

Pavement Structural Design Matrix – Minimum Requirements

City of Toronto



		30,000		40,000		50,000		60,000		75,000	
		30 MPa	50 MPa	30 MPa	50 MPa	30 MPa	50 MPa	30 MPa	50 MPa	30 MPa	50 MPa
Major Arterial	Non-Truck Routes (5% Commercial Vehicles)	40 mm SP12.5 FC2 D 110 mm SP19.0 D 150 mm Granular A 200 mm Granular B* 500 mm Total	40 mm SP12.5 FC2 D 90 mm SP19.0 D 150 mm Granular A 200 mm Granular B* 480 mm Total	40 mm SP12.5 FC2 D 125 mm SP19.0 D 150 mm Granular A 200 mm Granular B* 515 mm Total	40 mm SP12.5 FC2 D 100 mm SP19.0 D 150 mm Granular A 200 mm Granular B* 490 mm Total	40 mm SP12.5 FC2 D 135 mm SP19.0 D 150 mm Granular A 200 mm Granular B* 525 mm Total	40 mm SP12.5 FC2 D 110mm SP19.0 D 150 mm Granular A 200 mm Granular B* 500 mm Total	40 mm SP12.5 FC2 D 145 mm SP19.0 D 150 mm Granular A 200 mm Granular B* 535 mm Total	40 mm SP12.5 FC2 D 120 mm SP19.0 D 150 mm Granular A 200 mm Granular B* 510 mm Total	40 mm SP12.5 FC2 D 155mm SP19.0 D 150 mm Granular A 200 mm Granular B* 545 mm Total	40 mm SP12.5 FC2 D 125 mm SP19.0 D 150 mm Granular A 200 mm Granular B* 515 mm Total
	Truck Routes (7.5% Commercial Vehicles)	40 mm SP12.5 FC2 D 130 mm SP19.0 D 150 mm Granular A 250 mm Granular B* 570 mm Total	40 mm SP12.5 FC2 D 110 mm SP19.0 D 150 mm Granular A 250 mm Granular B* 550 mm Total	40 mm SP12.5 FC2 D 150 mm SP19.0 D 150 mm Granular A 250 mm Granular B 590 mm Total	40 mm SP12.5 FC2 D 130 mm SP19.0 D 150 mm Granular A 250 mm Granular B* 570 mm Total	40 mm SP12.5 FC2 D 155 mm SP19.0 D 150 mm Granular A 250 mm Granular B* 595 mm Total	40 mm SP12.5 FC2 D 135 mm SP19.0 D 150 mm Granular A 250 mm Granular B* 575 mm Total	40 mm SP12.5 FC2 E 160 mm SP19.0 E 150mm Granular A 250 mm Granular B* 600 mm Total	40 mm SP12.5 FC2 E 145 mm SP19.0 E 150 mm Granular A 250 mm Granular B* 585 mm Total	40 mm SP12.5 FC2 E 170 mm SP19.0 E 150 mm Granular A 250 mm Granular B* 610 mm total	40 mm SP12.5 FC2 E 150 mm SP19.0 E 150 mm Granular A 250 mm Granular B* 590 mm Total
	Truck Routes (10% Commercial Vehicles)	40 mm SP12.5 FC2 D 150 mm SP19.0 D 150 mm Granular A 250 mm Granular B* 590 mm Total	40 mm SP12.5 FC2 D 125 mm SP19.0 D 150 mm Granular A 250 mm Granular B* 565 mm Total	40 mm SP12.5 FC2 D 160 mm SP19.0 D 150 mm Granular A 250 mm Granular B* 600 mm Total	40 mm SP12.5 FC2 D 135 mm SP19.0 D 150 mm Granular A 250 mm Granular B* 575 mm Total	40 mm SP12.5 FC2 E 170 mm SP19.0 E 150 mm Granular A 250 mm Granular B 610 mm Total	40 mm SP12.5 FC2 E 145 mm SP19.0 E 150 mm Granular A 250 mm Granular B* 585 mm Total	40 mm SP12.5 FC2 E 175 mm SP19.0 E 150 mm Granular A 250 mm Granular B* 615 mm Total	40 mm SP12.5 FC2 E 155 mm SP19.0 E 150 mm Granular A 250 mm Granular B* 595 mm Total	40 mm SP12.5 FC2 E 185 mm SP19.0 E 150 mm Granular A 250 mm Granular B* 625 mm Total	40 mm SP12.5 FC2 E 165 mm SP19.0 E 150 mm Granular A 250 mm Granular B* 605 mm Total

		20,000		25,000	
		30 MPa	50 MPa	30 MPa	50 MPa
Minor Arterial	Non-Truck Routes (4% Commercial Vehicles)	40 mm SP12.5 FC1 C 95 mm SP19.0 D 150 mm Granular A 150 mm Granular B* 435 mm Total	40 mm SP12.5 FC1 C 80 mm SP19.0 D 150 mm Granular A 150 mm Granular B* 420 mm Total	40 mm SP12.5 FC1 C 105 mm SP19.0 D 150 mm Granular A 150 mm Granular B* 445 mm Total	40 mm SP12.5 FC1 C 85 mm SP19.0 D 150 mm Granular A 150 mm Granular B* 425 mm Total
	Truck Routes (7.5% Commercial Vehicles)	40 mm SP12.5 FC1 C 135 mm SP19.0 D 150 mm Granular A 150 mm Granular B* 475 mm Total	40 mm SP12.5 FC1 C 110 mm SP19.0 D 150 mm Granular A 150 mm Granular B* 450 mm Total	40 mm SP12.5 FC1 C 140 mm SP19.0 D 150 mm Granular A 150 mm Granular B* 480 mm Total	40 mm SP12.5 FC1 C 120 mm SP19.0 D 150 mm Granular A 150 mm Granular B* 460 mm Total

		5,000		7,500		10,000		15,000	
		30 MPa	50 MPa	30 MPa	50 MPa	30 MPa	50 MPa	30 MPa	50 MPa
Collector	Comm./Ind. (5% Commercial Vehicles)			40 mm SP12.5 B 105 mm SP19.0 B 150 mm Granular A 150 mm Granular B* 445 mm Total	40 mm SP12.5 B 75 mm SP19.0 B 150 mm Granular A 150 mm Granular B* 415 mm Total	40 mm SP12.5 B 115 mm SP19.0 B 150 mm Granular A 150 mm Granular B* 455 mm Total	40 mm SP12.5 B 85 mm SP19.0 B 150 mm Granular A 150 mm Granular B* 425 mm Total	40 mm SP12.5 B 125 mm SP19.0 B 150 mm Granular A 150 mm Granular B* 465 mm Total	40 mm SP12.5 B 95 mm SP19.0 B 150 mm Granular A 150 mm Granular B* 435 mm Total
	Residential (3% Commercial Vehicles)	40 mm SP12.5 B 70 mm SP19.0 B 150 mm Granular A 150 mm Granular B* 410 mm Total	40 mm SP12.5 B 60 mm SP19.0 B 150 mm Granular A 150 mm Granular B* 400 mm Total	40 mm SP12.5 B 85 mm SP19.0 B 150 mm Granular A 150 mm Granular B* 425 mm Total	40 mm SP12.5 B 60 mm SP19.0 B 150 mm Granular A 150 mm Granular B* 400 mm Total	40 mm SP12.5 B 95 mm SP19.0 B 150 mm Granular A 150 mm Granular B* 435 mm Total	40 mm SP12.5 B 60 mm SP19.0 B 150 mm Granular A 150 mm Granular B* 400 mm Total		

		All Traffic & Subgrade
Composite Pavements	Major Arterial	40 mm Surface layer** 50 mm Base layer** 250 mm PCC Concrete 150 mm Granular A 490 mm Total
	Minor Arterial - Bus/Truck Route	40 mm SP12.5 FC1 C 50 mm SP19.0 D 250 mm PCC Concrete 150 mm Granular A 490 mm Total
	Local Collector - Bus/Truck Route	50 mm SP12.5 B 200 mm PCC Concrete 150 mm Granular A 400 mm Total
	Local Collector - Non Bus/Truck Route	50 mm SP12.5 B 150 mm PCC Concrete 150 mm Granular A 350 mm Total

Notes:	AADT
	Subgrade

* Subbase is Granular B - Type II as specified in TS 1010
 ** Surface and base layer asphalt mix types for Major Arterial composite pavements should be selected based on the AADT as prescribed for flexible pavements

		2,500		3,000		4,500	
		Local Residential (3% Commercial Vehicles)		Local Industrial (10% Commercial Vehicles)		Local Throughway (3% Commercial Vehicles)	
		30 MPa	50 MPa	30 MPa	50 MPa	30 MPa	50 MPa
Local		40 mm SP12.5 B 60 mm SP19.0 B 150 mm Granular A 150 mm Granular B* 400 mm Total	40 mm SP12.5 B 80 mm SP19.0 B 150 mm Granular A 150 mm Granular B* 420 mm Total	40 mm SP12.5 B 60 mm SP19.0 B 150 mm Granular A 150 mm Granular B* 400 mm Total	40 mm SP12.5 B 60 mm SP19.0 B 150 mm Granular A 150 mm Granular B* 400 mm Total	40 mm SP12.5 B 60 mm SP19.0 B 150 mm Granular A 150 mm Granular B* 400 mm Total	40 mm SP12.5 B 60 mm SP19.0 B 150 mm Granular A 150 mm Granular B* 400 mm Total

Designers shall use the pavement structural design matrix as minimum layer thickness during pavement design and analysis. Layer thickness may need to be increased based on the higher traffic volume, higher truck percentage or in situ resilient modulus.