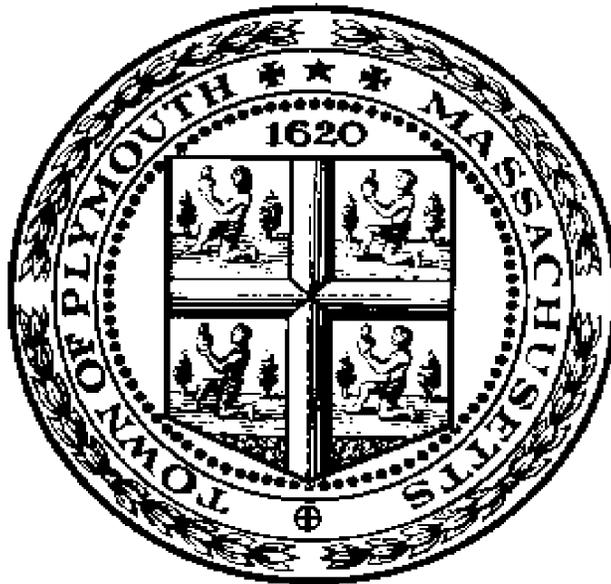


# **RULES AND REGULATIONS GOVERNING THE SUBDIVISION OF LAND**



Adopted under the Subdivision Control Law  
Section 81-K through 81-GG inclusive, Chapter 41  
Massachusetts General Laws

Original Adoption: October 26, 1970  
As Amended Through: April 28, 2008

**PLYMOUTH PLANNING BOARD**  
Plymouth, Massachusetts

This is a copy of the Rules and Regulations Governing the Subdivision of Land, Plymouth, Massachusetts, as adopted and amended:

Adopted ..... October 26, 1970

Amended..... October 9, 1979  
 Section 221  
 Section 508

Amended..... July 29, 1980  
 Section 307, Paragraph 3  
 Section 316, Paragraph 3  
 Section 415  
 Section 417, Paragraph 3  
 Plate 7

Amended..... December 2, 1980  
 Section 413, Paragraph 4

Amended..... December 30, 1980  
 Section 422

Amended..... August 24, 1982  
 Section 202  
 Section 427

Amended..... June 7, 1983  
 Section 202

Amended..... October 6, 1987  
 Section 106

Amended..... January 12, 1988  
 Section 406  
 Section 408  
 Section 428

Amended..... February 23, 1988  
 Section 208  
 Section 212  
 Section 214

Amended..... August 9, 1988  
 Section 405

Section 407  
 Section 415  
 Plates 1, 1A, 4, & 7

Amended..... January 3, 1989  
 Section 405

Amended..... February 21, 1989  
 Section 505

Amended..... November 7, 1989  
 Section 202  
 Section 207  
 Section 217  
 Section 218  
 Section 219  
 Section 220  
 Section 303  
 Section 310  
 Section 314  
 Section 407

Amended..... November 29, 1990  
 Section 404

Amended..... March 30, 1993  
 Section 202

Amended..... August 10, 1993  
 Section 316  
 Section 406  
 Section 407

Amended..... November 2, 1993  
 Section 405  
 Section 307

Amended..... August 30, 1994  
 Section 406

Amended..... March 21, 1995  
 Section 313  
 Section 408  
 Section 411

Amended.....August 9, 1999  
 Section 206  
 Section 207  
 Section 210  
 Section 219  
 Section 222  
 Section 305  
 Section 306  
 Section 313  
 Section 505  
 Section 221

Amended.....August 30, 1999  
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 Section 302

Amended.....September 18, 2000  
 Section 221  
 Section 302

Amended.....May 7, 2001  
 Section VII

Amended.....April 14, 2003  
 Section 202  
 Section 206  
 Section 210  
 Section 211  
 Section 222  
 Section 313  
 Section 314  
 Section 315  
 Section 316  
 Section 317  
 Section 318  
 Section 319

Amended.....July 19, 2004  
 Section 311

Amended.....	April 28, 2008
Section 105	(Paragraph No. 3)
Section 106	(Paragraph No. 2)
Section 202	(Paragraphs No. 1, 3, 4 and 5)
Section 206	(Paragraphs No. 1 and 2)
Section 207	(Paragraphs No. 1, 3 and 8)
Section 210	(and including Paragraphs No. 1, 2, 3, 5 (added), 6 and 7)
Section 211	(Paragraph No. 1)
Section 217	(Paragraph No. 7)
Section 219	(Paragraphs No. 6 and 8)
Section 222	(Paragraphs No. 1, 2, 3a, 3c, 3e and 4)
Section 301	(first sentence)
Section 303	(Paragraphs No. 1, 3 Temporary Stabilization, 3 Permanent Stabilization, 3 Temporary Sediment Control for Drainage, 3 Responsibility, 3 Protection of Existing Trees)
Section 306	
Section 307	(Paragraph 1, 2 and 3)
Section 308	(Paragraph 5)
Section 309	(Paragraphs No. 4 and 6)
Section 310	(Paragraphs No. 1, 2 and 4)
Section 311	(Paragraphs No. 2 and 3)
Section 314	(added)
Section 314	(becomes Section 315, also amendments to opening Paragraph and Paragraphs No. 1, 4, 6, 7 and 8)
Section 315	(becomes Section 316, also amended)
Section 316	(becomes Section 317, also amended first sentence and No. 5)
Section 317	(becomes Section 318, also amended No. 3)
Section 318	(becomes Section 319)
Section 319	(becomes Section 320)
Section 321	(added)
Section 401	(adds Paragraph No. 7 and 8)
Section 404	(first sentence of third paragraph added)
Section 405	(Paragraph No. 3)
Section 406	(Paragraphs No. 1 and 2)
Section 407	(Paragraphs No. 1A, 1F and 6)
Section 408	(Paragraph 2)
Section 410	(Paragraph 2)
Section 411	(replaced)
Section 413	(Paragraphs 2, and 4A 4 <sup>th</sup> paragraph)
Section 414	(Paragraphs No. 1 and 3)
Section 415	(Paragraph 3A 3 <sup>rd</sup> paragraph and 3B 3 <sup>rd</sup> paragraph)
Section 416	
Section 417	(Paragraphs 1 and 3)

Amended (continued) .....April 28, 2008  
Section 423  
Section 427 (added)  
Section 427 (becomes Section 428)  
Section 428 (becomes Section 429, also amends Inspection No. 2 and Paragraph No. 3)  
Section 429 (becomes Section 430, also amends first paragraph)

Section 501  
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Section 506  
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Section 601  
Section 602 (Paragraph 6)

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Article VIII (added)

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**ARTICLE I GENERAL PROVISIONS**

101 Authority

Under the authority vested in the Planning Board of the Town of Plymouth by Section 81-Q of Chapter 41 of the General Laws of the Commonwealth of Massachusetts, and by all other applicable sections of the Subdivision Control Law and other enabling laws, said Planning Board hereby adopts these Rules and Regulations governing the subdivision of land in the Town of Plymouth. These Rules and Regulations may be cited as the "Subdivision Regulations of the Town of Plymouth".

102 Purpose

These regulations are adopted to establish standards for and to regulate the subdivision of land in the Town of Plymouth in accordance with the purposes set forth in Section 81-M and other applicable sections of Chapter 41 of the General Laws.

103 Intent

It is the general intent of these Rules and Regulations to regulate the division and development of land in the Town of Plymouth so as to:

1. Further the orderly and appropriate use of land in the Town.
2. Assure sites suitable for building purposes and human habitation.
3. Coordinate existing streets with proposed streets, parks, or other features of the Town.
4. Assure the provision of uniform streets and ways throughout the Town.
5. Assure the provision of required improvements at standards acceptable to the Town.

104 Jurisdiction

1. Subdivision Control

No person, firm, or corporation shall subdivide any lot, tract, or parcel of land, or construct any street, sanitary sewer, storm sewer, water or drainage facility, until definitive plans of such subdivision have been prepared by a registered professional engineer, or registered land surveyor, and submitted to, and approved by the Planning Board, as hereinafter provided.

## 2. Plan Recording; Sale of Lots

No subdivision plan shall be recorded, and no lots in subdivision sold, unless a definitive plan has been approved by the Planning Board as hereinafter provided.

## 3. Issuance of Building Permits

No building permit shall be issued for a lot within a subdivision unless a definitive plan for such subdivision has been recorded or entitled to be recorded, except that the Board of Appeals may by vote grant exception and issue a building permit if the circumstances of the case do not require that a building be related to a way shown on a subdivision plan.

## 105 Definitions

1. Applicant - A property owner, or his agent or representatives, or his assigns.
2. Board - The Planning Board of the Town of Plymouth.
3. Designer - Professional Engineer (civil) or Professional Land Surveyor registered to practice in Massachusetts. All work defined as professional engineering shall be done by or under the direct supervision of a registered professional engineer, and all work defined as professional land surveying shall be done by or under the direct supervision of a registered land surveyor.
4. Easement - A grant of the use of a parcel of land for the use of the public, a corporation, or person, for a specific purpose.
5. Board's Engineer - The registered professional engineer acting as the designated agent of the Planning Board.
6. Improvements - Those physical additions, installations, and changes, such as streets, curbs, sidewalks, water mains, sewers, drainage facilities, public utilities, and other appropriate items required to render land suitable for the use proposed.
7. Lot - An area of contiguous land in one ownership, with definite boundaries, used, or available for use, as the site of one or more buildings.
8. Roadway or Traveled Way - The portion of a street intended for vehicular use.
9. Recorded - Shall mean recorded in the Registry of Deeds of Plymouth County, except that as affecting registered land, it shall mean with the recorder of the Land Court.
10. Street or Way - A way, street, or road open and dedicated to public use, including a public way or a way certified by the Town Clerk to have been used and maintained by public authorities as a public way, a way approved and constructed under the provisions of the Subdivision Control Law, or a private way in existence prior to said

Subdivision Control Law having become effective in the Town of Plymouth and having, in the opinion of the Board, adequate width, grades, and construction for the vehicular traffic and the installation of municipal services to serve the land abutting on such way and the buildings erected or to be erected thereon.

11. Subdivision - the division of a tract of land into two or more lots including resubdivision except that the establishment of lots having adequate frontage under the Zoning Bylaw, on a recognized street or way, shall not be considered a subdivision.
12. Subdivision Control Law - Sections 81-K to 81-GG of Chapter 41 of the General Laws and any acts in amendment thereof, addition thereto or substitution therefor.
13. These Rules and Regulations - The "Subdivision Regulations of the Town of Plymouth" as adopted and amended by the Planning Board pursuant to Section 81-Q of the Subdivision Control Law.
14. Town - The Town of Plymouth, Massachusetts.
15. Utilities - Same as municipal services, may include sanitary sewers, storm water drains, water supply piping, fire alarm conduits electric, cable, fiber-optic and telephone wiring and all appurtenances thereof.

## 106 Plans Not Requiring Approval

### 1. Criteria

Any plan of land to be recorded which is not a subdivision, according to Section 105 (11) of these Rules and Regulations, and Section 81-L of the Subdivision Control Law, (Definition of Subdivision), does not require the approval of the Board. Such plans do require the Board's endorsement as specified below.

### 2. Submission of Plans

Any person wishing to cause to be recorded a plan which he believes is not a subdivision may submit to the Board such plan suitable for recording, accompanied by two full size copies, by a completed application Form A in duplicate and by other evidence necessary to enable the Board to determine that the plan does not show a subdivision within the meaning of these Rules and Regulations. Such information shall include but shall not necessarily be limited to the delineation of lot area and frontage, and the buildings on any lot or parcel of land the boundaries of which are being established, changed or to be recorded without change.

The date of submission of the plans and application shall be taken to be the date of the first regularly scheduled meeting of the Board after such plans and application have been received by the Board's representative, or the meeting at which such plans and application are submitted by the applicant.

### 3. Endorsement of Plan Not Requiring Approval

If the Board determines that the plan does not require approval, it shall without public hearing and within twenty-one (21) days from the date of submission, endorse on the plan the words "Approval Under the Subdivision Control Law Not Required", in the space provided therefore.

### 4. Determination that Plan Requires Approval

If the Board determines that the plan does require approval under these Rules and Regulations, it will so inform the applicant in writing, and return the plan the Board will also notify the Town Clerk in writing of its action.

### 5. Failure of the Board to Act

If the Board fails to act upon a plan submitted under this section or fails to notify the Town Clerk and the person submitting the plan of its action within twenty-one (21) days after its submission, it shall be deemed that approval under these Rules and Regulations is not required, and it shall thereafter make such endorsement on said plan, and on its failure to do so, the Town Clerk shall issue a Certificate to the same effect.

**ARTICLE II SUBMISSION PROCEDURE AND PLAN ENDORSEMENTS**

200 General

201 Approval Required

No person shall subdivide any land in the Town of Plymouth or cause to be recorded any such subdivision plan unless such plan is approved by the Board in accordance with the procedures and requirements of these Rules and Regulations.

No subdivision plan shall be approved unless it complies with the applicable provisions of zoning and other Town bylaws and regulations and of the General Laws, nor unless, in the opinion of the Board such subdivision meets the requirements of public safety, including traffic safety and convenience, adequate water supply, sewerage disposal and drainage facilities. Proposed plans shall adhere to the principals of correct land-use, sound planning, and good engineering.

202 Fees and Deposits

1. Administration

When filing an Approval Not Required Plan, Preliminary Plan, or Definitive Plan the following Filing and Review Fee Schedule shall apply:

- A. Approval Not Required Plan  
\$ 250.00 Per Plan  
Plus \$ 150.00 Per Newly Created Buildable Lot  
\$ 75 for a Lot Line Adjustment
- B. Preliminary Plan  
\$ 500.00 Per Plan  
Plus \$ 100.00 Per Newly Created Buildable Lot
- C. Definitive Plan with a Preliminary Plan  
\$ 1,000.00 Per Plan  
Plus \$ 200.00 Per Newly Created Buildable Lot
- D. Definitive Plan without a Preliminary Plan  
\$1,500.00 Per Plan  
Plus \$ 300.00 Per Newly Created Buildable Lot
- E. Modification of a Definitive Plan  
\$ 250.00 Per Plan  
Plus \$ 50.00 Newly Created Buildable Per Lot

F. Waiver of Frontage Plan  
\$ 25.00 Per Plan  
Plus \$ 10.00 Per Lot

- \* The Administration Fee covers the cost incurred by the Town for the processing of legal documents, site inspections, consultations with staff, meetings, contingency account maintenance, bond reductions, etc. If a definitive plan is not approved the administration fee will be returned to the applicant.

2. Materials:

Advertising notices - Costs to develop and/or confirm a list of abutters entitled to receive notice of any hearing, action, etc. of the Board with respect to the plan; plus costs to run all required legal advertisements in appropriate newspapers or other media.

3. Consultants:

Cost of Town's consultants to provide services to the Town including but not limited to processing of legal documents associated with the subdivision, and review of plans and calculations, inspect construction works, estimate costs to complete required improvements and prepare reports on proposals, plans and construction works, and the extent to which they do or do not meet the Board's Rules and Regulations.

4. Amount of Deposit for Consultant costs:

The deposit shall be equal to: \$3.00 per lineal foot of roadway but not less than \$2,000 minimum; **and** \$2.00 per linear foot of public water main during construction, \$1,000 minimum for residential and minimum \$5,000 for commercial developments. The minimum balance above shall be maintained until such time as the project is substantially completed. Upon completion of the subdivision any unused portion of the Deposit shall be returned to the applicant.

5. Account Detail:

Upon request, the Board shall make available to the developer detailed accounting of expenses incurred for which withdrawals have been made. The cost for such accountings shall be assessed against the developer's deposit.

203 Correctness of Plans

The Board assumes any plans submitted for its approval or endorsement to be correct; unless otherwise notified. The acquisition of necessary rights and the presentation of complete and correct information to the Board are responsibilities of the applicant, and the failure to do so, including the failure to obtain all necessary permits, licenses, releases or rights may constitute a reason for the disapproval or rescission of approval of a subdivision plan.

204 One Dwelling Per Lot

Not more than one building designed or available for use for dwelling purposes shall be erected or placed or converted to use as such on any lot in a subdivision or elsewhere in the Town without the consent of the Board and such consent may be conditioned upon the provision of adequate access and egress to each site for such building in the same manner as otherwise required for lots within a subdivision.

**PRELIMINARY PLANS**

205 Purpose

The Board strongly recommends but does not require the submission of preliminary plans for all proposed subdivision. The purpose of a preliminary plan is to provide for the detailed review of the layout and features of the proposed subdivision by the Board, and other Town agencies and Boards. Changes required by the Board in preliminary plans are to be incorporated in definitive plans, thus saving the effort and expense of the applicant. Tentative approval of preliminary plans may be given by the Board.

206 Procedure

Any person filing a preliminary plan may submit to the Planning Board a preliminary plan, and shall give written notice to the Town Clerk by delivery or by registered mail, postage prepaid, that he has submitted such plan.

1. Two (2) completed "Application for Preliminary Plan", (Form B). One such form shall be directly forwarded by the applicant to the Town Clerk.
2. Six (6) contact prints and nine (9) 11" x 17" reduced copies of the prints, dark line on white paper, of the preliminary plan, showing the requirements of Section 207 of these Rules and Regulations, to be distributed by the Board as follows:

Planning Board.....2 copies and Original, 7 reduced  
 Fire Chief ..... 1 copy reduced  
 Town Engineer ..... 1 copy  
 Board of Health..... 1 copy reduced  
 Conservation Commission..... 1 copy  
 Water and Sewer.....1 copy, if connections to public system  
 ..... are shown

The Town Engineer, Water and Sewer Commissioners, and Conservation Commission

within thirty (30) days of receipt of such submission may each make a report in writing to the Board. Such report shall be considered by the Board in making its findings on the submission. If no report is received by the Board within thirty (30) days, the Board will assume these agencies have no adverse comments on the proposed subdivision.

## **PRELIMINARY PLAN REQUIREMENTS**

### 207 Components

1. Plans shall be on consecutively numbered sheets of uniform size 18"x24" or 24"x36."
2. Subdivision name, boundaries, north point, locus, date, scale, legend, and title "Preliminary Plan".
3. Names and addresses of record owner, applicant, and designer, and recording information as to record owner.
4. Names of all abutters, including property owned by the applicant, the names, approximate location and width of all adjacent streets.
5. The existing and proposed lines of streets, ways, easements, and any public areas within or next to the subdivision.
6. The approximate boundary lines of proposed lots showing approximate areas and dimensions.
7. The topography of the land in general manner; proposed alterations in topography, if significant.
8. The proposed drainage system, including adjacent existing natural waterways, and major proposed drainage improvements, consistent with "A Guide for the Design of Storm Drainage Facilities in the Town of Plymouth, Massachusetts, as amended".
9. Location of existing buildings, species and size of trees larger than six (6) inches in breast height diameter (diameter at breast height of mature man) standing alone and within the proposed right-of-way, the outline of wooded areas, marshy areas, areas subject to inundation, and other data which may serve to affect the street or building layout.
10. General indication as to intended method of water supply and sanitary sewage disposal or systems.

### 208 Preliminary Plan Approval

As soon as is practicable, and in no case more than forty-five (45) days after the submission of preliminary plans, the Board and the Public Safety Commission shall

notify the applicant and the Town Clerk whether such submission has been not accepted as a complete and accurate plan, approved with modifications, or disapproved giving specific reasons for disapproval. If a VOTE to “Not to Accept” plan is taken, the plan will be considered incomplete and will not have a legal date of submission. Approval in no case constitutes approval of the proposed subdivision, but does provide for the direct processing of definitive plans. In the case of nonresidential subdivisions a preliminary plan must be filed prior to submitting a definitive plan.

## **DEFINITIVE PLAN SUBMISSION**

### 209 Purpose

The Board requires the submission of definitive plans for all proposed subdivisions. The definitive plan provides: the basis for the formal review and approval of the definitive plan after a public hearing, entitles the applicant to cause such plan to be recorded, and to proceed with the subdivision and improvement of the land as provided by these Rules and Regulations.

### 210 Procedure

A definitive plan of a subdivision may be submitted by delivery to the Board at a scheduled meeting, or by registered mail to the Planning Board. If so mailed, the date of receipt shall be the date of submission of the plan. Such plans shall be considered accepted for submission unless within two (2) weeks the Board determines the submission to be incomplete in which case the date when the submission is complete will be considered the legal date of plan submission. Definitive plans evolved from preliminary plans shall be submitted within seven (7) months of the submission of preliminary plans.

Any person submitting a definitive plan of a subdivision shall file with the Board:

1. Two (2) completed "Application for Definitive Plan" Forms, Form C. One to be delivered to the Town Clerk. Such notice to the Clerk shall describe the land to which the plan relates sufficiently for identification, and shall state the date when such plan was submitted and the name and address of the owner of such land.
2. Designer's Certificate on Form D.
3. Recording information as to record owner.
4. A deposit as required payable as directed to cover expenses for advertising, notices, and mailings, in connection with the submission.
5. Three (3) complete sets of mailing labels or pre-addressed blank business envelopes for notice to abutters, with certified abutters list from the Assessor's Office.

6. An original drawing and six (6) contact prints and nine (9) 11” x 17” reduced copies of the prints, dark line on white paper, of the definitive plan, showing the requirements of Sections 216-222 of these Rules and Regulations.
7. A drainage design analysis as specified in Section 315.
8. Written notification of waiver requests, including:
  - a. Section of Rules & Regulations in which a waiver is being sought.
  - b. Reason why waiver is being sought.
  - c. Mitigation measure (if any) of waiver request and cost/benefit analysis.
9. A list of all necessary permits required to complete the project, including a permit timetable and reason permit is necessary.
10. Proposed residential developments shall provide the information referenced in Section 222 under Conservation of Resources as a part of final plan submission, provided that the development contains 25 acres or more, and meets either of the following criteria:
  - a. Within 500-feet of any publicly owned property (including but not limited to Federal, State, County or Town, but not including public ways)
  - b. Within 500-feet of any property owned or managed by a non-profit agency or private landowner protected under M.G.L. Chapter 61, 61A, or 61B.

211 Review by Local Boards

1. The Board will distribute copies of the definitive plan to various town boards and commissions for their review and comment as follows:
  - Planning Board..... 2 copies and Original, 7 reduced
  - Fire Chief ..... 1 copy reduced
  - Town Engineer ..... 1 copy
  - Board of Health..... 1 copy reduced
  - Conservation Commission..... 1 copy
  - Water and Sewer Dept..... 1 copy, if connections to public system  
..... are shown
2. The Public Safety Commission shall, within forty-five (45) days of receipt of the submission, report to the Board in writing its findings on the definitive plan and whether it approves or disapproves such plan. Should the plan be disapproved, the Public Safety Commission shall make specific findings as to which lots, if any, cannot be used for building sites, and where possible, shall make recommendations for the adjustment thereof.

3. The Town Engineer, Water and Sewer Commissions, and Conservation Commission, may within thirty-five (35) days of receipt of the definitive plan, each make a report in writing to the Board. Such report shall be considered by the Board in making its findings on the submission. If no report is received by the Board within thirty-five (35) days, the Board will assume the particular agency has no adverse comments on the proposed subdivision.

#### 212 Public Hearing

Before approval or disapproval of the definitive plan a public hearing shall be held by the Board, notice of the time and place of which and of the subject matter suitable for identification shall be given in a newspaper of general circulation in the Town, once in each of two successive weeks, the first publication being not less than fourteen (14) days before the date of such hearing, and by mailing a copy of such advertisement to the applicant and to each owner of land abutting or within three hundred (300) feet of the land included in such plan as appearing on the most recent tax list.

#### 213 Performance Guarantee

Before the Board endorses its approval on a definitive plan, the applicant shall make such performance guarantees as required by Article V of these Rules and Regulations.

#### 214 Approval or Disapproval

After the public hearing and not later than 90 days, or 135 days for residential subdivisions where no preliminary plan has been filed, after the submission of the definitive plan, unless an extension of this time limit has been requested in writing by the applicant and granted by the Board, the Board shall by a majority vote approve, with or without modification and conditions, or disapprove such plan. The action of the Board, including any conditions of approval or specific reasons for disapproval, shall be stated in a letter of approval, and filed with the Town Clerk and a copy thereof sent by the Board to the applicant by registered mail. Unless an appeal is taken to the Superior Court from the action of the Board and a written notice of such appeal is received by the Town Clerk within 20 days of the receipt by the Town Clerk of the certificate of action, the Planning Board shall sign the approved definitive plan and refer thereon to any conditions of approval or to any instrument describing such conditions. The applicant shall then at his expense furnish the Board with four (4) sets of full size copies of all drawings comprising the definitive plan and with one complete set of duplicate tracings on tracing cloth.

The approval by the Board of a definitive subdivision plan does not constitute a laying out or acceptance by the Town of the streets within the subdivision as Town or public ways.

## **DEFINITIVE PLAN REQUIREMENTS**

### 215 Components

Definitive plans shall consist of several sheets including the following components:

- a. Title block
- b. Locus map
- c. Lot layout plan
- d. Street and utilities construction plans and profiles
- e. Detailed drawings as required.

### 216 Drafting Standards

The plans shall be drawn to scale 1"=40' or such other scale as the Board may approve, except that locus map and required profiles shall be drawn to the particular scales indicated in Sections 219 and 221 respectively.

1. Plans shall be dark line on clear and legible white paper.
2. Dimensions shall be in feet and decimals to the nearest hundredth of a foot, and the bearings in degrees, minutes, and seconds.
3. Each sheet shall be consecutively numbered.
4. The boundary line of a subdivision shall be shown as a solid heavy line.
5. Plans shall be on sheets of uniform size, 18" x 24", or 24" x 36".

### 217 Title Block

Each sheet shall have a title block containing:

1. The name of the subdivision.
2. The names and addresses of the applicant and designer.
3. Imprint of designer's stamp.
4. Scale, date and north point.
5. The Assessors' Map and Lot(s) being subdivided.
6. The total number of sheets.
7. The dates that revisions are added to the plan.

There shall be provided on each drawing space for endorsement by the Board, including space for reference to any external documents, and space for the signature of the Town Clerk's certificate of no appeal, and for the date of certified approval and covenant recorded herewith.

#### 218 Locus Map

The first sheet of the definitive plan shall include a locus map of the proposed subdivision at a scale of 1"=800' or 1"=1000'.

A lotting plan of the approved subdivision drawn at the same scale as the full Assessors' Maps (1"= 200') shall be submitted to facilitate the revisions of the Assessors' Map.

#### 219 Lot Layout Plan

The lot layout plan shall include:

1. Lot layout, including dimensions and bearings and consecutive numbering of lots, Assessor's plat numbers and the zoning district or districts in which the proposed subdivision is located. A "Buildable Area" shall be shown and defined by the appropriate dimensional setbacks required by the particular Zoning District. The proposed lot numbers must be approved by the Town's Engineering Department.
2. Names and location of all abutters, including abutters who are separated from the subdivision by rights-of-ways and adjacent lands of the applicant, as they appear in the most recent tax list.
3. Proposed street names in pencil, roadway width, and right of way width for all proposed streets.
4. Sufficient data to determine readily the location, bearing and length of every street, lot, and boundary line and to establish these lines on the ground.
5. Accurate locations of all monuments, existing or proposed, one (1) to be placed at each change in direction of boundary.
6. The location, width of all easements or rights of way or public areas, and boundaries by bearings or dimensions. The purpose of such easements or rights of way shall be indicated. In the event that such easements or rights of way shall be granted to the Town, the applicant shall submit easement documents, suitable for recording, deeding said easements to the Town, if acceptable to the Town, or to a homeowners' association.
7. All existing buildings, structures, and major trees, larger than six (6) inches in breast height diameter (diameter at breast height of mature man) standing alone and within

the proposed right-of-way, drawn in outline; those to be removed shall be drawn with a broken line; those to remain, drawn with a solid line. The location of all proposed tree plantings shall be shown.

8. Topography, at two (2) foot intervals. The ground elevation of all water bodies within the subdivision shall be given, and ground surfaces identified as to type, such as woodland, swamp, ledge outcrops, periodically flooded, etc. Major existing site features such as waterways, flood hazard areas as identified on Flood Insurance Rate Maps and other flood hazard areas identified by a professional engineer, fences, buildings, flood control structures, large boulders, stone walls, shall be shown, and shall be shown extending a minimum of fifty (50) feet beyond project boundaries, further if required by the Planning Board. Buildings within one hundred feet of project boundaries shall be shown.

## 220 Street and Utilities Construction Plans and Profiles

A street and utilities construction plan and profile for each street shall be provided on a separate sheet and shall consist of a layout plan of the street and of a profile matching the layout either above or below it for ease in locating corresponding points. The profile shall be drawn at a vertical scale of 1"=4'. The plan and profile shall show:

1. Existing grades along the center and both sidelines of street.
2. Proposed finished centerline grades with elevations at every 50-foot station, location of vertical curves and gradient of even grades.
3. Proposed layout of storm drainage, water supply systems, hydrants, sewerage disposal systems, and dimensions of gutters, and method of carrying water to nearest watercourse or easements for drainage as needed whether or not within the subdivision.
4. The location and elevation of the starting benchmark and at least one other benchmark. These benchmarks are to be within or adjacent to the subdivision. All elevations shall refer to U.S. Coast and Geodetic Survey benchmarks.
5. Typical sections of roadways showing widths and grades of street lines, roadway pavement, sidewalks, street lights, grass strips and side slopes, location and size of water, sewer, drain and gas lines. The depth of roadway pavement, sidewalks, base courses and all underground utilities.
6. All details required by the Planning Board must be suitable for construction.

## 221 Street Layout Plans

Following completion of all improvements including the setting of bounds but before final release of the bond or covenant securing such improvements, the applicant shall

submit a complete set of street layout lines and a complete set of survey data plans to be used by the Town Engineer in preparing street acceptance plans for the Town as follows:

A. Street Layout Submission: the applicant shall submit to the Department of Public Works, Engineering Division (1) set of original mylar plans and one (1) set of plans in electronic format compatible to the Town's system showing each street on a separate sheet or sheets to the following standards:

1. Drafting

- Scale: 1"=40'
- Materials: Single Mat Mylar (4 Mil)
- Dimensions: Feet and decimals to the nearest hundredth of a foot; bearings in degrees, minutes and seconds; multiple sheets for a single street shall be consecutively numbered
- Size: 18"x24" or 24"x36"
- Border: 3/4" border all around
- Match lines: Multiple sheets shall have match lines with sufficient information on each side of the lines to assure a proper and complete match
- Conventions: Including but not limited to line weights, lettering styles and sizes, location of data, etc. shall be as exemplified in a standard layout plan obtained from the engineering office by the applicant and certified as appropriate for such use by the Town Engineer. The applicant shall submit a copy of said plan and certificate to the Planning Board for its official record.

2. Title Block

Each layout shall have a title as shown on the attached sample. Each plan sheet shall also have a north arrow, certification block for the responsible registered Professional Land Surveyor (P.L.S.), space for his/her stamp, data and block as required by the Registry of Deeds. On the upper right-hand edge of the plan, above the border, shall be a filing title of the form "(name of street) layout plan, sheet 0 of 0".

The first or only sheet for each street shall have blocks for endorsement by the Planning Board, Board of Selectmen, Town Clerk, and Town Meeting.

3. Street Layout

Each street shall be shown on a separate sheet or set of sheets as follows:

- a. Existing Abutting Public Ways: Sidelines and definitions of sidelines including but not limited to: bearing, distances, radius, and length of each arc, name, date of acceptance, width of right-of-way, monumentation (if available).

- b. Proposed Street: Sidelines and definitions of sidelines including but not limited to: bearings, distances, radius, deflection angle and length of each arc, name, width of right-of-way, monumentation (if available).
- c. Drainage Areas: Proper label, complete perimeter definition including but not limited to bearings, distances, radius, and length of each street arc; interior dimensions, relationship to street line(s).
- d. Existing Property Lines leaders.
- e. Existing Abutting Private Ways: As with public ways and with the additional notation "Private Way".
- f. For Land Court: Show all encumbrances for easements or taking purposes pertinent to the layout. Such plans shall be prepared in accordance with Land Court instructions in addition to the other standards contained herein.
- g. Abutters: Show all abutters to the subject layout. Land Court abutters must also list Certificate of Title Numbers. Abutter should be current to January 1<sup>st</sup> of the year the street is to be accepted.
- h. Show all Town Utilities (Drainage, Water, Sewer, etc.) and Pavement appurtenant to the layout. They shall be located within the limits of the layout or shall be contained within their appurtenant easement.
- i. All layouts shall show existing locations of buildings, driveways, sidewalks, utility structures, etc. and shall be appropriately labeled.

## B. Survey Data

The applicant shall submit a copy of his surveyor's working plot which shall show all of the above information or a print of the street layout plan above, either of which must show sufficient additional information to allow the Town Engineer to verify the information shown on the layout plan and to verify the location of monumentation. Such additional information to include but not be limited to the following:

- 1. An orthogonal coordinate system, system is the most recent Mass. Grid System. Coordinate list shall be in an electronic ASCII file format (*File.txt*) and shall contain all horizontal coordinate points.
- 2. Sidelines: Tangent distances on curves, bearings at points of compound and reverse curvature (all non-tangent curves shall be clearly denoted).
- 3. Baseline or Working Line should include: Angle points, distances and bearings

between angle points, designation of physical type (spike, bound, stake, etc.) and ties thereto.

4. All office and/or field information used to locate each sideline monument in a well-organized format acceptable to the Town Engineer for his verification purposes.

C. Certification:

Layout plans shall be prepared, stamped, signed and dated by the registered Professional Land Surveyor in Massachusetts.

**PROPOSED LAYOUT OF - 1908  
SAMPLE STREET - 1908  
PLYMOUTH, MASSACHUSETTS - 1908**

Scale: 40 feet to an inch  
Month: JULY, 1908  
PLANNING DEPT. OF PUBLIC WORKS - CIVIL ENGINEERING DIVISION - 1908  
Prepared by: State  
Town Engineer: \_\_\_\_\_

**NOTE**  
Whenever it shall be necessary to amend, alter, modify, or change any of the provisions of the Statutes of the Commonwealth of Massachusetts...

**APPROVED BY**  
Town Clerk \_\_\_\_\_ Date: \_\_\_\_\_

**APPROVED BY**  
Town Engineer \_\_\_\_\_ Date: \_\_\_\_\_

1908

222 Supporting Documentation (also see Section 210, No. 9)

1. Excavation Impact Report. The applicant shall submit an Excavation Impact Report, to be prepared and stamped by a Registered Engineer detailing volumetric calculations (in cubic yards) of proposed cuts and fills based on existing and proposed topography, including: total excavation quantity; total fill quantity, total excavated material to be trucked off-site; and total fill material to be trucked onto the site. The report shall also include an evaluation of required blasting and the identified areas in which the blasting will occur. Report shall be consistent with Section 205-18 the Plymouth Zoning Bylaw.
2. Construction Management Plan, which shall include construction start date, dates for starting and completing major phases of the work, any proposed phasing of roadway and/or dwelling construction, and anticipated subdivision completion date prior to the start of construction. In the event that a binder course will be placed for a period of more than three (3) months without a wearing course, the developer is responsible to set drainage structures to binder grade and then reset the drainage structures to finish grade at the time of the placement of the wearing course. The developer/contractor is responsible for all stormwater management best management practices being in place to contain stormwater in the event that drainage structures are not at pavement grade (binder or finished) during a storm event, and all cleanup in the event that such measures fail during said storm event.
3. Traffic Impact Report – which shall be prepared, signed and stamped by a Professional Engineer registered in the Commonwealth of Massachusetts, and shall contain, at a minimum, the following data:
  - a. Number of trips estimated to be generated by the subdivision, according to the type and density of the proposed construction, including peak-hour traffic levels and average daily vehicle trips.
  - b. Recent background traffic counts for the collector street, which the proposed subdivision street will intersect
  - c. Road capacities and sight distances: Width, grades and sight distances of the street(s) onto which the subdivision street connects.
  - d. Level-of-service (LOS) estimates for proposed intersection(s).
  - e. Discussion of traffic impacts of the subdivision and subdivision construction on the surrounding neighborhoods and any proposed mitigation measures. Mitigation measures should be specifically addressed, at a minimum, if there is a LOS degradation of more than one level when compared to a no build scenario for the design year as a result of the proposed subdivision.

- f. The most recent accident data within the nearest intersecting streets. Any other information necessary to show that safe and efficient traffic flow is being provided.
  - g. Discussion of pedestrian circulation within and around the proposed subdivision.
4. Proposed residential developments shall provide the information referenced in Section 222 under Conservation of Resources as a part of final plan submission, provided that the development contains 25 acres or more, and meets either of the following criteria:
- a. Within 500-feet of any publicly owned property (including but not limited to Federal, State, County or Town, but not including public ways)
  - b. Within 500-feet of any property owned or managed by a non-profit agency or private landowner protected under M.G.L. Chapter 61, 61A, or 61B.

Conservation of Resources - The following information shall be used to assist in determining the appropriate location of roadways, easements, infrastructure and building areas. The information shall be submitted in both hard copy format and electronic format compatible with the Town system. It may be used for the basis of possible mitigation when reviewing waivers of the Rules & Regulations Governing the Subdivision of Land.

- 1. Environmental Inventory/Analysis
  - a. Location of resources subject to the Wetlands Protection Act
  - b. Description of wildlife habitat and/or observation of activities, specifically rare, endangered, or threatened species or habitat
  - c. Dispersal/migration analysis
  - d. Plant inventory
  - e. Identify Areas of Critical Environmental Concern (ACEC)
- 2. Groundwater Resource Information/Analysis
  - a. Location of all private and public wells
  - b. Identify Aquifer Protection District (if applicable)
  - c. Hydrological analysis
  - d. Projected yearly withdrawal at full build-out
  - e. Projected nutrient loading of nitrogen and phosphorus
- 3. Traffic Impact Analysis
  - a. Projected trip generation and build-out
  - b. Analysis of adjacent roadway and related infrastructure
  - c. Intersection Level of Service (LOS) analysis within ¼ mile
  - d. Proposed mitigation, if any
  - e. Identify all sidewalks, pedestrian/bike paths and cart paths

4. School Impact Analysis
  - a. Projected number of school age children
  - b. Identify currently served bus routes
  - c. Identify school district to be served
  
5. Trash and Wastewater Impact Analysis
  - a. Projected household trash (pounds per year for project)
  - b. Projected wastewater (gallons per household and total project)
  
6. Management Plan
  - a. Identification of a management plan, if applicable, for property within M.G.L. Chapter 61, 61A, or 61B.

### **ARTICLE III          DESIGN STANDARDS**

#### 301    Lots

Lots shown on the plan shall comply with the frontage, area and other requirements of the Plymouth Zoning Bylaw.

All portions of the tract being subdivided shall be taken up in lots, streets, public lands, or other proposed uses, so that remnants and landlocked areas shall not be created.

#### 302    Parks and Open Spaces

Before approval of a plan, the Board may in proper cases require the plan to show a park or parks suitably located for playground or recreation purposes or for providing light and air. The park or parks shall not be unreasonable in area in relation to the land being subdivided and to the prospective uses of such land. The Board may by appropriate endorsement on the plan require that no building be erected upon such park or parks without its approval for a period of 3 years from the date of approval of a subdivision. In plans where open space and/or buffers are required, the applicant shall provide markers or landscaping to identify the limits of the area.

#### 303    Protection of Natural Features

1. Due regard shall be shown for all natural features, such as trees, water courses, stone walls, scenic points, historic spots, and similar community assets, which if preserved, will add attractiveness and value to the subdivision and the Town.
2. Water courses, marshes and like natural features shall be protected in accordance with the recommendations of the Conservation Commission.
3. Erosion and Sedimentation Control

##### Minimize Site Disturbance

During the construction of the roadway and drainage system, disturbance to the site shall be minimized. Construction equipment and trucks must stay within the areas of proposed work as shown on the approved definitive plan.

##### Temporary Stabilization

Temporary vegetation, mulching, or other protective measures must be provided for areas that will be exposed for one or more months. These temporary measures must be applied immediately after disruption. Temporary measures include: seeding with rye grass or other annual grasses, jute netting, spreading straw mulch, and any other method acceptable to the Board. The Planning Board may require a specific type of temporary stabilization for any given area within the subdivision. If a disturbed area

will be exposed for greater than one year, permanent grasses or other approved cover must be installed.

In disturbed areas, if the surface material is not suitable for the growing of seed, a minimum of 4 inches of loam will be required.

#### Permanent Stabilization

In all areas where the natural vegetation is disturbed a plan detailing the proposed re-vegetation of the site must be submitted. Wood chips and mulches will not generally be permitted.

Disturbed areas within or outside the proposed layout, that are less than eight feet in width may be treated with a perennial grass mixture or sod.

A minimum of six (6) inches of loam is required for areas that will be seeded. The loam must be raked and free of roots, stones, and twigs and other debris.

In areas where the horizontal disturbance is greater than eight feet in width, additional vegetation including shrubs and trees is required. The size, quantity, species, and spacing shall be determined by the Board.

When posting a bond or other surety to secure the release of lots, the money held for the installation of loam, seed, sod, shrubs, trees, or other vegetation is to be held for two growing seasons.

If the Board or its representative questions the installation or quality of the required stabilization material, they may request an inspection by a registered landscape architect. If the installation or the material used is found to be inadequate, it must be replaced. This inspection shall be at the developers' expense.

#### Temporary Sediment Control for Drainage

Temporary sediment controls are required for unpaved roads, paved roads where curbing has not been installed, drainage inlets, and drainage outfalls. Temporary sediment controls are also required for all unpaved driveways and disturbed lots that slope toward the road. Temporary sediment control devices include: silt fences, filter strips, filter socks, double row staked haybales, silt traps, sediment basins, and crushed rock berms or other proprietary products approved by the Planning Board. Temporary sediment control devices shall be used along road sides where runoff may occur and around storm drain inlets and outfalls and shall be selected based on the specific site conditions. The Planning Board may require a specific type of temporary sediment controls. All sediments must be removed from the roadway and other collection areas on a regular basis, and properly disposed of.

Where an EPA NPDES Permit and Stormwater Pollution Prevention Plan (SWPPP) is required, it shall be submitted before the start of construction. If an SWPPP is not required, an erosion and sedimentation control plan shall be submitted before the start of construction. A copy of the plan is to be provided to the Board and its Agent as part of the pre-construction sign off.

### Responsibility

The developer is responsible for compliance with the SWPPP and the prevention of all erosion and build-up of sediment within the area disturbed due to the construction of the road and drainage system.

### Protection of Existing Trees

All healthy trees located within the areas of disturbance that are 16 inches dbh or greater must be preserved. Tree wells are required for trees where fill of six (6) inches or more is proposed. The tree well must be at least 18 inches away from the trunk of younger, growing trees and at least 36 inches away from the trunk of younger, fast growing trees. In cut areas stone retaining walls are required. The walls must have a minimum diameter of four feet or a diameter that is the width of the crown, whichever is greater. The selective cutting of these trees must be approved by the Board. Trees that are greater than 16 inches dbh that must be removed must be shown on the plan. At the Planning Board's discretion, in the event that an area is heavily forested a representative section of the vegetation is acceptable in lieu of all trees being shown on the plan.

### 304 Contours

Existing contours shall be preserved insofar as is practical. In any event, no change shall be made in existing contours which in the opinion of the Board adversely affects any land abutting the proposed subdivision.

Subdivisions shall be designed so as to minimize the necessity for excessive cut or fill.

### 305 Easements

1. Where necessary, easements for utilities, drainage systems or pedestrian or bicycle paths shall be provided. Such easements shall be at least twenty (20) feet wide and whenever possible shall be centered on rear or side lot lines, rather than across lots. Access easements shall be required where deemed desirable to provide circulation or access to abutting streets, schools, playgrounds, parks, shops, transportation, open spaces and/or community facilities.
2. Where a subdivision is traversed by a water course, drainage way, channel or storm drain, the Board may require that there be provided a storm water easement or drainage right of way of adequate width to conform substantially to the lines of such

water courses, drainage way, channel or stream, and to provide for construction or other necessary purposes. Slope easements shall be provided where necessary to ensure lateral support and protection of streets and other construction features.

### 306 Utilities Underground

Electric, telephone and other utilities or wiring shall be placed underground in all residential and non-residential subdivisions. The installation shall be to the specifications of the utility company concerned and of the Town of Plymouth. Utility boxes shall be landscaped to provide visual screening from pedestrian and vehicular traffic.

## **STREETS**

### 307 Street Classification and Widths

Proposed streets, shall be classified by the Board as provided below, depending upon the amount of traffic they are projected to accommodate.

1. Major Street - Designed to accommodate large volumes of moderate speed traffic with access to abutting lots controlled. Major streets are thoroughfares and carry through traffic between the various parts of Town. Major streets shall have a minimum right of way of sixty (60) feet. Proposed pavement widths shall be determined by a Professional Engineer licensed for civil, traffic or transportation, registered in the Commonwealth of MA and subject to the final approval of the Planning Board.
2. Collector Street - Designed to accommodate and direct traffic generated by minor streets in one or more neighborhoods or subdivisions to major streets, and other areas of Town. Collector streets shall have a minimum right of way of fifty (50) feet, and a paved surface width, exclusive of berms, of twenty four (24) feet. This category includes industrial subdivision.
3. Minor Street - Designed for use by local residential and service traffic only. The function of a minor street is to provide direct access from abutting homes to collector streets, and the Town street system. Minor streets shall have a minimum right-of-way of fifty (50) feet, and a paved surface width of twenty-two (22) feet. In special cases, the Board may allow rights-of-way widths of less than 50 feet, but in no case shall the minimum widths of street rights-of-way be less than forty (40) feet.

In subdivisions where one sidewalk is waived the traveled way shall be off-set as shown on Plate 1A.

Amendment Effective 10-10-80

308 Location

1. All streets in the subdivision shall be designed so that, in the opinion of the Board, they will provide safe vehicular travel. Due consideration shall also be given by the subdivider to the attractiveness of the street layout in order to obtain the maximum livability and amenity of the subdivision.
2. The proposed streets shall conform as far as practicable to the most recent issue of the Master Plan as adopted or amended in whole or in part by the Board.
3. Provisions satisfactory to the Board shall be made for the proper projection of streets, or for access to adjoining property which is not yet subdivided.
4. 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.
5. Where a subdivision abuts an existing or proposed expressway, major, or collector street, the Board may require internal access streets, reverse frontage with screen planting contained in a non-access reservation along the rear property line, extra deep lots or such other treatment as may be necessary for adequate protection of through and local traffic.
6. Residential streets shall be so laid out that their use by through traffic will be discouraged.
7. Private streets are prohibited and will be approved only if they meet public street standards.

309 Alignment

1. Street jogs with centerline offsets of less than one hundred twenty-five (125) feet should be avoided.
2. The minimum centerline radii of curved streets shall be as follows:

Minor (Residential) Streets:	One hundred and fifty feet	(150)
Collector Streets:	Three hundred feet	(300)
Major Street:	Five hundred feet	(500)
3. All reverse curves on major and collector streets shall be separated by a tangent at least one hundred (100) feet long.
4. Streets shall be laid out so as to intersect as nearly as possible at right angles. No street shall intersect any other street at less than sixty (60) degrees. The maximum number of ways converging at an intersection shall be kept to four (4) with the

centerline of said street intersections at one common point.

5. Property lines at street intersections shall be rounded with a street line radius of not less than one half of the wider right-of-way.
6. The intersection of centerlines of streets shall be greater than two hundred (200) feet apart.
7. The grading at the intersection of ways shall be so designed as to be safe and convenient for travel, and to direct the flow of surface water in a suitable manner.

### 310 Grade

1. The minimum centerline grade for any street shall not be less than one percent (1%).
2. The maximum centerline grade for any street shall be in accordance with the following table:

Type of Street	Maximum Grade
Minor (Residential)	10%
Collector	8%
Major Street	8%

3. The grade at an approach to an intersection shall not be more than 2% within fifty (50) feet of the street center line of the intersecting street. If a vertical curve is used in this area, the instantaneous slope of the vertical curve measured at a point fifty (50) feet from the street center line of the intersection street shall not be more than 2%.
4. All streets shall be free of abrupt and frequent changes. A vertical curve is required for any grade change over 1%. All crests of vertical curves shall be designed in a manner which provides visibility as given below:

Type of Street	Minimum Forward Sight Distance in Feet
Minor Street	150
Collector Street	200
Major Street	300

### 311 Dead End Streets

1. Dead end streets, whether temporary or permanent shall not be longer than five hundred (500) feet unless, in the opinion of the Planning Board, a greater length is necessitated by topography or other local conditions.
2. Dead end streets, shall be provided at closed end with a turnaround having an outside roadway diameter of at least one hundred twenty feet (120) for minor residential

roads only. Greater diameters may be required by the Planning Board for commercial or industrial subdivisions.

3. Throughout the whole of the rotary the grades shall be as flat as practicable and shall not exceed 3%.

The Planning Board may consider waiving the maximum length of a dead end street if the subdivision includes suitable emergency vehicle access. The following standards shall apply to all portions of the emergency access. The emergency access must begin at a Town maintained way or a way shown on a plan heretofore approved by the Board under the Subdivision Control Law, which has been constructed in substantial conformance with the Board's requirements at the time of approval. Suitable emergency access shall include:

1. A minimum easement or right-of-way width of 20 feet is required.
2. Road grades shall not exceed 8%.
3. The minimum road radius shall be 50 feet.
4. Access ways must be located within 500 feet of the end of a cul-de-sac.
5. The emergency access must end at a Town maintained way or a way shown on a plan heretofore approved by the Board under the Subdivision Control Law, which has been constructed in substantial conformance with the Board's requirements at the time of approval and must be at least 400 feet from the subdivision's primary roads.
6. The applicant must document the rights to use all off-site private ways associated with the emergency access.
7. The access ways must have adequate drainage provisions.
8. A gate or breakaway barrier suitable in design and construction to the Board shall be installed.
9. The Board may require access ways be paved.

**[Amended July 19, 2004, Recorded in Book 28807, Page 281)**

### 312 Driveway Cuts

Driveway cuts shall not be within fifty-five (55) of the intersection of the street line of intersecting streets.

### 313 Adequate Access from a Public Way

Adequate Access from a Public Way shall be determined as follows:

- A. Where the street system within the subdivision does not connect with or have in the opinion of the Planning Board, adequate access from a Town, County, or State (public) way, the Board may require, as a condition of approval of a plan, that such adequate access be provided by the

subdivider, and/or that the subdivider make physical improvements to and within such a way of access, in accord with the provisions of these regulations, from the boundary of the subdivision to a Town, County or State (public) way.

- B. Where the physical condition or width of a public way from which the subdivision has its access is considered by the Board to be inadequate to carry the traffic expected to be generated by such subdivision, the Board may require the subdivider to dedicate a strip of land for the purpose of widening the abutting public way to a width at least commensurate with that required within the subdivision, and to make physical improvements to and within such public way to the same standards required within the subdivision. Any such dedication of land for the purpose of way and any such work performed within such public way shall be made only with permission of the governmental agency having jurisdiction over such way, and all costs of any such widening or construction shall be borne by the subdivider.

#### 314 Traffic Calming

Consistent with these standards, roads shall be designed to make every effort to reasonably calm the traffic within the subdivision and on surrounding streets to ensure pedestrian and bicycle friendly design and to prevent a decrease in traffic safety as a result of the additional traffic the project will generate. Traffic calming methods must utilize methods that will not make snow plowing or road maintenance especially burdensome for the municipality.

#### 315 Drainage

All proposed subdivisions shall comply with the performance standards of the most recent version of the Commonwealth of Massachusetts Stormwater Standards and shall be consistent with "A Guide for the Design of Storm Drainage Facilities in the Town of Plymouth, Massachusetts as amended." Designers are encouraged to meet water quality standards through the use of Low Impact Design techniques in order to conserve natural areas and drainage patterns.

1. Construction details for all proposed drainage structures shall be provided. In the event that a drainage structure discharges within 200 feet of a brook, stream, or drainage area, a profile shall be provided of the brook, stream or drainage area to determine condition, and proposed method of stabilization.
2. When the subdivision causes a requirement for drainage improvements outside its area, the subdivider shall be required to secure the necessary approvals and provide such improvements in the public interest.
3. Appropriate storm drainage installations, including drains, gutters, manholes,

culverts, and related installations shall be required, if in the Board's opinion such installations are necessary to permit the unobstructed flow of all natural water courses, to insure adequate drainage of all low points along streets, and to provide a proper means for stormwater run-off from the streets and area being drained. Sizes, spacing, and materials of drainage installations shall be determined by a registered professional engineer and shall be subject to the Board's approval.

4. New drainage systems shall not be connected to an existing drain(s) in adjacent streets or easements, which may exist unless an analysis for the pre and post connection capacity is prepared and adequate capacity is shown to exist. Where no adequate drainage system exists, or where it is inadequate, it shall be the responsibility of the subdivider to extend his system outside the subdivision in a manner specified or approved by the Board to dispose properly of all the drainage from the proposed subdivision.
5. Where the adjacent property is not subdivided adequate provision shall be made for the extension of the drainage system beyond the boundaries of the subdivision and for it to carry the additional load that may be placed on the system. This shall be done by providing drains of adequate size and at proper slopes as specified by the Planning Board in order to permit their extension to the boundaries and the proper connection of those of future subdivisions in the adjacent area.
6. Storm drains and culverts shall be a minimum of 12" inside diameter and shall be greater when required by the Board or by the design.
7. Drainage catchment areas shall be designed, whenever possible, to use natural forested low point areas and to be consistent with "A Guide for the Design of Storm Drainage Facilities in the Town of Plymouth, Massachusetts as amended". The intent is to preserve natural topography and vegetation to increase the aesthetic quality of these areas. If natural topography and vegetation cannot be used for a catchment area, then the design for the catchment area shall be made to look natural. Catchment areas should not be designed with rectilinear sides, if it is possible to create an area with a more natural or curvilinear shape. If existing vegetation is removed to construct catchment areas, there shall be a 100 foot planted buffer planted as referenced above between roads and between properties outside the subdivision. Construction and maintenance access to the catchment areas should be planned so that the constructed access does not destroy the natural look of the area.
8. Storm water runoff should be treated before any infiltration device and shall be consistent with Commonwealth of Massachusetts Stormwater Standards and shall comply with "A Guide for the Design of Storm Drainage Facilities in the Town of Plymouth, Massachusetts as amended". This requirement reduces or eliminates the opportunities for system failure by removing the major portion of sediment, oils, grease, or other substances that clog infiltrative surfaces.

9. Where necessary, proposed development shall provide an area to be designated as snow removal area.

### 316 Design Analysis

A design analysis shall be submitted with each definitive plan submitted for approval. The design analysis shall comply with "A Guide for the Design of Storm Drainage Facilities in the Town of Plymouth, Massachusetts as amended".

### 317 Sanitary Sewers

All subdivisions shall comply with 314 CMR7.00 for sewer system extensions and connection permits, as well as the following:

1. Sanitary sewers including all appurtenances shall be designed to serve as many lots in a subdivision as possible and to provide connection to municipal sewerage system, as approved by the Sewer Commissioners.
2. Sewers shall extend to adjacent undeveloped land if future continuation into such land is feasible.
3. No portion of sewerage system shall be approved if it requires a connection to municipal system over land of others, unless appropriate easements are first obtained.
4. The calculations used in designing the sewer system including the method of estimating average flows (including infiltration allowances), the peaking factor used, the hydraulic design of the system including quantity and velocity of flow under both average and peak flow conditions shall be included.
5. Minimum sewer pipe size shall be 8" and sanitary sewers shall be such as to ensure the flow of not less than two (2) feet per second nor more than ten (10) feet per second except that house connections shall be at least six (6) inches in diameter and shall pitch up towards the lot at a minimum of 3/16" per foot.
6. Manholes shall be no more than three hundred (300) feet apart.

### 318 Water Supply

1. Water mains, laterals, and appurtenances shall be of the size, material, and location as directed by the Water Division, Department of Public Works.
2. All lots on streets on which a water main is to be installed shall be provided with an approved service connection at the property line, with the location of said service connection accurately shown on an approved plan.
3. Hydrants, with valves of a type approved by the DPW-Water Division, shall be

installed on all water mains at a spacing of not more than 500 feet. In addition, there shall be a hydrant or blow-off and valve placed at the end of every water main, or as directed by the DPW-Water Division. All hydrants shall be located within 8' of the curb line. Hydrants shall not be located so close to the street as to be vulnerable to damage by snowplows or other maintenance equipment. Normally hydrants shall be located behind the sidewalks. Hydrants shall always be located within the right-of-way of the street. Hydrants shall have a steamer connection (4 1/2" outlet) facing the traveled way at 90 degree angle to the street. The bottom of said connection shall be a minimum of 20" above the finished grade at the hydrant so as to allow easy access to all connections and shall also be a minimum of 20" above the finished centerline grade of the street so as to assure visibility of the hydrant.

The Fire Department shall be contacted for approval of all hydrant locations.

319 Bank Gravel

Bank gravel shall consist of inert material that is hard durable stone and coarse sand free from loam and clay and having no stones larger than six (6) inches. The grading of the material shall conform to the following:

Passing 1/2 inch sieve	50-85% maximum
Passing No.4 sieve	40-75% maximum
Passing No.40 sieve	10-35% maximum
Passing No.200 sieve	0-10% maximum

320 Select Gravel

Material - Select gravel base coarse material shall consist of approved, hard, durable stone and coarse sand, bank run or blended, practically free from loam and clay, uniformly graded and containing no stone having any dimension greater than 1 1/2 inches. When spread and rolled, it shall form a firm foundation. The grading of the material shall conform to the following requirements:

Passing 3/8 inch sieve	70% maximum
Passing No.10 sieve	50% maximum
Passing No.200 sieve	5% maximum

321 Americans with Disabilities Act (ADA) Compliance

All submittals shall clearly show compliance with the ADA, as amended, and the Massachusetts Architectural Access Board requirements.

**ARTICLE IV            REQUIRED IMPROVEMENTS**

401    Purpose

The developer is responsible for the completion of the following improvements as set forth in this article:

1. Street Construction

- |                 |                  |
|-----------------|------------------|
| (A) Preparation | (F) Grass Plots  |
| (B) Base        | (G) Side Slopes  |
| (C) Pavement    | (H) Trees        |
| (D) Curbs       | (I) Street Signs |
| (E) Sidewalks   | (J) Bounds       |

- 2. Storm Drains
- 3. Sanitary Sewers
- 4. Water Supply
- 5. Utilities
- 6. Parks and Open Space
- 7. Landscaping
- 8. Clean-up

402    Reference

All required improvements shall be installed or constructed in accordance with the applicable provisions of these Rules and Regulations, and as shown on approved definitive plans or as specified in the certificate of Planning Board's approval, or in any covenants and agreements accepted by the Board.

403    Revision of Plans

When changes from the approved definitive plans become necessary during construction, written acceptance by the Board shall be secured before the execution of such changes.

404    Protection of Improvements

The applicant shall protect improvements required under the Subdivision Rules and Regulations including utilities, streets, curbing, sidewalks, etc. from any and all damage, until the entire subdivision is completed and approved as a whole by the Planning Board. Any damage to these utilities, etc. prior to the approval of the Planning Board, shall be repaired in a manner satisfactory to the Planning Board, the full cost of which shall be borne by the subdivider. Any material used which does not meet the standards as set forth in these regulations shall be replaced by the subdivider at his own expense. Underground utilities and appurtenances not installed in accordance with the final grades approved by

the Planning Board shall be removed and reset to proper grade at the expense of the subdivider.

Prior to issuance of the certificate of performance, the subdivider shall establish a mechanism, acceptable to the Planning Board for the maintenance and protection of all required improvements in the subdivision until such time as the Town accepts the subdivision way (s) as public, and for the continuing maintenance and protection of all street lights within the subdivision after Town acceptance of the way(s). A mechanism shall include a homeowner association and/or trust.

The Applicant shall consult with the Department of Public Works for policy on snow removal on private roads. A subdivider who does not retain responsibility for the improvements shall in all cases be required to establish a trust. The subdivision way(s) shall be deeded to the trust. A provision is to be included that the trust's responsibilities for the maintenance and protection of all subdivision improvements, except street lights, shall terminate upon acceptance of the subdivision way(s) as public by the Town and the recording of an easement from the trust to the Town to use the way(s) for all purposes for which public ways are used by the Town.

The deeds for all lots within the subdivision shall state that they are subject to the provisions of any recorded covenant or trust.

If a homeowner's association is proposed, the following documents are to be submitted to the Planning Board for approval:

A draft covenant and a sample purchase and sales agreement which shall be used for the purchase of lots. The covenant shall be recorded prior to issuance of the certificate of performance. The agreement shall include in conspicuous type the following: that the property is located within a development that is required to have an association; that the purchaser and subsequent owners are subject to the requirements therein contained; that the purchaser shall be required to be a member of the homeowner's association, shall be subject to rules and regulations of said association, and shall be liable for any applicable assessment made be or against said association. The purchase and sales agreement shall further contain a statement by the seller that the purchaser has been provided with a copy of the rules and regulations of the homeowner's association, copies of any proposed management policies, copies of restrictions, or covenants running with the land, and a prospectus which shall be a summarization in layman's language of the information contained in other documents.

Copies of any documents or proposed documents creating the homeowner's association, the bylaws and rules and regulations of the homeowner's association, any management policies or proposed management policies, copies of any restrictions or covenants running with the land in the subdivision, and the prospectus which shall be a summarization in layman's

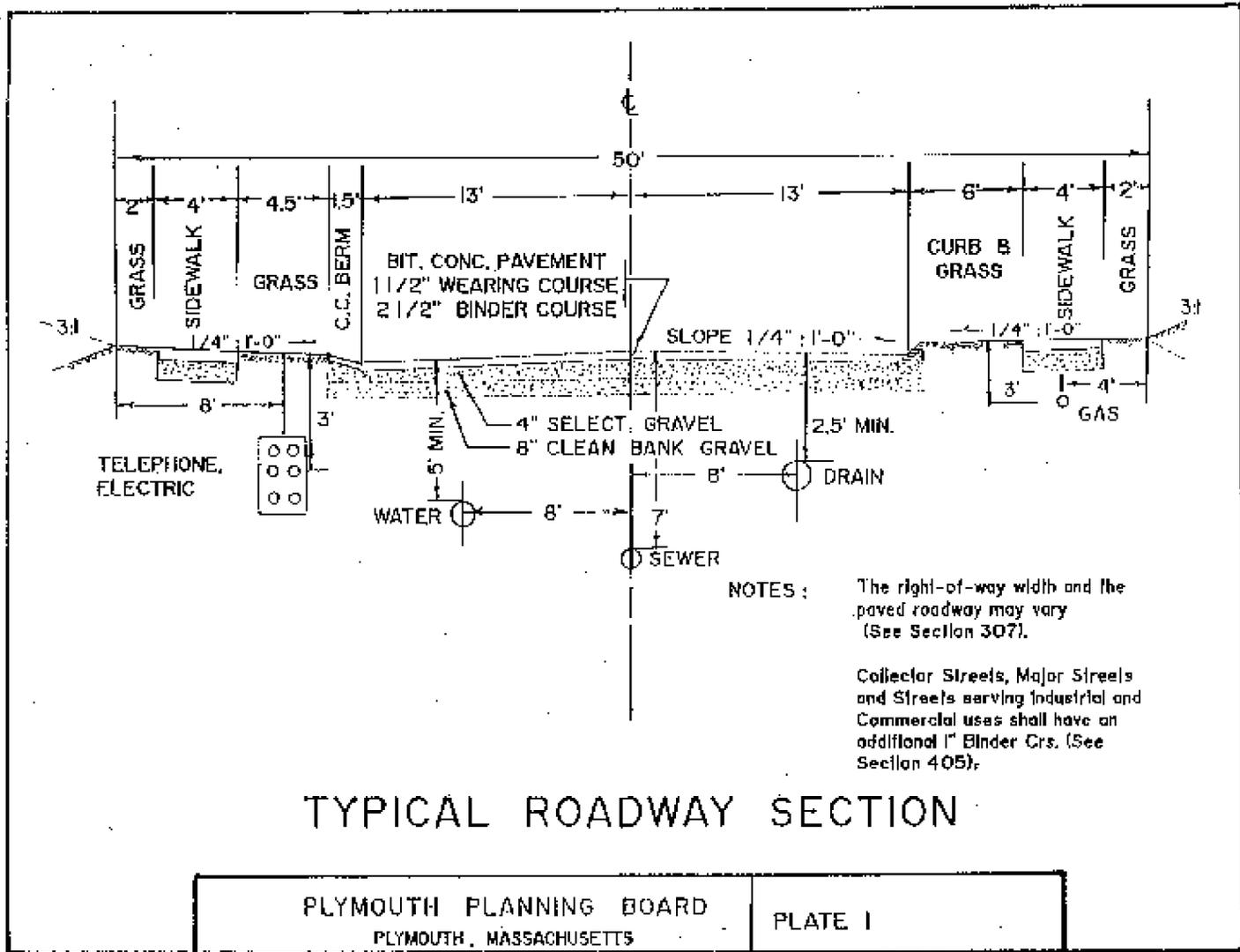
language of the information contained in all the filed documents. Said homeowner's association documents shall include a provision stating that, in the event of failure of a lot owner to render to the association an established fee amount proportionate for its share of reasonable and appropriate maintenance, the association may place a lien upon the lot in order to assure payment, with said lien to include related legal expenses.

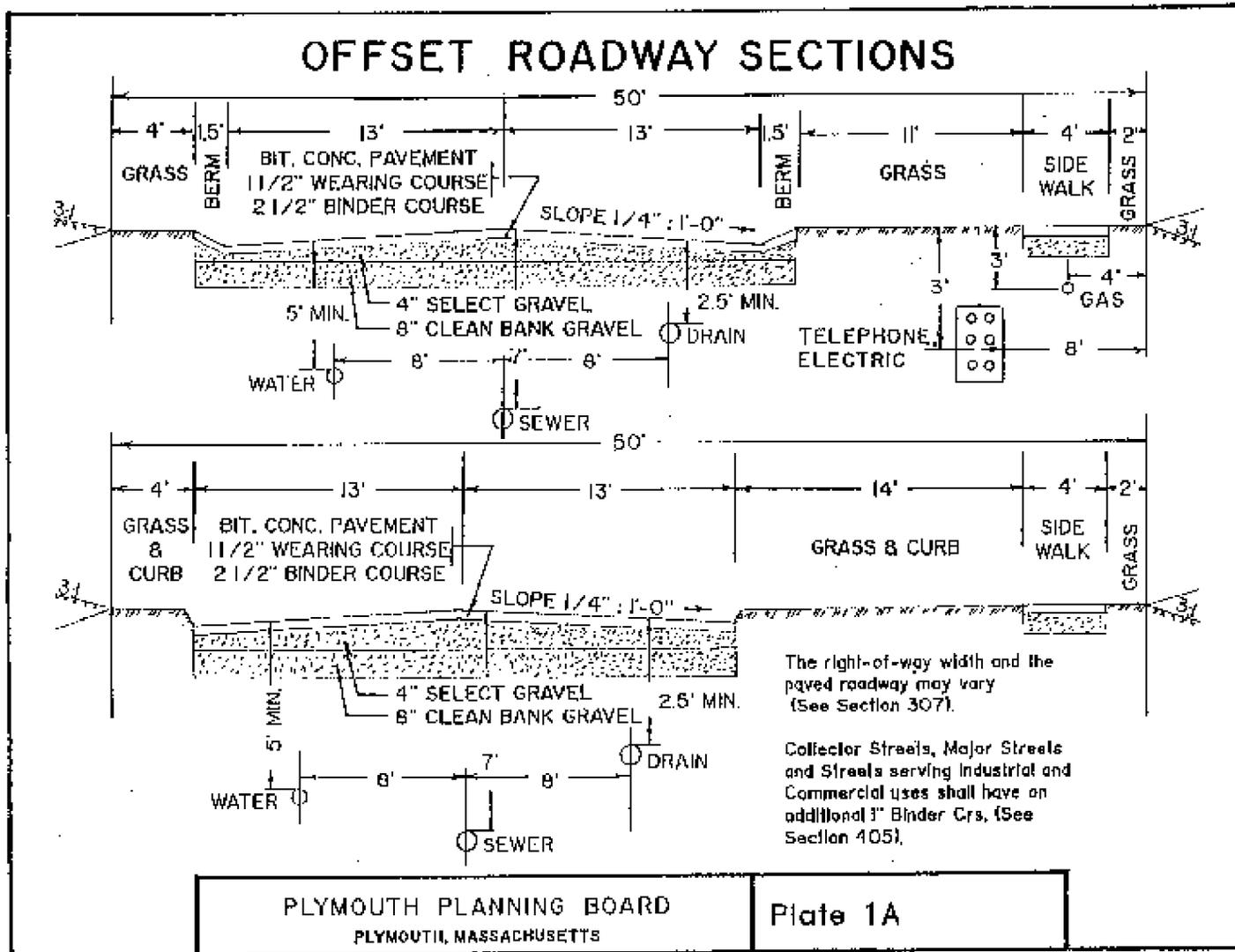
## **STREETS**

### 405 Construction

#### 1. Preparation

The entire area within each right-of-way or easement for future extension, and as far beyond as necessary to provide firm support or protection for the street, shall be cleared, and excavated and/or filled as necessary and graded as shown on the approved definitive plans, and in accordance with the street cross sections included as Plate 1 of these Rules and Regulations. **(1st Inspection)**





## 2. Drains, Water Mains, Sewers and Utilities Placements

All drains, public utilities, water mains, and sewers including individual service laterals shall be installed and the roadway inspected as provided in Section 429 of these Rules and Regulations prior to any further construction of the roadway. Water mains to be inspected by the Water Dept. **(2nd Inspection)**

## 3. Base

At least eight (8) inches of good, clean bank gravel with no stones larger than six (6) inches in diameter shall be placed and rolled with at least a ten ton roller. The surface shall be wet during rolling to bind the material. Thereafter the roadway shall receive a layer of select gravel of at least four and one-half (4 1/2) inches of thickness, free of all stone over one and one-half (1 1/2) inches in diameter and free from loam or other foreign material. This layer shall also be wet and rolled with said roller. Prior to any further construction, the roadway shall be inspected as provided in Section 429 of these Rules and Regulations and compaction testing performed. A sufficient number of compaction tests shall be performed by a state certified laboratory and shall be submitted to the Board's Engineer for approval prior to installation of pavement. The location of tests shall be determined by the Board's Engineer. **(3rd Inspection)**

## 4. Pavement

Prior to the installation of pavement a surveyor or the project engineer is to certify that the way has been properly staked as to elevation and alignment in accordance with the approved definitive plan and these Rules and Regulations. Minor variations are to be presented to the Board's engineer for review and approval.

The roadway of Minor Streets shall be paved to a thickness of four (4) inches measured after compaction with two (2) coats of Class One Bituminous concrete pavement, type I-1 or F-1 in two (2) courses consisting of a 2 1/2 inch binder and a 1 1/2 inch wearing after compaction as shown on Plate #1. The aggregate shall be composed, mixed and laid hot in two courses as specified in the "Massachusetts Public Works Specifications, Section 460 for Class I Bituminous Concrete Pavement" as specifically set forth in Sections 460.20 to 460.82 or as amended. Upon completion of the surface treatment, said roadway shall be inspected as provided in Section 429 of these Rules and Regulations. **(4th Inspection)**

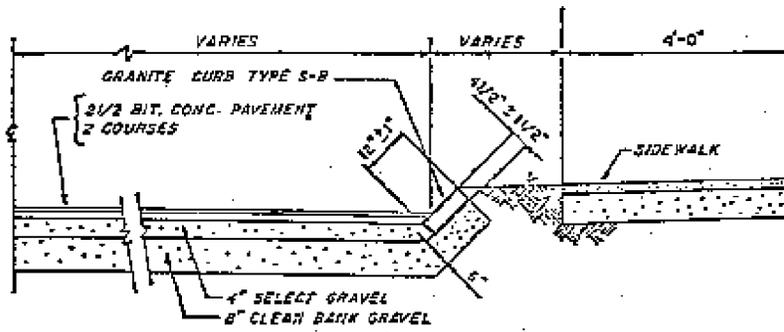
Collector streets, major streets, and streets serving industrial and/or commercial uses shall be paved to a thickness of five (5) inches measuring after compaction of Class One Bituminous concrete pavement, Type I-1 or F-1 in two (2) courses consisting of a 3-1/2 inch binder and a 1-1/2 inch wearing after compaction as shown on Plate #1. The aggregate shall be composed, mixed and laid hot in two courses as specified in the "Massachusetts Public Works Specifications, Section 460 for class I bituminous concrete pavement" as specifically set forth in Section 460.20 to 460.82 or as amended. Said

roadway shall be inspected as provided in Section 429 of these Rules and Regulations.  
**(4th Inspection)**

406 Curbing

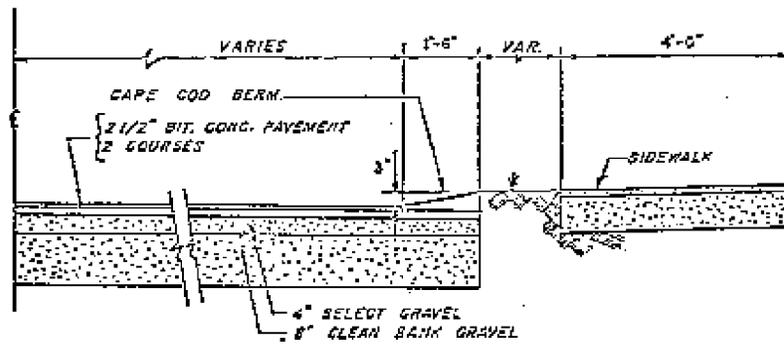
1. Curbing is required on both sides of all roadways and shall be vertical granite or slope granite; however,
2. The Planning Board may allow the use of low impact development design instead of curbs for all or a portion of the subdivision when consistent with low impact design standards as described in "A Guide for the Design of Storm Drainage Facilities in the Town of Plymouth, Massachusetts as amended".

Specifications for curbing, workmanship and method of setting shall conform to the requirements of these Rules and Regulations, and to the requirements of the Town Highway Department.



DETAIL - SLOPED GRANITE CURB

Scale 3/8" = 1'-0"

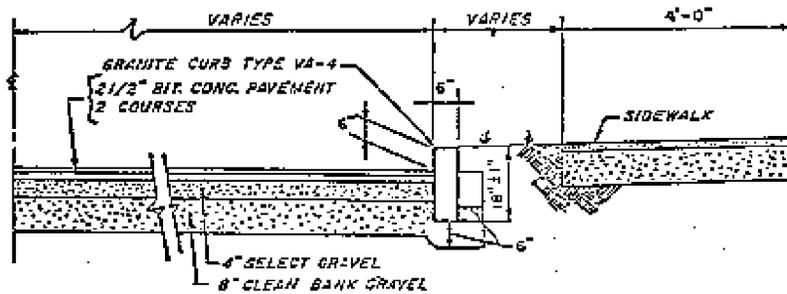


DETAIL - CAPE COD BERM

Scale 3/8" = 1'-0"

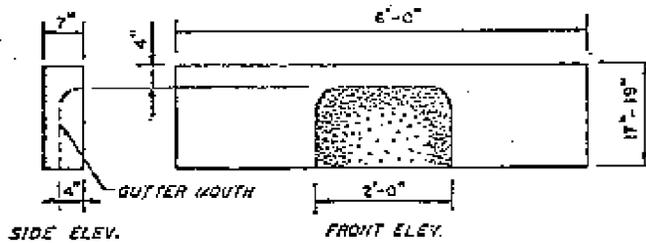
PLYMOUTH PLANNING BOARD  
 PLYMOUTH, MASSACHUSETTS

PLATE 2



DETAIL - VERTICAL GRANITE CURB

Scale 3/8" = 1'-0"



GRANITE CURB INLET

Scale 1/2" = 1'-0"

PLYMOUTH PLANNING BOARD  
 PLYMOUTH, MASSACHUSETTS

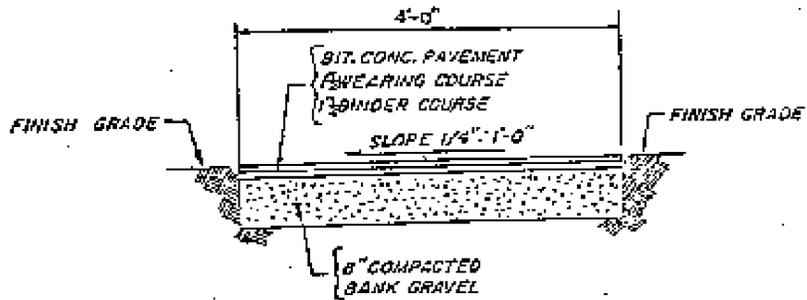
PLATE 3

#### 407 Sidewalks and Grass Plots

1. Sidewalks shall be reinforced concrete placed on both sides of the street, unless otherwise approved by the Board. Bituminous concrete will not be allowed for sidewalk construction.
  - A. Sidewalks shall be a minimum of four (4) feet wide, with 1/4 inch cross-slope toward the road. Sidewalks shall be a minimum of six (6) feet wide in heavy pedestrian use areas at the discretion of the Planning Board.
  - B. Reinforce concrete sidewalks shall conform to material and construction methods as specified in Section 701 of the Commonwealth of Massachusetts, Highway Department, Standard Specifications for Highways and Bridges, dated 1988 and latest amendments, except that cement concrete shall be air-entrained 3000 PSI, 3/4", 520, and shall have steel mesh reinforcement.
  - C. The subgrade shall be shaped parallel to the proposed surface of the sidewalk and thoroughly compacted. All soft and yielding material below such subgrade shall be removed and replaced with a suitable material, and again compacted until the surface is smooth and hard.
  - D. After the subgrade has been prepared, an 8 inch gravel base compacted to 95 percent (ASTM 1557-70 method D) shall be placed.
  - E. Forms shall be wood or metal, and shall extend for the full depth of the concrete. All forms shall be straight, free from warp, and of sufficient strength to resist the pressure of the concrete without springing. Bracing and staking of forms shall be such that the forms remain in both horizontal and vertical alignment until their removal. Form oil shall be placed on all forms prior to placing concrete.
  - F. The concrete shall be placed in alternate slabs 30 feet in length. Slabs shall be separated by a 1/2" transverse preformed expansion joint filler conforming to ASSHTO M153.
  - G. The gravel base shall be thoroughly moistened immediately prior to the placing of the concrete. The reinforced concrete sidewalk shall have a finished thickness or 4 inches, except at driveways, where it shall be 6 inches. Steel mesh reinforcement shall be 6 x 6 - W 2.9 X W 2.9, and shall be placed at mid-depth.
  - H. Concrete shall be finished by skilled concrete finishers. The sidewalks shall be scored into block units of lengths not more than 6 feet. The depth of the scoring shall be at least one quarter of the thickness of the sidewalk. A fine-grained broom finish shall be required to provide a non-skid surface.

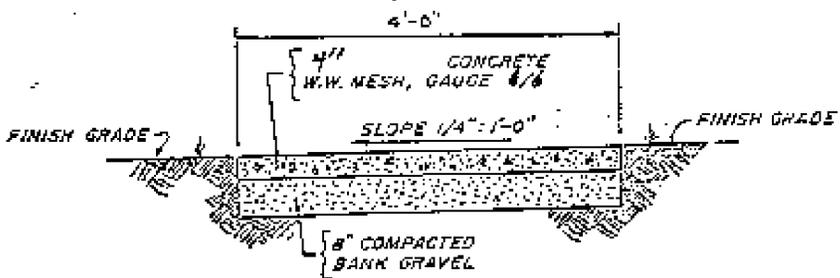
- I. When completed the walks shall be kept moist and protected from traffic and weather for at least 7 days.
2. Between the sidewalk and the edge of the curb/berm there shall be installed a grass strip of a minimum width of four (4) feet. The top six (6) inches of all such plots shall consist of loam, rolled and seeded.
3. No utility poles or trees shall be placed within the grass plot so as to be closer than two (2) feet from the curb line.
4. The area in back of the sidewalk shall be sloped at the rate of three to one (maximum) to a point where it precisely coincides with the finished grade of abutting lots. All slopes shall be covered with topsoil and seeded.
5. A Minimum One (1) foot grass strip shall be provided between the sidewalk and the sideline of the proposed right-of-way.
6. All subdivisions with ten (10) or more lots located in an area where school busing is provided or is likely to be provided in the future must provide at least one durable surfaced bus waiting area for school children located at or near the entrances to the subdivision or in the area where the schools determine buses will stop to pick up children who live in the subdivision. Said waiting area shall be constructed of bituminous concrete, reinforced concrete, pervious grassed pavers, or other suitable materials consistent with accepted design practices.

Lamar R. Pifer



TYPICAL BITUMINOUS CONCRETE  
SIDEWALK SECTION

Scale 1/2" = 1'-0"



TYPICAL CONCRETE  
SIDEWALK SECTION

Scale 1/2" = 1'-0"

PLYMOUTH PLANNING BOARD  
PLYMOUTH, MASSACHUSETTS

PLATE 4

#### 408 Slopes and Walls

Wherever the approved street grade differs from the grade of adjacent land or where otherwise necessary for public safety, the developer shall be required to provide slopes no steeper than 3 feet horizontal to one foot vertical in fill and three feet horizontal to one foot vertical in cut to ensure proper protection and lateral support. In order to minimize the amount of disruption of natural features, the Planning Board may require the developer to erect retaining walls and/or guard rail fences. Such walls, fences and slopes shall be subject to the Board's approval as to location, design and dimensions and shall be constructed in a manner satisfactory to the Board's engineer. Retaining walls shall be constructed of concrete with a stone veneer or field stone masonry.

A landscape plan is required by the Board for areas disturbed by such grading to ensure slope stabilization, revegetation, restoration of natural features, and minimization of erosion. Such plans shall be subject to the Board's approval as to location, quantity, species and design.

When constructing a roadway the maximum vertical cut or fill of the natural topography allowed shall be 12 feet.

A bench swale to collect stormwater runoff and prevent erosion, shall be provided for every 20 feet in height of a fill or cut slope. The design of the swales shall be shown to adequately handle the runoff flowing to them. The swales shall connect to drain inlets, or other approved measures so that a concentrated flow of runoff does not flow across the sidewalk or into a roadway area.

#### 409 Street Signs & Permanent Address Markers

1. The developer shall furnish and erect necessary street signs to designate the name of each street in his development, said signs to conform with those used by the Town.
2. Street names shall be approved by the Planning Board to prevent duplication and to provide names in keeping with the character of the Town.
3. The developer shall furnish and install permanent address markers for each buildable lot in a subdivision. Such permanent address markers shall be installed within the street layout, within 15 feet of either sideline of the lot, and shall be shown on all definitive plans submitted to the Planning Board. The design and materials shall also be shown on the definitive plans. The permanent address markers shall be constructed of granite, stone, or other alternatives acceptable to the Board.

The Planning Board shall approve the location, design and materials for the permanent address markers.

#### 410 Street Lights

1. Street lights shall be installed at each intersection to conform to the standard established by the Selectmen.
2. Street lights may be required if appropriate, and shall be located at such other intervals as required by the Board in the grass plot, and shall be installed in accord with the procedure required by the Town of Plymouth.

#### 411 Street Trees and Landscaping

##### 1. Purpose

When a new or existing street is constructed or significantly improved, street trees and supplemental landscaping is required as part of these improvements.

##### 2. Design Standards

- a. All landscape plans shall, to the greatest extent feasible, maximize the use of indigenous / native plant material (see recommended plant lists).
- b. All street trees shall be single-stemmed with a single, straight leader. Minimum Sizes for trees shall be as follows:
  - i. Deciduous Shade Trees: Three-Inch Caliper
  - ii. Deciduous Ornamental Trees: Two and ½ Inch Caliper
  - iii. Evergreen Trees: Eight foot height
- c. All plant material must meet all American National Standards Institute (ANSI) standards for plant material, as set forth by the American Standard for Nursery Stock, latest edition published by the American Association of Nurseryman. All landscape materials shall meet certain standard of quality, form, health and structure and have a minimum winter hardiness for Zone 6, as determined by the American standards for Nursery Stock.

##### 3. Street Tree Requirements

The Landscape Architect or approved designer shall select an appropriate planting pattern for street trees in subdivision development. New or significantly improved existing streets shall be planted with street trees. Trees shall be planted on both sides of the street. The maximum spacing for Street Trees shall be 50 feet on-center. Street trees may be clustered or grouped together with 25 foot maximum on-center spacing within a landscape bed; such beds shall maintain a 75 foot maximum distance between clusters.

- a. Provide a single species per street (alternating species are required on parallel and perpendicular streets).

- b. Alternate species are allowed on either side of the same street when a sidewalk is designated on one side of such street.
- c. Multiple species may be designated on the same side of any street between intersections only when proposing an informal massing or clusters of trees, whereby each massing or cluster consists of four trees minimum in a staggered layout, consisting of one species per cluster. Species may then alternate from cluster to cluster, using no more than four species on any one street in this fashion.
- d. The Town recommends (to the extent feasible) the developer preserve existing (healthy) trees located within and adjacent to the right-of-way whenever possible, and in lieu of proposing new plant material as required herein.

The following list of NATIVE TREE SPECIES is recommended. Landscape Architect’s and approved designers may substitute varieties, however such substitutions must be able to demonstrate suitability of alternatives to the satisfaction of the Town Arborist or Landscape Architect. (size and spacing as described above per section 2b).

**NATIVE TREE SPECIES**

<u>Common Name</u>	<u>Botanical Name</u>
Red Maple	<i>Acer rubrum</i>
Sugar Maple	<i>Acer saccharum</i>
Shadblow Serviceberry	<i>Amelanchier canadensis</i>
Paper Birch	<i>Betula papyrifera</i>
Blue beech, Hornbeam	<i>Carpinus caroliniana</i>
Flowering Dogwood	<i>Cornus florida</i>
Pagoda Dogwood	<i>Cornus alternifolia</i>
Gray Dogwood	<i>Cornus racemosa</i>
Beech	<i>Fagus grandifolia var. grandifolia</i>
White Ash	<i>Fraxinus americana</i>
Green Ash	<i>Fraxinus pensylvanica</i>
Witch Hazel	<i>Hamamelis virginiana</i>
Sycamore	<i>Platanus occidentalis</i>

NATIVE TREE SPECIES (continued)

<u>Common Name</u>	<u>Botanical Name</u>
Black Cherry	<i>Prunus serotina</i>
Chokecherry	<i>Prunus virginiana</i>
White Oak	<i>Quercus alba</i>
Red Oak	<i>Quercus rubra</i>
Scarlet Oak	<i>Quercus coccinea</i>
Sassafras	<i>Sassafras albidum</i>
American linden	<i>Tilia americana</i>
American Elm	<i>Ulmus americana</i>

4. Shrubs.

The following list of NATIVE SHRUB SPECIES is recommended for their high performance in slope stabilization, urban, and roadside conditions. Landscape Architect’s and approved designers may substitute varieties, however such substitutions must be able to demonstrate suitability of alternatives to the satisfaction of the Town Arborist or Landscape Architect.

NATIVE SHRUB SPECIES

<u>Common Name</u>	<u>Botanical Name</u>	<u>Minimum Size Spacing</u>
Downy Serviceberry, Shadbush 4’ o.c.	<i>Amelanchier arborea</i>	18”-24”
Summer sweet 18” o.c.	<i>Clethra alnifolia</i>	15”-18”
Kelsey Dwf. Red Osier Dogwood 18” o.c.	<i>Cornus sericea</i> ‘Kelseyi’	12”-15”
Dwarf Winterberry 2’ o.c.	<i>Ilex verticillata</i> ‘Nana’	18”-24”
Rosebay Rhododendron 4’ o.c.	<i>Rhododendron maximum</i>	18”-24”
Swamp Azalea 2’ o.c.	<i>Rhododendron viscosum</i>	15”-18”
Dwarf Fragrant Sumac 18” o.c.	<i>Rhus aromatic</i> ‘Gro-low’	15”-18”

NATIVE SHRUB SPECIES (continued)

<u>Common Name</u>	<u>Botanical Name</u>	<u>Minimum Size</u>
<u>Spacing</u> Pussy Willow 4' o.c.	<i>Salix discolor</i>	18"-24"
Lowbush Blueberry 2' o.c.	<i>Vaccinium angustifolium</i>	1 gallon
Highbush Blueberry 4' o.c.	<i>Vaccinium corymbosum</i>	2 gallon

The following list of NON-NATIVE SPECIES is recommended for high performance in bank stabilization, urban, and roadside conditions. Substitutions are acceptable. The Landscape Architect or approved designer must be able to demonstrate suitability of alternatives to the satisfaction of the Town Arborist or Landscape Architect.

#### NON-NATIVE SPECIES

<u>Common Name</u>	<u>Botanical Name</u>	<u>Minimum Size</u>
<u>Spacing</u> Rockspray Cotoneaster 2' o.c.	<i>Cotoneaster horizontalis</i>	18"-24"
Baltic Ivy 8" o.c.	<i>Hedera helix</i> 'Baltica'	2 yr.
Sargent Juniper 2' o.c.	<i>Juniperus chinensis sargentii</i>	18"-24"
Creeping Juniper Sp. 2' o.c.	<i>Juniperus horizontalis</i> varieties	18"-24"
Hall's honeysuckle 18" o.c.	<i>Lonicera japonica</i> 'Halliana'	2 yr.
'Max Graf' Rugose 2' o.c.	<i>Rosa rugosa</i> 'Max Graf' Rose	1 gallon
Dwarf Rugose Rose 2' o.c.	<i>Rosa rugosa</i> 'Repens'	1 gallon
Anthony Waterer Spirea 2' o.c.	<i>Spiraea bumalda</i> 'A.W.'	18"-24"
Periwinkle 8" o.c.	<i>Vinca minor</i>	2 yr.

5. Salt Tolerant species.

The following list of SALT TOLERANT SPECIES is recommended for high performance in urban, and roadside conditions. Substitutions are acceptable. The Landscape Architect or approved designer must be able to demonstrate suitability of alternatives to the satisfaction of the Town Arborist or Landscape Architect.

Salt Tolerant Deciduous Trees:

Common Name	Botanical Name
Red Maple	<i>Acer rubrum</i>
Common Honeylocust	<i>Gleditsia triancanthos</i>
American Planetree	<i>Platanus occidentalis</i>
London Planetree	<i>Platanus acerifolia</i>
White Oak	<i>Quercus alba</i>
Scarlet Oak	<i>Quercus coccinea</i>
Willows	<i>Salix species</i>

Salt Tolerant Evergreen Trees and Shrubs:

Common Name	Botanical Name
Junipers	<i>Juniperus</i> , various species
Eastern Redcedar	<i>Juniperus virginiana</i>
Mugh Pine	<i>Pinus Montana var. mughus</i>
Austrian Pine	<i>Pinus nigra</i>
American Holly	<i>Ilex opaca</i>

Salt Tolerant Deciduous Shrubs and Small Trees:

Common Name	Botanical Name
Downy Shadblow	<i>Amelanchier Canadensis</i>
Flowering Dogwood	<i>Cornus florida</i>
Gray Dogwood	<i>Cornus racemosa</i>
Redosier Dogwood	<i>Cornus stolonifera</i>
Northern Bayberry	<i>Myrica pennsylvanica</i>
Flameleaf sumac	<i>Rhus copallina</i>
Rugosa rose	<i>Rosa rugosa</i>
Spireas, all kinds	<i>Spirea species</i>

## 6. Drought Tolerant Species.

The following list of DROUGHT TOLERANT SPECIES is recommended to be drought tolerant in urban, and roadside conditions. Any species, regardless of how drought tolerant it may be, will require supplemental watering during its period of establishment in the landscape. Substitutions are acceptable. The Landscape Architect or approved designer must be able to demonstrate suitability of alternatives to the satisfaction of the Town Arborist or Landscape Architect.

### Drought Tolerant Deciduous Trees:

<u>Common Name</u>	<u>Botanical Name</u>
Paperbark maple	<i>Acer griseum</i>
American hornbeam	<i>Carpinus caroliniana</i>
Kousa dogwood	<i>Cornus kousa</i>
Washington hawthorn	<i>Crataegus phaenopyrum</i>
Ginkgo	<i>Ginkgo biloba</i>
Carolina silverbells	<i>Halesia tetraptera</i>
Goldenraintree	<i>Koelreuteria paniculata</i>
Crabapple	<i>Malus spp.</i>
London planetree	<i>Platanus x acerifolia</i>
Oak, many species	<i>Quercus spp.</i>
Linden	<i>Tilia spp.</i>
Japanese zelkova	<i>Zelkova serrata</i>

### Drought Tolerant Deciduous Shrubs:

<u>Common Name</u>	<u>Botanical Name</u>
Chokeberry	<i>Aronia spp.</i>
Butterfly bush	<i>Buddleia davidii</i>
Heather	<i>Calluna spp.</i>
Japanese flowering quince	<i>Chaenomeles x superba</i>
Sweetfern	<i>Comptonia peregrina</i>
Corneliancherry dogwood	<i>Cornus mas</i>
Smokebush	<i>Cotinus coggygria</i>
Cotoneaster	<i>Cotoneaster spp.</i>
Forsythia	<i>Forsythia sp.</i>
Virginia sweetspire	<i>Itea virginica</i>
Bayberry	<i>Myrica pensylvanica</i>
Bush cinquefoil	<i>Potentilla fruticosa</i>
(aromatica, copallina, typhus)	<i>Rhus spp.</i>
Saltspray rose	<i>Rosa rugosa</i>
Spirea, many species	<i>Spirea spp.</i>
Lilac	<i>Syringa spp.</i>
Lowbush blueberry	<i>Vaccinium angustifolium</i>
Arrowwood	<i>Viburnum dentatum</i>

Drought Tolerant Needled Evergreens:

<u>Common Name</u>	<u>Botanical Name</u>
Atlas cedar	<i>Cedrus atlantica</i>
Sawara false cypress	<i>Chamaecyparis pisifera</i>
Junipers, most species	<i>Juniperus spp.</i>
Spruce, most species	<i>Picea spp.</i>
Pine, most species	<i>Pinus spp.</i>
Yew, most species	<i>Taxus spp.</i>
Japanese holly	<i>Ilex crenata</i>
Inkberry	<i>Ilex glabra</i>
American holly	<i>Ilex opaca</i>

7. Groundcover and ground surface treatment.

- a. All unpaved surfaces within the right-of-way shall pitch at 1:50 minimum.
- b. All unpaved areas within the right-of-way with a gradient between 1:50 and 1:3 shall be lawn. Grass shall be sod, seed, or hydroseed using species mix composition typically used in New England for grass receiving routine mowing.
- c. Any unpaved areas within the right-of-way between 1:3 and 1:1.5 shall be planted with low shrubs (under three feet height at maturity) or groundcover, having fibrous root systems to control erosion.

8. Prohibited Plant Species

Per the Massachusetts Department of Agricultural Resources, The Town hereby requires developers to recognize the State regulations regarding Invasive New England Plant Species. The Massachusetts Prohibited Plant List identifies more than 140 plants as either noxious and/or invasive. Such species are prohibited within the Town of Plymouth.

9. Replanting Disturbed Areas

The developer shall be responsible for replanting all disturbed areas (within and/or outside the limit of work) with trees, shrubs, groundcover, and/or loam and seed, except as may be required for drainage catchment areas.

10. Forested Lot Disturbance

The subdivider is encouraged to maintain vegetation on each lot in the event that a forested lot is disturbed to ensure that at least 65% of the lot outside the footprint of the house, driveway and accessory uses and structures remains shaded.

#### 11. Existing Vegetation

Vegetation shall be cleared from the right-of-way only as needed to accommodate roadway, utilities, and sidewalks. Alignment of roads shall follow the existing topography to the greatest extent feasible in an effort to reduce the impact of undisturbed woodlands within and adjacent to the right-of-way.

#### 12. Substitutions and Site Disturbance

The above lists of recommended species are for the developer's use in estimating the level of effort to replant the site. Equal numbers of other similar species may be substituted for those listed above in the appropriate category. No more than 35% of any one species shall be used throughout the subdivision. Greater numbers of plants of smaller size may be submitted to the Planning Board for their consideration. The intent is to minimize disturbance of natural vegetation during construction, and to reforest those disturbed areas with indigenous or compatible species whenever possible, or to supplement that planting with attractive species. Areas between plants shall be stabilized with six inches of good quality loam, raked, screened and seeded. Final determination of the plant species and groupings shall be at the discretion of the Planning Board's Landscape Architect.

#### 13. Erosion and Sedimentation Control

An erosion and Sedimentation Control Plan prepared by a Registered Landscape Architect or a Registered Professional Engineer shall be submitted when a tract of land, to be developed, contains slopes in excess of 15%. In preparing such plan due regard shall be given to minimizing the amount of clearing, grading and slope modifications and making use of existing topography and natural land features and preservation of existing vegetative cover. Permanent vegetative plantings to control erosion shall be of a variety compatible with specific soil and site conditions. Adjacent property, public and private, shall be protected from damage, hazard or pollution which may result from land disturbing operations. Stock piles of soil, fill and loam shall be protected from wind and water erosion. Dust shall be controlled in the entire development.

#### 14. Maintenance and Guarantee

The developer is responsible for the maintenance and care of plantings for a period of one (1) year. In addition, the developer shall provide a one (1) year guarantee from the time of final acceptance. Any unhealthy or dead tree shall be replaced with another which again shall be guaranteed for one (1) year.

#### 412 Monuments

Monuments shall be installed at all street intersections, at all points of change in direction

or curvature of streets and at other points where, in the opinion of the Board, permanent monuments are necessary. Such monuments shall be at least 4" x 4" reinforced concrete or granite posts and must extend from 3-1/2 feet below finished grade to not more than 6" above ground unless otherwise specifically authorized by the Board in writing.

No permanent monuments shall be installed until all construction, which would destroy or disturb the monuments is completed.

## **DRAINAGE**

### 413 Pipe Standards

#### 1. Selection of Drain Size

The proper drain size may be calculated by using "Manning's Formula" with a "Kutter's" "N" value of pipe. For culverts less than 30 feet in length and all drains, the minimum size of pipe shall be 12 inches diameter. Culverts and drains shall be large enough to pass the design storm without surcharge.

#### 2. Type of Pipe

All storm drains shall be reinforced concrete of adequate strength except that in off-street locations bituminous coated, galvanized, corrugated metal pipe, HDPE or pipe arch may be used if approved by the Board. All pipe shall have waterproof joints. Concrete pipe shall conform to the State of Massachusetts standard specifications for highways and bridges, as amended.

#### 3. Slope of Pipe

All pipes shall be laid on a slope so that the minimum velocity with the pipe flowing full shall be 3.0 feet per second. Consideration will be given to flatter slopes if adequate provisions are made for cleaning the pipes. All plans having drains with slopes which will produce pipe velocities less than 3.0 feet per second, flowing full, shall be accompanied by a letter stating the reason for approval by the Planning Board or its agent, and the drain shall not be constructed until the letter has been approved.

#### 4. Catch Basins, Manholes and Inlets

A. Storm drainage manholes, catch basins and inlets shall be constructed of either precast reinforced concrete sections or precast concrete masonry blocks. All structures shall be set on a base of either poured concrete, eight (8) inches in thickness or precast segmented base blocks not less than four (4) inches in thickness. Catch basins and inlets shall have an adequate water-way opening to pass the design storm with not more than 0.2 feet of surcharge. Grates and frames shall be cast iron suitable for the loads, which can occur during the construction and afterward.

The top precast section or rows of block shall be set at an elevation that will allow for installation of a minimum of two (2) courses and a maximum of five (5) course of brick and mortar for setting the cast iron frame and cover or grate. Where the grade adjustment requires more than two (2) courses of brick to be used, precast concrete rings manufactured specifically for this purpose may be used but in no case shall the grade adjustment exceed the equivalent of five (5) courses of brick.

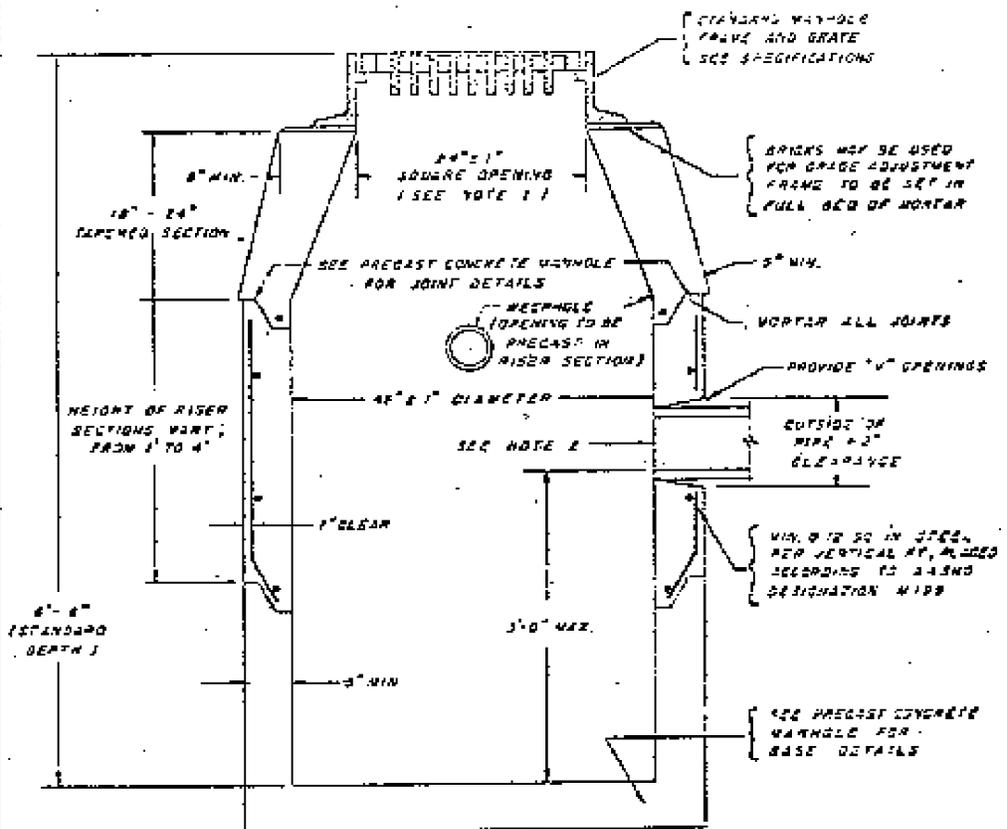
At structures where the outlet pipe is larger than the inlet pipe, the crown of the outlet pipe shall be at the same elevation or lower than the crown of the inlet pipe. Standard four (4) foot diameter manholes, catch basins and inlets shall not be used for drain pipes greater than 30 inches in diameter.

All construction shall conform to Plates 5 and 6 of these Rules and Regulations and to applicable details of the Commonwealth of Massachusetts DPW construction standards, latest edition. Cases not specifically covered by this section shall be in accordance with good engineering practice as detailed in the Commonwealth of Massachusetts Department of Public Works Standard Specifications for Highways and Bridges, current edition. No waiver from the requirements of this section shall be allowed except by action of the Planning Board on the written request of the applicant.

Materials shall conform to the following requirements:

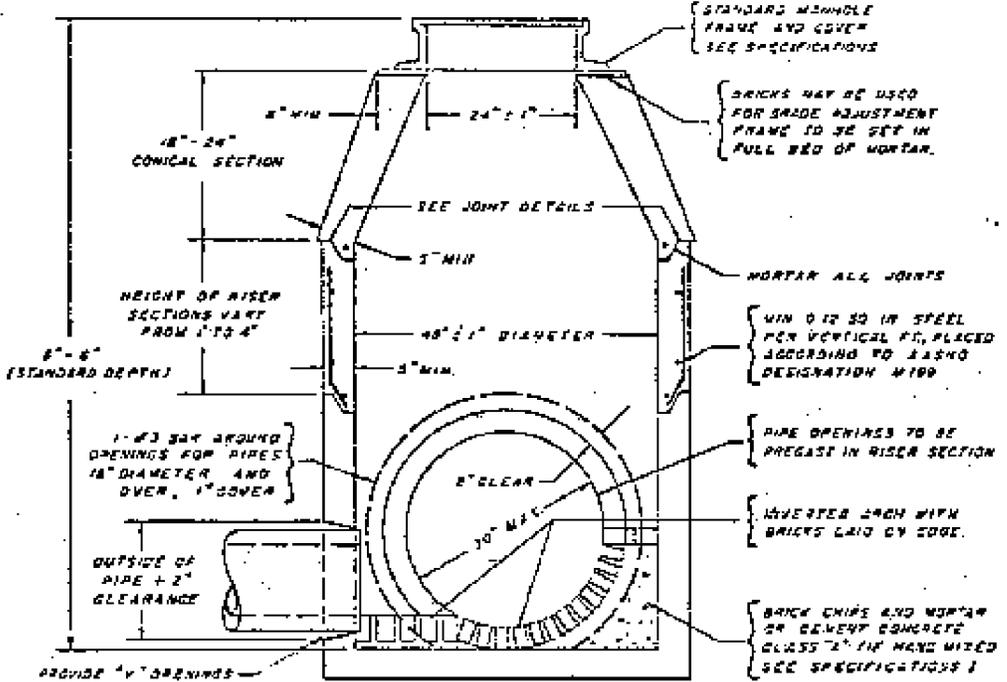
1. Precast reinforced concrete units shall conform ASTM C478 and shall be of the sizes indicated on the referenced details or shown on the definitive plan.
2. Precast concrete masonry block shall conform to ASTM C139 and shall be of proper radius in accordance with the referenced details.
3. Brick shall be new, whole, clay brick or equal, conforming to ASTM C32 Grade MS.
4. Concrete for bases, paved inverts and similar uses shall be 3,000 PSI Concrete.
5. Mortar for use in setting brick, block and joining sections shall be composed of one part Portland cement (ASTM C150) to two parts sand (ASTM C144) with 20 percent hydrated lime (ASTM C207).

## PRECAST CONCRETE CATCH BASIN

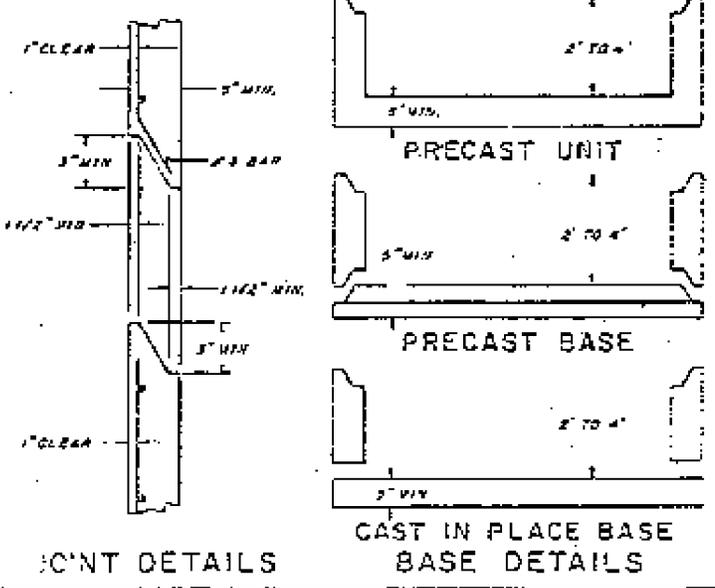


- NOTES:**
1. WHEN A CURB INLET IS INSTALLED, THE OPENING IS TO BE 24" x 24" x 24" x 24"
  2. FACE OF PIPE FLUSH OR NOT TO PROJECT MORE THAN 1" FROM FACE OF WALL ALONG CENTERLINE OF PIPE.
  3. FOR DESCRIPTION, MATERIALS AND CONSTRUCTION METHOD, SEE SPECIFICATIONS.

# PRECAST CONCRETE MANHOLE 9 FEET OR LESS IN DEPTH



NOTE: FOR DESCRIPTIONS, MATERIALS AND CONSTRUCTION METHOD, SEE SPECIFICATIONS.



PLYMOUTH PLANNING BOARD  
PLYMOUTH, MASSACHUSETTS

PLATE 6

## B. Catch Basins and Manholes

Catch basins shall be installed on both sides of the roadway on continuous grades at intervals not to exceed 300 feet, at low points and sags in the roadway, near the corners of the roadway at intersecting streets, and at other such locations as required by the Board. Each catch basin shall be provided with a cast iron frame and grate and granite curb inlet. The grate and curb inlet shall be positioned on the structure in a manner that will not obstruct the grate and gutter mouth openings. All catch basins shall be constructed with concentric top sections. All manholes shall be constructed with shaped concrete or brick inverts and shall be provided with cast aluminum steps.

Drain pipes shall extend through a maximum of 3 catch basins and thereafter through manholes to the point of discharge, with a manhole being required at every change in direction, slope or diameter in the drain pipes. All catch basins, except for the first three, shall discharge into the drain through a manhole.

## C. Inlets

Inlets shall be used in off-street locations and the grate frame shall be mortared in position with the top 0.2 feet below the grade of the finished ground surface. Side openings may be used in lieu of a grate if the quantity of runoff exceeds the capacity of a grate or reasonable size as approved by the Planning Board or its agent. A shaped invert is not required, but the bottom of the inlet shall be finished at the same grade as the lowest pipe invert.

## 414 Construction

### 1. Excavation

The trench for the pipe shall be excavated to the required line and grade including earth boulders and ledge. Trenches for storm drains shall be no wider than the outside diameter of the pipe plus 16 inches for pipes through 18 inches nominal diameter, and the outside diameter plus 24 inches for pipe larger than 18 inches. This trench width shall apply from the top of the pipe to the bottom of the trench. Above the top of the pipe the trench width may be as necessary to properly install the pipe. Trenches with side slopes steeper than the natural angle of repose of the soil shall be sheeted in an approved manner, as necessary, to avoid cave-ins and sloughing. All excavations shall be properly barricaded and lighted at night where they are close to pedestrian or vehicular traffic. Before any pipe is placed in a newly constructed fill, the contractor shall, as directed, place the filling 2 feet above the top grade of the pipe after which the pipe trench may be excavated. If any cross pipes, conduits, drains or other unforeseen obstacles are encountered in the excavation which cannot be relocated, the drain shall be redesigned to avoid the obstruction in a manner suitable to the Planning Board or its agent. Possible obstructions to the line shall be investigated prior to the construction of the drain in its

immediate vicinity.

## 2. Bedding

Trenches may be excavated with a flat bottom, but the full length of the pipe, except the bell, must rest upon undisturbed soil excepted as hereinafter specified. Where trenches have been over excavated, a selected earth or gravel foundation, thoroughly compacted, shall be provided for proper pipe bedding. Soil, which is considered to be unstable by the Planning Board or its agent, shall be removed to a depth of not less than 2 feet below the bottom of the pipe and replaced with compacted sand and gravel to the bottom of the pipe. Unstable soil or other excavated material shall be disposed of off site as directed by the Planning Board or its agent.

## 3. Pipe Laying

Pipe shall be laid starting with the downstream end. Grade boards or other approved devices shall be provided to insure that the pipe is laid true to line and grade. Reference bench marks shall be clearly marked to enable the inspector to quickly check the grade and invert elevations. The joints of all concrete pipes shall be filled with mortar composed of one part Portland Cement to three parts clean sharp sand. Lime may be added up to 25 percent of the cement and enough water to make a workable mix. The downstream pipe shall be laid with the groove or bell facing upstream in the proper position, and a dab of mortar shall be placed in the bell or groove. The spigot or tongue end shall be placed in the bell or groove, such that the inverts match, and the peripheral space shall be filled with stiff mortar. All mortar squeezed out on the inside of the pipe shall be removed before it sets. Other pipe materials shall be installed per the manufacturer's directions and provided for water tight joints.

## 4. Backfilling

After the pipe has been laid and inspected, the trench shall be backfilled. The space under the pipe haunches shall be carefully filled with selected material, free from stones or frozen earth, and compacted carefully to prevent the pipe from moving. The layer of backfill up to 12 inches over the top of the pipe shall also be of selected material free from stones and frozen earth, well compacted. The remainder of the trench shall be backfilled in 12 inch layers except as noted below, and each layer shall be fully compacted in an approved manner. Under roads or other traffic areas the trench shall be backfilled in 6 inch layers with each layer compacted to the density of surrounding soil. Pavement and base course materials removed during the excavation process shall be replaced with pavement and base course to match those removed. When, in the opinion of the Planning Board or its agent, the excavation is deep enough to warrant it, temporary pavement shall be provided as directed. Trenches not in pavement shall be left in a mounded condition as directed by the Planning Board or its agent.

FRONT ELEVATION

END ELEV.

PIPE 2:1 SLOPE			
D	L	CU- YDS.	LBS.
12"	7'-6"	1.49	26
15"	8'-9"	1.82	29
16"	9'-2"	1.94	30
18"	10'-0"	2.18	32
21"	11'-6"	2.62	42
24"	12'-5"	2.97	46
30"	15'-0"	3.86	56

CONCRETE GRABLE  
FOR PIPE CULVERTS  
(TO BE USED WHERE SPECIFIED)  
CLASS "C" CONCRETE

FIELD STONE MASONRY AND CONCRETE ENDS  
FOR 12" TO 30" PIPE CULVERTS

PLYMOUTH PLANNING BOARD  
PLYMOUTH, MASSACHUSETTS

PLATE 7

## 415 Grates and Headwalls

### 1. Security Bars

Security bars in the form of grates shall be provided at all accessible openings to culverts or open pipe drains. At outfalls of 12" diameter pipes, a single bar grate which passes through the center of the opening is sufficient. At outfalls of 15" diameter pipes, a two-bar grate, which divides the opening into thirds, is sufficient. At all other locations, including upstream openings of all pipes, grates are required as follows:

The grate shall be constructed of steel bars not less than 1/2" diameter welded together to provide a grate not smaller than the pipe opening. The vertical bars shall be placed with 4" clear openings between them, and the horizontal bars shall be placed 6" on center. The grate shall be installed at the face of the headwall in such a manner as to allow removal for maintenance purposes. A suitable sketch of the grate and method of installation shall be submitted for approval with the plans for the drains and appurtenances.

### 2. Headwalls

Concrete with a stone veneer or field stone masonry headwalls shall be provided at both ends of culverts and the discharge end of storm drains. They shall conform to the tables on Plate #7.

### 3. Scour Protection

#### A. Description:

The discharge end of all storm drainage lines shall be protected with a rip-rap apron. Said rip-rap apron shall be installed so as to coincide in elevation exactly with the elevation of the bottom of the pipe and the ground line as shown in Plate #7.

At straight headwalls, the width of the apron shall equal the length of the headwall. At headwalls with wingwalls, the width of the apron shall equal the width of the opening between the wingwalls. At flared end units the width of the apron shall equal the nominal pipe diameter plus 6". The length of the apron shall be equal to 10 times the nominal diameter of the drain pipe at all outfall structures except at flared end units, where the rip-rap shall also be placed on the embankment to a point 1 foot above the top of the outfall pipe.

The rip-rap apron shall be composed of a layer of stone 12" or more in thickness, placed upon a gravel filter layer 6" in thickness, unless in the opinion of the Board or the Board's engineer, the quality of the existing subgrade material is of a gradation equivalent to the filter layer material specified. Filter fabric shall be provided between the gravel and subgrade layers.

The stone used for rip-rap shall consist of a protective covering of angular shaped

stones laid on the slopes in front of and around drainage ends to ensure protection of the headwall or flared end unit, the embankment and the downstream channel.

In areas where rip-rap must be placed on slopes equal to or greater than 5%, the stone shall be grouted and shall be extended in a channel to a point where the slope of the land is less than 5%, at which point an additional 10' length of unmortared rip-rap shall be placed.

**B. Materials:**

Stone for rip-rap shall consist of sound, durable angular boulders, quarry stone or rock fragments. Bounded stones, boulders, sandstone or similar stone or relatively thin slabs will not be acceptable. Stone shall be free of overburden, spoil, shale, and organic material and shall meet the following gradation requirements:

<u>Size of Stone:</u> <u>Weight (LB)</u>	<u>Maximum Percent of Total</u> <u>Weight Smaller than Given Size</u>
150	100
100	80
50	25
25	10

No more than 5% by weight shall pass a 2" sieve. Each load of rip-rap shall be reasonable well-graded from the smallest to the maximum size specified. Control of gradation shall be by visual inspection.

Gravel for filter layer shall conform to requirements of Sec. 319 of these regulations.

Mortar for grouted rip-rap shall conform to Section M4.02.15 of the Commonwealth of Massachusetts Department of Public Works Standard Specifications for Highways and Bridges, 1973.

**C. Construction Methods:**

Prior to placement of the rip-rap, all unsuitable materials such as topsoil, vegetation, roots, sand, etc. shall be removed from the area to be protected by rip-rap. The area shall be filled to the subgrade of the rip-rap with material hereinbefore specified for the filter layer and compacted as for roadway embankments. All slopes adjacent to the headwall or the flared end unit shall be graded to a slope not to exceed two (2) horizontal to one (1) vertical. The slope immediately downstream of the outfall structure shall be graded generally in the shape of the trapezoidal channel, flaring to a flat cross section at the terminus of the rip-rap apron.

Stone for rip-rap shall be placed on the filter layer or, when the filter layer is not required, directly on the prepared slope or area in a manner, which will produce a reasonably well-graded mass of stone with the minimum practicable percentage of

voids. The entire mass of stone shall be placed in conformance with the lines, grades, and thickness as specified. The rip-rap shall be placed to its full course thickness in one operation and in such a manner as to avoid displacing the underlying material. Placing rip-rap by methods likely to cause segregation, will not be permitted.

The larger stones shall be well distributed and the entire mass of stone shall conform approximately to the gradation specified. The rip-rap shall be so placed and distributed that there will be no large accumulations of either the larger or smaller sizes of stone. All voids, measuring 4" or larger in any dimension, shall be filled with stone (chinked) to the satisfaction of the Board or the Board's engineer.

It is the intent of these specifications to produce a fairly compact rip-rap protection in which all sizes of material are placed in their proper proportions. Hand placing chinking, or rearranging of individual stones or existing stone, may be required to the extent necessary to secure the results specified.

The stone for grouted rip-rap shall conform to the gradation requirement for rip-rap as hereinbefore specified. The stone be clean and free of fines which prevent penetration of grout. Care shall be taken in placing the stone to keep earth or sand from filling the spaces between the stones. The stones shall be placed on the prepared slope and shall be thoroughly moistened. Any excess of fines shall be sluiced to the underside of the stone blanket before grouting. The grout shall be delivered to the site by means that will insure uniformity of prevent segregation of the grout. Penetration of the grout shall be to the full depth of the rip-rap apron and the grout shall fill the interstices to within one (1) inch of the surface.

## **SEWERS AND WATER SUPPLY**

### **416 Sanitary Sewers**

Sanitary sewers shall be installed, flushed and tested in accordance with the requirements of the Sewer Department, and to the satisfaction of the Board's engineer. Connections to all lots shall be installed on the exterior right-of-way line as shown on the definitive plan.

### **417 Water Supply**

1. Water mains, laterals, and appurtenances shall be of the size, material and location as directed by the Water Department.
2. All lots on streets on which a water main is to be installed shall be provided with an approved service connection at the property line.
3. Hydrants, with valves of a type approved by the water commissioners, shall be installed on all water mains at a spacing of not more than 500 feet. In addition, there shall be a hydrant and valve placed at the end of every water main. Hydrants shall be designed and located in accordance with Section 318-3, as amended.

Amendment Effective 10-10-80

418 Waiver of Sewer and/or Water Requirements

1. Where in the opinion of the Board, municipal sewer lines are not accessible, and will not become available within two years, the Board shall waive the requirements of the construction of sewers, and require instead other means of sewerage disposal acceptable to the Board of Health.
2. Where in the opinion of the Board, municipal water lines are not accessible, and will not become accessible within two years, the Board shall waive the requirement of construction of water lines and shall require instead other means of water supply acceptable to the water commissioners.

**UTILITIES**

419 Location

1. All utilities within a subdivision shall be placed underground.
2. All utility lines shall be shown in plan and profile in the definitive plan as required by Section 220 of these Rules and Regulations.

420 Connections

Connections for all utilities from the main structures to the exterior line of the way shall be constructed for each lot whether or not there is a building thereon.

421 Extension of Utilities

Where adjacent property is not subdivided or where all the property of the applicant is not being subdivided at the same time, provisions should be made for the extension of the utility system by continuing mains the full length of streets to the exterior limits of the subdivision at such grade and size which will, in the opinion of the Planning Board, permit their proper extension.

422 Fire Alarm Boxes

Fire alarm service, and all necessary equipment, wiring and appurtenances incidental thereto, shall be installed by the applicant at his expense in accordance with the requirements of the Fire Department and to the satisfaction of the Fire Chief who may designate a representative to perform his duties under this section.

All plans, equipment and installation of equipment shall be in conformity, where

applicable, with the standards and provisions of the current edition of the National Fire Protection Association's National Fire Codes, as amended, including particularly Volume 7 thereof and Public Communications Standard No. 73 and all amendments thereto.

Unless otherwise required pursuant to this regulation, all fire alarm boxes shall be Gamewell or the equivalent as determined and specifically approved by the Fire Chief. Fire alarm boxes shall be located not closer than four (4) feet to the edge of the pavement and not more than one thousand (1,000) feet apart, measured along the center line of the road, provided however, that the Fire Chief may in his discretion require fire alarm boxes to be placed at certain other specified distances or locations, where deemed appropriate, for example, at or near places of assembly, lodging houses, churches or school buildings.

In the event an existing adequate municipal circuit is available at the site, installation shall include connection with such circuit, with all expenses to be borne by the applicant. In the event an adequate municipal circuit does not exist at the site, but is located within twenty-five hundred (2500) feet of the site, measured along the center line of the road, the applicant shall furnish at his expense the necessary equipment for connection and the Town shall furnish at its expense the necessary labor to make the connection. In the event an adequate municipal circuit is not located within twenty-five (2500) hundred feet of the site, or for other good cause shown, the Fire Chief may, notwithstanding for the foregoing provisions, grant in his discretion a waiver of the requirements of this section either in whole or in part. The granting of a waiver of one requirement shall not necessarily constitute grounds for the granting of a waiver of another requirement in the same matter or of the same requirement in some other matter.

The applicant's obligation under this section shall not be deemed satisfied unless and until the Fire Chief so certifies in writing to the Planning Board. Such certification shall constitute a release of the applicant from all obligations under this section, provided however, the Fire Chief may impose conditions, suitably secured, for the performance of same with regard to obligations on the part of the applicant to maintain or repair the fire alarm service, including all equipment, wiring and appurtenances, until acceptance of the streets or otherwise. All equipment installed in, over or under streets, ways and easements shall become the property of the Town upon acceptance and shall be maintained by the Town thereafter.

#### 423 Clean Up

The entire work area must be cleaned up so as to leave a neat and orderly appearance free from debris and other objectionable materials.

### **INSPECTIONS**

#### 424 Purpose

Inspections of the quality of materials used and methods of installation of the improvements within a subdivision by the Board's engineer are required to protect the

health and welfare of the future subdivision residents and of the Town.

#### 425 Access

The applicant will provide safe and convenient access to all parts of the subdivision, for the purpose of inspection, to representatives of the Board or other town agencies and Boards.

#### 426 Responsibility

The applicant is responsible for requesting inspections at the proper stage in the process of installation of improvements, as provided in Section 428 below. Should an inspection not be performed due to the failure of the applicant to notify the inspector, the applicant will be required to uncover the improvements. No work will be accepted that has been covered before inspection.

#### 427 Pre-Construction Conference

Prior to any construction, the developer, their project engineer, and their contractor must meet with the Planning Board or its designated representatives and other appropriate town parties to review the subdivision permit and conditions. The applicant must provide evidence that all of the required documents have been recorded and adequate copies of all documents have been provided to the Planning Board, including the Construction Management Plan (Section 222-2) and the SWPPP or erosion and sedimentation control plan required in Section 303-3. The pre-construction meeting will take into consideration grading field changes which may be authorized through the Town's consulting engineer in order to preserve natural features and vegetation.

After the pre-construction conference, the developer shall notify in writing the Planning Board and Department of Public Works at least two (2) business days in advance of the date of commencement of construction and subsequent phases of construction.

In the event that work has ceased on the site for a period of three (3) months or a change in the contractor or developer occurs, another pre-construction conference is required with notification prior to continuation of work. Failure to comply with this section may result in the Board withholding final construction sign-off per Section 504 and/or release of surety per Section 506.

#### 428 Inspection Deposit and Fee (See Section 202)

#### 429 Inspection Schedule

1. The applicant shall request each inspection in writing at least three (3) days before the preferred date for such inspection.
2. Inspections shall be for the following purposes:

	<u>Timing</u>	<u>Purpose</u>
Inspection #1	Prepared Site Open Trenches Preparation	Correct Materials Proper Site
Inspection #2	Installed Drains Water Mains, Sewer, Utilities, and Open Trenches	Correct Installation of Line; and shall be witnessed by an inspector hired by the Town. Applicant must check with Water and Sewer Departments with regards to inspection requirements for public water and sewer.
Inspection #3	After Compaction of Roadway Before Paving	For Correct Placement of Fill Gravel, and Compacting
Inspection #4	During Street Construction	For Correct Construction of Pavement, Curb, and Sidewalk
Inspection #5	After Cleaning Up	For Installation of Grass Plots, Street Signs, and for Cleaning Up

3. The Board's engineer shall indicate on Form G, the date of inspection and approval of work completed. Such form shall be filed with the Board.

#### 430 Pressure and Leakage Tests for Water Mains

1. All specifications covering material, workmanship, installation size of pipes, etc. used in the Town of Plymouth shall be approved by the Board of Water Commissioners. Also, two (2) pressure tests, one before and one after a four (4) hour leakage test must be provided by the contractor or developer under the supervision of the Water Department.

##### Pressure Test

The contractor shall, by pumping, raise the water pressure of the section under test to a pressure in pounds per square inch numerically equal to the class rating of the pipe. If the contractor cannot achieve the specified pressure and maintain it for a period of one hour, the section under test shall be considered as having failed to pass the pressure test.

## **ARTICLE V                    PERFORMANCE GUARANTEES**

### 500     Guarantee Required

Before endorsement of its approval of a plan, the Board shall require in accordance with Section 81-LL of the Subdivision Control Law, that the construction of ways and the installation of municipal services be secured by one or in part by the other of the methods described in Sections 501 or 502 below, which method may be varied by the applicant.

### 501     Final Approval with Bond or Surety

The applicant shall file with the Town a surety bond in a form satisfactory to the Board, or deposit negotiable securities of a kind acceptable to the Board, in a penal sum or amount sufficient in the opinion of the Board to secure the performance of the construction of ways and installation of utilities for all lots not covered by a covenant as described in Section 502 below. Any bond, surety agreement, or securities filed or deposited in accordance herewith, shall be executed so as to secure the completion of all required work within two years of such filing of deposit or within such other time as the Board may specify, in an amount determined by the Planning Board in consultation with their advisers to be sufficient to cover the cost of all or any part of the improvements specified in these regulations at State “prevailing wage rates” not covered by a covenant and to cover the costs of inspections, record plans, street acceptance plans, as-built plans and legal work, including a 20% contingency/inflation factor. Warranty principal shall not be less than 15% of the estimated costs of those components of the total project which shall be dedicated for public use and shall cover workmanship and materials. Upon failure of the developer to complete such work to the satisfaction of the Board, and in accordance with all applicable plans, regulations and specifications, the Town shall be entitled to enforce such bond or to realize upon such securities to the extent necessary to complete all such work without delay.

### 502     Final Approval with Covenant

The applicant shall execute a covenant (Form E) which shall be approved by the Board as to contents and recorded with the approved definitive plan at the expense of the applicant. The applicant shall covenant and agree therein that no lot within the subdivision or the portion thereof described in the covenant shall be built upon or conveyed, except by mortgage deed, until such lot or lots shall be released from the conditions of said covenant by a majority vote of the Planning Board upon satisfactory completion of ways and the installation of municipal services in accordance with the approved definitive plan and with all applicable plans, regulations and specifications. the covenant shall run with the land and shall be binding upon the applicant and the applicant's successors in title to the land to which the covenant refers or any portions thereof.

Any covenant and any conditions required by the Board of Health shall be inscribed on

the definitive plan to which they refer or shall be recorded as a separate document and referred to on such definitive plan.

#### 503 Reversion of Bond to Covenant

If the developer desires to secure by means of a covenant the construction of ways and the installation of municipal services in a portion of a subdivision for which no building permits have been granted and to have the Board release the bond or negotiable securities previously furnished to secure such construction and installation, the developer shall submit to the Board a cloth tracing and three copies of a new plan, limited only to that part of the definitive plan which is to be subject to such covenant. Upon approval of the covenant by the Board, reference thereto shall be inscribed on such new plan and the plan endorsed by the Planning Board and recorded with the covenant at the expense of the developer.

#### 504 Certification of Performance

Before the bond or surety or covenant, required in Sections 501 and 502, is released by the Board, the applicant shall submit to the Board an engineer's certificate of performance certifying that the ways within the subdivision have been completed in accordance with these Rules and Regulations and the definitive plan and profile.

#### 505 As Built Plan

Prior to the Board's release of surety bond or deposit, or in the case of a covenant issue a certificate of performance, the developer shall supply the Town with one (1) reproducible set, one (1) in electronic format compatible with standards to be established by the Town, and two (two) prints of As Built Plans. The electronic format shall be labeled with the submission date, municipal project number or identifier, project or subdivision name, and name and version of the computer operating system on which the media was written.

As Built Plans shall be consistent with the plan and profile sheets, and detail sheets of the approved definitive plan. Said plans shall be corrected to indicate "As Built" conditions by inserting "As Built" dimensions and conditions in parentheses on the plan. Said plan shall be certified by a registered professional engineer and/or land surveyor.

As Built Plans must contain the following information:

1. The material, location and grade of the roadway, easements, and other associated improvements (i.e. sidewalks, berms, curbing, retaining walls, guard rails, street signs, grass strips, etc.)
2. The material, size, and location of all the drainage improvements including: drainage areas, manholes, catch basins, inlets, leaching pits, and pipes.
3. The material, size, and location of all Town utilities including water and sewer lines. Hydrants, ties to gate valves, service connections, rim and invert grades at sewer

manholes are to be located.

4. The material, size, and location of all other utilities, including electric, gas, telephone, television cables, and fire alarms as located on the ground.

#### 506 Release of Surety

Upon the receipt of such request for the release of lots or sureties, the Board shall request from the Board's engineer a verification of the satisfactory completion of all work in the subdivision and shall either approve the work and release the surety or lots or state wherein the work fails to comply with the definitive plan and with these Rules and Regulations and refuse the request. Either action shall be by a majority vote of the Board and a certificate of the Board's action shall be transmitted, within 45 days of the developer's request, to the Town Clerk, to the developer-by registered mail, in a form suitable for recording, and to the surety company concerned, if any.

The Planning Board shall hold all lot covenants, or at least twenty (20%) of the original approved cost estimate or twenty thousand dollars (\$20,000), whichever is greater, until one year after the completion of all pavement, drainage facilities and until two growing seasons after the installation of landscaping, to ensure the success of those features. Only at the successful completion of said warranty shall these covenants or funds be released. The required subdivision improvements are not considered complete, in accordance with the state subdivision control law, until this warranty period is complete and it has been documented that the improvements are well enough constructed to last this warranty period.

#### 507 Conveyance of Utilities

Before the Board will release a surety bond or deposit, or, in the case of a covenant, issue a Certificate of Performance, the developer shall execute an instrument (Form F) transferring to the Town valid, unencumbered title to all sanitary sewers, fire alarm conduits, water mains and all appurtenances thereto constructed and installed in the subdivision and conveying to the Town, without cost and free of all liens and encumbrances, perpetual rights and easements to construct, inspect, repair, renew, replace, operate and forever maintain such sanitary sewers, storm water drains, fire alarm conduits, water mains and all appurtenances thereof and to do all acts incidental thereto, in, through and under the whole of all streets in the subdivision, and if such sewers, storm water drains, fire alarm conduits and water drains, fire alarm conduits and water mains have been constructed and installed in land not within such streets, then in, through and under the easements, as shown, in, through and under a strip of land extending then feet in width on each side of the centerline of all such sewers, drains, fire alarm conduits, and water mains. The above shall not be construed to relieve the developer and his successors in title to a portion of land or street in the subdivision of responsibility to complete all construction, as required by developer's covenants and agreements with the Town, and to thereafter maintain all streets and utilities in a satisfactory condition until

they are accepted by the Town.

508 Street Layout Plan

Before the Board will release a surety bond or deposit or in the case of a covenant, issue a Certificate of Performance, the developer shall supply the Board with the street layout plan as described in Section 221.

Amendment Effective 1-25-80

## **ARTICLE VI            ADMINISTRATION**

### 601    Variation

Strict compliance with the requirements of these Rules and Regulations may be waived when, in the judgment of the Board, such action is in the public interest and not inconsistent with the Subdivision Control Law. A subdivision approved and endorsed by the Planning Board must comply with all the rules and regulations for the subdivision of land unless a specific waiver is granted. Waivers are only granted for projects which provide, in the sole opinion of the Planning Board, clear and significant improvements to the quality of a project compared with a project which meets the minimum of the subdivision regulations.

### 602    Modification, Amendment or Rescission

1. The Planning Board, acting on its own motion or on the petition of any interested person, shall have the power to modify, amend, or rescind its approval of a subdivision plan, or to require a change in a plan as a condition of its retaining the status of an approved plan. All the provisions relating to the submission or approval of a subdivision plan shall also apply, so far as apt, to the approval of the modification, amendment or rescission of such approval and to a plan which has been changed under this paragraph.
2. No modification, amendment or rescission of the approval of a subdivision plan or change in such plan shall affect the lots which have been sold or mortgaged subsequent to the approval of the plan, or any right appurtenant thereto, without the consent of the owner of such lots, and of the holder of the mortgage or mortgages, if any, thereon.
3. No modification, amendment or rescission or change in an approved plan shall take effect until the applicable provisions of Section 81-W of the Subdivision Control Laws are complied with.
4. The construction of all ways and the installation of all municipal services shall be required to be completed in accordance with the applicable rules and regulations of the Board within two years of the date of endorsement. Upon a finding by the Planning Board that the construction of all ways and the installation of all municipal services has not been completed within two years the approval of the plan shall be automatically rescinded.
5. If a subdivision is developed in phases as required by Section 205-67 of the Zoning Bylaw, the developer shall:
  - A.    comply with the requirements of Section 602(4) or

- B. shall submit a phased construction plan of all ways and the installation of all municipal services. Said phased construction plan shall note:
  - a. the commencement date for work in each phase,
  - b. where work shall occur, and
  - c. be consistent with number of building permits allowed per year by Section 205-67 of the Zoning Bylaw.

The construction of all ways and the installation of all municipal services shall be required to be completed in the first phase in accordance with the applicable rules and regulations of the Board within two years of the date of endorsement. Subsequent phases must be completed within two years of the phase's commencement date. Upon a finding by the Planning Board that the construction of all ways and the installation of all municipal services has not been completed within two years the approval of the plan shall be automatically rescinded.

- 6. Definitive plans shall be endorsed within 120 days from the date of approval, or in the case of an appeal, endorsement of the plans and profiles shall be within 120 days of the settlement of the appeal.

#### 603 Severability

If any provision of these Rules and Regulations is found to be invalid or void, it shall not affect any other provision of these Rules and Regulations.

#### 604 Reference

For matters not covered by these Rules and Regulations, reference is made to Sections 81-K to 81-GG inclusive of Chapter 41 of the General Laws.

#### 605 Appeal

Appeals may be taken from the determination of the Board in accordance with the provisions of Section 81-BB, Chapter 41 of the General Laws.

## ARTICLE VII      OPEN SPACE MIXED USE DEVELOPMENT

### 701      General Introduction

Notwithstanding any other provisions of the above Articles I through VI of the Rules and Regulations to the contrary, the Rules and Regulations contained in this Article VII shall govern any land for which the Planning Board has approved a Master Plan Special Permit for an Open Space Mixed Use Development (“OSMUD”), or for which the Plymouth Town Meeting has approved a Development Plan for an OSMUD, as provided in Section 205-63<sup>1</sup> of the Plymouth Zoning Bylaw (the “Bylaw”). In the event that any provisions of this Article VII shall be in conflict with any provisions of Articles I through VI of the above Rules and Regulations, the provisions of this Article VII shall control.

Under Section 205-63 (F)(3) of the Bylaw, streets within an OSMUD have different design standards than a conventional residential subdivision. Generally, OSMUD preserves open space and mandates smaller lots and roads to protect and to reflect the rural character of Plymouth and provides protections to existing forest roads and particularly to Old Sandwich Road, an existing Scenic Street. The overall area of land subject to an OSMUD Master Plan approved by the Planning Board or a Development Plan approved by Plymouth Town Meeting, Section 205-63 (F)(3) of the Bylaw specifically provides that the Planning Board “shall” allow Collector Streets within OSMUD to have a paved surface width of twenty-two (22’) feet (with or without Cape Cod berms), and Minor and Residential Streets within OSMUD to have a paved surface width of eighteen (18’) feet (with or without Cape Cod berms). Required granite shall be installed in any Neighborhood Green along the perimeter of the green and where sidewalks abut the street. Meandering pedestrian paths, rather than paved sidewalks, are acceptable within the OSMUD. Also, under that Section the Planning Board “shall” encourage flexibility in the roadway design, length of cul-de-sac, steepness of grade, and construction standards based upon the topography of the land and the Bylaw’s intent to minimize the disturbance of the natural site by any proposed development.

### 702      Roadway Classifications

All roads will be classified according to anticipated traffic use, adjacent land use and zoning, and land access requirements. Road standards for design and construction have been developed for three functional classifications:

- **Collector Streets** - roads primarily designed to accommodate the larger volumes of internal site traffic.
- **Minor Streets** - roads typically linking development areas exclusive of the collector roads.

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<sup>1</sup> Formerly known as Section 401.25, Old Bylaw.

- **Residential Streets** - roads designed for low-speed, low-traffic conditions within development areas.

703 Roadway Design Standards

Road layouts will conform to the rural character of the site by following existing topography to the extent practicable, and will promote “traffic calming” aimed at reducing the speed and dominance of motor vehicles, and creating a compatibility between mixed transport modes and land use. Speed containing techniques may include:

- Traffic throttles (or pinch points)
- Textured surfaces and rumble strips
- Speed tables (speed bumps, raised intersections, etc.)
- Entry treatment across intersections
- Meandering roads, in vertical and horizontal alignment

In certain situations, based on natural features, such as significant trees to be preserved, shoulder widths may be relaxed in specific locations. The right-of-way width may vary from place to place. The Table below specifies additional detail on roadway design standards.

**Table – Section 703 Roadway Design Standards**

	<b>Collector</b>	<b>Minor</b>	<b>Residential</b>
Minimum Centerline Radius (Rmin)	200'	135'	(1)
Ksag (desired/minimum)	20/15	15/10	N/A
Kcrest (min.)	10	10	N/A
Min. length of vertical curve	50'	50'	40'
Normal Crown	2%	2%	2%
Maximum Superelevation (emax)	4%	4%	4%
Minimum Road Grade (Smin)	1%	1%	1%
Maximum Road Grade (Smax)	12%	15%	15%
Minimum Right of way width	22'	18'	18'
Pavement Width	22'	18'	18'
Width of graded shoulders	4'	4'	3'
Min. Intersection offset	200'	200'	N/A
Rmin - Pavement returns	25'	20'	20'
Rmin - ROW returns	20'	15'	15'
Max. dead-end length	N/A	N/A	1000'
Gravel Base Course	12"	12"	12"
Bituminous Pavement Thickness	4"	4"	3"

(1) = As required for fire apparatus

N/A = Not Applicable

## 704 Intersection Design Standards

Intersections will be designed to provide clear lines of sight for turning movements, either through alignment design or through the creation of buffer areas in which obstructive plantings, buildings and/or signing will be prohibited. Intersection sight distances consistent with anticipated travel speed and traffic volume will be provided.

Intersections will be created at angles greater than 60 degrees where practical.

The minimum spacing between intersecting minor and collector roadways shall be 200 feet, except in the Neighborhood Green.

The centerline grade of a street on a stopped approach to an intersection will not exceed 4% within fifty (50') feet of the edge of pavement of the through street.

The maximum number of approaches to an intersection will be four (4).

Driveway cuts on to minor streets will not be within fifty-five (55') feet of an intersection with a collector road.

## 705 Dead End Streets

The following standards shall govern dead-end streets within an OSMUD:

1. Dead-end streets will not exceed 1000 feet, unless extenuating circumstances require greater lengths.
2. Except in instances in which a secondary emergency access is available in accordance with item 4., below, a turn-around will be provided at or near the closed end of all dead-end street in accordance with one of the following design criteria:
  - a. A so-called “teardrop” design with a centerline radius of 35’ and a 20” wide edge of pavement; or
  - b. A so-called “T” design which is 30’ in depth and 15’ wide with a 20’ curb return radius and 8’ of clearance at the end of the turn-around; or
  - c. A so-called “hammer head” design with 18’ of depth and 80’ long with a 20’ curb return radius with 6’ of clearance.

Each such turn-around must be signed for no parking. In the case of the “T” design and the “hammer head” design, such turn-around does not have to be paved.

3. Grades will not exceed 4% throughout the turn-around.

4. Wherever feasible, a secondary emergency access will be provided at dead-ends. The secondary access does not have to be paved.

#### 706 Neighborhood Green District

Roads, sidewalks and curbing in the Neighborhood Green shall conform to the following standards:

1. All through roads will be collector roads.
2. Sidewalks will be constructed along storefronts.
3. Granite curbing will be provided along the perimeter of the Town common and where sidewalks abut the street.
4. Pavement widths may include on-street parking for head-in, parallel, or angle parking.
5. Right of way widths may be increased to include street and sidewalk, as appropriate.
6. Curb return radii may be reduced to ten (10') feet where truck accessibility can be demonstrated.

#### 707 More Than One Dwelling Per Lot

More than one building, each containing a number of attached or detached dwelling units, may be provided on a lot within an OSMUD. This is intended to facilitate shared use of common facilities, including but not limited to shared use of landscaping, driveways and septic systems.

#### 708 Drafting Standards

Any definitive subdivision plan for OSMUD land, or any modified definitive subdivision plan in connection therewith, will be drawn at a scale acceptable to the Engineering Division. Final plans shall be submitted to the Engineering Division in an electronic format compatible to the Town's system.

#### 709 Locus Map

Given the area of land included within an OSMUD, a locus map at the required scale of Section 218 of the Rules and Regulations (1"=800' or 1"=1000') would not provide a viable plan of the locus. Consequently, the locus map submitted with a Master Plan Special Permit application for an OSMUD may be drawn at a scale of 1" = 100,000'. A locus map and lotting plan at the scales required by Section 218, if feasible, will be submitted for any definitive subdivision plan for OSMUD land, or any modification thereof.

#### 710 Lot Layout Plan

Given the intended size of an OSMUD, the lot layout plan need not show major trees or

the location of all proposed tree plantings. The lot layout must show topography at a minimum of four (4') foot intervals.

#### 711 Street and Utilities Construction Plans and Profiles

A street and utilities construction plan and profile for each street must be provided on a separate sheet or sheets, consisting of a layout plan of the street and a profile matching the layout either above or below it for ease in locating corresponding points. The profile must be drawn at a vertical scale acceptable to the Engineering Division.

#### 712 Street Layout Plans

Because streets within an OSMUD will remain private, no layout plans are required for street acceptance by the Town.

#### 713 Utilities Underground

Electric, telephone and other utilities shall be placed underground , except for existing utilities on-site or adjacent to the site, and except for such aboveground utilities as may be allowed by the Planning Board.

#### 714 Private Streets

Consistent with OSMUD Section 205-63 of the Bylaw, the streets within an OSMUD will be private.

#### 715 Protection of Improvements

The subdivision ways are to be deeded to Landowners' Associations, or to a trust or other such entity or entities.

#### 716 Curbing

Streets will be installed with or without Cape Cod berms, except in the Neighborhood Green, where granite curbing will be provided along the perimeter of the common and where sidewalks abut the street.

#### 717 Sidewalks and Grass Plots

Residential Streets within an OSMUD will not require sidewalks, as they are intended to preserve a more rural character, consistent with OSMUD Section 205-63 (F)(3), and pedestrian trails will be provided within adjacent open space. Collector and Minor Streets within the site are not required to have sidewalks, but rather pedestrian trails, either existing or new, which will not necessarily follow the roadway paths and may meander depending on site and topographical considerations, with the exception of the

Neighborhood Green, which will have sidewalks along store fronts, with or without grass strips.

#### 718 Street Signs

Street, stop and other such signs may be custom designed, not necessarily conforming to conventional signage. The fact that roads within an OSMUD will remain private, that substantial buffers from public streets are required, and that an OSMUD will be self-contained and unique dictate that the signs may also be unique. OSMUD Section 205-63 (F)(10) provides, in part, that “the Planning Board may by special permit allow signs of such size and height as appropriate for identification and safety in relation to a proposed use and in relation to the intensity, buffers and setbacks of such use”.

#### 719 Street Lights

Driveway and house lanterns instead of conventional streetlights are preferable within residential and planned retirement areas of an OSMUD. In the Neighborhood Green, appropriate street and building lighting will be provided.

#### 720 Street Trees and Landscaping

Landscaping is not required in locations where existing trees and natural ground vegetation will remain, depending on location of roadways and other amenities.

#### 721 Drainage

The stormwater treatment intended for an OSMUD differs from the general standards of the Town. Established stormwater management techniques will be employed both during construction and as a permanent amenity of an OSMUD. Subdivision applications will include design of drainage facilities, as required.

Both the Rational Method and SCS Method will be used to estimate runoff, as appropriate, for the size and character of the watershed and for pond routing and hydraulic modeling.

The following documents (as same may be modified or amended) will be referenced for the design of drainage facilities:

- “A Guide for the Design of Storm Water Facilities in the Town of Plymouth, Massachusetts”, Plymouth DPW, December, 1983, as amended.
- “Stormwater Management, Volume One: Stormwater Policy Handbook, and Volume Two: Stormwater Technical Handbook”, MADEP and MACZM, March 1997.
- “Urban Hydrology for Small Watersheds - Technical Release No. 55”, US Soil Conservation Service, June 1986.

The following general concepts shall apply:

1. Ponds and water courses may function as stormwater treatment facilities, sources of water for irrigation, and aesthetic enhancement.
2. Surface water and ground water quality will be protected by implementing best management practices (BMPs) to remove sediments and contaminants from the water prior to discharging off-site or infiltrating into the ground in conformance with Massachusetts Stormwater Management Policy.
3. Temporary erosion and soil sedimentation control measures will be used through the construction phases until soil is sufficiently stabilized with final ground cover.

#### 722 Sewer and/or Water Requirements

Consistent with OSMUD Section 205-63 (D) of the Bylaw, sewer and water will not be provided by municipal services. Therefore, on-site septic systems, wastewater treatment plants, and private and community wells are permitted.

#### 723 Conveyance of Utilities

Consistent with the requirements of OSMUD Section 205-63 (D) of the Bylaw that infrastructure and utilities not be maintained by the Town, infrastructure and utilities within an OSMUD will not be conveyed to the Town.

#### 724 Schedule of Completion

Construction of roads and utilities (including septic, storm water drains, wells or other water supply, fire alarm conduits, electric and telephone wiring), or a performance guarantee, shall be provided for the relevant area within an OSMUD prior to the grant of a building permit for any building within that area being serviced by such roads and utilities. All time frames may be extended by the Planning Board without requiring modification and amendment of the subdivision approval or modified subdivision approval.

#### 725 Consistency with Master Plan

The intent of Article VII OSMUD of the Rules and Regulations is to reflect applicable provisions of the Master Plan for The Pinehills, Plymouth, Massachusetts, as previously adopted and amended by Plymouth Town Meeting, and as it may be amended in the future; by Town Meeting (the “Master Plan”). To the extent that any inconsistencies may exist between Article VII OSMUD of the Rules and Regulations and the Master Plan, the Master Plan shall govern.

## Article VIII – TRADITIONAL RURAL VILLAGE DEVELOPMENT

### 801 General Introduction

Notwithstanding any other provisions of the above Articles I through VI of the Rules and Regulations to the contrary, the Rules and Regulations contained in this Article VIII shall govern any land for which the Planning Board has approved a Master Plan pursuant to a Master Concept Plan Special Permit for a Traditional Rural Village Development (“TRVD”), as provided in Section 205-72 of the Plymouth Zoning Bylaw (the “Bylaw”). In the event that any provisions of this Article VIII shall be in conflict with any provisions of Articles I through VI of the above Rules and Regulations, the provisions of this Article VIII shall control; further, to the extent that any inconsistencies may exist between this Article VIII and an approved Master Plan, the Master Plan shall govern.

Generally, TRVD allows for an alternative form of land use development consistent with the design principles of “traditional” neighborhoods and villages. These principles provide the design and development opportunities for diversification and integration of land for residential, retail, restaurant, office, services, community facilities, agricultural, and active and passive indoor and outdoor recreational uses with the protection of environmentally significant land, within close proximity to one another, thereby providing for many of the daily needs of the residents of the neighborhood and village as well as many of the daily needs of other residents living in nearby established neighborhoods and village areas.

Under Section 205-72(H) of the Bylaw, streets within a TRVD shall have different design standards than a conventional residential subdivision. As creativity and diversity of home and neighborhood layouts are goals in a TRVD in tandem with the protection of natural features, flexibility of roadway design is encouraged to support creative development patterns. Roads shall be designed and located in such a manner as to maintain and preserve natural topography, groundcover, significant landmarks, significant trees, minimize cut and fill, and preserve and enhance views and vistas on or off the street to the extent practicable. Street widths and alignments should be scaled to neighborhood size and be patterned after the character of traditional rural communities. Meandering pathways and walkways placed away from roadways are acceptable within a TRVD and are encouraged rather than paved sidewalks.

### 802 Roadway Classifications

All roads will be classified according to anticipated traffic use, adjacent land use and zoning, and land access requirements. Road standards for design and construction have been developed for three functional classifications:

- **Collector Road** - roads primarily designed to accommodate the larger volumes of internal site traffic.
- **Minor Road** - roads typically linking development areas exclusive of the collector roads.

- **Residential Streets** - roads designed for low-speed, low-traffic conditions within development areas.

### 803 Roadway Design Guidelines

Road layouts are to relate to the land uses they serve and conform to the rural character of the site by following existing topography to the extent practicable. Roads within the TRVD should promote “traffic calming” aimed at reducing the speed and dominance of motor vehicles, thereby creating compatibility between mixed transport modes and land use. Speed containing techniques may include, for example,

- Meandering roads, in vertical and horizontal alignment
- Textured surfaces and rumble strips
- Speed tables (speed bumps, raised intersections, etc.)
- Entry treatment at intersections

The envisioned design speed of roadways in a TRVD is 20-25 mph.

The following table provides detail on recommended design guidelines for roadways. Certain situations may necessitate alternative design parameters and/or deviation from these values, such as those that may be considered for preservation of natural resources. Alternative design standards may be permitted if submitted with an individual Use Area Plan for site plan approval along with appropriate Engineering justification. Roadways associated with infrastructure improvements (*i.e.*, wastewater plants, water storage facility) are allowed and exempt from compliance with this Article. Alternative design standards will govern if approved as part of a TRVD Master Concept Plan special permit.

**Table 1 – Typical Roadway Design Guidelines \*\***

	<b>Collector</b>	<b>Minor</b>	<b>Residential</b>
Desired Design Speed	25 mph	20 mph	<20 mph
Minimum Centerline Radius (Rmin)	200'	150'	(1)
Ksag (min)	26	17	N/A
Kcrest (min.)	12	7	N/A
Min. length of vertical curve	50'	50'	40'
Normal Crown (min.)	2%	2%	2%
Maximum Superelevation (emax)	4%	4%	4%
Minimum Road Grade (Smin)	1%	1%	1%
Maximum Road Grade (Smax)	10% (2)	15%	15%
Minimum Right of way width	50'	40'	30'
Pavement Width (min.) (3)	24'	22'	20'
Width of graded shoulders	4'	4'	3'
Min. Intersection offset	200'	200'	N/A
Rmin - Pavement returns	25'	20'	20'
Rmin - ROW returns	20'	15'	15'
Max. Dead-end length (4)	NA	NA	500'
Gravel Base Course	8.5"	12.5"	12.5"
Dense Graded Crushed Stone	4.0"	0"	0"
Bituminous Pavement Thickness	5"	4"	4"

(1) As required to provide access and acceptable maneuverability for fire apparatus.

(2) 9% maximum road grade is desirable. Use of steeper road grades up to 10% may be permitted with appropriate Engineering justification.

(3) Exclusive of curb or berm

(4) Dead End as defined in Section 805.

N/A=Not Applicable

\*\* Deviations from these guidelines may be permitted with appropriate Engineer's design justification.

#### 804 Intersection Design Guidelines

The following shall govern intersection design within a TRVD:

1. Intersections will be designed to provide clear lines of sight for turning movements, either through alignment design or through the creation of buffer

areas in which obstructive plantings, buildings and/or signing will be prohibited. Intersection sight distances consistent with anticipated travel speed and traffic volume will be provided.

2. Intersections will be created at 90-degree angles to the extent practicable, and shall not be less than 60-degrees.
3. The minimum spacing between intersecting minor and collector roadways shall be two hundred (200) feet.
4. The centerline grade of a street on a stopped approach to an intersection will not exceed 4% within fifty (50) feet of the edge of pavement of the through street.
5. The maximum number of approaches to an intersection will be four (4).
6. Driveway cuts on to minor streets will not be within fifty-five (55) feet of an intersection with a collector road.

### 805 Dead End Street

The following standards shall govern dead-end streets within a TRVD:

1. Dead-end streets, as defined herein, will not exceed 500 feet unless extenuating circumstances require greater lengths. Longer lengths will not be approved without secondary emergency access provisions.
2. It is desirable to have secondary emergency access to all dead-end streets. The secondary access may be paved or unpaved subject to site conditions (and as may be approved by the Planning Board.)
3. Except in instances in which a secondary emergency access is available in accordance with item 6 below, one of the following turn-arounds will be provided to accommodate fire apparatus at the closed end of all dead-end streets:
  - a. Cul-de-sac or tear-drop which will have a minimum centerline radius of thirty-five (35) feet.
  - b. "T" turnaround which will have a minimum depth of thirty (30) feet from the edge of pavement, a minimum width of fifteen (15) feet, and located a minimum of forty (40) feet from the end of the street.
  - c. Hammerhead which will have a minimum width of eighty (80) feet.
  - d. Modified hammerhead which will have a minimum width of eighty (80) feet, and a minimum centerline radius of one hundred ten (110) feet.
4. Grades will not exceed 4% throughout the turn-around.
5. A turn-around is not required if the dead-end serves access to only one structure. Typically this would be a design for one single family home or one two (2) to three (3) unit attached structure with a shared driveway. A shared driveway should be no less than 14 feet wide.

### 806 Village Mixed-Use Area

Roads, sidewalks and curbing in the Village Mixed-use Area shall conform to the following standards unless alternative design standards for individual use area plans are submitted with engineering justification:

1. Sidewalks will be constructed along store fronts.
2. Sloped face edging or vertical curbing will be provided along the perimeter of the Village Center. Vertical curb is required where sidewalks abut the street. Curbing materials shall be specified in the design guidelines submitted with individual use area plans or otherwise provided pursuant to a Master Concept Plan Special Permit.
3. Curb inlets, if used, shall be constructed with appropriate transitions.
4. Pavement widths may include on-street parking for head-in, parallel, or angle parking.
5. Curb return radii may be reduced to ten (10) feet where truck accessibility can be demonstrated.

Parking and loading in the Village Mixed-use Area shall conform to the following standards:

1. Notwithstanding any provisions of Section 205-23(A) of the Bylaw, parking requirements may be met by a combination of parking interior to lots and on-street, as appropriate to a pedestrian oriented commercial center, and may be located greater than 400 feet from the principal building served.
2. Notwithstanding any provisions of Section 205-23(D)(2) of the Bylaw, more than two (2) driveways may be allowed on any street frontage, and driveways may be less than thirty (30) feet apart or shared.
3. Notwithstanding any provisions of Sections 205-23(E), (G) and (H), of the Bylaw, off-street parking spaces may be perpendicular, head-in or angled on streets or lots adjacent to the street.
4. Notwithstanding any provisions of Section 205-23(F) of the Bylaw, secondary overflow parking areas may consist of turf, gravel, stone dust or other suitable pervious surfaces, which can be included in common open space.
5. Notwithstanding any provisions of Section 205-23(G)(2) of the Bylaw, designated compact parking spaces shall not be less than eight (8) feet by seventeen (17) feet in size; standard angled parking spaces shall not be less than nine (9) feet by eighteen (18) feet in size; and generally, drive aisles within parking lots serving 90-degree (perpendicular) parking on both sides shall not be less than twenty-four (24) feet in width. Drive aisles serving angled parking shall not be less than twenty (20) feet in width. Alternative design plans may be approved by the Planning Board.
6. Notwithstanding any provisions of Section 205-23(G)(3) of the Bylaw, parking lanes may be separated by landscaped islands, with or without curbs.
7. Within the Village Center, landscaping and dividers appropriate to parking areas should be consistent with the standards of Section 205-23(H) of the Bylaw.
8. Notwithstanding any provisions of Section 205-23(K)(2) of the Bylaw for non-residential uses, one parking spaces for each 400 square foot should be sufficient to provide adequate parking, by taking into account multiple complementary uses in order to reduce excessive pavement.
9. Notwithstanding any provisions of Section 205-24(A) of the Bylaw, one loading space for each building or shared loading space meeting the loading space

requirement of the table contained within section 205-24(A) shall be sufficient to provide adequate loading areas. Notwithstanding, any provisions of Sections 205-24(C) and 205-24(D) of the Bylaw, loading spaces may be designated on the streets for smaller commercial establishments.

#### 807 More Than One Dwelling Per Lot

More than one building, each containing a number of attached or detached dwelling units, may be provided on a lot within a TRVD. This is intended to facilitate shared use of common facilities, including but not limited to shared use of landscaping, driveways, and septic systems.

#### 808 Plan Content and Drafting Standards

The plan content and drafting standards for Individual Use Area Plans will generally conform to those of the Definitive Plan Requirements as identified in Sections 215 through 221 of the Rules and Regulations, as applicable, except that:

- i. Any definitive subdivision plan for a TRVD, or any modified definitive subdivision plan in connection therewith, will be drawn at a scale acceptable to the Engineering Division;
- ii. Drawing sheet size will be 24"x36"; and,
- iii. Profiles will be prepared with a 5:1 vertical exaggeration.

Final plans, as endorsed and recorded, shall be submitted to the Engineering Division in an electronic format compatible with the Town's system, as well as in an 11" x 17" paper format to be copied to the Planning and Assessing Departments.

#### 809 Locus Map

Given the area of land included within a TRVD, a locus map at the required scale of Section 218 of the Rules and Regulations (1"=800' or 1"=1,000') would not provide a viable plan of the locus. Consequently, the locus map submitted with a TRVD Special Permit application may be drawn at a smaller scale (e.g. 1"=5000'). A locus map and lotting plan will be submitted for any definitive subdivision plan for TRVD land, or any modification thereof.

#### 810 Lot Layout Plan

Given the intended size of a TRVD, the lot layout plan need not show major trees or the location of all proposed tree plantings. A representative sampling of the site will be acceptable. The lot layout must show topography at 2-foot contour intervals.

#### 811 Monuments

Granite or reinforced concrete monuments shall be installed at points of changes in direction or curvature of streets, and along the perimeter of conservation open space areas.

#### 812 Street Utilities Construction Plans and Profiles

A street and utilities construction plan and profile for each street must be provided on a separate sheet or sheets, consisting of a layout plan of the street and a profile matching the layout either above or below if for ease in locating corresponding points.

#### 813 Street Layout Plans

Layout plans are not required for street acceptance by the Town if streets within a TRVD are to remain private.

#### 814 Utilities Underground

Permanent electric, telephone and other typically overhead utilities shall be placed underground except that existing overhead utilities on-site may remain and overhead utilities serving remote areas may be approved by a TRVD Master Concept Plan Special Permit or as may be shown on individual neighborhood Use Plans, approved pursuant to Section 205-72 of the By-Law.

#### 815 Private Streets

The streets within a TRVD may be private.

#### 816 Protection of Improvements

Private streets are to be deeded to Landowners' Associations, or to a trust or other appropriate entity or entities for perpetual maintenance. Association or trust documents shall include provisions for operation and maintenance of improvements.

#### 817 Curbing

Streets will be installed with or without Cape Cod berms, except in the Village Center, where curbing will be provided along the perimeter of the Village Common (see Section 806 of this Article for curbing at the Village Common).

#### 818 Sidewalks and Grass Plots

Residential Streets within a TRVD will not require sidewalks, as they are intended to preserve a more rural character, consistent with Section 205-72(H) of the Bylaw

governing a TRVD. In the alternative, pedestrian trails will be provided within adjacent open space. Collector and Minor Streets within the site are not required to have sidewalks, but rather pedestrian trails, either existing or new, which will not necessarily follow the roadway paths and may meander depending on site and topography considerations.

#### 819 Street Signs

Street signs, wayfinding and other such signs within a TRVD will gracefully direct people throughout the community, whether by foot or vehicle, through strategic placement and easily readable type. Signage within the site will be designed in accordance with Section 205-19 of the Bylaw, as appropriate or as modified by design standards submitted with individual Use Area Plans.

#### 820 Street Lights

Driveway and photosensitive house lanterns instead of conventional streetlights are preferable within residential areas of a TRVD provided that the lanterns are within 30-feet of the edge of pavement or as may be set forth in an approved Master Concept Plan Special Permit or design guidelines adopted for each Use Area. In the Village Center, appropriate street and building lighting in accordance with Section 205-65 Prevention of Light Pollution will be provided.

#### 821 Street Trees and Landscaping

Landscaping will be required to diminish the visual impact resulting from construction activities. Landscape plantings will use drought tolerant native species. Refer to Article IV Section 411 of the Rules and Regulations for guidance.

#### 822 Drainage

Low Impact Design (LID) stormwater management techniques should be employed both during construction and as a permanent amenity of a TRVD. Individual Use Area Plan applications should include detailed design of drainage facilities utilizing fundamental good engineering design, best management practices (BMPs) and LID techniques to control the volume and rate of discharge of site runoff; to direct, collect, and discharge/dispose of stormwater runoff; and, to provide water quality treatment prior to discharge.

Stormwater quality and quantity design components should be based on the specific existing and proposed conditions for each Use Area and phase of development considering the existing soil characteristics, size of the drainage area, available site surface area, and aesthetics. To assist in the prolonged effectiveness of the drainage facilities and prevention of sediment from entering the stormwater management system, Operation and Maintenance (O&M) Plans that detail items such as maintenance requirements, schedules, reporting and responsible parties shall be required.

Drainage design should conform to the then current Town of Plymouth Stormwater Facilities Design Guidelines and MaDEP Stormwater Management Regulations, as adopted and as applicable. Any proposed deviations must be identified in applications for Individual Use Plans, and must be supported with sufficient Engineering justification.

#### 823 Sewer and/or Water Requirements

Sewer and water may not be provided by municipal services. Therefore, on-site septic systems, wastewater treatment plants, and private and community wells are permitted. Hydrants and hydrant locations shall be coordinated with and meet the requirements of the Fire Chief in all respects (placement, types, models, spacing, operation, etc.). Inspection requirements shall be coordinated with applicable Town Departments.

Copies of construction inspection reports and final acceptance testing reports for all new sewer and water infrastructure construction, whether private or public, shall be provided to the Town Engineer.

#### 824 Conveyance of Roads and Utilities and Inspections

Roads and utility infrastructure within a TRVD that are to be maintained by the Town will be conveyed to the Town. No road or utility will be accepted without as-built plans certified by a Licensed Professional Engineer or Land Surveyor. Refer to Article V, Section 505 for specific as-built plan requirements. Construction of any roadway or utility planned to be conveyed to the Town as part of a TRVD Master Plan must follow the Town's inspections protocol as required per Sections 424 through 430 of the Rules and Regulations. Construction of any roadway not to be conveyed to the Town as part of a TRVD Master Plan must supply a Certification letter to the Planning Board from a Registered Professional Engineer (civil) registered to practice in Massachusetts that the roadways and associated improvements have been constructed substantially in compliance with the approved subdivision plans.

#### 825 Schedule of Completion

Construction of roads and utilities (including septic, storm water drains, wells or other water supply, fire alarm conduits, electric, and telephone wiring, etc.), or a performance guarantee, shall be provided for the relevant area within a TRVD prior to the conveyance of land or the grant of a building permit for any building within that area being serviced by such roads and utilities. All time frames may be extended by the Planning Board without requiring modification and amendment of the subdivision approval or modified subdivision approval.

#### 826 Applicability

The Rules and Regulations contained in this Article VIII shall apply to land that is both:  
(i) contained in a Rural Residential Receiving Area (RRRA), as defined in Section

205-70, and

(ii) contained in a filed Master Concept Plan accompanying a filed Special Permit Application for a Traditional Rural Village Development (TRVD), as defined in Section 205-72.