Ohio Department of Transportation

Division of Construction Management

2006 Status of the Warranty Program

2/1/2007

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Executive Summary

In response to House Bill 163 of the 123rd General Assembly (1999-2000), the Ohio Department of Transportation established a set of warranty contract requirements for implementation in highway construction projects. These specifications cover items such as pavements, bridge decks and other maintenance items for varying lengths of time. These contract documents were developed by ODOT in collaboration with the Federal Highway Administration (FHWA), the Ohio Contractors Association, Flexible Pavements of Ohio, the American Concrete Pavement Association, the Ohio Aggregates & Industrial Minerals Association and various Contractor personnel.

Since 1997 ODOT has awarded 390 projects with almost 653 million dollars worth of warranted project work. During the same time period ODOT awarded 6,379 projects worth 10.8 billion dollars. The warranted work consisted of about 5 percent of the total. The Division of Construction Management has been tracking the warranty program through the use of Quality Assurance Reviews, and produced a report to the legislature in 2000.

The current outlook of the Districts is that Contractors, while being more conscientious about their work, are not producing significantly better products. Also most construction personnel feel the Department has lost control of the product under the warranty provisions. The Districts are able to advise the Contractor of obvious visual defects, but cannot stop the progress of usually non-specification work under the warranty specification requirements.

Field reports also indicated that warranties did not reduce the need for inspection. “Case Building” via sometimes excessive documentation of preexisting conditions and construction methods were witnessed by both parties.

Conclusion

The ODOT warranty program has declined in recent years, and in 2006 approximately $26,000,000 of warranty work was paid for, down from $185,000,000 in 2005. The cost comparison of similar warranty and non-warranty items indicate modest cost differences. Warranty asphalt costs about 1% more, warranty concrete bridges cost 5.6% more, and warranty concrete pavement costs 7.8% less. A review of bonding companies and contractors indicate warranty bonds costs between 0.5% - 1% of the warranted item. Quality Assurance Reviews performed by the Central Office indicate that most Districts are adequately tracking, reviewing, and responding to warranty provisions on construction projects. From the QAR’s it was also determined that a majority of District personnel felt that warranty provisions reduce the ability of ODOT inspectors to correct normally non-spec work, and require a significant amount of extra effort to track over the warranty period. Some Districts have had Contractors correct warranty work with no problem, while other Districts have had problems getting corrective work accomplished. There is currently one claim regarding warranty specifications pending.

Introduction

Through the implementation of the warranties program, Amended Substitute House Bill 163 required the Director of Transportation to submit a report evaluating the use of warranties.

A report was provided to the Controlling Board in September of 1999 that detailed the process that was followed to integrate warranties into highway construction projects.

This updated report will highlight the following current warranty issues:

- Past reports on Ohio's warranty program,
- Comparison of similar warranted and non-warranted items bid cost,
- Bonding costs,
- Current specifications,
- Past ODOT research and published FHWA guidance,
- A summary of Quality Assurance Review findings.

Background

House Bill 163, the Ohio Department of Transportation budget bill, was passed during the 123rd General Assembly and became effective on July 1,1999. The bill included in permanent law a warranty provision (ORC 5525.25) which requires the director of ODOT to comply with the following provisions for each fiscal year:

Requirement 1. 20 percent of the department's construction project contracts shall be bid requiring a warranty.

Requirement 2. 10 percent of the department's capital construction budget shall be bid requiring a pavement warranty.

During 1999, ODOT undertook the task of meeting or exceeding the requirements of the legislation by forming teams of individual experts from within ODOT, FHWA, industry associations and various Contractor personnel.

These work groups jointly developed warranty specifications for 13 different warranted construction items as well as common contract language for warranty processes that could be applied to most warranty items. Specifications are contract provisions and requirements contained in the bidding document.

Each warranty specification requires the Contractor to provide a bond and liability insurance for the duration of the warranty period. The bond varies from 30 to 90 percent depending upon the total amount bid for the actual work. The specifications also address the minimum material and quality control requirements. The annual reviews to be performed by the Department and the appeal process available to the Contractor are also addressed.

Finally, each specification clearly requires the remedial actions that the Contractor must undertake for each type of distress specified.

In the nine years since its inception, several specifications have been modified or removed from warranty consideration as part of the continuous monitoring of the program. Inspection concerns, benefits, and other material issues have driven changes.

Current ODOT warranty specifications are listed below.

Item	Spec	Period (Years)	Application
Asphalt	880	7	New and major rehabilitation
	1059	3	Preventative maintenance and minor rehabilitation
Bridge Deck	892, 893, 894	2	New Bridge deck Concrete
Bridge Painting	885	5	Painting of Structural Steel
Concrete Pavement	884, 896	7	New and major rehabilitation
Chip Seal	882	2	Preventive maintenance
Hot In-place Recycling	886	3	Surface courses
Microsurfacing	881	2	Preventative maintenance

More warranty specifications are currently in development, including Metalizing Structural Steel with warranty.

Status of Current Program

ODOT sold 23 warranty projects in 2006 with a total contract value of $762,790,800.07, the contracts have had $27,138,302 in warranty items paid for to date. The 47 contracts sold in 2004 have had $160,818,310 in warranty items paid for, and the 38 contracts sold in 2005 had $185,781,702 in warranty items paid for.

A detailed summary of the last three years of warranty items paid for is shown in the Table 1 on the next page.

Table – 1, Summary of Recent Years Warranty Item Expenditures

Item Prefix	Item (Full) Description	2004	2005	2006
442	ASPHALT CONCRETE SURFACE COURSE, 12.5MM, TYPE A (446) WITH SUPPLEMENT 1059 WARRANTY	$ 4,034,898.14	$ 3,104,931.49	$ 990,088.57
	ASPHALT CONCRETE SURFACE COURSE, 12.5MM, TYPE A (446) WITH SUPPLEMENT 1059 WARRANTY, AS PER PLAN	$ 1,892,485.89	$ 2,745,797.87	$ 844,168.00
	ASPHALT CONCRETE SURFACE COURSE, 12.5MM, TYPE B (446) WITH SUPPLEMENT 1059 WARRANTY			
	ASPHALT CONCRETE SURFACE COURSE, 12.5MM, TYPE B (446) WITH SUPPLEMENT 1059 WARRANTY, AS PER PLAN	$ 789,964.84		
442 Total		$ 6,717,348.87	$ 5,850,729.36	$ 1,834,256.57
448	ASPHALT CONCRETE SURFACE COURSE, TYPE 1, PG64-22 WITH SUPPLEMENT 1059 WARRANTY	$ 144,322.25		
448 Total		$ 144,322.25		
854	FINE GRADED POLYMER ASPHALT CONCRETE, TYPE B, WITH SUPPLEMENT 1059 WARRANTY	$ 677,742.03	$ 1,574,317.84	
	FINE GRADED POLYMER ASPHALT CONCRETE, TYPE B, WITH SUPPLEMENT 1059 WARRANTY, AS PER PLAN			
854 Total		$ 677,742.03	$ 1,574,317.84	
874	ULTRATHIN BONDED ASPHALT CONCRETE, WITH SUPPLEMENT 1059 WARRANTY	$ 725,953.21		
	ULTRATHIN BONDED ASPHALT CONCRETE, WITH SUPPLEMENT 1059 WARRANTY, AS PER PLAN	$ 1,044,990.00		
874 Total		$ 1,770,943.21		
880	ASPHALT CONCRETE (5 YEAR WARRANTY)			$ -
	ASPHALT CONCRETE (7 YEAR WARRANTY)	$ 15,673,245.11	$ 37,793,185.02	$ 4,052,807.12
	ASPHALT CONCRETE WITH WARRANTY (7 YEARS), AS PER PLAN	$ 31,357,225.34	$ 1,136,583.57	$ 3,039,536.85
	SPECIAL - ASPHALT PAVEMENT (5 YEAR WARRANTY)			
	SPECIAL - ASPHALT PAVEMENT (7 YEAR WARRANTY)			
880 Total		$ 47,030,470.45	$ 38,929,768.59	$ 7,092,343.97
881	MICROSURFACING WITH WARRANTY, MULTIPLE COURSE	$ 5,396,468.19	$ 3,494,264.95	$ 536,482.36
	MICROSURFACING WITH WARRANTY, MULTIPLE COURSE, AS PER PLAN	$ 1,441,412.76		
	MICROSURFACING WITH WARRANTY, SINGLE COURSE	$ 367,685.24	$ 543,505.19	
	MICROSURFACING WITH WARRANTY, SINGLE COURSE, AS PER PLAN	$ 115,576.20		
881 Total		$ 7,321,142.39	$ 4,037,770.14	$ 536,482.36
882	DOUBLE CHIP SEAL WITH WARRANTY	$ 108,075.80		
	SINGLE CHIP SEAL WITH TWO YEAR WARRANTY		$ 218,414.35	$ -
	SINGLE CHIP SEAL WITH WARRANTY	$ 170,803.18	$ 395,488.74	
882 Total		$ 278,878.98	$ 613,903.09	$ -
883	CRACK SEALING WITH WARRANTY, MISC.:			
883 Total				
884	10" PORTLAND CEMENT CONCRETE PAVEMENT (7 YEAR WARRANTY)		$ 1,247,320.75	
	11" PORTLAND CEMENT CONCRETE PAVEMENT (7 YEAR WARRANTY)		$ -	
	12" PORTLAND CEMENT CONCRETE PAVEMENT (7 YEAR WARRANTY)		$ 872,594.70	
	12" PORTLAND CEMENT CONCRETE PAVEMENT (7 YEAR WARRANTY), AS PER PLAN			
	12.5" PORTLAND CEMENT CONCRETE PAVEMENT (7 YEAR WARRANTY)		$ 484,262.85	
	13" PORTLAND CEMENT CONCRETE PAVEMENT (7 YEAR WARRANTY)		$ 4,905,140.76	$ 1,244,183.64
	13.5" PORTLAND CEMENT CONCRETE PAVEMENT (7 YEAR WARRANTY)		$ 4,142,070.45	
	14" PORTLAND CEMENT CONCRETE PAVEMENT (7 YEAR WARRANTY)		$ 7,962,613.82	
	225 MM PORTLAND CEMENT CONCRETE PAVEMENT (7 YEAR WARRANTY)			
	225 MM PORTLAND CEMENT CONCRETE PAVEMENT (7 YEAR WARRANTY), AS PER PLAN			
	250 MM PORTLAND CEMENT CONCRETE PAVEMENT (7 YEAR WARRANTY)			
	260 MM PORTLAND CEMENT CONCRETE PAVEMENT (7 YEAR WARRANTY)			
	310 MM PORTLAND CEMENT CONCRETE PAVEMENT (7 YEAR WARRANTY)			
	350 MM PORTLAND CEMENT CONCRETE PAVEMENT (7 YEAR WARRANTY)			
	8" PORTLAND CEMENT CONCRETE PAVEMENT (7 YEAR WARRANTY)			
	9" PORTLAND CEMENT CONCRETE PAVEMENT (7 YEAR WARRANTY)			
	9" PORTLAND CEMENT CONCRETE PAVEMENT (7 YEAR WARRANTY), AS PER PLAN			
	9.5" PORTLAND CEMENT CONCRETE PAVEMENT (7 YEAR WARRANTY)		$ 2,300,216.31	
	PORTLAND CEMENT CONCRETE PAVEMENT (7 YEAR WARRANTY), MISC.:		$ 2,378,045.34	
	SPECIAL - PORTLAND CEMENT CONCRETE PAVEMENT (7 YEAR WARRANTY)		$ 8,168,310.00	
	VARIABLE THICKNESS PORTLAND CEMENT CONCRETE PAVEMENT (7 YEAR WARRANTY)			
884 Total			$ 32,460,574.98	$ 1,244,183.64
888	PORTLAND CEMENT CONCRETE PAVEMENT, 10" THICK (NON-REINFORCEDPER 452)			$ -
	PORTLAND CEMENT CONCRETE PAVEMENT, 8" THICK (NON-REINFORCED PER 452)			$ 87,100.00
888 Total				$ 87,100.00
892	FULL DEPTH REPAIR WITH WARRANTY			
	HAND CHIPPING WITH WARRANTY			
	MICRO-SILICA MODIFIED CONCRETE OVERLAY (VARIABLE THICKNESS), MATERIAL ONLY WITH WARRANTY			
	MICRO-SILICA MODIFIED CONCRETE OVERLAY (VARIABLE THICKNESS),MATERIAL ONLY WITH WARRANTY			
	MICRO-SILICA MODIFIED CONCRETE OVERLAY USING HYDRO-DEMOLITION WITH WARRANTY			
	QC/QA CONCRETE, CLASS QSC2, SUPERSTRUCTURE (DECK) WITH WARRANTY	$ 335,888.98	$ 989,565.20	$ 412,141.60
	QC/QA CONCRETE, CLASS QSC2, SUPERSTRUCTURE (DECK) WITH WARRANTY, AS PER PLAN		$ 841,382.00	$ 2,113,043.00
	SPECIAL - BRIDGE DECK CONCRETE OVERLAYS WITH WARRANTY			
	SURFACE PREPARATION USING HYDRO-DEMOLITION WITH WARRANTY			
	TEST SLAB			
892 Total		$ 335,888.98	$ 1,830,947.20	$ 2,525,184.60
893	CLASS S CONCRETE, FOR BRIDGE DECK WITH WARRANTY	$ 379,105.00	$ 1,187,932.50	
	CLASS S CONCRETE, FOR BRIDGE DECK WITH WARRANTY, AS PER PLAN	$ 695,404.80		
	SPECIAL - STRUCTURAL CONCRETE WITH WARRANTY			
	SPECIAL - STRUCTURE, MISC.:			
893 Total		$ 1,074,509.80	$ 1,187,932.50	
894	HIGH PERFORMANCE CONCRETE, FOR BRIDGE DECK WITH WARRANTY, AS PER PLAN	$ 2,716,915.61	$ 5,756,895.94	$ 249,600.00
	HIGH PERFORMANCE CONCRETE, FOR BRIDGE DECK WITH WARRANTY	$ 9,573,820.86	$ 648,011.50	
	SPECIAL - HIGH PERFORMANCE CONCRETE WITH WARRANTY			
	SPECIAL - HIGH PERFORMANCE CONCRETE, FOR BRIDGE DECK WITH WARRANTY			
894 Total		$ 12,290,736.47	$ 6,404,907.44	$ 249,600.00
898	QC/QA CONCRETE, CLASS QSC2, SUPERSTRUCTURE (DECK)	$ 2,767,172.00		
898 Total		$ 2,767,172.00		
Grand Total		**$ 160,818,310.86**	**$ 185,781,702.28**	**$ 27,138,302.28**

Comparison of Unit Bid Prices

Table - 2 summarizes the 2005 unit bid prices awarded as provided by the Office of Estimating. Several items highlighted in pink are listed but could not be compared because of an insufficient number of comparable projects. The pink highlighted items are not included in the percent change calculations. The Table-2 summary shows that the warranty specifications have a mixed effect on the unit bid prices, some increase some decrease, and some are the same. As noted below, earlier reports have documented that warranty items were significantly higher than the non-warranty items. This trend from warranty items being fairly significantly higher in cost to now being comparable, and in some cases lower in unit cost indicate that the contracting industry is becoming much more comfortable with the warranty provisions.

In 2000 the Warranty Report to the legislature stated the following:

Item Description	Unit	Warranty (Years)	Warranty Bid Price Change
Asphalt Pavement (Full Depth)	Cubic Yard	5 and 7	+9%
Asphalt Pavement (Overlay)	Cubic Yard	3	+8%
Concrete Pavement (11")	Square Yard	7	+7%
Concrete Pavement (12" & 13")	Square Yard	7	+15%
Pavement Markings	Miles	3	+171%
Pavement Markings	Miles	5	+9%
New Concrete Deck, Class S	Cubic Yard	7	+6%
New Concrete Deck, HPC	Cubic Yard	7	+3%
Bridge Painting	Square Feet	5	+26%

It should be noted that the Bridge Painting with Warranty is no longer in effect, and has been removed from the comparison. The Warranty Bridge Painting with Warranty specification was withdrawn due to the significant cost increase as compared to non warranty painting, and Contractors not being able to meet the bonding requirements. Pavement Marking with Warranty was also withdrawn from use.

For 2005, the Unit Bid Prices from Table 2 are summarized below:

Item Description	Unit	Warranty (Years)	Warranty Bid Price Change
Asphalt Pavement (Full Depth)	CY	7	+1.19%
Asphalt Pavement (Overlay)	CY	3	-1.83%
Chip Sealing	SY	2	+12.49%
Concrete Pavement, (Average of all thicknesses)	SY	7	-7.83%
New Concrete Deck, (Average of all types)	CY	2	+5.65%

Table – 2, Comparison of Warranty Items to Non-Warranty Items

Item	Quantity	Unit	Description	Average Bid	% Difference in Bid Price
442E10000	**150,032**	**CU Y**	**Asphalt Concrete Surface Course, 12.5mm, Type A (446)**	**$84.55**	
442E10002	**38,874**	**CU Y**	**Asphalt Concrete Surface Course, 12.5mm, Type A (446) With Supplement 1059 Warranty**	**$83.00**	**-1.83%**
442E10001	**20,155**	**CU Y**	**Asphalt Concrete Surface Course, 12.5 Mm, Type A (446), APP**	**$91.67**	
442E10003	**41,445**	**CU Y**	**Asphalt Concrete Surface Course, 12.5mm, Type A (446) With Supplement 1059 Warranty, A**	**$91.86**	**0.21%**
854E15011	**1,614**	**CU Y**	**Fine Graded Polymer Asphalt Concrete, Type B, APP**	**$97.38**	
854E15020	**14,120**	**CU Y**	**Fine Graded Polymer Asphalt Concrete, Type B, With Supplement 1059 Warranty**	**$98.51**	**1.17%**
301E46000	35,316	CU Y	Asphalt Concrete Base, Pg64-22	$56.93	
442E10101	6,792	CU Y	Asphalt Concrete Intermediate Course, 19 Mm, Type A (446),	$69.25	
442E10000	5,811	CU Y	Asphalt Concrete Surface Course, 12.5mm, Type A (446)	$79.75	
442 w 301	**47,919**	**CU Y**	**A Weighted Average Of The Above**	**$61.44**	
880E15000	**409,212**	**CU Y**	**Asphalt Concrete (7 Year Warranty)**	**$62.80**	**2.21%**
421E10010	39,822	SQ Y	Microsurfacing, Surface Course	$2.51	
421E10020	39,822	SQ Y	Microsurfacing, Leveling Course	$2.93	
881E10000	**331,691**	SQ Y	Microsurfacing With Warranty, Single Course	$1.69	**-32.82%**
881E20000	**1,161,307**	SQ Y	Microsurfacing With Warranty, Multiple Course	$2.73	**0.18%**
422E10000	**769,529**	**SQ Y**	**Single Chip Seal With Polymer Binder**	**$0.94**	
882E10000	**644,832**	**SQ Y**	**Single Chip Seal With Warranty**	**$1.06**	**12.49%**
451E14000	**8,171**	**SQ Y**	**9" Reinforced Concrete Pavement**	**$65.32**	
884E10080	**139,302**	**SQ Y**	**9.5" Portland Cement Concrete Pavement (7 Year Warranty)**	**$32.64**	
451E16000	**541**	**SQ Y**	**12" Reinforced Concrete Pavement**	**$90.00**	
884E10200	**26,375**	**SQ Y**	**12" Portland Cement Concrete Pavement (7 Year Warranty)**	**$33.78**	
452E17200	**8,700**	**SQ Y**	**Non-Reinforced Concrete Pavement, Misc.:**	**$50.65**	
884E80000	**66,684**	**SQ Y**	**Portland Cement Concrete Pavement (7 Year Warranty), Misc.:**	**$34.18**	
452E15000	**2,668**	**SQ Y**	**12" Non-Reinforced Concrete Pavement**	**$62.28**	
452E15001	**137,827**	**SQ Y**	**12" Non-Reinforced Concrete Pavement, APP**	**$39.00**	
884E10200	**26,375**	**SQ Y**	**12" Portland Cement Concrete Pavement (7 Year Warranty)**	**$33.78**	**-13.37%**
884E10240	**24,950**	**SQ Y**	**12.5" Portland Cement Concrete Pavement (7 Year Warranty)**	**$47.76**	**22.46%**
452E13000	**25,657**	**SQ Y**	**9" Non-Reinforced Concrete Pavement**	**$36.10**	
884E10080	**139,302**	**SQ Y**	**9.5" Portland Cement Concrete Pavement (7 Year Warranty)**	**$32.64**	**-9.58%**
452E14000	**54,649**	**SQ Y**	**10" Non-Reinforced Concrete Pavement**	**$38.55**	
884E10100	**43,927**	**SQ Y**	**10" Portland Cement Concrete Pavement (7 Year Warranty)**	**$26.67**	**-30.82%**
511E31504	981	CU Y	Class S Concrete, Superstructure	$374.29	
511E31506	169	CU Y	Class S Concrete, Superstructure	$676.15	
511E31600	778	CU Y	Class S Concrete, Superstructure	$343.32	
511E33400	399	CU Y	Class S Concrete, Superstructure	$656.65	
511E34400	286	CU Y	Class S Concrete, Superstructure	$1,074.60	
511E34434	207	CU Y	Class S Concrete, Bridge Deck	$619.03	
511	**2,820**	**CU Y**	**A Weighted Average Of The Above**	**$512.70**	
892E10200	**3,559**	**CU Y**	**Qc/Qa Concrete, Class Qsc2, Superstructure (Deck) With Warranty**	**$541.67**	**5.65%**

Average difference between Warranty Item, and similar Non-warranty Item unit price bid: -3.67%

Pink indicates that the average bid price of the item may not be comparable due to being a small quantity or differing project conditions

Summary of Warranty Bonding Costs

The Department currently requires a maintenance bond to be provided in the amount of the warranted item (or portion thereof, depending on the specification). These charges are normally added together with the other project bonds and paid for by the pay item "Premium for Contract Performance Bond, Payment Bond and Maintenance Bond".

Year	Number of All Jobs	Sum of Original Contract Amount	Sum of Regular Projects Bond Amounts Bid	Number of Warranty Projects	Sum of Warranty Project Bond Amounts Bid
2004	626	$1,046,401,342	$3,836,989	43	$1,841,421
2005	594	$1,095,032,017	$4,232,247	37	$2,619,870

As part of this warranty review, several Contractors, and bonding companies were contacted to determine amounts normally paid for the warranty bonds.

Contractor's contacted	Phone Number
CJ Mahan	614-875-8200
Complete General	614-258-9515
ES Wagner	419-691-8651
Great Lakes	330-220-3982
Kokosing	614-228-1029
Miller Brothers	419-445-1015
Ruhlin	330-239-2800
Shelly and Sands	740-453-0721
Bonding Companies contacted	
Saint Paul	651-310-7911
Safeco	206-545-5000
Ohio Department of Insurance	614-644-2658

The bonding companies have a fairly wide range of rates filed with the Ohio Department of Insurance. The rates range from 0.05% to 10% for Painting. The Contractors contacted stated that the normal bonding rate charged for asphalt paving is 0.9% ($40,000 for $4.4 Million worth of work) It was noted that the prime contractor also requires the paving subcontractor to carry a similar bond, which in effect will double the bond cost to ODOT since they also have to pay the premium (and it is usually at a higher percentage rate). The amount ODOT is paying for the warranty bonds is estimated below:

Item Description	2004	2005
Asphalt Pavement	$49,097,540	$33,604,417
Bridge Deck	$14,746,203	$6,417,557
Concrete Pavement		$8,404,178
Pavement Maintenance	$7,600,021	$6,811,304
Total of Work Bid:	**$71,455,965**	**$61,772,225**
Warranty Bond Payment Estimate:	$643,104	$555,950

Current ODOT Policy on Implementation and Administration of Warranty Provisions

The Department views the legislation on warranties as direction to enhance the quality of Ohio's highways, thereby minimizing repairs and driver delay. ODOT's warranty policy 27-015(P) dated 4/1/2006 establishes responsibilities and requirements. The policy also seeks consistency in the implementation and administration of the warranty requirements in construction contracts, as well as proper selection of warranted items. The policy helps ensure that the impact of warranty requirements on the contracting industry is manageable and fair while meeting the requirements of the legislation. Implementation of the warranty program is outlined in the Innovative Contracting Manual dated 4/10/2006. The warranty policy and warranty section of the Innovative Contracting Manual are included in Appendix's B and C.

2006 Construction Season Warranty QAR Summary

The following is a summary of the QAR reports gathered from ODOT District construction personnel via District Office reviews and 20 warranty project visits in all 12 Districts in 2006:

Advantages of the warranty program

• Generally the ODOT field staff believe Contractors appear more conscientious about their work and are willing to pay closer attention to the quality of the product warranted. Some indicated their Contractor provided a higher level of quality assurance and quality control programs due to the warranty provisions.

• As for pavement warranties, the ODOT construction personnel indicated that Contractors were more proactive and took steps to fix poor existing soil conditions prior to placing the pavement.

• The reports also indicated that maintenance staff saw potential savings in time and materials due to not needing to maintain pavements during the warranty period.

• Most Districts do an adequate job of tracking and performing follow-up inspections on warranty projects.

• Warranty requirements have been held up in the Step 3 claim number: 04-0323(00)-1102-01 for cracking thin concrete pavement.

Disadvantages of the warranty program

• Field reports indicated warranties did not reduce the need for inspection. Documentation of existing conditions and methods is necessary in case of future claims by Contractors against the Department.

• Several warranty projects have had material performance problems that were not determined to be covered by the warranty (such as reflective cracking).

• District field reports also indicated that Contractors registered complaints on some warranty projects. For example, some districts received letters indicating that the pavement warranty provisions would be impossible to enforce during the review periods. Contractor letters cited existing faulty soil conditions will void the warranty provisions unless the necessary repairs were directed by the Department prior to placing the warranted item. Other letters indicated that joints in the new asphalt pavement cannot possibly be included as a warranted item due to the maintenance of traffic schemes indicated in the plans. Contractors made suggestions for improving the existing conditions and requested additional compensation to perform the extra work.

• Another Contractor concern relates to the Equivalent 18,000-pound Single Axle Loads (EASL's) from significantly heavy vehicles, known as "superloads," and how those loads are accounted for in determining the warranty pavement review requirements. The Department specification states that superloads will be calculated by the Department and prorated for the duration of the warranty period. Such information will be collected from the districts' weigh in motion systems where available. Even though past experience shows Department pavement design is more than adequate for such loads, Contractors believe superload traffic on the warranted pavement sections should void the warranty requirements.

• Some construction personnel felt the Department has lost control of the product under the warranty provisions. They maintain that districts are able to advise the Contractor of less than acceptable performance, but in view of the warranty specifications are not able to enforce better standards.

• Another concern for the District offices was the logistics of assembling review teams to inspect the warranted product during the warranty period. Future reviews are referred to as "delayed inspections." The larger multi-phase projects may have several warranty expiration dates (but no more than one per C-95/year) for various warranted items such as pavement, bridge decks and bridge painting. The pavement warranty is the most complex to track. By specification, a pavement warranty starts when all safety items (guard rail, striping) are in place and the Department accepts the pavement. On large multiple-phase projects, this may add up to three or four sections in each direction of travel, plus ramps and other collector roads.

• The Districts believe warranties are only as good as the Contractor and the surety companies involved. The concern is whether the Contractor will remain in business for the length of the warranty period and whether the company will honor the warranty bond if problems arise. The true test will be the first time ODOT asks for remedial action to be performed on a warranted item.

2006 Legislated Warranty Program Summary

In 2006, ODOT sold 23 new warranty projects. This number is the smallest since the warranty program was required by the 1999 legislation. The value of the 2006 warranty program is approximately $27,138,000 or about 2.2% of the ODOT total budget of $1.2 billion, well under the legislated 20% maximum allowed.

2003 ODOT Sponsored Warranty Research Project Summary

ODOT, in cooperation with the University of Cincinnati, conducted a 30 month research project in order to develop proper selection of projects with the current warranty requirements. Defining proper use of warranties to extend the life cycle of the product and to provide maintenance-free highways was also a goal of the research. The executive summary of the report is in Appendix D, the entire report can be found online here: http://www.dot.state.oh.us/research/Construction.htm

One suggestion of the research is as follows:

> *"The current practice of warranty provisions is worthwhile if its role is considered mainly as an insurance mechanism against the unexpected and a protection from early Contractor defaults. The optional warranty and a combination of warranty provisions with other contractual methods are two alternative approaches that could provide ODOT with a better way of utilizing warranty provisions on its contracts."*

2004 National Survey of Warranty Provision Usage

The ODOT Division of Construction conducted a nationwide survey of warranty specification usage in 2004. Based on this survey, most States have at least experimented with warranty provisions in pavements and bridges.

Text of questions sent via Email on 12/29/2004 to all 50 states:

- Does your state use any specifications that include a warranty clause (where the Contractor would be held responsible for repair of the item for a given duration) (Yes/No)
- How many construction projects are bid annually in your statewide construction program? (fill in a number ____)
- How many construction contracts (projects) in your current annual state wide construction program include at least one warranted item? (fill in a number ____) or what percentage of your construction program (fill in a number ____) ?
- What is the bid dollar value of your annual construction program? (fill in a dollar value ____)
- What is the approximate bid value of the warranted items in your current annual state wide construction program? (fill in a dollar value ____) or what percentage of your construction program (fill in a number ____) ?

Table - 3 details the responses received for the survey.

Table - 3, Summary of 2004 Survey on Usage of Warranty Provisions

Totals:	24		6274	800	$14,866,200,000	$546,616,000	
State	Email Contact	Warranty clause used in State?	How Many Projects sold	How Many Projects have Warranty?	Dollar Value of Whole program	Dollar Value of Warranty Items	Coments
Alabama							
Alaska	mark_obrien@dot.state.ak.us	No	90	0	$300,000,000	$0	
Arizona							
Arkansas	erry.Trotter@arkansashighways.cor	Yes	350	175	$570,000,000		
California							
Colorado							
Connecticut	Pall.Oushana@po.state.ct.us	Yes	130	5	$300,000,000	$3,000,000	Very small percentage
Delaware	JEustis@mail.dot.state.de.us						
Florida							
Georgia							
Hawaii	Virgilio.Gonzales@hawaii.gov	Yes	46	46	$170,000,000	$170,000,000	All projects have a warranty clause
Idaho							
Illinois							
Indiana	RSMUTZER@indot.state.in.us	Yes		3	$750,000,000	$50,000,000	Researching Erosion control warranties (3-5 current additional projects)
Iowa	John.Smythe@dot.iowa.gov	No	350	0	$400,000,000	$0	
Kansas	DennisW@ksdot.org	No					We did attempt to use them on pavement markings for a time but found the contractors could not provide the type warranty we wanted at a price we wanted to pay and we dropped the idea.
Kentucky	Dexter.Newman@ky.gov	Yes	800	5	$750,000,000	$3,250,000	We have several material warranties, where a manufacturer will stand by his product. We also let a few alternate paving projects a year in which we use a variable warranty in lieu of doing bid credits to equate the pavements.
Louisiana							
Maine	Scott.Bickford@maine.gov	Yes	150	150	$150,000,000	$150,000,000	We are currently investigating requiring extended warranty provisions on some of our paving projects but have not advertised any to date. All our Projects have a 1 year warranty.
Maryland							
Massachusetts	Michael.Mcgrath-DPW@state.ma.us	No	211	0	$448,000,000	$0	
Michigan	kennedyk@michigan.gov	Yes	220	176	$538,000,000		
Minnesota	Denny.Springer@dot.state.mn.us	Yes	250	11	$459,500,000	$3,000,000	Warranty projects are still in the more or less pilot stage and are being studied further. We are moving in that direction. As you can see most of the current warranties are for the simpler projects (Rout & Seal or Bituminous overlay Br. Painting
Mississippi	dfunchess@mdot.state.ms.us	Yes	130	2	$350,000,000	$6,000,000	Mississippi DOT only has warranty specifications for hot mix asphalt pavement, which is used on select projects only.
Missouri	Travis.Koestner@modot.mo.gov	No	450	0	$800,000,000	$0	We have one "experimental project" that was bid with a 15 year asphalt pavement warranty, this was an approximately $20 million project that was a partnership with a transportation corporation.
Montana							
Nebraska							
Nevada							
New Hampshire	WBoynton@dot.state.nh.us	No	70	0	$130,000,000	$0	
New Jersey							
New Mexico							
NewYork							
North Carolina							
North Dakota	sdewitt@dot.state.nc.us	Yes	300	60	$1,200,000,000	$120,000,000	Approximately 300 over $1.2 million. Many, many others under the $1.2 threshold on our "purchase order" program. Any major project includes the one year warranty. Only a handful (5 +/-) have anything more than that.
Ohio	bob.jessberger@dot.state.oh.us	Yes	600	30	$880,000,000	$14,000,000	Data for 2003 (last complete year of projects)
Oklahoma							
Oregon							
Pennsylvania	tramirez@state.pa.us	Yes	350	20	$1,250,000,000	$500,000	We have let a total of four (4) HMA Warranty projects since 1999 (1999-2003). One potential HMA Warranty contract planned for this year. All four are still under the warranty period. I am also aware that we let some 3-year warranty contracts for durable pavement markings in the late 1990's to 2002. I do not know the total number of contracts let during this period. No Durable Pavement Marking Warranty projects have been let during the last two years. This program typically had 3-4 contracts per year for a total of $2 to $2.5 Million per year. There are currently 4 projects still under the warranty period for this program. The PENNDOT lead for this program has been Ken Williams (phone: 717-772-5462).
Rhode Island							
South Carolina							
South Dakota							
Tennessee							
Texas	SNICHOLS@dot.state.tx.us	Yes	1000	23	$4,000,000,000	$7,700,000	
Utah	rwestover@utah.gov	Yes	160	24	$363,700,000	$5,000,000	Mostly Traffic Signal warranties used
Vermont	James.Lacroix@state.vt.us	No	40	0	$95,000,000	$0	Towns are responsible for the advertisement, bid opening, and award
Virginia	Warner.Coburn@VDOT.Virginia.gov	Yes	462	45	$722,000,000	$2,166,000	Yes, but mostly related to electrical and traffic items. Contractor is required by Specifications to supply an in-service operational guaranty (warranty) for at least 6 months beginning with the date of final acceptance on all mechanical and electrical equipment and related components.
Washington							
West Virginia							
Wisconsin							
Wyoming	Ken.Spear@dot.state.wy.us	Yes	115	25	$240,000,000	$12,000,000	

2003 FHWA Warranty Report findings

The FHWA has performed extensive work researching best practices in warranty usage, including the 11/2003 report: "*Asphalt Pavement Warranties — Technology and Practice in Europe"* available here: http://international.fhwa.dot.gov/apw/executive.htm

An excerpt from the reports "**Conclusions and Recommendations":**

"The European host countries all believe that their long history of warranty application has improved the performance of their highway and trunk road systems. Their warranty systems continue to evolve through a customer-focused partnership between government and industry. Best-value procurement and prequalification are vital elements of the warranty system. Material and workmanship warranties are in use on all short-term warranties. Five-year performance warranties are in use when the Contractor completes some level of design. The long-term performance warranties include design, construction, and some type of planned maintenance. The Europeans hosts use all of these warranties in balanced contracting approaches. The European Asphalt Pavement Warranties Scan team included representatives from Federal, State, and local agencies, industry, and academia. The scan team offers the following recommendations on the basis of its observations of successful warranty programs in the European host countries."

…

State and Local Government

"Create model warranty documents: Draft contract documents for warranty implementation with representation from all stakeholders. AASHTO should take the lead in the creation of these documents in collaboration with local governments and industry.

Implement material and workmanship warranties: The State and local highway agencies should develop material and workmanship warranty programs through internal education and industry participation.

Implement short-term performance warranties: State and local highway agencies should implement short-term performance warranties when it is appropriate for the Contractor to perform the necessary design.

Enable best-value and prequalification procedures: State and local highway agencies should work to enable legislation allowing contract awards based on technical and quality factors in addition to cost."

U.S. Parallel: U.S. Warranty Use

"In December 2000, the FHWA issued a Briefing on Warranty Clauses in Federal Aid Highway Contracts (FHWA 2000) that outlined the use of warranties in federal-aid highway contracts in the United States. In this briefing, it listed the following States as using pavement-related warranty provisions.

Product	Range of Warranty Periods	States
Asphaltic Concrete/Rubberized Asphalt	3-8 years	AL, CA, CO, FL, IN, ME, MI, MO, MS, OH, NM, UT, WI
Asphaltic Crack Treatment	2 years	MI
Chip Sealing	1-2 years	CA, MI
Microsurfacing	2 years	CO, MI, NV, OH
Pavement Marking	2-6 years	FL, MT, OR, PA, UT,WV

Numerous other States have used warranties since this 2000 FHWA briefing. These States include, but are not limited to, Illinois, Kentucky, Louisiana, Minnesota, Virginia, and Washington. In addition to asphalt paving, some States are also using warranties for concrete paving, bridge painting, and intelligent transportation system components. Although the United States does not have the long history of pavement warranty experience found in Europe, warranties are in use and growing throughout the country."

Appendix A, Ohio Revised Code 5525.25

§ 5525.25. Pavement and other warranties.

(A) For each fiscal year, not more than one-fifth of the department of transportation's capital construction projects shall be bid requiring a warranty as specified in the bidding documents and in division (B) of this section.

(B) A warranty period under this section shall be:

(1) Not more than seven years, for pavement in the case of new construction;

(2) Not more than five years, in the case of bridge painting and pavement resurfacing and rehabilitation;

(3) Not more than two years, in the case of pavement preventative maintenance, pavement markings, raised pavement markers, guardrail, and other project items as determined by the director.

This section does not apply to contracts the director makes on behalf of a political subdivision.

HISTORY: 148 v H 163 (Eff 6-30-99); 149 v H 73. Eff 6-29-2001; 151 v H 68, § 101.01, eff. 6-29-05.

The effective date is set by § 612.03 of 151 v H 68.

Effect of Amendments
Section 101.01, 151 v H 68, effective June 29, 2005, in (B)(2), inserted "bridge painting and"; and, in (B)(3), deleted "bridge painting" preceding "pavement markings".

Appendix B, Warranty Policy, and Warranty Excerpt from the Innovative Contacting Manual

Approved:

Policy: 27-015(P)
Effective: April 1, 2006
Responsible Office: Division of Construction Management
Supersedes 510-002(P) dated: 7/24/2000

_____
Gordon Proctor
Director

IMPLEMENTATION AND ADMINISTRATION OF WARRANTY PROVISIONS

POLICY STATEMENT:

Senior Leadership views the legislation on warranties as an opportunity to satisfy the driving public by improving our highways, minimizing repairs and driver delays.

The purpose of this policy is to establish responsibilities, expectations and consistency in the Department's implementation and administration of warranty requirements in construction contracts. Of particular importance is the proper selection of warranted items in contracts and consistent and equitable review of warranty criteria. Following this policy will help ensure the impact of warranty requirements on the contracting industry is manageable and fair while meeting the requirements of the legislation and demands of the taxpayer.

AUTHORITY:

Transportation Budget Act, Ohio General Assembly Bill 163

REFERENCES:

Ohio Revised Code Section 5525.25 (A) & (B)
Construction and Material Specifications
Warranty Supplemental Specifications
Warranty Application Guidelines section of the Innovative Contracting Manual
Construction Manual of Procedures
Standard Construction Drawings

SCOPE:

This policy is for the use of Districts in selecting, applying, and reviewing projects with warranted construction items.

ABBREVIATIONS:

C&MS: Construction and Material Specifications
Contractor: Defined in C&MS Section 101.14.
DDD: District Deputy Director
WC: Warranty Coordinator
DCE: District Construction Engineer
DWC: District Warranty Coordinator
DRT: District Review Team
PE/PS: Project Engineer or Project Supervisor

PROCEDURE STATEMENT:

I. Central Office shall name a Warranty Coordinator.

A. Authority -The Warranty Coordinator (WC) shall be given authority by the Deputy Director of Construction Management and shall serve as liaison between the Districts and Central Office for warranty implementation and administrative issues. The WC shall also act as a liaison between the industry and the department.

B. Responsibilities -The WC will track the implementation of the warranty items, from project inception through construction, for the purposes of reporting to Senior Leadership and the Legislature on the progress of the warranty program. In order to ensure success of the warranty program, the WC shall work in close cooperation with the Division of Contract Administration and the Division of Construction Management in analyzing and evaluating data and information submitted by the Districts. Success of the warranty program is defined as a program that can be fairly contracted and attain an improved product for the Ohio taxpayer.

II. Each District shall name a DWC.

A. Authority -The DWC shall be given authority by the DDD to drive, advise, and track the warranty program progress in all involved offices of the district. The DWC will have practical knowledge in the field of project selection including experience in contract administration. All communications on warranties shall go through the DWC.

B. Reporting responsibilities -The DWC shall submit written monthly and annual reports to the WC. The reports shall include project progress tracking from selection through construction, cost of warranty items, construction updates generated by the PE/PS, and DRT feedback. The WC shall set the required format for the reports.

III. Warranty project selection.

A. District responsibility - The District is fully responsible for selecting projects with warranted work items. The written Warranty Application Guidelines, as approved by the Division of Construction Management, will be closely followed by the DWC, District Production, District Planning, and Highway Management personnel for warranty project selection.

B. Central Office responsibilities - If requested, the WC, with the help of the Division of Construction Management shall provide feedback and advice to districts in project selection.

C. Warranty Application Guidelines -Maintaining the Warranty Application Guidelines will be the responsibility of the WC in cooperation with the Division of Construction Management.

IV. Warranty contract letting requirements

A. the Division of Contract Administration will identify all upcoming projects that contain warranted bid items. This will be provided as notice to the Contractors.

B. Warranty items shall not be added by addendum during project advertisement.

C. The District is encouraged to conduct a pre-bid meeting for larger projects. The DWC shall attend the pre-bid meeting.

V. Documentation and field inspection requirements

A. The PE/PS and his staff shall enforce the material and construction techniques, when called for in the warranty supplemental specifications, as required in the C&MS and the appropriate manual of procedure.

B. When the warranty supplemental specifications require necessary materials, but generally do not call for a method of workmanship, the PE/PS shall not advise the Contractor on how to proceed with the material application. The PE/PS must insure that the material used is approved and shall document the method used by the Contractor in applying the material. This documentation shall be technical, objective and descriptive in nature and shall not include personal opinion or other unnecessary remarks.

C. Requiring the Contractor to provide a warranty does not relieve PE/PS of their responsibility to check the adequacy of existing base conditions in the field. Failures during the warranty period which are the result of the existing conditions are still ODOT's responsibility. To prevent these sorts of failures, deficient existing bases must be undercut and stabilized according to ODOT specifications.

D. The DCE shall maintain district project files and plans for the duration of the

warranty period. A project file shall include the district copy of the Warranty Maintenance Bond, Payment Bond, Performance Bond, signed proposal and agreement, signed extra work change orders and C-85 form.

VI. Warranty review administration

A. Uniformity -The DCE and DRT have full responsibility for reviewing warranted projects and items according to the specified warranty review requirements.

B. Reviews -The warranty specifications allow the District Deputy Director to waive the yearly review on warranted projects. However, each District shall select one warranty *pavement* project and perform annual reviews with NO waiver. This should be done for every calendar year in order to collect data for research purposes. This annual review data shall be sent to the WC.

C. Forming the DRT -The District will form teams of experienced construction, highway management and/or structures personnel to perform the annual review of warranty items. The DRT makeup will vary depending on the warranted item reviewed. The minimum team for pavement items should consist of three people for a formal review. Where practical, the team should always be the same people for a given warranty item. It is advisable to include as observers when possible the DWC, and planning and production personnel so they have an opportunity to learn about application issues through the review process.

D. Administering the DRT

1. Uniformity - All members of the DRT will receive training for reviews under the auspices of the DCE. When possible, a pavement DRT shall always have at least two personnel experienced in pavement warranty reviews.

2. Reporting - The DRT will report all findings to the DCE. The findings will become part of a warranty projects records file in the district.

E. Feedback from the DRT - Although the review findings of the DRT are filed in the District, pertinent information from the DRT or DCE regarding the review process and/or success of warranties in general must be forwarded to the WC in order to improve processes where possible. At a minimum, the DWC shall report annually to the WC the general findings of the warranty process. This report shall briefly summarize problems encountered, warranty administration effort, and success or lack of success in terms of the purpose of warranties.

VII. Enforcement of warranties

A. Appeal Process -The appeal process as outlined in each warranty specification shall be strictly followed. A record of the appeal process shall be maintained in the District

with the DRT review results.

B. Invoking the bond -Should a Contractor refuse to conduct repairs but not appeal, or should a Contractor refuse to perform repairs according to the repair requirements of the specification, or should a Contractor refuse to conduct repairs in accordance with arbitration, the bond on the project shall be invoked. In this event, the Division Of Contract Administration and the Chief Legal Counsel shall be contacted by the DCE and DWC.

C. Follow through on enforcement of warranty provisions is the responsibility of the DCE, DWC and WC.

VIII. Relationship with the Contracting Industry

A. The WC shall ensure that open communications with all affected industry exist on issues surrounding specifications, reviews, enforcement or the warranty program direction.

B. Concerns raised by industry shall be investigated and discussed with all involved Central Office and District personnel in an open and expedient manner. All input by the department personnel shall be communicated by the WC to Senior Leadership.

TRAINING:

The WC, Division of Construction Management and the Office of Quality and Organizational Development shall provide training to the DCE, DRT and DWC. The training will cover the warranty specifications focusing on the review process and appeal process. These trained people will become trainers when necessary in the District.

FISCAL ANALYSIS:

The Department has outsourced a 30-month research program to evaluate the effect of using the warranty provisions. The research will help determine if the savings, with respect to cost, quality and time, for warranted versus non-warranty projects were beneficial to the department. The research will also compare data from litigation costs, cost to review the warranted product, life cycle cost and savings of not having the department maintain the product during the warranty period.

Appendix C, Warranty Excerpt from the Innovative Contacting Manual

Warranties

Purpose and Benefits

A warranty is a guarantee of the integrity of an individual's work that carries with it the responsibility to repair or replace deficiencies. Highway construction warranties, however, are for a specific work item. They are generally provided for a period of time and are only for items which the Contractor has full control over. Long-term maintenance is not normally included.

Quality: Warranties are to guarantee the quality and durability of selected work items for a specific period of time after construction, resulting in lower life-cycle costs.

Warranty: The Warranty Coordinator will assure the new Warranty Guidelines are consistent. Warranties lower the owner risk by providing assurance that the Contractor will correct early failures due to poor materials or workmanship that may have gone unnoticed during construction. This reduces or eliminates unnecessary costs of early maintenance due to poor performance. Warranties also induce a higher concern for quality by Contractors, designers, and suppliers of transportation facilities and systems. Warranties encourage the development of better testing equipment and techniques for construction projects and reduce inspection and contract administration responsibilities for the owner.

Guidance: The District must follow the Policy 510-002(P), Implementation and Administration of Warranty Provisions, and the guidelines in this document.

Criteria for Selection

- The warranted work element is entirely within the Contractor's control and is measurable.
- Work items have material and workmanship performance attributes or failure thresholds which can be explicitly defined in the specification and measured in the field.
- Aspects of the design, or other factors not under the Contractor's control, will have minimal impacts on the warranted work during the warranty period or can be distinguished from the warranted work.
- The project may have opportunities to develop and incorporate innovative technologies in materials, equipment, and construction processes.
- Existing project conditions must be well defined.
- Performance requirements must be clearly defined. Monitoring methods and acceptable thresholds for these requirements must also be defined.
- Construction quality parameters and acceptance criteria must be clearly defined.

Project Types

Asphalt -New and Major Rehabilitation (see SS 880) - 7 years.
Asphalt - Preventive maintenance and minor rehabilitation (see S 1059) - 3 years.

New Bridge Deck (see SS 892, SS 893 or SS 894) - 2 years.
Painting Bridge Steel (see SS 885) – 5 years.
Concrete - New and Major Rehabilitation (see SS 884, SS 896) - 7 years.
Chip Seal, Micro Surfacing, (see SS 882) - 2 years.
Hot in Place Recycling (see SS 886) – 3 years.
Microsurfacing (see SS 881) – 2 years

Concerns

- The use of warranties without adequate technology or processes to handle the contracts may lead to an increase in disputes and costly litigation. This could harm the long-term adoption and potential benefits of using warranties.
- Owners are unsure of their ability to administer contracts with warranties and to enforce them over an extended period of time. The length of the warranty period required to catch deficiencies caused by poor material or construction is of particular concern.

Warranty Specification Guidelines

In order to assure success of the warranty program, ODOT must apply warranty specifications to the proper projects. These guidelines are intended to clarify application and reduce the chances for disagreements during the warranty period. Failure to follow these guidelines may lead to disagreements in the future and could void the warranty or harm the warranty program. The policy titled: *Implementation And Administration Of Warranty Provisions, 510-002(P)* describes how ODOT is to administer and monitor the warranty program.

Below please find a list of available warranty specifications contained in this document. Questions regarding this document should be directed to the Key Person(s) listed. The latest version of warranty specifications can be found online at:
www.dot.state.oh.us/construction/OCA/Specs/SSandPN2005/default2005.htm

Item	Supp Spec	Period (Years)	Application	Key Person (s)	
Asphalt	880	7	New and major rehabilitation	Aric Morse Dave Powers Lloyd Welker	614.995.5994 614.275.1387 614.275.1351
	1059	3	Preventative maintenance and minor rehabilitation		
Bridge Deck	892, 893, 894	2	New Bridge deck Concrete	Scott Leblanc	614.644.6628
Bridge Paint	885	5	Painting of Structural Steel	Scott Leblanc	614.644.6628
Concrete Pavement	884, 896	7	New and major rehabilitation	Aric Morse Lloyd Welker	614.995.5994 614.275.1351
Chip Seal	882	2	Preventive maintenance	Aric Morse Dave Powers Lloyd Welker	614.995.5994 614.275.1387 614.275.1351
Hot In-place Recycling	886	3	Surface courses		
Microsurfacing	881	2	Preventative maintenance		

Bridge Deck Warranty Application Guidelines

The warranty covers three different types of possible defects. These defects are alligator or map cracking, scaling, and spalling. These three defects are the result of actions under the control of the Contractor and are independent of the design of the deck.

The following items apply to all bridge deck warranty specifications:

1. Must be used on all priority system routes.
2. Must be used for projects with average daily traffic (ADT) greater than 30,000.

The maximum warranty period is only 2 years while bridges are designed to last much longer then this period.

Supplemental Specification 892

QC/QA Concrete for New Bridge Decks with Warranty
This is intended for new bridge decks.
The pay description is:

Item 892 QC/QA Concrete Class _____Superstructure (Deck) with Warranty

Supplemental Specification 893

Class S Concrete for New Bridges Decks with Warranty
This is intended for new bridge decks.
The pay description is:

Item 893 Class S Concrete for Bridge Deck with Warranty

Supplemental Specification 894

High Performance Concrete for New Bridges Decks with Warranty
This is intended for new bridge decks.
The pay description is:

Item 894 High Performance Concrete for Bridge Deck with Warranty

Structural Steel Paint Warranty Application Guidelines

The warranty covers any of the following conditions that are discovered within the specified warranty period.

- The occurrence of visible rust or rust breakthrough, paint blistering, peeling, scaling or un-removed slivers.
- Paint applied over dirt, debris, blasting debris, or rust products not removed during blast cleaning.
- Material deficiencies, application deficiencies, incomplete coatings, or coating thicknesses outside the thickness limits specified in the paint system specifications.
- Damage to the coating system caused by the Contractor while removing scaffolding, forms, or performing other work.

The following items apply to all structural steel paint warranty specifications:

- Must be used on all projects that call for painting of structural steel.

The maximum warranty period is only 5 years.

Supplemental Specification 885

Painting of Structural Steel with Warranty

This is intended for all painting of structural steel. The pay descriptions are:

Item	Unit	Description
885	Square Foot (Square Meter) Lump Sum	Surface Preparation of Existing Structural Steel, with Warranty
885	Square Foot (Square Meter) Lump Sum	Field Painting of Existing Structural Steel, Prime Coat, with Warranty
885	Square Foot (Square Meter) Lump Sum, Pound (Kilogram)	Field Painting Structural Steel, Intermediate Coat, with Warranty
885	Square Foot (Square Meter) Lump Sum, Pound (Kilogram)	Field Painting Structural Steel, Finish Coat, with Warranty
885	Man Hour	Grinding Fins, Tears, Slivers on Existing Structural Steel
885	Each	Final Inspection Repair

Pavement Warranty Application Guidelines

Requiring the Contractor to provide a warranty does not relieve ODOT of its responsibility to apply the proper pavement rehabilitation strategy. Pavements which require full depth repairs in a non-warranty situation require those same repairs under a warranty. The warranty does not hold the Contractor responsible for the condition of the existing pavement. Failures during the warranty period which were the result of the existing conditions are still ODOT's responsibility and not the Contractor's. To prevent these sorts of failures, ODOT must specify the proper treatment(s) of the existing pavement and base so the Contractor has the opportunity to provide a pavement which will last through the warranty period. Failure to follow these guidelines may lead to disagreements in the future and could void the warranty.

The following documents are to be followed for all pavement warranty projects, where applicable:

1. Pavement Design and Selection Process (Pavement Policy)
2. Pavement Design & Rehabilitation Manual (Pavement Manual)
3. Pavement Preventive Maintenance Program Guidelines.
   (http://www.dot.state.oh.us/pavement/Pubs/PM%20Guide.pdf)

The recommended minimum project length for pavement warranties is one lane-mile.

The following pages detail guidelines for application of each of the pavement warranty specifications and supplements.

Supplemental Specification 880

Asphalt Concrete with Warranty *(7 year)*

The following items apply:

1. Restricted to new pavement, pavement replacement, and major rehabilitation (Rubblize and Roll, and Crack and Seat).
2. Must be used on all projects that have a continuous pavement length greater than 1 mile.
3. May not be used on urban routes with forced stop conditions along the mainline.
4. Must be structurally designed for a minimum 20 year life.

Plan development is intended to be done in a timely manner in order to sell the project within the time frame assumed in the pavement design calculations. Contract documents must include the Design Designation and all pertinent information necessary for a successful contract.

A project file containing all pavement design information must be kept on file in the District office until the end of the warranty period. This file must include all traffic information, ESAL calculations, deflection data and analysis, all pavement history performance information, and any other design information used in the design and analysis of the pavement.

The warranty requirements for rutting are waived within 200' of the end of a ramp if the pavement depth is tapered down. Districts should consider following the High Stress Guidelines, Appendix B of the Pavement Manual, and specifying non-warranted material in these locations.

Typical Sections will show assumed lift thicknesses and step widths according to Section 103 of the Pavement Manual. A note must be included in the General Notes stating; "Lift thicknesses and step widths shown in the plan are for quantity estimation only and are not required lift thicknesses for actual construction."

The pay description is:

Item 880 Asphalt Concrete (7 year warranty).

Supplemental Specification 884

Concrete Pavement with Warranty

The following items apply:

1. Restricted to new pavement, pavement replacement, and major rehabilitation (Unbonded Concrete Overlay).
2. Must be used on all priority system routes.
3. Must be used for projects with average daily traffic (ADT) greater than 30,000.
4. Must be used on all projects that have a continuous pavement length greater than 1 mile.
5. Must be structurally designed for a minimum 20 year life.

Plan development is intended to be done in a timely manner in order to sell the project within the

time frame assumed in the pavement design calculations. Contract documents must include the Design Designation and all pertinent information necessary for a successful contract.

A project file containing all pavement design information must be kept on file in the District office until the end of the warranty period. This file must include all traffic information, ESAL calculations, deflection data and analysis, all pavement history performance information, and any other design information used in the design and analysis of the pavement.

Plans must show the entire concrete pavement, mainline, shoulders, ramps, etc., as Item 884. Typical sections must specify the locations and types of longitudinal joints. Transverse joints and intersection details are not necessary. All Standard Drawings for concrete pavement are still required.

This Item may be placed on an asphalt base or an aggregate base. When an asphalt base is used, a minimum of 4 inches Item 301 or 302 Bituminous Aggregate Base on 6 inches of Item 304 Aggregate Base is required. When aggregate base is used, a minimum of 6 inches of Item 304 Aggregate Base is required.

It is up to the Department to specify the base to be used.
The warranty specification allows the Contractor to choose reinforced or plain (451 or 452) concrete pavement.

The pay item description is:

Item 884 Portland Cement Concrete Pavement (7 year warranty)

Supplemental Specification 896

QC/QA Concrete Pavement with Warranty

The following items apply:

1. Restricted to new pavement, pavement replacement, and major rehabilitation (Unbonded Concrete Overlay).
2. Must be used on all priority system routes.
3. Must be used for projects with average daily traffic (ADT) greater than 30,000.
4. Must be used on all projects that have a continuous pavement length greater than 1 mile.
5. Must be structurally designed for a minimum 20 year life.

Plan development is intended to be done in a timely manner in order to sell the project within the time frame assumed in the pavement design calculations. Contract documents must include the Design Designation and all pertinent information necessary for a successful contract.

A project file containing all pavement design information must be kept on file in the District office until the end of the warranty period. This file must include all traffic information, ESAL calculations, deflection data and analysis, all pavement history performance information, and any other design information used in the design and analysis of the pavement.

Plans must show the entire concrete pavement, mainline, shoulders, ramps, etc., as Item 884. Typical sections must specify the locations and types of longitudinal joints. Transverse joints and intersection details are not necessary. All Standard Drawings for concrete pavement are still required.

This Item may be placed on an asphalt base or an aggregate base. When an asphalt base is used, a minimum of 4 inches Item 301 or 302 Bituminous Aggregate Base on 6 inches of Item 304 Aggregate Base is required. When aggregate base is used, a minimum of 6 inches of Item 304 Aggregate Base is required.

It is up to the Department to specify the base to be used.
The warranty specification allows the Contractor to choose reinforced or plain (451 or 452) concrete pavement.

The pay item description is:

Item 896 QC/QA Concrete Pavement (7 year warranty)

Supplement 1059

Asphalt Concrete Surface Course Warranty Requirements

This Supplement requires the Contractor to provide a 3 year warranty. Standard specification items are used in the plans for all pavement materials, i.e. 446, 448, etc.
The following items apply:

1. Must be used on all priority system preventive maintenance projects that qualify for thin hot-mix overlay, as defined in the Pavement Preventive Maintenance Program Guidelines.
2. May be used on all general system preventive maintenance projects that qualify for thin hot-mix overlay, as defined in the Pavement Preventive Maintenance Program Guidelines.
3. Must be used on all priority system minor rehabilitation projects, designed in accordance with Pavement Design and Rehabilitation Manual.
4. May not be used on urban routes with forced stop conditions along the mainline.
5. May be used on two-lane routes for non preventative trial projects with prior approval from the Office of Pavement Engineering.
6. The warranty shall only be applied to current items listed in the item master as approved by Central Office.

To qualify for minor rehabilitation, the projected PCR must be between 55 and 75 in the year construction is to take place. PCR projection equations are given in Section 100 of the Pavement Manual. Projects which do not qualify for preventive maintenance nor have been designed in accordance with the minor rehabilitation requirements are not eligible for a warranty.

Where preventive maintenance or minor rehabilitation is set up to address medium or high severity rutting as defined in the PCR manual, considerations of milling must be in accordance with High Stress Guidelines, Appendix B of the Pavement Manual.

The warranty requirements for rutting are waived 250' prior to a forced stop control (i.e. stop sign, traffic signal, etc.). Districts should consider following the High Stress Guidelines, Appendix B of the Pavement Manual, and specifying non-warranted material in these locations.

Typical pavement items such as full depth repair or milling must be specified in the plans as they have always been. The warranty requirements do not require the Contractor to perform any work not specified in the plans nor do they hold him responsible for any failures resulting from existing conditions.

Typical sections will specify each layer of asphalt and the thickness according to Section 404 of the Pavement Manual. SS 1059 Warranty only applies to the surface course. For the warranted layers, only the surface pay item description will change.

Examples of pay items are:

Item 446, Asphalt Concrete Surface Course, Type 1H with Supplement 1059 Warranty
Item 448, Asphalt Concrete Surface Course, Type 2, PG 64-28 with Supplement 1059 Warranty
Item 442, Asphalt Concrete Surface Course, 12.5 MM, Type A (446) With Supplement 1059 Warranty etc.

Supplemental Specification 881

Micro-Surfacing with Warranty

This Item requires the Contractor to provide a 2 year warranty. The following items apply:

1. Must be used on all preventive maintenance projects that qualify for micro-surfacing, as defined in the Pavement Preventive Maintenance Program Guidelines.
2. This Item can be used on minor rehabilitation projects which do not require a structural overlay (see Pavement Design and Rehabilitation Manual).

Projects which do not qualify for preventive maintenance nor have been designed in accordance with the minor rehabilitation requirements are not eligible for a warranty.

High stress locations are not candidates for micro-surfacing and must be treated in accordance with High Stress Guidelines, Appendix B of the Pavement Manual.

The guidelines for using micro-surfacing with warranty are essentially the same as the preventive maintenance guidelines for conventional micro-surfacing. With warranty, however, it is more important that proper pavements be selected and the existing pavement is properly prepared, otherwise the warranty could be voided.

The pay item descriptions are:

Item 881 Micro-Surfacing with Warranty, Single Course
Item 881 Micro-Surfacing with Warranty, Multiple Course

Supplemental Specification 882

Chip Seal with Warranty

This Item requires the Contractor to provide a 2 year warranty. The following items apply:

1. Must be used on all preventive maintenance projects that qualify for chip sealing, as defined in the Pavement Preventive Maintenance Program Guidelines.
2. Restricted to two-lane routes, with less than 2500 ADT.
3. Projects which do not qualify for preventive maintenance are not eligible for a warranty.

It is very important that pavements be selected in accordance with the Pavement Preventive Maintenance Guidelines; otherwise the warranty could be voided.

The pay item descriptions are:

Item 882 Single Chip Seal with Warranty
Item 882 Double Chip Seal with Warranty

Supplemental Specification 886

Hot In-Place Recycling with Warranty

This Item requires the Contractor to provide a 3 year warranty. It may be used on multi-lane or two-lane facilities. There are no traffic volume restrictions.

The following items apply:

1. This Item can be used on minor rehabilitation projects which do not require a structural overlay (see Pavement Design and Rehabilitation Manual).
2. This Item can be used as a preventive maintenance treatment where the project qualifies for any of the preventive maintenance applications as defined in the Pavement Preventive Maintenance Programs Guidelines.
3. May not be used on urban routes with forced stop conditions along the mainline.

Projects which do not qualify for preventive maintenance nor have been designed in accordance with the minor rehabilitation requirements are not eligible for a warranty.
High stress locations are not candidates for Hot In-Place Recycling and must be treated in accordance with High Stress Guidelines, Appendix B of the Pavement Manual.

Hot in-place recycling is not an appropriate treatment on pavements with an existing surface course consisting of an Item 404 or Item 448 Type 1 mix if the current truck traffic calls for a heavy traffic volume mix design.

The pay item description is:

Item 886 Hot In-Place Recycling with Warranty

Appendix D, "The Evaluation of Warranty Provisions on ODOT Construction Projects", 12/20/2003

Excerpts from the Research Report Findings, Purdue University, 12/20/2003

Objectives
This research addresses several objectives:

- Establish the state-of-practice of warranty contracting in the US, analyze its pros and cons, and determine its future prospects.
- Prepare a reference document on warranty contracting that addresses all the issues associated with the major components of a project including cost, quality, time, bonding, and disputes and litigation.
- Provide a philosophical discussion on the effectiveness of warranty contracting.
- Propose methods and formats for data collection on warranty projects.

Description
The objectives and deliverables of the research were achieved through three modes of data collection:

(i) literature review of academic publications, technical reports and online resources,
(ii) questionnaire surveys targeting state DOTs, the 12 ODOT districts, Contractors and bonding companies, and
(iii) personal interviews of selected parties and individuals. The literature review helped in identifying a list of variables associated with the major project components to differentiate warranty projects from non-warranty projects. As such, four sets of questionnaires were compiled and mailed to 170 organizations including state DOTs, 12 districts of ODOT, Contractors, and surety companies. As a follow-up to the questionnaire survey, thirty-six (36) interviews with selected parties and individuals were conducted through physical trips and phone calls.

Conclusions & Recommendations
This study presents many important results on the pros and cons of warranty provisions including:

- The increase in the initial bid prices due to warranty provisions are estimated to be somewhere between 0-15 percent, while the changes in maintenance and project life cycle costs are expected to be minimal. The expected variation in project life cycle cost due to warranty provisions according to the responses received from state DOTs is shown in Figure 1.

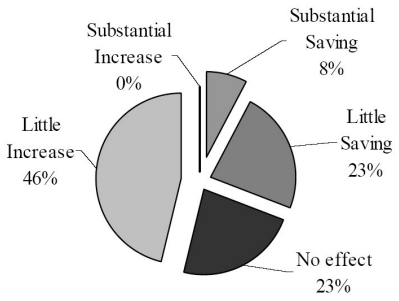

Figure 1: Expected Variation in Project Life Cycle Cost

- About 46% of the state DOTs indicated that there is only a slight increase in quality on warranted projects as compared to similar but conventional projects (Figure 2).

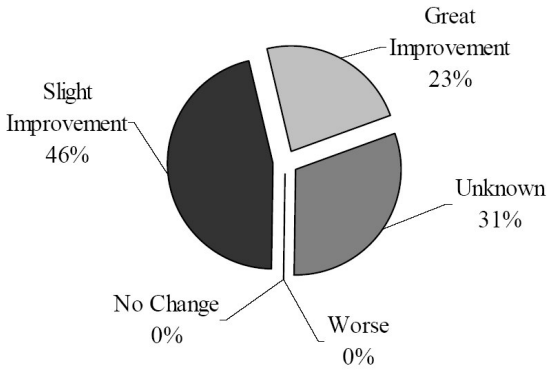

Figure 2: Impact of Warranties on Project Quality

- Contractors, because of the associated risks, do not favor innovative technologies and methods, new materials, or better equipment on warranty projects. Figure 3 illustrates the innovations preferred by the Contractors who responded to the survey.

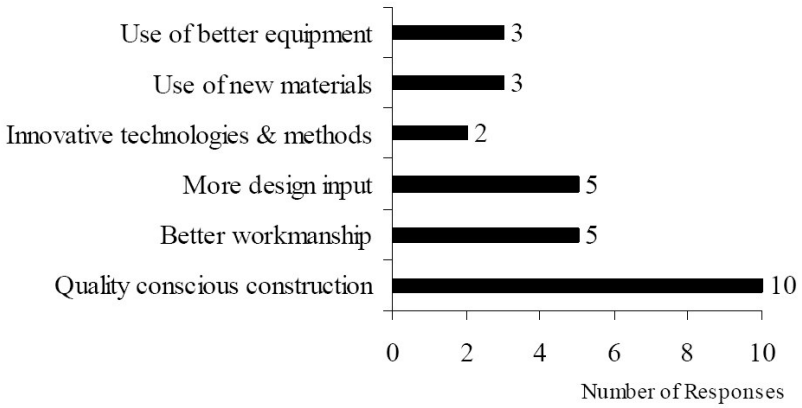

Figure 3: Contractor Innovation on Warranty Projects

- The current practice of warranty provisions is worthwhile if its role is considered mainly as an insurance mechanism against the unexpected and a protection from early Contractor defaults. The optional warranty and a combination of warranty provisions with other contractual methods are two alternative approaches that could provide ODOT with a better way of utilizing warranty provisions on its contracts.

- A comprehensive data collection system and decision tool that is compatible with the data available at ODOT could be established according to the criteria and framework provided in the main report. Such a system would help the agency evaluate future projects to determine how, where, and when to use warranty provisions and the best warranty duration for the project.