

(b) The standards referenced in these rules and listed in N.J.A.C. 5:21-8 shall be considered a part of the requirements of these rules to the prescribed extent of each reference. Where differences occur between provisions of these rules and referenced standards, the provisions of these rules shall apply, except as provided in N.J.A.C. 5:21-1.5(e).

Administrative correction.
See: 29 N.J.R. 1296(a).
Administrative change.
See: 33 N.J.R. 691(b).

5:21-1.9 Violations

(a) Where any site improvement is required to meet any part of these rules pursuant to the requirements of any ordinance adopted pursuant to N.J.S.A. 40:55D-37, Subdivision and Site Plan Review and Approval, or N.J.S.A. 40:55D-62, Zoning, then any failure of any person to construct such site improvements in accordance with the requirements of these rules shall constitute a violation of the Municipal Land Use Law (N.J.S.A. 40:55D-1 et seq.). Any person responsible for such failure shall be subject to such penalties and enforcement procedures as are provided by that law and by any valid ordinance adopted pursuant thereto which may be initiated by the administrative officer designated by the ordinance (N.J.S.A. 40:55D-18).

(b) In addition to any remedy provided by (a) above, any failure to comply with the requirements of these rules, where compliance is required, shall constitute a failure to meet the conditions of the construction permit and/or certificate of occupancy issued pursuant to the State Uniform Construction Code Act (N.J.S.A. 52:27D-119 et seq.). Notification from the approving authority or from the municipal engineer acting on behalf of the approving authority that any of the requirements of these rules that are conditions of the Construction Permit and/or Certificate of Occupancy have not been met shall subject any person responsible for such failure to the remedies provided under the State Uniform Construction Code Act.

Administrative correction.
See: 29 N.J.R. 1296(a).

5:21-1.10 Operative date

(a) These rules shall be operative on June 3, 1997. The requirements of any municipal ordinances or rules adopted by any instrumentality deriving authority therefrom in effect on that date which establish rules or requirements for any matter within the scope of these regulations shall be deemed to have been repealed and of no further force or effect.

(b) Any project for which preliminary subdivision or site plan approval has been given prior to June 3, 1997 shall continue to be subject to the municipal development ordinance under which it was approved.

(c) Any project for which application is made after June 3, 1997 shall be governed by these rules.

(d) These rules shall not be construed as requiring the revision or amendment of any application for site plan or subdivision approval which is pending on June 3, 1997. Such pending applications may, however, be amended provided that any such amendments shall meet the requirements of these rules.

1. For any project for which a completed application has been submitted on or before the operative date of these rules, but which has not yet received preliminary approval, the applicant shall have the option of amending the application in its entirety to comply with these rules or of requesting that the municipality continue to review the application under the municipal ordinances in effect at the time of application.

(e) For a period of six months following the operative date of a technical revision to the standards, applicants may submit a complete application to be reviewed under the standards in effect immediately prior to the technical revision. Provided that the application is deemed complete within the meaning of the Municipal Land Use Law, the planning board or zoning board of adjustment, as appropriate, shall review the application based on the technical standards in force immediately prior to the operative date of the revision to the standards. This grace period shall only apply to technical revisions to the standards.

(f) In the case of a subdivision or project for which a complete application has been submitted but for which preliminary approval has not been issued by the operative date of any technical change to the standards, review shall continue and approval shall be granted based on the standards in force immediately prior to the operative date of the revision to the standards.

Amended by R.2004 d.35, effective January 20, 2004.
See: 35 N.J.R. 3981(a), 36 N.J.R. 447(a).
Added (e) and (f).

5:21-1.11 Validity

If any provision of these rules or the application thereof to any person or circumstances is held invalid, the invalidity shall not affect other provisions or applications of the rules which can be given effect, and to this end the provisions of the rules are severable.

APPENDIX

**NEW JERSEY MUNICIPALITIES
LIMESTONE AREAS**

<u>County</u>		<u>Municipality</u>
Hunterdon	Alexandria Township Bethlehem Township Bloomsbury Borough Califon Borough Clinton Township Clinton Town	Hampton Borough Holland Township Lebanon Township Tewksbury Township Union Township
Morris	Chester Township Jefferson Township Mendham Township Mendham Borough Minchill Township Montville Township Morris Township	Mount Olive Township Mt. Arlington Borough Randolph Township Rockaway Township Roxbury Township Washington Township Wharton Borough
Passaic	Bloomfield Borough	Wanaque Borough

<u>County</u>		<u>Municipality</u>
Somerset	Ringwood Township Bedminster Township Far Hills Borough	West Milford Township Peapack/Gladstone Borough
Sussex	Andover Township Andover Borough Branchville Borough Byram Township Frankford Township Franklin Borough Fredon Township Green Township Hamburg Borough Hampton Township Hardyston Township	Lafayette Township Montague Township Newton Town Ogdensburg Borough Sandyston Township Sparta Township Stillwater Township Vernon Township Walpack Township Wantage Township
Warren	Allamuchy Township Alpha Borough Belvidere Township Blairtown Township Franklin Township Frelinghuysen Township Greenwich Township Hackettstown Town Hardwick Township Harmony Township Hope Township	Independence Township Knowlton Township Liberty Township Lopatcong Township Mansfield Township Oxford Township Phillipsburg Township Pohatcong Township Washington Township Washington Borough White Township

† Listing established by the Department of Environmental Protection, Division of Science and Research (April 1995)

Administrative correction.
See: 29 N.J.R. 2816(a).

5:21-2.2 Application form and checklist (Reserved)

SUBCHAPTER 3. EXCEPTIONS, WAIVERS, AND SPECIAL AREA STANDARDS

5:21-3.1 Exceptions

(a) The municipal approving authority may grant such de minimis exceptions from the requirements of the site improvement standards as may be reasonable and within the general purpose and intent of the standards if the literal enforcement of one or more provisions of the standards is impracticable or will exact undue hardship because of peculiar conditions pertaining to the development in question.

(b) An application for an exception pursuant to this section shall be filed in writing with the municipal approving authority and shall include:

1. A statement of the requirements of the standards from which an exception is sought;
2. A statement of the manner by which strict compliance with said provisions would result in practical difficulties; and
3. A statement of the nature and extent of such practical difficulties.

SUBCHAPTER 2. APPLICATION AND REVIEW PROCEDURES

5:21-2.1 Application and review procedures

The procedure for municipal review and action on applications for residential subdivisions and/or site plans shall not be affected by anything contained in these rules, and shall continue to be as set forth in the Municipal Land Use Law (MLUL), N.J.S.A. 40:55D-1 et seq. and in municipal ordinances adopted pursuant to the MLUL. This review shall include a review for compliance with these rules.

(c) Exceptions shall become a part of the construction documents and shall be retained by the municipal approving authority.

(d) Within 30 days of granting a de minimis exception request, a municipal approving authority agreeing to an exception pursuant to this section shall send a copy of the document(s) constituting the de minimis exception resolution and/or document to the New Jersey Department of Community Affairs, Division of Codes and Standards, 101 South Broad Street, PO Box 802, Trenton, NJ 08625-0802. Such notice shall be clearly marked "Site Improvement Exception(s)."

(e) An application for an exception may also be made by an officer or agency of the municipality.

(f) Examples of de minimis exceptions include, but are not limited to, the following:

1. Reducing the minimum number of parking spaces and the minimum size of parking stalls;
2. Reducing the minimum geometrics of street design, such as curb radii, horizontal and vertical curves, intersection angles, centerline radii, and others;
3. Reducing cartway width; and
4. Any changes in standards necessary to implement traffic calming devices.

(g) The municipal approving authority's granting of a request for a de minimis exception shall be based on a finding that the requested exception meets the following criteria:

1. It is consistent with the intent of the Site Improvement Act;
2. It is reasonable, limited, and not unduly burdensome;
3. It meets the needs of public health and safety; and
4. It takes into account existing infrastructure and possible surrounding future development.

Administrative correction.
See: 29 N.J.R. 1296(a).

Case Notes

Department of Community Affairs (DCA) was authorized to adopt standards different from those contained in a Model Subdivision and Site Plan Ordinance if those standards were supported by any academic or professional institution or organization. *New Jersey State League of Municipalities v. Department of Community Affairs*, 158 N.J. 211, 729 A.2d 21 (N.J. 1999).

5:21-3.2 Waiver request

(a) A municipality or developer may, in connection with a specific development, request a waiver of any site improvement standard adopted under this chapter in accordance

with N.J.S.A. 40:55D-40.4(c). A waiver request may also be made jointly by a municipality and a developer.

(b) The Site Improvement Advisory Board may approve a request for a waiver based on any danger to public health and safety that would be caused by adherence to a standard specified in this chapter.

(c) A waiver may be requested by a municipality or a developer, or the request may be made jointly. The waiver request shall consist of the following:

1. A copy of the development application as submitted to the municipal approving authority; and
2. A brief memorandum to the Commissioner of the Department of Community Affairs containing sufficient information upon which to base a determination, including:
 - i. A short description of the project in narrative form;
 - ii. A citation to the particular site improvement standard from which waiver is requested;
 - iii. A clear description of the condition(s) giving rise to the request;
 - iv. A clear description of the anticipated result if the standard were to be followed;
 - v. The name, address, and telephone number of a contact person for the developer; and
 - vi. The name, address, and telephone number of a contact person for the municipal approving authority.

(d) The party requesting the waiver shall send the request to the New Jersey Department of Community Affairs, Division of Codes and Standards, 101 South Broad Street, PO Box 802, Trenton, NJ 08625-0802.

(e) Where a waiver is requested by the developer, the developer shall send a copy of the request to the administrative officer of the municipality concerned. Where a waiver is requested by the municipality, the municipality shall send a copy of the request to the developer.

(f) A waiver may be requested by the developer or the municipal approving authority at any time during the pendency of a development application. The Site Improvement Advisory Board recommends submission of a waiver request early in the application process or prior to the submission of a formal development application. If the applicant or the municipal approving authority determines during the planning board review process that a waiver request is appropriate, the municipal approving authority shall give consideration whenever possible to the granting of an extension for the purpose of pursuing a waiver. In some cases it may be impracticable for the party requesting or appealing a waiver to complete the waiver process within the time guidelines of the Municipal Land Use Law (N.J.S.A. 40:55D-1 et seq.;

see, for example, N.J.S.A. 40:55D-45.3, 46(c), 46.1, 47, 48 and 50). In such cases, the municipal approving authority may provide for the disposition of the waiver as a condition of its approval.

(g) There is no fee for requesting a waiver.

5:21-3.3 Waiver review

(a) The Commissioner shall review the waiver request to determine whether it appears on preliminary review that adherence to a particular standard would jeopardize the public health and safety.

1. If the waiver request on its face does not meet the requirements of this subsection, the Commissioner shall contact the requesting party within 20 days of receipt of the request and advise the requesting party of the waiver request rejection. Grounds for rejection shall be indicated in writing.

(b) Within 20 days of receipt of a waiver request, the Commissioner shall date and mark as justified for review each waiver request accepted for review. The Commissioner shall then direct each such waiver request to the Site Improvement Advisory Board's technical committee which consists of Board members who represent the New Jersey Society of Professional Engineers, the New Jersey Society of Municipal Engineers, and the New Jersey Builders Association (see N.J.S.A. 40:55D-40.4(c)).

(c) The Commissioner shall send notice of the Commissioner's determination of justification to designated contacts at the same time as the waiver request is sent to the technical committee.

(d) The technical committee shall render a decision by resolution within 30 days of the Commissioner's determination that the waiver request is justified.

(e) A waiver resolution adopted by the committee shall specify the grounds for granting or denying the waiver request.

(f) The Commissioner shall promptly notify the developer and the municipal approving authority of the committee's decision, and shall provide a copy of the resolution memorializing such decision to those parties and to the Site Improvement Advisory Board.

Amended by R.1999 d.374, effective November 1, 1999 (operative May 1, 2000).
See: 31 N.J.R. 477(a), 31 N.J.R. 3259(a).

5:21-3.4 Appeal of waiver decisions

(a) Any decision of the technical committee may be appealed to the Site Improvement Advisory Board. The party wishing to appeal shall notify the Board of its intention to appeal within 10 business days from receipt of the resolution memorializing the technical committee's decision. The Board shall hear appeals in a public session at regularly scheduled or special meetings announced in compliance with the Open Public Meetings Act (see N.J.S.A. 10:4-6 et seq.).

(b) For each hearing, the Site Improvement Advisory Board shall designate, by simple majority of the members present, a voting member of the Board to serve as presiding officer.

(c) Any documents and materials constituting the appeal shall be available for public inspection at the Department of Community Affairs, Division of Codes and Standards during normal business hours at least 10 days before the date of the hearing. Other documents, records, or testimony may be produced at the hearing to clarify or supplement materials previously submitted.

(d) The hearings shall be informal. Rules of evidence shall not apply, but the presiding officer may exclude irrelevant, immaterial, or unduly repetitious evidence.

(e) The testimony of all witnesses in a waiver appeal shall be under oath or affirmation and shall be recorded verbatim either mechanically or stenographically. Transcripts may be obtained at the expense of the requesting party and shall be certified by the transcriber to be accurate.

(f) The Site Improvement Advisory Board shall render a final decision within 10 days of the hearing. The Board's decision shall be in writing, and shall contain findings and conclusions. The Board shall mail a copy of the decision to the developer and to the municipal approving authority.

Amended by R.2000 d.480, effective December 4, 2000 (operative June 3, 2001).
See: 32 N.J.R. 2670(b), 32 N.J.R. 4277(a).
Rewrote (a).

5:21-3.5 Special area standards

(a) The Commissioner and the Site Improvement Advisory Board as a matter of policy recognize the need for preservation and/or enhancement of community character in New Jersey municipalities. This section is intended to provide a procedure whereby a municipal approving authority may develop and recommend to the Board supplementary and/or alternative standards in the form of municipal ordinances for review and amendment to this chapter. The Site Improvement Advisory Board shall solicit the input of the Department of Environmental Protection, the Office of State Planning, and the Department of Transportation and may solicit input from public or private organizations and individuals as it deems appropriate during the process of review of special area standards.

(b) A special area designation may be applied by ordinance by a municipality or group of municipalities to an area or areas of a municipality or municipalities exhibiting or planned to exhibit a distinctive character or environmental feature that the municipality or municipalities by ordinance have identified and expressed a desire to preserve and enhance. Examples of a special area may include:

1. Designated redevelopment areas pursuant to N.J.S.A. 40A:12A-1 et seq.;

2. Designated special improvement districts pursuant to N.J.S.A. 40:56-65 et seq.;

3. Designated historic districts pursuant to N.J.S.A. 40:55D-65.1;

4. Municipalities in the Metropolitan Planning Area (Planning Area 1), and Regional Centers, villages, hamlets, or other Centers identified by the State Development and Redevelopment Plan or designated by the State Planning Commission;

5. Infill areas in urban settings;

6. Planned unit and planned unit residential developments, and residential clusters pursuant to N.J.S.A. 40:55D-39;

7. Areas where environmental systems such as watersheds may require special environmental controls;

8. Designated scenic corridors, pursuant to the Intermodal Surface Transportation Efficiency Act or other similar State or local initiatives; and

9. Rural preservation areas including, but not limited to, designated Agricultural Development Areas, pursuant to N.J.S.A. 4:1C, and in support of the rural preservation policies of the State Development and Redevelopment Plan.

(c) The Site Improvement Advisory Board shall consider at its regular or specially-scheduled public meetings special area standards submitted for approval by or on behalf of a municipality or municipalities. The following procedures shall govern the review of special area standards submitted for approval:

1. Upon receipt of an application for approval of special area standards conforming to (e) below, the Department of Community Affairs, on behalf of the Board, shall prepare and file with the Office of Administrative Law, for publication in the New Jersey Register, a notice of receipt of the application, including a summary of its contents. Any such notice shall conform to the requirements applicable to petitions for rules set forth at N.J.A.C. 5:2-2. The notice shall indicate the time and place of any meeting that is to be held to consider the application and shall also indicate the address and telephone number at which persons may contact the Department in order to be placed on lists that the Department shall use to keep interested persons informed as to the status of any specific application or of special area standards applications generally.

i. The application shall be accompanied by proof of publication by the municipality, in its official newspaper, of either a copy of the application or a summary of its contents. If the municipality does not publish the full text of the application, it shall include in the published notice a statement that interested persons may review a copy of the application that is on file in the office of the municipal clerk, and may purchase

copies of the application in accordance with the New Jersey Right-to-Know law, N.J.S.A. 47:1A-1.1 et seq., and that information concerning the date of any meeting at which the application will be considered will be available in the office of the municipal clerk once that determination has been made.

2. Upon receipt of an application for approval of special area standards, the Department, with the concurrence of the chairperson of the Board, shall refer the application to the appropriate Board committee. The committee shall consider the application at a meeting held at least 15 days following publication of notice of the application in the New Jersey Register. Notice of such meeting shall be sent to the municipal clerk and to all known parties in interest. The committee shall recommend such action to the Board as it may deem appropriate.

3. A notice of the action recommended by the committee, including the text of any recommended special area standards, shall be forwarded by the Department to the Office of Administrative Law for publication in the New Jersey Register as a public notice. The notice, copies of which shall be sent to the municipal clerk and to all known parties in interest, shall include the time and place of the meeting of the Board at which the application and the committee's recommendations thereon shall be considered.

i. Upon receipt of the notice, the municipality shall publish a copy of the notice in its official newspaper.

4. Prior to making a decision on any application for special area standards, the Board shall hold a public hearing at which all interested persons shall be given an opportunity to testify and to present their views, both orally and in writing. A taped record shall be made of all statements made at the hearing, which record shall be made available by the Department to interested persons upon request. At the conclusion of the hearing, the Board shall either take action on the application or schedule the matter for further consideration at its next meeting. Any Board decision shall be by formal resolution. Notice of any Board decision shall be published in the New Jersey Register.

5. The Board and any of its committees shall meet at least monthly when any application for approval of special area standards is ripe for action before them.

(d) The Site Improvement Advisory Board shall review special area standards submitted for approval if:

1. The special area is delineated on the zoning map, adopted redevelopment plan, special improvement district ordinance, Center designation petition, or other duly authorized ordinance of the municipality or municipalities;

2. The special area is incorporated into the municipality's master plan;

3. Site improvement standards for use in the special area are consistent with the purposes of this chapter, deviations from the standards are identified, and a rationale is provided for each such deviation; and

4. Site improvement standards for use in the special area are set forth in an ordinance or draft ordinance that has been referred to the Board for approval by resolution of the municipal governing body. Municipalities may submit their existing codes and plans to satisfy these requirements; provided, however, that no ordinance setting forth special area standards shall be effective unless and until it is approved by the Board.

(e) The application of the municipality for Site Improvement Advisory Board approval of its special area standards shall consist of:

1. A resolution of the governing body as described in (b) above;
2. The standards;
3. A copy of the ordinance, or of the draft ordinance and supporting resolution, adopting the standards;
4. An identification and narrative rationale for the deviations from the standards of this chapter; and
5. Any maps, exhibits, or supporting documentation.

(f) Developers, nonprofit groups, and other agencies may submit applications for special area status on behalf of the municipalities if duly authorized by the municipal governing body.

(g) The Site Improvement Advisory Board's decision on municipal special area standards shall be rendered in writing.

(h) The Site Improvement Advisory Board shall incorporate into its annual review of this chapter a review of approved municipal special area standards and shall recommend to the Commissioner any appropriate changes in the rules (see N.J.S.A. 40:55D-40.4(d)).

(i) The Site Improvement Advisory Board may approve or deny, in whole or in part, special area standards submitted for consideration by a municipality or municipalities.

(j) The Site Improvement Advisory Board's review is limited in scope to those areas within its purview pursuant to N.J.S.A. 40:55D-40.4, that is streets, off-street parking, water supply, sanitary sewers, and stormwater management in the context of residential development.

(k) The Board's review of a municipal special area standards ordinance shall be based on the following criteria. Standards set forth in an ordinance submitted for review by the Board:

1. Shall be consistent with the intent of the Site Improvement Standards Act,
2. Shall be reasonable and not unduly burdensome,
3. Shall meet the needs of public health and safety, and
4. Shall take into account existing infrastructure and surrounding development possibility.

(l) A developer whose application is complete on or before the date of approval of a special area standard shall have the option of complying with that standard or complying with the standard in effect prior to the date of approval of the special area standard.

Petition for Rulemaking: Notice of Receipt of a Petition for Rulemaking.

See: 29 N.J.R. 3900(a).

Amended by R.1998 d.400, effective August 3, 1998.

See: 30 N.J.R. 755(a), 30 N.J.R. 2861(b).

In (c), rewrote the introductory paragraph and added new 1 through 5; in (d), rewrote 4; in (e), inserted "or of the draft ordinance and supporting resolution" preceding "adopting the standards;" in 3; and added a new (l).

Amended by R.1999 d.374, effective November 1, 1999 (operative May 1, 2000).

See: 31 N.J.R. 477(a), 31 N.J.R. 3259(a).

Rewrote (e)1.

Public Notice: Special area standards.

See: 33 N.J.R. 130(a), 897(a).

Public Notice: Special area standards.

See: 34 N.J.R. 4224(a).

Public Notice: Special area standards.

See: 36 N.J.R. 220(a).

5:21-3.6 Agreement to exceed standards

(a) A standard set forth in these rules may be exceeded when both the developer and the municipal approving authority agree that such exceeding of a standard is desirable under the specific circumstances of a proposed residential development.

(b) Any agreement between developer and municipal approving authority to exceed a standard set forth in these rules shall be placed in writing by the developer.

(c) The developer shall transmit forthwith to the Department notification of each agreement with a municipal approving authority to exceed any of the standards set forth in these rules.

(d) The Department shall review each agreement between a developer and a municipal approving authority wherein they mutually agree to exceed a standard otherwise set forth in the Residential Site Improvement Standards. Each such agreement shall be reviewed for consistency with the intent and purpose of the Act and these rules.

(e) The Department shall apprise the Site Improvement Advisory Board periodically of all agreements to exceed the standards, together with a summary of the review described in (d) above for each such agreement.

(c) At signalized intersections, street signs shall be located on the overhead arm supporting the traffic signal, or otherwise suitably suspended over the intersection. Roadway clearance shall be a minimum of 15 feet from the bottom of any sign or supporting equipment and the top of the paved surface.

5:21-4.14 Parking: number of spaces

(a) An adequate number of on-street and off-street parking spaces shall be required in all developments to accommodate residents and visitors. For projects containing dwelling units required by the New Jersey Uniform Construction Code's Barrier Free Subcode (N.J.A.C. 5:23-7) to be accessible, accessible parking spaces for people with disabilities shall be provided in accordance with the requirements of the Barrier Free Subcode and shall be considered part of the total number of required spaces.

(b) For residential developments, parking shall be provided, as set forth in Table 4.4 below. If applicant does not specify the number of bedrooms per unit, note "c" for each category in Table 4.4 shall apply for the parking requirement.

(c) Alternative parking standards to those shown in Table 4.4 shall be accepted if the applicant demonstrates these standards better reflect local conditions. Factors affecting minimum number of parking spaces include household characteristics, availability of mass transit, urban versus suburban location, and available off-site parking resources.

(d) Garage and driveway combinations shall be counted as follows:

1. Each garage car space shall be counted as 1.0 off-street parking space regardless of the dimensions of the driveway.

2. A one-car garage and driveway combination shall count as 2.0 off-street parking spaces, provided the driveway measures a minimum of 18 feet in length between the face of the garage door and the right-of-way.

3. A two-car garage and driveway combination shall count as 3.5 off-street parking spaces, provided a minimum parking width of 20 feet is provided for a minimum length of 18 feet as specified for a one-car garage and driveway combination.

(e) When housing is included in mixed-use development, a shared parking approach to the provision of parking shall be permitted.

(f) When, in the judgment of the local approving authority, on-street parking is available, then only that proportion of the parking requirement which is not available on the street shall be provided in off-street parking facilities. A length of 23 feet per on-street parking space shall be used in calculating the number of available on-street parking spaces.

TABLE 4.4

PARKING REQUIREMENTS FOR RESIDENTIAL LAND USES^a

Housing unit type/size ^b	Parking requirement per dwelling unit
Single-Family Detached	
2 Bedroom	1.5
3 Bedroom	2.0
4 Bedroom	2.5 ^c
5 Bedroom	3.0
Two Family (Duplex)	"Single-Family Detached" values shall apply to each unit
Garden Apartment	
1 Bedroom	1.8
2 Bedroom	2.0 ^c
3 Bedroom	2.1
Townhouse	
1 Bedroom	1.8
2 Bedroom	2.3 ^c
3 Bedroom	2.4
High Rise	
1 Bedroom	0.8
2 Bedroom	1.3 ^c
3 Bedroom	1.9
Mobile Home	
1 Bedroom	1.8
2 Bedroom	2.0 ^c
Retirement Community	Values shall be commensurate with the most appropriate housing unit type and size noted above that the retirement community resembles.
Recreational Homes (owner occupied)	Values shall be commensurate with the most appropriate housing unit type and size noted above that the recreational homes (owner occupied) resemble.
Mid-Rise Apartment Assisted living	"Garden Apartment" values shall apply 0.50

Notes:

^aWhen determination of the required number of parking spaces results in a fractional space for the entire development, any fraction of one-half or less may be disregarded, while a fraction in excess of one-half shall be counted as one parking space.

^bRequirements for attached units (apartment/condominium/townhouse) include provisions for guest parking (0.5 spaces per dwelling unit). Guest parking must either be provided for on street or in common parking areas.

^cIf applicant does not specify the number of bedrooms per unit, this parking requirement shall apply.

Source: Modified and adapted from U.S. Department of Commerce, Bureau of the Census, Public Use File—New Jersey (cross-tabulation of vehicles by housing unit for units constructed 1975 to 1980).

Amended by R.1999 d.374, effective November 1, 1999 (operative May 1, 2000).

See: 31 N.J.R. 477(a), 31 N.J.R. 3259(a).

Rewrote (d); and in Table 4.4, deleted "offstreet" preceding "parking" in Note c.

Administrative correction.

See: 32 N.J.R. 684(b).

Amended by R.2000 d.480, effective December 4, 2000 (operative June 3, 2001).

See: 32 N.J.R. 2670(b), 32 N.J.R. 4277(a).

In Table 4.4, amended column headings and inserted requirement for assisted living.

Amended by R.2002 d.399, effective December 16, 2002.

See: 34 N.J.R. 2615(a), 34 N.J.R. 4412(a).

In Table 4.4, added "Two Family (Duplex)" and rewrote footnote b.

Public Notice: Notice regarding the Publication of two Notices of Adoption in the December 16, 2002 New Jersey Register.

See: 34 N.J.R. 4343(a), 4412(a), 35 N.J.R. 219(b).

Administrative change.

See: 35 N.J.R. 1663(a).

5:21-4.15 Parking space size

Each off-street parking space shall measure nine feet in width by 18 feet in length. Parking spaces for people with disabilities shall be in accordance with the New Jersey

Uniform Construction Code (N.J.A.C. 5:23) or the Americans with Disabilities Act, as applicable.

5:21-4.16 Parking lots

(a) Off-street parking lots shall be oriented to, and within a reasonable walking distance of, the buildings they are designed to serve.

(b) Access to parking lots shall be designed so as not to induce queues on travel ways, and to provide adequate pedestrian circulation and safety. There shall be adequate provision for ingress to and egress from all parking spaces to ensure ease of mobility, ample clearance, and safety of vehicles and pedestrians.

(c) The width of all aisles providing direct access to individual parking stalls shall be in accordance with the requirements specified in Table 4.5 below. Only one-way traffic shall be permitted in aisles serving single-row parking spaces placed at an angle other than 90 degrees.

TABLE 4.5

PARKING ANGLES AND AISLE WIDTHS

Parking angle (degrees)	Aisle width (feet)
30	12
45	13
60	18
90	24

(d) Where sidewalks occur in parking areas, parked vehicles shall not overhang or extend over the sidewalk unless an additional two feet of sidewalk width are provided to accommodate such overhang.

(e) Where sole access to dwelling units is via a parking lot, the following features shall be provided:

1. Designated fire lanes a minimum of 18 feet in width shall be required as provided for in the Uniform Fire Code.

2. Parking lots shall be provided with turning bays or other means of turning at intervals of not greater than 1,200 feet. Turning bays, such as hammerheads or other configurations, shall measure at least 18 feet by 60 feet, or provide equivalent maneuvering space.

3. Parking lots having more than 100 spaces shall have a minimum of two means of ingress and egress, or be provided with a divided-type entrance.

Amended by R.2002 d.399, effective December 16, 2002.
See: 34 N.J.R. 2615(a), 34 N.J.R. 4412(a).

In (a), substituted "lots" for "areas" following "Off-street parking"; added (e).

Public Notice: Notice regarding the Publication of two Notices of Adoption in the December 16, 2002 New Jersey Register.
See: 34 N.J.R. 4343(a), 4412(a), 35 N.J.R. 219(b).

5:21-4.17 Curb construction standards

(a) Construction specifications for acceptable curb types of granite block and concrete are shown in Figure 4.1 below.

(b) The standard concrete curb section used shall be a maximum of 20 feet in length, with a scored joint every 10 feet. All concrete used for curbs or combination curbs and gutters shall be prepared in accordance with the requirements, by class of concrete, of the New Jersey Department of Transportation, *Standard Specifications for Road and Bridge Construction*, effective at the time of preparation. Where bituminous concrete pavement is used for the road surface, the curb and/or gutter shall be constructed first.

(c) Where drainage inlets are constructed but curbs are not required, curbing must be provided at least 10 feet on each side of the inlet, set back one foot from the extension of the pavement edge.

Administrative correction.

See: 29 N.J.R. 1296(a).

Amended by R.1999 d.374, effective November 1, 1999 (operative May 1, 2000).

See: 31 N.J.R. 477(a), 31 N.J.R. 3259(a).

Administrative correction.

See: 32 N.J.R. 684(b).

Amended by R.2000 d.480, effective December 4, 2000 (operative June 3, 2001).

See: 32 N.J.R. 2670(b), 32 N.J.R. 4277(a).

In Figure 4.1, amended (1 of 5), (2 of 5) and (3 of 5).

Amended by R.2002 d.399, effective December 16, 2002.

See: 34 N.J.R. 2615(a), 34 N.J.R. 4412(a).

Added Figure 4.1 (4 of 6); the elements of Figure 4.1 redesignated from "of 5" to "of 6"; amended Figure 4.1 (3 of 6).

Public Notice: Notice regarding the Publication of two Notices of Adoption in the December 16, 2002 New Jersey Register.

See: 34 N.J.R. 4343(a), 4412(a), 35 N.J.R. 219(b).

Amended by R.2004 d.35, effective January 20, 2004.

See: 35 N.J.R. 3981(a), 36 N.J.R. 447(a).

In (c), amended 3, 5 and 6 of 6 in Figure 4.1.

5:21-4.18 Sidewalks and bikeways construction standards

(a) The following apply to sidewalks and graded areas:

1. Sidewalks of concrete shall be four inches thick except at points of vehicular crossing, where they shall be at least six inches thick. At vehicular crossings, concrete sidewalks shall be reinforced with welded wire fabric mesh or an equivalent.

2. Concrete, air-entrained sidewalks shall be Class B concrete, having a 28-day verification strength of 4,500 p.s.i. Other materials may be permitted, depending on the design of the development.

3. Graded areas shall be planted with grass or treated with other suitable ground cover, and their width and cross slope shall correspond to that of sidewalks.

(b) The following apply to bikeways:

1. The construction of bikeways shall conform to the New Jersey Department of Transportation Planning and Design Guidelines for Bicycle Compatible Roadways and Bikeways (November 1995) and the AASHTO Guide for the Development of Bicycle Facilities (1999), incorporated herein by reference.

2. Bicycle-safe drainage grates shall be used in the construction of all residential streets.

Administrative correction.

See: 29 N.J.R. 1296(a).

Amended by R.2000 d.480, effective December 4, 2000 (operative June 3, 2001).

See: 32 N.J.R. 2670(b), 32 N.J.R. 4277(a).

Rewrote (b)1.

Amended by R.2002 d.399, effective December 16, 2002.

See: 34 N.J.R. 2615(a), 34 N.J.R. 4412(a).

In (a)2, substituted "Class B concrete" for "Class C concrete" and substituted "4,500 p.s.i." for "4,000 p.s.i."

Public Notice: Notice regarding the Publication of two Notices of Adoption in the December 16, 2002 New Jersey Register.

See: 34 N.J.R. 4343(a), 4412(a), 35 N.J.R. 219(b).

5:21-4.19 Street grade, intersections, pavement, and lighting construction standards

(a) The following apply to street grade:

1. Minimum street grade permitted for all streets shall be 0.5 percent.

2. Maximum street grade shall vary by road hierarchy with flatter grades required for roads with higher ADTs, in accordance with the requirements shown in Table 4.6. Where terrain makes it necessary, the allowable maximum grade may be increased by up to two percent, but shall not exceed a maximum grade of 16 percent.

(b) The following shall apply to intersections:

1. Street intersections shall be as nearly at right angles as possible and in no case shall be less than 75 degrees.

2. New intersections along one side of an existing street shall, if possible, coincide with any existing intersections on the opposite side of each street. Where provided, offsets for intersections along the same or opposite sides shall be at least 150 feet between right-of-way centerlines.

3. Intersections shall be rounded at the curbline with the street having the highest radius requirement, as shown in Table 4.6 below, determining the minimum standard for all curb lines.

4. Intersections shall be designed with a flat grade wherever practical.

5. The minimum centerline radius, minimum tangent length between reverse curves, and curb radii shall be as shown in Table 4.6 below.

6. Sight triangles shall be in accordance with AASHTO's "A Policy on Geometric Design of Highways and Streets" standards and based on the speed limits established by the government agency having jurisdiction. Sight triangle easements shall be required and shall include the area on each street corner that is bounded by the line which connects the sight or "connecting" points located on each of the right-of-way lines of the intersecting street. The planting of trees or other plantings, or the location of structures exceeding 30 inches in height that would obstruct the clear sight across the area of the easements, shall be prohibited, and a public right-of-entry shall be reserved for the purpose of removing any object, material or otherwise, that obstructs the clear sight.

TABLE 4.6
STREET GRADE, CURVE AND INTERSECTION DESIGN CRITERIA

	Street Hierarchy		Rural, residential access, and <u>neighborhood</u>	Minor <u>collector</u>	Major <u>collector</u>
	Special purpose street: <u>alley</u>	Special purpose street: <u>cul-de-sac</u>			
Minimum Grade	0.5%	0.5%	0.5%	0.5%	0.5%
Maximum Grade	15%	12%	12%	10%	8%
Maximum Grade of Secondary Street within 50 feet of Intersection [†]	5%	5%	5%	5%	5%
Minimum Center-Line Radius	100 ft	100 ft	100 ft	150 ft	300 ft
Minimum Tangent Length between Reverse Curves	0 ft	50 ft	50 ft	100 ft	150 ft
Curb Radii	20 ft	25 ft	25 ft	30 ft	35 ft

Note: [†]As measured from the nearest right-of-way line.

(c) Pavement shall be designed using either Figures 4.2 through 4.5, the structural number method, or the alternate pavement design methods referenced in (c)3 below.

1. Pavement design using figures: Pavement design for special-purpose streets (cul-de-sac, rural, etc.), residential access, neighborhood, minor collector, and major collector shall follow the specifications shown in Figures 4.2 through 4.5 based on the street type. Subgrade categories are shown in Table 4.7 below.

2. Structural number method: As an alternative to using Figures 4.2 through 4.5, applicants may design pavement using the structural numbers found in Table 4.9 below.

i. The designated structural number must be achieved by choosing the appropriate layers of bituminous stabilized surface course (Mix I-4, Mix I-5), bituminous stabilized base course (Mix I-2, stone mix), bituminous stabilized base course (Mix I-2, gravel mix), dense graded aggregate base course, soil aggregate base course, and subbase. The structural values and minimum layer thicknesses for the various materials are listed in Table 4.8 below.

TABLE 4.8
PER-INCH STRUCTURAL VALUE FOR VARIOUS PAVING MATERIALS

<u>Layer material</u>	<u>Structural value per-inch thickness</u>	<u>Minimum thickness</u>
Bituminous stabilized concrete surface (Mix I-4, Mix I-5) ¹	0.44	2 inches
Bituminous stabilized base course (Mix I-2, stone mix) ²	0.44	3 inches
Bituminous stabilized base course (Mix I-2, gravel mix) ²	0.37	3 inches
Dense graded aggregate base course ²	0.14	4 inches
Soil aggregate base course ²	0.11	4 inches
Subbase	0.08	6 inches

Notes:

¹ Materials for asphalt concrete surface shall conform to Section 404.02 or 406.02 of the New Jersey Department of Transportation's Standard Specifications for Road and Bridge Construction (1989).

² Materials for asphalt concrete base shall conform to Sections 301.02 and 304.02 or 406.02 of the New Jersey Department of Transportation's Standard Specifications for Road and Bridge Construction (1989).

ii. Thicknesses shall be provided in 0.5 inch increments.

TABLE 4.9
STRUCTURAL NUMBER VALUES AS A FUNCTION OF ADT AND M_r¹

Maximum <u>ADT</u> ²	SN ₀ prior to two-inch asphalt concrete surface course		
	M _r = 3,000 psi <u>Poor</u> <u>Subgrade</u>	M _r = 5,000 psi <u>Medium</u> <u>Subgrade</u>	M _r = 7,500 psi <u>Good/Excellent</u> <u>Subgrade</u>
200	1.60	1.15	0.84
250	1.69	1.23	0.91
500	1.99	1.49	1.14
750	2.17	1.65	1.29

1,000	2.31	1.77	1.40
1,250	2.42	1.87	1.48
1,500	2.52	1.95	1.55
1,750	2.60	2.02	1.61
2,000	2.67	2.08	1.67
2,250	2.73	2.13	1.72
2,500	2.79	2.18	1.76
2,750	2.84	2.23	1.80
3,000	2.89	2.27	1.84
3,250	2.93	2.31	1.88
3,500	2.97	2.35	1.91
3,750	3.17	2.52	2.06
4,000	3.21	2.55	2.09
4,250	3.24	2.58	2.12
4,500	3.28	2.61	2.15
4,750	3.31	2.64	2.17
5,000	3.34	2.67	2.20
5,250	3.37	2.69	2.22
5,500	3.40	2.72	2.24
5,750	3.42	2.74	2.26
6,000	3.45	2.76	2.28
6,250	3.48	2.79	2.30
6,500	3.50	2.81	2.32
6,750	3.52	2.83	2.34
7,000	3.55	2.85	2.36
7,250	3.57	2.87	2.38
7,500	3.59	2.89	2.39

Notes:

¹ All subgrades shall be considered "poor," unless the applicant proves otherwise through CBR testing or field evaluation of soil classification. Test results shall be reviewed by the municipal engineer.

² ADT ranges for street types listed in the standards are as follows:

Rural Lane	0-200
Cul-de-sac	0-250
Rural Street	0-500
Alley	0-500
Multifamily Access Cul-de-sac	0-1,000
Residential Access	0-1,500
Residential Neighborhood	0-1,500
Minor Collector	1,501-3,500
Major Collector	3,501-7,500

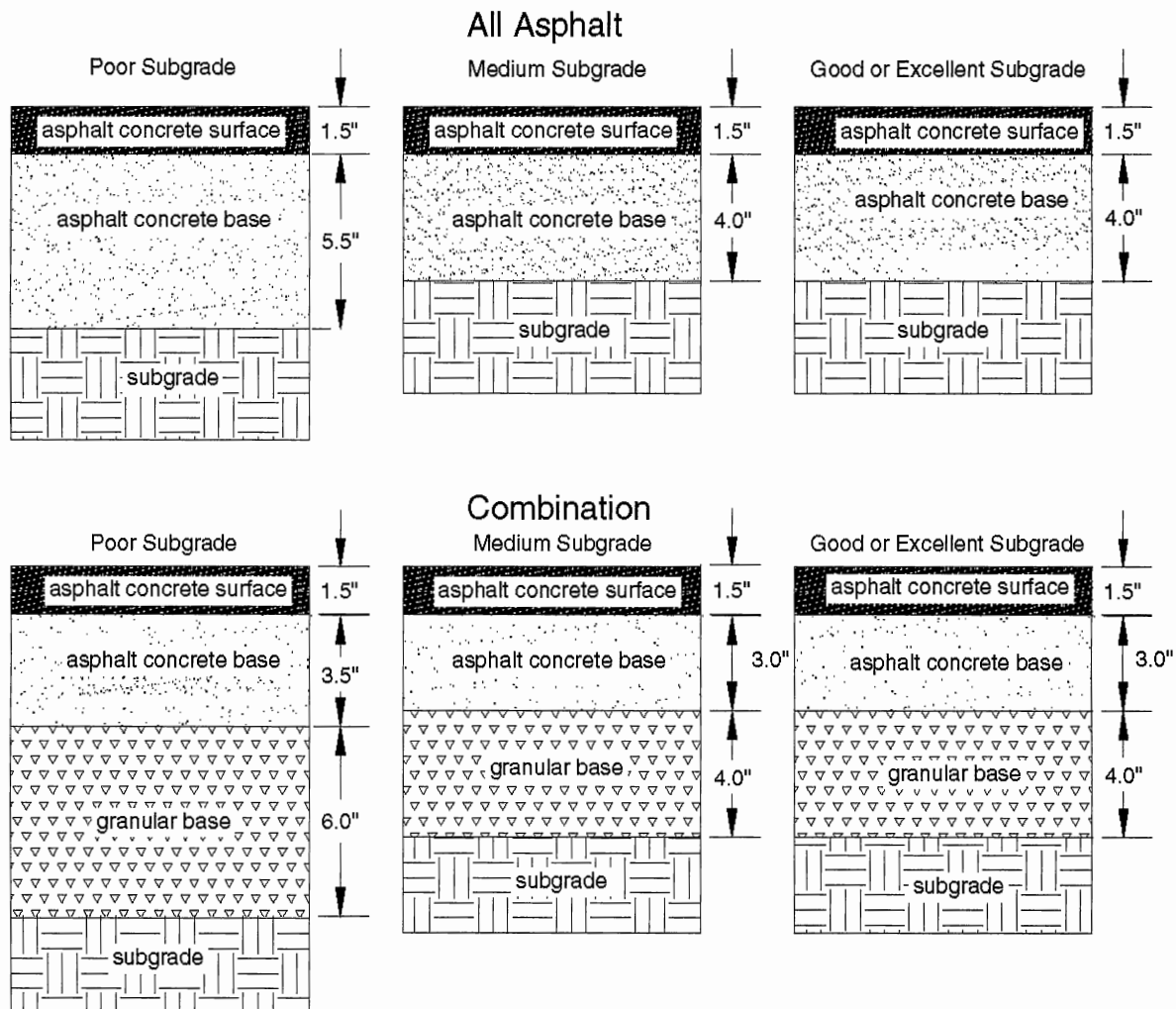
Source: The Table is derived from the AASHTO Guide for Design of Pavement Structures (1993).

3. Alternate pavement design: Alternate pavement design shall be allowed provided it conforms with one of the following: AASHTO Method of Flexible Pavement Design, AASHTO Method of Rigid Pavement Design, Fa-

tigue Strength Method of Design, Multilayer Elastic Analysis, or the National Crushed Stone Association Design, incorporated herein by reference.

(d) Lighting (Reserved)

Figure 4.2
Pavement Sections for Rural Lanes, Rural Streets, Cul-de-Sacs, and Alleys
(ADT \leq 500) (EAL \leq 30,000)

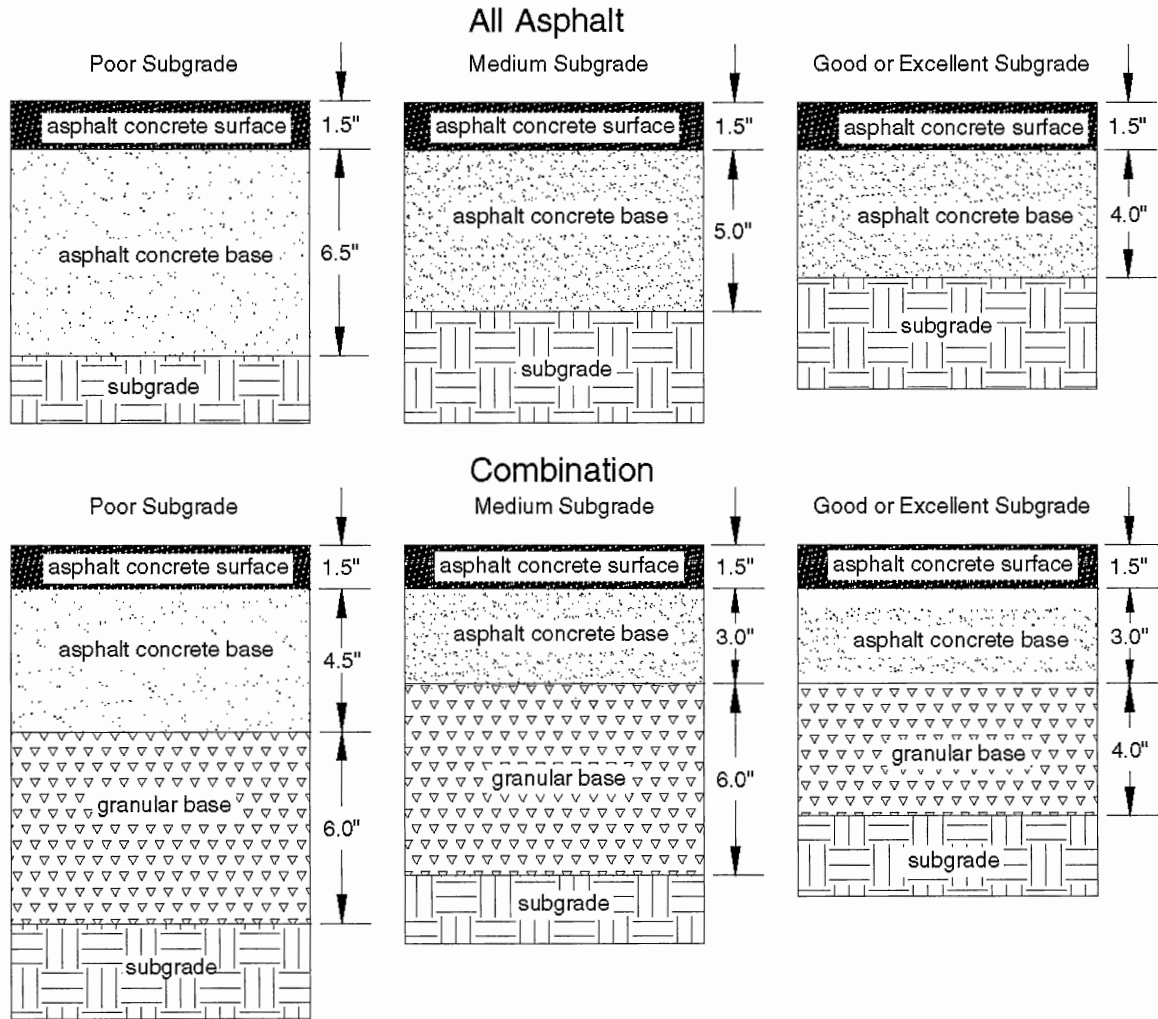


Source: N.J.S.M.E., *Asphalt Handbook for County and Municipal Engineers*, 3rd Edition, March 2000. The figures were derived by applying the Asphalt Institute's *Thickness Design – Full Depth Asphalt Pavement Structures for Highways and Streets*.

NOTES:

1. Materials for the asphalt concrete surface shall conform to Section 404.02 or 406.02 of the New Jersey Department of Transportation's Standard Specification for Road and Bridge Construction.
2. Materials for asphalt concrete base shall conform to Sections 301.02 and 304.02 or 406.02 of the N.J. Department of Transportation's Standard Specification for Road and Bridge Construction.
3. Thickness may have to be constructed in multiple lifts, based on equipment capabilities.
4. The granular base shall be dense graded aggregate conforming to Section 901.08 or soil aggregate designated I-5 conforming to Section 901.09 and shown in Table 901-2 of the N.J. Department of Transportation's Standard Specification for Road and Bridge Construction (1989).
5. All subgrades shall be considered "poor" unless the applicant proves otherwise through CBR testing or field evaluation of soil classification. Test results shall be reviewed by the municipal engineer.
6. Subgrade compaction shall be approved by the municipal engineer.
7. Drawings are based on the following design assumption: A 20-year design period with staged construction use. Base courses are designed to withstand the construction traffic anticipated during the 3-year construction period and have a residual life of 17 years at the end of the 3-year period. The entire pavement section, base course plus finish course, is designed to withstand the traffic loading for the remaining 17 years of the 20-year design period.

Figure 4.3
 Pavement Sections for Residential Access and Neighborhood Streets
 (ADT ≤ 1,500) (EAL ≤ 80,000)

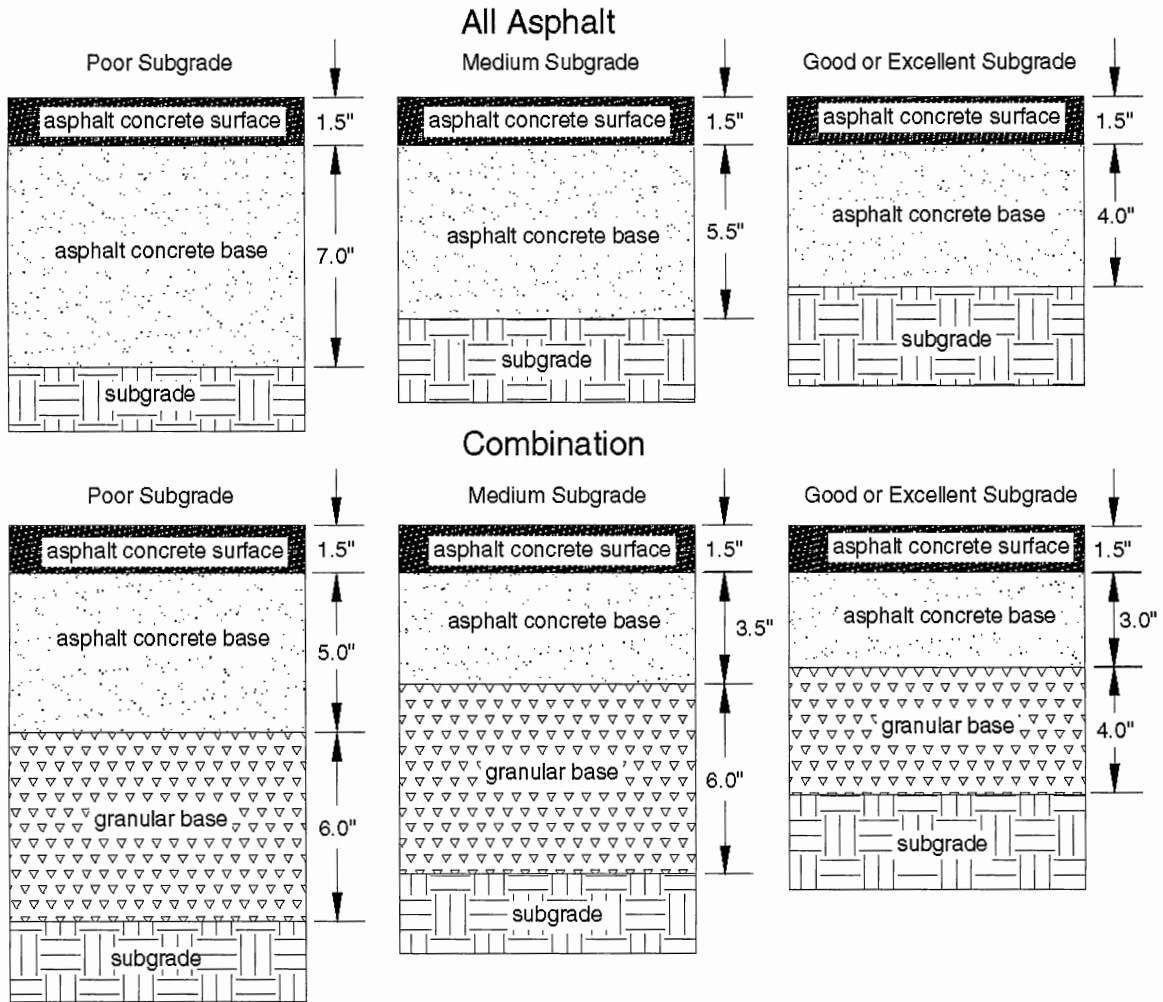


Source: N.J.S.M.E., *Asphalt Handbook for County and Municipal Engineers*, 3rd Edition, March 2000. The figures were derived by applying the Asphalt Institute's *Thickness Design -- Full Depth Asphalt Pavement Structures for Highways and Streets*.

NOTES:

1. Materials for the asphalt concrete surface shall conform to Section 404.02 or 406.02 of the New Jersey Department of Transportation's Standard Specification for Road and Bridge Construction.
2. Materials for asphalt concrete base shall conform to Sections 301.02 and 304.02 or 406.02 of the N.J. Department of Transportation's Standard Specification for Road and Bridge Construction.
3. Thicknesses may have to be constructed in multiple lifts, based on equipment capabilities.
4. The granular base shall be dense graded aggregate conforming to Section 901.08 or soil aggregate designated I-5 conforming to Section 901.09 and shown in Table 901-2 of the N.J. Department of Transportation's Standard Specification for Road and Bridge Construction (1989).
5. All subgrades shall be considered "poor" unless the applicant proves otherwise through CBR testing or field Evaluation of soil classification. Test results shall be reviewed by the municipal engineer.
6. Subgrade compaction shall be approved by the municipal engineer.
7. Drawings are based on the following design assumption: A 20-year design period with staged construction use. Base courses are designed to withstand the construction traffic anticipated during the 3-year construction period and have a residual life of 17 years at the end of the 3-year period. The entire pavement section, base course plus finish course, is designed to withstand the traffic loading for the remaining 17 years of the 20-year design period.

Figure 4.4
 Pavement Sections for Minor Collectors (ADT ≤ 3,500) (EAL ≤ 200,000)

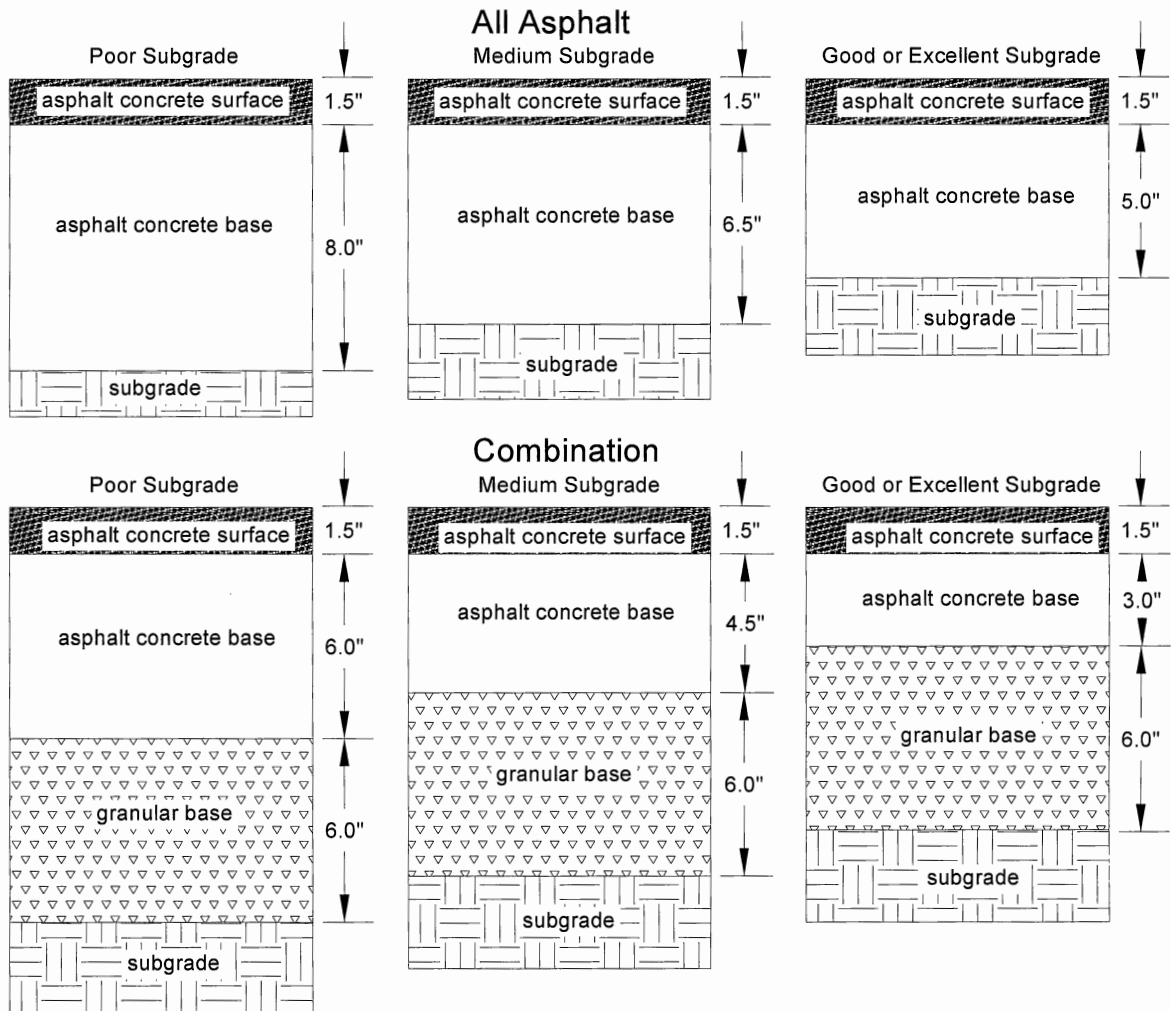


Source: N.J.S.M.E., *Asphalt Handbook for County and Municipal Engineers*, 3rd Edition, March 2000. The figures were derived by applying the Asphalt Institute's *Thickness Design – Full Depth Asphalt Pavement Structures for Highways and Streets*.

NOTES:

1. Materials for the asphalt concrete surface shall conform to Section 404.02 or 406.02 of the New Jersey Department of Transportation's Standard Specification for Road and Bridge Construction.
2. Materials for asphalt concrete base shall conform to Sections 301.02 and 304.02 or 406.02 of the N.J. Department of Transportation's Standard Specification for Road and Bridge Construction.
3. Thicknesses may have to be constructed in multiple lifts, based on equipment capabilities.
4. The granular base shall be dense graded aggregate conforming to Section 901.08 or soil aggregate designated I-5 conforming to Section 901.09 and shown in Table 901-2 of the N.J. Department of Transportation's Standard Specification for Road and Bridge Construction (1989).
5. All subgrades shall be considered "poor" unless the applicant proves otherwise through CBR testing or field evaluation of soil classification. Test results shall be reviewed by the municipal engineer.
6. Subgrade compaction shall be approved by the municipal engineer.
7. Drawings are based on the following design assumption: A 20-year design period with staged construction use. Base courses are designed to withstand the construction traffic anticipated during the 3-year construction period and have a residual life of 17 years at the end of the 3-year period. The entire pavement section, base course plus finish course, is designed to withstand the traffic loading for the remaining 17 years of the 20-year design period.

Figure 4.5
Pavement Sections for Major Collectors (ADT ≤ 7,500) (EAL ≤ 400,000)



Source: N.J.S.M.E., *Asphalt Handbook for County and Municipal Engineers*, 3rd Edition, March 2000. The figures were derived by applying the Asphalt Institute's *Thickness Design -- Full Depth Asphalt Pavement Structures for Highways and Streets*.

NOTES:

1. Materials for the asphalt concrete surface shall conform to Section 404.02 or 406.02 of the New Jersey Department of Transportation's Standard Specification for Road and Bridge Construction.
2. Materials for asphalt concrete base shall conform to Sections 301.02 and 304.02 or 406.02 of the N.J. Department of Transportation's Standard Specification for Road and Bridge Construction.
3. Thicknesses may have to be constructed in multiple lifts, based on equipment capabilities.
4. The granular base shall be dense graded aggregate conforming to Section 901.08 or soil aggregate designated I-5 conforming to Section 901.09 and shown in Table 901-2 of the N.J. Department of Transportation's Standard Specification for Road and Bridge Construction (1989).
5. All subgrades shall be considered "poor" unless the applicant proves otherwise through CBR testing or field evaluation of soil classification. Test results shall be reviewed by the municipal engineer.
6. Subgrade compaction shall be approved by the municipal engineer.
7. Drawings are based on the following design assumption: A 20-year design period with staged construction use. Base courses are designed to withstand the construction traffic anticipated during the 3-year construction period and have a residual life of 17 years at the end of the 3-year period. The entire pavement section, base course plus finish course, is designed to withstand the traffic loading for the remaining 17 years of the 20-year design period.

TABLE 4.7
SUBGRADE CATEGORIES
A. BASED ON STRENGTH TEST

<u>Subgrade category</u>	<u>California Bearing Ratio (Cbr)</u>	<u>Resilient Modules Mr Value</u>
Good to excellent	+10	Above 15,000
Medium	+5 to 9	7,500 to 13,500
Poor	2 to 4	3,000 to 6,000

B. BASED ON SOIL CLASSIFICATION

<u>Subgrade category</u>	<u>Material</u>	<u>Unified System^a</u>	<u>AASHTO System^a</u>
Good to excellent	Gravels and sands	GW, GP, GM, GC, SW, SP, SM, SC	A-1, A-2-4, A-2-5, A-2-6, A-2-7, A-3
Good or poor	Silts and clays	ML, CL, OL, MH, CH, OH	A-4, A-5, A-6, A-7-5, A-7-6

Notes: ^aRefers to categories of soil types and properties

Sources: Per the Rutgers Model Subdivision and Site Plan Ordinance by David Listokin and Carole W. Baker, January 1987—Original strength test and soil classification information derived from the Asphalt Institute, "Thickness Design—Full-Depth Asphalt Pavement Structures for Highways and Streets," MS-1, 8th Edition, August 1970 in Robert F. Baker et al. (editor), Handbook of Highway Engineering. Inclusion of SW, SP, SC soil classifications based on information from the Portland Cement Association's Thickness Design for Concrete Highway and Street Pavements.

Revised CBR strength test and M[r] value information are from the Asphalt Handbook for County and Municipal Engineers, November 1991 (Second Edition), published by the New Jersey Society of Municipal Engineers.

Administrative correction.

See: 29 N.J.R. 1296(a).

Administrative correction.

See: 29 N.J.R. 2816(a).

Amended by R.1999 d.374, effective November 1, 1999 (operative May 1, 2000).

See: 31 N.J.R. 477(a), 31 N.J.R. 3259(a).

Rewrote (b)2; and in Table 4.6, deleted Intersection Standard heading, and substituted a reference to Maximum Grade of Secondary Street for a reference to Maximum Grade.

Amended by R.2000 d.480, effective December 4, 2000 (operative June 3, 2001).

See: 32 N.J.R. 2670(b), 32 N.J.R. 4277(a).

Rewrote (c); amended Figures 4.2 and 4.3; and inserted Figures 4.4 and 4.5.

Amended by R.2002 d.399, effective December 16, 2002.

See: 34 N.J.R. 2615(a), 34 N.J.R. 4412(a).

Added new (c), including Tables 4.8 and 4.9; deleted former (c); recodified former (d) as new (c)3; added new Figures 4.2 through 4.5 and deleted former Figures 4.2 through 4.5.

Public Notice: Notice regarding the Publication of two Notices of Adoption in the December 16, 2002 New Jersey Register.

See: 34 N.J.R. 4343(a), 4412(a), 35 N.J.R. 219(b).

Administrative correction.

See: 35 N.J.R. 2494(a).

Amended by R.2005 d.56, effective February 7, 2005.

See: 36 N.J.R. 4025(a), 37 N.J.R. 481(c).

Amended by R.2006 d.47, effective February 6, 2006.

See: 37 N.J.R. 3878(a), 38 N.J.R. 925(a).

In (b)2, added "for intersections along the same or opposite sides"; in (b), added "CURVE" to the heading of Table 4.6.

Amended by R.2007 d.177, effective June 4, 2007.

See: 38 N.J.R. 3698(a), 39 N.J.R. 2234(a).

In footnotes 1 and 2 of Table 4.8, inserted "or 406.02"; and in footnotes 1 and 2 of Figures 4.2 through 4.5, inserted "or 406.02" and deleted "(1989)" from the end.

Administrative correction.

See: 39 N.J.R. 4395(a).

5:21-4.20 Curves

(a) Vertical curves shall be designed in accordance with AASHTO's "A Policy on Geometric Design of Highways and Streets" standards, incorporated herein by reference.

(b) Sight easements on vertical and horizontal curves shall be required and determined based on the sight distance requirements contained in AASHTO's "A Policy on Geometric Design of Highways and Streets" standards, taking into consideration the speed limits established by the government agency having jurisdiction. Residential access, residential neighborhood, and rural street design shall be based on a speed limit of 25 miles an hour. Minor collector street design shall be based on a speed limit of 30 miles per hour. Major collector design shall be based on a speed limit of 30 miles per hour or five miles over the anticipated posted speed limit, whichever is higher.

Amended by R.2000 d.480, effective December 4, 2000 (operative June 3, 2001).

See: 32 N.J.R. 2670(b), 32 N.J.R. 4277(a).

In (b), substituted "shall" for "should" in the second and third sentences, deleted "and major" following "Minor" in the third sentence, and the last sentence was added.

Administrative correction.

See: 35 N.J.R. 2494(a).

Amended by R.2006 d.47, effective February 6, 2006.

See: 37 N.J.R. 3878(a), 38 N.J.R. 925(a).

In (a), deleted "and horizontal" following "Vertical."

SUBCHAPTER 5. WATER SUPPLY

5:21-5.1 Water supply system

Water supply systems, where installed, shall conform to the standards contained in this subchapter.

SUBCHAPTER 6. SANITARY SEWERS

5:21-6.1 Sanitary sewer system

(a) Sanitary sewer systems, where installed, shall conform to the standards contained in this subchapter.

(b) When plans for future development necessitate over-sizing or grade changes, the municipality or utility authority may enter into an agreement with the developer to address the fair share of the costs of improvements not required for the proposed development.

(c) If a public sanitary sewer system will be provided to the area within a six-year period as indicated in the municipal sewer master plan, official map, or other official document, a municipality may require installation of a capped system within the road right-of-way or existing utility authority easements to service the approved lots; or, alternatively, a municipality may require a performance guarantee in lieu of the improvement. Capped sanitary sewers shall be allowed only in areas indicated for sewer service in the State of New Jersey Statewide Water Quality Management (WQM) Plans and where permitted by NJ DEP through sewer connection approval.

(d) Individual subsurface disposals systems shall comply with N.J.A.C. 7:9A-3.2 and 3.16.

(e) The applicant shall submit to the municipality or utility authority for review for compliance with this subchapter details of the planned pipes, joints, mains, laterals, and appurtenances. All materials used for sanitary sewer systems shall be manufactured in the United States, wherever available, as governed by P.L. 1982, c.107, effective date October 3, 1982. The details shall comply with all standards and specifications listed in this subchapter.

5:21-6.2 System planning, design, and placement

(a) The planning, design, construction, installation, modification, and operation of any treatment works or sanitary sewer system shall be in accordance with the flow and design criteria set forth in N.J.A.C. 7:14A-23 and with the applicable NJDEP rules implementing the New Jersey Water Pollution Control Act (N.J.S.A. 58:10A-1 et seq.) and the New Jersey Water Quality Planning Act (N.J.S.A. 58:11A-1 et seq.); and, for items not covered by NJDEP rules, with ASCE Manual on Engineering Practice No. 60, incorporated herein by reference; and, in the Pinelands Area, with the Pinelands Comprehensive Management Plan and, in the coastal area, with NJDEP rules implementing the Coastal Area Facilities Review Act (N.J.S.A. 13:19-1 et seq.). Where the NJDEP accepts reduced flows, those reduced flows shall also be accepted under these rules.

(b) Sanitary sewer pumping stations shall be considered where gravity system design leads to excessive sewer depths which are not economically justifiable and shall comply with N.J.A.C. 7:14A-23.10, 11 and 12.

(c) System design and placement shall comply with the following specifications:

1. Except where otherwise specified by municipality or utility authority, sanitary sewer manholes, when located within the municipal right-of-way, shall be at or near the center line of the paved cartway, but at a five-foot minimum from the edge of the pavement. Sanitary sewer mains shall be a minimum of 10 feet from the right-of-way line.

2. Easements shall be in a form approved by the utility authority or the municipal engineer and municipal attorney. Easements shall be required for all sanitary sewer lines which are not within a public right-of-way. Easements shall be a minimum of 20 feet wide for sanitary sewers that are not more than 15 feet deep. For sewers that are more than 15 feet deep, easements shall be a minimum of 30 feet wide. The depth of the sewer shall be measured from the design invert of the pipe to the surface of the proposed final grading. Where the easement is located adjacent to a right of way, the municipality or authority may approve a narrower easement.

3. Common sewer laterals shall be permitted in accordance with the Plumbing Subcode of the Uniform Construction Code (N.J.A.C. 5:23-3.15).

4. All sewers shall be designed to meet the New Jersey Department of Environmental Protection's slope standards at N.J.A.C. 7:14A-23.6(b).

5. Except where shallower depths are permitted by the municipality or utility authority, sewer lines, including force mains and laterals, shall be constructed at least three feet below the proposed grade (as measured from the top of the pipe to the grade elevation).

6. Pipe materials used in the construction of gravity sanitary sewers shall be reinforced concrete, ductile iron, PVC, or clay pipe. All pipe and appurtenances shall comply with AWWA and ASTM standards referenced in this paragraph, which are incorporated herein by reference. Where PVC pipe is installed, a metallic locator tape shall also be installed in the trench adjacent to the pipe.

i. Reinforced concrete pipe shall be used only in sizes 24 inches and larger and shall meet all the requirements of ASTM C76. All pipe shall be Class III strength installed with class C ordinary bedding, except in the following conditions where stronger pipe may be required:

(1) For depths less than three feet, measured from the top of the pipe, installed under traffic areas, Marston Class IV pipe shall be required.

(2) The presence of clay soils, poor bedding conditions, or other unusual loading conditions shall be given special consideration and the developer shall submit an engineering analysis to the municipality or authority for approval.

ii. PVC sewer pipe shall have bell and spigot ends and O-ring rubber gasketed joints. PVC pipe and fittings shall conform to ASTM D3034, with a minimum wall thickness designation of SDR 35 or shall conform to ASTM F679, F789, F794, or F949 with a designated pipe stiffness of PS-46.

(1) The plastic material from which the pipe and fittings are extruded shall be impact types of PVC, unplasticized, having high mechanical strength and maximum chemical resistance conforming to Type 1, Grade 1 of the specification for rigid polyvinyl chloride compounds, ASTM D1784.

(2) Pipe shall be free from defects, such as bubbles or other imperfections, in accordance with accepted commercial practice. Test results demonstrating that the pipe meets ASTM D2444 for impact and ASTM D2321 for deflection and pipe stiffness, shall be provided when requested by the municipality or utility authority.

(3) Joints shall conform to ASTM D3212. Rubber ring gaskets shall conform to ASTM F477. The gasket shall be the sole element depended upon to make the joint watertight.

(4) The pipe shall be installed as specified in ASTM D2321 and as specified in Figure 6.1. When installing pipe in unstable soil or excessive groundwater, a determination regarding special precautions, such as poured concrete slabs, shall be made by the municipal engineer or utility authority engineer.

(5) Bedding, haunching and initial backfill material shall be placed in six-inch lifts and be Class IA, IB, or II embedment material conforming with ASTM D2321, unless otherwise approved in writing by the municipal or utility authority engineer. Soil aggregate I-8 conforming to Article 901.09, Table 901-2 of the 1989 New Jersey Department of Transportation's Standard Specifications for Road and Bridge Construction when compacted to 95 percent maximum dry density, and stone crushing conforming with AASHTO designation M43-88 (ASTM designation D448) size no. 8, $\frac{1}{8}$ inch to $\frac{3}{8}$ inch (2.36 mm to 9.25 mm) meet this requirement. All material shall be clean and free flowing and shall meet all ASTM C33 specifications for quality and soundness.

iii. Ductile iron pipe shall be centrifugally cast in metal or sand-lined molds to ANSI/AWWA C151/A21.51. Joints shall be rubber gasketed joints that conform to ANSI/AWWA C111/A21.11 or flanged joints that comply with ANSI/AWWA C115/A21.15. Pipe shall be a minimum of Class 50. The outside of the pipe shall be coated with a uniform thickness of hot applied asphaltic coating. In corrosive soils, pipe shall be encased in polyethylene in accordance with ANSI/AWWA C105/A21.5. Ductile iron pipe shall be installed with Class C, Ordinary Bedding, when site conditions allow. The inside shall be lined with cement in accordance with ANSI/AWWA C104/A21.4 or, where hydrogen sulfide is present, ductile iron pipe with polyethylene coating that protects the interior of the pipe shall be used.

iv. Clay pipe shall comply with ASTM C700.

7. Inverted siphons and outfalls shall be constructed of ductile iron pipe or PVC pipe, as specified above. Inverted siphons shall consist of a minimum of two pipes with provisions for flushing. Flow control gates shall be provided in the chambers.

8. Force mains shall be designed in accordance with the requirements of N.J.A.C. 7:14A-23. Force mains shall be constructed of ductile iron pipe, as specified above, or PVC pipe that meets ASTM D1785, ASTM D2241 or AWWA C909. Where PVC pipe is installed, a metallic locator tape also shall be installed in the trench adjacent to the pipe.

9. In addition to the pipe materials at N.J.A.C. 7:14A-23.6(b)5, PVC pipe shall be considered a suitable material.

10. For other than PVC pipe, pipe and manhole bedding shall be provided as specified in "Gravity Sanitary Sewer Design and Construction, ASCE Manual and Reports on Engineering Practice No. 60," prepared by the Joint Task Force of the American Society of Civil Engineers and Water Pollution Control Federation, New York, 1969. Any pipe material not covered by this manual shall be installed in accordance with the manufacturer's recommendations.

i. The municipality or the authority may require the developer to provide an opinion of a professional engineer regarding the suitability of the on-site material to be used as backfill. The municipality or authority shall rely on this opinion.

ii. Where the on-site material is deemed suitable, the opinion shall specify the appropriate installation methods for the material. Where the on-site material is deemed not suitable, the opinion shall specify modification or replacement of the material and the appropriate installation methods for the specified material.

11. Manholes shall comply with the standards in ASCE Manual on Engineering Practice No. 60, and shall meet the following requirements:

i. Manholes shall be precast concrete or concrete block. Manhole barrels shall be a minimum of four feet in diameter when serving sewers 24 inches or less in diameter, and shall be a minimum of five feet in diameter when serving sewers greater than 24 inches in diameter. Where manholes are precast, the base and first section shall be monolithically cast. Concrete block shall be coated with two coats of Portland cement mortar. Precast concrete or concrete block shall be sealed with two coats of an acceptable waterproofing tar, asphalt, or polyplastic alloy, with enough time allowed between the seal coats to bond.

ii. Masonry brick, concrete block, or half rings may be used to make vertical adjustments to rims.

Amended by R.2000 d.480, effective December 4, 2000 (operative June 3, 2001).

See: 32 N.J.R. 2670(b), 32 N.J.R. 4277(a).

In (c), rewrote 3, inserted last sentence of introductory paragraph to 6, rewrote 6ii(4) and (5), inserted reference to AWWA C909 and inserted last sentence in 8, and rewrote 11v; and amended Figure 6.1.

SUBCHAPTER 7. STORMWATER MANAGEMENT

5:21-7.1 Stormwater management: scope

(a) Stormwater management measures meeting the requirements of this subchapter shall be provided for major developments. Stormwater management systems prepared by design engineers shall emphasize a natural, as opposed to an engineered, drainage strategy. To the maximum extent practicable, stormwater management standards shall be met by incorporating nonstructural stormwater management strategies into a design. Where more than one design or method may be used to comply with the rules, the choice of design approach and the methods used shall rest with the design engineer.

1. For projects that fall below the threshold of major development, as defined, a municipality may require, by ordinance, the control of runoff rate and routing from any site that is the subject of a site plan or subdivision application.

(b) The applicability of a natural approach depends on such factors as site storage capacity, open channel hydraulic capacity, and maintenance needs and resources. Applicability of a stormwater approach also can be limited by regulatory constraints that govern certain structures (for example, dams) or areas (for example, development in a floodplain or wetland).

(c) The person submitting the application for review shall identify the nonstructural strategies incorporated into the design of the project. If the applicant contends that it is not feasible for engineering, environmental, or safety reasons to incorporate any nonstructural stormwater management strategies, identified in (d) below, into the design of a particular project, the applicant shall identify the strategy and provide a basis for the contention of infeasibility.

(d) Nonstructural stormwater management strategies incorporated into site design shall:

1. Protect areas that provide water-quality benefits or areas that are particularly susceptible to erosion and sediment loss;
2. Minimize impervious surfaces and break up or disconnect the flow of runoff over necessary impervious surfaces;
3. Maximize the protection of natural drainage features and vegetation;

4. Minimize the decrease in "time of concentration" from pre-construction to post-construction. "Time of concentration" is defined as the time it takes for runoff to travel from the hydraulically most distant point of the drainage area to the point of interest in the watershed (see the Rational Method equation in N.J.A.C. 5:21-7.2(c)2);

5. Minimize land disturbance including clearing and grading;

6. Minimize soil compaction;

7. Provide low-maintenance landscaping that encourages retention and planting of native vegetation and minimizes the use of lawns, fertilizers, and pesticides;

8. Provide vegetated open-channel conveyance systems discharging into and through stable vegetated areas; and

9. Provide preventative source controls to prevent or minimize the use or exposure of pollutants at a site so that the release of pollutants into stormwater runoff will be prevented or minimized. The source controls include, but are not limited to:

i. Site design features that help to prevent accumulation of trash and debris in drainage systems;

ii. Site design features that help to prevent discharge of trash and debris in the drainage system; and

iii. When establishing vegetation after land disturbance, applying fertilizer in accordance with the Standards for Soil Erosion and Sediment Control in New Jersey at N.J.A.C. 2:90 as administered by the New Jersey Department of Agriculture.

(e) Any land area used as a nonstructural stormwater management measure to meet the performance standards for quantity control at N.J.A.C. 5:21-7.5, water quality at N.J.A.C. 5:21-7.6, or groundwater recharge at N.J.A.C. 5:21-7.7 shall be dedicated to a government agency, subject to a conservation restriction filed with the appropriate County Clerk's office or equivalent restriction that ensures the stormwater measure, or an equivalent stormwater management measure approved by the reviewing agency, is maintained in perpetuity.

(f) Guidance for nonstructural stormwater management strategies is available in the New Jersey Stormwater Best Management Practices Manual (hereafter Best Management Practices Manual), April 2004 edition.

(g) All stormwater collection and conveyance structures shall be designed in accordance with the provisions of this subchapter. Any structures designed to control stormwater runoff volume, flow rate, quality, or groundwater recharge shall be designed and constructed in accordance with these provisions. Where more than one design or method may be used to comply with the rules, choices among design options to meet the volume, rate, quality, and recharge provisions of this subchapter shall rest with the design engineer.

(h) Construction practices shall conform to Standards for Soil Erosion and Sediment Control in New Jersey, N.J.A.C. 2:90.

(i) The standards of this subchapter do not apply to development if alternative design and performance standards exist under a regional stormwater management plan adopted in accordance with the DEP rules, N.J.A.C. 7:15. The standards must be at least as protective as those of this subchapter.

Amended by R.1999 d.374, effective November 1, 1999 (operative May 1, 2000).

See: 31 N.J.R. 477(a), 31 N.J.R. 3259(a).

Inserted a new (c); recodified former (c) through (g) as (d) through (h); in the new (e)1, inserted "there is a uniform flow, as defined by the following conditions:" following "only when" in the last sentence; and in the new (g), substituted a reference to three feet per second for a reference to two feet per second.

Administrative correction.

See: 32 N.J.R. 684(b).

Amended by R.2005 d.56, effective February 7, 2005.

See: 36 N.J.R. 4025(a), 37 N.J.R. 481(c).

Rewrote the section.

5:21-7.2 Stormwater calculations: runoff estimation techniques

(a) Drainage area stormwater management requires the determination of a watershed runoff hydrograph that displays the peak discharge rate and volume over time. The hydrograph shall compare pre-and post-development conditions. In computing pre-construction stormwater runoff, the design engineer shall account for all significant land features and structures, such as ponds, wetlands, depressions, hedgerows, or culverts, that may reduce pre-construction stormwater runoff rates and volumes. For the purpose of calculating runoff coefficients and groundwater recharge, there is a presumption that the pre-construction condition of a site, or portion thereof, is a wooded land use with good hydrologic condition. The term "runoff coefficient" applies to both the Natural Resources Conservation Service (NRCS) of the United States Department of Agriculture (USDA) methodology of the TR-55 program (see (c)1iii below) and the Rational and the Modified Rational Methods (see (c)1i and (c)1ii, respectively, below). Both the Rational and Modified Rational methods are described in "Appendix A-9 Modified Rational Method" in the Standards for Soil Erosion and Sediment Control in New Jersey at N.J.A.C. 2:90. A runoff coefficient or a groundwater recharge land cover for an existing condition may be used on all or a portion of a site if the design engineer verifies that the hydrologic condition has existed on the site or portion of the site for at least five years without interruption immediately prior to the time of application. If more than one land cover has existed on the site during the five years immediately prior to the time of application, the land cover with the lowest runoff potential shall be used for the computations. In addition, there is the presumption that the site is in good hydrologic condition (if

the land-use type is pasture, lawn, or park), with good cover (if the land-use type is woods), or with good hydrologic condition and conservation treatment (if the land use is cultivation).

(b) Design engineers shall use the runoff hydrograph peak rate to determine the configuration and sizes of pipes, channels, and other routing or flow-control structures. They shall use the hydrograph to determine the size of stormwater management facilities.

(c) For the runoff peak rate of discharge calculation, design engineers shall have the option to choose the methodology to estimate peak rate of discharge.

1. Design engineers shall calculate peak rate of runoff in accordance with the following procedures and methods, incorporated herein by reference:

i. For relatively small drainage areas of up to one-half square mile (320 acres), the peak rate of runoff may be calculated by the Rational Method, its derivatives, or the referenced methods that follow.

ii. Where the project necessitates reductions in the rate of runoff or the calculation of runoff volume in accordance with N.J.A.C. 5:21-7.5, the Modified Rational Method must be used. The use of the Modified Rational Method is limited to drainage areas of 20 acres or less.

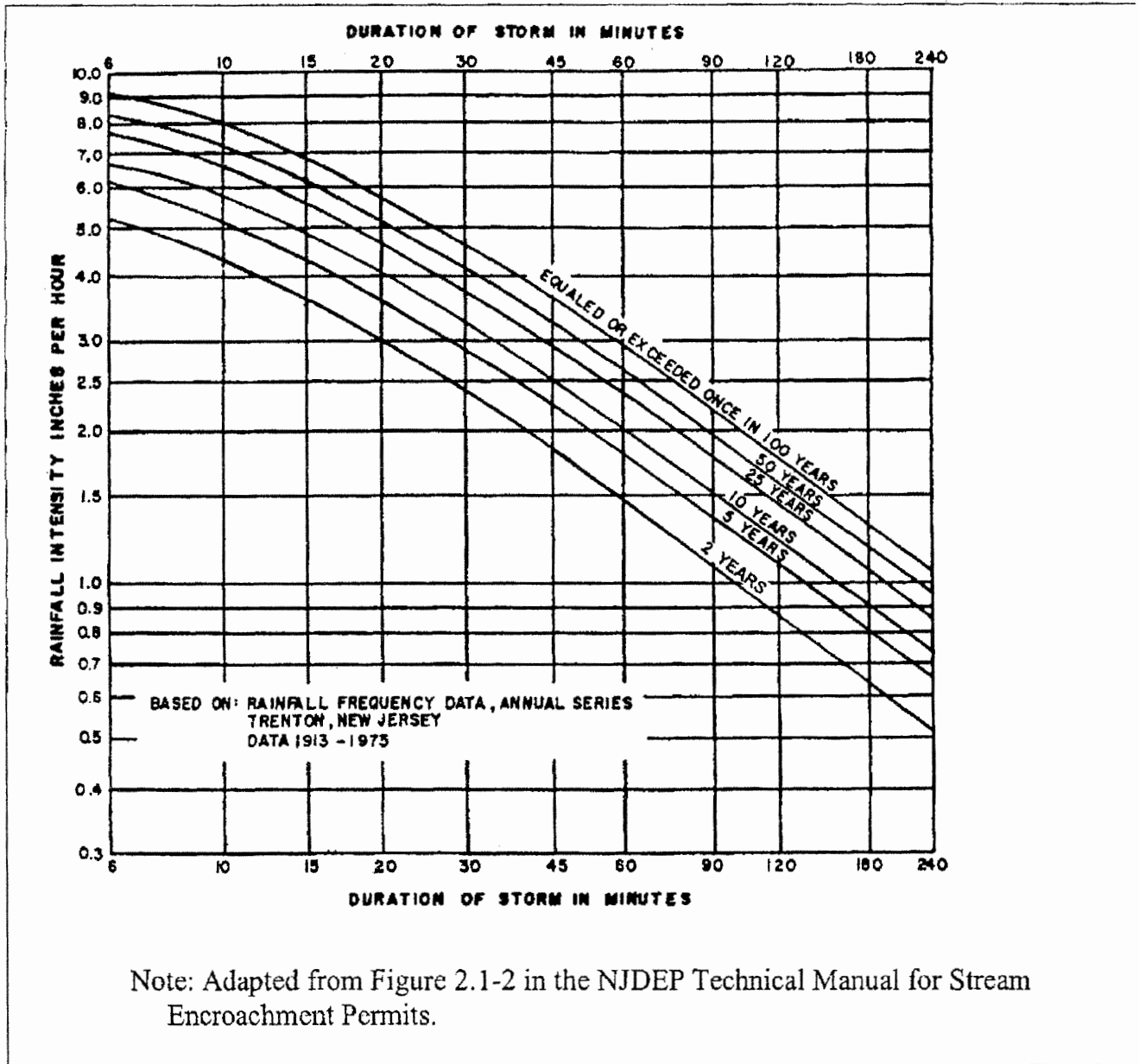
iii. NRCS's *Urban Hydrology for Small Watersheds*, Technical Release No. 55 (TR-55).

iv. NRCS's *Computer Program for Project Formulation—Hydrology*, Technical Release No. 20 (TR-20).

v. *HEC-HMS Hydrologic Modeling System*, version 2.2, May 2003, Hydraulic Engineering Center, U.S. Army Corps of Engineers, used in appropriate conditions with appropriate values.

vi. Runoff calculations derived from NRCS methods (TR-20 and TR55) shall be done in accordance with NRCS New Jersey Bulletin No. NJ210-3-1, September 8, 2003 (application of the Delmarva unit hydrograph in the coastal plain region of New Jersey) and NRCS New Jersey Bulletin No. NJ210-4-1, September 8, 2004 (average county rainfall data), incorporated herein by reference. The coastal plain region is shown on the map below. New Jersey Bulletin No. NJ210-3-1 from the NRCS calls for the use of the Delmarva hydrograph only in coastal plain areas that have a flat topography (average watershed slope less than five percent), low relief, and significant surface storage in swales and depressions. (For more information on NRCS methods in New Jersey see: www.nj.nrcs.usda.gov/.)

Figure 7.2
RAINFALL INTENSITY CURVES



6. The size of the drainage area shall include onsite and offsite lands contributing to the design point.

7. Computer software adaptations of the Rational Method or the NRCS's TR-55 are acceptable, provided their data and graphic printout allow review and evaluation.

(d) Design engineers shall use a consistent method to calculate peak rate of runoff and volume when computing runoff hydrographs. If TR-55, TR-20, HEC-HMS, or another recognized method is used to calculate peak rate of runoff, then the same method shall be used to determine volume. If

the Rational Method is used for peak flow calculations, design engineers shall use the Modified Rational Method to calculate peak volume to be used for basin routing. Both the Rational and Modified Rational Methods are described in "Appendix A-9 Modified Rational Method" in the Standards for Soil Erosion and Sediment Control in New Jersey at N.J.A.C. 2:90. A maximum drainage area of 20 acres shall be used for the Modified Rational Method.

(e) In computing stormwater runoff from all design storms, the design engineer shall consider the relative stormwater runoff rates and/or volumes from pervious and imper-

vious surfaces separately to accurately compute the rates and volume of stormwater runoff from the site. To calculate runoff from unconnected impervious cover, urban impervious area modifications as described in NRCS TR-55, Urban Hydrology for Small Watersheds or other approved methods may be employed.

Administrative correction.

See: 29 N.J.R. 1296(a).

Amended by R.1999 d.374, effective November 1, 1999 (operative May 1, 2000).

See: 31 N.J.R. 477(a), 31 N.J.R. 3259(a).

In (b), substituted "size" for "necessity for, and sizing" in the second sentence; in (c), added a third sentence in 2i, and inserted new third and fourth sentences in the introductory paragraph of 4; in (d), inserted "when computing runoff hydrographs" at the end of the first sentence; and in Table 7.1, added a reference to Minor Streams.

Administrative correction.

See: 32 N.J.R. 684(b).

Amended by R.2004 d.35, effective January 20, 2004.

See: 35 N.J.R. 3981(a), 36 N.J.R. 447(a).

In (c)3, amended Figure 7.1.

Administrative correction.

See: 36 N.J.R. 1751(b).

Amended by R.2005 d.56, effective February 7, 2005.

See: 36 N.J.R. 4025(a), 37 N.J.R. 481(c).

Rewrote the section.

Amended by R.2007 d.177, effective June 4, 2007.

See: 38 N.J.R. 3698(a), 39 N.J.R. 2234(a).

Added (c)1vi.

5:21-7.3 Design of runoff collection system

(a) Design engineers shall determine hydraulic capacity for open-channel or closed-conduit flow based on the Manning equation, or charts/monographs based on this equation. The hydraulic capacity is termed Q and expressed as discharge in cubic feet per second as follows:

$$Q = (1.486/n)AR^{2/3}S^{1/2}$$

where

n = Manning's roughness coefficient

A = Cross-sectional area of flow in square feet

R = Hydraulic radius in feet, $R = A/P$ where P is equal to the wetted perimeter, measured in feet and defined as the length of a line of contact between the flowing water and the channel.

S = Slope of energy grade line in feet per foot

The Manning's roughness coefficients used by design engineers appear in N.J.A.C. 5:21-7.2, Table 7.2.

1. A direct application of Manning's equation may be used for piped storm sewer systems. As an option, design engineers can use a standard step backwater calculation for storm sewer systems if the use of this approach is deemed appropriate by the designer. For other than pipe storm sewer systems, design engineers shall apply Manning's equation only when there is uniform flow, as defined by the following conditions:

i. The bottom slope of the channel, energy grade line, and water surface (hydraulic grade line) are parallel;

ii. The flow regime is in the turbulent range of Reynolds number; and

iii. The boundaries of the cross section of the channel do not move;

2. The design of open channels and conduits shall take tailwater effects into consideration.

(b) Velocities in open channels, excluding water quality swales, at design flow shall not be less than 0.5 of a foot per second and not greater than a velocity that will begin to cause erosion or scouring of the channel. Design engineers shall determine permissible velocities for swales, open channels, and ditches using methods presented in Standards for Soil Erosion and Sediment Control in New Jersey at N.J.A.C. 2:90.

(c) Velocities in closed conduits at design flow shall be at least two feet per second but not more than the velocity that will cause erosion damage to the conduit, per the manufacturer's specifications. Minimum allowable pipe slopes shall produce velocity of at least three feet per second when the flow depth is full or half the pipe diameter.

(d) Design engineers shall base culvert capacity on inlet/outlet analysis, as specified in Hydraulic Design of Highway Culverts, Hydraulic Design Series (HDS) No. 5, Report No. FHWA-IP-85-15, U.S. Department of Transportation, Federal Highway Administration, September 1985, incorporated herein by reference.

(e) Design engineers shall determine pipe size based on design runoff, conduit entrance conditions, and hydraulic capacity.

(f) In general, no pipe size in the storm drainage system shall be less than 15 inches in diameter. Design engineers may use a 12-inch diameter pipe as a cross-drain to a single inlet.

(g) All discharge pipes shall terminate with an appropriate precast concrete or flared-end section or concrete headwall with or without wingwalls, as conditions require. Design engineers shall consider such site conditions as slope, soil stability, vegetation, grade, and size of conduit to determine whether or not to use wingwalls.

(h) Materials used in the construction of storm sewers shall be constructed of reinforced concrete, ductile iron, or corrugated polyethylene or, when approved by the municipal engineer, corrugated metal. The most cost-effective materials shall be permitted that conform to local site conditions and reflect the relevant operations, maintenance, and system character of the municipal stormwater system. Specifications referred to, such as ASTM or AWWA, shall be the latest revision in effect at the time of application.

1. The following apply to reinforced concrete pipe:
 - i. Circular reinforced concrete pipe and fittings shall meet the requirements of ASTM C76.
 - ii. Elliptical reinforced concrete pipe shall meet the requirements of ASTM C507.
 - iii. If rubber gaskets are used for circular pipe, the joint design and joint material shall conform to ASTM C443.
 - iv. If external sealing bands are used for joints for elliptical pipe, they shall conform to ASTM C877.
 - v. Mortar joints shall conform to Sections 602.05 and 914.03 of the New Jersey Department of Transportation's "Standard Specifications for Road and Bridge Construction," incorporated herein by reference, as amended and supplemented.
 - vi. All pipe shall be Class III, minimum unless loading conditions call for stronger pipe (that is, higher class).
 - vii. The minimum depth of cover over the concrete pipe shall be as designated by the American Concrete Pipe Association in Table 7.4 below as follows.

TABLE 7.4

MINIMUM DEPTH OF COVERAGE OVER CONCRETE PIPE

Pipe Diameter (in inches)	ASTM Class Pipe	Minimum Cover (surface to top of pipe in inches)
12	III	17
	IV	12
	V	7
15	III	16
	IV	11
	V	7
18	III	16
	IV	10
	V	6
24	III	15
	IV	6
	V	6
30	III	10
	IV	6
	V	6
36 & above	III	6
	IV	6

Minimum depth of coverage as designated by the American Concrete Pipe Association.

- viii. Minimum depth of cover standards for ductile iron and corrugated polyethylene pipe shall conform to manufacturer standards.

2. Ductile iron pipe shall conform to ANSI/AWWA C151/A21.51. Joints shall conform to ANSI/AWWA C111/A21.11 or ANSI/AWWA C115/A21.15 as appropriate. Pipe shall be designed in accordance with ANSI/AWWA C150/A21.50. The outside of the pipe shall be coated in accordance with ANSI/AWWA C151/A21.51, and the inside lined in accordance with ANSI/AWWA C104/A21.4. Ductile iron pipe shall be installed in accordance with AWWA C600.

3. Corrugated polyethylene pipe shall conform to AASHTO M252 for three through 10 inches and AASHTO M294 for sizes 12 inches and larger. The use of corrugated polyethylene pipe greater than 36 inches in diameter shall be subject to approval by the municipal engineer. All pipes greater than 12 inches in diameter shall be Type S, unless conditions dictate otherwise. Materials shall conform to ASTM D3350, "Standard Specification for Polyethylene Plastics Pipe and Fittings Materials." Pipe joints and fittings shall be compatible with the pipe material and shall conform to the same standards and specifications as the pipe material. Pipe couplers shall not cover less than one full corrugation on each section of pipe. Installation shall be in accordance with ASTM D2321, "Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications." Backfill material shall be placed in six-inch lifts and compacted to 95 percent minimum dry density, per AASHTO T99. In areas of high ground water tables, design engineers shall check for flotation.

4. Corrugated metal pipe, when approved by the municipal engineer, shall meet the requirements and be installed in the manner specified in subchapter Appendix A.

(i) Pipe bedding and backfill shall be provided as specified in *Design and Construction of Urban Stormwater Management Systems*, ASCE Manuals and Reports of Engineering Practice No. 77, 1993, incorporated herein by reference. Bedding and backfill for any pipe material not covered by this manual shall be installed in accordance with manufacturer's recommendations. The municipal engineer may require the developer to provide professional certification as to the suitability of backfill material and where such suitability does not exist, any modifications needed to use on-site material and the appropriate methods to install this material. The municipal and/or utility engineer shall rely on this certification.

(j) No pipe shall be placed on private property unless the owner of the land is to own or operate the pipe, or an easement deeded to the municipality is obtained. All easements shall be a minimum of 20-feet wide unless depth of pipe, soil conditions, or additional utilities require wider. Where the easement is located adjacent to a right-of-way, the municipality may approve a narrower easement.

Amended by R.1999 d.374, effective November 1, 1999 (operative May 1, 2000).

See: 31 N.J.R. 477(a), 31 N.J.R. 3259(a).

In (d), inserted a reference to Table 7.4 in 1vi, rewrote 2, and rewrote the first sentence in 3.

Amended by R.2000 d.480, effective December 4, 2000 (operative June 3, 2001).

See: 32 N.J.R. 2670(b), 32 N.J.R. 4277(a).

Rewrote (f).

Amended by R.2005 d.56, effective February 7, 2005.

See: 36 N.J.R. 4025(a), 37 N.J.R. 481(c).

Rewrote the section.

Amended by R.2007 d.177, effective June 4, 2007.

See: 38 N.J.R. 3698(a), 39 N.J.R. 2234(a).

Rewrote (h)1iii and (h)1iv; added new (h)1v; recodified former (h)1v through (h)1vii as (h)1vi through (h)1viii; and in (h)3, inserted the second sentence.

5:21-7.4 Inlets, catch basins, manholes, and outlets

(a) Design engineers shall design inlets, catch basins, and manholes in accordance with the NJ DOT *Standard Specifications for Road and Bridge Construction*, November 2001 as supplemented. For Type A inlets, they should use a frame and single grate. Type B inlets require a frame, grate, and curb-type inlet with back piece. Type E inlets require a frame and double grate.

(b) Design engineers shall use one of the following grate types for stormwater inlets:

1. The NJDOT bicycle-safe grate, as described in the NJDOT *Bicycle Compatible Roadways and Bikeways Planning Design Guidelines* (April 1996).

2. If there is no bicycle traffic, a grate where each individual clear space in that grate has an area of no more than seven square inches or is no greater than 0.5 inches across the smallest dimension.

3. Another grate design may be used provided that:

- i. There will be no bicycle traffic and
- ii. Runoff discharging through the inlet is routed through a trash rack that complies with N.J.A.C. 5:21-7.8(d)1ii.

(c) Whenever a curb-opening inlet is used, the clear space in that curb opening (or each individual clear space if the curb opening has two or more clear spaces) shall have an area of no more than seven square inches, or be no greater than two inches across the smallest dimension.

1. Exception: Compliance with the above dimensional requirements for curb openings shall not be required provided that runoff discharging through the inlet is routed through a trash rack that complies with N.J.A.C. 5:21-7.8(d)1ii.

(d) Inlet spacing depends on the inlet capacity. Maximum gutter line flow is 400 feet. The maximum capacity of a curb inlet shall be six cubic feet per second. Area inlets in parking lots should be limited to three cubic feet per second.

(e) Manholes shall be precast concrete or concrete block coated with two coats of portland cement mortar outside the manhole. Masonry brick may be used to make vertical adjustment to rims, as long as the adjustments are 12 inches or less. In acidic soils, all manholes shall have two coats of black bitumastic waterproofing applied per manufacturer's instruction.

(f) If precast manhole barrels and cones are used, they shall conform to ASTM Specification C478, with round rubber gasketed joints, conforming to ASTM Specification C923. Both ASTM Specifications are incorporated herein by reference. Maximum absorption shall be eight percent in accordance with ASTM Specification C478, method A.

(g) If precast manholes are used, the top riser section shall terminate less than one foot below the finished grade, and the manhole cover shall be flush with the finished grade.

(h) Manhole frames and covers shall be of cast iron, conforming to ASTM Specification A48, Class 30, incorporated herein by reference, and be suitable for H-20 loading capacity. Manhole covers in remote locations may have a locking device.

(i) Outlet grates, fences, and other safety features for stormwater management facilities shall conform with DEP Stormwater Management Rules, N.J.A.C. 7:8. Safety requirements for detention basins and other stormwater facilities are incorporated in N.J.A.C. 5:21-7.8(d)6.

(j) The channel should be, insofar as possible, a smooth continuation of the pipe. The pipe may be laid through the manhole and the top half removed by saw cut. The completed channel should be U-shaped. The channel height shall be three-fourths of the diameter of the pipe.

(k) The bench should provide good footing for a workman and a place where minor tools and equipment can be laid. It must have a slope of four to eight percent.

Administrative correction.

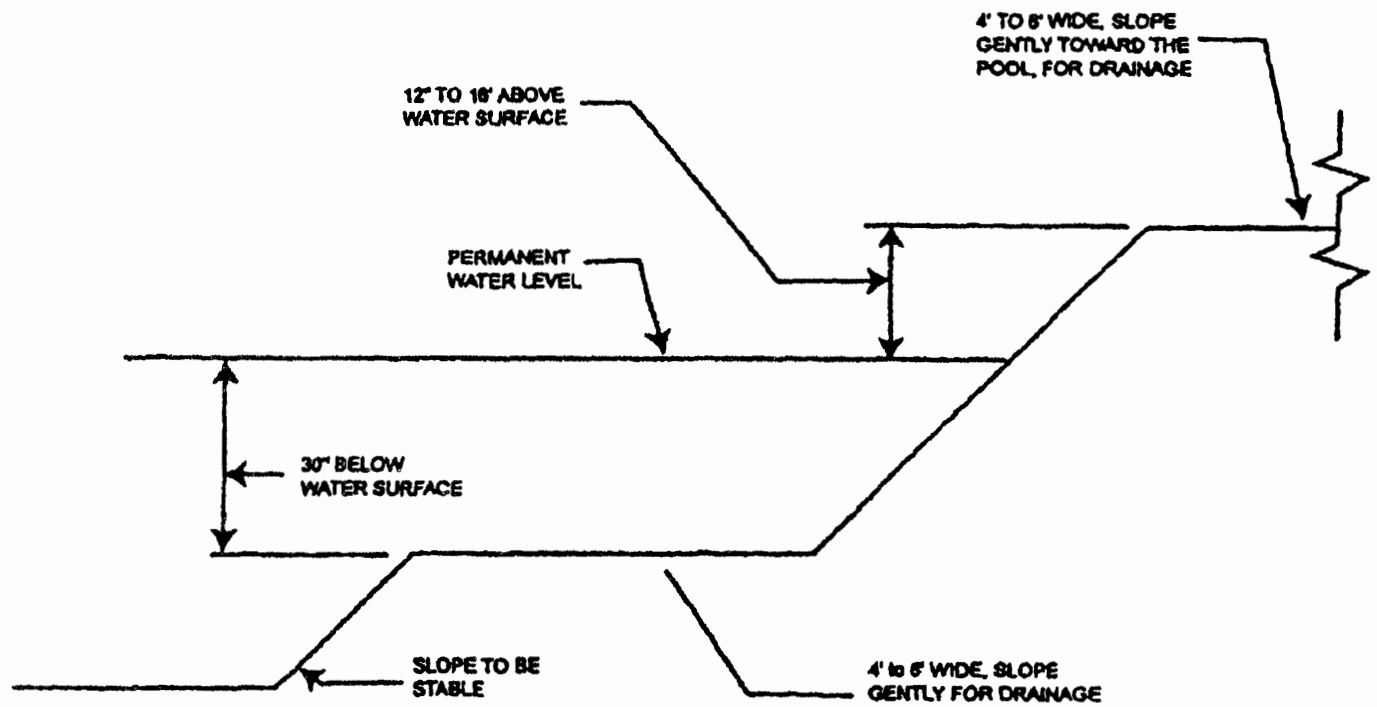
See: 29 N.J.R. 1296(a).

Amended by R.1999 d.374, effective November 1, 1999 (operative May 1, 2000).

See: 31 N.J.R. 477(a), 31 N.J.R. 3259(a).

Amended by R.2002 d.399, effective December 16, 2002.

See: 34 N.J.R. 2615(a), 34 N.J.R. 4412(a).



NOTE: NOT DRAWN TO SCALE

NOTE: FOR BASINS WITH PERMANENT POOL OF WATER ONLY

New Rule, R.2005 d.56, effective February 7, 2005.
See: 36 N.J.R. 4025(a), 37 N.J.R. 481(c).

SUBCHAPTER 8. REFERENCED STANDARDS

5:21-8.1 Referenced standards

(a) The following is a list of the standards referenced in this chapter. The standards are listed by the promulgating agency of the standard, the standard identification, the edition of the standard, the title of the standard, and the section(s) of this code that reference the standard. The standards listed in this chapter are not adopted or to be used in their entirety unless the rules specifically so state. The use of the standards included in this chapter is limited to those specific areas of the standard for which this chapter directs the user to the standard.

1. American Association of State Highway and Transportation Officials (AASHTO), Suite 249, 444 North Capitol Street, N.W., Washington, D.C. 20001. Tel. (202) 624-5800 or (800) 231-3475.

<u>Standard reference number</u>	<u>Title</u>	<u>Referenced in N.J.A.C. section number</u>
M33-93	Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type)	Figure 4.1 (Concrete Vertical Curb)
M43-88	Standard Specification for Sizes of Aggregate for Road and Bridge Construction	Figure 6.1
M114-91	Building Brick (Solid Masonry Units Made from Clay or Shale)	5:21-6.2(c)11vii(1)
M213-92	Standard Specification for Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)	Figure 4.1 (Concrete Vertical Curb)
M252-94	Standard Specification for Corrugated Polyethylene Drainage Tubing	5:21-7.3(d)3
M294-94	Standard Specification for Corrugated Polyethylene Pipe, 12-to 36-in. Diameter	5:21-7.3(d)3
T99-94	Standard Method of Test for the Moisture-Density Relations of Soils Using a 5.5-lb. (2.5 kg) Rammer and a 12-in. (305 mm) Drop	5:21-7.3(d)3
2001 Edition	A Policy on Geometric Design of Highways and Streets	5:21-4.19(b)6 5:21-4.20(a) 5:21-4.20(b)
1999 Edition	AASHTO Guide for the Development of Bicycle Facilities	5:21-4.2(e) Table 4.3
1993 Edition	Guide for Design of Pavement Structures	5:21-4.18(b) Figure 4.2 Figure 4.3 Figure 4.4 Figure 4.5 Table 4.9

2. American Concrete Pipe Association, Suite 105, 8618 Westwood Center Drive, Vienna, Virginia 22182. Tel. (703) 821-1990. Concrete Pipe Association of New Jersey, Post Office Box 1013, Dover, New Jersey 07802-1013. Tel. (201) 328-8723.

<u>Standard reference number</u>	<u>Title</u>	<u>Referenced in N.J.A.C. section number</u>
Minimum Cover (Minimum Depth of Coverage over Concrete Pipe)	Published in Concrete Pipe Association of New Jersey Newsletter, "The Pipeline," September/October 1985; table derived from information provided by the American Concrete Pipe Association	Table 7.4

3. American Society for Testing and Materials (ASTM), 100 Barr Harbor, West Conshohocken, Pennsylvania 19428. Tel. (610) 832-9500.

<u>Standard reference number</u>	<u>Title</u>	<u>Referenced in N.J.A.C. section number</u>
A48-92	Standard Specification for Gray Iron Castings	5:21-6.2(c)11v 5:21-7.4(f)
A536-84	Standard Specification for Ductile Iron Castings	5:21-6.2(c)11v
C33-93	Standard Specification for Concrete Aggregates	Figure 6.1
C76-90	Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe	5:21-6.2(c)6i 5:21-7.3(d)1i
C150-92	Standard Specification for Portland Cement	5:21-6.2(c)11vii(2)
C443-85a (1990)	Standard Specification for Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets	5:21-6.2(c)11iv 5:21-7.3(d)1iii
C478-90b	Standard Specification for Precast Reinforced Concrete Manhole Sections	5:21-6.2(c)11iv 5:21-7.4(d)
C507-90	Standard Specification for Reinforced Concrete Elliptical Culvert, Storm Drain, and Sewer Pipe	5:21-7.3(d)1ii
C700-91	Standard Specification for Vitrified Clay Pipe, Extra Strength, Standard Strength, and Perforated	5:21-6.2(c)6iv
C877-91	Standard Specification for External Sealing Bands for Noncircular Concrete Sewer, Storm Drain, and Culvert Pipe	5:21-7.3(d)1iv
C923-89	Standard Specification for Resilient Connectors between Reinforced Concrete Manhole Structures, Pipes, and Laterals	5:21-6.2(c)11vi 5:21-7.4(d)
D448-86	Standard Classification for Sizes of Aggregate for Road and Bridge Construction	Figure 6.1
D1784-90	Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds	5:21-6.2(c)6ii(1)
D1785-91	Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120	5:21-6.2(c)8 Table 7.6
D2241-89	Standard Specification for Poly(Vinyl Chloride) (PVC) Pressure Rated Pipe (SDR Series)	5:21-6.2(c)8 Table 7.6
D2321-89	Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity Flow Applications	5:21-6.2(c)6ii(2) 5:21-6.2(c)6ii(4) 5:21-7.3(d)3
D2444-92	Standard Test Method for Determination of the Impact Resistance of Thermoplastic Pipe and Fittings by Means of a Tup (Falling Weight)	5:21-6.2(c)6ii(2)
D3034-89	Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings	5:21-6.2(c)6ii
D3139-89	Standard Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals	5:21-5.3(j)3
D3212-92	Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals	5:21-6.2(c)6ii(3)
D3350-93	Standard Specification for Polyethylene Plastics Pipe and Fittings Materials	5:21-7.3(d)3
F477-90	Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe	5:21-6.2(c)6ii(3)
F679-89	Standard Specification for Poly(Vinyl Chloride) (PVC) Large Diameter Plastic Gravity Sewer Pipe and Fittings	5:21-6.2(c)6ii
F789-89	Standard Specification for Type PS-46 and Type PS-115 Poly(Vinyl Chloride) (PVC) Plastic Gravity Flow Sewer Pipe and Fittings	5:21-6.2(c)6ii
F794-91	Standard Specification for Poly(Vinyl Chloride) (PVC) Profile Gravity Sewer Pipe and Fittings Based on Controlled Inside Diameter	5:21-6.2(c)6ii
F949-92	Standard Specification for Poly(Vinyl Chloride) (PVC) Corrugated Sewer Pipe with a Smooth Interior and Fittings	5:21-6.2(c)6ii

4. American Society of Civil Engineers (ASCE), 345 East 47th Street, New York, New York 10017. Tel. (212) 705-7496 or (800) 548-2723.

<u>Standard reference number</u>	<u>Title</u>	<u>Referenced in N.J.A.C. section number</u>
ASCE Manual on Engineering Practice No. 60 1982	Gravity Sanitary Sewer Design and Construction	5:21-6.2(a) 5:21-6.2(c)10
WEF Manual of Practice FD-20	Design and Construction of Urban Stormwater Management Systems	5:21-6.2(c)11
ASCE Manuals and Reports of Engineering Practice No. 77 (1993) ©1992		5:21-7.3(e)

5. American Water Works Association (AWWA), 6666 West Quincy Avenue, Denver, Colorado 80235. Tel. (303) 794-7711 or (800) 926-7337.

<u>Standard reference number</u>	<u>Title</u>	<u>Referenced in N.J.A.C. section number</u>
ANSI/AWWA C104/A21.4-90	American National Standard for Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water	5:21-5.3(j)1
ANSI/AWWA C105/A21.5-93	American National Standard for Polyethylene Encasement for Ductile-Iron Pipe Systems	5:21-6.2(c)6iii 5:21-7.3(d)2 5:21-5.3(j)1
ANSI/AWWA C110/A21.10-93	American National Standard for Ductile-Iron and Gray-Iron Fittings, 3 in. through 48 in. (75 mm through 1200 mm) for Water and Other Liquids	5:21-5.3(j)1
ANSI/AWWA C111/A21.11-90	American National Standard for Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings	5:21-5.3(j)1 5:21-6.2(c)6iii 5:21-7.3(d)2
ANSI/AWWA C115/A21.15-88	American National Standard for Flanged Ductile-Iron Pipe with Threaded Flanges	5:21-5.3(j)1 5:21-6.2(c)6iii 5:21-7.3(d)2
ANSI/AWWA C150/A21.50-91	American National Standard for for the Thickness Design of Ductile-Iron Pipe	5:21-5.3(j)1 5:21-7.3(d)2
ANSI/AWWA C151/A21.51-96	American National Standard for Ductile-Iron Pipe, Centrifugally Cast, for Water and Other Liquids	5:21-5.3(j)1 5:21-6.2(c)6iii 5:21-7.3(d)2
ANSI/AWWA	AWWA Standard for Reinforced Concrete Pressure Pipe, Steel Cylinder Type for Water and Other Liquids	5:21-5.3(j)2
ANSI/AWWA C301-92	AWWA Standard for Prestressed Concrete Pressure Pipe, Steel-Cylinder Type, for Water and Other Liquids	5:21-5.3(j)2
ANSI/AWWA C303-95	AWWA Standard for Concrete Pressure Pipe, Bar Wrapped, Steel Cylinder Type	5:21-5.3(j)2
ANSI/AWWA	AWWA Standard for Gate Valves for Water and Sewerage Systems	5:21-5.3(e)
ANSI/AWWA C303-95	AWWA Standard for Concrete Pressure Pipe, Bar Wrapped, Steel Cylinder Type	5:21-5.3(j)2
ANSI/AWWA C500-86	AWWA Standard for Gate Valves for Water and Sewerage Systems	5:21-5.3(e)
ANSI/AWWA C502-85	AWWA Standard for Dry-Barrel Fire Hydrants	5:21-5.4(b)1
ANSI/AWWA C504-94	AWWA Standard for Rubber-Seated Butterfly Valves	5:21-5.3(e)
ANSI/AWWA C509-94	AWWA Standard for Resilient Seated Gate Valves for Water Supply Service	5:21-5.3(e)
ANSI/AWWA C600-93	AWWA Standard for Installation of Ductile-Iron Water Mains and Their Appurtenances	5:21-7.3(d)2
ANSI/AWWA C900-89	AWWA Standard for Polyvinyl Chloride (PVC) Pressure Pipe, 4 in. through 12 in., for Water Distribution	5:21-5.3(j)3
ANSI/AWWA C901-88	AWWA Standard for Polyethylene (PE) Pressure Pipe and Tubing, ½ in. through 3 in., for Water Service	5:21-5.3(j)5
ANSI/AWWA C905-88	AWWA Standard for Polyvinyl Chloride (PVC) Water Transmission Pipe Nominal Diameters 14 in.	5:21-5.3(j)3

<u>Standard reference number</u>	<u>Title</u>	Referenced in N.J.A.C. section number
April 2002	National Engineering Handbook, Part 630	5:21-7.2(c)4
Technical Release No. 20 PB83-223768 May 1982	Computer Program for Project Formulation—Hydrology	5:21-7.8(d)4vii(2) 5:21-7.2(c)1iv
Technical Release No. 55 PB87-101580/AS 2nd Edition June 1986	Urban Hydrology for Small Watersheds	5:21-7.2(d) 5:21-7.2(a) 5:21-7.2(c)1iii 5:21-7.2(c)3 5:21-7.2(c)7 5:21-7.2(d) 5:21-7.2(e)
Technical Release No. 56 PB85-239622 December 1974	Guide for Design and Layout of Vegetative Wave Protection for Earth Dam Embankments	5:21-7.8(d)4ii(5)
Technical Release No. 69 PB85-245165 February 1983	Riprap for Slope Protection Against Wave Action	5:21-7.8(d)4ii(5)
PB96-111570 June 1, 1990	Engineering Field Handbook Chapter 2—Estimating Runoff and Peak Discharges (corrected version)	5:21-7.2(c)4
PB85-175164/LT July 1, 1984	Engineering Field Handbook Chapter 6— Structures	5:21-7.8(d)4vii(2)
PB 243 644/AS	National Engineering Handbook Section 5 Hydraulics Section	5:21-7.2(c)4
PB 243 645/LT	11— Drop Spillways Section 14—Chute Spillways	5:21-7.8(d)4vii(2)
PB 279 759/LT		
New Jersey Bulletin No. NJ210-3-1 September 8, 2003	Engineering Field Handbook Supplement – Dimensionless (Delmarva) Unit Hyrdograph	5:21-7.2(c)1vi
New Jersey Bulletin No. NJ210-4-1 September 8, 2004	Engineering Field Handbook Supplement - Rainfall Frequency Data	5:21-7.2(c)1vi

17. United States Department of Commerce (USDOC), Bureau of the Census, Washington, D.C. 20233. Tel. (202) 482-2000.

<u>Standard reference number</u>	<u>Title</u>	Referenced in N.J.A.C. section number
1975-1980 (Data tabulated by Rutgers University)	Public Use File—New Jersey	Table 4.4 Table 5.1

18. United States Department of Transportation (USDOT), Federal Highway Administration (FHWA), 820 First Street, S.E., Washington, D.C. 20002. Tel. (301) 322-4961.

<u>Standard Reference Number</u>	<u>Title</u>	Referenced in N.J.A.C. section number
† Hydraulic Engineering Circular No. 15 Report No. FHWA-EPD-86-111 PB86-184835 October 1975	Design of Stable Channels with Flexible Linings	5:21-7.8(d)2iii
† Report No. FHWA-TS-79-225 PB83-259903 August 1979	Design of Urban Highway Drainage, The State of the Art	Table 3
† Second Edition FHWA-NHI-01-021 August 2001	HEC-22 Urban Drainage Design Manual	5:21-7.2(c)2ii(1)
† Hydraulic Design Series No. 5 Report No. FHWA-IP-85-15 PB86-196961 September 1985	Hydraulic Design of Highway Culverts	5:21-7.3(d)
‡ 1988 Edition	Manual on Uniform Traffic Control Devices for Streets and Highways	5:21-4.13(a)

‡ Documents obtainable from the National Technical Information Service, Springfield, Virginia 22161. Tel. (703) 605-6000 or (800) 553-6847.

‡ Documents obtainable from the United States Government Printing Office, Superintendent of Documents, PO Box 371954, Pittsburgh, Pennsylvania 15250-7954. Tel. (202) 512-1800 or (866) 512-1800.

19. Urban Land Institute (ULI), Suite 500 West, 1025 Thomas Jefferson Street, N.W., Washington, D.C. 20007-5201. Tel. (800) 321-5011.

Standard Reference Number	Title	Referenced in N.J.A.C. section number Table 7.5
ULI-ASCE-NAHB 1975	Residential Storm Water Management: Objectives, Principles, and Design Considerations	
<p>Administrative correction. See: 29 N.J.R. 1296(a). Administrative correction. See: 29 N.J.R. 2816(a). Amended by R.1999 d.374, effective November 1, 1999 (operative May 1, 2000). See: 31 N.J.R. 477(a), 31 N.J.R. 3259(a). Rewrote the section. Administrative correction. See: 32 N.J.R. 684(b). Amended by R.2000 d.480, effective December 4, 2000 (operative June 3, 2001). See: 32 N.J.R. 2670(b), 32 N.J.R. 4277(a). Added designation (a) to the main paragraph; amended tables in 1, 3, 5, 7, 12 and 13. Amended by R.2002 d.399, effective December 16, 2002. See: 34 N.J.R. 2615(a), 34 N.J.R. 4412(a). Rewrote the section.</p>	<p>Public Notice: Notice Regarding the Publication of two Notices of Adoption in the December 16, 2002 New Jersey register. See: 34 N.J.R. 4343(a), 4412(a), 35 N.J.R. 219(b). Amended by R.2004 d.35, effective January 20, 2004. See: 35 N.J.R. 3981(a), 36 N.J.R. 447(a). In (a)1, inserted "Table 4.9" in tabular column "Referenced in N.J.A.C. section number". Amended by R.2005 d.56, effective February 7, 2005. See: 36 N.J.R. 4025(a), 37 N.J.R. 481(c). Rewrote the section. Amended by R.2007 d.177, effective June 4, 2007. See: 38 N.J.R. 3698(a), 39 N.J.R. 2234(a). In the table in (a)7, substituted "7th Edition" for "6th Edition" and "2003" for "First Printing 1997"; in the table in (a)12, inserted "5.21-7.3(h)1v"; in the introductory paragraph of (a)16, inserted "(NRCS)"; and in the table in (a)16, inserted entries for "New Jersey Bulletin No. NJ210-3-1 September 8, 2003" and "New Jersey Bulletin No. NJ210-4-1 September 8, 2004".</p>	