METRIC RATE OF APPLICATION and CONVERSION

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
742	37R-2	OGLE	389	155
STA.		TO STA.		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		

CONTRACT #64157

METRIC RATE OF APPLICATION

Common Rate of Application
(English to Metric)

Bituminous Prime	7.63 Lbs/Gal = 0.914 kg/L
Aggregate	2.05 Ton/CuYds = 2.43 MT/M^3
Bituminous	112 Lbs/In/SqYds = 2.392 Kg/mm/m^2

1. A-2
   Bituminous Materials (Prime Coat) 1.5 L/m^2 .00137 MT/m^2

   Bituminous Materials 3 L/m^2
   (1 application each Cover & Seal Coat) .00274 MT/m^2

   Cover Coat Aggregate (1 application) 11 Kg/m^2 .011 MT/m^2

   Seal Coat Aggregate (1 application) 11 Kg/m^2 .011 MT/m^2

2. A-3
   Bituminous Materials (Prime Coat) 1.5 L/m^2 .00137 MT/m^2

   Bituminous Materials 4.5 L/m^2
   (2 applications Cover and 1 application Seal Coat) .00411 MT/m^2

   Cover Coat Aggregate (2 applications) 22 Kg/m^2 0.022 MT/m^2

   Seal Coat Aggregate (1 application) 11Kg/m^2 .011 MT/m^2

3. I-11
   Bituminous Materials (Prime Coat) (on Pavement) 0.35 L/m^2 .00032 MT/m^2

   Bituminous Materials (Prime Coat) (on Gravel) 1.5 L/m^2 .00137 MT/m^2

   Aggregate (Prime Coat) 1.5 Kg/m^2 .0015 MT/m^2

   Leveling Binder (Hand Method) 5-15 MT/Mile

   Other Items as shown on the typical sections usually use:

   60 mm Resurfacing

   20 mm Leveling Binder (Machine Method) 60 Kg/m^2

   40 mm Bituminous Concrete Surface Course 96 Kg/m^2
   (Sub-Class I, Mixture D)

   I-11 Surfacing, Mixture D, and its allied items are rated 2.392 Kg/mm/m^2

   Class I, Mixture E - 2.541 Kg/mm/m^2

   Class 1, Mixture E (Special) - 2.627 Kg/mm/m^2

4. Gravel and Crushed Stone
   Gravel or Crushed Stone Base Course, Type A 2.43 MT/m^3

   Gravel or Crushed Stone Base Course, Type B 2.43 MT/m^3

   Salvage is 75% of original amount

   Type B Shoulder (1 meter wedge)

40 mm	0.097 MT/m
60 mm	0.146 MT/m
85 mm	0.207 MT/m

   *Increase these by a minimum of 50% or as field review indicates.

5. Seeding and Fertilizers
   Fertilizer Nutrients 100 Kg/ha

   Ground Limestone 4.5 MT/ha

   Straw for Asphalt-Coated Mulch 4.5 MT/ha

   Sup. Water 15 L/m^2 x 3 = 45 L/m^2

6. Calcium Chloride

   0.01 to 0.016 Kg/mm/m^2 for thickness of the Base Course

RATE OF APPLICATION
(continued)

7. "Good Neighbor" Policy

   Calcium Chloride 1 Kg/m^2

8. Rock Excavation Expansion - 10% - 15%

9. Lime Modified Soil

   Processing Lime Modified Soils (Specify thickness) Sq. Meter

   LIME in MT (3.5% by weight of specified thickness).
   Example: Processing Lime Modified Soils 300 mm

   90 pounds/cubic feet of soil = 1441.7 Kg/m^3 = 432/5_Kg/m^2/300 mm thick

   Lime - 432.5 x .035 divided by 1000 = 0.0151 MT/m^2

   Water (Slurry Mix) (In urbanized areas)
   2 MT of water/MT of lime = 1/2 unit water/MT of lime

   Water (Dry Mix) (In rural areas)
   1/2 MT of water/MT of lime = 1/8 unit water/MT of lime

10. Pavement Marking

Short-term Pavement Marking (one application on each, prime coat, binder course, and surface course)	1.2 m per 12 m 1.2 m per 30 m on shoulders on 4-lane highways and other highways with paved shoulders greater than 4' wide.

Permanent Pavement Marking (Passing Zone) 3 m per 12 m

PAVEMENT MARKING LETTERS AND SYMBOL AREAS

LETTERS m^2

	A	B	C	D	E	F	G	H	I	J	K	L
SIZE												
2.44m.	51	.66	.45	.57	.55	.44	.54	.56	.24	.34	.53	.35

	M	N	O	P	Q	R	S	T	U	V	W	X
SIZE												
2.44m.	69	.66	.56	.49	.59	.59	.53	.35	.52	.45	.68	.45

	Y	Z
SIZE		
2.44m.	36	.47

NUMBERS m^2

SIZE	1	2	3	4	5	6	7	8	9	0
2.44m	.24	.54	.54	.47	.57	.58	.35	.62	.58	.56

SYMBOLS LARGE SIZE m^2

Through Arrow	1.07
Left or Right Arrow	1.47
Combination Left or Right and Through Arrow	2.42
Railroad "R" (6 feet)	.33
Railroad "X" (20 feet)	5.02
Handicapped Symbol	.43 (Disabled)

*Table applies to all types of pavement marking materials.

METRIC CONVERSIONS

	From English	To Metric	Multiply Quantity Units By
LENGTHS	Inch	mm	25.4
	ft.	mm	304.8
	ft.	m	0.3048
	yd.	m	0.9144
	mile	km	1.609344
	mile	m	1609.344
	inches/mile	mm/km	15.7828
AREAS	sq. inch	mm^2	645.16
	sq. ft.	m^2	0.092903
	sq. yd.	m^2	0.836127
	acre	m^2	4046.856
	acre	ha	0.404685
	sq. mile	km^2	2.59
VOLUME	cubic inch	mm^3	16387.06
	cubic foot	m^3	0.028316
	cubic yard	m^3	0.764555
	gallon	L	3.78541
	gal./yd.	L/m	4.1398
	gal./sq. yd.	L/m^2	4.5273
	gal./cubic yd.	L/m^3	4.9511
MASSES	ounces	g	28.349523
	pound	kg	0.453592
	kip (1000 lbs)	metric ton	0.453692
	ton	metric ton	0.9072
FORCES	pound	N	4.44822
	kip	kN	4.44822
FORCE/UNIT LENGTH	lb./ft.	N/m	14.5939
	lb./inch	N/mm	0.1751
PRESSURE/STRESS	lbs./sq. ft.	Pa	47.3803
	kips/sq. ft.	kPa	47.3803
	lbs./sq. inch	kPa	6.89476
	lbs./sq. inch	MPa	0.006895
	kips/sq. inch	MPa	6.89476
ENERGY	foot pound	J	1.35582
MASSES/LENGTH	ounces/sq. yd.	kg/m^2	0.0339057
	lbs./sq. ft.	kg/m^2	4.8824
	lbs/sq. yd.	kg/m^2	0.5425
	lbs./cubic ft.	kg/m^3	16.01894
	lbs./cubic yd.	kg/m^3	0.5933

TEMPERATURE (F-32)/1.8 = C

Definitions: Soft Conversion is an exact conversion of the English Unit. Hard conversion is a close approximate of the English unit but is rounded logically in the metric system.

Basic Dimensions

millimeter	(mm)	
meter	(m)	
square meter	(m^2)	
cubic meter	(m^3)	
liter	(L)	
Pascal	(Pa)	
kilopascal	(kPa)	
Megapascal	(MPa)	
Newton	(N)	
kilonewton	(kN)	
Joule	(J)	
degree celsius	(°C)	
gram	(g)	
kilogram	(kg)	
Megagram	(Mg) (Metric Ton)	

kilogram per square meter (kg/m2)

Prefixes

deci (d)	10^1	one tenth
centi (c)	10^2	one hundredth
milli (m)	10^3	one thousandth
micro (u)	10^6	one millionth
nano (n)	10^9	one billionth
deca (da)	10^1	ten
hecto (h)	10^2	one hundred
kilo (k)	10^3	one thousand
Mega (M)	10^6	one million
Giga (G)	10^9	one billion

Metric Measurements

Lengths	= millimeters, meters, kilometers
Areas	= square meters or hectare (10,000 square meters)
Volume	= liters or cubic meters
Mass	= kilograms, metric tons
Force	= newton (N = kg m/s)
Pressure, Stress	= Pascal (Pa = N/m)
Energy, Work	= Joule (J - Nm)
Torque	= Newton meter
Speed, Velocity	= meter/second, kilometers/hour
Acceleration	= meters/second squared, kilometers/hours squared
Density	= Newton/meter cubed
Temperature	= Celsius
Power	= grams/Watt

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