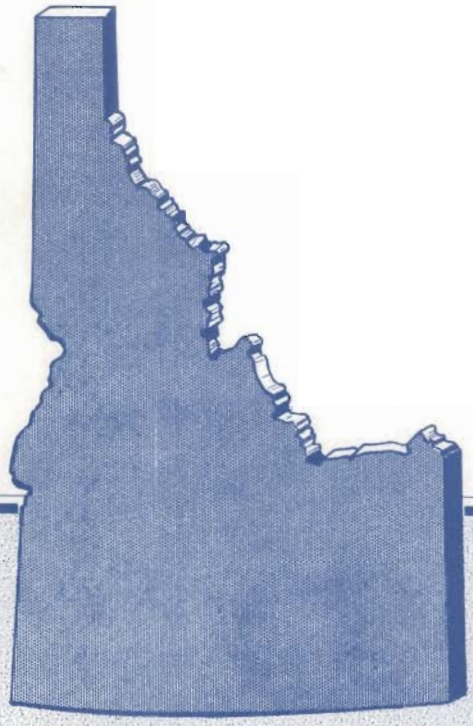
FIELD DETERMINATION OF THE AREAL EXTENT OF STRIPPING IN IDAHO PAVEMENTS



AUGUST 1969

RESEARCH PROJECT NO. 24

STATE OF IDAHO DEPARTMENT OF HIGHWAYS

FIELD DETERMINATION

OF THE AREAL EXTENT OF

STRIPPING IN IDAHO'S PAVEMENTS

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Boise, Idaho

ACKNOWLEDGEMENTS

In order to successfully conduct this project, it was necessary to depend on many people. We extend our thanks to the Districts for their cooperation and especially to the District Materials Engineers and Chiefs, and the Technicians who did the field work, as well as the project data research.

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INTRODUCTION

The stripping of asphalt from the aggregate within the plantmix pavements on many sections of Idaho highways is a problem of major proportions. In the report of their study "Evaluation of Asphalt Pavement Performance" in Idaho the firm Materials Research & Development (MR&D) Inc. of Oakland, California, listed stripping as one of the major factors causing the failure of asphalt pavements in Idaho. They recommend that research be initiated to determine the causes and to eliminate pavement failures. Both immediate and long term research should be undertaken. MR&D made the following suggestions for research concerning stripping which should be undertaken immediately:

1. Identify the full extent of asphalt-aggregate stripping on a statewide basis.
2. Develop laboratory tests to identify susceptibility to stripping.
3. Develop corrective procedures to eliminate stripping.

Following the suggestions made in the MR&D report the Department has initiated two research projects. This report concerns the project to identify the areal extent of stripping statewide. We have also contracted with the University of Idaho to conduct a research project which should result in laboratory tests which will identify susceptibility to stripping in accordance with the second suggestion. Additionally, the Central Materials Laboratory has conducted and is continuing to conduct variations in lab tests which hopefully may result in tests which will identify susceptibility to stripping more readily than the present test methods. The third suggestion appears to be somewhat dependent upon the results of the other two. However, following suggestions made by MR&D, the Department is adding hydrated lime to its plantmix in areas known to have stripping tendencies, unless experience or laboratory testing has shown lime to be detrimental to the mix.

This project was conducted to determine the areal extent of stripping characteristics according to their service experience. Figure 1 is a state map

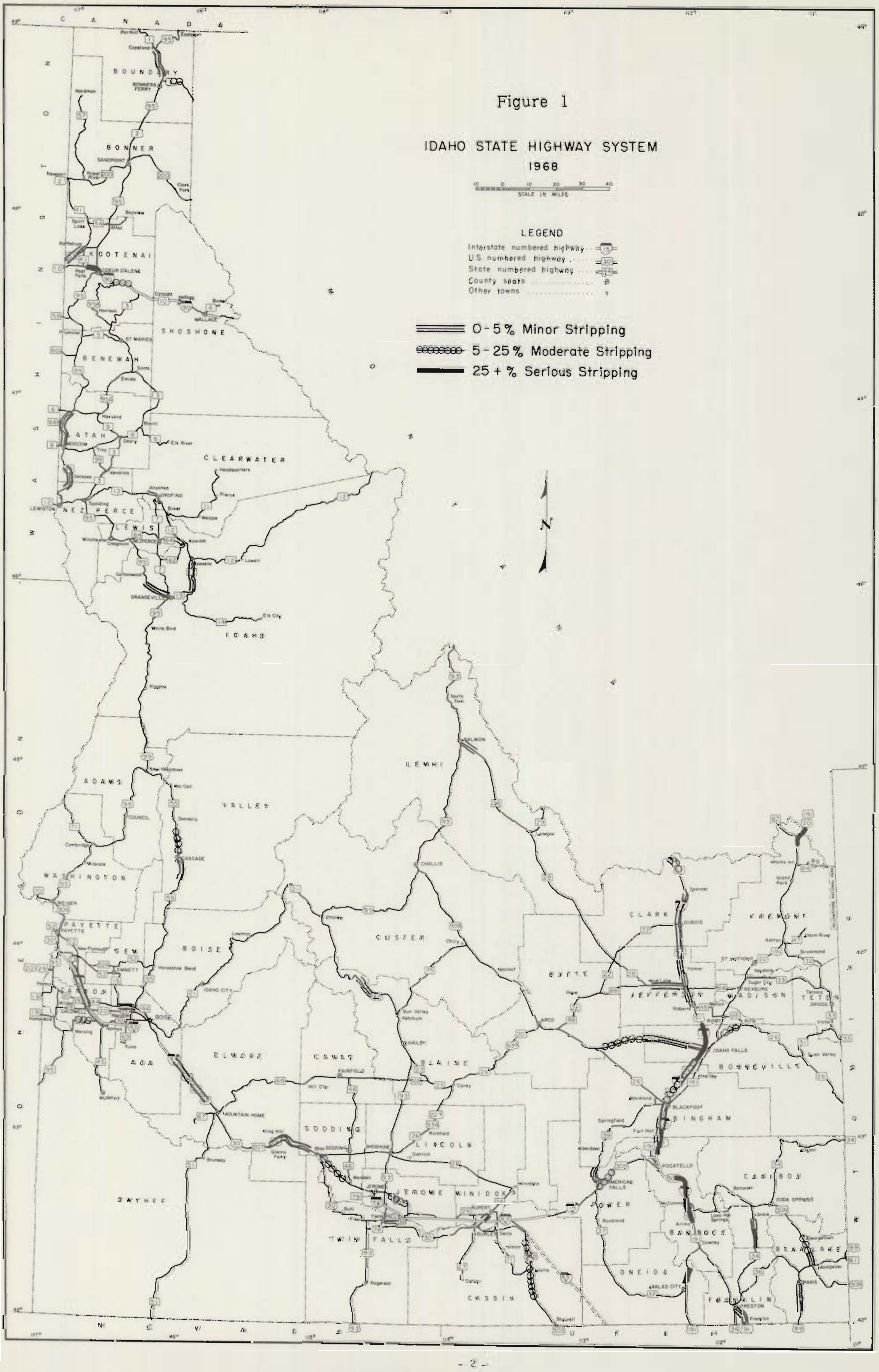
Figure 1
IDAHO STATE HIGHWAY SYSTEM
1968
SCALE IN MILES
LEGEND
Interstate numbered highway
U.S. numbered highway
State numbered highway
County seats
Other towns
0-5% Minor Stripping
5-25% Moderate Stripping
25+% Serious Stripping
CANADA
WASHINGTON
OREGON
NEVADA
UTAH
WYOMING
MONTANA
BOUNDARY
BONNER
KOOTENAI
SHOSHONE
BENEWAH
LATAH
CLEARWATER
NEZ PERCE
LEWIS
IDAHO
ADAMS
VALLEY
LEMHI
WASHINGTON
PAYETTE
GEM
BOISE
CUSTER
CLARK
FREMONT
BUTTE
JEFFERSON
MADISON
TETON
BONNEVILLE
ADA
ELMORE
CAMAS
BLAINE
BINGHAM
GOODING
LINCOLN
CARIBOU
JEROME
MINIDOKA
POWER
BANNOCK
BEAR LAKE
OWYHEE
TWIN FALLS
CASSIA
ONEIDA
FRANKLIN

showing areas of stripping aggregate as determined by relating the projects to the sources of aggregate.

CONCLUSIONS

The data appear to support the conclusion that stripping is not necessarily related to a particular type of aggregate, nor to a specific grade or source of asphalt. Pavements made of nearly every type of aggregate and all types, and grades, and many sources of asphalt were sampled and found to be stripping to some degree.

RECOMMENDATIONS

It is recommended that the research into the "Moisture Mechanism Which Causes Asphalt Stripping in Asphaltic Pavement Mixtures" being conducted by the University of Idaho be supported to its conclusion. Any findings of value should be immediately reported to the Department and should be implemented, or a project in the field of Applied Research be undertaken to further evaluate the finding and to determine if this new knowledge can help in the solution of the stripping problem under field conditions.

The Department should continue its investigation of construction practices in an effort to standardize methods which will give consistent results.

In the design of plantmix pavements the use of lime, either dry or in a slurry and/or anti-stripping additives should be used where stripping may be a problem.

The Department should continue its program of evaluating different stripping tests, especially the accelerated stripping tests. In combination with these tests anti-stripping agents (additives) and methods should be tested.

A continuous program of field testing for stripping should be undertaken to evaluate the effect of anti-stripping agents, lime and/or construction practices.

SCOPE OF INVESTIGATION AND METHODS USED

On April 17, 1967, a letter was sent to each District Engineer asking for their help and cooperation in making a survey of stripping on highway projects. In order to have uniformity in reporting and to help the Districts in recording the results, as well as to obtain the desired information, a form was developed (Figure 2, DH-1753 - Asphalt Pavement Stripping Survey) and sent to the Districts with instructions for conducting the survey. A number of projects to test were suggested to each District. These were intended to be representative of the aggregates in the District.

No particular method of sampling was suggested. The instructions for rating a sample, however, seems to have limited the method to the use of a jackhammer with a cutting blade (spade) or to a saw. All Districts used the jackhammer. This was probably the simplest and quickest method, and provided the means for patching the hole in the pavement by attaching a tamping head to the jackhammer or using a compressed air tamping machine.

When the sample had been cut and removed from the pavement it was rated by breaking off diagonally opposite corners (See instruction, Appendix A) and observing the amoung of stripping occurring in the plus #4 mesh and minus #4 mesh material and the distance the stripping had progressed from the top or the bottom of the asphalt (including Asphalt Treated Base, if there was one). The sample was then wrapped in visqueen (some Districts), identified and stored in the District shed or yard for future reference, or use, possibly on the previously mentioned University of Idaho stripping project. The hole from which the sample was taken was then tamped full of premix either by the sampling crew or by a maintenance man who accompanied the crew for this purpose.

DH-1753 4-67 ASPHALT PAVEMENT STRIPPING SURVEY

Project No. _____ Date _____ Rater _____

District _____ Project Identification _____

Limits of Project MP _____ to MP _____ Length _____

Construction Date: Year _____ Age _____

Traffic Info. ADT _____ Comm. Veh. per day _____

PLANTMIX DATA

Top Course: Class _____ Size Aggr. _____ Thickness _____

Grade Asph. _____ % Asphalt _____

Bottom Course: Class _____ Size Aggr. _____ Thickness _____

Grade Asph. _____ % Asphalt _____

ASPHALT TREATED BASE

Thickness _____ Grade Asphalt _____ % Asphalt _____

Aggregate Source Pit No. _____

Asphalt Supplier _____

Was project constructed with BST ____ yes ____ no How long before pavement placed

_____ Seal Coat ____ yes ____ no Year _____

Geologic Classification of Aggregate _____

VISUAL EVALUATION OF PAVEMENT CONDITION

____ 1. Rutting

____ 2. Ravelling

____ 3. Spalling

____ 4. Corrugations

____ 5. Transverse Cracking

____ 6. Longitudinal Cracking
  a. Construction
  b. Loading

____ 7. Block Cracking
  a. Alligator
  b. Shrinkage

____ 8. Ladder Cracking

____ 9. Other

Mark X beside appropriate condition.

Estimated per cent of total length of project having each classification of failure; note per cent after each condition marked with X.

FIGURE 2

RESULTS OF INVESTIGATION

Table I represents a compilation of the basic data obtained from this project. The columns under "Stripping Rating" are averages for the individual project. Individual samples may reflect greater or lesser amounts of stripping.

It appears from the visual ratings that the plus #4 material is more susceptbile to stripping than the minus #4 in most aggregates which are subject to stripping. This may be a true condition or it may be that, as most of the Districts expressed, it is very difficult if not impossible, to make an accurate estimate or count of the amount of stripping in the minus #4 portion of the plantmix without magnification. The writer, who visited each District during the progress of the sampling to observe the operations and give assistance where possible, believes that the ratings are as nearly accurate as is possible without the use of microscopes or some other means of magnifying the particles.

An attempt has been made by the use of tables to relate stripping to aggregate both as to source and geological classification, and asphalt as to grade and source and to per cent and grade of asphalt. This study was not designed to investigate the construction practices. No attempt could therefore be made to relate stripping to compaction or air voids.

Each project sampled was constructed from a different source so no correlation was possible. However, the map of Figure 1 identifies the stripping projects and the tables in the Appendix identifies the sources from which the aggregates were taken.

In the correlation of stripping to the geological classification of the aggregates there appeared to be an interesting relationship. Quartzite was the stone which occurred most frequently in the aggregates. There were 27 projects constructed of mixes containing quartzite. Of these 27 projects, 22 exhibited stripping in various degrees of severity. Second most frequent in its occurrence was sandstone followed by limestone. Fifteen of the 22 stripping mixes containing

quartzite. Of these 27 projects, 22 exhibited stripping in various degrees of severity. Second most frequent in its occurrence was sandstone followed by limestone. Fifteen of the 22 stripping mixes containing quartzite also contained sandstone, with 13 also containing limestone. Whether or not there is any actual relation between the stripping and the presence of any of these classifications of rock in the mix cannot be concluded on the basis of this small amount of evidence; especially considering that there were 5 projects containing quartzite with and without sandstone or limestone which had no stripping. Many other projects containing none of these type rocks were stripping; some of them severely. Table II relates stripping to the source and the geological classification of the aggregate.

Table I gives the age of each project tested and relates stripping to the sources of aggregate and asphalt and to the grade and design percent of asphalt. Age does not seem to be a factor in stripping, necessarily after 2 years. Table I shows that projects exhibiting stripping fall into virtually all age groups, as do those projects showing no stripping. There were a total of 50 plantmix pavements sampled using penetration grade asphalts. Of this number, 26 used 120-150 pen asphalt, 20 used 85-100 pen asphalt, 2 used 60-70 pen and 2 used 200-300 pen asphalts. Except for the 200-300 pen asphalt all grades showed stripping. Both projects were adjacent but the aggregates came from different sources. The asphalt also came from different sources.

Both the 85-100 and the 120-150 penetration grade asphalts were stripping on the majority of projects on which they were used. The 85-100 pen asphalt evidenced stripping on 70 per cent of the projects. Sixty-five per cent of the projects using 120-150 pen asphalt showed stripping. With each of these grades of asphalt the degree of stripping varied from none to very severe, almost complete loss of asphalt from the aggregate.

There appears to be little or no correlation between the degree of stripping in an asphalt pavement mix and the per cent of asphalt used; Table I shows this

comparison. In order to properly evaluate this the grade of asphalt should also be considered. A column has therefore been provided in this Table for the grade.

Although it would seem reasonable that pavement surface condition, such as good, cracking, spalling, ravelling, cutting, etc., would be directly related to the amount of stripping found in the plantmix pavement, the evidence of this study does not appear to support this. In comparing pavement condition to amount and degree of stripping there appears to be no direct correlation. This will be noted in Table III which compares stripping with pavement condition as rated by the Districts.

Longitudinal cracking appears to be the major failure of the pavements, followed closely by transverse cracking. Both of these occur in pavements exhibiting little or no stripping as well as those with severe stripping. The same is true of rutting and ravelling.

APPENDIX A

Instructions for the Conduct of Research Project
"Investigation of Stripping as a Factor in Loss
of Serviceability in Idaho Asphalt Pavements"

General

A map has been prepared for this project showing projects of sufficient age to have a stripping reaction if there is going to be one. In order to get adequate information to analyze, a minimum of 6, and preferably 10, samples should be taken from each project specified. If more than one source of materials (either asphalt or aggregate) was used on a project samples should be obtained from each section of project using those products.

Sampling

It is suggested that the conduct of the project be done under the direction of the District Materials Engineer. He will be responsible for determining the locations at which samples will be taken, and for the training of personnel to properly take and rate the samples.

Pavement samples shall be at least 1 foot square and shall be cut so as to do the least possible damage to the sample.

As soon as the sample is removed two diagonally opposite corners shall be broken off, inspected for stripping, and rated according to the tables below. If the rating values do not agree the other two opposite corners shall be broken off and rated. The averages of the four corners then becomes the rating of the sample. A rating form is provided for recording this information. The rating of each corner should be recorded on the form.

Rating System for Stripping Samples

A. Percent of coarse aggregate (+ No. 4) stripping

No stripping	0
5-25%	1
25-50%	2
Over 50%	3

b. Percent of fine aggregate (- No. 4) stripping

No stripping	0
5-25%	1
25-50%	2
Over 50%	3

c. Depth of mixture showing stripping, in % of total, measured either from the surface down or from the bottom up, including ATB where one is present

No stripping	0
5-25%	1
25-50%	2
Over 50%	3

d. Stripping evaluation - a + b + c; maximum of 9

A single sample of the mix and of the aggregate base will be submitted to the Central Laboratory for testing for sulphates.

Samples will be taken randomly throughout the project. It is desirable to obtain samples from the wheelpaths as well as outside the wheelpahts, and from areas showing distress as well as from areas showing no distress. On interstate highways the wheelpath samples will be taken from the outside lane.

In addition to the stripping evaluation the form provides space for project information concerning the plantmix and base coarses, geologic classification of the aggregate, and a visual evaluation of the pavement condition. The form should be made out with sufficient copies so that at least three may be submitted to the Boise Office.

APPENDIX B

TABLE I

STRIPPING RELATED TO SOURCES OF AGGREGATE & SOURCE
GRADE & PER CENT OF ASPHALT

Project		Age	Stripping Ratings*			Aggregate	Asphalt		
Number	Location		+ #4	- #4	Depth	Source	Grade	Source	Percent
I-15-2(11)96 A	Porterville Br.-G.W. Canal	5	2	1	2	Bg-75	120-150	American	5.2
I-15-2(11)96 B	G.W. Canal-Bonneville Co. L.	5	2	0	2	Bg-77	120-150	Phillips	5.3
I-15W-4(9)88	Rockland Jct.-Igo O.H.	4	1	1	2	Pw-54	120-150	American	5.7
I-15-2(6)71 A	Chubbuck G.S.-North	6	1	1	2	Bg-71	85-100	American	5.4
I-15-2(6)71 B	So.Blackfoot I.C.-South	6	1	0	1	Bg-69	85-100	Phillips	5.5
I-15-1(5)17	Deep Creek-Colton Rd.	4	3	2	2	On-43	120-150	American	5.9
I-15-1(11)47	McCammon-Portneuf River	4	2	1	3	Bk-133	120-150	American	5.6
SDS-1721(4)	American Falls Dam-Bingham Co. L.	8	0	0	0	Pw-1-D	200-300	Phillips	5.0
S-1778(2)	Niter-Grace	12	1	0	1	Bk-27B	120-150	American Phillips	4.4
F-1481(4)	Montpelier-Bennington	9	1	1	1	Bl-11A	85-100	American	5.4
F-1531(1)	Fish Haven-Paris	11	0	0	0	Bl-54	120-150	American	5.28
F-1481(10)	Bennington-Georgetown	7	2	2	3	Bl-61	85-100	American	5.0
F-1491(1) & (3)	Preston-Whitney	6	1	0	2	Fk-54	85-100	American	5.5
S-1778(13)	Thatcher-Niter	6	3	2	3	Fk-51	120-150	Phillips	4.7
F-1421(1) HAA-6	Jct.U.S.26 at AEC, East	13	1	0	1	Bu-32	120-150	American	4.2
F-2441(8),(11)	Heyburn-Rupert	3	1	0	3	Cs-145	60-70	Phillips	6.8
F-2441(7)	Rupert Streets	6	1	0	3	Cs-120	60-70 85-100	American	5.6
ST-2011(502)	Malta N & S	13	1.5	1	3	Cs-111	120-150	Phillips American	5.0
F-2441(15)	Barrymore Jct.-SH-50,SH-25	5	1	1	3	Jr-38 Jr-31	85-100	Phillips	6.3
F-2361(14)	T.F. Cemetery-Red Cap Corner	3	1	0	3	Tf-67	85-100	American	6.3
FHP 26	Galena Store, South	12	1	0	3	--	--	--	--

TABLE I

STRIPPING RELATED TO SOURCES OF AGGREGATE & SOURCE
GRADE & PER CENT OF ASPHALT

Project		Age	Stripping Ratings*			Aggregate	Asphalt		
Number	Location		+ #4	- #4	Depth	Source	Grade	Source	Percent
F.I. 2023(1)	Bliss-Wendell	16	1	1	3	Gd-5	150-200	Phillips	4.7
I-80N-1(30)14	13.5 Mi. E. Ore.S.L.-East	6	0	0	0	Py-32 Ext.		Pen Asphalt	5.3
I-80N-1(31)18	17.6 Mi.E. Ore.S.L.-East	5	0	0	0	Cn-28	85-100 120-150		5.3
F-3321(1)	SH-44, Star-Eagle	8	0	0	0	Ad-85	85-100	Blackline	6.0
F-3022(6)	US-30,Glenns Ferry Bypass	10	1	1	1+	E-38	85-100		5.8
I-80N-2(2)71	Regina-Cleft,WBL	7	0	0	0	A-53	85-100		5.8
I-80N-2(5)71	Regina-Cleft,EBL	5	0	0	0	A-53	85-100 or 120-150		5.5
SAP 194(5)	SH-72,Jct.US-30-Huston Jct.	19	2	1.5	2	Cn-45	MC-3		4.0
F-3271(1)	SH-15, Cascade-So. 6 Mi.	12	0	0	0	V-41	150-200		5.0
Misc.Project 953(1)	Cascade, No. 6.1 Mi.	19	1	1	1+	V-10	MC-3, MC-5		4.3
F-4114(3)	Genesee N & S, US-95	14	0	0	0	Lt-107	120-150	Phillips	4.95
F-75(5),F-82(9)	Moscow-Potlatch Jct.	17	0	0	0	Lt-108	200-300	Farmers Phillips Carter	4.4
ST-4211(501)	Kooskia-Harpster	13	0	0	0	Id-105S	85-100	Blackline	-
DF-4113(26)	Grangeville-Cottonwood	9	0	0	0	Id-117S	120-150	Shell	-
DS-5730(1)	SH-53,Wash. S.L.-Rathdrum	9	1	0	1	Kt-163	120-150	Phillips	5.0
F-5041(8)	Tunnel E & W (Carywood)	9	1.5	1	1.7	Bnr-97	120-150 MC-2-4	Phillips	5.0

Note: Rating of 3 under Depth indicates that there was aggregate throughout the mix which appeared to have stripped.

TABLE I

STRIPPING RELATED TO SOURCES OF AGGREGATE & SOURCE
GRADE & PER CENT OF ASPHALT

Project		Age	Stripping Ratings*			Aggregate	Asphalt		
Number	Location		+ #4	- #4	Depth	Source	Grade	Source	Percent
FAP 62-A(2) or 77(2)	US-95, Jct. US-2,Copeland	3	0	0	0	Roadmix	SC-3		4.1
I-90-1(6)23	Wolf Lodge-Cedar Canyon	6	1.3	0	1.2		85-100		
FHP 2-A-1, B-1	Moyie-Montana Line	13	2	0	2+				
DS-6751(1)	SH-28,Sage Jct.-Mud Lake	8			0	Jf-83	120-150		5.0
S-6873(3)	Baker-Salmon	8			0	Le-72A	120-150		5.0
FHP 34(2)1	Macks Inn-Henrys Lake	5			2.75	Fr-41	120-150		5.8
F-6422(1)	Bingham Co.L-Idaho Falls	13			0.5	Bn-52-S	120-150		5.22
F-6501(1)	Beeches Corner-Ririe	13			3.2	Bn-66-S	120-150		5.0
I-15-3(2)194	Monida-South	7			0	Cl-40-S	85-100		5.0
I-15-3(11)187	Pleasant Valley-Monida	1			1.7	Cl-40-S	85-100		5.6
I-15-3(21)163	Dubois-China Point	2			0.5	Cl-56-S	85-100	Humble	5.6
I-15-3(9)150	Hamer-Dubois	4			0	Cl-28	120-150		5.5
I-15-3(8)142	Sage Jct.-Hamer	7			0	Jf-38	120-150		5.0
I-15-3(7)111	Bingham Co. Line-Idaho Falls	5			3.2	Bn-111-S	85-100		5.1
I-15-3(1)134	Roberts-Sage Jct.	9			0.1	Jf-38	120-150		5.0
I-15-3(5)117	Ida.Falls-Bassett				2.5	Bn-80 Bn-111-S	85-100		5.0

* Ratings as follows
Average of Project

%	Ratings
0-5	0
5-25	1
25-50	2
Over 50	3

STRIPPING RELATED TO SOURCE AND GEOLOGICAL CLASSIFICATION OF AGGREGATE

	Aggregate	Stripping Rating		
Source	Geological Classification	+ 4	- 4	Depth
Bg-75	Quartzite, Sandstone, Basalt	2	1	2
Bg-77	Quartzite, Sandstone, Granite	2	0	2
Bg-71	Quartzite, Quartz, Sandstone, Chert	1	1	2
Bg-69	Quartzite, Limestone, Sandstone, Quartz	1	0	1
PW-54	Quartzite, Limestone	1	1	2
Pw-1-D	Quartzite, Sandstone, Porphyry, Quartzose, Conglomerate	0	0	0
On-43	Quartzite and Limestone	3	2	2
Bk-133	Quartzite, Sandstone, Limestone, Basalt	2	1	3
BK-27B	Limestone, Sandstone, Quartzite	1	0	1
Bl-11A	Limestone, Sandstone, Quartzite	1	1	1
Bl-61	Limestone, Sandstone, Quartzite	2	2	3
Bl-54	Dolomite, Quartz	0	0	0
Fk-54	Quartzite, Limestone, Sandstone	1	0	2
Fk-51	Quartzite and Limestone	3	2	3
Bu-32	Limestone, Basalt, Quartz, Quartzite, Granodiorite and Dolomite	1	0	1
Cs-145	Chert, Quartzite, Basalt	1	0	3
Cs-129	Chert, Quartzite, Basalt	1	0	3
Cs-111	Porphyry	1.5	1	3
Jr-38	Basalt	1	1	3
Jr-31 FA				
Tf-67	Basalt	1	0	3
Gd-5	Limestone, Granite, Sandstone, Andesite, Quartzite	1	1	3
Py-32 Ext.		0	0	0
Cn-28		0	0	0
A-81		0	0	0
E-38		1	1	1+
A-53		0	0	0
Cn-45		2	1.5	2
V-41		0	0	0
V-10		1	1	1+
Lt-107	Basalt	0	0	0
Lt-81	Basalt	0	0	0
Id-105S	Basalt	0	0	0
Id-117S	Basalt	0	0	0
Kt-163	Glacial Gravel	1	0	1
Bnr-97		1.5	1	1.7
Project				
I-90-1(6)23	Basalt	1.3	0	1.2
FHP 2-A-1 B-1	Quartzite and Granite	2	0	2
Moyie-Montana	(Glacial and river gravels)			
Jf-83	Quartzite, Quartz, Granite			0

TABLE II

STRIPPING RELATED TO SOURCE AND GEOLOGICAL CLASSIFICATION OF AGGREGATE

	Aggregate	Stripping Rating		
Source	Geological Classification	+ 4	- 4	Depth
Le-72A	Quartzite, Sandstone, Rhyalite Mica Schist			0
Fr-41	Limestone, Sandstone, Quartz, Mics Schist			2.75
Bn-52S	Limestone, Quartzite, Basalt, Quartz			0.5
Bn-66S	Quartzite, Sandstone, Limestone			3.2
Cl-40S	Quartzite, Sandstone, Porphyry			0
Cl-40S	Quartzite Sandstone			1.7
Cl-56S	(Only at 1 sampling point)			0.5
Cl-28	Quartzite, Limestone, Sandstone, Quartz			0
Bn-111S	(Top Course) Quartzite, Quartz,Sandstone			3.2
Bn-87S	Sandstone			
Bn-80S	Quartzite, Sandstone, Prophyry			2.44

TABLE II

Project		Stripping Rating			Pavement Condition					Remarks
							Cracking			
Number	Location	+ 4	- 4	Depth	Rutting	Ravelling	Transverse	Longitud'l	Block	
I-15-2(11)96 A	Porterville Br.-G.W. Canal	2	1	2				50%		
I-15-2(11)96 B	G.W. Canal-Bonneville Co. Line	2	0	2				90%		
I-15W-4(9)88	Rockland Jct.-Igo O. H.	1	1	2				5%		
I-15-2(6)71 A	Chubbuck G.S.-North	1	1	2			x	80%	2%	
I-15-2(6)71 B	So. Blackfoot I.C.-South	1	0	1			10 mi	70%	1%	
I-15-1(5)17	Deep Creek-Colton Rd.	3	2	2		10%	1 mi	65%		
I-15-1(11)47	McCammon-Portneuf River	2	1	3		1%		80%	3%	
SDS-1721(4)	American Falls Dam-Bingham Co. Line	0	0	0			5 mi	1%		
S-1778(2)	Niter-Grace	1	0	1	x			65%	40%	
F-1481(4)	Montpelier-Bennington	1	1	1	70%		x	95%		
F-1531(1)	Fish Haven-Paris	0	0	0			8.8 mi	37%	x	
F-1481(10)	Bennington-Georgetown	2	2	3			x	90%		
F-1491(1) & (3)	Preston-Whitney	1	0	2		3%	2 mi	70%	2%	
S-1778(3)	Thatcher-Niter	3	2	3			x	x	90%	
F-1421(1) HAA-6	Jct.US-26 at AEC-East	1	0	1	90%				95%	
F-2441(8) & (11)	Heyburn-Rupert	1	0	3			x	x		occasional
F-2441(7)	Rupert Streets	1	0	3						none
ST-2011(502)	Malta N & S	1.5	1	3			100 mi	100%	5%	alligator
F-2441(15)	Barrymore Cor.-Jct SH-50	1	1	3			25 mi	85%		
F-2361(14)	T.F. Cemetery-Red Cap Corner	1	0	3						none
FHP 26	Galena Store-South	1	0	3	1%		10 mi	5%		
FI-2023(1)	Bliss-Wendell	1	1	3			5 mi	2%		
I-80N-1(30)14	13.5 Mi. E. Ore. S.L.-East	0	0	0						
I-80N-1(31)18	17.6 Mi. E. Ore. S.L.-East	0	0	0						
S-3321(1)	SH-44, Star-Eagle	0	0	0						
F-3022(6)	US-30, Glenns Ferry Bypass	1	1	1			60 mi	10%		
I-80N-2(2)71	Regina-Cleft WBL	0	0	0						
I-80N-2(5)71	Regina Cleft EBL	0	0	0			1 mi			

Table III Relation Between Stripping and Pavement Condition

Project		Stripping Rating			Pavement Condition					Remarks
							Cracking			
Number	Location	+ 4	- 4	Depth	Rutting	Ravelling	Transverse	Longitud'l	Block	
SAP 194(5)	SH-72 Uct US-30-Huston Jct.	2	1.5	2			*5 mi	50%		
F-3271(1)	Cascade-So. 6 Mi.	0	0	0			50mi			
Misc.Proj. 953(1)	Cascade No. 6.1 Mi.	1	1	1	2%	1%	20mi	20%		
	Note: *At pipes and culverts									
F-4114(3)	Genesee N & S	0	0	0	minor		40mi		5%	
F-75(5),F-82(9)	Moscow-Potlatch Jct.	0	0	0	15%				10%	Alligator
ST-4211(501)	Kooskia-Harper	0	0	0	20%		5mi	50%	5%	centerline
DF-4113(26)	Grangeville-Cottonwood	0	0	0	Shallow 40%**			1%		
	Note: *Bleeding and instability -20% **Shallow rutting scattered entire length of project-more prevalent at or near grade points.									
DS-5730(1)	SH-53 Wash.St.Line-Rathdrum	1	0	1						good condition
F-5041(8)	Tunnel E & W	1.5	1	1.7						no distress
FAP 62-A(2) or 77(2)	US-95 Jct. US-2 - Copeland	0	0	0	70%		Roadmix			
I-90-1(6)23	Wolf Lodge-Cedar Canyon	1.3	0	1.2				15%		
FHP 2-A-1, B-1	Moyie-Montana Line	2	0	2						good
DS-6751(1)	Sage Jct.-Mud Lake, SH-28			0						
S-6873(3)	Baker-Salmon			0						
FHP-34(2)1	Macks Inn-Henrys Lake			2.8		5%				
F-6422(1)	Bingham Co. Line-Idaho Falls			0.5						
F-6501(1)	Beeches Cor.-Ririe			3.2			x	15%		
I-15-3(2)194	Monida, So. 3 Mi.			0			5 mi	10%		

Table III Relation Between Stripping and Pavement Condition

Project		Stripping Rating			Pavement Condition					Remarks
							Cracking			
Number	Location	+ 4	- 4	Depth	Rutting	Ravelling	Transverse	Longitud'l	Block	
I-15-3(11)187	Pleasant Valley-Monida			1.7						
I-15-3(21)163	Dubois-China Point			0.5						
I-15-3(9)150	Hamer-Dubois			0						
I-15-3(8)142	Sage Jct.-Hamer			0						
I-15-3(7)111	Bingham Co. Line-Idaho Falls			3.2			1 mi			
I-15-3(1)134	Roberts-Sage Jct.			0.1						
I-15-3(5)117	Idaho Falls-Bassett			2.4			1 mi.			

Table III Relation Between Stripping and Pavement Condition