

Access Delay Times – Fences

<i>Description</i>	<i>Adversary Equipment</i>	<i>Equipment Weight (Kg.)</i>	<i>Penetration Time (Seconds)</i>			
			<i>Min.</i>	<i>Mean</i>	<i>Max.</i>	<i>Standard Deviation</i>
2.5-m chain-link mesh with outriggers 4-mm x 50-mm mesh	Ladder	5.0	6	12	18	2.4
	Tarpaulin	2.0	6	12	18	2.4
	Pliers	1.0	60	120	180	24.6
	Manual Boltcutters	3.0	30	60	90	12
	Circular Saw	10	30	60	90	12
	Manual Boltcutters (larger opening)	3.5	45	90	135	18.6
	Circular Saw (larger opening)	11	45	90	135	18.6
	Gloves	0.5	6	12	18	2.4
2.5-m Vinyl-coated chain-link mesh with outriggers 3-mm x 50-mm mesh	Ladder	5.0	6	12	18	2.4
	Manual Boltcutters	3.0	30	60	90	12
	Pliers	1.0	60	120	180	24.6
	Circular Saw	11.0	45	90	135	18.6
2.5-m chain-link mesh without outriggers, Vinyl-coated, 1.8-mm x 50-mm mesh	Ladder	3.0	6	12	18	2.4
	No equipment	0.0	3	6	9	1.2
	Manual Boltcutters	3.0	30	60	90	12
	Pliers	0.5	60	120	180	24.6
	Vise grip pliers	0.5	18	36	54	7.2
2.5-m Welded wire fabric fence 3-mm wire	Ladder	3.0	6	12	18	2.4
	Manual Boltcutters	3.0	30	60	90	12
	Circular Saw	11.0	45	90	135	18.6
2.5-m concrete panel wall	Ladder	3.0	6	12	18	2.4
	Sledgehammer	5.0	60	90	120	27
	No equipment	0.0	6	9	12	2.7

Access Delay Times – Gates and Turnstiles

Description	Adversary Equipment	Equipment Weight (Kg.)	Penetration Time (Seconds)			
			Min.	Mean	Max.	Standard Deviation
Vehicle gate Chain-link mesh pipe gate 2.4-m high x 4-m wide chain-link gate on metal pipe frame, chained and padlocked	Ladder	5.0	6	12	18	2.4
	Pliers	1.0	60	120	180	24.6
	Truck	1500	3	6	9	1.2
Pedestrian gate Chain-link mesh pipe gate 2.4-m high by 1.2-m wide 3-mm wire x 5 cm mesh on 4.8-cm metal pipe frame, chained and padlocked	Sledgehammer	5.0	30	60	90	12
	1.8 m pry bar	10	60	120	180	24.6
	Boltcutters	3.0	45	90	135	18.6
	Hacksaw	0.2	60	120	180	24.6
Steel Turnstile	Circular Saw	10	12	18	30	6
	Hand tools	3	60	75	145	22.5
High security padlock	Hand tools	3	60	90	120	18
	Power saw	4	30	60	90	12
	Explosives (1Kg)	1	20	30	45	10

Penetration Times- Walls

Description	Adversary Equipment	Equipment Weight (Kg.)	Penetration Time (Seconds)			
			Min.	Mean	Max.	Standard Deviation
Concrete-10cm Thick 210 kg/cm ² one layer 6.4-mm dia. 15-cm x 15-cm mesh	Sledgehammer, hand boltcutters	8.0	120	240	360	50
	Sledgehammer, cutting torch	30	150	300	450	60
	Sledgehammer, Circular saw	15	258	516	774	100
	Rotohammer, chisel, punch, sledgehammer, hand boltcutters, generator	50	192	384	576	35
	Explosives (1.0 Kg), sledgehammer, hand boltcutters	9	135	210	315	60
	Explosives (3.0 Kg), hand boltcutters	6	75	150	225	45
	Explosives (5.0 Kg), hand boltcutters	8	75	140	200	40
	Explosives (10.0 Kg),	10	60	120	180	36
	Sledgehammer, hand hydraulic boltcutters	20	144	288	432	60
Concrete-10cm Thick 210 kg/cm ² one layer No. 5 rebar, 15-cm centers	Sledgehammer, cutting torch	30	120	240	360	50
	Rotohammer, chisel, punch, sledgehammer, hand boltcutters, generator	50	235	470	700	95

Penetration Times- Walls (continued)

Description	Adversary Equipment	Equipment Weight (Kg.)	Penetration Time (Seconds)			
			Min.	Mean	Max.	Standard Deviation
Concrete-15cm Thick 210 kg/cm ² one layer No. 4 rebar, 20-cm centers	Sledgehammer, hand boltcutters	13.0	240	480	720	100
	Explosives (1.0 Kg), sledgehammer, hand boltcutters	14	150	222	336	67
	Explosives (3.0 Kg), hand boltcutters	6	115	175	260	50
	Explosives (5.0 Kg), hand boltcutters	8	100	150	230	45
Concrete-20-cm Thick, 210 kg/cm ² one layer No. 5 rebar, 15-cm centers	Rotohammer, drill, sledgehammer, chisel, punch, cutting torch, generator	65	420	840	1260	170
	Explosives (2.0 Kg), sledgehammer, hand hydraulic boltcutters	30	260	390	580	120
	Explosives (3.0 Kg), hand hydraulic boltcutters	13	150	225	335	67.5
	Explosives (5.0 Kg), hand hydraulic boltcutters	15	150	225	335	67.5
	Explosives (12Kg)	12	90	180	270	54
Concrete-30-cm Thick 210 kg/cm ² one layer No. 4 rebar, 15-cm centers	Explosives (5.0 Kg), hand boltcutters	8	130	195	295	60
	Explosives (7.0 Kg), hand boltcutters	10	138	210	315	60
	Explosives (12.0 Kg), hand boltcutters	15	150	230	336	70
	Explosives (16.0 Kg), hand boltcutters	19	150	230	336	70

Penetration Times- Walls (continued)

<i>Description</i>	<i>Adversary Equipment</i>	<i>Equipment Weight (Kg.)</i>	<i>Penetration Time (Seconds)</i>			
			<i>Min.</i>	<i>Mean</i>	<i>Max.</i>	<i>Standard Deviation</i>
Concrete-46cm Thick 350 kg/cm ² three layers No. 6 rebar, 15-cm centers	Explosives (16.0 Kg), hand-held power hydraulic boltcutters, generator	282	300	450	675	75
Concrete-46cm Thick 350 kg/cm ² two layers No. 4 rebar, 15-cm centers	Explosives (20.0 Kg), hand boltcutters	23	150	300	450	90
Concrete-60cm Thick 350 kg/cm ² four layers No. 6 rebar, 15-cm centers	Explosives (30.0 Kg), gas-powered hydraulic boltcutters	59	440	660	990	200
Wood studs and sheetrock wall	No equipment	0	45	60	90	18
	Sledgehammer	5	20	30	45	10
	Chainsaw	8	20	30	45	10
Tempered glass window	No equipment or hand tools	0	3	5	10	1.5

Penetration Times- Doors

Description	Adversary Equipment	Equipment Weight (Kg.)	Penetration Time (Seconds)			
			Min.	Mean	Max.	Standard Deviation
Standard industrial pedestrian door, 1.6-mm sheet metal, hollow, panic hardware, cylinder lock, rim set, butt hinges with removable pins	Explosives (1 Kg)	1.0	75	115	170	35
	Sledgehammer, cutting torch, oxy-lance, fire-resistant suit	170	96	192	288	39
	Cordless drill	2.7	90	180	270	37
	Pry bar	7	6	12	18	2.4
	Fire Ax	4.5	115	230	340	50
	Hammer, suction cups, punch, chisel	4	60	120	180	30
	Suction cups, sledgehammer, cutting torch	25	30	60	90	12
	Explosives (0.5)	0.5	72	150	192	45
	Lock picking tools	0.2	6	150	300	90
	Pipe Wrench	1	12	24	36	4.8
	Explosives (2.0)	2.0	72	150	225	45
Standard industrial pedestrian door, 1.6-mm sheet metal, hollow, narrow glass one side, louvers near bottom	Hammer	2.0	9	18	27	3.6
	Fire Ax	4.5	48	96	144	19.8
Standard industrial pedestrian door, 1.6-mm sheet metal, hollow, narrow half glass expanded metal 2.8-mm grill	Grappling hook, wire cable, truck	1520	18	36	54	7.2
	Manual boltcutters	3.0	30	60	90	18
30-cm wood pedestrian door with 3-mm metal sheeting	Circular saw, Fire Ax, Pry bar	20	300	530	750	160
	Explosives (1.0)	1.0	120	160	200	40
	Explosives (3.0)	3.0	20	30	45	12
10-cm wood pedestrian door with 1.6-mm metal sheeting	Circular saw, Fire Ax, Pry bar	20	120	180	240	54
	Explosives (1.0)	1.0	20	30	45	9

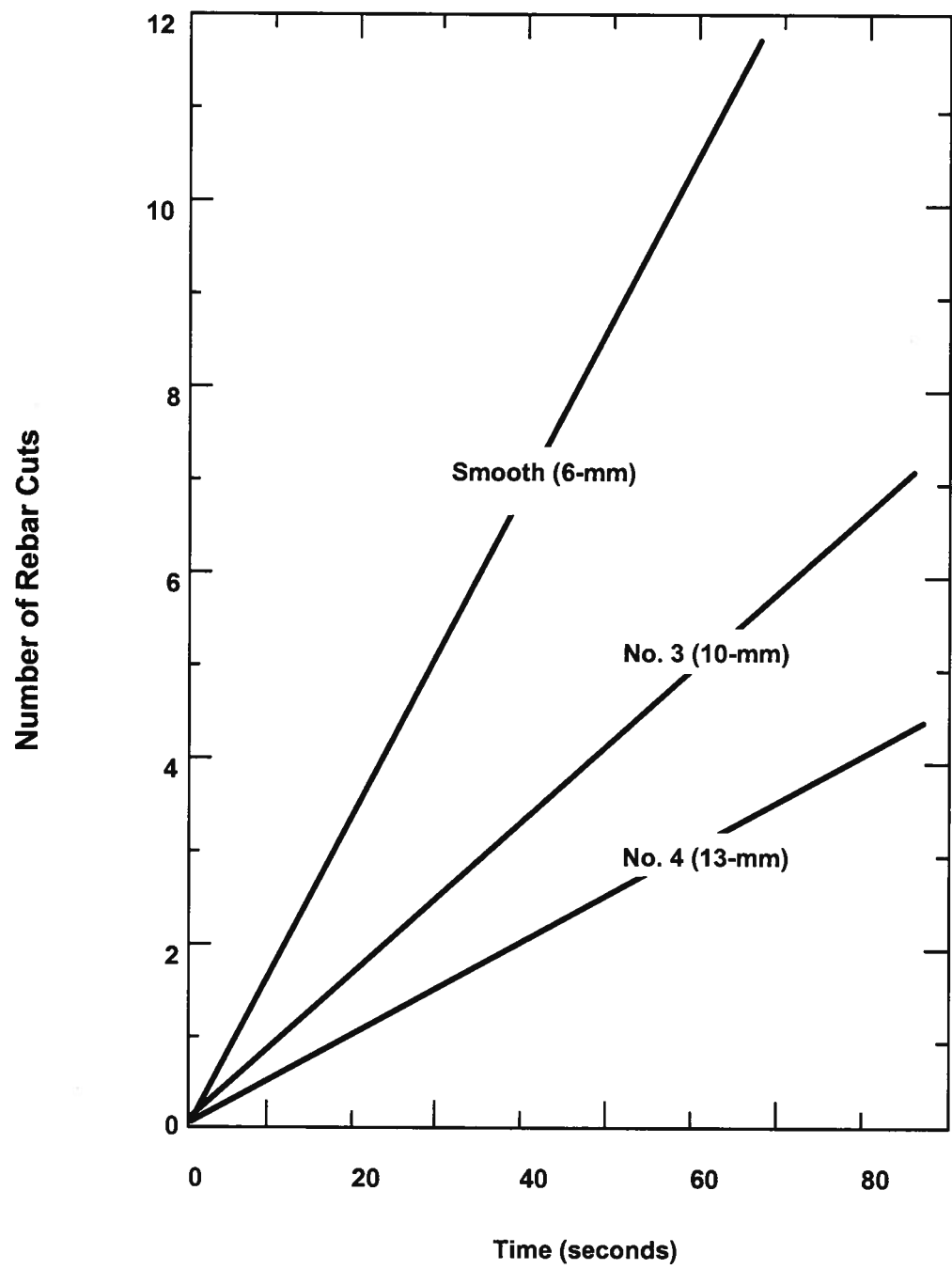
Penetration Times- Doors (continued)

Description	Adversary Equipment	Equipment Weight (Kg.)	Penetration Time (Seconds)			
			Min.	Mean	Max.	Standard Deviation
5-cm wood pedestrian door	Fire Ax	4.5	9	12	15	2.4
	Circular saw	10	9	12	15	2.4
	Explosives (1Kg)	1.0	9	12	15	2.4
5-cm wood pedestrian door with glass panel	Fire Ax	4.5	9	12	15	2.4
	Circular saw	10	9	12	15	2.4
	Explosives (1Kg)	1.0	9	12	15	2.4
0.75-cm steel plate door	Pry bar, sledgehammer	17	240	300	360	54
	Cutting torch	20	15	30	45	12
	Explosives (1 Kg)	1.0	15	30	45	12
Class V or VI vault door	Pry bar, sledgehammer	17	360	480	600	144
	Cutting torch	20	45	60	75	24
	Explosives (2 Kg)	2.0	45	60	75	24
High security padlock	Hand tools	3	60	90	120	18
	Power saw	4	30	60	90	12
	Explosives (1Kg)	1	20	30	45	10
Standard industrial vehicle door, hollow steel panel, 1.6 mm	Explosives (0.5)	0.5	45	66	102	19.8
	Sledgehammer, cutting torch, oxy-lance, fire resistant suit, water	385	48	96	144	24
	Truck	2025	18	36	54	7.2
	Pry bar, wooden plank	9	45	90	135	18.6
	Fire Ax	4.5	66	132	198	27
	Explosives (1.0)	1.0	75	115	170	35
Standard 10 cm wooden vehicle door, with 1.6-mm sheeting	Explosives (0.5)	0.5	48	78	114	23.4
	Sledgehammer, cutting torch, oxy-lance, fire-resistant suit, water	385	60	120	180	24.6
	Sledgehammer, cutting torch, oxy-lance, fire-resistant suit	171	39	78	117	16.2
	Truck	2025	3	5	9	1.5
Sheet metal roll-up vehicle door	Truck	2025	3	5	9	1.5
	Pry bar, wooden plank	9	60	120	180	24.6
	Fire Ax	4.5	66	132	198	27
	Explosives (1.0)	1.0	78	114	168	34.2

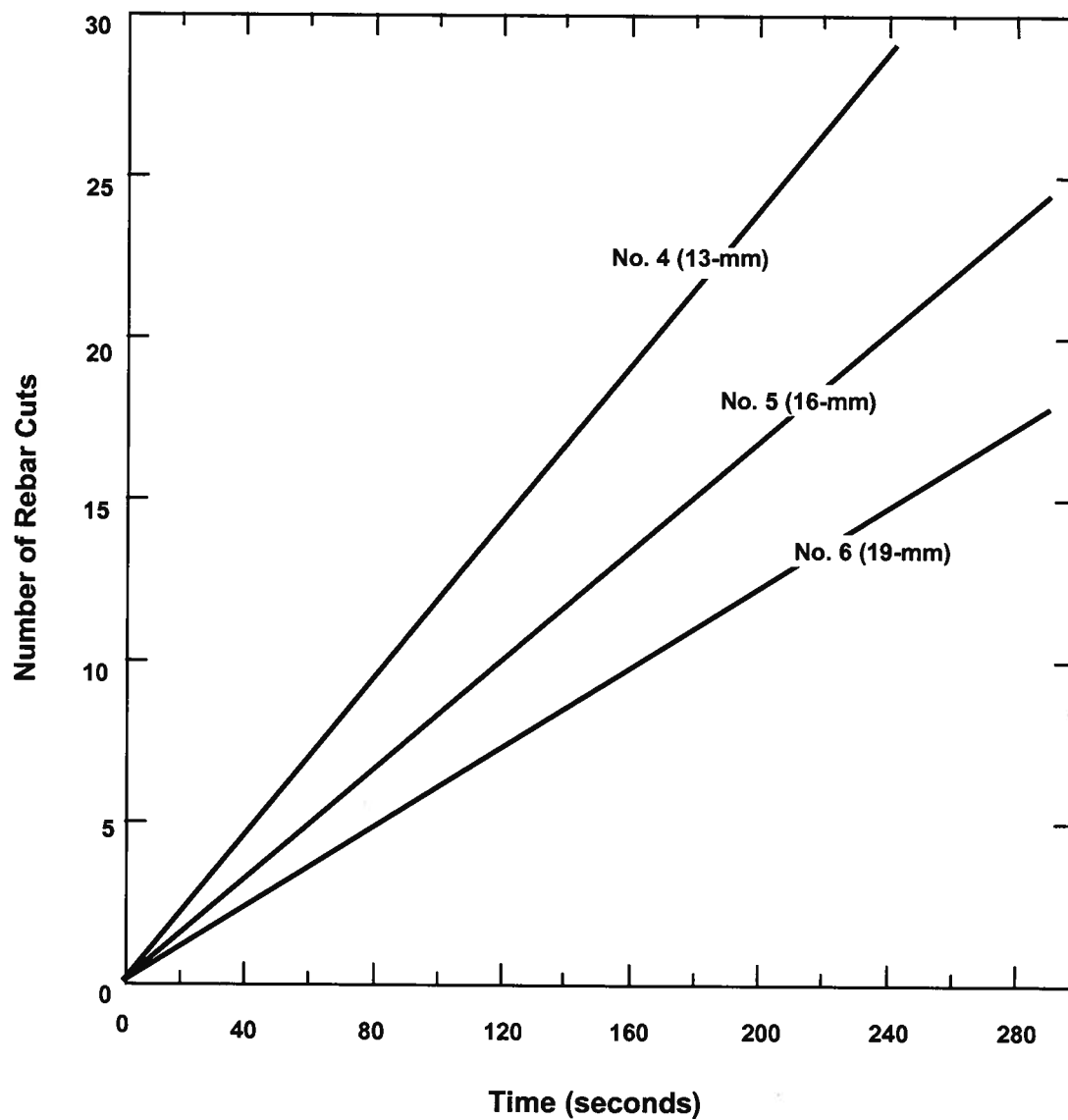
Penetration Times- Doors (continued)

<i>Description</i>	<i>Adversary Equipment</i>	<i>Equipment Weight (Kg.)</i>	<i>Penetration Time (Seconds)</i>			
			<i>Min.</i>	<i>Mean</i>	<i>Max.</i>	<i>Standard Deviation</i>
Magazine door, 6.4-mm steel plate, one padlock	Explosives (0.5)	0.5	30	60	78	18
	Sledgehammer, cutting torch, fire-resistant gloves, water	248	120	240	360	50
	Circular saw	11	126	252	378	51.6
	Suction cups, sledgehammer, chisel	4.5	36	72	108	14.4
	Sledgehammer, cutting torch, oxy-lance, fire-resistant suit	385	75	150	225	30.6
Heavy vehicle door with tow large-hinged hasps for padlocking, 19-mm steel, 10-cm air space, 1.3-mm steel		10	78	114	168	34.2
	Sledgehammer, cutting torch, oxy-lance, fire-resistant suit, water	385	186	372	558	76.2
	Sledgehammer, cutting torch, oxy-lance, fire-resistant gloves	165	18	36	54	7.2
30-cm wood vehicle door with 3-mm metal sheeting	Circular saw, Fire Ax, Pry bar	20	300	530	750	160
	Explosives (1.0 Kg)	1.0	120	160	200	40
	Explosives (3.0 Kg)	3.0	20	30	45	12
60-cm steel and concrete rolling vehicle door	Sledgehammer, cutting torch, oxy-lance, fire-resistant suit, water	385	800	930	1500	300
	Explosives (4 Kg)	10	160	200	300	60
30-cm steel and concrete rolling vehicle door	Sledgehammer, cutting torch, oxy-lance, fire-resistant suit, water	385	450	640	775	200
	Explosives (4 Kg)	10	45	54	90	20

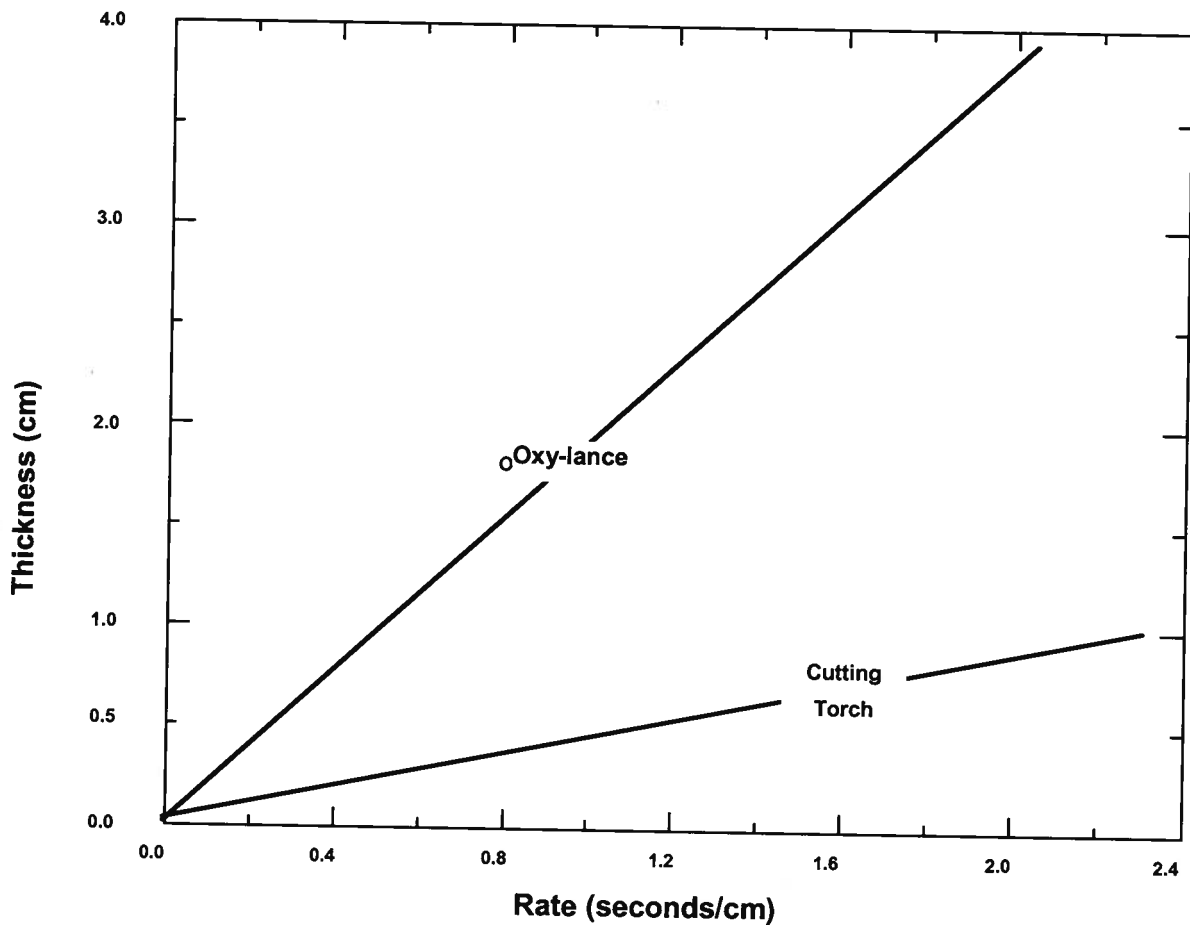
Cutting Rates for Reinforcement Bar Using 1-Meter Boltcutters



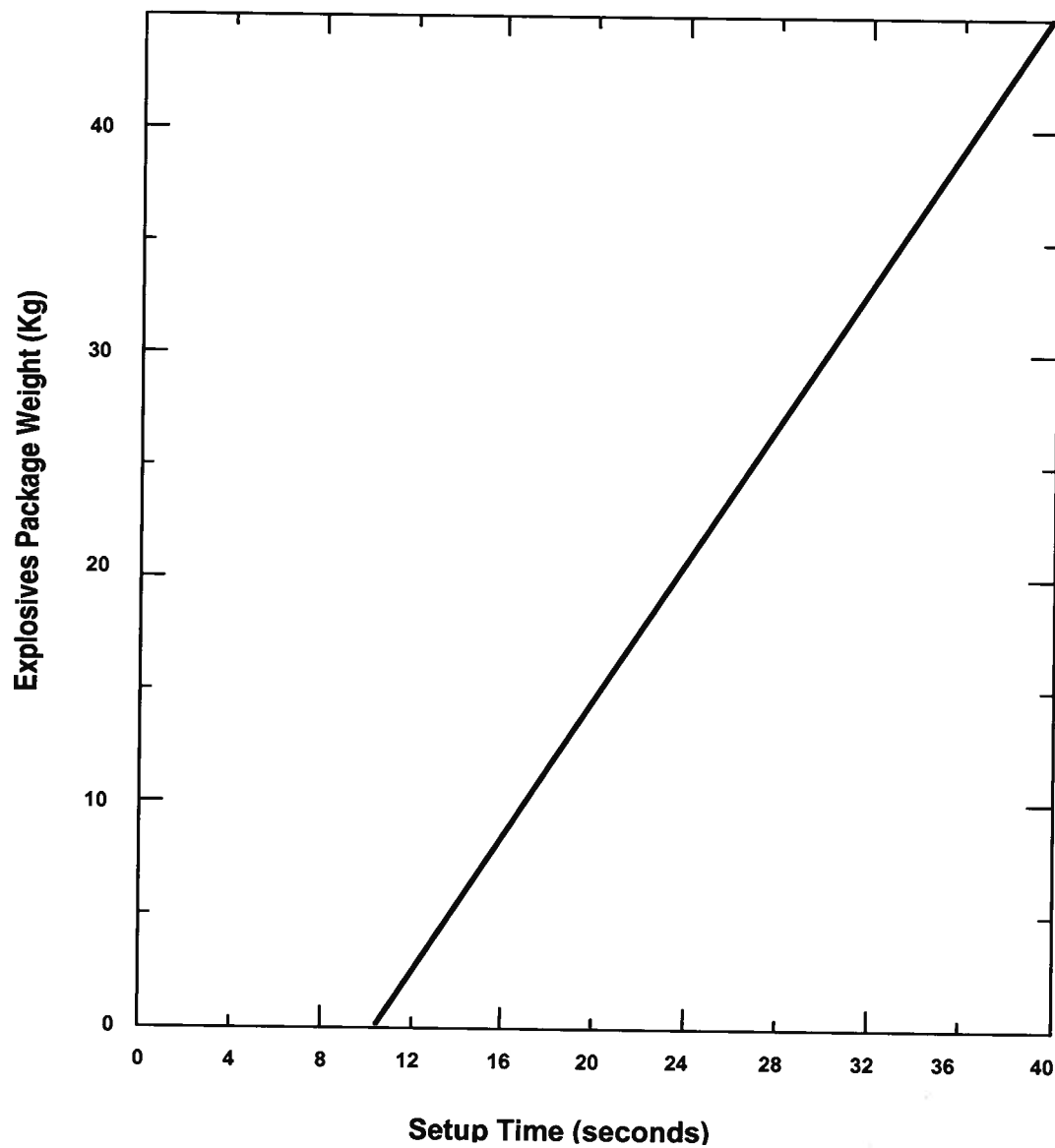
Cutting Rates for Reinforcement Bar Using Portable Oxygen/Acetylene Cutting Torch



Cutting Rates for Mild Steel Sheet & Plate Using Oxygen Acetylene Cutting Torch or Iron Oxygen Burn Bar

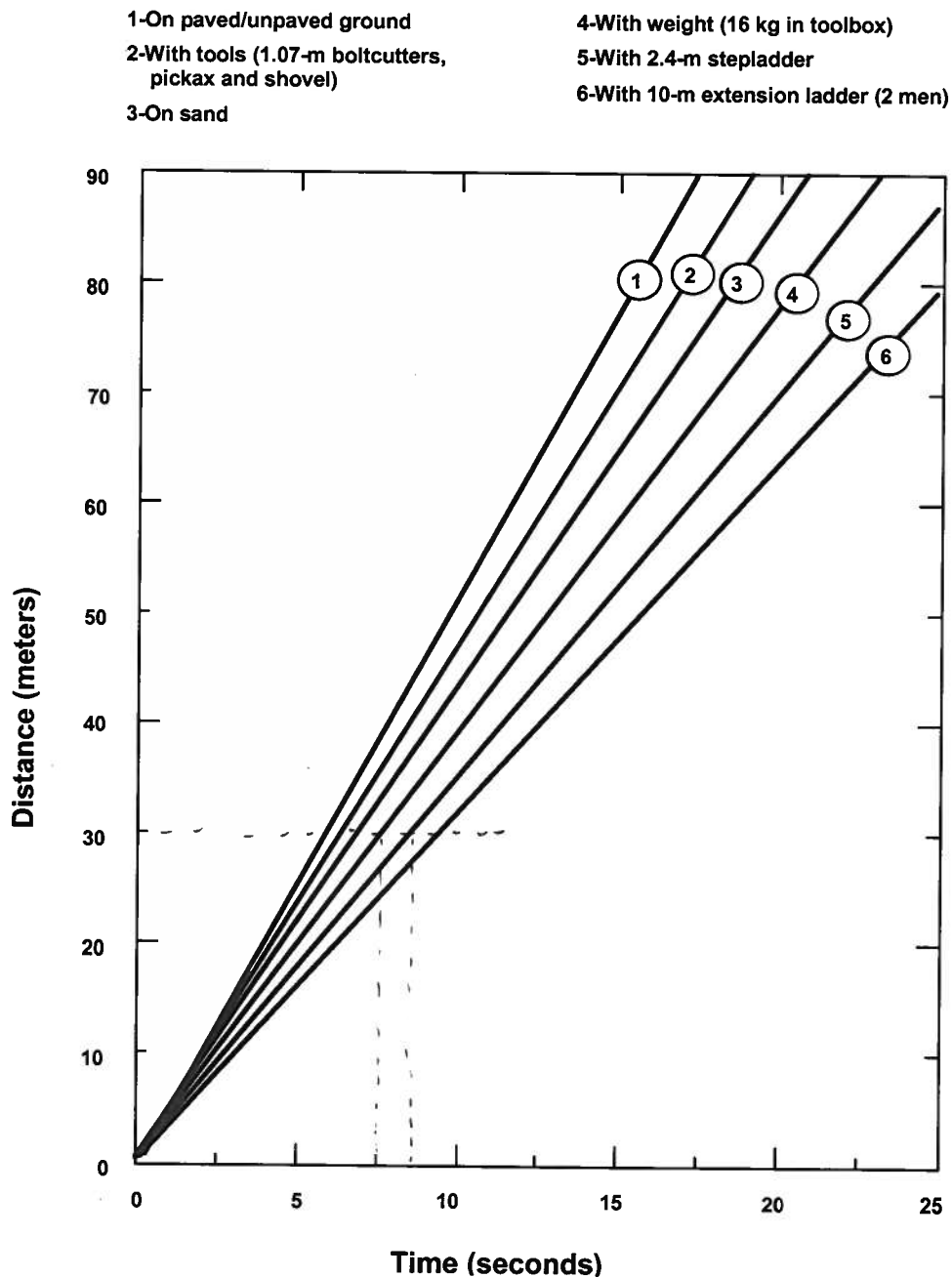


Time Required to Set an Explosives Package as a Function of Package Weight



Adversary Running Rates

Note: For the purposes of the subgroup exercises, you may ignore fatigue and simply estimate that an adversary on foot can run at approximately 4 meters/second.



Vehicle Rates for Experienced Drivers

TERRAIN – Road with on 90-degree turn.

