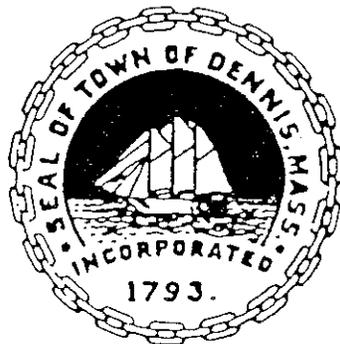


# Town of Dennis Subdivision Rules & Regulations

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## **Section 1 Objective:**

### **A Purpose**

The Subdivision Control Law has been enacted for the purpose of protecting the safety, convenience and welfare of the inhabitants of the Town of Dennis. This shall be accomplished by regulating the laying out and construction of ways in subdivisions providing access to the several lots therein, but which have not become public ways and ensuring sanitary conditions in subdivisions and in proper cases, parks and open areas. The powers of the Planning Board and the Board of Appeals under the Subdivision Control Law shall be exercised with due regard for the provision of adequate access to all of the lots in a subdivision by ways that will be safe and convenient for travel, for lessening congestion in such ways and in the adjacent public ways, for reducing danger to life and limb in the operation of motor vehicles, for securing safety in the case of fire, flood, panic and other emergencies, for insuring compliance with the applicable zoning ordinances or By-Laws, for securing adequate provisions for water, sewerage, drainage, underground utilities services, fire, police and other similar municipal equipment and street lighting and other requirements where necessary in a subdivision and for coordinating the ways in a subdivision with each other and with the public ways in the Town of Dennis and with the neighboring subdivisions. It is the intent of the Subdivision Control Law that any subdivision plan filed with the Planning Board shall receive the approval of such Board if said plan conforms to the recommendations of the Dennis Board of Health and to the Rules and Regulations of the Dennis Planning Board; provided however, that the Planning Board may, when appropriate, waive such portions of the Rules and Regulations as it deems advisable.

### **B Authority**

Under the authority vested in the Planning Board of the Town of Dennis by Section 81-Q of Chapter 41 of the General Laws, said Board hereby adopts these Rules and Regulations governing the Subdivision of Land in the Town of Dennis. These Rules and Regulations shall supersede and replace any previously adopted Subdivision Control Law Rules and Regulations; and may be amended in accordance with the provisions of Section 81-Q of Chapter 41 of the General Laws.

## Section 2

### GENERAL INFORMATION:

#### A Definitions

- AASHTO:** American Association of State Highway and Transportation Officials.
- ACI:** American Concrete Institute.
- ASTM:** American Society for Testing and Materials.
- Applicant:** Either the owner of the land stated in the application or all the owners where title is held jointly, in common, or in tenancy by the entirety including corporations, as shown by the record in the appropriate Registry District or the Land Court. An agent, representative or assignee may act for the owner/owners, provided written evidence of such fact is submitted to the Board.
- Board:** The Planning Board of the Town of Dennis.
- Collector St:** A street which in the opinion of the Board is being used or will be used as a thoroughfare between different sections of the Town, or which will be used as a principle access to a business or industrial subdivision, and shall include any street servicing 100 or more lots or dwelling units.
- Engineer:** A person who has been registered by the Commonwealth of Massachusetts to perform Professional Engineering.
- Lot:** An area of land in one ownership with definite boundaries, used or available for use as the site of one or more buildings.
- NGVD:** National Geodetic Vertical Datum
- Minor St:** A street which in the opinion of the Board is used to service abutting lots and is not intended for use by through traffic, and shall include any street servicing 6-49 lots or dwelling units.
- Preliminary Plan:** A plan of proposed subdivision as defined in Section 81-L, Chapter 41, General Laws.
- Right-of-Way:** The area laid out that is intended to be occupied by a road, utilities, storm drains, sidewalks and other similar uses. (See Figures 2 thru 7 and Table 1).

**Roadway:** That portion of a street right-of-way which is designed and prepared for vehicular travel.

**Secondary St:** A street collecting traffic from several minor streets, and shall include any street servicing 50-99 lots or dwelling units.

**Shape Factor:** The number resulting from the division of the square of the perimeter by the area of the lot or said portion thereof.

**Subdivision**

**Control Law:** Section 81-K to 81-GG inclusive, of Chapter 41, General Laws.

**Surveyor:** A person who has been registered by the Commonwealth of Massachusetts to perform Land Surveying.

**USGS:** United States Geological Survey.

**Way:** A street which services five (5) or less lots or dwellings units.

## **B General**

1. The Board recommends that the owner of the property and/or their representative be present at the submission of the preliminary plan and at the hearing on the definitive plan or plan thought not to require approval (Approval Not Required or ANR).
2. The Board has the authority to waive any portion of these Rules and Regulations, when, in its judgement such action is in the public interest and does not conflict with the purpose of the Subdivision Control Law or any other applicable Town By-Law or Ordinance.
3. The owner and/or applicant shall be responsible for complying with the Zoning By-Law of the Town of Dennis and all sections of these Rules and Regulations. Inspection by Town Departments shall in no way relieve the owner and/or applicant from these responsibilities.
4. If any section, paragraph, sentence, clause or provision of these regulations shall be adjudged not valid, the adjudication shall apply only to the material adjudged not valid and the remainder of these regulations shall be deemed valid and effective.
5. All plans submitted to the Board shall include a certification of conformance with these Rules and Regulations, said certification to be by a Registered Land Surveyor or Professional Engineer in the Commonwealth of Massachusetts, or both, as required by the Board.
6. No plan shall be deemed to have been submitted to the Board until said plan, together with all application forms, fees and other items required and executed as specified herein has been delivered in person or mailed to the office of the Town Clerk by the owner of the land involved or their authorized agent. Reference is made to Section 81-K to 81-GG, inclusive, Chapter 42, General Laws, as to specific Filing Requirements.
7. The Board shall determine the class of road required for any use other than residential (i.e., commercial, industrial).
8. All plans prepared by a Land Surveyor and submitted to the Board shall be prepared in accordance with *Procedural and Technical Standards for the Practice of Land Surveying* (250 CMR 6.00) and shall be so certified by the Surveyor.

## **Section 3**

### **Procedure for the Submission of Plans:**

#### **A Approval Not Required Plan (ANR)**

Any person submitting a plan believed not to require approval shall submit and comply with items 1 thru 3, following, and be prepared to furnish the Planning Board, at the time of submission, any information needed by the Board to determine that approval is not required.

1. Plan shall include all information required on "Approval Not Required Plan Checklist" (see Appendix 2).
2. Form A "Application for Endorsement of Plan Believed Not to Require Approval", with the filing fee.
3. The original plan plus five (5) copies.

#### **B Preliminary Plans**

A Preliminary Plan may be submitted for discussion and approval by the Board. The Board shall approve, approve with modifications, or disapprove the plan. In the case of disapproval, the Board should state in detail its reasons for disapproval. Within forty five (45) days of submission, the applicant and the Town Clerk shall be notified of the Board's action in writing per section 81-S, Chapter 41, General Laws. If the Plan is approved, such approval does not constitute approval of a subdivision.

A Preliminary Plan must be submitted with the following:

1. Completed "Application for approval of Preliminary Plan of Subdivision".
2. Payment of filing fee.
3. Seven (7) copies of the Plan shall be submitted to the Board. Copies will be given to the Board of Health and Engineering Office for review.

4. The Preliminary Plan shall be drawn to a scale not smaller than one inch equals one hundred feet (1" = 100') and shall include the following:
  - a. The subdivision name, boundaries, north arrow, date, scale, locus, zoning district and title "Preliminary Plan".
  - b. The names of the record owner and the applicant, name of designer, engineer or surveyor.
  - c. All abutters names, as determined from the most recent local tax list.
  - d. Lines of existing streets, ways, easements and the approximate lines of proposed streets, ways, easements and public areas.
  - e. Approximate boundary lines of proposed lots, with approximate areas, dimensions and shape factor.
  - f. The names, location and widths of adjacent streets, locus map at appropriate scale to determine location.
  - g. The topography of the land in a general manner.
  - h. Ancient ways, walls and/or foundations shall be shown.

## **C Definitive Plan**

### **1. General:**

When a Definitive Plan of a subdivision is submitted for approval in accordance with Sections 81T and 81U, Chapter 41, General Laws, the following shall be filed:

- a. Original Definitive Plan plus eight (8) prints of Plan, all carrying an original stamp and signature of a Registered Land Surveyor.
- b. Eight (8) prints of Construction Plan and Profiles all carrying the original stamp and signature of a Professional Engineer.
- c. One (1) copy of Definitive Plan and one (1) copy of Construction Plan and Profile with the Board of Health.
- d. Completed "Application of Approval of Definitive Plan" form and payment of appropriate fees.

- e. Separate Plans of the Definitive Subdivision at a scale of 1" = 100' and 1" = 200'.
- f. Two (2) copies of drainage calculations stamped and signed by a Professional Engineer. A topographic plan delineating contributing areas.
- g. A topographical survey of the entire subdivision area with two (2) foot contours and based on NGVD of 1929 Datum.
- h. Proposed street names must be approved by the Planning Board. Three (3) alternative street names, or a package averaging two (2) alternatives per street when more than four (4) streets are involved, must be submitted at the time of filing. Existing street names or names similar to existing street names shall not be allowed.

## **2. Contents of Plan:**

### **A. Definitive Plan**

The Definitive Plan shall be prepared by a Registered Land Surveyor and shall be clearly and legibly drawn in permanent ink upon tracing cloth or drafting film, complying with the requirements of the Registry of Deeds and Land Court, if applicable, and having an error of closure not to exceed one part in twelve thousand (1: 12,000). The Plan shall be drawn at a scale not smaller than one inch equals sixty feet (1" = 60'). A title block must appear on each page. If multiple sheets are used, they shall be accompanied by an index sheet showing the entire subdivision. Maximum sheet size shall be 24" x 36".

The following shall be shown:

- a. Name of subdivision, scale, name of owner and applicant, name of surveyor, north arrow, bench marks (Note: Benchmark elevations shall refer to NGVD of 1929) and legend.
- b. Names of all abutters as they appear in the most recent tax list and approximate location of intersecting boundary lines of the abutting land.
- c. All information required on a preliminary plan.
- d. Lines of existing and proposed streets, ways, lots, easements and public or common areas within the subdivision.

e. Location, names and present widths of streets bounding or providing access to the subdivision from one or more corners of the subdivision parcel.

f. Bearings and distances to any Massachusetts Co-ordinate System point within five hundred feet (500') of the subdivision.

g. Sufficient data to determine the location, bearing and length of all straight segments of street, lot, easement and boundary lines. On curved segments the arc length, radius, tangent and deflection angle shall be given.

h. Location of all existing monuments sufficient to establish the lines referred to in d. thru g., above, on ground.

i. The following areas shall be noted on Plan:

1. Gross area of subdivision in square feet and acres.
2. Gross area of roads and cul-de-sacs, in square feet and acres.
3. Area(s) subject to the Wetlands Protection Act and approval and/or restriction of the Conservation Commission.
4. Gross area of wetlands, in square feet and in acres.
5. Net area of wetlands within each lot or parcel, in square feet and percentage.
6. Net area of upland of each lot or parcel, in square feet and percentage.
7. Shape factor.

j. Areas set aside for conservation and/or recreational use.

k. All deed references and plan references of subdivision area and abutting property.

l. Space for noting the following dates shall be provided on the plan:

1. "Date of Application - Preliminary".
2. "Date of Approval - Preliminary".
3. "Date of Application - Definitive".
4. "Date of Approval - Definitive".
5. "Date Plan Signed - Definitive".

m. The approval and/or restrictions of the Board of Health.

- n. The following note shall appear on all Definitive Subdivision Plans:  
"Covenant to be filed with Plan".
- o. Assessor's map, parcel number and lot number to be noted on Plan.
- p. All variances or waivers granted.
- q. Zone in which property is located and zoning line where more than one zone is involved.
- r. The applicant will provide a copy of the Definitive Plan in an Arc/Info, DXF or Autocad digital computer format or in a format acceptable to the Town Engineer.

## **B. Construction Plan and Profile**

The Construction Plan and Profile of proposed street(s) shall include:

- a. Exterior lines of the proposed way and any intersecting way with sufficient data to determine location, direction and length.
- b. The plan shall delineate centerline, edge of pavement, property corners and all other information required for the Preliminary Plan necessary for the construction of the road.
- c. Profiles drawn on plan and profile paper twenty four (24) by thirty six (36) inches, with plan view shown above the corresponding profile having a horizontal scale of one inch equals forty feet (1" = 40') and a vertical scale of one inch equals four feet (1" = 4').
- d. Existing ground profile at the right side line in fine dotted line.
- e. Existing ground profile at the left side line in fine dashed line.
- f. Existing ground profile at the centerline profile in fine solid line.
- g. Proposed centerline profile in heavy solid line.
- h. Proposed centerline grades ( in %) will be shown, vertical tangents and centerline elevations will be shown at fifty foot (50') stations.

- i. Proposed centerline elevation will be shown at points of vertical curvature (P.V.C.), points of vertical intersections (P.V.I.), points of vertical tangency (P.V.T.), high or low points (which ever may apply) and at twenty five foot (25') stations on the vertical curve.
- j. Size and location of existing storm drains, water mains, utilities and their appurtenances, including hydrants, within and adjacent to the subdivision.
- k. Proposed location, size, grade (in %), invert elevations, finished ground elevation (as applies) of all underground drainage structures, including, but not limited to, pipes, manholes, leaching pits, catch basins, etc., shall appear on the plan and profile view in accordance with accepted engineering practice.
- l. Typical sections of proposed streets shall be drawn on the plan section of the plan and profile paper for each type of street within subdivision.
- m. Location of deep soil test hole and percolation test. All soil logs and percolation rates.
- n. Stopping Sight Distance for all vertical curves and intersections.
- o. Approximate limit of clearing.

### **3. Review by other Town Departments:**

The Board may request review and comments from other Town Departments or Commissions listed below or such other Officials, Committees or Boards as deemed necessary.

- a. Engineering Department
- b. Fire Department
- c. Police Department
- d. Highway Department
- e. Dennis Water District
- f. Conservation Commission
- g. Health Department

### **4. Performance Guarantee:**

The Board shall require, before approval of a Definitive Plan of a subdivision, that the applicant agree to complete the required improvements as shown on the Definitive Plan and as specified in Section 5, such construction and

installation to be secured by one or a combination of the methods described below, which may from time to time be varied, with the Boards consent.

**A. Approval with Bonds or Surety:**

The applicant shall file a performance bond or deposit money or negotiable securities in an amount determined by the Board to be sufficient to cover the cost of the improvements shown on plans. Such bond or security, if filed or deposited, shall be approved as to form and manner of execution by the Town Counsel and as to sureties by the Town Treasurer. Such bond or surety shall be valid for a period of two (2) years at which time, at the discretion of the Board, a new bond or surety shall be posted at an amount that reflects the current cost of completion of improvements to standards in effect at the time.

**B. Approval with Covenant:**

The applicant shall file a covenant, executed and duly recorded in the Barnstable County Registry of Deeds by the owner of record, running with the land, whereby such ways and service shall be provided to serve any lot before such lot may be built upon or conveyed, other than by mortgage deed; provided, that a mortgagee who acquires title to the mortgaged premises by foreclosure or otherwise and any succeeding owner of such premises or part thereof may sell any such lot, subject to that portion of the covenant which provides that no lot shall be built upon until such ways and services have been provided to serve such lot; and provided, further, that nothing herein shall be deemed to prohibit a conveyance by a single deed, subject to such covenant, of either the entire parcel of land shown on the subdivision plan or of all lots not previously released by the Board.

**C. 50% Lot Release Policy - 50% Threshold:**

Provided the Board is satisfied that work toward completion of the ways is progressing at a satisfactory rate, the Board may allow up to 50% of lots to be released from the covenant prior to completion of the streets. The remaining lots shall only be released if the applicant posts a negotiable security to insure completion of the ways, the amount of the security to be developed by the Applicant's Engineer and approved by the Engineering Department.

Prior to the release of the remaining 50% of the lots a written statement from all utility companies, responsible for the particular service, indicating approval of said work in accordance with their standards shall be submitted to the Board.

## **5. Evidence of Satisfactory Performance:**

Before the Board releases the interest of the Town in a performance bond or deposit, or issue a complete release of covenant, the following must be submitted to and approved by the Board:

a. Five (5) copies of an "As-Built" Plan, prepared and certified by a Massachusetts Registered Professional Land Surveyor. The certification shall read, "I certify the streets, sidewalks, sewers, storm drains, water mains, hydrants, valves, bounds and other improvements shown have been constructed in accordance with the lines and grades of the approved plan or the approved revised plan and are accurately located as shown hereon". The "As-Built" Plan shall accurately show the following and shall be drawn on twenty four (24) by thirty six (36) inch reproducible sheets (i.e. tracing cloth or drafting film) at a scale of one inch equals forty feet (1" = 40') horizontal and one inch equals four feet vertical (1" = 4'):

1. Final centerline profile and the "as designed" centerline.
2. Street lines, traveled ways, berms and sidewalks.
3. Permanent monuments and boundary points.
4. All roadway drainage including:
  - a. basin and manhole rim and invert elevations.
  - b. structure type and size.
  - c. pipe type and size.
  - d. type and size of all other drainage such as underdrains, trenches, channels and detention/retention areas.
5. Location of water mains, gate valves and hydrants.
6. Location of gas mains and gates.
7. Location of above and underground electric components.
8. Location of all easements including drainage and slope.

**9. Location of miscellaneous features installed within the street layout such as signs, lights, guard rail, etc.**

**10. Location of ancient ways, historical walls, foundation, etc.**

**b. A written report from the Town Engineering Department that certifications, reports and the "As-Built" Plan indicates that all workmanship and materials used comply with the standards set forth in sections 5 & 6 of these Rules and Regulations.**

**c. A written statement from the Water Commissioners, that the applicant has completed all related work in accordance with the requirements of the Dennis Water District.**

## **Section 4**

### **Design Standards:**

#### **A General:**

Proposed subdivisions shall conform to overall development plans which may be adopted by the Board. Proposed roads within the subdivision shall be designed in accordance with these Rules and Regulations and sound planning and engineering practices. Due consideration shall be given to the attractiveness of the layout and the preservation of existing natural features and topography.

#### **B Streets:**

##### **1. Location and Alignment:**

a. Subdivisions of more than 35 lots or units or subdivisions which would increase the number of lots or units within a subdivision to more than 35 lots or units shall be required to have access from more than one location.

b. Subdivision plans shall provide for future continuation of streets to adjoining undeveloped land which is not subdivided. Reserve strips prohibiting access to streets or adjoining property shall not be permitted, except where, in the opinion of the Board, such strips shall be in the public interest. Proposed streets shall connect with the streets of abutting subdivision whether or not the abutting streets have been constructed.

c. Subdivision plans shall maintain reasonable access over any ancient way which crosses the subject property.

d. In case access to a subdivision crosses land in another municipality, the Board shall require certification from appropriate authorities that such access is in accordance with the requirements of such municipality or

that an adequate performance bond has been posted to insure the construction of the needed improvements. The needed improvements in the other municipality shall be completed prior to release of 50% of the lots.

e. Streets shall be laid out to intersect as nearly as possible at right angles. No street shall intersect any other street at less than 60 degrees. See Figure 1.

f. Public and private utilities shall be located within the right-of-way in accordance with Figures 2 thru 7. All utilities shall be underground. The applicant may be requested to make provisions for street lighting.

g. Centerline offsets of intersecting streets, with either existing or proposed streets, shall be not less than 150 feet measured from centerline to centerline (See Figure 1).

h. Minimum centerline radii of curved streets shall conform to Table 1.

i. All streets shall be more than ten (10) feet above mean sea level.

j. All changes in grade with an algebraic difference exceeding two percent (2%) shall be connected by a vertical curve of sufficient length to afford a sight distance as specified in AASHTO.

k. Proposed street intersections shall be designed with a drainage low point no closer than 30 feet from the centerline intersection point. An area for safe stopping shall be provided; such area shall have a maximum grade of  $\pm 2\%$  for a minimum distance of 50 feet from the centerline intersection point.

l. Bituminous concrete berms or other approved curbing shall be used on all roadways. (See Figure 6B for Berm Detail).

m. The paved roadway shall be centered within the right-of-way unless otherwise approved by the Board.

n. Sight distances for vertical and horizontal curves and intersections shall conform to the specifications in AASHTO and Section 2.3.3.4 of the Zoning By-Law.

o. Slope easements shall be provided where cut or fill slopes cannot be contained within the road right-of-way.

## **2. Dead-End Streets:**

a. Dead-end streets shall not be longer than 800 feet unless, in the opinion of the Board, greater length is necessitated by topography or other local conditions. The 800 foot distance shall be measured along the proposed center-line from the centerline intersection to the center of the turn-around.

b. Dead-end streets shall be provided at the closed end with a circular turn-around having an outside pavement radius of at least 45 feet and a right-of-way radius of at least 55 feet. (See Figure 1).

c. Temporary turn-arounds shall be constructed where the permanent right-of-way crosses a subdivision phase line or is extended to the subdivision perimeter property line to allow for access to an abutting parcel. Temporary turn-arounds shall have the same dimensions as permanent turn-arounds (Figure 1) and be constructed to the same standards as the permanent road (Figures 2 thru 7). Temporary turn-arounds shall be placed in temporary easements over all affected lots. Temporary turn-around easements shall have reversion clauses which terminate the easement on construction and approval of the extension of the permanent right-of-way and provide for the removal of the temporary turn-around and landscaping of the vacated easement. Utility stubs may be located under the temporary turn-around, but must be located in the permanent right-of way in accordance with Figures 2 thru 7.

## **C Drainage:**

### **1. General:**

Drainage systems within the subdivision shall be designed in accordance with the method shown on Appendix 1 and based on the storm frequencies shown in Table 1. Calculations shall be made by using topographic maps for the entire drainage area, including areas outside the subdivision. In addition to the proposed roadway surface area, 10% of the total area of the buildable lots shall be considered to have a run-off coefficient of 0.9. Copies of all drainage calculations shall be submitted with Definitive Plans. Drainage design by another method acceptable to the Town Engineer may be allowed.

- a. Storm drains and cross culverts shall be designed to permit the unimpeded flow of water, to prevent undue flooding of low points, to minimize erosion of shoulder and embankment areas and/or to dispose of storm water from the right-of-way via subsurface leaching.
- b. All drainage systems shall be designed such that the bottom of the subsurface leaching area is at least one (1.0) foot above the maximum high groundwater level.
- c. A minimum of one deep soil test hole and percolation test shall be required at each proposed subsurface leaching area.
- d. Drainage system components shall be constructed in accordance with Figure 7. Only solid precast catch basins are to be installed within the proposed road layout.
- e. All subsurface leaching structures shall be placed outside the road layout in dedicated drainage easements. The use of leaching trenches is prohibited.

## **2. Storm Drains:**

A complete storm drain system shall be designed for each street within the proposed subdivision to the satisfaction of the Board sufficient to permit the unimpeded flow of natural waterways, to reduce flooding, to intercept storm water runoff before reaching adjacent lots and eliminate the undesirable accumulation of water on any portion of the proposed subdivision except where intended by design. The storm drain system may include catch basins, manholes, leaching catch basins, culverts and other such items as may be required to complete the system to the satisfaction of the Board. Storm water shall be disposed of by subsurface leaching. No paved surface runoff shall be allowed to be discharged directly into any natural wetland or waterbody.

- a. Catch basins shall be located in pairs, one on each side of the roadway at all low points of sag curves, at intervals of not more than 300 feet on continuous grades of less than 4%, at intervals of 200 feet on continuous grades greater than 4% and at intersection low points (see Section 4.B.1.k). In certain cases, the designer may be asked to demonstrate that catch basins are sufficiently spaced to prevent excess gutter flow and by-pass.

b. Manholes shall be located at all changes in grade or direction of pipes, at the intersection of two or more pipes, and on continuous sections (constant slope and direction) at not more than 300 foot intervals. Refer to Figure 9.

c. All storm water pipes shall be either sixteen (16) gauge corrugated aluminum, reinforced concrete, or approved equal and shall be a minimum of twelve (12) inches in diameter. It is recommended that all pipes be laid at a slope of not less than 1% and in no case, except that of equalizing pipes, less than 0.5%. All pipes shall be designed for a minimum velocity of 2.5 feet per second.

d. Pre-fabricated culvert ends, appropriate to the type of pipe used, shall be installed at all surface outlet and inlet locations. Where required to minimize erosion, riprap protection shall be provided.

e. All drainage systems shall be backfilled in one foot (1') lifts using clean sand or gravel, free of large stones, stumps or other debris and compacted using mechanical plate compactors. All pipes shall have a minimum of two (2) feet of cover.

f. Drainage systems located at low points or in areas subjected to heavy sediment flow shall be protected during the length of construction by the use of staked hay bales surrounding any potential inlet.

g. All storm water shall typically be disposed of by subsurface leaching systems contained within designated drainage easements located outside the right-of-way. In Zones of Contribution (Zone II), as defined on the MADEP - Division of Water Supply, Town of Dennis Zones of Contribution, other methods may be employed with the approval of the Town Engineer. Drainage easements shall be of sufficient size and shape to allow for maintenance and to provide a 100% reserve leaching capacity. Leaching basins shall be precast concrete type (see Figures 7). These leaching basins shall be connected by twelve (12) inch minimum diameter corrugated metal pipe or reinforced concrete pipe, Class III or approved equal.

h. At all low points in the proposed roadway, a drainage easement area shall be provided outside the street right-of-way for the intended purpose of minimizing flood damage in the event of a system failure. The easement shall contain a surface depression, either naturally or artificially created, designed to contain the runoff from the design storm and may be combined with subsurface drainage easement requirements.

i. The center of catch basin grates shall be located one (1) foot outside the gutter line. (See Figure 6A). All basins in the roadway at low points shall have double grates when runoff flow exceeds one (1) cubic foot per second.

j. Easements shall be provided for all proposed drainage facilities located outside the proposed road layout. Easements for drainage pipes, channels and culverts shall be located and sized to allow sufficient room for maintenance but shall be at least 20 feet wide unless approved by the Board. Where a subdivision is traversed by an existing water course(s) or drainage way(s), the Board may require a drainage easement conforming substantially to the line of such water course(s) or drainage way(s).

**D Water:**

Water systems shall be installed in accordance with the standards of the Dennis Water District.

**E Easements:**

Easements for utilities, where necessary, shall be centered on rear or side lot lines and shall be at least twenty feet (20') wide.

## **Section 5 Required Improvements:**

### **A Administration:**

#### **1. General**

a. All work performed as a consequence of these Rules and Regulations shall be subject to the review of the Board or its representative. The Board shall approve and accept or disapprove and reject each phase or portion of such work as outlined below and at completion shall recommend or reject release of the performance guarantee. Inspections shall be performed in accordance with the schedule outlined in Section 5.A.2.b or as deemed necessary by the Board.

b. In order to facilitate inspection of the work, the applicant shall have placed and maintained grade stakes for all roads, drainage structures and other work requiring inspection for the duration of construction. Such grade stakes shall accurately indicate final grades and shall be installed at appropriate intervals for construction, but no more than 50 feet apart.

c. The applicant shall employ the services of a Professional Engineer throughout both the design and construction phases of the work who will act as his agent with the Board and submit to the Board certified inspection reports.

d. The applicants engineer shall make certain inspections as prescribed herein in order to check the accuracy and quality of the work and shall submit a report certifying that the work is completed relative to the inspection schedule outlined in Section 5.A.2.b prior to the performance of subsequent work. Any work which has been covered by subsequent work prior to acceptance or is otherwise obscured to the point of rendering inspection impossible may be deemed unacceptable.

e. All work which has been deemed unacceptable by the Board shall be removed and replaced or otherwise corrected so that it complies with the requirements of these specifications.

f. The Board may designate representatives to make inspections on its behalf. The Board, directly or through it assigned representative, may

require the applicant to have samples taken, tests performed and reports submitted to verify the quality of any work performed. These samples, tests and reports may be part of or in addition to the required inspections.

g. The Board shall not release lots on roads constructed in direct violation of the Rules and Regulations, until such work has been removed and reconstructed to these standards, or the applicant, at his/her own expense has provided satisfactory evidence, such as core samples, to prove to the satisfaction of the Board that the work meets the requirements of these standards and specifications.

## **2. Inspection**

a. The applicant or his designee shall notify the Town Engineer at least twenty four (24) hours prior to the commencement of each phase of work. The applicant shall notify the Board through the Town Engineer's Office, at least forty-eight (48) hours in advance that the work has progressed to a stage that an inspection is required.

b. The certification inspections of the required improvements shall be made by the applicant's engineer and shall be verified by the Board or its representative. Certification for items 1-7 shall be submitted within seven (7) days after inspection:

1. Clearing, grubbing and removal of unsuitable material.
2. Subbase including compaction of fills and excavation of unsuitable material.
3. Drainage systems.
4. First six inch (6") lift of compacted gravel base.
5. Second six inch (6") lift of compacted gravel base. This inspection shall be performed just prior to the installation of binder course.
6. Completion of bituminous concrete pavement and berm.
7. Completion of all required work including clean-up and bounding. Certifications for this inspection may be submitted in conjunction with the As-Built Plan.

**B Granite or Reinforced Concrete Bounds:**

1. Granite or reinforced concrete bounds shall be set at all angle points, points of curvature, points of tangency, all lot corners, and at any other points where, in the opinion of the Board, permanent monuments are necessary. In no case shall bounds be more than five hundred feet (500') apart on any line. Monuments shall be at least five inches by five inches by thirty inches ( 5" x 5" x 30") long with a dressed top, with a one half inch ( $\frac{1}{2}$ " ) drill hole in the center and shall be set to no more than six inches (6") above or below finished grade.

2. All bounds destroyed, damaged or whose position is disturbed during construction covered by these Rules and Regulations shall be replaced by a Land Surveyor, registered by the Commonwealth of Massachusetts.

**C Street Signs:**

Street signs of the type commonly used on public ways of the Town and bearing the names of the intersecting streets as indicated on the Definitive Plan shall be erected at all intersections in the subdivision. Permanent signs shall be erected prior to the issuance of a Building Permit. Other designs shall be subject to the approval of the Board.

**D Cleaning Up:**

The entire area of the subdivision shall be cleaned up so as to leave, in the opinion of the Board, a neat and orderly appearance free of debris and objectionable materials. All catch basins and manholes shall be cleaned out. Shoulder vegetation shall be well established such that bare spots are insignificant in size and number.

**E DPW Responsibilities:**

The Town of Dennis shall not be responsible for the snow plowing and sanding of a subdivision road until such time as a lot or lots have been released from covenant and an occupancy permit has been issued by the building department. Until such time as all lots are released, and the road completed in accordance with the Subdivision Rules and Regulations, the Town shall snow plow and sand for dwelling access as determined by the Superintendent of the Department of Public Works.

## **Section 6**

### **Specifications for Construction:**

#### **A Streets and Roadways**

##### **1. General**

a. General roadway construction shall be performed in accordance with the Massachusetts Standard Specifications for Highways and Bridges, as amended, herein referred to as Mass. DPW Standard Specifications.

##### **2. Cleaning, grubbing and excavation:**

a. All trees, stumps, brush, roots, boulders and other unsuitable material shall be cleared from the proposed right-of-way to a width extending five feet (5') beyond the proposed limit of slopes, but in no case less than 30 feet (30') of a 40 foot right-of-way and 40 feet (40') of a 50 foot right-of-way. All such material shall be disposed of outside of the subdivision unless authorized or required by the Board. The applicant is responsible for permits required for disposal of unsuitable material. All materials not suitable for road foundations such as peat, clay or loam shall be removed from beneath the roadway to a width extending five feet (5') beyond each side of the paved area and to a depth of at least two feet (2') below final grade. All fill material required within the roadway shall be of clean sand or gravel placed in six inch (6") lifts and compacted to 95% of the maximum density as determined by the modified Proctor Test in accordance with ASTM D-1557 Method D.

b. Topsoil shall be stockpiled for future use on the side of the cleared roadway.

##### **3. Preparation of Subbase:**

a. The upper two feet (2') of the subbase shall be of clean sand or gravel with not more than 10% by weight passing the #200 sieve.

##### **4. Base Course:**

a. Roadways and shoulders shall be provided with a foundation in accordance with the requirements of Figure 6B and Table 1. The material shall be placed in two equal lifts and compacted to a minimum depth of six inches (6") per lift and compacted to 95% of maximum

density as determined by the modified Proctor Test in accordance with ASTM D-1557 Method D. Compaction equipment shall be a vibrating mechanical roller of a size and type adequate to produce the densities required by these Rules and Regulations. Material shall meet the requirements of M1.03.1 of the Mass. DPW Standard Specifications for processed gravel subbase.

**5. Pavement:**

a. Roadway pavement shall be installed in two-courses of Class I bituminous concrete to the depths indicated on Table 1. The job mix formula shall meet the requirements of M3.11.03 of the Mass. DPW Standard Specifications for top and binder courses. No pavement work shall be done during rainy weather, upon surfaces which have standing water, are saturated or contain frost. No pavement work shall be done before April 1 nor after November 30 or when the temperature is lower than 40 degrees Fahrenheit, unless authorized in writing by the Town Engineer. At all intersections, roadway pavements shall have a radii as indicated on Table 1.

**6. Berms:**

a. Berms, as shown in Figures 6A and 6B, concrete or granite curbing shall be installed along the edges of all proposed travelways.

**7. Sideslopes:**

a. Roadway side slopes shall be three feet (3') horizontal to one foot (1') vertical or flatter. Upon the approval of the Board, a side slope of two feet (2') horizontal to one foot (1') vertical may be allowed. In any area where fill height exceed six feet (6') with sideslopes steeper than 3:1, a highway guardrail of a type approved by the Board may be required.

**8. Topsoiling and Seeding:**

a. All areas disturbed during roadway construction shall be graded to blend into undisturbed areas and top covered with six inches (6") of screened loam, free of debris, fertilized and seeded. All disturbed areas shall be hydroseeded using a seed mixture as follows:

	<u>Prop.</u>	<u>Germ. Min.</u>	<u>Purity Min.</u>
<b>Shoulders &amp; Slopes</b>			
Creeping Red Fescue	50%	85%	95%
Kentucky 31	30%	85%	95%
Domestic Rye	10%	90%	98%
Red Top	5%	85%	92%
Ladino Clover	5%	85%	96%

All seeded areas must be fully germinated before release of final covenant. Alternate seeding methods may be used with the approval of the Town Engineer.

**B Utilities:**

All utilities shall be located underground prior to installation of the binder course and in accordance with Figures 2 thru 5 and the requirements of the respective utility company. Water systems shall be installed in accordance with the standards of the Dennis Water District. It shall be the responsibility of the applicant to obtain all permits and approvals, both municipal and private, necessary to connect the proposed utilities with existing utility systems.

**C Sidewalks:**

Sidewalks, where required by the Board, shall be constructed to a minimum width of four feet (4'). They shall be constructed of two inch (2") compacted thickness bituminous concrete. Sidewalks shall be laid over a base of six inches (6") compacted gravel base. Applicable construction methods shall meet those outlined under Section 6, Streets and Roadways.

**D Guardrails:**

Highway guardrails shall be installed where required by the Board. Construction of the guardrails shall be in accordance with Mass. DPW Standard Specifications for Highways and Bridges. Historic District approval may be required.

# Appendix 1

## Drainage Design

# Appendix 1

## A Drainage Design

The following calculation method is suggested; other methods may be used with the approval of the Town Engineer.

1. The Rational Method should be used for all drainage calculations. Drainage calculations and appropriate drawings shall be submitted with the application for the Definitive Plan.

2. The runoff coefficients (C) are listed as follows; (includes parking areas and driveways):

<u>Type of Surface</u>	<u>Runoff Coefficient (C)</u>
Concrete or Bituminous Concrete	0.8 - 0.9
Gravel	0.4 - 0.6
Bare Earth	0.2 - 0.8
Steep Grass Slopes (2:1 or more)	0.5 - 0.7
Turf Meadows (Gentle Slope)	0.1 - 0.4
Cultivated Fields (Gentle Slope)	0.2 - 0.4
Forested Areas (Gentle Slope)	0.2 - 0.3

If variable surfaces exist within a drainage area, the average C value will be determined by the following formula:

$$C_{ave.} = \frac{C_1A_1 + C_2A_2 + C_3A_3 + \dots + C_NA_N}{A_1 + A_2 + A_3 + \dots + A_N}$$

Where  $C_{ave.}$  = Average C Value for Area

$C_N$  = C Value for Drainage Area<sub>N</sub>

Where  $A_N$  = Area of Drainage Area<sub>N</sub> in Acres

3. The rainfall intensity (I) shall be determined from the rainfall intensity curves. Starting at the left of the curve, the distance is the greatest measured distance of water runoff from the highest to the lowest elevation. Plot a horizontal line from the appropriate distance to the % slope (% slope is the

difference in elevation divided by the distance times 100). From the appropriate % slope, plot a line vertically downward until it intersects the C Value curve; thence plot a line horizontally to the right until it intersects the storm frequency curve for the appropriate class road. Now, plot a line vertically downward and read the rainfall intensity in inches per hour.

**4. Calculate the rate of runoff using the Rational Method Formula:**

$$Q = CIA$$

Where: Q = Rate of runoff in cubic feet per second  
 C = Runoff Coefficient  
 I = Rainfall intensity in inches per hour  
 A = Drainage area in acres

Convert Q from cubic feet per second to gal. per min as follows:

$$Q(\text{gal/min}) = Q(\text{cf/sec}) \times 60 (\text{sec/min}) \times 7.48 (\text{gal/cf})$$

**5. The ratio of square feet of leaching area provided to Q(gal/min) shall not exceed the following value:**

	<u>Ratio</u>
Soil Percolation Rate	Q(gal/min) ÷ Leaching Area (sf)
Less than 2 min/inch	0.9
2 min/inch to 8 min/inch	0.5
8 min/inch to 12 min/inch	0.2
12" - unsuitable for leaching basin	

**6. A minimum of one deep soil pit and a percolation test shall be required at each proposed leaching area. Additional tests may be required at the discretion of the Engineering Department. Location of all soil test shall be shown on the construction plan.**

**TABLE 1**

	Collector Street	Secondary Street	Minor Street	Way *
Minimum right-of-way width (feet)	50	50	40	40
Minimum Roadway width - not including curbing (feet)	24	22	20	18
Sidewalks (number)	1	1	--	--
Minimum centerline radius (feet)	500	300	150	100
Grade: a. maximum percent b. minimum percent	5% 1%	7% 1%	7% 0.75%	10% 0.75%
Minimum radius at edge of Roadway at edge of property line (feet)	50	30	25	25
Minimum length of vertical curve (feet)	200	150	100	100
Storm frequency for drainage calculations	50 years	25 years	25 years	25 years
Storm frequency for cross culverts sizing	100 years	50 years	50 years	50 years
Pavement, compacted thickness (inches)	4" total 2.5" binder 1.5" finish	3" total 2" binder 1" finish	3" total 2" binder 1" finish	3" total 2" binder 1" finish
Base, compacted thickness (inches)	6" dense graded crushed stone 12" gravel	4" dense graded crushed stone 12" gravel	2" dense graded crushed stone 10" gravel**	2" dense graded crushed stone 6" gravel***

\* Specifications may be waived at the discretion of the Planning Board

\*\* A total of 8" of dense graded crushed stone may be used at the discretion of the Planning Board

\*\*\* A total of 6" dense graded crushed stone may be used at the discretion of the Planning Board

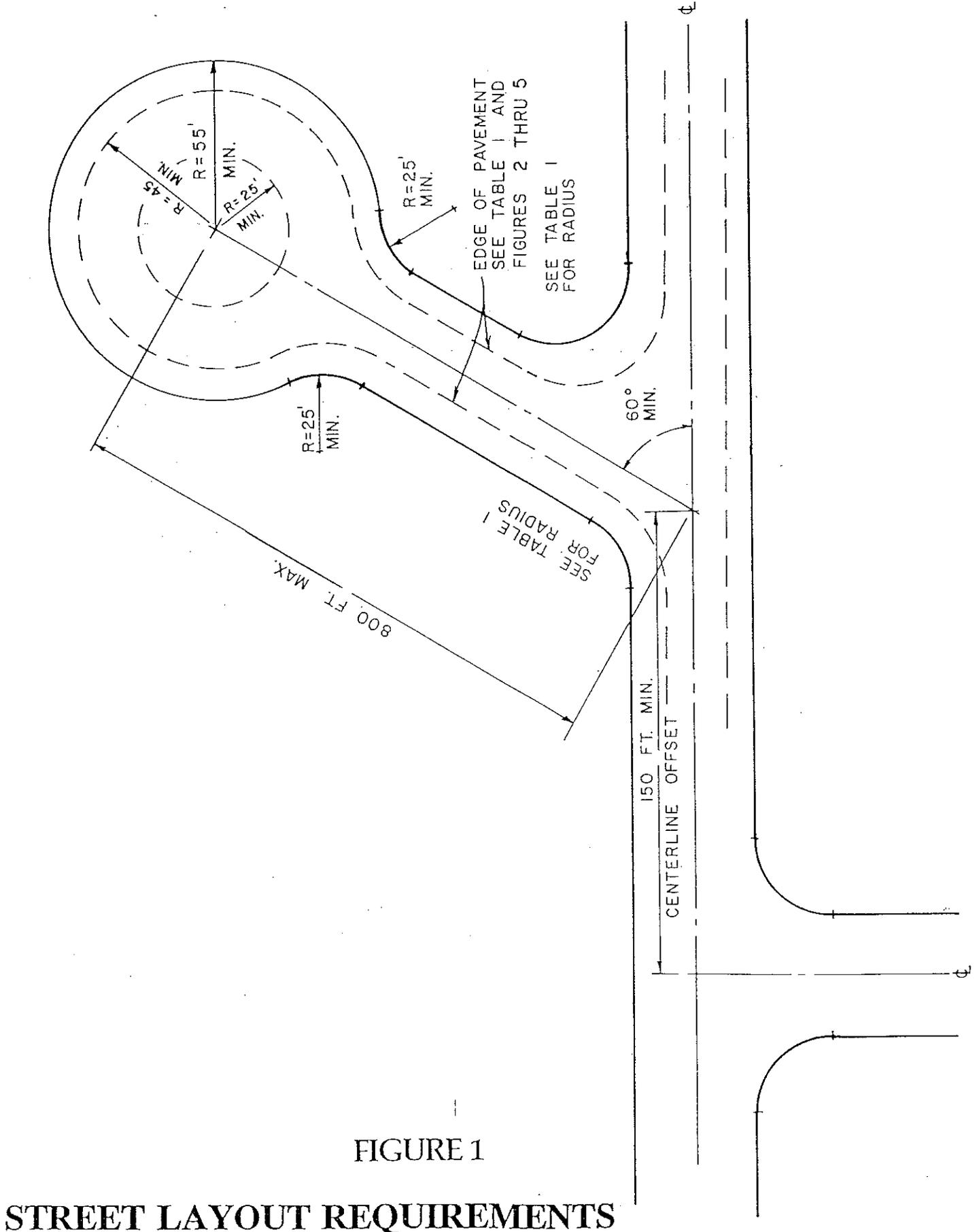
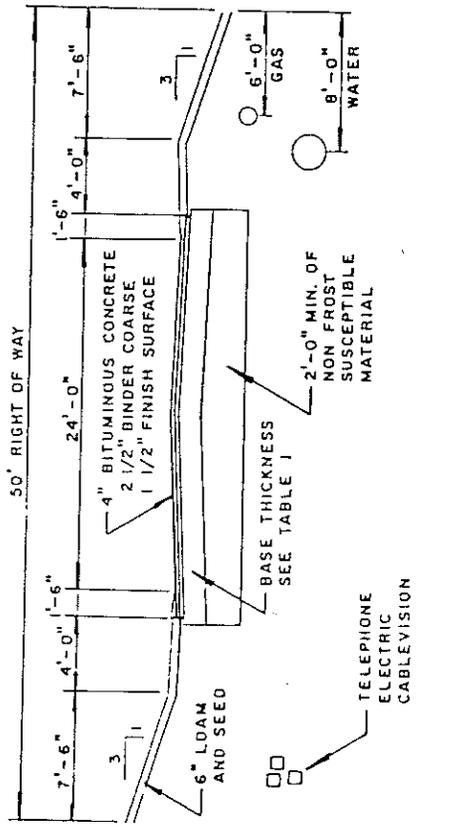


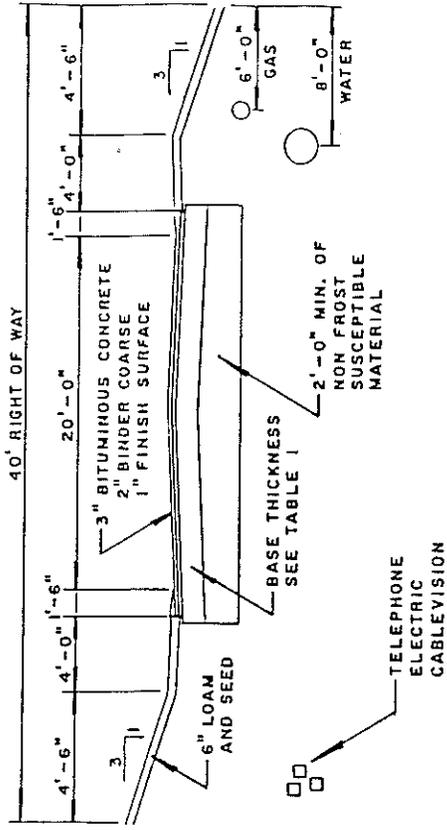
FIGURE 1

**STREET LAYOUT REQUIREMENTS**

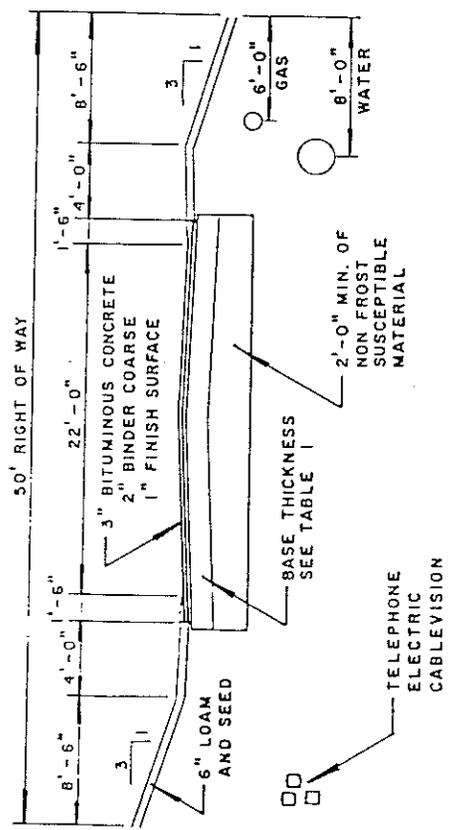
# TYPICAL SECTIONS



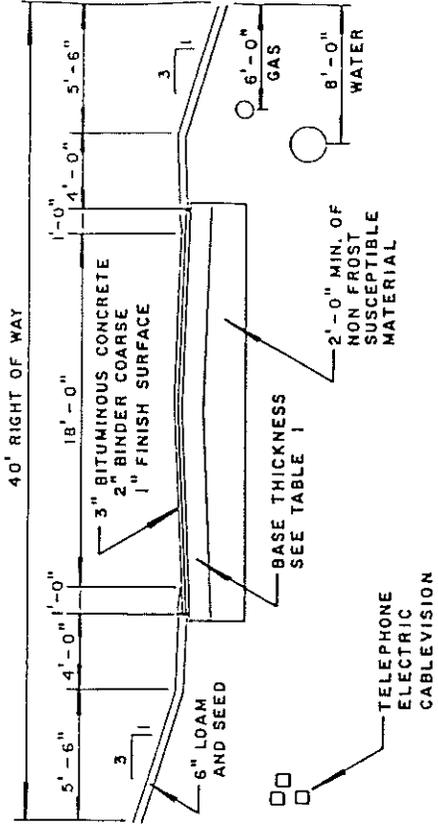
COLLECTOR STREET  
FIGURE 2



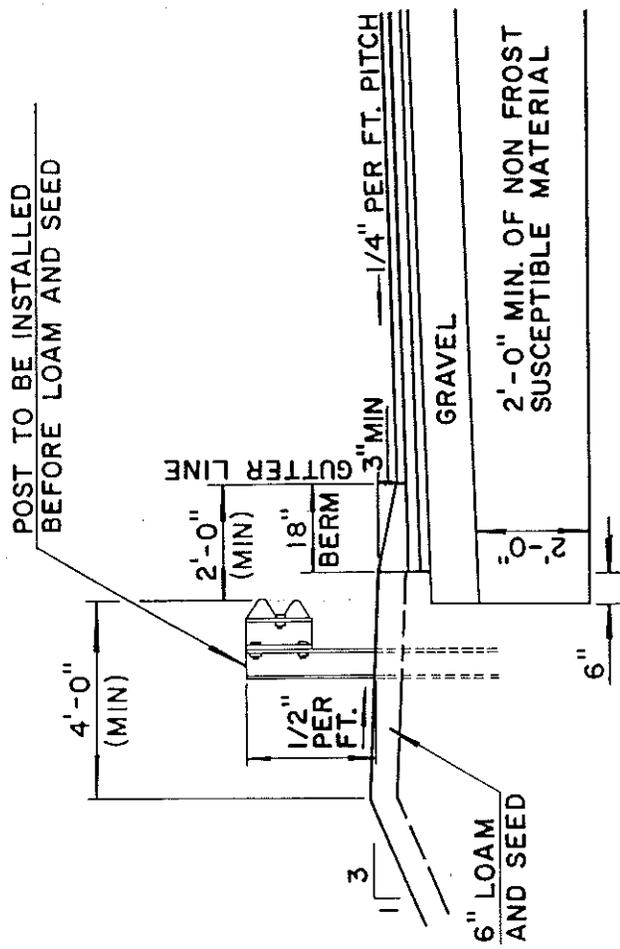
MINOR STREET  
FIGURE 3



SECONDARY STREET  
FIGURE 4



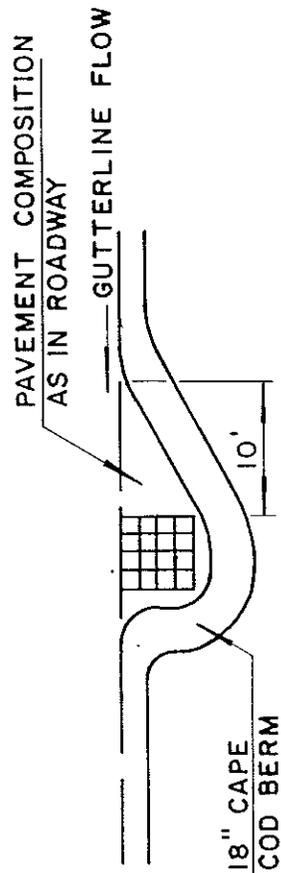
WAY  
FIGURE 5



SEE TABLE 1 FOR BASE, BINDER COARSE AND FINISH SURFACE THICKNESSES (PAGE 28)

SHOULDER DETAIL  
NOT TO SCALE

FIGURE 6B



COLLAR DETAIL  
NOT TO SCALE

FIGURE 6A



NOTE:

ALL HAY BALES SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION UNTIL SOILS HAVE SUFFICIENTLY STABILIZED.

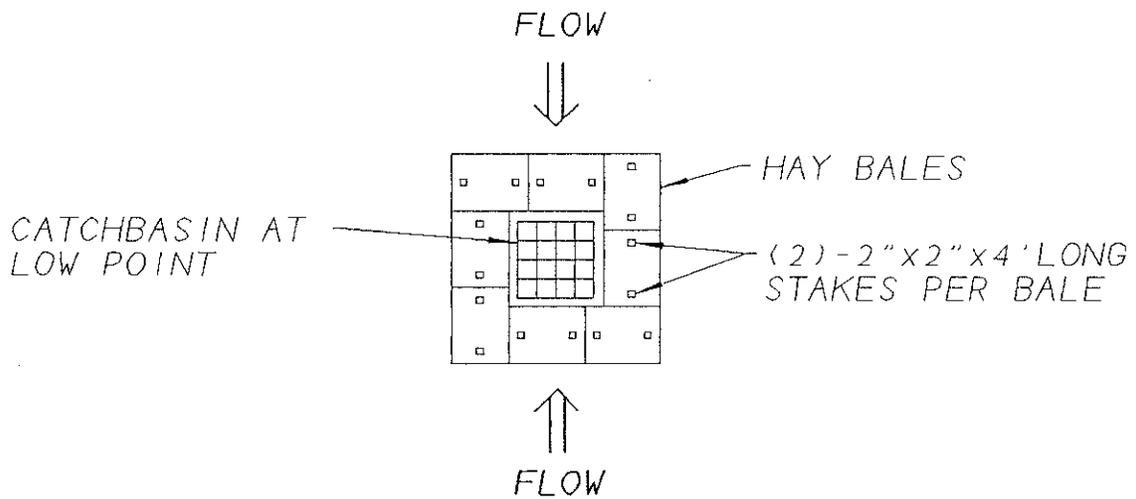
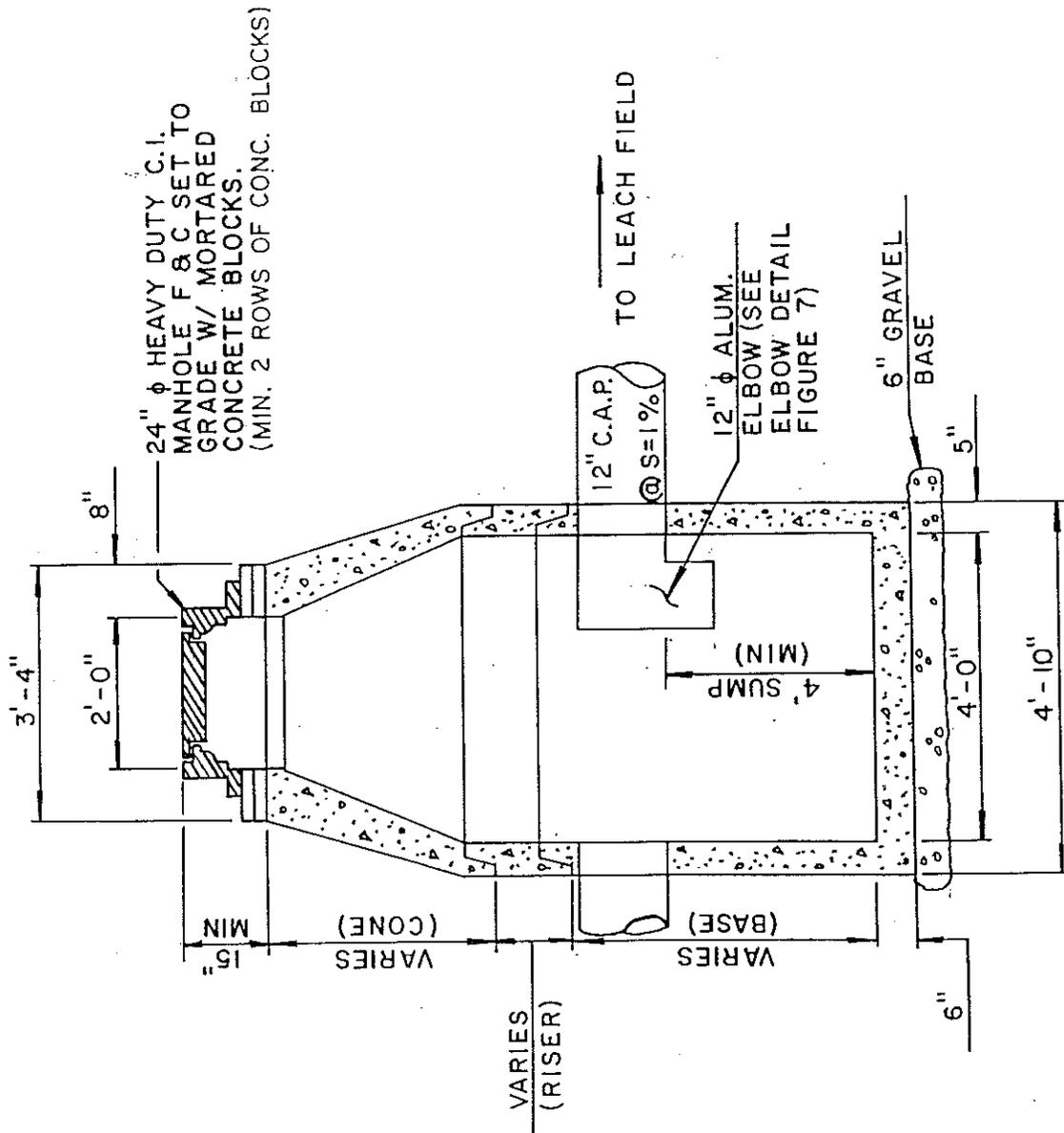


FIGURE 8  
SEDIMENT CONTROL DETAIL



TYPICAL MANHOLE  
NOT TO SCALE

FIGURE 9

## **Appendix 2**

# **Plan and Application Checklists**

**TOWN OF DENNIS  
PLANNING BOARD**

**Approval Not Required Plan Checklist**

Petitioner: \_\_\_\_\_

Meeting: \_\_\_\_\_

- 1. Application submitted
- 2. Fee paid
- 3. Five (5) copies of plan submitted
- 4. Names and addresses - Owner of record, Petitioner, Surveyor
- 5. Deed reference noted on plan
- 6. Plan reference noted on plan
- 7. Wetlands Protection Act noted, if applicable
- 8. Date of application noted on plan
- 9. Location and setbacks of all buildings on lot(s) including buildings on abutting lots within fifteen feet (15') of property line
- 10. Minimum square footage and frontage on an approved way
- 11. Minimum width at building line
- 12. Abutters listed
- 13. Gross area (square feet and acres)  
Net area of each lot (square feet) - Parcel (square feet and acres)  
Gross area of wetlands and upland (square feet and acres)  
Net area of wetlands and upland (square feet and acres)
- 14. North arrow, locus sketch, date and scale
- 15. Seal, certification, as applicable, and signature of Registered Land Surveyor
- 16. Land suitable for building
- 17. Calculated ties (bearing and distance) across open perimeter

**TOWN OF DENNIS  
PLANNING BOARD**

**Preliminary Subdivision Plan Checklist**

**Petitioner:** \_\_\_\_\_

**Meeting:** \_\_\_\_\_

- 1. Application filed and fee paid
- 2. Seven (7) copies of plan
- 3. Name and address - owner of record
- 4. Name and address - petitioner, subdivider
- 5. Name and address - surveyor
- 6. Deed Reference and Plan reference noted on plan
- 7. Location and setbacks of all buildings on lot including buildings on abutting lots within 15 feet (15') of the property line
- 8. Lot lines with appropriate dimensions
- 9. Minimum square footage lots
- 10. Minimum frontage on an approved way
- 11. Name and addresses of abutters noted
- 12. Land suitable for building
- 13. Proposed public areas
- 14. Two foot (2') contours if adjacent to tide water relative to mean high water
- 15. All ways, easements and right-of-ways shown on plan
- 16. North arrow, scale, locus sketch
- 17. Location of existing water mains, gas line, electric lines and/or poles
- 18. Board of Health approval and/or restrictions

**TOWN OF DENNIS  
PLANNING BOARD**

**Definitive Subdivision Plan Checklist**

Petitioner: \_\_\_\_\_

Meeting: \_\_\_\_\_

- 1. Application form
- 2. Fee
- 3. Eight (8) copies of definitive plan
- 4. Eight (8) copies of construction plan and profile plan
- 5. One (1) copy each of subdivision plan at one inch equals one hundred feet (1" = 100') and one inch equals two hundred feet (1" = 200')
- 6. Two (2) copies of drainage calculations
- 7. Preferred method of road compliance (covenant)
- 8. Name and address - petitioner, subdivider
- 9. Name and address - owner of record
- 10. Name and address - surveyor
- 11. Dates of:
  - preliminary application
  - preliminary approval
  - definitive application
  - definitive approval
  - definitive plan signed
- 12. Calculations for:
  - gross area of subdivision (square feet and acres)
  - gross area of road and cul-de-sacs (square feet and acres)
  - gross area of wetland and upland (square feet and acres)
  - area of each lot/parcel (square feet and acres)
  - upland and wetland for each lot or parcel (square feet and acres)

13. Location of:
- all existing buildings
  - test holes and pits, water table or spot elevation measurements with date taken
  - existing and proposed streets, ways, lots, easements and public or common areas within and bounding the subdivision
  - existing storm drains, water mains, utilities and their appurtenances, including hydrants, within and adjacent to the subdivision
  - zoning district boundaries
14. Notations:
- abutting parcels and owners
  - deed and plan references
  - north arrow, locus sketch, bench marks, date and scale
  - ties across open perimeter (bearing and distance)
  - Wetlands Protection Act, if applicable
  - underground utilities to be installed
  - covenant to be filed with plan
  - seal, signature and certification of Registered Land Surveyor
  - shape factor
15. Approval/restrictions (for internal use only)
- Board of Health
  - Conservation Commission
  - Engineering Department
  - Fire Department
  - Police Department
  - Assessor's Office
16. The following is required for Open Space Village Developments only:
- date of Open Space application
  - date of Open Space approval
  - minimum Open Space dedication
  - number of lots
  - road area
17. Attachments (to be filed with application prior to hearing)
- protective covenants
  - restructuve easements (if required)
  - Notice of Intent filed with Conservation Commission (if required)