard enough to walk upon without damage.

Straight edging was being done in the transverse direction immediately behind the finishing machine. A rolling straight edge was later being used in the longitudinal direction after the concrete had been set-up. During this inspection, the straight edging showed the concrete was within acceptable tolerance limits in the transverse direction. The high and low spots in the longitudinal direction that would affect rideability and/or drainage patterns will be ground off later on.

The project staffing for this operation was considered adequate. The State had six inspectors on the job at the time of this inspection. Four of these inspectors were part of a survey crew that overlapped the hours of the inspection crew. The remaining two project inspectors were handling the concrete material tests and inspecting the contractor's operation. No other work was being done at the time of this inspection, so that no other State inspectors were needed.

Since most of the concrete overlay on this project will be placed at night where the temperatures are less than 80 F, the contractor has been supplementing the existing roadway lighting with portable ground mounted lights. This additional lighting provided adequate visibility for the contractor's workmen and for increased visibility of traffic control devices adjacent to the immediate work site. The existing roadway lighting has been adequate for traffic control on this project since it has started. The stop sign located at the end of the eastbound TH 47 on-ramp to southbound I-35W is the major problem area. Since this stop sign is placed on the right side of the ramp, motorists driving down the ramp have a tendency to look to the left side so as to view the traffic passing by to find an appropriate gap to merge. This means that some motorists, even though they are aware of the stop sign, do not always see it at the appropriate time, especially when they are looking to the left. So far, no major accidents or injuries have occurred at this ramp. It was suggested that an additional stop sign be placed on the left side of the ramp, but the project engineer stated that this has been discussed with the Traffic Engineering Section who agreed that this would block the vision of motorists on the on-ramp and would not be of any benefit.

The Concrete Mobile was calibrated by the Mn/DOT Central Office on June 27 and July 5, 1977. The calibration work sheets and graph of gate settings versus weight of sand/stone were reviewed. The inspector had a copy of the graph with him while inspecting the machine. The minimum number of gradation samples had been taken and all were within the allowable specifications before the machine was calibrated. The course aggregate being used was Shiely granite.

The performance of an air content, slump test, and the making of a concrete cylinder were observed during this inspection. The air content and slump testing procedures could have been improved by assuring that the testing apparatus was on a level surface and the rodding of the concrete was more in an up and down motion rather than in a circular motion. The concrete used for the slump test was allowed to hydrate for 5 minutes before the actual slump test was made. The slump test taken on one 8 CY load of concrete varied considerably; 1-1/8", 3/8", and 1". This variation was due largely to the differences in the amount of water being added to the concrete by the contractor at the work site. These variances were later discussed with the project supervisor and resident engineer. They stated that with such a low slump of 3/4" plus or minus 1/4" specified for this job, it was hard for the contractor to achieve this small slump and the measurements varied considerably. It is difficult to measure 1/8" slump with this type of concrete. The air content tests taken on this same load of concrete were 6.6 and 7.0, which was within the allowable range of 6.0 to 7.0. The method used in making a concrete test cylinder was not adequate. The inspector making the cylinder was carrying the cylinder with him under his arm while he was filling and rodding the concrete in the cylinder. When he finished making the cylinder it was placed on a level surface near the job site. This procedure was later discussed with the project supervisor who instructed the project inspector of the proper method of making concrete cylinders.

A construction quality survey was also performed on this project with the work sheets attached to the file copy of this report. The quality index procedure was applied to the air content and slump characteristics of the concrete overlay mix. The results show a quality level of 80% for the air content and 64% for the slump.

The contractor's progress of work on this project has been unsatisfactory. So far, the contractor has used 52 of the allowable 60 working days and has only completed approximately 35% of the work. The slow progress of work has been of major concern to the State and to the Division office. The major concern at this point in time is whether the contractor will be able to complete the overlay on this bridge within this construction season. This will depend largely on the weather situation during the months of October and November. While the contractor is not progressing satisfactorily, he is also presenting a safety hazard to the motorists driving through the project. Traffic has been restricted to two lanes in both directions since the start of the project. The problem associated with the stop sign at the bottom of the ramp is also being extended beyond what was originally anticipated. Although there have not been any major traffic accidents or injuries on this construction project, the possibility of such occurrences has been extended due to the contractor's slow progress. These concerns have been discussed with the project and resident engineers at several times. The project supervisor feels that the contractor will still finish the specified work in this construction season.

The reasons for the contractor's slow progress are beyond the control of the State. He has been working on the job every day since the contract was let, and his work has been usually within the specifications and special provisions set up for the job.

One major item that has slowed progress is the lack of joints being delivered to the project site. The joint material has not been fabricated at a fast enough rate to keep the contractor on his schedule originally set up for the project, and he has not been able to effectively alter his schedule around this material delay. The contractor is in the process of submitting justification for a time extension due to material delays. This will only amount to a contract extension of approximately 10-15 working days, which is still not sufficient to complete the project. The remaining days used by the contractor to complete the project will be charged as liquidated damages.

The contractor also feels that he is eligible for working day extensions, due to the noise restrictions the City of Minneapolis has placed on his working hours. He is not able to create excessive noise between the hours of 10:00 PM and 6:00 AM. The contractor is claiming that this only leaves him 15 hours to work time during the day which he can use to scarify the existing bridge deck. This 15-hour time period does not allow him to adequately use two 8-hour crews. This means that his second crew, which would only be allowed to work 7 hours is not as effective and efficient as it should be. This is also costing the contractor additional money because he is not getting the full work out of the crew. The contractor has submitted a claim due to the noise restriction, which the State so far has not considered eligible for time extension.

The contractor has also experienced some equipment breakdowns and labor problems which have also slowed his progress. Since this is an out of state contractor, he has been forced to hire iron workers and laborers from the immediate area which are not always experienced and familiar with the type of work he is doing. The project supervisor has noticed that these locally hired workers are not as productive as they should be. It appears that they are trying to extend the project as long as possible so that they will have enough work until late fall. The contractor also has another similar type job in the St. Paul area. He is using several men from this job on the other job and interchanging men frequently.

This means that his total work force on this job is not always adequate. He has also been sharing equipment on both jobs. He has two or three Concrete Mobile machines that are being used for both jobs. At the time of this inspection, he was only using one machine on this job, and two machines on the other job. It appears that the contractor is trying to divide his equipment, workers, and time between the two jobs. The contractor is also falling behind in progress and time on the other job.

We have expressed concern that the contractor should try to at least finish one job this construction season, rather than partially completing both jobs. The State has no authority to force the contractor to complete one job and let the other one go over the winter.

In summary, the contractor's progress of work has been reflected in his work force, equipment, material delays, and his overall scheduling of the project. Some of these items are beyond his control for which a time extension will be given when he submits adequate justification. These time extensions will not give him sufficient working days to prevent assessing liquidated damages. The contractor's progress will be monitored very closely in the next month to assure everything is being done to complete this project this construction season.

The findings of this inspection were discussed with the project supervisor and resident engineer on August 5 and 9, 1977.

CONSTRUCTION QUALITY SURVEY  
(BRIDGE DECK CONSTRUCTION)

Sheet		
1	of	1
Date		
Mo.	Day	Yr.
8	3	77

Construction Type Code No.	PROJECT		State Code No.	Date		
	Location	No.		Mo.	Day	Yr.
X 007	I 35W over Mississippi River in Hpts. I-56-DR 35W		Z7	8	3	77

DESCRIPTION OF BRIDGE -3(182)

Width(C. to C.)	Max Span Length	No. Spans	Type of Spans	Slab Thickness	Total Length
113 <del>ft</del> (ft)	120 (ft.)	13	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Simple	2" overlay (in.)	1907 (ft.)

CONSTRUCTION QUALITY FACTORS						
OPERATIONS		CONTROL FACTORS				
1. Deck Forms	NA	<input type="checkbox"/> Removable		<input type="checkbox"/> PERMANENT		
2. Steel Placement Deck	<input type="checkbox"/> Precheck Made NA	Min. Cover	Placement Tolerance	Min. Splice Overlap	Method of Support	
		(in.) ±	(in.)	(in.)	<input type="checkbox"/> Blocks	<input type="checkbox"/> Other
3. Batching & Mixing	Concrete mobile	Transit		Central		Shrink
		<input type="checkbox"/> Manual <input type="checkbox"/> Auto.	<input type="checkbox"/> Manual <input type="checkbox"/> Auto.	<input type="checkbox"/> Manual <input type="checkbox"/> Auto.		
4. Placing		Rate: 10 yd <sup>3</sup> /hr.		Method: <input type="checkbox"/> Pumping <input type="checkbox"/> Bucket <input type="checkbox"/> Other		
5. Finishing		Manual		Mechanical		Timely
		<input type="checkbox"/> Transv. <input type="checkbox"/> Long.	<input type="checkbox"/> Transv. <input checked="" type="checkbox"/> Long.			Yes No
6. Texturing		<input checked="" type="checkbox"/> Tine <input type="checkbox"/> Broom <input type="checkbox"/> Burlap Drag	<input checked="" type="checkbox"/> Other Astro Grass			X
7. Curing		<input type="checkbox"/> Membrane <input checked="" type="checkbox"/> Wet Burlap <input type="checkbox"/> Paper or Plastic Film	<input type="checkbox"/> Other			X
8. Environmental Factors @ Time of Placing		Air Temp. 75 °F Wind Velocity 0 mph				
		<input checked="" type="checkbox"/> Dry <input type="checkbox"/> Damp <input type="checkbox"/> Wet				

MATERIAL QUALITY FACTORS							
ELEMENT	Characteristics	No. of Tests	Specifications		Average	Range	Quality Level
			U. L.	L. L.			
1. Concrete * 65 yd <sup>3</sup>	Mix Temperature						
	Air Content	8	7.0	6.0	6.55	1.10	80
	Slump	7	1.0	0.5	.750	.750	64
W/C Ratio	Indicate Method of Test						
	Density						
	Strength						
	Thickness						
	Surface Smoothness						



BR 9340

DEPARTMENT Mn/DOT, Materials Engineering Section  
Rm 134

## Office Memorandum

TO : W. M. Crawford, District Engineer  
District 5 - Golden Valley

DATE: June 7, 1977

FROM : Leo P. Warren, P.E., Chief of Concrete Engineering  
Materials Engineering Section *Leo P. Warren*

296-3111

S.P. 2783-9340  
SUBJECT: Low Slump Concrete Overlay

On June 6, 1977 I visited the bridge in company with the Project Engineer and observed that the spans with steel girders are subject to considerable movement due to traffic impact. In view of the grade and the high speeds of truck traffic, I am gravely concerned about the low slump concrete overlay which is due to be placed this summer. In my opinion the flexing and other movement will cause surface tolerance problems and may affect the overlay bond.

I recommend that the traffic be diverted from the roadway during overlay placement and cure and special weaving lanes be established to reduce vehicle speeds.

## cc:

E. J. Heinen - F. W. Thorstenson  
K. V. Benthin  
R. M. Methven  
P. L. Chandler  
R. M. Robinson  
V. A. Rasmussen  
D. Rigley  
File (2)

LPW:bh  
DACaswell

820 7571  
33  
6. 7

# Profile Denton Concrete Services

**Denton Concrete Services has been in business for over 60 years. The company had been known as Denton Construction prior to 1995. Over it's long history, Denton has worked in 26 states and had been a leading concrete paving contractor. Notable jobs include rebuilding the Eden's Expressway in Chicago, Penn Lincoln Parkway in Pittsburgh, the Lodge Expressway in Detroit, runway and aprons at Orlando, Florida and Kansas City, MO runways and taxiways.**

**At present Denton Concrete Services specializes in Concrete Pavement Restoration and Rehabilitation. Recently, from our office and yard in Lanexa, VA we have done this type work in Atlanta, GA, North Carolina and Virginia as well as smaller concrete paving jobs.**

[back](#)

From: Edward Lutgen  
To: Paul Stenberg  
Date: Saturday - September 1, 2007 4:15 PM  
Subject: Fwd: BR9340-Proposal-1977.pdf  
BR9340-Proposal-1977.pdf (4467022 bytes) [Open] [Save As]  
9340 1977 overlay quality report.pdf (2136668 bytes) [Open] [Save As]  
9340 pier 8 dredging.pdf (329713 bytes) [View] [Open] [Save As]  
9340 Rail 1998 slipformed.pdf (172977 bytes) [View] [Open] [Save As]

Paul,

Can you send this email to Dave Rayburn, Dan Walsh, Joe Epperson, Jim Wildey and Mark Bagnard at NTSB and Mike and Jon at WJE. My email is not working to these people. It kicks back and says it is undeliverable. They were asking for this information. Also I printed these out and could you add to our document area.

Ed Lutgen, P.E.  
Asst Construction Engineer  
Mn Dept of Transportation  
3485 Hadley Ave No.  
Oakdale MN 55128  
Tel 651-366-4565  
Fax: 651-366-4566  
edward.lutgen@dot.state.mn.us

>>> Paul Kivisto 8/31/2007 8:08 AM >>>

Ed,

Regarding your e-mail from David Rayburn dated 8/28/07, the attached pdf files are the original proposal (bridge portion only) from the 1977 overlay which was performed by Denton Construction Company, an FHWA quality review report on the 1977 overlay, a memo from 1998 stating the rails were slipformed, and a couple of memos describing the dredge site near pier 8 including the column protection. I could not find any 1977 pre-construction meeting minutes in the file.

I could glean the following from the files and in response to questions asked by David Rayburn:

The 1977 overlay was performed by Denton Construction Company of Grosse Pointe Woods, MI. The project engineers were Don Bigley and Dave Miller. I know Dave Miller retired fairly recently (within 5 years) from Mn/DOT.

The project engineer and inspector on the 1998 rehab project were Dave Reinsch and Marty Skar.

Mr. Rayburn is correct that an overlay was not placed in 1998.

I could not find any information on the as-built X, Y, Z, coordinates of the piers during or after construction.

Please let me know if you need any additional information.

Paul

>>> Lisa Hartfiel 8/29/2007 5:52 PM >>>

Paul-

BR9340-Proposal-1977.pdf is attached per your request.

I have your paper copies at my desk and will deliver them to you Thursday morning.

Lisa Hartfiel