

DEVELOPMENT REGULATIONS

22 Attachment 2

EXHIBIT 1
OFF-STREET PARKING REQUIREMENTS FOR RESIDENTIAL LAND USES
(Subsection 22-9.3)

Housing Unit Type/Size	Off-Street Parking Requirement
Single-Family Detached and Single Semi-Detached	
2 Bedroom	2.0
3 Bedroom	2.0
4 Bedroom	3.0
5 Bedroom	4.0
Townhouse, Quadraplex, and Single Family Attached	
1 Bedroom	2.0
2 Bedroom	2.3
3 Bedroom	2.4
Other Multiple Dwellings	
1 Bedroom	1.8
2 Bedroom	2.0
3 Bedroom	2.1

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**EXHIBIT 2
GUIDELINES FOR OFF-STREET PARKING REQUIREMENTS FOR NON-RESIDENTIAL LAND USES
(Subsection 22-9.3)**

Nonresidential Land Uses	Required Off-Street Parking Spaces Per Indicated Area
Assembly Operations	1 per 800 square feet GFA
Banks, Savings & Loan Associations	1 per 200 square feet GFA plus room for 12 automobiles per drive-in window and/or lane for queuing purposes
Bar	1 per 2 seats
Bowling Alley	4 per alley
Church/Synagogue	1 per 3 seats**
Community Center, Museum, Art Gallery	1 per 200 square feet GFA
Community Club, Private Club, Lodge	1 per 100 square feet GFA
Dental or Medical Office	1 per 100 square feet GFA
Finishing Operations	1 per 800 square feet GFA
Hotel/Motel	1 per guest room plus 1 per*** each 3 employees
Industrial	1 per 800 square feet GFA
Library	1 per 300 square feet GFA
Manufacturing	1 per 800 square feet GFA
Marina, Boat Yard, Boat Sales	1.0 per boat slip and 1 per 300 square feet GFA of sales or office space, and other ancillary uses.
Meeting rooms, assembly or Exhibition Hall	1 per 50 square feet GFA
Offices Under 49,999 square feet GFA	4.5 per 1,000 square feet GFA
50,000-99,999 square feet GFA	4 per 1,000 square feet GFA
100,000+ square feet GFA	3.5 per 1,000 square feet GFA
Receiving	1 per 5,000 square feet GFA
Research	1 per 500 square feet GFA
Restaurant	1 per 3 seats
Fast-food establishments	1 per 30 square feet GFA
Retail store	1 per 200 square feet GFA
Schools	
Elementary or Intermediate	2 per classroom; but not less than 1 per teacher and staff
Secondary	2.5 per classroom; but not less than 1 per teacher and staff
Motor Vehicle Service Station	4 per bay and work area
Shipping	1 per 5,000 square feet GFA
Shopping Center	4 per 1,000 square feet GFA
Studio - art, music, dance, gymnastics for the purpose of giving instruction	1 per 100 square feet GFA
Theater	1 per 3 seats

DEVELOPMENT REGULATIONS

Nonresidential Land Uses	Required Off-Street Parking Spaces Per Indicated Area
In shopping center	1 per 4 seats
Warehouse	1 per 5,000 square feet GFA

NOTES:

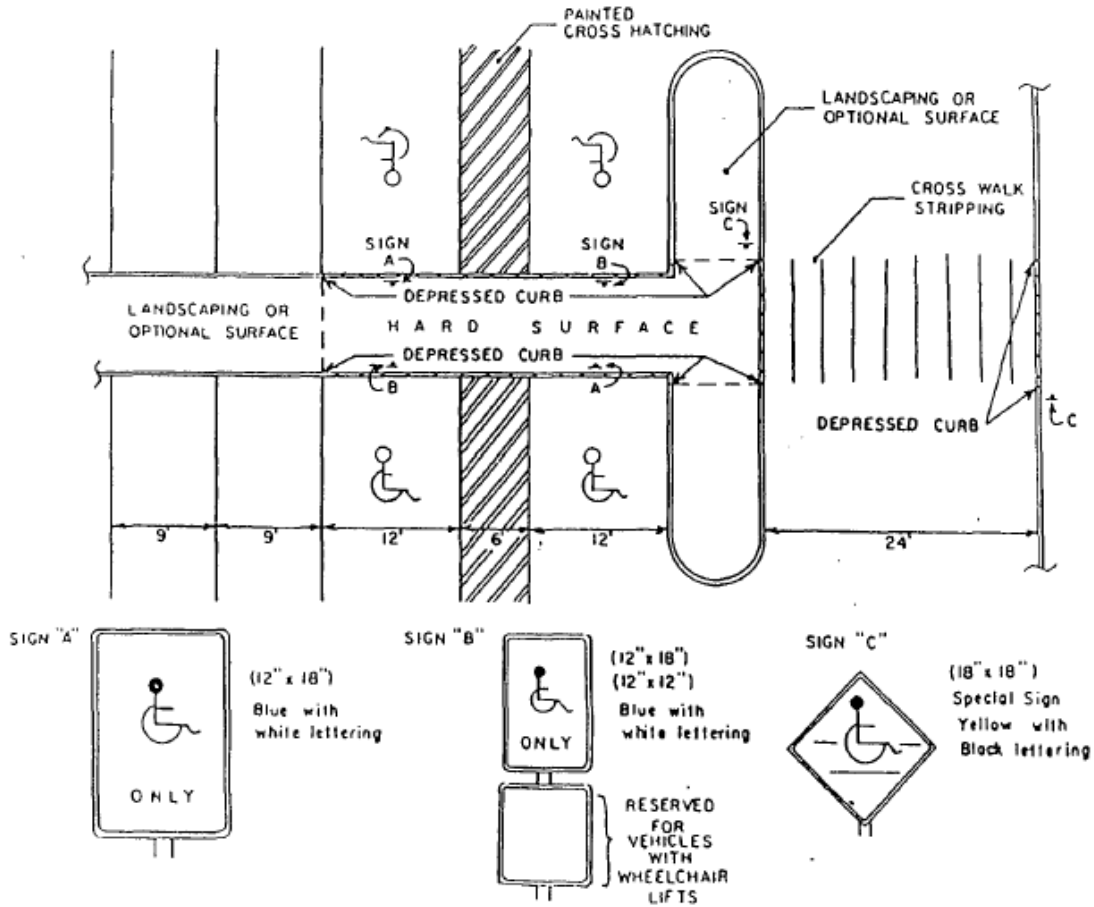
- * In computing the number of the above required parking spaces, the criteria contained herein shall apply
- ** 1 seat shall be considered 22 inches in calculating the capacity of pews or benches
- *** For hotels and motels, each commercial use within the building shall be computed separately. At the board’s discretion, required parking for these uses may be reduced by up to 50% of the guest room parking
- **** For mixed use developments, a shared parking approach may be permitted by the approving authority following the methodology described in the publication “Shared Parking” (Urban Land Institute and Barton Aschman Associates, Inc.)

GFA = Gross Floor Area

- (1) Where fractional spaces result, the required number shall be construed to be the next highest whole number
- (2) The parking space requirements for a use not specifically mentioned herein shall be the same as required for a use of similar nature as determined by the Municipal Agency upon that use mentioned
- (3) If there is no use enumerated herein having sufficient similarity to the use proposed to enable the Municipal Agency to establish rational parking requirements, the Municipal Agency may, in its discretion, direct the applicant to furnish the Municipal Agency with such data as may be necessary to enable the Municipal Agency to establish rational parking requirements

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**EXHIBIT 3
HANDICAPPED PARKING AND SIGN DETAIL
(Subsection 22-9.3)**



DEVELOPMENT REGULATIONS

**EXHIBIT 4
FIRE FLOWS
(Subsection 22-9.5)**

Population	Flow GPM*	Duration of Flow Hours
Under 100	500	4
1,000	1,000	4
1,500	1,250	5
2,000	1,500	6
3,000	1,750	7
4,000	2,000	8
5,000	2,250	9
6,000	2,500	10
10,000	3,000	10

* GPM = gallons per minute

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EXHIBIT 5
DESIGN STANDARDS FOR PEAK HOUR FLOW
(Subsection 22-9.5)

Total Houses Served	Peak Hourly Rates GPM per House
5	8.0
10	5.0
50	3.0
100	2.0
250	1.3
500	0.8
750	0.7
1,000 or more	0.6

DEVELOPMENT REGULATIONS

EXHIBIT 6
SHORT METHOD FOR CALCULATING FIRE FLOWS
(Subsection 22-9.5)

Distance Between Buildings*	Required Fire Flow
Over 100 feet	500 GPM
31 feet to 100 feet	750 GPM to 1,000 GPM
11 feet to 30 feet	1,000 GPM to 1,500 GPM
10 feet or less	1,500 GPM to 2,000 GPM

* For contiguous buildings (attached dwelling units of 2 or more two-family units and/or multi-family units), a minimum of 2,500 GPM may be used.

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**EXHIBIT 7
WATER AND SEWER DEMAND/GENERATION BY TYPE/SIZE OF HOUSING UNIT
(Subsection 22-9.6)**

Housing Type/Size	Number of Residents	Residential Water Demand^a (daily)	Sewer Flow^b (daily)	Peak Sewer Flow^c (daily)
Single Family Detached				
2 Bedroom	2.13	215	140	560
3 Bedroom	3.21	320	210	840
4 Bedroom	3.93	395	255	1,020
5 Bedroom	4.73	475	310	1,240
Garden Apartment				
1 Bedroom	1.57	120	100	400
2 Bedroom	2.33	175	150	600
3 Bedroom	3.56	270	230	920
Townhouse				
1 Bedroom	1.69	125	110	440
2 Bedroom	2.02	150	130	520
3 Bedroom	2.83	210	185	740
4 Bedroom	3.67	275	240	960

- a. Based on 100 gallons per day (gpd) per person for single-family detached units and 75 gpd for other housing types (rounded).
- b. Based on 65 gpd per person (rounded). Note: These figures do not include allowance for infiltration/inflow. Determination of infiltration/inflow should be made and added to the sewer flow figures shown in this exhibit.
- c. Based on four times daily sewer flow (rounded).

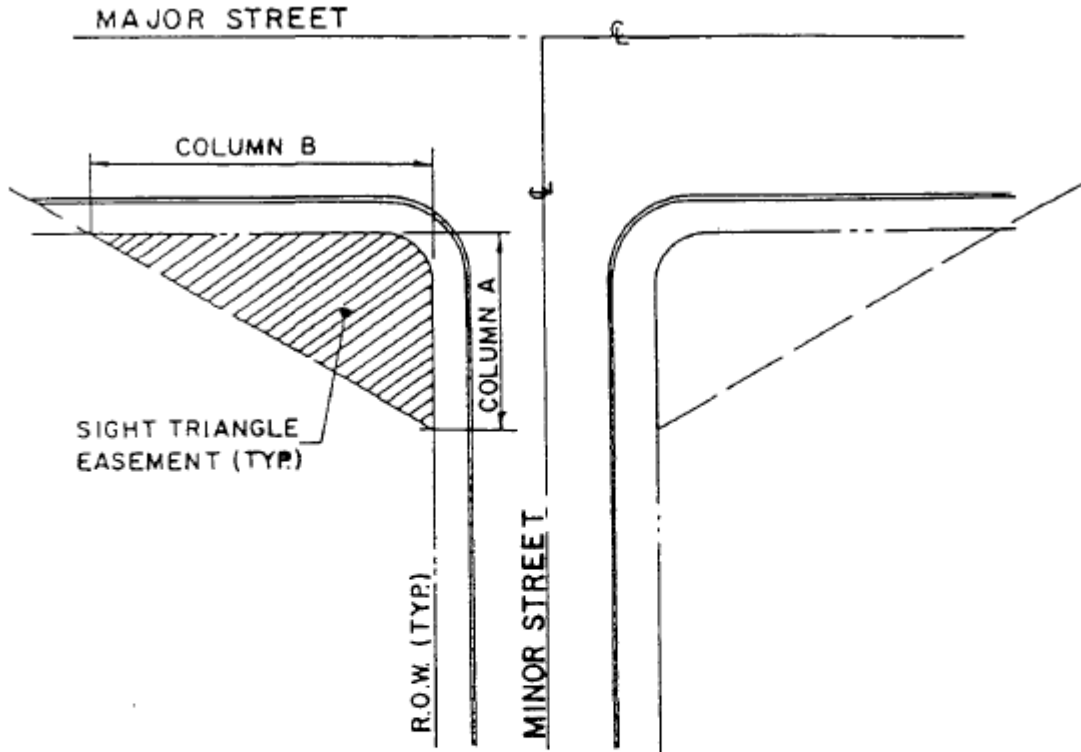
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EXHIBIT 8
INTERSECTION STANDARDS
(Subsection 22-9.8c)

Intersection Standards	Local Street	Collector Street
Maximum Grade within 50 feet of Intersection	5%	3%
Minimum Centerline Radius	150 feet	300 feet
Minimum Tangent Length Between Reverse Curves	100 feet	150 feet
Curb Radii	25 feet	35 feet

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**EXHIBIT 9
SIGHT TRIANGLES
(Subsection 22-9.3)**



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

<u>COLUMN A</u>		<u>COLUMN B</u>	
MINOR STREET		MAJOR STREET	
LOCAL	25	25	
COLLECTOR	100	100	
ARTERIAL	200	200	

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**EXHIBIT 10
PAVEMENT SPECIFICATIONS
(Subsection 22-9.8c)**

Local Streets	
Bituminous Concrete Surface Course, Mix I-5	1 1/2 inches Thick
Bituminous Stabilized Base Course, Mix I-2	3 1/2 inches Thick
Prime Coat on Gravel Base	
Gravel Base Course, Soil Aggregate, Gradation Designation I-5	6 inches Thick (1), (2), (3)
If Required Add:	
Subbase, Soil Aggregate, Gradation Designation I-2 or I-3	6 inches Thick
Collector Streets	
Bituminous Concrete Surface Course, Mix I-5	1 1/2 inches Thick
Bituminous Stabilized Base Course, Mix I-2 (Laid in 2 Courses)	4 1/2 inches Thick
Prime Coat on Gravel Base	
Gravel Base Course, Soil Aggregate, Gradation Designation I-5	8 inches Thick (1), (2), (3)
If Required Add:	
Subbase, Soil Aggregate, Gradation Designation I-2 or I-3	8 inches Thick
Parking Areas and Aisles	
Bituminous Concrete Surface Course, Mix I-5	1 1/2 inches Thick
Bituminous Stabilized Base Course, Mix I-2	2 inches Thick
Gravel Base Course, Soil Aggregate, Gradation Designation I-5	4 1/2 inches Thick (1), (2)

Notes:	
(1)	Bituminous stabilized base course may be substituted for gravel base course on a 1 to 3 inch ratio
(2)	If subgrade is approved as adequate by the engineer, gravel base course may be completely eliminated and bituminous stabilized base course may be substituted on a 1 to 3 inch ratio
(3)	Gravel base course may be reduced to 3 inch minimum if subbase is provided
(4)	Subbase may be required depending on subgrade soils, ground water elevations and other variables
(5)	Portions of parking areas and aisles likely to be subjected to significant heavy truck traffic shall meet the standards for local streets. Parking areas and aisles serving a total development of less than 20 parking spaces with good subgrade soil conditions may utilize the following:
	Bituminous Concrete Surface Course, Mix I-5 2 inches Thick
	Gravel Base Course, Soil Aggregate, Gradation Designation I-5 6 inches Thick (1), (2)

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**EXHIBIT 11
ILLUMINATION GUIDELINES FOR STREET, PARKING,
AND PEDESTRIAN AREAS
(Subsection 22-9.8c.)**

A. Street Illumination

Street Hierarchy	Area Classification					
	Commercial		Intermediate		Residential	
	Lux	Footcandles	Lux	Footcandles	Lux	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		Pedestrian Safety		Pedestrian Security	
	Lux	Footcandles	Lux	Footcandles	Lux	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		Average Levels for Special Pedestrian Security			
	Lux	Footcandles	Mounting Heights 3 to 5 meters (9 to 15 feet)		Mounting Heights 5 to 10 meters (15 to 30 feet)	
			Lux	Footcandles	Lux	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

DEVELOPMENT REGULATIONS

	Minimum Average Level		Average Levels for Special Pedestrian Security			
			Mounting Heights 3 to 5 meters (9 to 15 feet)		Mounting Heights 5 to 10 meters (15 to 30 feet)	
Walkways & Bikeway Classification	Lux	Footcandles	Lux	Footcandles	Lux	Footcandles
Pedestrian tunnels	43	4.0	54	5.0	—	—
Pedestrian overpasses	3	0.3	4	0.4	—	—
Pedestrian stairways	6	0.6	9	0.8	—	—

IES Lighting Handbook definitions:

a. Area Classification:

1. Commercial shall mean that portion of a municipality in a business development where ordinarily there are large numbers of pedestrians during business hours.
2. Intermediate shall mean 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 shall mean 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.

b. Activity Level:

1. High activity shall mean major league athletic events cultural or civic events, and major regional shopping centers.
2. Medium activity shall mean fast food facilities, area shopping centers, hospital parking areas, transportation parking (airports, etc.) cultural, civic or recreational events, and residential complex parking.
3. Low activity shall mean local merchant parking, industrial employee parking, educational facility parking.

c. Bikeway Classification:

1. Type A bikeway shall mean a strip within or adjacent to a public roadway or shoulder, used for bicycle travel.
2. Type B bikeway shall mean an improved strip identified for public bicycle travel and located away from a roadway or its adjacent sidewalk system.

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EXHIBIT 12
COLOR CODE SYSTEM FOR FIRE HYDRANTS
(Subsection 22-9.8d)

Class "A"	1,000 gpm or greater and water mains of 10 inches and greater — green caps and bonnets
Class "B"	Greater than 500 gpm but less than 1,000 gpm and water mains of at least eight inches but less than 10 inches — orange caps and bonnets
Class "C"	500 gpm or less and water mains of at least six inches but less than eight inches — red caps and bonnets
Barrels	All fire hydrants shall be chrome yellow or equivalent, and all yellow paint shall be of "traffic yellow".

DEVELOPMENT REGULATIONS

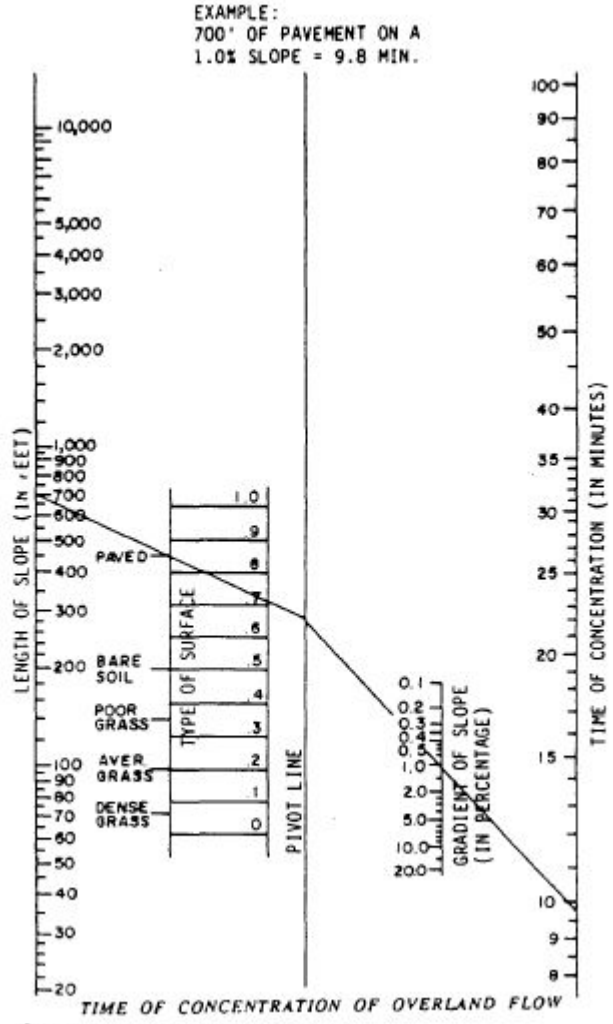
EXHIBIT 13
RUNOFF COEFFICIENTS
(Subsection 22-9.8f)

Land Use Description		Hydro. Soil Group			
		A	B	C	D
Cultivated land: without conservation treatment		0.49	0.67	0.81	0.88
with conservation treatment		0.27	0.43	0.61	0.67
Pasture or range land: poor condition		0.38	0.63	0.78	0.84
good condition		—	0.25	0.51	0.65
Meadow: good condition		—	—	0.44	0.61
Wood or forest land: thin stand, poor cover, no mulch		—	—	0.59	0.79
good cover		—	—	0.45	0.59
Open spaces, lawns, parks, golf courses, cemeteries					
good condition: grass cover on 75% or more of the area		—	0.25	0.51	0.65
fair condition: grass cover on 50% to 75% of the area		—	0.45	0.63	0.74
Commercial and business areas (85% impervious)		0.84	0.90	0.93	0.96
Industrial districts (72% impervious)		0.67	0.81	0.88	0.92
Residential:					
Average lot size — Average % Impervious					
1/8 acre or less	65	0.59	0.76	0.86	0.90
1/4 acre	38	0.25	0.55	0.70	0.80
1/3 acre	30	—	0.49	0.67	0.78
1/2 acre	25	—	0.45	0.65	0.76
1 acre	20	—	0.41	0.63	0.74
Paved parking lots, roofs, driveways, etc.		0.99	0.99	0.99	0.99
Streets and roads:					
paved with curbs and storm sewers		0.99	0.99	0.99	0.99
gravel		0.57	0.76	0.84	0.88
dirt		0.49	0.69	0.80	0.84

Source: New Jersey Department of Environmental Protection, Technical Manual for Stream Encroachment (Trenton, New Jersey: Department of Environmental Protection, 1984), p.51.

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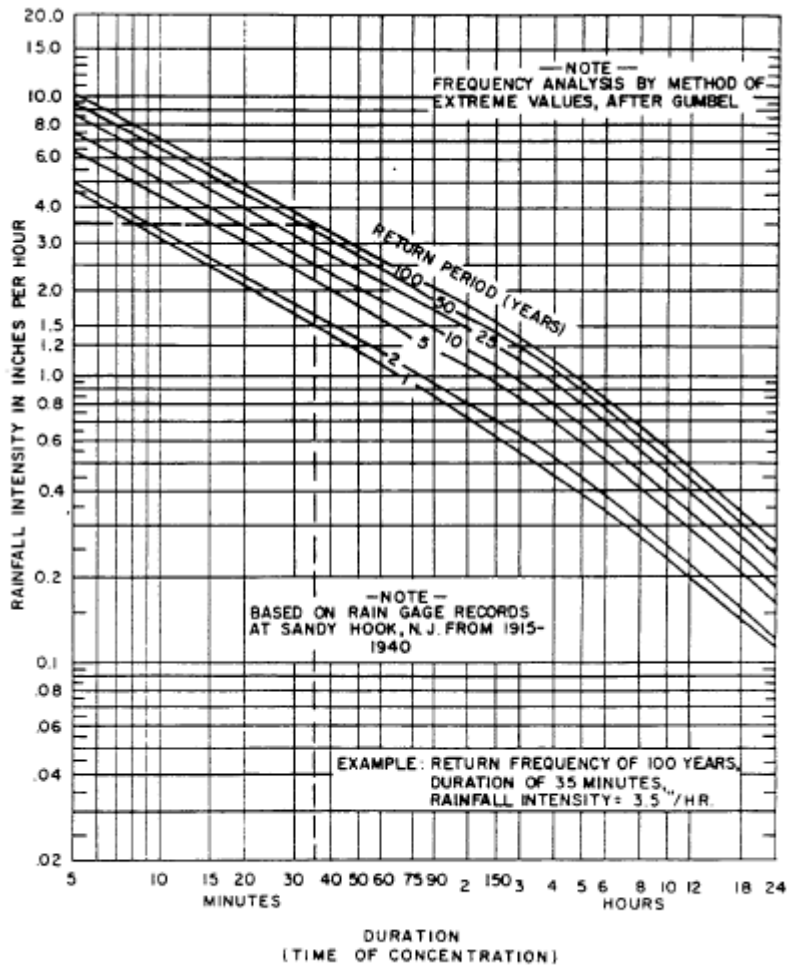
EXHIBIT 14
NOMOGRAPH FOR THE DETERMINATION OF TIME OF CONCENTRATION
(Subsection 22-9.8f)



Source: State of New Jersey Highway Authority

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EXHIBIT 15
(Subsection 22-9.8f)



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EXHIBIT 16
MANNING'S ROUGHNESS COEFFICIENTS
(Subsection 22-9.8f)

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. Clazed	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

DEVELOPMENT REGULATIONS

Type of Channel			Minimum	Normal	Maximum
	j.	Rubble masonry, cemented	0.018	0.025	0.030
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		
		2. Mortar	0.011		
	b.	Wood			
		1.		0.012	0.014
		2. 0.011	0.013	0.012	0.015
		3. 0.013	0.015	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
C.	EXACAVATED OR DREDGED				
	a.	Earth, straight and uniform			

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Type of Channel				Minimum	Normal	Maximum
		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.	ragline-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 feet)				
		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
		b.	Mountain streams, no vegetation in canal, 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			

DEVELOPMENT REGULATIONS

Type of Channel			Minimum	Normal	Maximum
		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 under-growth, 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 feet). 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)

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EXHIBIT 17
PERMISSIBLE VELOCITIES FOR SWALES, OPEN CHANNELS, AND DITCHES WITH
UNIFORM STANDS OF VARIOUS WELL-MAINTAINED GRASS COVERS
(Subsection 22-9.8f.)

Ground Cover	Permissible Velocity On:		
	Slope Range Percent	Erosion-Resistant Soils (fps)	Easily Eroded Soils (fps)
Bermudagrass	0 to 5	8	6
	5 to 10	7	5
	Over 10	6	4
Buffalograss	0 to 5	7	5
Kentucky bluegrass	5 to 1	6	4
Smooth brome	Over 10	5	3
Grass mixture	0 to 5	5	4
	5 to 10	4	3
Lespedeza			
Weeping lovegrass			
Yellow bluestem			
Kudzu	0 to 5	3.5	2.5
Alfalfa			
Crabgrass			
Common lespedeza			
Sundangrass	0 to 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).