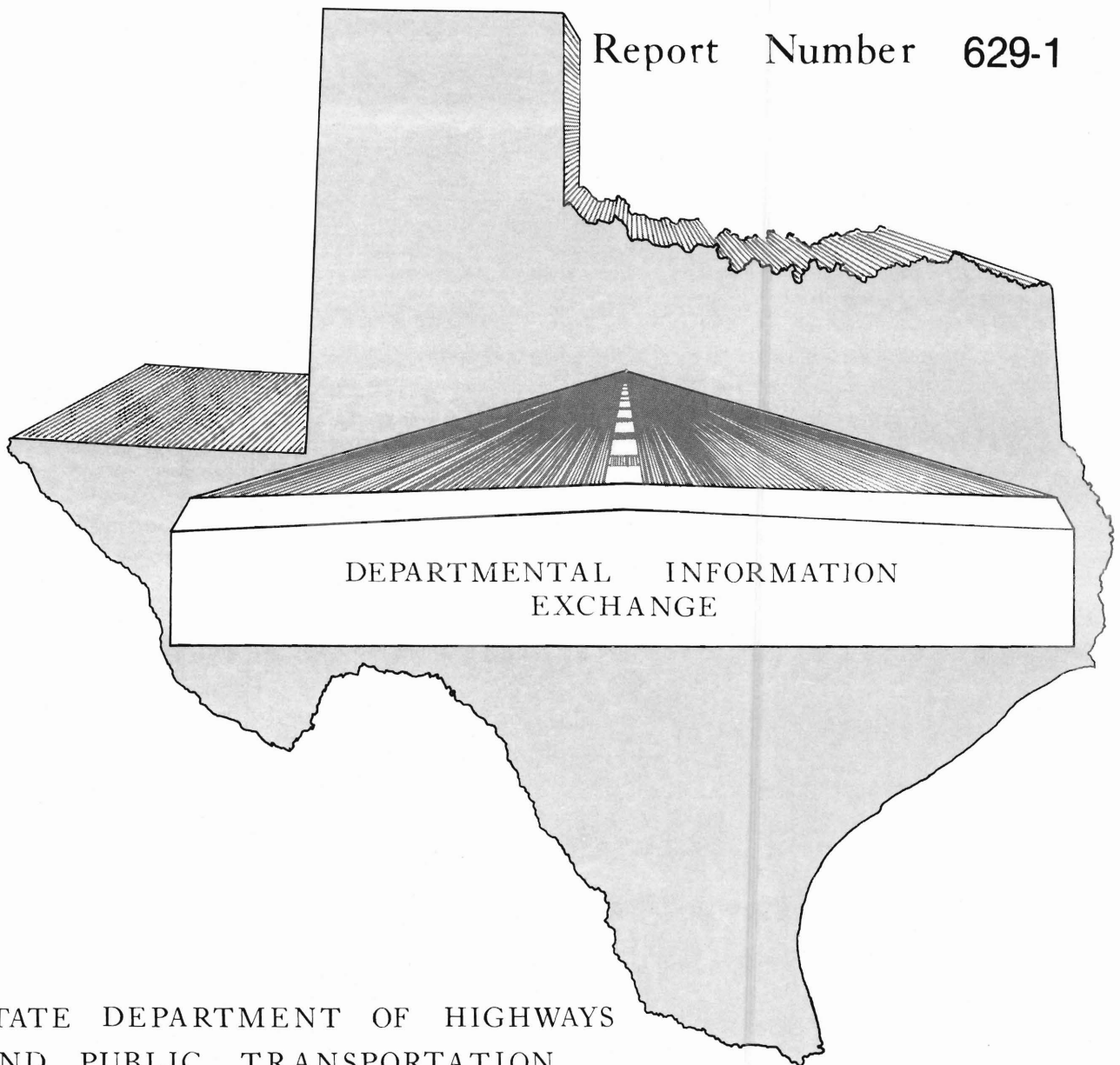


# EXPERIMENTAL PROJECTS

## THE USE OF A STABILIZING ADDITIVE IN HOT MIX ASPHALT CONCRETE

Report Number 629-1



STATE DEPARTMENT OF HIGHWAYS  
AND PUBLIC TRANSPORTATION

1. Report No. Exp. Proj. 629-1	2. Government Accession No. FHWA Exp. Proj. 83-08	3. Recipient's Catalog No.	
4. Title and Subtitle THE USE OF A STABILIZING ADDITIVE IN HOT MIX ASPHALT CONCRETE		5. Report Date September 1982	6. Performing Organization Code
7. Author(s) Windell D. Clark	8. Performing Organization Report No.		
9. Performing Organization Name and Address State Department of Highways and Public Transportation District 4 Amarillo, Texas		10. Work Unit No.	11. Contract or Grant No.
12. Sponsoring Agency Name and Address State Department of Highways and Public Transportation District 4 Amarillo, Texas		13. Type of Report and Period Covered Design and Construction	
14. Sponsoring Agency Code			
15. Supplementary Notes			
16. Abstract  Major problems of rutting and shoving frequently occur in new hot mix asphalt concrete overlays when they are placed on high traffic volume intersections which are distressed. The experimental project on US Highways 60 and 66 in Potter County was designed to evaluate the performance of an asphalt concrete stabilizing additive (Asphadur, by 3M Company). Both a stabilized section and a control were placed.			
17. Key Words Additives           Asphadur Hot Mix Asphalt Concrete Rutting Shoving Instability		18. Distribution Statement This document is available from: State Department of Highways and Public Transportation Transportation Planning Division P.O. Box 5051, Austin, Tx. 78763	
19. Security Classif. (of this report) Unclassif.	20. Security Classif. (of this page) Unclassif	21. No. of Pages 13	22. Price

INITIAL REPORT  
FOR  
EVALUATION OF EXPERIMENTAL  
CONSTRUCTION PROJECT  
ON

U.S. HIGHWAYS 60 & 66

POTTER COUNTY

AMARILLO, TEXAS

CONTROLS: 90-6, 169-1, & 169-2

FROM: ONG STREET

TO: LAKE STREET

PROJECT SUPERVISION

WILLIAM E. BRYAN, SUPERVISING RESIDENT ENGINEER

REPORT PREPARED BY

WINDELL D. CLARK, ENGINEERING TECHNICIAN V

DATES OF CONSTRUCTION:

MAY 26, 1982 to SEPTEMBER 22, 1982

The material contained in this report is experimental in nature and is published for informational purposes only. Any discrepancies with official views or policies of the DHT should be discussed with the appropriate Austin Division prior to implementation of the procedures or results.

## TABLE OF CONTENTS

	Page No.
Objectives .....	1
Project Background .....	2
Design .....	3
Construction Phase .....	4
Evaluation .....	5
Summary .....	6
Appendix .....	7

## OBJECTIVES

A major problem encountered in overlaying a distressed pavement with asphalt concrete pavement concerns stabilizing the new pavement to prevent rutting and shoving at major high traffic volume intersections. The objective of an experimental project on U.S. Highways 60 and 66 in Potter County is to evaluate the performance of an asphalt concrete stabilizing additive to increase the resistance to shoving, rutting and movement under heavy traffic.

## PROJECT BACKGROUND

This project is located in Amarillo on Amarillo Boulevard. The roadway is at an elevation of 3650 ft. and is oriented from West to East. The soil is Pullman clay loam with a Plasticity Index (P. I.) between 21 and 27 and a Triaxial Class of 4.3 to 5.0.

The average annual rainfall is 20.28 in. with an average of 15 in. of snow. The mean annual temperature is 59 degrees Fahrenheit with a minimum of 21 degrees Fahrenheit in January. The lowest recorded temperature is -16 degrees Fahrenheit and daily variations of 30 degrees to 40 degrees are common.

The project was originally upgraded to multi-lanes in 1951. The roadway consisted of three 11 ft. lanes east and three 11 ft. lanes west with a 4 ft. concrete median strip. The structure of the pavement consisted of 14 in. of flexible base and 3 in. of asphalt concrete pavement (Ty C). The roadway had an 8 in. to 12 in. parabolic crown.

The project was overlaid in 1974 with 70 lbs/sq.yd. of asphalt concrete pavement (Ty F).

## CONSTRUCTION PHASE

The asphalt concrete stabilizing additive and the locations where it was placed will be the only construction discussed here.

The asphalt stabilizing additive for this project was produced by the 3-M Company under the brand name of Asphadur.

The additive was introduced in the pug mill after the aggregate and asphalt had been mixed. The mixing was then continued an additional 60 seconds. The amount of additive used was 6 percent by weight of the asphalt content. The temperature selected for the stabilized mix was 375 degrees Fahrenheit. This temperature was selected after consultation with 3-M Company personnel and a field change was implemented to revise the Special Provision covering this item.

The only difficulty encountered during the construction operations was the pneumatic rolling phase. The asphalt concrete mix temperature was approximately 290 degrees Fahrenheit while the asphalt concrete stabilized mix was approximately 375 degrees Fahrenheit. This necessitated a delay in rolling the stabilized areas to prevent "picking-up" on the tires of the roller.

All of the major intersections and their approaches were stabilized with the exception of Fillmore Street, which will be used for control purposes.

The air temperature varied from the 70's to the high 90's during construction operations.

Traffic was carried through the new construction except during actual construction operations. The heavy cross-street traffic caused some problems but this was unavoidable and seemed to cause no damage. The average daily traffic count was 14,400 on the west end of the project, 22,000 in the middle of the project and 15,400 on the east end of the project.

The appendix contains photographs of Grand Street and Fillmore Street intersections after construction. These can be used for references in follow-up reports.



## EVALUATION

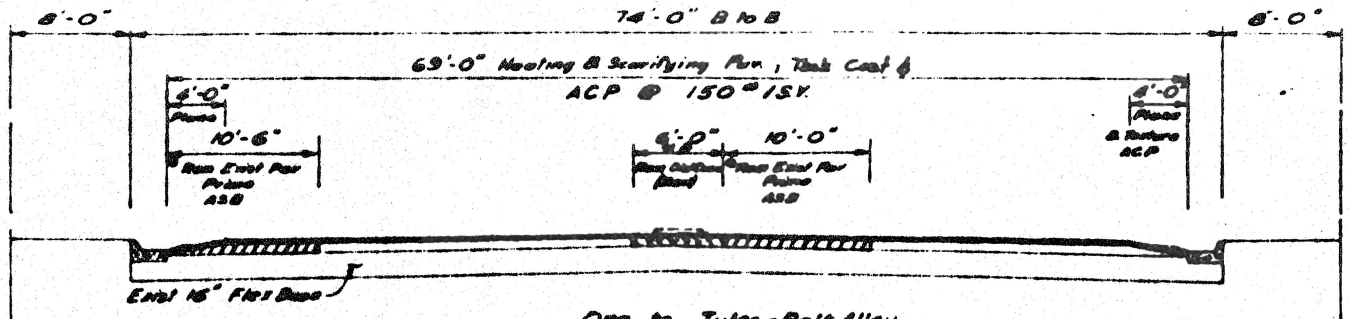
The purpose of this experimental project was primarily to evaluate performance of an asphalt concrete stabilizing additive in increasing the asphalt's resistance to shoving, rutting, and movement under heavy traffic and to restore structural integrity to the pavement.

The performance of the roadway will be watched regularly by the Maintenance Foreman and any unusual changes will be called to the attention of the District Engineer.

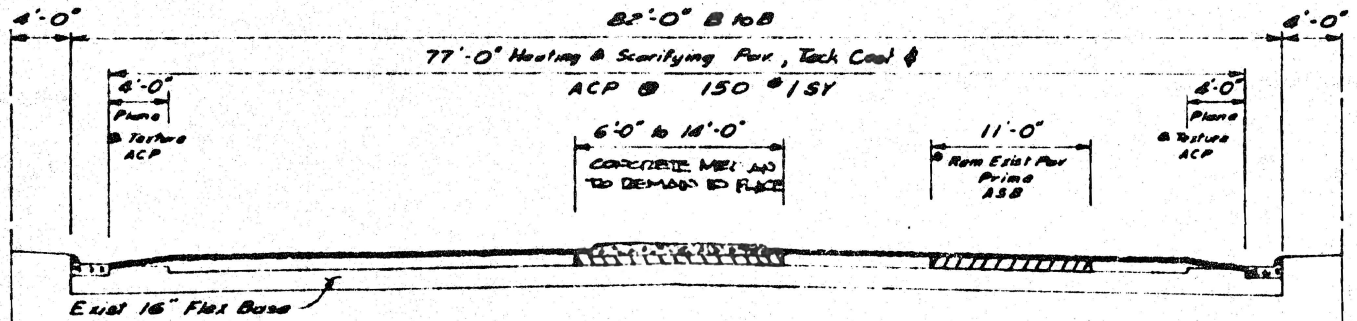
The cost per square yard for the stabilized asphalt concrete pavement was \$3.90 with the stabilizing additive being \$1.57 or 40 percent of the total cost.

## SUMMARY

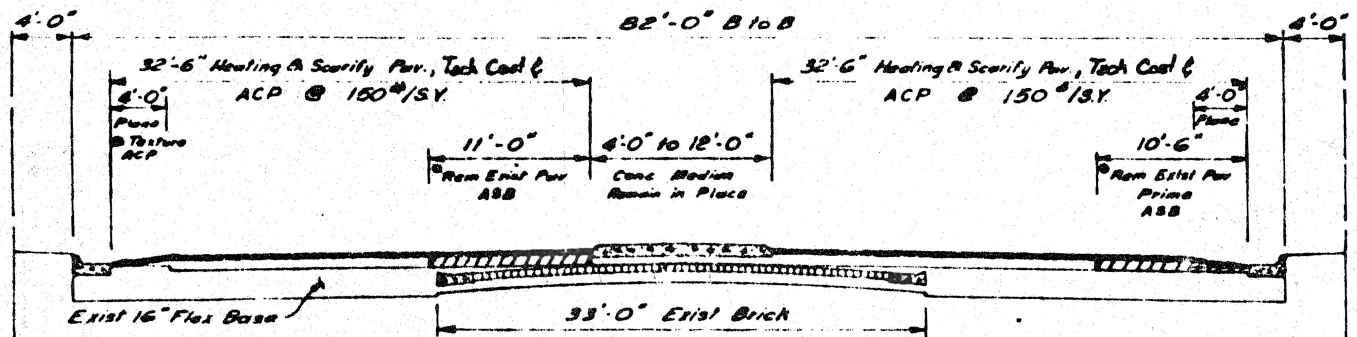
The evaluation of the performance of the stabilized asphalt concrete pavement is initiated with this report. To this date, October 1982, no shoving, rutting or movement has been observed and there are no failures in the pavement structure.



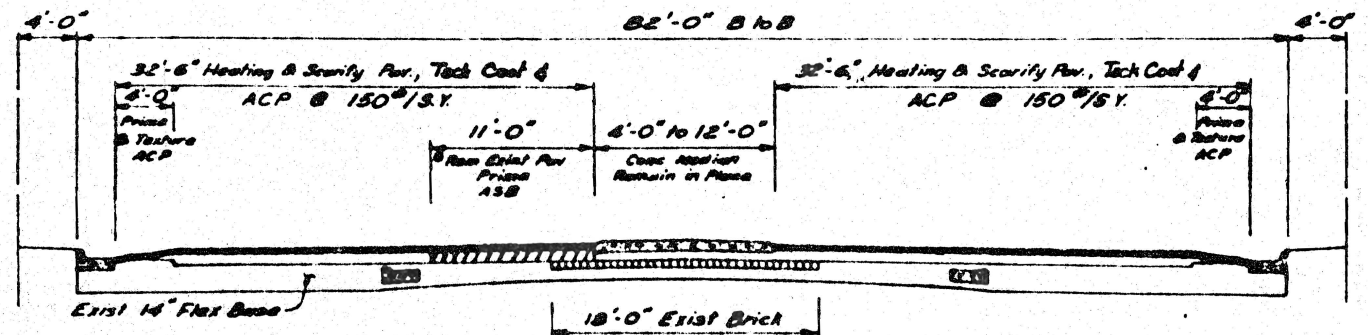
Orig to Tyler - Polk Alley  
 Sta 1017+78.2 to Sta 1059+70.0  
 Cont 90-6-27 Relay Area = 32,091 SY  
 #2 2 1/4 L.F. CONCRETE MEDIAN 14'-6" TAPERING  
 TO STANDARD 4' CONCRETE MEDIAN (SEE LAYOUT SHEET)



Tyler - Polk Alley to Polk  
 Sta 1059+70.0 to Sta 1062+06  
 Cont 90-6-27 Relay Area = 1,929 SY

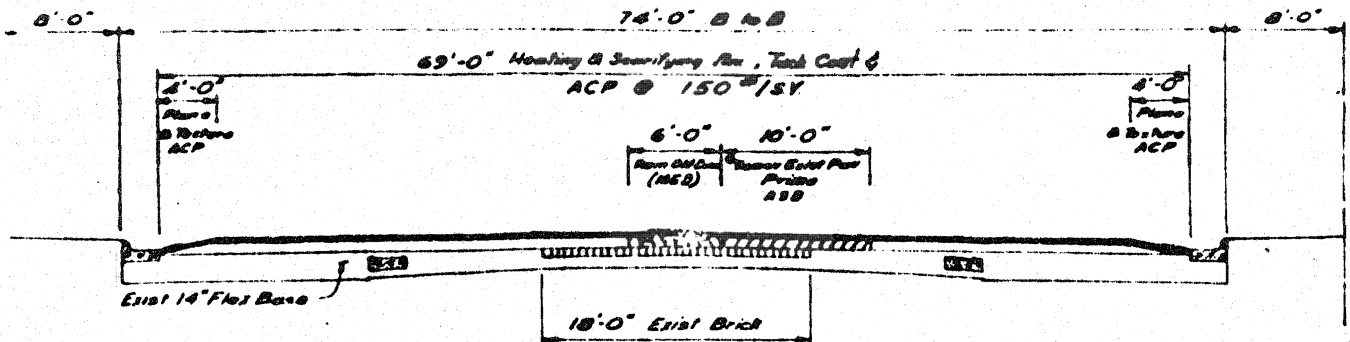


Polk to Fillmore  
 Sta 1062+06 to Sta 1068+87  
 Cont 90-6-27 Relay Area = 5,452 SY

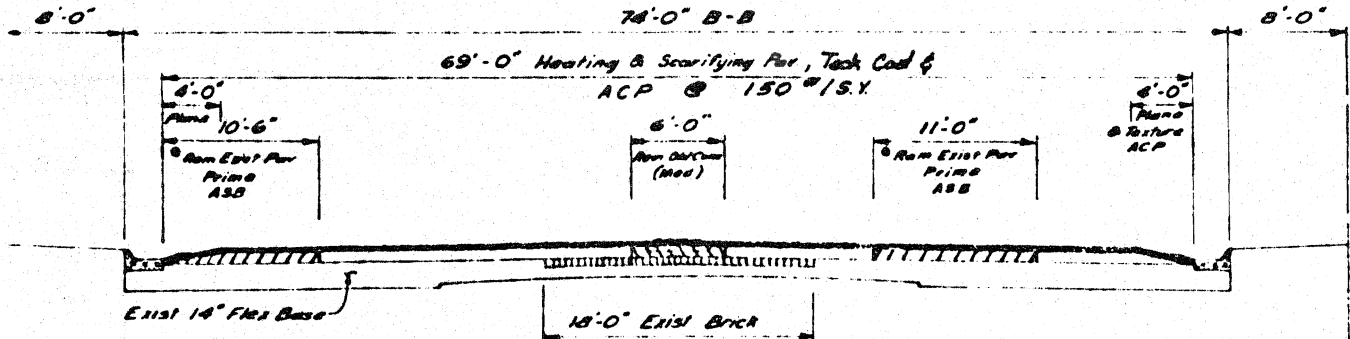


Fillmore to Lincoln-Johnson Alley  
 Sta 0-39.2 to Sta 13+64  
 Cont 169-1-13 Relay Area = 11,043 SY

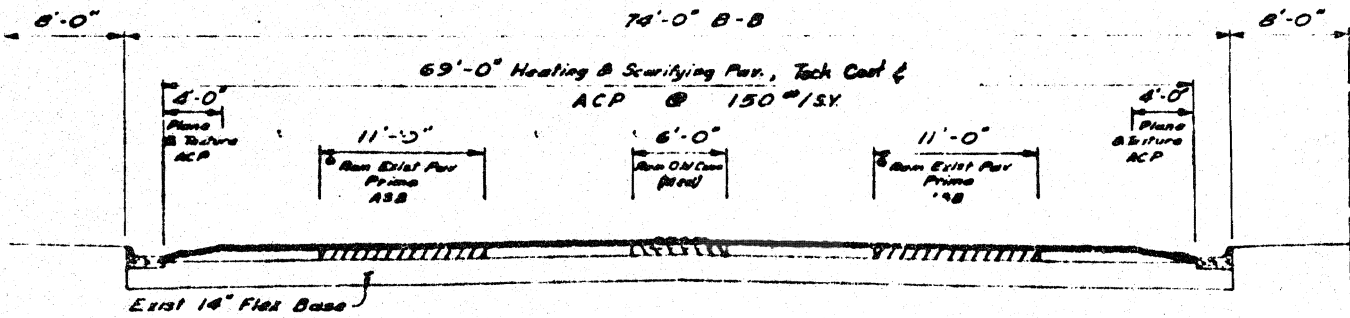
Figure I



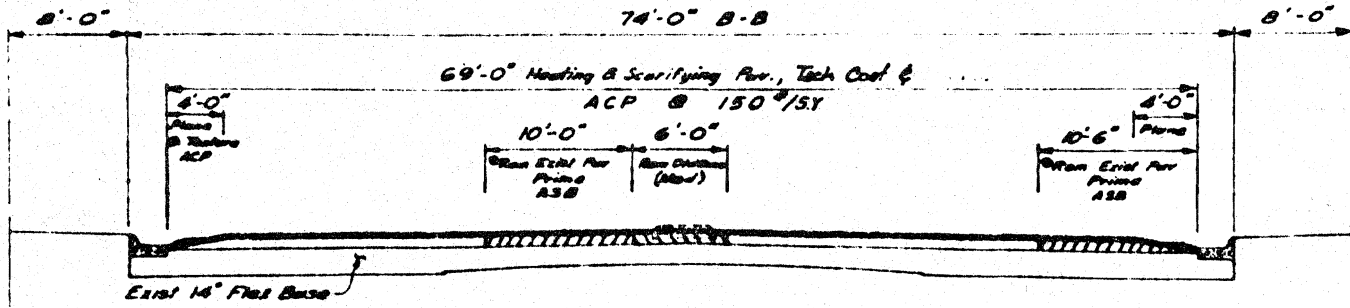
Lincoln-Johnson Alley to Cleveland  
 Sta 13+64 to Sta 34+78  
 Cont 169-1-13 Rwy Area = 16,207 SY



Cleveland to Mirror  
 Sta 34+78 to Sta 42+50  
 Cont 169-1-13 Rwy Area = 5,919 SY



Mirror to George  
 Sta 42+50 to Sta 56+50  
 Cont 169-1-13 Rwy Area = 10,733 SY



George to Lake  
 Sta 56+50 to Sta 128+36.4  
 Cont 169-1-13 Rwy Area = 26,163 SY  
 Cont 169-2-22 Rwy Area = 28,932 SY

Approximately 5" of Exst Surface  
 and Base Material is to be removed  
 at Specified Areas.

Figure II

Rev 9-5-22

PROJECT NO.	STATE	FEDERAL AID PROJECT NO.	SECTION
4	TEXAS	HES 0005 (129)	2
DIST. NO.	COUNTY	ROUTE	POST MILE
4	POTTER	20.6	27.100
169-1A-13B-22			



Fillmore Street Without Stabilizing Additive  
October 1982



Grand Street With Stabilizing Additive  
October 1982