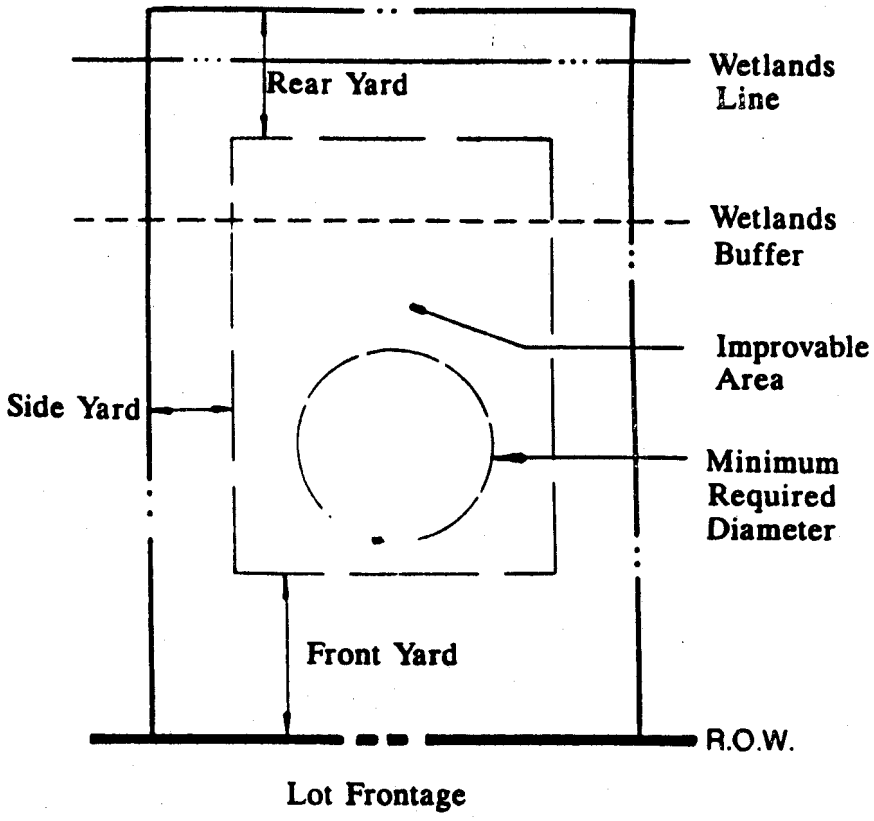
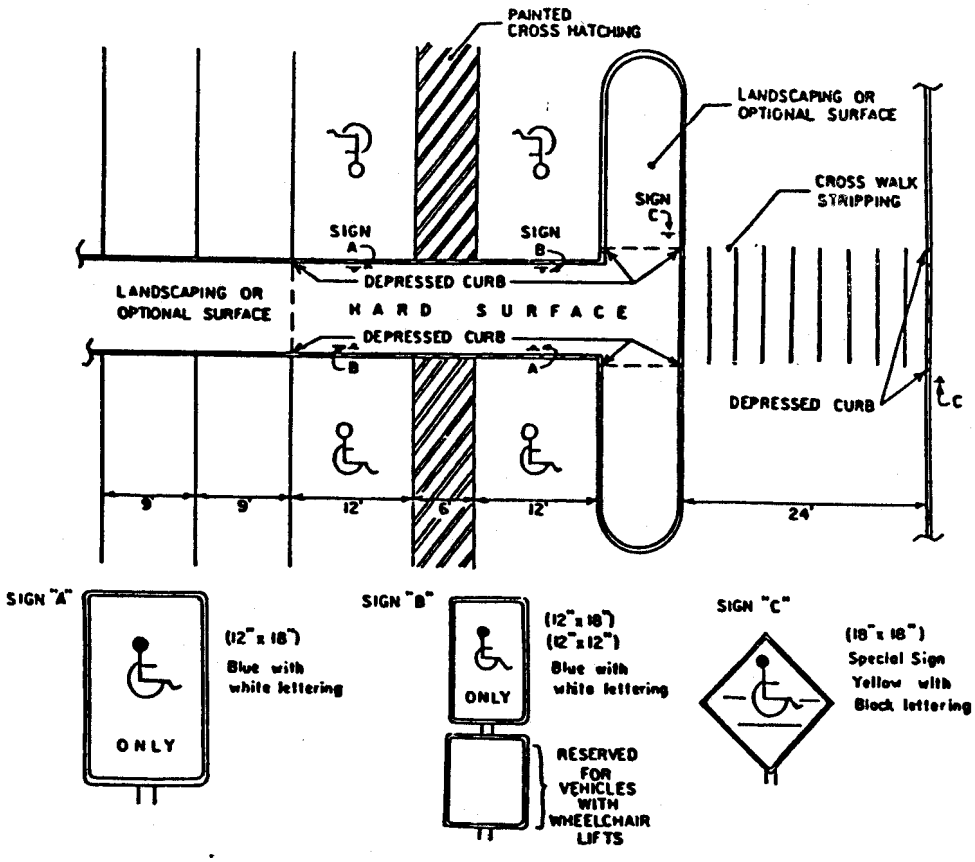
95 Attachment 8

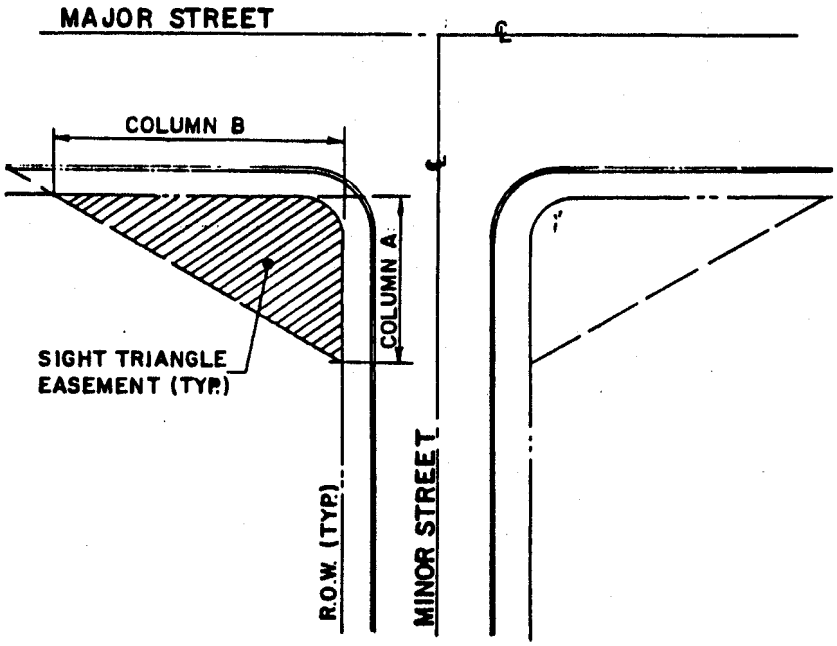
Manalapan Township Development Regulations
Exhibit 5-5
Illustration of Improvable Area Requirements
(§ 95-2.4)



Manalapan Township Development Regulations
Exhibit 9-3
Handicapped Parking and Sign Detail
(§ 95-9.2B)



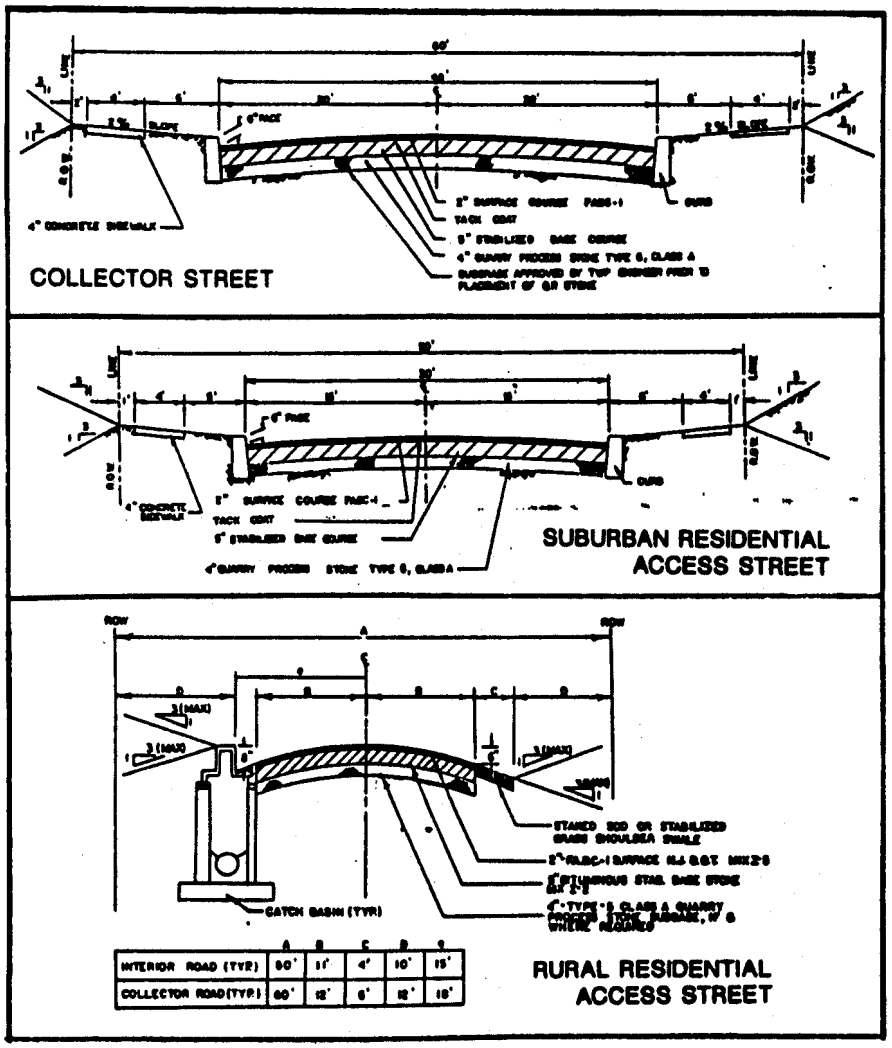
Manalapan Township Development Regulations
Exhibit 9-8
Sight Triangles
(§ 95-9.3C)



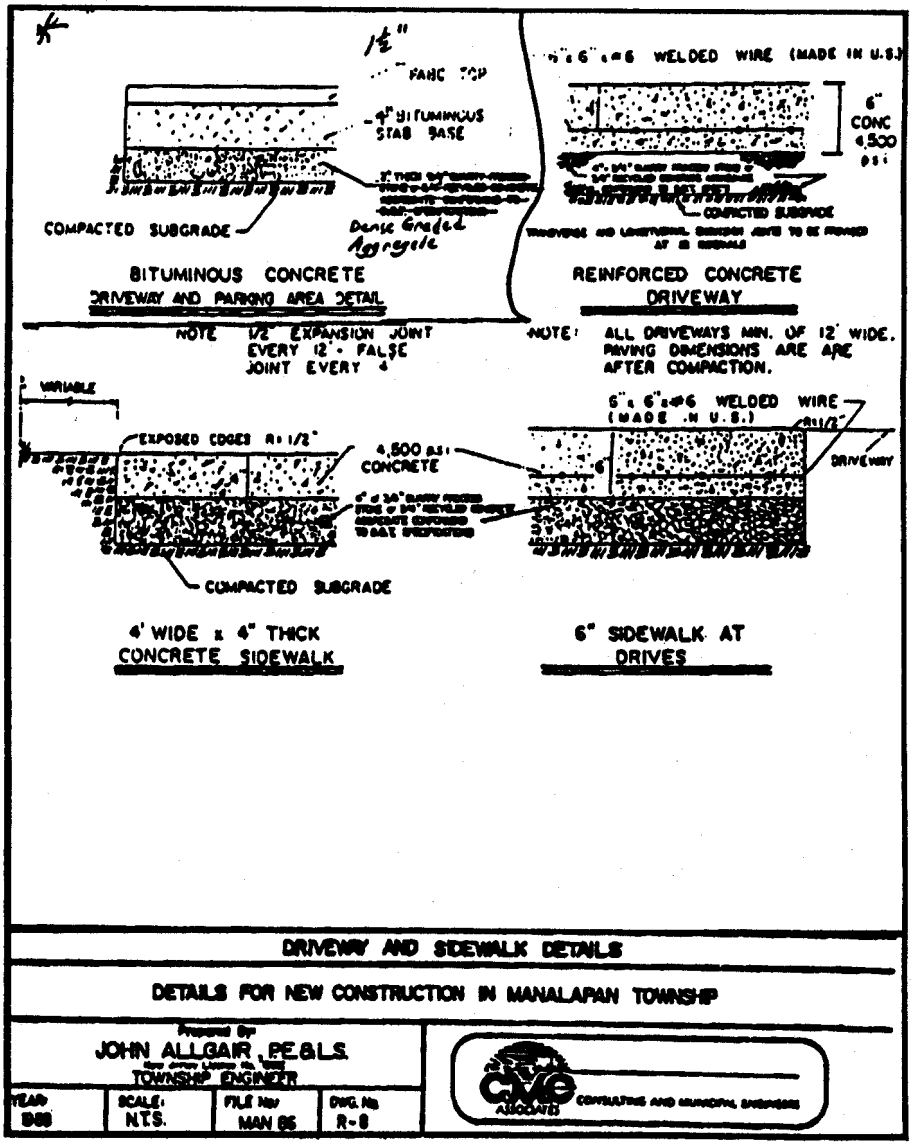
TYPICAL DISTANCE REQUIREMENTS ALONG R.O.W. LINE:

COLUMN A MINOR STREET		COLUMN B MAJOR STREET
RESIDENTIAL ACCESS	50	50
RESIDENTIAL SUBCOLLECTOR	100	100
RESIDENTIAL COLLECTOR	150	150
ARTERIAL	200	200

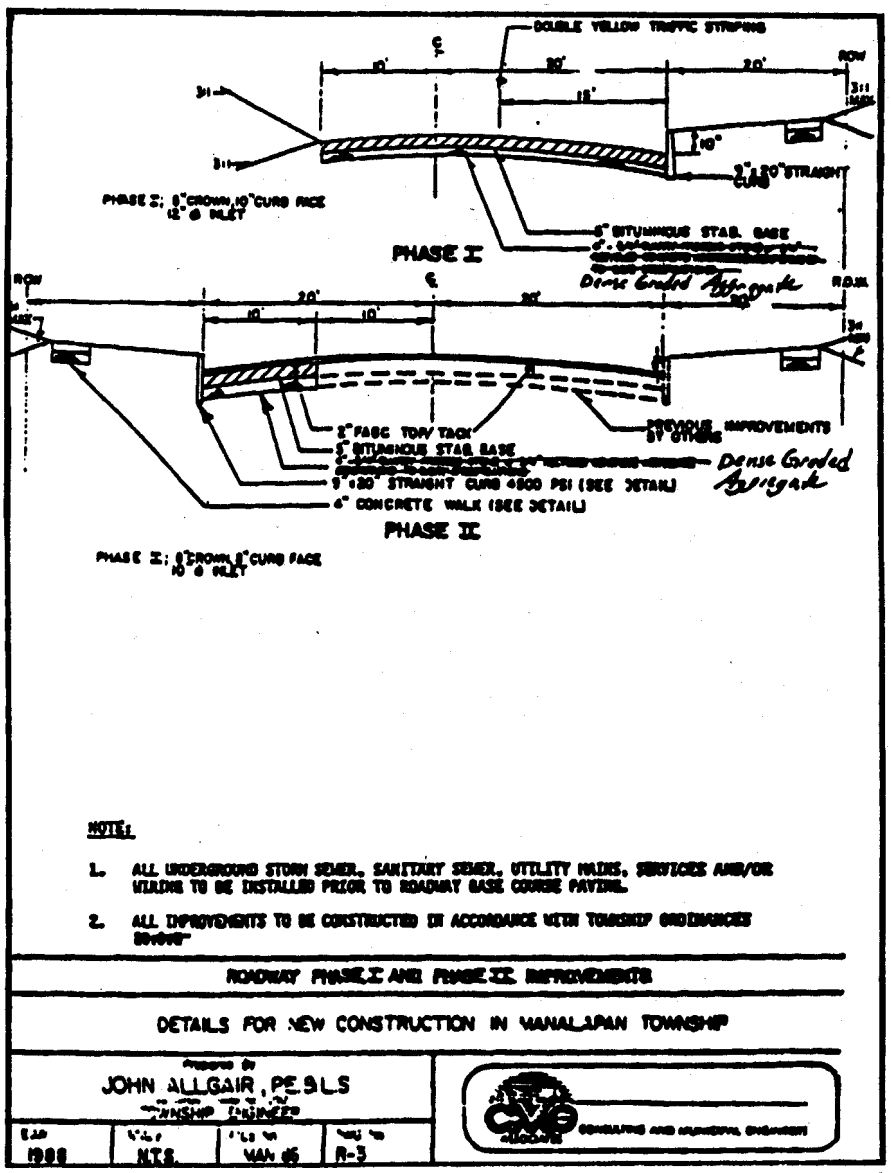
Manalapan Township Development Regulations
Exhibit 9-9
Pavement Sections
(§ 95-9.3C)



Manalapan Township Development Regulations
Exhibit 9-9A
Driveway and Sidewalk Details
(§ 95-9.2)



Manalapan Township Development Regulations
Exhibit 9-9B
Roadway Phase I and Phase II Improvements
(§ 95-9.2A)



Manalapan Township Development Regulations
Exhibit 9-10
Illumination Guidelines
(§ 95-9.3C)
A. Street Illumination

Street Hierarchy	Area Classification: Commercial Lux	Commercial Footcandles	Intermediate Lux	Intermediate Footcandles	Residential Lux	Residential Footcandles
Collector	13	1.2	10	0.9	6	0.6
Local	6	0.6	4	0.4	4	0.4

B.
Parking Illumination (Open Parking Facilities)

Level of Activity	Illumination Objective: Vehicular Traffic Lux	Vehicular Traffic Footcandles	Pedestrian Safety Lux	Pedestrian Safety Footcandles	Pedestrian Security Lux	Pedestrian Security Footcandles
Low activity	5	0.5	2	0.2	9	0.8
Medium activity	11	1	6	0.6	22	2
High activity	22	2	10	0.9	43	4

C.
Pedestrian Way Illumination

Walkways & Bikeway Classification	Minimum Average Level Lux	Minimum Average Level Footcandles	Average Levels for Special Pedestrian Security: Mounting Heights 3 to 5 meters (9 to 15 feet) Lux	Mounting Heights 3 to 5 meters (9 to 15 feet) Footcandles	Mounting Heights 5 to 10 meters (15 to 30 feet) Lux	Mounting Heights 5 to 10 meters (15 to 30 feet) Footcandles
Sidewalks (roadside) and Type A bikeways						
Commercial areas	10	0.9	22	2.0	43	4.0
Intermediate areas	6	0.6	11	1.0	22	2.0
Residential areas	2	0.2	4	0.4	9	0.8
Walkways distant from roadways and Type B bikeways						
Park walkways and bikeways	5	0.5	6	0.6	11	1.0
Pedestrian tunnels	43	4.0	54	5.0	—	—
Pedestrian overpasses	3	0.3	4	0.4	—	—
Pedestrian stairways	6	0.6	9	0.8	—	—

Manalapan Township Development Regulations
Exhibit 9-10 (continued)
Illumination Guidelines for Street, Parking, and Pedestrian Areas

IES Lighting Handbook definitions:

1. Area classification:

    1. Commercial. That portion of a municipality in a business development where ordinarily there are large numbers of pedestrians during business hours.

    2. Intermediate. That portion of a municipality often characterized by a moderately heavy nighttime pedestrian activity such as in blocks having libraries, community recreation centers, large apartment buildings or neighborhood retail stores.

    3. Residential. A residential development, or a mixture of residential and commercial establishments, characterized by a few pedestrians at night. This definition includes areas with single family homes, townhouses and/or small apartment buildings.

2. Activity level:

    High activity. Major league athletic events cultural or civic events, and major regional shopping centers.

    Medium activity. Fast food facilities, area shopping centers, hospital parking areas, transportation parking (airports, etc.), cultural, civic or recreational events, and residential complex parking.

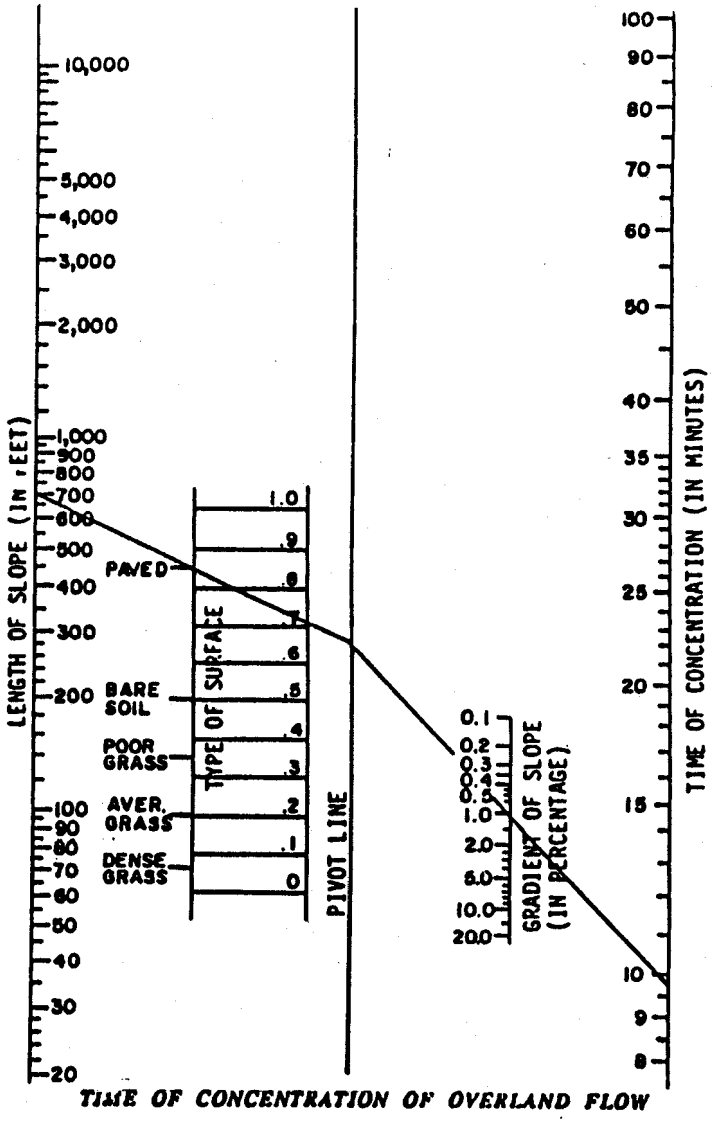
    Low Activity. Local merchant parking, industrial employee parking, educational facility parking.

3. Bikeway classification:

    1. Type A bikeway - a strip within or adjacent to a public roadway or shoulder, used for bicycle travel.

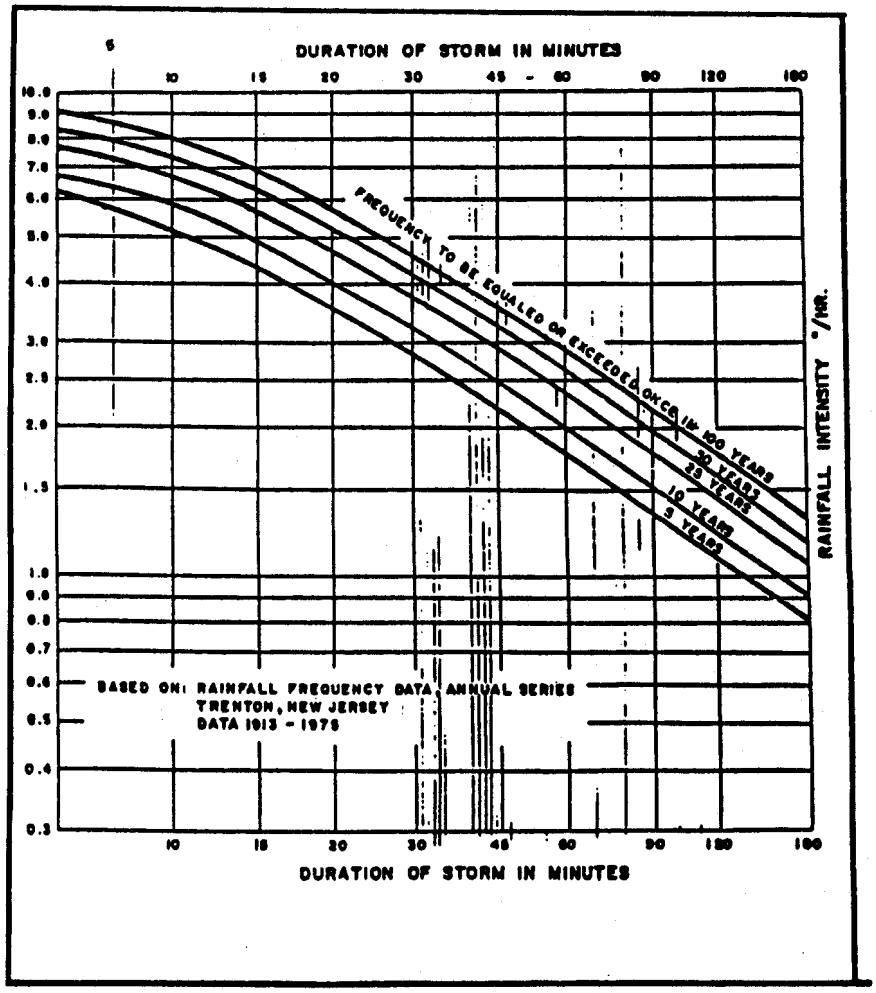
    2. Type B bikeway - an improved strip identified for public bicycle travel and located away from a roadway or its adjacent sidewalk system.

Manalapan Township Development Regulations
Exhibit 9-12
Nomograph for the Determination of Time Concentration
EXAMPLE: 700' OF PAVEMENT ON A 1.0% SLOPE=9.8 MIN.
(§ 95-9.3F)



Source: State of New Jersey Highway Authority

Manalapan Township Development Regulations
Exhibit 9-13
Rainfall Intensity Curves
(§ 95-9.3F)



Manalapan Township Development Regulations
Exhibit 9-14
Manning's Roughness Coefficients
(§ 95-9.3F)

Type of channel			Minimum	Normal	Maximum
A.	CLOSED CONDUITS FLOWING PARTLY FULL				
	A-1. Metal				
	a.	Brass, smooth	0.009	0.010	0.013
	b.	Steel			
		1. Lockbar and welded	0.010	0.012	0.014
		2. Riveted and spiral	0.013	0.016	0.017
	c.	Cast iron			
		1. Coated	0.010	0.013	0.014
		2. Uncoated	0.011	0.014	0.016
	d.	Wrought iron			
		1. Black	0.012	0.014	0.015
		2. Galvanized	0.013	0.016	0.017
	e.	Corrugated metal			
		1. Subdrain	0.017	0.019	0.021
		2. Storm drain	0.021	0.024	0.030
	A-2. Nonmetal				
	a.	Lucite	0.008	0.009	0.010
	b.	Glass	0.009	0.010	0.013
	c.	Cement			
		1. Neat, surface	0.010	0.011	0.013
		2. Mortar	0.011	0.013	0.015
	d.	Concrete			
		1. Culvert, straight and free of debris	0.010	0.011	0.013
		2. Culvert with bends, connections, and some debris	0.011	0.013	0.014
		3. Finished	0.011	0.012	0.014
		4. Sewer with manholes, inlet, etc. straight	0.013	0.015	0.017
		5. Unfinished, steel form	0.012	0.013	0.014
		6. Unfinished, smooth wood form	0.012	0.014	0.016
		7, Unfinished, rough wood form	0.015	0.017	0.020
	e.	Wood			
		1. Stave	0.010	0.012	0.014
		2. Laminated, treated	0.015	0.017	0.020
	f.	Clay			
		1. Common drainage tile	0.011	0.013	0.017
		2. Vitrified sewer	0.011	0.014	0.017
		3. Vitrified sewer with manholes, inlet, etc.	0.013	0.015	0.017
		4. Vitrified subdrain with open joint	0.014	0.016	0.018
	g.	Brickwork			
		1. Glazed	0.011	0.013	0.015
		2. Lined with cement mortar	0.012	0.015	0.017
	h.	Sanitary sewers coated with sewage slimes, with bends and connections	0.012	0.013	0.016
	i.	Paved invert, sewer, smooth bottom	0.016	0.019	0.020
	j.	Rubble masonry, cemented	0.018	0.025	0.030

Manalapan Township Development Regulations
Exhibit 9-14 (continued)

Type of channel	Minimum	Normal	Maximum
B. LINED OR BUILT-UP CHANNELS			
B-1. Metal			
a. Smooth steel surface			
1. Unpainted	0.011	0.012	0.014
2. Painted	0.012	0.013	0.017
b. Corrugated	0.021	0.025	0.030
B-2 Nonmetal			
a. Cement			
1. Neat, surface	0.010	0.011	0.013
2. Mortar	0.011	0.013	0.015
b. Wood			
1. Planed, untreated	0.010	0.012	0.014
2. Planed, creosoted	0.011	0.012	0.015
3. Unplaned	0.011	0.013	0.015
4. Plank with battens	0.012	0.015	0.018
5. Lined with roofing paper	0.010	0.014	0.017
c. Concrete			
1. Trowel finish	0.011	0.013	0.015
2. Float finish	0.013	0.015	0.016
3. Finished, with gravel on bottom	0.015	0.017	0.020
4. Unfinished	0.014	0.017	0.020
5. Gunite, good section	0.016	0.019	0.023
6. Gunite, wavy section	0.018	0.022	0.025
7. On good excavated rock	0.017	0.020	
8. On irregular excavated rock	0.022	0.027	
d. Concrete bottom float finished with sides of			
1. Dressed stone in mortar	0.015	0.017	0.020
2. Random stone in mortar	0.017	0.020	0.024
3. Cement rubble masonry, plastered	0.016	0.020	0.024
4. Cement rubble masonry	0.020	0.025	0.030
5. Dry rubble or riprap	0.020	0.030	0.035
e. Gravel bottom with sides of			
1. Formed concrete	0.017	0.020	0.025
2. Random stone in mortar	0.020	0.023	0.026
3. Dry rubble or riprap	0.023	0.033	0.036
f. Brick			
1. Glazed	0.011	0.013	0.015
2. In cement mortar	0.012	0.015	0.018
g. Masonry			
1. Cemented rubble	0.017	0.025	0.030
2. Dry rubble	0.023	0.032	0.035
h. Dressed ashlar	0.013	0.015	0.017
i. Asphalt			
1. Smooth	0.013	0.013	
2. Rough	0.016	0.016	
j. Vegetal lining	0.030	....	0.500

Manalapan Township Development Regulations
Exhibit 9-14 (continued)

Type of channel	Minimum	Normal	Maximum
C. EXCAVATED OR DREDGED			
a. Earth, straight and uniform			
1. Clean, recently completed	0.016	0.018	0.020
2. Clean, after weathering	0.018	0.022	0.025
3. Gravel, uniform section, clean	0.022	0.025	0.030
4. With short grass, few weeds	0.022	0.027	0.033
b. Earth, winding and sluggish			
1. No vegetation	0.023	0.025	0.030
2. Grass, some weeds	0.025	0.030	0.033
3. Dense weeds or aquatic plants in deep channels	0.030	0.035	0.040
4. Earth bottom and rubble sides	0.028	0.030	0.035
5. Stony bottom and weedy banks	0.025	0.035	0.040
6. Cobble bottom and clean sides	0.030	0.040	0.050
c. Dragline-excavated or dredged			
1. No vegetation	0.025	0.028	0.033
2. Light brush on banks	0.035	0.050	0.060
d. Rock cuts			
1. Smooth and uniform	0.025	0.035	0.040
2. Jagged and irregular	0.035	0.040	0.050
e. Channels not maintained, weeds and brush uncut			
1. Dense weeds, high as flow depth	0.050	0.080	0.120
2. Clean bottom, brush on sides	0.040	0.050	0.080
3. Same, highest stage of flow	0.045	0.070	0.110
4. Dense brush, high stage	0.080	0.100	0.140
D. NATURAL STREAMS			
D-1. Minor streams (top width at flood stage 100 ft)			
a. Streams on plain			
1. Clean, straight, full stage, no rift or deep pools	0.025	0.030	0.033
2. Same as above, but more stones and weeds	0.030	0.035	0.040
3. Clean, winding, some pools and shoals	0.033	0.040	0.045
4. Same as above, but some weeds and stones	0.035	0.045	0.050
5. Same as above, lower stages, more ineffective slopes and sections	0.040	0.048	0.055
6. Same as 4, but more stones	0.045	0.050	0.060
7. Sluggish reaches, weedy, deep pools	0.050	0.070	0.080
8. Very weedy reaches, deep pools, or floodways with heavy stand of timber and underbrush	0.075	0.100	0.150

Manalapan Township Development Regulations
Exhibit 9-14 (continued)

Type of channel	Minimum	Normal	Maximum
b. Mountain streams, no vegetation in channel, banks usually steep, trees and brush along banks submerged at high stages			
1. Bottom: gravels, cobbles, and few boulders	0.030	0.040	0.050
2. Bottom: cobbles with large boulders	0.040	0.050	0.070
D-2. Flood plains			
a. Pasture, no brush			
1. Short grass	0.025	0.030	0.035
2. High grass	0.030	0.035	0.050
b. Cultivated areas			
1. No crop	0.020	0.030	0.040
2. Mature row crops	0.025	0.035	0.045
3. Mature field crops	0.030	0.040	0.050
c. Brush			
1. Scattered brush, heavy weeds	0.035	0.050	0.070
2. Light brush and trees in winter	0.035	0.050	0.060
3. Light brush and trees, in summer	0.040	0.060	0.080
4. Medium to dense brush, in winter	0.045	0.070	0.110
5. Medium to dense brush, in summer	0.070	0.100	0.160
d. Trees			
1. Dense willows, summer, straight	0.110	0.150	0.200
2. Cleared land with tree stumps, no sprouts	0.030	0.040	0.050
3. Same as above, but with heavy growth of sprouts	0.050	0.060	0.080
4. Heavy stand of timber, a few down trees, little undergrowth, flood stage below branches	0.080	0.100	0.120
5. Same as above, but with flood stage reaching branches	0.100	0.120	0.160
D-3. Major streams (top width at flood stage 100 ft). The n value is less than that for minor streams of similar description, because banks offer less effective resistance.			
a. Regular section with no boulders or brush	0.025	.....	0.060
b. Irregular and rough section	0.035	.....	0.100

Source: State of New Jersey, Department of Environmental Protection, *Technical Manual for Stream Encroachment*, Trenton, New Jersey, 1984), Table 3.2-11 (A-1)

Manalapan Township Development Regulations
Exhibit 9-15
Permissible Velocities for Swales, Open Channels, Ditches and Uniform Stands for Various Well-Maintained Grass Covers
(§ 95-93F(1)(c)[3])

GROUND COVER	SLOPE RANGE PERCENT	PERMISSIBLE VELOCITY ON: Erosion-Resistant Soils (fps)	Easily Eroded Soils (fps)
Bermudagrass	0-5	8	6
	5-10	7	5
	Over 10	6	4
Buffalograss	0-5	7	5
Kentucky bluegrass	5-1	6	4
Smooth brome	Over 10	5	3
Grass mixture	0-5	5	4
	5-10	4	3
Lespedeza			
Weeping lovegrass			
Yellow bluestem			
Kudzu	0-5	3.5	2.5
Alfalfa			
Crabgrass			
Common lespedeza			
Sundangrass	0-5	3.5	2.5

fps = feet per second

Source: Soil Conservation Service, U.S. Department of Agriculture (Washington, D.C.: Government Printing Office, 1959). Cited in ULI-ASCE-NAHB, *Residential Storm Water Management* (Washington, D.C.: Government Printing Office, 1975).

Manalapan Township Development Regulations
Exhibit 9-16
Required Safety Ledges with a Stormwater Management Wet Pond
(§ 95-9.3F(7)(a)[1][c][ii])