
PAVEMENT DESIGN TYPE # 4 -- ACP + FLEX BASE + STAB SBGR OVER SUBGRADE

PROB	DIST.-21	COUNTY-109	CONT.	SECT.	JOB	HIGHWAY	DATE	PAGE
1	Pharr	HILDAGO	1227	04	31	FM 1017	2/28/2006	2

INPUT DATA CONTINUED

CONSTRUCTION AND MAINTENANCE DATA

SERVICEABILITY INDEX OF THE INITIAL STRUCTURE	3.8
SERVICEABILITY INDEX P1 AFTER AN OVERLAY	4.0
MINIMUM OVERLAY THICKNESS (INCHES)	2.0
OVERLAY CONSTRUCTION TIME (HOURS/DAY)	10.0
ASPHALTIC CONCRETE COMPACTED DENSITY (TONS/C.Y.)	1.98
ASPHALTIC CONCRETE PRODUCTION RATE (TONS/HOUR)	150.0
WIDTH OF EACH LANE (FEET)	12.0
FIRST YEAR COST OF ROUTINE MAINTENANCE (DOLLARS/LANE-MILE)	200.00
ANNUAL INCREMENTAL INCREASE IN MAINTENANCE COST (DOLLARS/LANE-MILE)	50.00

DETOUR DESIGN FOR OVERLAYS

TRAFFIC MODEL USED DURING OVERLAYING	2
TOTAL NUMBER OF LANES OF THE FACILITY	2
NUMBER OF OPEN LANES IN RESTRICTED ZONE (OVERLAY DIRECTION)	0
NUMBER OF OPEN LANES IN RESTRICTED ZONE (NON-OVERLAY DIRECTION)	1
DISTANCE TRAFFIC IS SLOWED (OVERLAY DIRECTION) (MILES)	0.60
DISTANCE TRAFFIC IS SLOWED (NON-OVERLAY DIRECTION) (MILES)	0.60
DETOUR DISTANCE AROUND THE OVERLAY ZONE (MILES)	0.00

PAVING MATERIALS INFORMATION

LAYER CODE	MATERIALS NAME	COST PER CY	E MODULUS	POISSON RATIO	MIN. DEPTH	MAX. DEPTH	SALVAGE PCT.
1	A ASPH CONC PVMT	70.00	250000.	0.35	0.50	0.50	30.00
2	B FLEXIBLE BASE	28.00	50000.	0.35	6.00	12.00	75.00
3	C STABILIZED SUBGR	8.00	35000.	0.30	12.00	12.00	90.00
4	D SUBGRADE(200)	2.00	12000.	0.40	200.00	200.00	90.00

 PAVEMENT DESIGN TYPE # 4 -- ACP + FLEX BASE + STAB SBGR OVER SUBGRADE

PROB	DIST.-21	COUNTY-109	CONT.	SECT.	JOB	HIGHWAY	DATE	PAGE
1	Pharr	HILDAGO	1227	04	31	FM 1017	2/28/2006	3

 C. LEVEL B SUMMARY OF THE BEST DESIGN STRATEGIES
 IN ORDER OF INCREASING TOTAL COST
 1

MATERIAL ARRANGEMENT	ABC
INIT. CONST. COST	8.31
OVERLAY CONST. COST	0.00
USER COST	0.00
ROUTINE MAINT. COST	0.91
SALVAGE VALUE	-1.60

TOTAL COST	7.62

NUMBER OF LAYERS	3

LAYER DEPTH (INCHES)	
D(1)	0.50
D(2)	6.00
D(3)	12.00

NO.OF PERF.PERIODS	1

PERF. TIME (YEARS)	
T(1)	26.

OVERLAY POLICY(INCH)	
(INCLUDING LEVEL-UP)	

SWELLING CLAY LOSS	
(SERVICEABILITY)	
SC(1)	0.00

Note: At confidence level B, an initial performance period of 26 years is projected. Routine crack sealing/seal coat program will still be needed.

Example of Low Volume Road Structural Design using Confidence Level C

TEXAS DEPARTMENT OF TRANSPORTATION
 FPS19W FLEXIBLE PAVEMENT SYSTEM VS. 1.1.36978

 PAVEMENT DESIGN TYPE # 4 -- ACP + FLEX BASE + STAB SBGR OVER SUBGRADE

PROB	DIST.-21	COUNTY-109	CONT.	SECT.	JOB	HIGHWAY	DATE	PAGE
2	Pharr	HILDAGO	1227	04	31	FM 1017	2/27/2006	1

 COMMENTS ABOUT THIS PROBLEM

Run 2 using Confidence Level C, Low-Volume Highway

 BASIC DESIGN CRITERIA

LENGTH OF THE ANALYSIS PERIOD (YEARS)	20.0
MINIMUM TIME TO FIRST OVERLAY (YEARS)	8.0
MINIMUM TIME BETWEEN OVERLAYS (YEARS)	8.0
MINIMUM SERVICEABILITY INDEX P2	3.0
DESIGN CONFIDENCE LEVEL (95.0%)	C
INTEREST RATE OR TIME VALUE OF MONEY (PERCENT)	7.0

PROGRAM CONTROLS AND CONSTRAINTS

NUMBER OF SUMMARY OUTPUT PAGES DESIRED (8 DESIGNS/PAGE)	3
MAX FUNDS AVAILABLE PER SQ.YD. FOR INITIAL DESIGN (DOLLARS)	99.00
MAXIMUM ALLOWED THICKNESS OF INITIAL CONSTRUCTION (INCHES)	69.0
ACCUMULATED MAX DEPTH OF ALL OVERLAYS (INCHES) (EXCLUDING LEVEL-UP)	6.0

TRAFFIC DATA

ADT AT BEGINNING OF ANALYSIS PERIOD (VEHICLES/DAY)	650.
ADT AT END OF TWENTY YEARS (VEHICLES/DAY)	900.
ONE-DIRECTION 20.-YEAR ACCUMULATED NO. OF EQUIVALENT 18-KSA	456000.
AVERAGE APPROACH SPEED TO THE OVERLAY ZONE(MPH)	70.0
AVERAGE SPEED THROUGH OVERLAY ZONE (OVERLAY DIRECTION) (MPH)	45.0
AVERAGE SPEED THROUGH OVERLAY ZONE (NON-OVERLAY DIRECTION) (MPH)	45.0
PROPORTION OF ADT ARRIVING EACH HOUR OF CONSTRUCTION (PERCENT)	6.0
PERCENT TRUCKS IN ADT	16.0

ENVIRONMENT AND SUBGRADE

DISTRICT TEMPERATURE CONSTANT	38.0
SWELLING PROBABILITY	0.00
POTENTIAL VERTICAL RISE (INCHES)	0.00
SWELLING RATE CONSTANT	0.00
SUBGRADE ELASTIC MODULUS	12000.00

PAVEMENT DESIGN TYPE # 4 -- ACP + FLEX BASE + STAB SBGR OVER SUBGRADE

PROB	DIST.-21	COUNTY-109	CONT.	SECT.	JOB	HIGHWAY	DATE	PAGE
2		Pharr HILDAGO	1227	04	31	FM 1017	2/27/2006	2

INPUT DATA CONTINUED

CONSTRUCTION AND MAINTENANCE DATA

SERVICEABILITY INDEX OF THE INITIAL STRUCTURE	3.8
SERVICEABILITY INDEX P1 AFTER AN OVERLAY	4.0
MINIMUM OVERLAY THICKNESS (INCHES)	2.0
OVERLAY CONSTRUCTION TIME (HOURS/DAY)	10.0
ASPHALTIC CONCRETE COMPACTED DENSITY (TONS/C.Y.)	1.98
ASPHALTIC CONCRETE PRODUCTION RATE (TONS/HOUR)	150.0
WIDTH OF EACH LANE (FEET)	12.0
FIRST YEAR COST OF ROUTINE MAINTENANCE (DOLLARS/LANE-MILE)	200.00
ANNUAL INCREMENTAL INCREASE IN MAINTENANCE COST (DOLLARS/LANE-MILE)	50.00

DETOUR DESIGN FOR OVERLAYS

TRAFFIC MODEL USED DURING OVERLAYING	2
TOTAL NUMBER OF LANES OF THE FACILITY	2
NUMBER OF OPEN LANES IN RESTRICTED ZONE (OVERLAY DIRECTION)	0
NUMBER OF OPEN LANES IN RESTRICTED ZONE (NON-OVERLAY DIRECTION)	1
DISTANCE TRAFFIC IS SLOWED (OVERLAY DIRECTION) (MILES)	0.60
DISTANCE TRAFFIC IS SLOWED (NON-OVERLAY DIRECTION) (MILES)	0.60
DETOUR DISTANCE AROUND THE OVERLAY ZONE (MILES)	0.00

PAVING MATERIALS INFORMATION

LAYER CODE	MATERIALS NAME	COST PER CY	E MODULUS	POISSON RATIO	MIN. DEPTH	MAX. DEPTH	SALVAGE PCT.
1	A ASPH CONC PVMT	70.00	250000.	0.35	0.50	0.50	30.00
2	B FLEXIBLE BASE	28.00	50000.	0.35	8.00	12.00	75.00
3	C STABILIZED SUBGR	8.00	35000.	0.30	12.00	12.00	90.00
4	D SUBGRADE(200)	2.00	12000.	0.40	200.00	200.00	90.00

 PAVEMENT DESIGN TYPE # 4 -- ACP + FLEX BASE + STAB SBGR OVER SUBGRADE

PROB	DIST.-21	COUNTY-109	CONT.	SECT.	JOB	HIGHWAY	DATE	PAGE
2	Pharr	HILDAGO	1227	04	31	FM 1017	2/27/2006	3

C. LEVEL C SUMMARY OF THE BEST DESIGN STRATEGIES
 IN ORDER OF INCREASING TOTAL COST
 1

 MATERIAL ARRANGEMENT ABC
 INIT. CONST. COST 9.86
 OVERLAY CONST. COST 1.76
 USER COST 0.00
 ROUTINE MAINT. COST 0.74
 SALVAGE VALUE -2.20

 TOTAL COST 10.16

 NUMBER OF LAYERS 3

 LAYER DEPTH (INCHES)
 D(1) 0.50
 D(2) 8.00
 D(3) 12.00

 NO.OF PERF.PERIODS 2

 PERF. TIME (YEARS)
 T(1) 15.
 T(2) 40.

 OVERLAY POLICY(INCH)
 (INCLUDING LEVEL-UP)
 O(1) 2.5

 SWELLING CLAY LOSS
 (SERVICEABILITY)
 SC(1) 0.00
 SC(2) 0.00

Note: Using confidence level C, the initial performance period is 15 years, with a 2.5” overlay predicted at that time.

Example of Medium Volume Highway Structural Design using Confidence Level B

FPS19W TEXAS DEPARTMENT OF TRANSPORTATION VS. 1.1.36978
 FLEXIBLE PAVEMENT SYSTEM

 PAVEMENT DESIGN TYPE # 3 -- ACP + ASPH STAB BASE + FLEX BASE OVER SUBGRADE

PROB	DIST.-	COUNTY-	CONT.	SECT.	JOB	HIGHWAY	DATE	PAGE
1	9	Waco BELL	0231	04	25	US 190	2/27/2006	1

 COMMENTS ABOUT THIS PROBLEM

Run 1 using Confidence Level B, Mid-volume highway

 BASIC DESIGN CRITERIA

LENGTH OF THE ANALYSIS PERIOD (YEARS)	20.0
MINIMUM TIME TO FIRST OVERLAY (YEARS)	12.0
MINIMUM TIME BETWEEN OVERLAYS (YEARS)	8.0
MINIMUM SERVICEABILITY INDEX P2	3.0
DESIGN CONFIDENCE LEVEL (90.0%)	B
INTEREST RATE OR TIME VALUE OF MONEY (PERCENT)	7.0

PROGRAM CONTROLS AND CONSTRAINTS

NUMBER OF SUMMARY OUTPUT PAGES DESIRED (8 DESIGNS/PAGE)	3
MAX FUNDS AVAILABLE PER SQ.YD. FOR INITIAL DESIGN (DOLLARS)	99.00
MAXIMUM ALLOWED THICKNESS OF INITIAL CONSTRUCTION (INCHES)	69.0
ACCUMULATED MAX DEPTH OF ALL OVERLAYS (INCHES) (EXCLUDING LEVEL-UP)	6.0

TRAFFIC DATA

ADT AT BEGINNING OF ANALYSIS PERIOD (VEHICLES/DAY)	3700.
ADT AT END OF TWENTY YEARS (VEHICLES/DAY)	6200.
ONE-DIRECTION 20.-YEAR ACCUMULATED NO. OF EQUIVALENT 18-KSA	3700000.
AVERAGE APPROACH SPEED TO THE OVERLAY ZONE(MPH)	70.0
AVERAGE SPEED THROUGH OVERLAY ZONE (OVERLAY DIRECTION) (MPH)	45.0
AVERAGE SPEED THROUGH OVERLAY ZONE (NON-OVERLAY DIRECTION) (MPH)	65.0
PROPORTION OF ADT ARRIVING EACH HOUR OF CONSTRUCTION (PERCENT)	6.0
PERCENT TRUCKS IN ADT	23.0

ENVIRONMENT AND SUBGRADE

DISTRICT TEMPERATURE CONSTANT	28.0
SWELLING PROBABILITY	0.00
POTENTIAL VERTICAL RISE (INCHES)	0.00
SWELLING RATE CONSTANT	0.00
SUBGRADE ELASTIC MODULUS	14000.00

PAVEMENT DESIGN TYPE # 3 -- ACP + ASPH STAB BASE + FLEX BASE OVER SUBGRADE

PROB	DIST.-	COUNTY-	CONT.	SECT.	JOB	HIGHWAY	DATE	PAGE	
1	9	Waco	BELL	0231	04	25	US 190	2/27/2006	2

INPUT DATA CONTINUED

CONSTRUCTION AND MAINTENANCE DATA

SERVICEABILITY INDEX OF THE INITIAL STRUCTURE	4.4
SERVICEABILITY INDEX P1 AFTER AN OVERLAY	4.0
MINIMUM OVERLAY THICKNESS (INCHES)	2.0
OVERLAY CONSTRUCTION TIME (HOURS/DAY)	10.0
ASPHALTIC CONCRETE COMPACTED DENSITY (TONS/C.Y.)	1.98
ASPHALTIC CONCRETE PRODUCTION RATE (TONS/HOUR)	150.0
WIDTH OF EACH LANE (FEET)	12.0
FIRST YEAR COST OF ROUTINE MAINTENANCE (DOLLARS/LANE-MILE)	200.00
ANNUAL INCREMENTAL INCREASE IN MAINTENANCE COST (DOLLARS/LANE-MILE)	50.00

DETOUR DESIGN FOR OVERLAYS

TRAFFIC MODEL USED DURING OVERLAYING	3
TOTAL NUMBER OF LANES OF THE FACILITY	4
NUMBER OF OPEN LANES IN RESTRICTED ZONE (OVERLAY DIRECTION)	1
NUMBER OF OPEN LANES IN RESTRICTED ZONE (NON-OVERLAY DIRECTION)	2
DISTANCE TRAFFIC IS SLOWED (OVERLAY DIRECTION) (MILES)	0.60
DISTANCE TRAFFIC IS SLOWED (NON-OVERLAY DIRECTION) (MILES)	0.60
DETOUR DISTANCE AROUND THE OVERLAY ZONE (MILES)	0.00

PAVING MATERIALS INFORMATION

LAYER CODE	MATERIALS NAME	COST PER CY	E MODULUS	POISSON RATIO	MIN. DEPTH	MAX. DEPTH	SALVAGE PCT.
1	A ASPH CONC PVMT	70.00	500000.	0.35	2.00	2.00	30.00
2	B ASPH STAB BASE	60.00	400000.	0.35	4.00	8.00	90.00
3	C FLEXIBLE BASE	28.00	42000.	0.33	6.00	6.00	75.00
4	D SUBGRADE(200)	2.00	14000.	0.40	200.00	200.00	90.00

 PAVEMENT DESIGN TYPE # 3 -- ACP + ASPH STAB BASE + FLEX BASE OVER SUBGRADE

PROB	DIST.-	COUNTY-	CONT.	SECT.	JOB	HIGHWAY	DATE	PAGE
1		Waco	BELL	0231	04	25	US 190	2/27/2006 3

C. LEVEL B SUMMARY OF THE BEST DESIGN STRATEGIES
 IN ORDER OF INCREASING TOTAL COST

	1	2
MATERIAL ARRANGEMENT	ABC	ABC
INIT. CONST. COST	15.22	18.56
OVERLAY CONST. COST	2.02	0.00
USER COST	0.00	0.00
ROUTINE MAINT. COST	0.69	0.91
SALVAGE VALUE	-3.06	-3.53
TOTAL COST	14.87	15.93
NUMBER OF LAYERS	3	3
LAYER DEPTH (INCHES)		
D(1)	2.00	2.00
D(2)	4.00	6.00
D(3)	6.00	6.00
NO.OF PERF.PERIODS	2	1
PERF. TIME (YEARS)		
T(1)	13.	22.
T(2)	26.	
OVERLAY POLICY(INCH) (INCLUDING LEVEL-UP)		
O(1)	2.5	
SWELLING CLAY LOSS (SERVICEABILITY)		
SC(1)	0.00	0.00
SC(2)	0.00	

Note: At confidence level B, the designer can exceed the goal of a 12-year initial performance period with a 2.0" HMA surface course and 4.0" ASB. A longer initial performance period is predicted if 6.0" of ASB is used.

Example of Medium Volume Highway Structural Design using Confidence Level C

TEXAS DEPARTMENT OF TRANSPORTATION
 FLEXIBLE PAVEMENT SYSTEM VS. 1.1.36978

 PAVEMENT DESIGN TYPE # 3 -- ACP + ASPH STAB BASE + FLEX BASE OVER SUBGRADE

 PROB DIST.- 9 COUNTY- 14 CONT. SECT. JOB HIGHWAY DATE PAGE
 2 Waco BELL 0231 04 25 US 190 2/27/2006 1

COMMENTS ABOUT THIS PROBLEM

Run 2 using Confidence Level C, Mid-volume highway.

 BASIC DESIGN CRITERIA

LENGTH OF THE ANALYSIS PERIOD (YEARS)	20.0
MINIMUM TIME TO FIRST OVERLAY (YEARS)	12.0
MINIMUM TIME BETWEEN OVERLAYS (YEARS)	8.0
MINIMUM SERVICEABILITY INDEX P2	3.0
DESIGN CONFIDENCE LEVEL (95.0%)	C
INTEREST RATE OR TIME VALUE OF MONEY (PERCENT)	7.0

PROGRAM CONTROLS AND CONSTRAINTS

NUMBER OF SUMMARY OUTPUT PAGES DESIRED (8 DESIGNS/PAGE)	3
MAX FUNDS AVAILABLE PER SQ.YD. FOR INITIAL DESIGN (DOLLARS)	99.00
MAXIMUM ALLOWED THICKNESS OF INITIAL CONSTRUCTION (INCHES)	69.0
ACCUMULATED MAX DEPTH OF ALL OVERLAYS (INCHES) (EXCLUDING LEVEL-UP)	6.0

TRAFFIC DATA

ADT AT BEGINNING OF ANALYSIS PERIOD (VEHICLES/DAY)	3700.
ADT AT END OF TWENTY YEARS (VEHICLES/DAY)	6200.
ONE-DIRECTION 20.-YEAR ACCUMULATED NO. OF EQUIVALENT 18-KSA	3700000.
AVERAGE APPROACH SPEED TO THE OVERLAY ZONE(MPH)	70.0
AVERAGE SPEED THROUGH OVERLAY ZONE (OVERLAY DIRECTION) (MPH)	45.0
AVERAGE SPEED THROUGH OVERLAY ZONE (NON-OVERLAY DIRECTION) (MPH)	65.0
PROPORTION OF ADT ARRIVING EACH HOUR OF CONSTRUCTION (PERCENT)	6.0
PERCENT TRUCKS IN ADT	23.0

ENVIRONMENT AND SUBGRADE

DISTRICT TEMPERATURE CONSTANT	28.0
SWELLING PROBABILITY	0.00
POTENTIAL VERTICAL RISE (INCHES)	0.00
SWELLING RATE CONSTANT	0.00
SUBGRADE ELASTIC MODULUS	14000.00

PAVEMENT DESIGN TYPE # 3 -- ACP + ASPH STAB BASE + FLEX BASE OVER SUBGRADE

PROB	DIST.-	COUNTY-	CONT.	SECT.	JOB	HIGHWAY	DATE	PAGE	
2		Waco	BELL	0231	04	25	US 190	2/27/2006	2

INPUT DATA CONTINUED

CONSTRUCTION AND MAINTENANCE DATA

SERVICEABILITY INDEX OF THE INITIAL STRUCTURE	4.4
SERVICEABILITY INDEX P1 AFTER AN OVERLAY	4.0
MINIMUM OVERLAY THICKNESS (INCHES)	2.0
OVERLAY CONSTRUCTION TIME (HOURS/DAY)	10.0
ASPHALTIC CONCRETE COMPACTED DENSITY (TONS/C.Y.)	1.98
ASPHALTIC CONCRETE PRODUCTION RATE (TONS/HOUR)	150.0
WIDTH OF EACH LANE (FEET)	12.0
FIRST YEAR COST OF ROUTINE MAINTENANCE (DOLLARS/LANE-MILE)	200.00
ANNUAL INCREMENTAL INCREASE IN MAINTENANCE COST (DOLLARS/LANE-MILE)	50.00

DETOUR DESIGN FOR OVERLAYS

TRAFFIC MODEL USED DURING OVERLAYING	3
TOTAL NUMBER OF LANES OF THE FACILITY	4
NUMBER OF OPEN LANES IN RESTRICTED ZONE (OVERLAY DIRECTION)	1
NUMBER OF OPEN LANES IN RESTRICTED ZONE (NON-OVERLAY DIRECTION)	2
DISTANCE TRAFFIC IS SLOWED (OVERLAY DIRECTION) (MILES)	0.60
DISTANCE TRAFFIC IS SLOWED (NON-OVERLAY DIRECTION) (MILES)	0.60
DETOUR DISTANCE AROUND THE OVERLAY ZONE (MILES)	0.00

PAVING MATERIALS INFORMATION

LAYER CODE	MATERIALS NAME	COST PER CY	E MODULUS	POISSON RATIO	MIN. DEPTH	MAX. DEPTH	SALVAGE PCT.
1	A ASPH CONC PVMT	70.00	500000.	0.35	2.00	2.00	30.00
2	B ASPH STAB BASE	60.00	400000.	0.35	4.00	8.00	90.00
3	C FLEXIBLE BASE	28.00	42000.	0.33	6.00	6.00	75.00
4	D SUBGRADE(200)	2.00	14000.	0.40	200.00	200.00	90.00

 PAVEMENT DESIGN TYPE # 3 -- ACP + ASPH STAB BASE + FLEX BASE OVER SUBGRADE

PROB	DIST.-	COUNTY-	CONT.	SECT.	JOB	HIGHWAY	DATE	PAGE
2		Waco	BELL	0231	04	25	US 190	2/27/2006 3

 C. LEVEL C SUMMARY OF THE BEST DESIGN STRATEGIES
 IN ORDER OF INCREASING TOTAL COST
 1

MATERIAL ARRANGEMENT	ABC
INIT. CONST. COST	18.56
OVERLAY CONST. COST	2.16
USER COST	0.00
ROUTINE MAINT. COST	0.67
SALVAGE VALUE	-3.83

 TOTAL COST 17.55

 NUMBER OF LAYERS 3

LAYER DEPTH (INCHES)	
D(1)	2.00
D(2)	6.00
D(3)	6.00

 NO.OF PERF.PERIODS 2

PERF. TIME (YEARS)	
T(1)	12.
T(2)	24.

OVERLAY POLICY(INCH)	
(INCLUDING LEVEL-UP)	
O(1)	2.5

SWELLING CLAY LOSS	
(SERVICEABILITY)	
SC(1)	0.00
SC(2)	0.00

Note: At confidence level C, the design now requires at least 6.0" ASB just to reach the 12-year initial performance requirement. A 2.5" overlay is predicted at that point.

Example of Medium Volume Highway Structural Design using Confidence Level D

FPS19W TEXAS DEPARTMENT OF TRANSPORTATION VS. 1.1.36978
 FLEXIBLE PAVEMENT SYSTEM

 PAVEMENT DESIGN TYPE # 3 -- ACP + ASPH STAB BASE + FLEX BASE OVER SUBGRADE

 PROB DIST.- 9 COUNTY- 14 CONT. SECT. JOB HIGHWAY DATE PAGE
 3 Waco BELL 0231 04 25 US 190 2/28/2006 1

COMMENTS ABOUT THIS PROBLEM

Run 3 using Confidence Level D, Mid-volume highway.

 BASIC DESIGN CRITERIA

LENGTH OF THE ANALYSIS PERIOD (YEARS)	20.0
MINIMUM TIME TO FIRST OVERLAY (YEARS)	12.0
MINIMUM TIME BETWEEN OVERLAYS (YEARS)	8.0
MINIMUM SERVICEABILITY INDEX P2	3.0
DESIGN CONFIDENCE LEVEL (99.0%)	D
INTEREST RATE OR TIME VALUE OF MONEY (PERCENT)	7.0

PROGRAM CONTROLS AND CONSTRAINTS

NUMBER OF SUMMARY OUTPUT PAGES DESIRED (8 DESIGNS/PAGE)	3
MAX FUNDS AVAILABLE PER SQ.YD. FOR INITIAL DESIGN (DOLLARS)	99.00
MAXIMUM ALLOWED THICKNESS OF INITIAL CONSTRUCTION (INCHES)	69.0
ACCUMULATED MAX DEPTH OF ALL OVERLAYS (INCHES) (EXCLUDING LEVEL-UP)	6.0

TRAFFIC DATA

ADT AT BEGINNING OF ANALYSIS PERIOD (VEHICLES/DAY)	3700.
ADT AT END OF TWENTY YEARS (VEHICLES/DAY)	6200.
ONE-DIRECTION 20.-YEAR ACCUMULATED NO. OF EQUIVALENT 18-KSA	3700000.
AVERAGE APPROACH SPEED TO THE OVERLAY ZONE(MPH)	70.0
AVERAGE SPEED THROUGH OVERLAY ZONE (OVERLAY DIRECTION) (MPH)	45.0
AVERAGE SPEED THROUGH OVERLAY ZONE (NON-OVERLAY DIRECTION) (MPH)	65.0
PROPORTION OF ADT ARRIVING EACH HOUR OF CONSTRUCTION (PERCENT)	6.0
PERCENT TRUCKS IN ADT	23.0

ENVIRONMENT AND SUBGRADE

DISTRICT TEMPERATURE CONSTANT	28.0
SWELLING PROBABILITY	0.00
POTENTIAL VERTICAL RISE (INCHES)	0.00
SWELLING RATE CONSTANT	0.00
SUBGRADE ELASTIC MODULUS	14000.00

PAVEMENT DESIGN TYPE # 3 -- ACP + ASPH STAB BASE + FLEX BASE OVER SUBGRADE

PROB	DIST.-	COUNTY-	CONT.	SECT.	JOB	HIGHWAY	DATE	PAGE
3	9	Waco	BELL	0231	04	25	US 190	2/28/2006 2

INPUT DATA CONTINUED

CONSTRUCTION AND MAINTENANCE DATA

SERVICEABILITY INDEX OF THE INITIAL STRUCTURE	4.4
SERVICEABILITY INDEX P1 AFTER AN OVERLAY	4.0
MINIMUM OVERLAY THICKNESS (INCHES)	2.0
OVERLAY CONSTRUCTION TIME (HOURS/DAY)	10.0
ASPHALTIC CONCRETE COMPACTED DENSITY (TONS/C.Y.)	1.98
ASPHALTIC CONCRETE PRODUCTION RATE (TONS/HOUR)	150.0
WIDTH OF EACH LANE (FEET)	12.0
FIRST YEAR COST OF ROUTINE MAINTENANCE (DOLLARS/LANE-MILE)	200.00
ANNUAL INCREMENTAL INCREASE IN MAINTENANCE COST (DOLLARS/LANE-MILE)	50.00

DETOUR DESIGN FOR OVERLAYS

TRAFFIC MODEL USED DURING OVERLAYING	3
TOTAL NUMBER OF LANES OF THE FACILITY	4
NUMBER OF OPEN LANES IN RESTRICTED ZONE (OVERLAY DIRECTION)	1
NUMBER OF OPEN LANES IN RESTRICTED ZONE (NON-OVERLAY DIRECTION)	2
DISTANCE TRAFFIC IS SLOWED (OVERLAY DIRECTION) (MILES)	0.60
DISTANCE TRAFFIC IS SLOWED (NON-OVERLAY DIRECTION) (MILES)	0.60
DETOUR DISTANCE AROUND THE OVERLAY ZONE (MILES)	0.00

PAVING MATERIALS INFORMATION

LAYER CODE	MATERIALS NAME	COST PER CY	E MODULUS	POISSON RATIO	MIN. DEPTH	MAX. DEPTH	SALVAGE PCT.
1	A ASPH CONC PVMT	70.00	500000.	0.35	2.00	2.00	30.00
2	B ASPH STAB BASE	60.00	400000.	0.35	4.00	10.00	90.00
3	C FLEXIBLE BASE	28.00	42000.	0.33	6.00	6.00	75.00
4	D SUBGRADE(200)	2.00	14000.	0.40	200.00	200.00	90.00

 PAVEMENT DESIGN TYPE # 3 -- ACP + ASPH STAB BASE + FLEX BASE OVER SUBGRADE

PROB	DIST.-	COUNTY-	CONT.	SECT.	JOB	HIGHWAY	DATE	PAGE
3		Waco	BELL	0231	04	25	US 190	2/28/2006 3

C. LEVEL D SUMMARY OF THE BEST DESIGN STRATEGIES
 IN ORDER OF INCREASING TOTAL COST
 1

 MATERIAL ARRANGEMENT ABC
 INIT. CONST. COST 24.39
 OVERLAY CONST. COST 2.02
 USER COST 0.00
 ROUTINE MAINT. COST 0.69
 SALVAGE VALUE -5.19

 TOTAL COST 21.91

 NUMBER OF LAYERS 3

 LAYER DEPTH (INCHES)
 D(1) 2.00
 D(2) 9.50
 D(3) 6.00

 NO.OF PERF.PERIODS 2

 PERF. TIME (YEARS)
 T(1) 13.
 T(2) 23.

 OVERLAY POLICY(INCH)
 (INCLUDING LEVEL-UP)
 O(1) 2.5

 SWELLING CLAY LOSS
 (SERVICEABILITY)
 SC(1) 0.00
 SC(2) 0.00

Note: At confidence level D, 9.5" of ASB is necessary to achieve the desired initial performance period of (at least)12 years. A 2.5" overlay is projected for year 13.