Appendix A10

ESAL Calculations

80 kN ESAL Calculation Sheet Date: 6/7/2023
Version 3.2 Updated 11/1/2017 MPH
Prepared by: LaBella Associates
This work sheet is used for the purpose of calculating the 80 kN ESAL using the "simple" method.
These calculations were taken from Figure 4-1 of the NYS Comprehensive Pavement
Design Manual (June 2000). Enter the parameters for items 0 through 8 below in the blue blocks.
The 80 kN ESAL count is calculated based on a compound traffic growth rate
ENTER DATA IN ALL SHEETS BEFORE PRINTING

PIN #:	P.I.N. 5512.52
Project:	Route 33, Kensington Expressway - City Streets
Location:	NY Route 33 - Region 5 - Buffalo
Date:	Rev'd - 11/6/2017

INPUT PARAMETERS:

0.	Construction Year	2027
1.	Design Life (use 50 years for determining pavement thickness)	50
2.	Projected Construction Year AADT	14875
3.	Percent Heavy Trucks Class 4 or greater	4%
4.	Percent Trucks in Design Direction	50%
5.	Percent Trucks in Design Lane	100%
6.	Truck Equivalency Factor (avg. ESAL per truck)	1.35
7.	Truck Volume Growth Rate	2.00%
8.	Annual Truck Weight Growth Rate	0.50%
9.	Modulus of Resilience Value	48

19	Enter the Functional Classification Code of the highway
NO	Does this road have full or partial access control?
NO	Is there a possibility of damaging homes, historic sites, etc., due to excessive vibration during compaction.
NO	Will there be less than 2000 MT of each course placed?
NO	Is the highway located in either Dutchess, Orange, Rockland, Putnam, Westchester, Nassau, Suffolk, Sullivan County or the City of New York?
NO	Are there are more than 3 lanes on this road?

RESULTS:

AADT for Design Year 2077 39,252

- Use 'F' series high friction asphalt.

Total 80 kN ESAL Count for the Design Life 15,181,547

- The 'Estimated Traffic' level should be < 30.0 million 80 Kn ESALs.
- 64V-22
-

PAVEMENT THICKNESS TABLE

80 kN ESAL Calculation Sheet — Date: 6/7/2023
Version 3.2 — Updated 11/1/2017 MPH
Prepared by: LaBella Associates

This work sheet is used for the purpose of calculating the 80 kN ESAL using the "simple" method. These calculations were taken from Figure 4-1 of the NYS Comprehensive Pavement Design Manual (June 2000). Enter the parameters for items 0 through 8 below in the blue blocks. The 80 kN ESAL count is calculated based on a compound traffic growth rate

Enter data also in pavt. thickness sheet. Print this sheet + item numbers

TOTAL ESAL VALUE	15,181,547	
Total HMA Thickness	7	inches

SELECT GRANULAR SUBGRADE	GRAVEL	BASE	BINDER	TOP
inches	inches	inches	inches	inches
0	12	3.0	2.5	1.5

ACTUAL PAVEMENT THICKNESSES TO USE

	THICKNESS	
SELECT GRANULAR SUBGRADE	0	in.
GRAVEL	12	in.
BASE	3	in.
BINDER	2.5	in.
TOP	1.5	in.

80 kN ESAL calculation Work Sheet
Version 3.2 Updated 11/1/2017 MPH
Prepared by: LaBella Associates Date: 6/7/2023

This work sheet is used for the purpose of calculating the 80 kN ESAL using the "simple" method. These calculations were taken from Figure 4-1 of the NYS Comprehensive Pavement Design Manual (June 2000). The 80 kN ESAL count is calculated based on a compound traffic growth rate and should be used for SUPERPAVE.

Make Sure to Double Check All Data

P.IN. #:	P.I.N. 5512.52
Project:	Route 33, Kensington Expressway - City Streets
Date:	Rev'd - 11/6/2017

INPUT PARAMETERS:

		Double Check
0.	Construction Completion Year	2027
1.	Design Life (Use 20 years for determining mix)	20
2.	Initial AADT	14875
3.	Percent Heavy Trucks Class 5 or greater	4%
4.	Percent Trucks in Design Direction	50%
5.	Percent Trucks in Design Lane	100%
6.	Truck Equivalency Factor (avg. ESAL per truck)	1.35
7.	Truck Volume Growth Rate	2.00%
8.	Annual Truck Weight Growth Rate	0.50%

Notes:

19	The Functional Classification of the highway is 19 - Urban Local.
NO	This road does not have full or partial access control.
NO	There is no possibility of damaging homes, historic sites, etc., due to excessive vibration during compaction.
NO	There will be more than 2000 MT of each course placed. ESALS are greater than 0.3 million.
NO	The highway is not located in either Dutchess, Orange, Rockland, Putnam, Westchester, Nassau, Suffolk, Sullivan County or the City of New York?
NO	There are less than 4 lanes on this road.

RESULTS:

AADT for Design Year 2047: 21,670

- Use 'F' series high friction asphalt.

Total 80 kN ESAL Count for the Design Life: 3,780,509

- The 'Estimated Traffic' level should be < 10.0 million 80 Kn ESALs.

Recommended SUPERPAVE Item number

TOP:	402.09	Or: 402.12
BINDER:	402.19	

- Confirm with the Regional Materials Engineer
- Remember to add the appropriate Quality Payment Items
- Remember to Print Out the Applicable Special Note

Your Special Note Is for: 64V-22

80 kN ESAL Calculation Sheet Date: 6/7/2023
Version 3.2 Updated 11/1/2017 MPH
Prepared by: LaBella Associates
This work sheet is used for the purpose of calculating the 80 kN ESAL using the "simple" method.
These calculations were taken from Figure 4-1 of the NYS Comprehensive Pavement
Design Manual (June 2000). Enter the parameters for items 0 through 8 below in the blue blocks.
The 80 kN ESAL count is calculated based on a compound traffic growth rate
ENTER DATA IN ALL SHEETS BEFORE PRINTING

PIN #:	P.I.N. 5512.52
Project:	Route 33, Kensington Expressway - Humboldt Parkway
Location:	NY Route 33 - Region 5 - Buffalo
Date:	Rev'd - 11/6/2017

INPUT PARAMETERS:

0.	Construction Year	2027
1.	Design Life (use 50 years for determining pavement thickness)	50
2.	Projected Construction Year AADT	12890
3.	Percent Heavy Trucks Class 4 or greater	4%
4.	Percent Trucks in Design Direction	100%
5.	Percent Trucks in Design Lane	100%
6.	Truck Equivalency Factor (avg. ESAL per truck)	1.35
7.	Truck Volume Growth Rate	2.00%
8.	Annual Truck Weight Growth Rate	0.50%
9.	Modulus of Resilience Value	48

19	Enter the Functional Classification Code of the highway
NO	Does this road have full or partial access control?
NO	Is there a possibility of damaging homes, historic sites, etc., due to excessive vibration during compaction.
NO	Will there be less than 2000 MT of each course placed?
NO	Is the highway located in either Dutchess, Orange, Rockland, Putnam, Westchester, Nassau, Suffolk, Sullivan County or the City of New York?
NO	Are there are more than 3 lanes on this road?

RESULTS:

AADT for Design Year 2077 34,014

- Use 'F' series high friction asphalt.

Total 80 kN ESAL Count for the Design Life 26,311,279

- The 'Estimated Traffic' level should be < 30.0 million 80 Kn ESALs.
- 64V-22
-

PAVEMENT THICKNESS TABLE

80 kN ESAL Calculation Sheet — Date: 6/7/2023
Version 3.2 — Updated 11/1/2017 MPH
Prepared by: LaBella Associates

This work sheet is used for the purpose of calculating the 80 kN ESAL using the "simple" method. These calculations were taken from Figure 4-1 of the NYS Comprehensive Pavement Design Manual (June 2000). Enter the parameters for items 0 through 8 below in the blue blocks. The 80 kN ESAL count is calculated based on a compound traffic growth rate

Enter data also in pavt. thickness sheet. Print this sheet + item numbers

TOTAL ESAL VALUE	26,311,279	
Total HMA Thickness	8	inches

SELECT GRANULAR SUBGRADE	GRAVEL	BASE	BINDER	TOP
inches	inches	inches	inches	inches
0	12	4.0	2.5	1.5

ACTUAL PAVEMENT THICKNESSES TO USE

	THICKNESS	
SELECT GRANULAR SUBGRADE	0	in.
GRAVEL	12	in.
BASE	4	in.
BINDER	2.5	in.
TOP	1.5	in.

80 kN ESAL calculation Work Sheet
Version 3.2 Updated 11/1/2017 MPH
Prepared by: LaBella Associates Date: 6/7/2023

This work sheet is used for the purpose of calculating the 80 kN ESAL using the "simple" method. These calculations were taken from Figure 4-1 of the NYS Comprehensive Pavement Design Manual (June 2000). The 80 kN ESAL count is calculated based on a compound traffic growth rate and should be used for SUPERPAVE.

Make Sure to Double Check All Data

P.IN. #:	P.I.N. 5512.52
Project:	Route 33, Kensington Expressway - Humboldt Parkway
Date:	Rev'd - 11/6/2017

INPUT PARAMETERS:

		Double Check
0.	Construction Completion Year	2027
1.	Design Life (Use 20 years for determining mix)	20
2.	Initial AADT	12890
3.	Percent Heavy Trucks Class 5 or greater	4%
4.	Percent Trucks in Design Direction	100%
5.	Percent Trucks in Design Lane	100%
6.	Truck Equivalency Factor (avg. ESAL per truck)	1.35
7.	Truck Volume Growth Rate	2.00%
8.	Annual Truck Weight Growth Rate	0.50%

Notes:

19	The Functional Classification of the highway is 19 - Urban Local.
NO	This road does not have full or partial access control.
NO	There is no possibility of damaging homes, historic sites, etc., due to excessive vibration during compaction.
NO	There will be more than 2000 MT of each course placed. ESALS are greater than 0.3 million.
NO	The highway is not located in either Dutchess, Orange, Rockland, Putnam, Westchester, Nassau, Suffolk, Sullivan County or the City of New York?
NO	There are less than 4 lanes on this road.

RESULTS:

AADT for Design Year 2047: 18,778

- Use 'F' series high friction asphalt.

Total 80 kN ESAL Count for the Design Life: 6,552,035

- The 'Estimated Traffic' level should be < 10.0 million 80 Kn ESALs.
-

Recommended SUPERPAVE Item number

TOP:	402.09	Or: 402.12
BINDER:	402.19	

- Confirm with the Regional Materials Engineer
- Remember to add the appropriate Quality Payment Items
- Remember to Print Out the Applicable Special Note

Your Special Note Is for: 64V-22

80 kN ESAL Calculation Sheet Date: 6/7/2023
Version 3.2 Updated 11/1/2017 MPH
Prepared by: LaBella Associates
This work sheet is used for the purpose of calculating the 80 kN ESAL using the "simple" method.
These calculations were taken from Figure 4-1 of the NYS Comprehensive Pavement
Design Manual (June 2000). Enter the parameters for items 0 through 8 below in the blue blocks.
The 80 kN ESAL count is calculated based on a compound traffic growth rate
ENTER DATA IN ALL SHEETS BEFORE PRINTING

PIN #:	P.I.N. 5512.52
Project:	Route 33, Kensington Expressway - Mainline
Location:	NY Route 33 - Region 5 - Buffalo
Date:	Rev'd - 11/6/2017

INPUT PARAMETERS:

0.	Construction Year	2027
1.	Design Life (use 50 years for determining pavement thickness)	50
2.	Projected Construction Year AADT	78700
3.	Percent Heavy Trucks Class 4 or greater	14%
4.	Percent Trucks in Design Direction	50%
5.	Percent Trucks in Design Lane	80%
6.	Truck Equivalency Factor (avg. ESAL per truck)	1.35
7.	Truck Volume Growth Rate	2.00%
8.	Annual Truck Weight Growth Rate	0.50%
9.	Modulus of Resilience Value	48

12	Enter the Functional Classification Code of the highway
YES	Does this road have full or partial access control?
NO	Is there a possibility of damaging homes, historic sites, etc., due to excessive vibration during compaction.
NO	Will there be less than 2000 MT of each course placed?
NO	Is the highway located in either Dutchess, Orange, Rockland, Putnam, Westchester, Nassau, Suffolk, Sullivan County or the City of New York?
YES	Are there are more than 3 lanes on this road?

RESULTS:

AADT for Design Year 2077 207,674

- Use 'F' series high friction asphalt.

Total 80 kN ESAL Count for the Design Life 224,901,223

- The 'Estimated Traffic' level should be > 100.0 million 80 Kn ESALs.
- 64V-22
-

PAVEMENT THICKNESS TABLE

80 kN ESAL Calculation Sheet — Date: 6/7/2023
Version 3.2 — Updated 11/1/2017 MPH
Prepared by: LaBella Associates

This work sheet is used for the purpose of calculating the 80 kN ESAL using the "simple" method. These calculations were taken from Figure 4-1 of the NYS Comprehensive Pavement Design Manual (June 2000). Enter the parameters for items 0 through 8 below in the blue blocks. The 80 kN ESAL count is calculated based on a compound traffic growth rate

Enter data also in pavt. thickness sheet. Print this sheet + item numbers

TOTAL ESAL VALUE	224,901,223	
Total HMA Thickness	10	inches

SELECT GRANULAR SUBGRADE	GRAVEL	BASE	BINDER	TOP
inches	inches	inches	inches	inches
12	12	6.0	2.5	1.5

ACTUAL PAVEMENT THICKNESSES TO USE

	THICKNESS	
SELECT GRANULAR SUBGRADE	12	in.
GRAVEL	12	in.
BASE	6	in.
BINDER	2.5	in.
TOP	1.5	in.

80 kN ESAL calculation Work Sheet
Version 3.2 Updated 11/1/2017 MPH
Prepared by: LaBella Associates Date: 6/7/2023

This work sheet is used for the purpose of calculating the 80 kN ESAL using the "simple" method. These calculations were taken from Figure 4-1 of the NYS Comprehensive Pavement Design Manual (June 2000). The 80 kN ESAL count is calculated based on a compound traffic growth rate and should be used for SUPERPAVE.

Make Sure to Double Check All Data

P.IN. #:	P.I.N. 5512.52
Project:	Route 33, Kensington Expressway - Mainline
Date:	Rev'd - 11/6/2017

INPUT PARAMETERS:

		Double Check
0.	Construction Completion Year	2027
1.	Design Life (Use 20 years for determining mix)	20
2.	Initial AADT	78700
3.	Percent Heavy Trucks Class 5 or greater	14%
4.	Percent Trucks in Design Direction	50%
5.	Percent Trucks in Design Lane	80%
6.	Truck Equivalency Factor (avg. ESAL per truck)	1.35
7.	Truck Volume Growth Rate	2.00%
8.	Annual Truck Weight Growth Rate	0.50%

Notes:

12	The Functional Classification of the highway is 12 - Urban Principal Arterial - Expressway.
YES	This road has full or partial access control.
NO	There is a possibility of damaging homes, historic sites, etc., due to excessive vibration during compaction.
YES	There will be more than 2000 MT of each course placed. ESALS are greater than 0.3 million.
NO	The highway is not located in either Dutchess, Orange, Rockland, Putnam, Westchester, Nassau, Suffolk, Sullivan County or the City of New York?
YES	There are 4 or more lanes on this road.

RESULTS:

AADT for Design Year 2047: 114,651

- Use 'F' series high friction asphalt.

Total 80 kN ESAL Count for the Design Life: 56,004,906

- The 'Estimated Traffic' level should be < 100.0 million 80 Kn ESALs.

Recommended SUPERPAVE Item number

TOP: 402.09	Or: 402.12
BINDER: 402.19	

- Confirm with the Regional Materials Engineer
- Remember to add the appropriate Quality Payment Items
- Remember to Print Out the Applicable Special Note

Your Special Note Is for: 64V-22

80 kN ESAL Calculation Sheet Date: 6/7/2023
Version 3.2 Updated 11/1/2017 MPH
Prepared by: LaBella Associates
This work sheet is used for the purpose of calculating the 80 kN ESAL using the "simple" method.
These calculations were taken from Figure 4-1 of the NYS Comprehensive Pavement
Design Manual (June 2000). Enter the parameters for items 0 through 8 below in the blue blocks.
The 80 kN ESAL count is calculated based on a compound traffic growth rate
ENTER DATA IN ALL SHEETS BEFORE PRINTING

PIN #:	P.I.N. 5512.52
Project:	Route 33, Kensington Expressway - Ramps
Location:	NY Route 33 - Region 5 - Buffalo
Date:	Rev'd - 11/6/2017

INPUT PARAMETERS:

0.	Construction Year	2027
1.	Design Life (use 50 years for determining pavement thickness)	50
2.	Projected Construction Year AADT	11500
3.	Percent Heavy Trucks Class 4 or greater	4%
4.	Percent Trucks in Design Direction	100%
5.	Percent Trucks in Design Lane	100%
6.	Truck Equivalency Factor (avg. ESAL per truck)	1.35
7.	Truck Volume Growth Rate	2.00%
8.	Annual Truck Weight Growth Rate	0.50%
9.	Modulus of Resilience Value	48

12	Enter the Functional Classification Code of the highway
YES	Does this road have full or partial access control?
NO	Is there a possibility of damaging homes, historic sites, etc., due to excessive vibration during compaction.
NO	Will there be less than 2000 MT of each course placed?
NO	Is the highway located in either Dutchess, Orange, Rockland, Putnam, Westchester, Nassau, Suffolk, Sullivan County or the City of New York?
NO	Are there are more than 3 lanes on this road?

RESULTS:

AADT for Design Year 2077 30,346

- Use 'F' series high friction asphalt.

Total 80 kN ESAL Count for the Design Life 23,473,989

- The 'Estimated Traffic' level should be < 30.0 million 80 Kn ESALs.
- 64V-22
-

PAVEMENT THICKNESS TABLE

80 kN ESAL Calculation Sheet — Date: 6/7/2023
Version 3.2 — Updated 11/1/2017 MPH
Prepared by: LaBella Associates

This work sheet is used for the purpose of calculating the 80 kN ESAL using the "simple" method. These calculations were taken from Figure 4-1 of the NYS Comprehensive Pavement Design Manual (June 2000). Enter the parameters for items 0 through 8 below in the blue blocks. The 80 kN ESAL count is calculated based on a compound traffic growth rate

Enter data also in pavt. thickness sheet. Print this sheet + item numbers

TOTAL ESAL VALUE	23,473,989	
Total HMA Thickness	8	inches

SELECT GRANULAR SUBGRADE	GRAVEL	BASE	BINDER	TOP
inches	inches	inches	inches	inches
0	12	4.0	2.5	1.5

ACTUAL PAVEMENT THICKNESSES TO USE

	THICKNESS	
SELECT GRANULAR SUBGRADE	0	in.
GRAVEL	12	in.
BASE	4	in.
BINDER	2.5	in.
TOP	1.5	in.

80 kN ESAL calculation Work Sheet
Version 3.2 Updated 11/1/2017 MPH
Prepared by: LaBella Associates Date: 6/7/2023

This work sheet is used for the purpose of calculating the 80 kN ESAL using the "simple" method. These calculations were taken from Figure 4-1 of the NYS Comprehensive Pavement Design Manual (June 2000). The 80 kN ESAL count is calculated based on a compound traffic growth rate and should be used for SUPERPAVE.

Make Sure to Double Check All Data

P.IN. #:	P.I.N. 5512.52
Project:	Route 33, Kensington Expressway - Ramps
Date:	Rev'd - 11/6/2017

INPUT PARAMETERS:

		Double Check
0.	Construction Completion Year	2027
1.	Design Life (Use 20 years for determining mix)	20
2.	Initial AADT	11500
3.	Percent Heavy Trucks Class 5 or greater	4%
4.	Percent Trucks in Design Direction	100%
5.	Percent Trucks in Design Lane	100%
6.	Truck Equivalency Factor (avg. ESAL per truck)	1.35
7.	Truck Volume Growth Rate	2.00%
8.	Annual Truck Weight Growth Rate	0.50%

Notes:

12	The Functional Classification of the highway is 12 - Urban Principal Arterial - Expressway.
YES	This road has full or partial access control.
NO	There is a possibility of damaging homes, historic sites, etc., due to excessive vibration during compaction.
NO	There will be more than 2000 MT of each course placed. ESALS are greater than 0.3 million.
NO	The highway is not located in either Dutchess, Orange, Rockland, Putnam, Westchester, Nassau, Suffolk, Sullivan County or the City of New York?
NO	There are less than 4 lanes on this road.

RESULTS:

AADT for Design Year 2047: 16,753

- Use 'F' series high friction asphalt.

Total 80 kN ESAL Count for the Design Life: 5,845,493

- The 'Estimated Traffic' level should be < 10.0 million 80 Kn ESALs.

Recommended SUPERPAVE Item number

TOP:	402.09	Or: 402.12
BINDER:	402.19	

- Confirm with the Regional Materials Engineer
- Remember to add the appropriate Quality Payment Items
- Remember to Print Out the Applicable Special Note

Your Special Note Is for: 64V-22