

**THE RULES AND REGULATIONS GOVERNING THE
SUBDIVISION OF LAND IN BILLERICA, MASSACHUSETTS**

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SECTION 1 GENERAL

A. PURPOSE OF LAW

(Section 81-M of Chapter 41 of the General Laws of the State of Massachusetts)

The subdivision control law has been enacted for the purpose of protecting the safety, convenience and welfare of the inhabitants of the cities and towns in which it is, or may hereafter be, put in effect by regulating the laying out and construction of ways in subdivisions providing access to the several lots therein, but which have not become public ways, and ensuring sanitary conditions in subdivisions and in proper cases parks and open areas. The powers of a Planning Board and of a Board of Appeal under the subdivision control law shall be exercised with due regard for the provision of adequate access to all of the lots in a subdivision by ways that will be safe and convenient for travel; for lessening congestion in such ways and in the adjacent public ways; for reducing danger to life and limb in the operation of motor vehicles; for securing safety in the case of fire, flood panic and other emergencies; for insuring compliance with the applicable zoning ordinances or by-laws; for securing adequate provision for water, sewerage, drainage, underground utility services, fire, police, and other similar municipal equipment, and street lighting and other requirements where necessary in a subdivision; and for coordinating the ways in a subdivision with each other and with the public ways in the city or town in which it is located and with the ways in neighboring subdivisions. Such powers may also be exercised with due regard for the policy of the commonwealth to encourage the use of solar energy and protect the access to direct sunlight of solar energy systems. It is the intent of the subdivision control law that any subdivision plan filed with the Planning Board shall receive the approval of such board if said plan conforms to the recommendation of the board of health and to the reasonable rules and regulations of the planning board pertaining to subdivisions of land; provided, however, that such board may, when appropriate, waive, as provided for in SECTION 81-R, such portions of the rules and regulations as is deemed advisable.

B. AUTHORITY

Under the authority vested in the Planning Board of the Town of Billerica by Section 81-O of Chapter 41 of the General Laws, said Board hereby adopts these rules and regulations governing the subdivision of land in the Town of Billerica. Such rules and regulations shall be effective on and after the first day of May 1996.

C. ACCESS TO SUBDIVISIONS

Private driveways, easements or rights-of-way, and all other sub-standard ways of access must be enlarged to a minimum layout width of fifty (50) feet, proper construction of such ways shall be done at the developer's expense even if he does not own the abutting land. When access to the subdivision is over private ways or easements, evidence of the applicant's right to use such ways as access, must be presented to the Board and approved by Town Counsel. Such rights must be transferable to the Town when the Subdivision is approved and the streets accepted as public ways. (Adopted 1986)

SECTION 2 ADMINISTRATION

A. OFFICIAL RESPONSIBLE

The Director of Planning is authorized for the interpretation, administration and enforcement of the Subdivision Regulations. The Zoning Officer is responsible for the interpretation, administration and enforcement of the Zoning By-Laws. Where these Regulations refer to the Director of Planning, the Planning Board Chairman is authorized to act in the absence of the Director of Planning and shall have the authority and responsibility these Regulations imply. In the absence of both the Director of Planning and the Planning Board Chairman, the Vice Chairman shall act in behalf of the Director of Planning.

B. RELIEF FROM PERSONAL LIABILITY

Insofar as the law allows, while acting for the Town of Billerica, an official designated under the provisions of paragraph A above, charged with the administration, interpretation or enforcement of the Subdivision Rules and Regulations, shall not be deemed to be personally liable in the discharge of his-her official duties.

C. ADMINISTRATIVE PROCEDURES

The Director of Planning is authorized to formulate administrative procedures necessary to uniformly administer and enforce these Regulations.

D. RIGHT OF ENTRY

In the discharge of his or her official duties, the Director of Planning, or any official authorized to act in his or her absence, shall have the authority to enter any site to administer or enforce the provisions of these Regulations.

E. CHANGES AND ALTERATIONS

No changes or alterations shall be made in an approved Definitive Plan without resubmitting the changes for approval of the Planning Board (see SECTIONS 81-U and 81W of CHAPTER 41 of the General Laws of Massachusetts). For the purposes of the paragraph, the Definitive Plan shall be defined to include all elements listed under Contents of the Definitive Plan, SECTION 3 PARAGRAPH B-2 of these regulations. Any alterations in grades, drainage plans or other utilities shall be deemed to constitute a change in the Definitive Plan.

2. F. 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. However, no waiver will be acted upon at the meeting at which it is proposed, but will be held over and acted upon at the next meeting at which it will be listed on the agenda. Waivers can only be granted prior to the vote to approve the Definitive Subdivision.

G. REFERENCE

- (1) For matters not covered by these rules and regulations, reference is made to SECTIONS 81-K to 81GG, inclusive, of CHAPTER 41 of the General Laws of the State of Massachusetts.
- (2) "Report on Drainage Facilities for the Town of Billerica, Massachusetts" prepared by Green Engineering Affiliates, Inc., Boston, MA.
- (3) "Soils and their Interpretations" prepared by U.S. Dept. of Agriculture Soils Conservation Service - 1970.

H. STIPULATIONS

- (1) In the event that the developer defaults, abandons the project before the completion or fails to maintain the roads and other utilities as set forth in these regulations the Town or its agents may enter upon any land in the subdivision for the purpose of doing such work as they may deem necessary to maintain or complete the project, and the cost of such work is to be borne by the developer.
- (2) Upon the acceptance of the Public Way by the Town, fee or easement to all public ways, water mains, sewer, and drain easements and those parcels of land and such other easements that have been dedicated or were otherwise intended for the public or the town, shall be granted to the Town. The documents conveying such title or fee to the Town shall be prepared and submitted to the Board prior to the final release of bonds. The decision as to which form of ownership shall be offered to the town shall be the Planning Board's.

SECTION 3 PLANS BELIEVED NOT TO REQUIRE APPROVAL (ANR'S)

A. APPLICATION

Any person who wishes to cause to be recorded in the Registry of Deeds or to be-filed with the Land Court a plan of land and who believes that such plan does not require approval under the Subdivision Control Law, may submit a transparent ink-on cloth or mylar original and six (6) prints with completed Form A, (see Appendix) to the Director of Planning accompanied by the necessary evidence to show that the plan does not require approval. In addition to the above requirements the applicant shall include on such plan the entire parcel of land from which the subdivision is being made and pay to the Town of Billerica, upon filing a said Form A, a non-refundable filing fee as established by, and available at the Planning Board Office. Said person shall file, by delivery or registered mail, a notice with the Town Clerk stating the date of submission for such determination and accompanied by a copy of said application. (Form A) If the Board determines that the plan does not require approval, it shall without a public hearing and within twenty-one (21) days of submission endorse on the plan the certification that Planning Board approval under Subdivision Control Law is not required. Said plan shall be returned to the applicant and the Board shall notify the Town Clerk of its action.

If the Board determines that the plan does require approval under the Subdivision Control Law, it shall within twenty-one (21) days of submission of said plan, so inform the applicant and return the plan. The Board shall also notify the Town Clerk of its determination.

It should be noted that a frontage variance does not satisfy the frontage requirement for ANR approval.

B. CONTENTS

Each Plan application submitted to the Board shall contain at least the following:

- (1) Identification of the Plan by name of owner of record; location of land in question and, if different, the name of the applicant
- (2) A letter from the Town Clerk stating (A) if the street is an accepted street of the Town; (B) a way in existence when the subdivision control law became effective in the Town or (C) a letter from the Planning Board showing a way on a plan approved in accordance with the subdivision control law
- (3) The zoning classification of the land that contains the property. If applicable, the location of any zoning boundary lines that lie within the area
- (4) The entirety of any lot having its boundaries changed must be shown unless specifically waived by the Board

- 3. C** (5) Written notice of any decisions by the Board of Appeal including but not limited to variance and special permits regarding the land or any building thereon, and a copy of plans for above decisions
- (6) Distance to nearest public or private intersection, or to any other monuments within that dimension
- (7) Location of existing buildings-on the lot and their distance to the nearest property line unless specifically waived by the Board
- (8) After the Land Court Plan is filed. The Planning Board shall be notified in writing of the Land Court registration within thirty (30) days
- (9) Plans that create or change existing lines of ownership and which show existing structures on the property, shall depict on the plan a minimum of two land survey physical monuments set in a manner providing a degree of permanency consistent with the terrain and physical features.
- (10) All abandoned roads, railroads, easements, and rights-of-way including the Middlesex Canal, whether previously of public record or not, shall be shown.
- (11) All direct abutters.

SECTION 4 PRELIMINARY PLAN

A. PURPOSE

A Preliminary Plan of a residential subdivision may be submitted by an applicant to the Board and to the Board of Health for discussion and approval, modification, or disapproval by the Board. In the case of a nonresidential subdivision a preliminary plan shall be submitted. The submission of such a Preliminary Plan will enable the applicant, the Board, other municipal agencies and the property owners abutting the subdivision to discuss and clarify any problems of the proposed subdivision before a Definitive Plan is prepared. Therefore, it is strongly recommended that a Preliminary Plan be filed in every case.

B. APPLICATION

Any person who desires approval of a Preliminary Plan for the subdivision of land shall:

- (1) Before approval of the Preliminary Plan is given, a public hearing shall be held by the Planning Board, notice of which shall be given to the abutters, at the expense of the applicant at least ten days prior thereto, by registered mail to the owner, if not the applicant, and to all property owners and abutters within three-hundred (300 ft.) feet including those across private and public road-ways, shown on such plan as appearing on the most recent tax list.
- (2) Submit a reproducible Preliminary Plan, on the form hereinafter set forth, with eight (8) contact prints thereof to the Board and three (3) contact prints thereof to the Board of Health. The Plan should meet subdivision control requirements design without waivers.
- (3) Shall also provide copies of Preliminary Plan for distribution by the Planning Board to: Fire and Police Depts., D.P.W. (Water, Sewer), Conservation, School Dept., Board of Selectmen, and Building Dept.
- (4) File by delivery or by registered or certified mail, postage paid a written notice with the Town Clerk accompanied by a copy of the completed application. Written notice which will specify:
 - (a) Date on which preliminary plan was submitted to the Planning Board.
 - (b) Description of the land to which the plan is related sufficient for identification.
 - (c) The name and address of the owner of such land.
- (5) The applicant shall obtain a certified abutters list from the Town Assessor, for direct abutters, and property owners within three-hundred (300) feet.
- (6) Within sixty (60) days after submission of a preliminary plan the Board shall notify by certified mail the applicant and the Town Clerk either: (a) that the plan has been approved, (b) that the plan has been approved with modifications suggested by the Board agreed upon by the person submitting the plan, or (c) that the plan has been disapproved, and in the case of disapproval, the Board shall state in detail its reasons therein.

4 C. FEES AND EXPENSES

If a Preliminary Plan is filed, it shall be accompanied by a Filing Fee, as per fee schedule, available at the Planning Board Office. This fee covers no expenses incurred by the Board for professional services of engineers and attorneys in connection with review or inspection of the plan, associated documents, and the subdivision.

The subdivider shall reimburse the Town for all expenses incurred by the Board for professional services, including, but not limited to, engineers, land surveyors and attorneys, rendered in connection with review or recording of the plan and associated documents and engineering and inspection of the plan and subdivision.

D. FORM AND CONTENTS OF PRELIMINARY PLAN

The Preliminary Plan shall be drawn on a reproducible transparency at a suitable scale (no smaller than 1 inch 40 feet) and shall contain the-following information:

- (1) Subdivision name, north point, date, scale, plate and parcel of entire subdivision as shown on assessor's map and titled "Preliminary Plan".
- (2) The names and addresses of the record owners and applicant, if not the owner, and the name and signature of the civil engineer and land surveyor, and his or her appropriate seal.
- (3) Existing and proposed lines of street, ways, two sidewalks, water ways, easements and public areas within or next to the subdivision.
- (4) Location and sizes of all existing and proposed gas pipes; drain, sewer, and water installation; including easements, and the intended outlet for the storm drains.
- (5) Lot lines with approximate dimensions. Each lot shall be numbered.
- (6) The existing topography and contours of the land at two (2) foot contour intervals including the location of all permanent monuments, Green Engineering Floodplain, Federal Emergency Mapping Agency (F.E.M.A.) 100 yr. floodplain, natural water courses, drainage courses, marshes and bodies of water, ledge outcroppings, large boulders, stonewalls and the like. (It is recommended that all wetland resource areas, as defined by MGLC 131, Section 40, also be identified on the plans.)
- (7) The names, location, and widths of adjacent streets.
- (8) The names and location of all direct abutters, as determined from the most recent tax list unless the applicant shall have more recent knowledge of such abutters.
- (9) Existing facilities for municipal services.

- 4. D.** (10) Where the owner or subdivider also owns or controls unsubdivided land adjacent to that shown on the Preliminary Plan, the applicant shall submit a sketch plan showing a possible or prospective street layout for such adjacent land. This sketch plan may be submitted on a separate sheet from the Preliminary Plan, but the Preliminary Plan will not be deemed to go before the Board until both are submitted.
- (11) The existing zoning of the land and any zoning boundary that lies within the area.
- (12) A statement of the volume of "earth" to be removed if applicable or a statement that no "earth" is to be removed shall be provided under the note section. Removal must be in conformance with Town zoning bylaws.
- (13) All deed lines within the subdivision. If the subdivision includes more than one deed, in all cases, deed references shall be given.
- (14) All abandoned roads, railroads, easements, rights-of-way including the Middlesex Canal; whether previously of public record or not

If there is more than one sheet to the preliminary plan, an index sheet shall be provided showing the parcel in its entirety outlining the proposed lots and roadways and the index.

E. LOCUS PLAN

Preliminary Plans shall include or be accompanied by a locus plan on a scale of one inch to 800 feet, indicating relationship of the proposed subdivision and its streets to nearby development, and shall be drawn at a minimum 1000 feet beyond the parcel. In the case of a Preliminary Plan covering less than all of the land owned by the subdivider in the area of the subdivision, the Preliminary Plan shall be accompanied by a plan showing in a general manner the overall, proposed development of all the land owned by the subdivider in the area of the subdivision and indicating the section for which approval is desired.

F. TENTATIVE APPROVAL

The Planning Board may give such Preliminary Plan its tentative approval, with or without modification. Such tentative approval does not constitute approval of a subdivision but does facilitate the procedure in securing final approval of the Definitive Plan.

SECTION 5 DEFINITIVE SUBDIVISION PLAN

A. APPLICATION

No person shall file a nonresidential subdivision within the meaning of the Subdivision Control Law of any land within the Town of Billerica, Massachusetts, or proceed with the improvement or sale of lots in a subdivision, or the construction of ways, or the installation of municipal services therein unless and until a Definitive Plan of such subdivision has been submitted to and acted on by the Planning Board as hereinafter provided. See Section 2, paragraph E, for procedure to be used in modifying an approved Subdivision Plan.

B. DEFINITIVE PLAN

Any person who submits a definitive plan of a subdivision to the Planning Board for approval shall file the following:

- (1) Original plans, prepared on mylar with black India Ink. Linen shall be allowed for the-lot layout plan if the property is registered as land court land. Eleven (11) complete sets and eleven (11) copies of the Lot Layout and Grading Plans.
- (2) A properly executed application Form B (see appendix) including a statement of the time within which the required construction of ways and installation of municipal services will be completed. The time shall not be greater than two (2) years from the date of approval of the Definitive Plan unless extended by the Planning Board in writing. The applicant shall file by delivery or registered mail, a notice with the Town Clerk stating the date of submission for such approval, accompanied by a copy of the completed application (Form B), stamped received by the Planning Board Office.
- (3) It shall be accompanied by a filing fee per Fee Schedule available at the Planning Board office.
- (4) A list of names and addresses of all abutters, and property owners within three hundred (300) feet, certified by an Assessor of the Town of Billerica as they appear as such on the most recent tax lists, together with a separate list of all changes in ownership of abutting land known to the subdivider.
- (5) Shall be submitted with a letter from the town clerk approving the proposed street name to be submitted to the Planning Board for the board's approval.
- (6) Proof that a Determination of Applicability has been obtained from the Conservation Commission.
- (7) If the applicant must seek a waiver he must supply a statement of hardship or justification per statute for each waiver at the time of submittal, along with the Section numbers being waived. A request of additional waivers will require a resubmittal of the Subdivision Plan
- (8) Proof of ownership or control shall be provided by the applicant

- (9) The subdivider shall provide a pre-construction video; color VHS that shall be submitted along with the definitive plan. The video shall show the existing abutting houses, properties, streams, ponds, slopes, walls, roadways and any other pertinent features. All video shall include an audio narrative detailing the date of the video and locations being viewed. Subdivision construction shall not begin until the Town Engineer has received and accepted the preconstruction video adequately showing preconstruction conditions. The applicant shall take any additional video determined necessary by the Town Engineer at any time during the construction process

5. C. DEVELOPMENT ACTIONS AND PLANNING BOARD MEETINGS

(1) Applications Submitted Through Planning Board Office

Applications and all other requests for action on development activities shall be submitted first to the Planning Department staff to be reviewed and scheduled for action at a Planning Board meeting. Such requests shall not be presented directly to the Planning Board at a meeting.

(2) Items Placed on Board Agenda When Ready for Action

Applications and all other requests for action on development activities shall not be placed on the agenda for a Planning Board meeting until they are ready for the Board to take action. A request for action on a development activity is not considered ready for Board action until it is complete, all necessary information has been supplied, and any form or document is ready for approval. Failure to supply all necessary information, in complete form, is grounds for the application to not be accepted for processing or for the Planning Board's action to be delayed.

(3) Review Prior to Board Meeting

Prior to any action by the Board, applications and all other requests for action on development activities shall be reviewed by the Planning Department staff, and, as applicable, other Town departments, boards and committees. The application and related documentation will be distributed to the Board with the preliminary agenda so that the Board members may review it prior to the meeting. The Planning Board will not take action on any application or other requests for action on development activities that: a) have not been filed with, and reviewed by, the Planning Board office by the time the agenda is prepared, and b) have not been distributed to members prior to the meeting. The Planning Board will not respond to plans or proposals presented to it for the first time at a meeting.

D. FORMS, COMMENTS NOT PART OF THESE REGULATIONS

The Appendix contains sample forms for the administration of these Regulations. These forms are not part of the Regulations. Forms may be added or deleted and the content of the forms may be revised from time to time by administrative action of the Planning Board; such changes are not amendments to these Regulations and may be made without holding a public hearing.

E. NOTES, CHARTS

These Regulations contain comments, charts and other illustrations, which may be interspersed within the text of the regulations. They are intended to assist the applicant in understanding the Regulations and the Planning Board's policies and procedures but are not part of these regulations. The notes are set off in a different typeface or in a box or are labeled to show their status as charts and illustrations.

5. F. CONTENTS

The Definitive Plan shall be prepared by a registered professional land surveyor; whenever drainage structures are indicated such shall be designed by a registered professional civil engineer. It shall be clearly and legibly drawn in black India ink on mylar. Linen shall be allowed for Land Court Land. The plan shall be at scale of one inch equals forty feet (40) feet or on a scale that the board may accept to show details clearly and adequately, or unless otherwise noted. Sheet sizes shall preferably not exceed 24"x36". The plan shall be clearly labeled as Definitive Plan. The Definitive Plan shall consist of the following sheets:

- Cover Sheet
- Index Sheet
- Lot Layout Plan
- Plan\Profile
- Grading Plan
- Topographic Plan
- Details

Each sheet, except Cover Sheet and Index Sheet, shall have a north arrow, graphic bar scale, proposed and existing street names, sheet number (i.e., sheet 3 of 7) and a title block entitled "Definitive Subdivision Plan of Land in Billerica." The title block shall include the name of the subdivision, name and address of land owner (and applicant, if different), name and address of land surveyor, and civil engineer or firm, and date of preparation. Each sheet shall have a signature block for Planning Board members and the Town Clerk. Cover Sheet shall consist of Locus Map at 1:25,000 (you may use USGS map).

- (1) **The Cover Sheet** shall consist of subdivision name, date, name and address of engineering firm, owner and applicant.
- (2) **The Index Sheet** shall have a lot layout Plan at a scale of 1 inch = 100 feet, and a Sheet Index. The index sheet information may be included on the cover sheet if space allows.
- (3) **Lot Layout Plan**

The Lot Layout Plan shall also be provided in AUTO cad DWG file format, version 12 or later and shall include the following:

- (a) Dimension and direction of all boundary lines shall be shown in accordance with 250 CMR 6.01

- (b) Areas of all proposed lots, with said lots designated numerically and in sequence
- (c) Dimension and direction of existing and proposed easements and their purposes
- (d) Covenants or restrictions applying to the land and their purposes, whether they are in the subdivision, public or common area, or outside the subdivision
- (e) Existing and proposed permanent monuments

- 5. F. (3)**
- (f) Location of ways, name and present width of streets bounding, approaching the site
 - (g) An endorsement by a registered professional land surveyor
 - (h) Names and location of all abutters
 - (i) The zoning classification of the land that contains the property, if applicable, the location of any zoning boundary lines that lie within the area
 - (j) The entirety of the parcel having its boundaries changed must be shown or specifically waived by the board
 - (k) Location of existing buildings on the parcel and their distance to the nearest property line
 - (l) Lot summaries for each lot, all easements and roadways
 - (m) All abandoned roads, railroads, easements, and rights-of-way including the Middlesex Canal: whether previously of record or not.
 - (n) A note per the requirements of Section 6 H. herein.
 - (o) A note stating "This plan has been endorsed for recording purposes only as required by Mass. General Laws, Chapter 41, Section 81P and contains conditions that may not comply with the Billerica Zoning By-Law."

(4) Plan\Profile

Plan\Profile sheets shall include the following:

- (a) The plan view to show street or way dimensions bearing, curve lengths, radii, center line stationing to readily determine the location, direction, length and width of each street, way and easement so that they can be established on the ground, proposed bound locations, lot numbers, sidewalks, curbing and a typical cross section
- (b) Benchmark elevations are to be based upon NGVD 1929
- (c) All existing and proposed overhead and underground utilities. Sewer and drain lines will be shown on both plan and profile. Show structure inverts, rim elevations, station numbers, sizes and slopes of pipes

- (d) The material type for existing and proposed storm drains, water mains and sewers shall be given and shall conform to the material specifications of these Rules and Regulations unless waived by the Planning Board
- (e) Show curbing in plan, identifying type of curbing and radius
- (f) The existing ground profile along the proposed centerline and both sidelines of the right of way. (Different dashed line symbols will designate one from another)
- (g) The proposed centerline profile showing gradients and vertical curves, including labels indicating length, K-value and design safe sight stopping distance

- 5.F.(4)** (h) Existing and proposed centerline grades on 50 foot stations (25 foot stations on vertical curves), centerline grades of low points for sag curves and high points for crest curves
- (i) Road stations shown on both plan and profile
 - (j) Lot numbers and sideline extensions in plan
 - (k) All buildings, walks, drives and other existing site features within one hundred (100) feet (either side) of the street centerline
 - (l) Certification by a registered professional civil engineer
 - (m) No existing or proposed contours are to be shown
 - (n) At least two (2) bench marks shall be shown

5. F. (5) Grading Plan

Grading Plan should contain all the information as the Topographic Plan in a faded image. It shall also include the following:

- (a) Proposed right of ways, and property lines
- (b) Proposed roadway improvements
- (c) Proposed drainage facilities
- (d) Proposed residences and driveways
- (e) Proposed grading for above improvements
- (f) Proposed erosion and sedimentation control measures
- (g) Construction sequence
- (h) Proposed street names

- (i) The plan shall be signed and stamped by both a registered professional land surveyor, and registered professional civil engineer.
- (j) Proposed street trees as outlined by Section 7.J
- (k) Proposed limit of vegetation clearing line
- (l) Location of any wetland resource area as reflected in the Conservation Commission's Determination of Applicability
- (m) The grading plans shall show contour lines on adjacent properties to show clearly how grading could possibly affect adjacent properties.
- (n) A cul-de-sac grading plan shall be provided including a staking detail describing the means and methods for conveying design grades in the field for the construction of the cul-de-sac. The location of the stakes and the labeling of the stakes shall also be noted.

5. F. (6) Topographic Plan shall include:

- (a) The plan shall show the two (2) foot contour interval and ground shots in flat areas ten (10) foot beyond the property line and to the opposite side of roads and ways.
- (b) Elevations shall be referenced to the National Geodetic Vertical Datum of 1929. Origin bench mark shall be noted
- (c) A minimum of two (2) permanent bench marks shall be established on each topographic sheet
- (d) The Topographic Plan shall be prepared in compliance with 250 CMR 6.02
- (e) Zone district lines or note stating the district that the property is located
- (f) The existing lines of the property, streets, bike\foot Protection Act, easements and any public or common areas within or adjacent to the subdivision.
- (g) The Green Engineering Flood Plain shall be shown
- (h) The Federal Emergency Management Agency one hundred (100)Year Elevation Zone A District
- (i) Location and outline of all existing buildings, cesspools and septic tanks, and sources of private water supply within the subdivision
- (j) Location of any wetland resource area as reflected in the Conservation Commission's Determination of Applicability

(7) Detail Sheet

Detail sheet shall contain all structures to be constructed in connection with the drainage, sewer, and water systems, and any other subdivision structure.

5. G. PERFORMANCE GUARANTEE

Before endorsement of approval the Board will require provision for the completion of construction of ways and the installation of municipal services in accordance with the rules and regulations of the Board. The construction of ways and installation of municipal services within the period required by the Board shall be secured by one, or in part by one and in part by the other, of the methods described in Section G. 1,2,3,4 below. Methods may be varied from time to time by the applicant.

1. By a proper bond, sufficient in the opinion of the Planning Board to secure performance of the construction of ways and the installation of municipal services required for lots in the subdivision shown on the plan, and the Planning Board may require that the applicant specify the time within which such construction shall be completed.

2. By a deposit of money or negotiable securities, sufficient in the opinion of the Planning Board to secure performance of the construction of ways and the installation of municipal services required for lots in the subdivision shown on the plan, and the Planning Board may require that the applicant specify the time within which such construction shall be completed.

3. By a covenant, executed and duly recorded by the owner of record, running with the land, whereby such ways and services shall be provided to serve any lot before such lot may be built upon or conveyed, other than by mortgage deed; provided, that a mortgagee who acquires title to the mortgaged premises by foreclosure or otherwise and any succeeding owner of such premises or part thereof may sell any such lot, subject to that portion of the covenant which provides that no lot shall be built upon until such ways and services have been provided to serve such lot; and, provided, further, that nothing herein shall be deemed to prohibit a conveyance by a single deed, subject to such covenant, of either the entire parcel of land shown on the subdivision plan or of all lots not previously released by the Planning Board. A deed of any part of the subdivision on violation hereof shall be voidable by the grantee prior to the release of the covenant but not later than three years from the date of such deed.

4. By delivery to the Planning Board of an agreement executed after the recording of a first mortgage covering the premises shown on the plan or a portion thereof given as security for advances to be made to the applicant by the lender, which agreement shall be executed by the applicant and the lender and shall provide for the retention by the lender of funds sufficient in the opinion of the Planning Board and otherwise due the applicant, to secure the construction of ways and the installation of municipal services. Said agreement shall also provide for a schedule of disbursements which may be made to the applicant upon completion of various stages of the work, and shall further provide that in the event the work is not completed within the time set forth by the applicant, any funds remaining undisbursed shall be available for completion.

Each bond filed shall be approved as to form, manner of execution and sureties by the Town Treasurer and all deposit agreements and securities shall be approved as to form and manner of execution by the Town Treasurer. The Board has the right to ask the financial institution to provide a current financial statement. If the Board decides at any time during the term of the performance that:

- (a) Improvements have been installed in a satisfactory manner in sufficient amount; the board may reduce the security.

- 5. G.4 (b) The character and extent of the subdivision requires additional improvements, previously waived, then the Board may modify its requirements for any or all such improvements and the face value of such performance bond, or amount of deposit of money or value of securities shall thereupon be reduced or increased respectively by an appropriate amount after suitable notice to the applicant.

H. BOARD OF HEALTH REVIEW

The Board of Health shall be supplied with two (2) copies of the Definitive Subdivision submittal. The Board of Health acts as a consultant to the Planning Board in matters of water supply, sewage disposal and surface water drainage. If the Board of Health is in doubt as to whether any of the land in the subdivision can be used as building sites without injury to the public health, it shall so notify the Planning Board in writing within forty-five (45) days. In the event approval by the Board of Health or Board or Officer having like powers and duties is by failure to make a report, the Planning Board shall note on the plan that health approval is by failure to report. Any approval of the plan by the Planning Board shall then only be given on condition that the lots or land as to which such doubt exists shall not be built upon without prior consent of the Board of Health, and shall endorse on the plan such condition, specifying the lots or land to which said condition applies. No land shall be subdivided for residential use, if it is considered by the Board of Health to be of such character that it cannot be used for building purposes without danger to health.

I. PUBLIC HEARING

Before approval of the Definitive Subdivision Plan, a public hearing shall be held by the Planning Board, notice of which shall be given at the expense of the applicant at least fourteen days prior thereto by advertisement in an official publication, or in a newspaper of general circulation in The Town of Billerica. Copies of said notice shall be mailed, by the applicant to all property owners and abutters within three hundred (300) feet including those across private and public roads as appearing on the most recent tax list. This shall be done by registered mail. Proof of notice shall be then given to the Planning Board prior to the public hearing.

J. CERTIFICATE OF APPROVAL

The Planning Board shall, within ninety (90) days after the submission of the Definitive Plan, approve, conditionally approve or disapprove the Definitive Subdivision. The action of the Board in respect to such plan shall be by a majority vote, copies of which shall be certified and filed with the Town Clerk and sent by registered mail postage prepaid to the applicant. If the Board modifies or disapprove such a plan, it shall state in its vote the reasons for its action. The board appends a standard set of conditions to all approvals. These conditions are attached as Attachment # 5 which may be periodically reviewed and amended. Final approval, if granted, shall be endorsed on the original drawing of the Definitive Subdivision Plan by the signatures of a majority of the Board (or by the signature of the person officially authorized by the Board) but not until the statutory twenty-day appeal period has elapsed following the filing of the certificate of approval of the board with the Town Clerk and said Clerk has notified the Board that no appeal has been filed. After the Definitive Plan has been approved, endorsed, and recorded the applicant shall furnish the Board with one copy of the recorded plan from the Land Court or Registry of Deeds, showing the book and page it was recorded in. Final approval of the

Definitive Subdivision Plan does not constitute the laying out or acceptance by the Town of streets within a subdivision

5. K. RECORD PLAN OF UTILITIES \ AS-BUILT PLAN

Asbuilt Plans shall be prepared in a similar format as the Plan\Profile for the Definitive Subdivision, and shall include the following:

- (1) Two (2) Benchmarks within the subdivision
- (2) Plan and Profile of the road
- (3) Road centerline-grade elevations at fifty (50) foot intervals
- (4) Invert and Rim elevations for all catch basins and sewer and drainage manholes
- (5) Numbering of all manholes and catch basins on the Plan\Profile
- (6) Slope of all drainage and sewer pipe
- (7) Gates for water and gas mains as well as all water and gas mains
- (8) A minimum of two (2) ties for all Sewer, Water, and Gas services off of house corners
- (9) House numbers
- (10) Any subdrains within project limits
- (11) Typical R.O.W. cross-sections
- (12) Topography for any and all Detention and Retention ponds
- (13) All street signs and bus stops
- (14) R.O.W. bearings and distances
- (15) Sidewalks and grass strips
- (16) Hydrants and gates with ties
- (17) All bounds
- (18) All outlets labeled with respect to type

5. L. REIMBURSEMENT TO THE TOWN

SUBDIVISION RULES & REGS BILLERICA, MASS.

The subdivider shall reimburse the Town for all expenses incurred by the Board for professional services including, but not limited to engineers and surveyors, rendered in connection with review or recording of the plan and associated documents and engineering and inspection of the plan and subdivision.

SECTION 6 DESIGN STANDARDS

A. STREETS

1. Classifications

The Planning Board will in all cases determine what classification shall be applied to all streets shown on a definitive plan. In general, these classifications will be assigned on the following basis:

- (a) Collector Streets are those which serve a residential area of over seventy-five **(75)** dwellings, unless otherwise waived by the Board.
- (b) Major Streets are those which serve a residential area of six **(6)** to seventy-five **(75)** dwellings, unless otherwise waived by the Board.
- (c) Minor streets are those which serve a residential area of not more than five **(5)** dwellings, unless otherwise waived by the Board.

2. Location and Alignment

- (a) All streets in the subdivision shall be designated so that, in the opinion of the Board, they provide safe vehicular and pedestrian travel. Due consideration shall also be given by the subdivider to the attractiveness and functionality of the street layout.
- (b) The proposed streets shall conform to any Master or Study Plan as adopted in whole or in part by the Board.
- (c) Provision satisfactory to the Board shall be made for the proper projection of streets or for access to adjoining property which is not yet subdivided.
- (d) 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.
- (e) Street jogs at intersections with centerline offsets of less than one-hundred and twenty-five **(125)** feet shall be avoided. Streets shall be continuous and in alignment with existing streets as far as possible.
- (f) The minimum centerline radii of curved streets shall be one hundred and twenty - five **(125)** feet. Greater radii may be required for major or collector streets
- (g) 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.
- (h) Property lines at street intersections shall be rounded or cut back to provide for a property line radius of not less than twenty-five **(25)** feet for residential and thirty-five **(35)** feet for nonresidential. Greater radii shall be required by the Board where deemed necessary for present and future vehicular travel.

- 6. A.2.** (i) Street pavement return radii shall not measure less than 35 feet for residential streets nor 45 feet for nonresidential streets.
- (j) No proposed street shall be located in such a manner as to render an existing structure non-conforming.
- 6.A.2.** (k) Intersections shall be designed with a nearly level grade, less than 3 % but not less than 1%, for a distance along the centerline of the proposed subdivision street of at least ninety five (95) feet from its point of intersection with the center line of the street with which it intersects.

3. Right of Way Width

The width of the right of way and pavement shall be as follows unless the Board deems otherwise:

(a)	Collector Street	60 feet r.o.w.	32 feet pavement
(b)	Major Street	50 feet “	28 feet “
(c)	Minor Street	50 feet “	24 feet “

4. Grade and Curvature

- (a) General: The minimum grade is established by the requirements for effective drainage and the maximum grade is established by the safe and practical requirements for vehicular travel under all road and weather conditions.

(b) Grades:

- (1) The minimum grade of tangents shall be not less than **(1.0%)** and of vertical curves not less than one **(1.0%)** percent per station at summits and depressions. .
- (2) The maximum grade of tangents and vertical curves shall not exceed **6%** except where, in the opinion of the Board, a greater grade is required due to unusual topographic conditions in which case grades up to ten (10%) percent may be permitted
- (3) The minimum sight distance at intersections and on horizontal and vertical curves shall be as tabulated below:

Street Classification	Minimum Sight Distance
Collector Street	300 Ft.
Major Street	250 Ft.
Minor Street	225 Ft.

Sight distances shall be determined using an eye elevation of 3.5 feet and an object elevation of six (6) inches above road surface

- (4) Minimum grade at gutter line shall be 1%. Water flow shall follow gutter line.

5. Dead-End Street Systems

- (a) No dead-end street shall be less than one-hundred eighty-five (**185**) feet long measured to the center of the cul-de-sac or turnaround nor shall any dead-end street system have more than a total of seventeen hundred (**1700**) feet measured to the center of the cul-de-sac or turnaround.

6. A.5. (b) Where property adjacent to the subdivision is not yet subdivided provision shall be made for the proper extension of the street at such alignment as will allow for the appropriate extension to the exterior boundaries of the subdivision.

- (c) Dead-End Streets shall serve no more than eight houses unless provisions have been made for the continuation of the water main so as to eliminate a dead end main serving more than eight houses.
- (d) Dead-End Street Systems shall serve no more than fifteen (**15**) lots based upon the minimum frontage requirements of the particular zoning district.
- (e) Dead-End streets shall be provided at the closed end with a turn-around with an outside roadway diameter of one-hundred (100) feet, and a property line diameter of not less than one hundred twenty (**120**) feet. The width of the paved roadway shall not be diminished at the turn-around. Minimum dead-end turnarounds having one-hundred (100) foot diameters shall be completely paved.

6. Guard Rails

Guard rails should be installed at culverts where the headwall or endwall are located within the street line at locations where fills are greater than 6 feet high and/or slopes are greater than 4 to 1, and at locations where there is a sudden change in alignments that would require a great reduction in speed and at other locations as the Board may require. Guard rails shall meet the requirements of Mass. Highway specifications for guard rails.

7. Cross Section:

- (a) The cross section shall be as shown on the plan. (**See figure in section 9**).
- (b) The cross slope of the paved surface shall be 2.5% and the shoulder shall have a cross slope of 1.5%.
- (c) Subgrade:

The subgrade shall be excavated of all frost susceptible material, loam, muck, or other soft material to hard bottom-from within the limits of the proposed street for its full length and width or as otherwise approved by the Board. Subgrade soils containing **35%** or more silt (35% passing #200 sieve) shall be removed to a minimum depth of four feet and backfilled with well graded bank gravel with no stone larger than eight (**8**) inches diameter. Subdrains shall be installed to lower the water table and control seepage into the road bed where the water table reaches subgrade levels, seepage extends to the road bed or elsewhere in the opinion of the Board such may be required to provide drainage for the road bed. The subgrade shall be graded and compacted in accordance with Mass. Highway specifications before applying the gravel base.

- (d) Subbase and Base:

The subbase and base shall be constructed of subbase gravel with no stone larger than four (4) inches thick in the bottom eight (**8**) inch layer and the top four (**4**) inches to be dense graded crushed stone for base with no

stone larger than two (2) inches. Dimensions are after compaction. Each layer to be rolled to **95%** compaction. Methods and materials shall meet the specification of the Billerica Department of Public Works. **All mix designs shall comply with Mass. Highway Standards.**

6. A.7. (e) Thickness of Paving:

Zoning	Paving	=	Base	+	Top
Residential	3 1/2 inches		2 inches		1 1/2 inches
Commercial and Industrial	5 inches		3 1/2 inches		1 1/2 inches
(Minimum dimensions after compaction)					

Spreading and compaction shall be in compliance with Mass. Highway specifications

B. DRAINAGE

1. General

On matters of surface and subsurface drainage of areas involving human occupancy, the Board of Health should be consulted, and their recommendations shall be incorporated in the design submitted for approval. The Department of Public Works shall be consulted with regard to connecting or interfacing with existing or proposed town facilities and the recommendations of that department shall be considered in any design submitted to the board for approval.

2. Surface Drainage

- (a) The drainage facilities shall be adequate enough to provide for the runoff from storms with a reoccurrence characteristics as tabulated on the following table (p. 26):

6. B.2.(a)

STORM FREQUENCY DESIGN STANDARD

Culverts and Crossdrains

Major Federal and State Highways

Minor State Highways

Major Town Roads

Collector Streets

Major Streets

Minor Streets

Minor Town Roads

Private Roads

Minimum Pipe Size

Drainage Ditches - All Roads

Curbs, Gutters, Catch Basins, and Drain inlets

Major Federal and State Highways

Minor State Highways

All Other Street Classifications

Underground Streets Drains*

Major Federal and State Highways

Minor State Highway

All Other Street Classifications

Minimum Pipe size

Storm Frequency

State Design

State Design

50 year

50 year

50 year

50 year

50 year

50 year

18 inches

25 year

State Design

State Design

2 year w/o carryover

State Design

State Design

25 year

12 inches

Maximum Distance Between Catch Basins or Manholes on a drainline is two-hundred and fifty (**250**) feet.

- All-underground entry drains which receive runoff from the subdivision retention or detention facilities shall accommodate the 100 year storm discharge rate of the retention or detention facilities.

- 6. B.2. (b)** In so far as practicable, surface drainage is to follow the design guidelines set fourth in the drainage report prepared for the town in 1974. Section 9 paragraph c.
- (c)** Cross drains or Culverts may be metal or concrete pipe.
- (d)** Catch basins can only be connected to a drain manhole. Catch basin to catch basin connections are expressly prohibited.
- (e)** The slope of the pipe shall provide a minimum design flow velocity of **2.5 fps** for a two year storm event.
- (f)** Unless otherwise approved by the Planning Board in writing, catch basins shall be used as drain inlets on all street drains where the design velocity is less than **3 fps** from drain inlet to pipe network outlet. In drains where the design velocity is **3 fps** or more from inlet to drain outlet, simple inlets are to be used to admit the runoff from streets to the drains. These inlets are to be designed with gutter. inlet or combination inlet (curb and gutter inlet) grates and the bottom shall have a shaped invert in the form of an inverted arch to match the diameter of the drain pipe.
- (g)** The entrance to easement drains and culverts shall be designed and constructed to prevent the entrance of debris that could interfere with the function of the drain. In so far as practicable, the debris control structure shall be located away from the inlet to provide a factor of safety against blockage shall be of sufficient capacity and shall be conveniently located to permit service by a maintenance crew.
- (h)** The Invert of the culvert or drain outlet shall discharge at the same elevation as the bottom of the channel of the water course. The outfall of pipes or culverts not discharging at the level of the bottom of the channel, and pipes or culverts with a discharge velocity in excess of **3 fps** shall be equipped with a suitable end section and, or spill way to prevent erosion.
- (i)** Design Velocity:
- The minimum slopes for storm drains for a velocity of **2.5** and **3 fps** are shown on the following page:

6. B.2.(i)**Table I** --- Minimum Slope for Storm Drains
for Velocity of 2.5 fps

Size of Pipe	Minimum Slope N=0.013	Minimum Slope N=0.015
12-in.	0.30 %	0.40%
15-in.	0.22	0.30
18-in.	0.18	0.23
21-in.	0.14	0.19
24-in.	0.12	0.16
27-in.	0.10	0.14
30-in.	0.089	0.12
36-in.	0.070	0.093
42-in.	0.057	0.076
48-in.	0.048	0.064
54-in.	0.041	0.054
60-in.	0.035	0.047
72-in.	0.028	0.037

Table 2 ---Minimum Slope for Storm Drain for Velocity of 3.0 fps

Size of Pipe	Minimum Slope N=0.013	Minimum Slope N=0.015
12-in.	0.44%	0.58%
15-in.	0.33	0.43
18-in.	0.26	0.34
21-in.	0.21	0.28
24-in.	0.18	0.23
27-in.	0.15	0.20
30-in.	0.13	0.17
36-in.	0.10	0.13
42-in.	0.085	0.11
48-in.	0.070	0.092
54-in.	0.061	0.078
56-in.	0.053	0.068
62-in.	0.042	0.053

6. B.2. (j) Rainfall Intensity

The intensity-duration curves for various storm reoccurrence intervals are included in the appendix

- (k) The maximum design inlet capacity of the common catch basin grate with thirty-six by two (36X2) inch openings shall be **1.75 cfs** for roadways with a 2 ½ % cross slope and a grade slope from **0 to 0.5%**
- (l) Reinforced concrete or stone masonry headwalls shall be provided where, in the opinion of the Planning Board, it is deemed necessary to support the street or the adjacent land for the protection and safety of the general public or the adjacent property owners. When retaining walls are proposed, a detailed structural design shall be provided.
- (m) Granite curbing shall be used with all curb inlets where the combination curb and gutter inlet grate is used.
- (n) The grading of the surface of the shoulders along the street and the surface of the developed area within the subdivision shall be such as to permit passage of surface water without damage or erosion and to eliminate ponding or flooding of areas within developed lots. The plan for surface drainage of developed lots that are not served by the town sanitary sewer system shall be approved by the Board of Health. Provision shall be made for an above ground watercourse suitable for the passage of water without damage in the event leaves or trash block catch basins, gratings, or other drainage facilities, and to provide for the storm runoff from storms with a runoff in excess of the system capacity.
- (o) All detention or retention ponds shall be designed to maintain a minimum of one (1) foot of freeboard during the one hundred (100) year event and shall have an emergency overflow capable of passing the one hundred (100) year event without damage to the pond or surrounding area.

3. Subsurface Drainage

- (a) Subsurface drainage shall be designed and constructed to provide for seepage and ground water conditions that are detrimental to any degree to the construction and durability of highways, the function of underground sewerage disposal systems, to eliminate water or dampness from within buildings and such other conditions associated with seepage and groundwater that might constitute a nuisance or be detrimental to human health or safety.
- (b) Ground water and seepage varies with season and soil characteristics to the extent that it is difficult to determine in advance the drainage requirements. In granting approval of plans for subsurface drainage the Planning Board will be guided by the information contained in the analysis and report on the soils in the Town completed June 1965 by the U.S. Department of Agricultural Soils Conservation Service; previous experience in the general area of the land proposed for development or conditions found elsewhere and believed by the Board to be similar to conditions that might be expected in the land proposed for development; and from information gained during the development and construction period. In the event that conditions are encountered during development and

construction that were not provided for in the original drainage design, the Board shall require that additional drainage be designed and constructed.

6. B.3. (c) Complete subsurface drainage plans shall be provided for all areas classified in the soils report as having moderate limitation, severe limitations unclassified and elsewhere where in the opinion of the Board ground water elevation, slope gradients, or seepage conditions are such as to require subsurface drainage.

(d) The surface drain may be a drain using a porous granular material, referred to as the drain rock, protected from clogging by a smaller porous granular material referred to as the drain filter or filter, a drain with a circular pipe surrounded with drain rock protected with a filter, or a combination of these above two types.

(e) French Drains: Simple French Drains made by backfilling a narrow trench with coarse material may be used as a temporary drain to correct a drainage problem during construction but shall not be used in the permanent drainage system. French drains used in the permanent drainage system shall be designed and constructed so that the drain rock will be surrounded and protected with a suitable filter to prevent silting and clogging of the drain and shall be connected to a catch basin.

(f) Piped Subsurface Drains: The pipe in piped subsurface drains shall be not less than six (6) inches in diameter, and shall be either a perforated pipe laid with perforations down, or drain tile laid in place with open joints. The slope of the pipe shall be sufficient to prevent the deposition or settling out of any solid material which may enter the pipe through the joints or perforations. The pipe shall drain into a water course or become connected to the street drain at a structure unless otherwise approved by the Board.

(g) Drains installed to lower the water table in the base and the subbase of highways shall be placed to lower the water table a sufficient amount to prevent loss of stability, possible frost damage and the detrimental effects of capillary actions.

(h) Subsurface drains are to be located so as not to interfere with the location of other utilities when such other utilities are placed in their proper locations.

(i) Street drainage shall not discharge into an underground infiltration structure or device unless otherwise waived by the board.

4. Drainage Plans and Calculations

(a) Surface Drainage Plans

(1) Surface Drainage Plans for Existing Conditions

The surface drainage plan shall show the natural drainage courses that existed on the land in the proposed subdivision, the amount of flow into the proposed subdivision before development, the amount of flow onto the proposed subdivision, and the flow from the subdivision. The calculations shall be completed with all of the area tributary to drainage across the proposed subdivision treated as if it were developed according to existing zoning regulations, and the land within the proposed subdivision in its undeveloped state using the design storm.

(2) The Surface Drainage Plan for the Developed Subdivision

The surface drainage plan for the proposed subdivision shall show the proposed water courses and drainage pipe network. The calculations shall be completed for water flowing into the proposed subdivision as described in **A** above and for the flow from the developed subdivision using the proposed pipe network and water courses with the land fully developed in accordance with zoning regulations. The plan shall show the flow in the various parts of the water courses and-pipe network for the design storm conditions and for the one-hundred (100) year storm conditions. The calculations for the one hundred (100) year storm shall show the flow in the proposed drainage system and the amount of flow in the bypass system described in **Section 6B-2-n**.

6. B.4 (b) Subsurface Drainage Plans

- (1)** The subsurface drainage plans shall show the drainage intended to provide for the conditions described in **Section 6 B-3** as well as the drainage proposed to provide for additional situations that might be encountered or discovered during development.
- (2)** The plans shall indicate how and where the subsurface drains join the surface drainage system.
- (3)** The plans shall include section views in sufficient detail to show construction of the drain.
- (4)** The plans shall be for a practical design for the drain to be installed from the standpoint of cost and availability of materials, ease of installation and maintenance free operational life. The operational life for the design of the installed drain shall be such that performance shall not be degraded by more than twenty **(20)** percent, nor shall the drain require service or maintenance for a period of at least thirty **(30)** years.
- (5)** Zero Increases in Rate of Runoff - Surface runoff rates to existing and discrete off site areas for the pre-development existing condition shall not be increased for the post-development condition.
- (6)** The drainage system design shall utilize the techniques described as Best Management Practices (BMP's) outlined in Figure 6. In addition, detention areas shall be grass or vegetative lined unless otherwise authorized by the Town Engineer.

C. SEWERAGE

- 1.** All subdivisions are to be serviced by sanitary sewers connected to the sewer system for the Town unless otherwise approved by the Planning Board. If town sewer is not accessible, dry sewer shall be designed and constructed for future connection.
- 2.** The sanitary sewers are to be designed and constructed in accordance with the requirements of and to the satisfaction of the sewer Commissioners.

D. UNDERGROUND UTILITIES

1. All utilities including telephone, electrical conductors, CATV and fire alarms shall be placed underground when a road is to be constructed. Underground transformers are required unless the Planning Board determines that conditions do not allow their use.
2. The location of underground utilities shall be as shown on typical road section in **Section 9**.

6. E. EASEMENTS

1. Easements for utilities across lots or centered on rear or side lot lines shall be provided where necessary and shall be at least thirty **(30)** feet wide.
2. Where a subdivision contains a water course, drainage way, channel, stream, retention or detention pond the Board requires that there be provided a storm water easement or drainage right-of-way of adequate width to conform substantially to the lines of the above listed water features in order to provide for construction or other necessary purposes.
3. Where drainage is laid beyond the street line or two lots, it shall be piped a minimum of one hundred (100) feet beyond street line.
4. If in the opinion of the Planning Board any easement or right of way cited in this section overburdens any lot the board may require changes to the plan to alleviate the Board's concerns.

F. OPEN SPACES

Before approval of a plan, the Board may require the plan to show a park or parks located as directed by the planning Board 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 for a period of not more than three years without its approval. In no case shall this open space exceed 10 % of the aggregate area of all the lots in the subdivision. This land shall be made available for purchase by the Town. Failure to purchase within three years shall free the owners from restrictions.

G. PROTECTION OF NATURAL FEATURES

Due regard shall be shown for all natural features, such as large trees, water courses, scenic points, historic spots, and similar community assets, which if preserved, will add attractiveness and value to the subdivision. Every effort shall be made to preserve the existing trees on the lots to be sold. Filling and excavating shall be done in such a manner as to preserve existing vegetation. The undisturbed area remaining on the site after construction shall be no less than 50% and each lot shall be no more than 70% disturbed all of which shall be delineated on the grading plan.

H. CURB CUTS

Driveways shall be located not less than seventy-five **(75)** feet from the intersection as measured from the curb line to the edge of the driveway. A note stating so shall be placed on the lot layout plan. Subdivider shall locate driveways so they do not conflict with stone bounds or granite inlets. Driveways shall be at least 10 feet from catch basins and 5 feet from stone bounds.

6. I. LOAMING AND SEEDING

On grass strip areas at least eight **(8)** inches of topsoil (depth after compaction) shall be placed. Topsoil shall be natural topsoil loam, free from brush, stumps, roots, and other objectionable matter and shall be free of all stones over two **(2)** inches in size. The loamed area shall be worked, limed, fertilized, seeded with a perennial seed and watered as necessary to secure a good catch.

J. STREET LIGHTING

Street lighting shall be provided in all subdivisions and shall meet the standards approved by the Planning Board. Lighting shall be located on the side of the street which has sidewalks.

K. COMPLIANCE WITH ZONING BY LAW

All lots created by the subdivision shall meet the dimensional requirements of the Billerica Zoning by Laws pursuant to MGLC 41 Section 81 Q.

SECTION 7 REQUIRED IMPROVEMENTS FOR AN APPROVED SUBDIVISION

A. MATERIALS, CONSTRUCTION PRACTICES, AND WORKMANSHIP STANDARDS

- (1) Materials, construction practices and workmanship standards shall be those in effect when the work is performed. If a discrepancy exists between the requirements of an approved plan and requirements in effect at the time the work is instituted, the Board shall decide which requirements apply.
- (2) During construction and installation of utilities and services; precautions shall be taken to guard against erosion of soil and accumulation of dirt and debris in water courses to the extent which would cause silting of existing drains and natural water courses or the blocking of same, of the transfer of natural silt and soil from the site of the development in drains or water courses.

B. STREETS AND ROADWAYS

- (1) The entire area of each right-of-way shall be cleared of all stumps, brush, roots, and boulders, like material except for trees and other items or features designated for preservation.
- (2)
 - (a) All top soil shall be removed for the full length and width of the paved roadway, regardless of whether or not finished grade is above existing grade.
 - (b) All other material shall be removed for the full length and width of the roadway, to a depth of at least fifteen (15) inches below the finished grade as shown on the profile plan; provided, however, that if the soil is soft and spongy, or contains undesirable material, such as clay, sand pockets, tree stumps, or any other material detrimental to the subgrade, a deeper excavation below the subgrade shall be made as required by the Planning Board.
- (3) All roadways shall be brought to a finished grade as shown on the profiles of the Definitive Plan with gravel as per specifications.
- (4) Street construction specifications shall be as follows: After the road has been carefully graded to subgrade elevations, eight (8) inches of base gravel shall be spread and rolled with a roller of sufficient weight to achieve ninety-five (95) percent compaction of gravel. Gravel shall meet the specification of the Billerica Department of Public Works (copies available) shall consist of hard, durable stone and coarse sand practically free from loam and clay, uniformly graded, and containing no stone having a dimension greater than four (4) inches. A top course four (4) inch thick shall be applied and rolled as specified above. Dense graded crushed stone shall be as described above except that the maximum size of any stone shall be two (2) inches. The above specified thickness of gravel refers to thickness after thorough compaction. The twelve (12) inches of gravel base described above shall be brought to true grade and compressed to fine grade with a roller of size specified above. The thickness of the wearing surface after compaction shall be as tabulated for class I Type I-1 plant mixed bituminous concrete, composed of materials and prepared in conformity with the most recent "Standard Specifications for Highway and Bridges" of Massachusetts Department of Public Works. It shall be applied in two courses, binder courses and finish course, in conformity with detailed specifications aforementioned. Spreading, rolling and tolerances shall also be in accordance with these specifications. Notification that the rolling and grading has been completed shall be given twenty-four (24) hours before laying the hot top. There

shall be no finish coarse paving after October 15 and no binder coarse after November 15 regardless of weather conditions. Paving of either coarse shall not begin until April 15 in the spring.

- 7. B.** (5) All utilities located beneath the binder shall be installed before the laying down of the binder. Patching of the binder is prohibited.

- (6) Guard rails shall be installed at locations indicated on the plan along the slopes of the highway fill, at culverts, along curves and at such other locations as the Board may require. Guard rails shall be meet Mass. Highway specifications and shall be installed in a manner approved by the Public Works Administrator.

C. DRAINAGE

(1) Surface Drainage

- (a) All drains shall be laid to uniform grades and carefully backfilled so that the pipe is supported throughout its entire length with compaction earth. Catch basins shall have at minimum four (4) foot sumps. Drain inlets shall have the bottom on the form of an inverted arch with the sides and the bottom sloped for self cleaning velocity. Bottom slab shall have an eight (8) inch thickness of concrete. A minimum of two layers of brick is required below all manhole and catch basin castings to allow for the lowering of castings. The materials and construction of catch basins shall conform to the specifications of Mass. Highway, using heavy duty frame and cover. (See "Standard Specifications for Highways and Bridges" published by Mass Highway.)

Any change in the alignment or grade, if not normally the location of a catch basin, shall be made by using a standard manhole conforming to the above specifications.

- (c) Where natural drainage courses are obstructed, cross drains and other structures, approved by the Public Works Director, shall be installed to restore natural drainage. Capacity of such structures shall be determined on the basis of fifty (50) year storm intensity. Where cross drains carry flow of natural water courses ' masonry headwalls or rip rap shall be installed, as approved by the Public Works Director, to prevent erosion.
- (d) The minimum pitch of storm drains shall be such that the design flow velocity is achieved. For the minimum slope, see the tables on previous pages where $N = .013$ is used for concrete pipe and where $N = .015$ is used for corrugated metal pipe. Minimum pitch of storm drains shall be 0.5% minimum size of pipe shall be twelve (12) inch diameter. Storm drains shall be reinforced concrete pipe or asphalt coated corrugated steel pipe. Pipe joints shall be carefully made up so that the spigot is tightly butted to the seat of the bell and the spacing between the spigot uniformly proportioned and caulked with loose or braided jute. The joints shall be filled with cement in all cases. All utility trenches shall be filled with bank gravel carefully compacted.

(2) Subsurface Drainage

- (b) Subsurface drainage shall be installed to provide for
Conditions encountered during construction.

- 7.C. (2) (b)** The depth and location of subsurface drains is controlled by the following requirements: elevation and location of outfall, elevation of impervious sub-stratum, water table, soil moisture due to capillary action, type of base and subgrade material and depth of frost penetration. Allowance shall be made for seasonal variations.
- (c) The outflow from the subsurface drain shall flow into a water course or into the underground pipe network of the surface drain. When the subsurface drain discharges into an open water course, the outlet shall be protected by a suitable structure constructed to prevent erosion and facilitate the location of the outlet. When the subsurface drain discharges into the under ground drainage network, the connection shall be made at a structure, manhole, catch basin or drain inlet.
 - (d) The pipe in the drain shall be laid to a uniform grade. The minimum pitch for six (6) inch diameter pipe is 0.5%.
 - (e) The minimum pipe size in a subdrain shall be six (6) inches.
 - (f) The materials shall be stored, handled and placed so as to prevent mixing with different materials. The moisture content of graded filter materials shall be great enough to prevent segregation during handling
 - (g) The pipe, drain rock, and drain filter material shall be placed in accordance with the approved plan.
 - (h) Subsurface drains shall not be connected or constructed to serve as sanitary sewers.
- (3) Subsurface drainage from foundation drains, roof leaders and other sources:**
- (a) In cases where the underground drainage is required in connection with the erection of buildings or the use of any lot, such underground lines may be connected to the storm drains in the proposed streets under the following conditions:
 - (b) In cases where a residence is constructed such as to have no clean out, floor drain or other opening accessible from the house may be tied into the street at a "Y" connection or other type of connection in accordance with the requirements of the Public Works Director.
 - (c) In cases where residences are constructed or planned to have a clean out, floor drain or other opening into the subsurface drainage line from said houses to the storm drainage line on the new way, the drain from each house must pass through a clean out box, constructed to conform the standard for manhole construction of the Public Works Director. The drain from the clean out box shall be at least four (4) inches in diameter and may be tied into the street drain at a "Y" connection or other type of connection in accordance with requirements of the Public Works Director. More than one house may be served by one clean out box. Such clean out boxes shall be immediately outside the exterior lines of the new way.

- (d) In both cases "a" and "b" above, all drainage lines from the residences shall be constructed of vitreous clay pipe, laid with closed cemented joints and carefully installed on compacted bed. Minimum size for such drains shall be four (4) inches in diameter.

Attention is directed to Section 3, Par. B-8 which requires the submission of a final plan showing drainage lines and structures as actually constructed.

- (4) Subdrains shall be required unless otherwise authorized by the Town Engineer and shall be included in cross section and plan views.

7. D. SIDEWALKS

- (1) Sidewalks shall be constructed on both sides of the street in both residential and industrial subdivisions, with crosswalks at the intersections. Sidewalks shall be located at least 1 foot from the edge of the right of way. Sidewalks shall be constructed in accordance with all applicable handicapped codes and shall be constructed continuous through driveways not sloping to meet driveways. Driveways shall be constructed to meet sidewalk.

The profile dimensions, and location shall be as shown in the figure 1 herein. The grade shall be at least 6" above the adjacent roadways. Sidewalks shall be constructed per specifications (a) for Industrial streets and residential collector streets and per specifications (b) for all other streets and shall comply with the provisions of the ADA:

- (a) Four (4) inch thick air entrained cement concrete, reinforced with a No. 4, four by six (4x6) inch mesh, 4000 lb. concrete, wood float finished, laid on a base of at least six (6) inch of well compacted base gravel. An expansion joint (3/4 inch open) shall be provided at least every twenty (20) feet; dividing joints shall be scored into walk every four (4) feet'. Base gravel material shall be dense graded crushed stone in accordance with the specifications of the Billerica Public Works Department (copies available); no stone shall have a dimension in excess of two (2) inches, and shall be compacted to ninety-five (95) percent. Sidewalks shall be six (6) inches thick at driveways.
- (b) Bituminous concrete: the foundation shall be 6" of bank gravel as specified in (a) above (material and compaction). The wearing surface shall be laid in two (2) courses, a one (1) inch bottom course and a one (1) inch top course, thickness measured after compaction. The material and application shall conform to the specifications outlined in paragraph 7B-4 of this section for the roadway surfacing. Sidewalks shall be six (6) inches thick at driveways
- (2) Safety Barriers: Guard rails, fences or other suitable barriers shall be installed at bridges, culverts, elevated shoulders of roadway, fills and other locations as the Board may require to protect pedestrians and other users from these hazards.

E. CURBING

- (1) Curbing is required on both sides of all streets. Vertical granite curbing shall be provided at all return radii, and around cul-de-sacs and for twenty (20) feet beyond the end of such curbs and shall begin and end at the same station on both sides of the road. Catch basin inlets stones shall have granite transition pieces at least 4 feet long at each end. All granite curbing shall end with transition pieces. At all other locations bituminous Cape

Cod berm of cross section, shown in figure 2, may be provided instead of vertical granite. Paving and base construction shall be extended in the full twelve (12) inch under bituminous concrete curbing. Straight ended granite curb inlet stones shall be used in all instances. If the center line profile of a roadway exceeds a 6% slope then all adjacent curb shall be vertical granite. Granite curb shall have cross sections approximately as described below:

Granite: 6 INCH minimum width at top; 4 INCH minimum at bottom;
 17 INCH minimum depth.
 6 FEET minimum length

Curbing shall be set on at least six (6) inches of compacted bank gravel and in accordance with the cross section shown in figure 2. Granite curbing to be set on curves with radii of 100 feet or less shall be cut to the required curvature and except for making closures shall be of minimum length as follows:

Radius	Minimum Length
50 to 100 feet	6 feet
25 to 49 feet	4 feet 6 inches
less than 25 feet	3 feet

7. F. EARTH REMOVAL AND GRADING

(1) Topsoil

(a) On grass strip areas, at least eight (8) inches of topsoil (depth after compaction) shall be applied. Seeding of lawn grass shall be done after building construction has been completed on the particular lots adjacent.

(b) No removal of loam from the development shall be made until an eight (8) inch thickness of compacted loam is provided throughout the entire area of all lots and on the planting strips along the roadway. Only such areas as roadways, driveways, building sites and areas requiring filling may be striped of topsoil. Only surplus loam after the above requirements have been met may be disposed of elsewhere.

(2) Earth

(a) Earth for grading or removal shall include but is not necessarily limited to the following: stone, rock, soil, sand and gravel.

(b) In cases where a contour plan of the proposed grades has not been prepared and approved by the Board, the grading and removal of earth shall be done in accordance with the following general requirements:

(1) There shall be no depressions that might accumulate water.

(2) Lawn, driveway, and walk surfaces shall slope away from the building. The edge of cut or filled areas shall be sloped to provide lateral support and minimize erosion.

7. F. (3) Earth Removal and Migration- The total amount of fill brought onto the site or brought off of the site for the purpose of constructing the roadway including any appurtenance thereto shall not exceed 8000 cubic yards per roadway acre. Waivers to this provision shall be granted only on the condition that there is no feasible design alternative. Subdividers shall submit a calculation of these amounts along with their definitive plans.

7. **G. UTILITIES**

(1) Water

Water pipes and related equipment, such as hydrants and main shut-off valves shall be sized and constructed to serve all lots on each street in the subdivision in conformity with specifications of the Public Works Director. Joints shall be left uncovered until inspected. Water service lines shall be extended from the main to each property line before the street is surfaced. Shut-off valves to each lot shall be located in the grass area within the right-of-way, placed flush with the surface. A copy of field notes or plans showing the location of all gates, hydrants, and service shut off shall be furnished to the Public Works Director prior to the testing and filling of mains. All trenches shall be filled with bank gravel carefully compacted.

- (a) All installations and extensions of water mains and appurtenances in the Town of Billerica shall conform to the Rules and Regulations of the Water Department, Billerica, Mass. 1971.

(b) Water Mains

All water mains shall be ductile iron cement lined Class 52 pipe with push on or mechanical joints. Wedges shall be provided at connections for conduction for most applications or as determined by the Division.

(c) Hydrants

Mueller, Centurion model, A-423, A.W.W.A. standard, or as determined by the Water Division. All hydrants will be of five (5) feet six (6) inch bury, with one four and one-half (4 ½) inch pumper and two two and one-half (2 ½) inch hose connections, and five and one-half (5 ½) inch valve opening, all hydrants shall have a gate valve inserted between hydrant and main located approximately six (6) feet zero (0) inches from the face of hydrant barrel, all hydrants will open left and will be set plumb, with proper size thrust block. Break rings shall be flush with finished grade. All hydrants shall be painted in accordance with water division specifications and requirements.

(d) Gate Valves

All gate valves to open left, A.W.W.A. approved, mechanical joints, non-rising stem, gate box will be set plumb and flush to finish grade of bituminous concrete surface, Mueller D-150 or equal.

(e) Brass

All A.W.W.A. standard three-quarter (3/4) inch corporation cocks, threaded compression fittings with conductive rings. Stop and waste with conductive rings (curb). Erie plug cover curb box with thirty-three (33) inch rod.

(f) Fittings, Joints and Appurtenances

A.W.W.A. standard, mechanical joints, all fittings will be of a pressure rating approved by the Division.

7. G. (1). (g) Meters

Domestic - 5/8 inch, shall be of a make approved by the Division, w/one (1) shut off on customer side of meter, installation to be inspected and approved by agent of Water Division.

Commercial/Industrial --- Individually approved.

(2) Sewerage

Sewerage shall be installed in accordance with plans approved by the Sewer Division of Department of Public Works and in accordance with the Sewer Division of Department of Public Works requirements for construction practices, materials and workmanship. All sewer extensions require DEP approval.

(3) Fire Alarm Boxes

Where necessary, Fire Alarm Boxes and hydrants shall be installed in accordance with the requirements of the Billerica Fire Department.

H. MONUMENTS

Granite or reinforced concrete monuments, a minimum of thirty-six (36) inches in length, six (6) inches by six (6) inches in cross section, shall be installed on both sides of the right of way, 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 conform to the standard specifications of the Massachusetts Land Court and shall be set according to such specifications. No permanent monuments shall be installed until all construction which would destroy or disturb the monuments is completed. Bound shall be set flush with grade.

I. STREET SIGNS

(a) The developer shall furnish and erect street signs to designate the name of each street in his development; said signs shall conform to the specifications of those used by the Town and shall be located as directed by the Planning Board.

(b) A dead end street sign shall be installed at the entrance of all dead end streets

(c) The base of the post shall be set in concrete at least eighteen (18) inches in diameter at a depth of thirty-six (36) inches. The concrete base shall be uniform diameter throughout or shall taper from larger diameter at the base to a smaller diameter at the top to prevent frost heaves.

(d) A stop sign shall be installed at intersections if deemed necessary by the Traffic Safety Officer.

7. J. TREES

Every effort shall be made to preserve the existing trees on the right-of-way and on the lots to be sold. Filling shall be done in such a manner as to preserve the trees wherever possible. The Planning Board requires that the subdivider provide and plant at least two **(2)** suitable three **(3)** inch caliper, measured six **(6)** inches above the root ball, shade trees (variety approved by the Planning Board) per lot having a minimum height of twelve **(12) feet**. Trees shall be planted on lots at least ten **(10) feet** from the exterior line of the street right-of-way. The location of street trees shall be shown on the plan view. Tree species shall be one of those listed in the street tree table (Attachment 2) including Sugar Maples but excluding Norway Maple.

K. CONSTRUCTION STANDARDS

The construction of these facilities shall be made only during weather and under conditions allowing for the fulfillment of good construction standards. Construction shall also follow the most recent DEP Stormwater Management Policies and performance standards as outlined in their Stormwater Management Handbook. In addition provisions for limiting disturbances during construction shall include measures to:

1. Address the increase in runoff resulting from the removal of ground cover
2. Minimize erosion
3. Trap sediments
4. Maintain the facilities
5. Stabilize the site

All construction shall meet good construction standards.

L. CLEANING UP

Upon completion of all work on the ground, the subdivider shall remove from the streets and adjoining property, all temporary structures and all surplus material and rubbish which may have accumulated during construction, and shall leave the work in a neat and orderly condition.

M. MAINTENANCE

Once the subdivision has been completed the subdivider shall maintain the subdivision roads and all appurtenances in a condition meeting all of the above requirements and all applicable Certificate of Approval conditions to the satisfaction of the board. The Planning Board shall retain 10% of cost of construction of all phases and aspects of the approved subdivision plan, to be determined by the Town Engineer, to guarantee the maintenance, workmanship, materials and the proper functioning of the subdivision until a period of eighteen (18) months has passed from the date of completion of the subdivision. The determination that the subdivision is complete shall be made by a majority vote of the Planning Board.

7. N. INSPECTIONS

- (1) Inspections with notice shall be as indicated else where in this report, and shall include but not limited to the following, unless otherwise indicated The Town engineer's Office shall inspect all aspects of roadway construction including subgrade, gravel, paving, sidewalks, utilities, subdrains, walls etc. Inspections shall be scheduled at least 48 hours in advance.

:

INSPECTION OPERATION

NOTICE

(a) Pre-construction meeting with Engineering	Before construction commences
(b) Clearing and grubbing	After completion of grubbing and clearing.
(c) Water mains installations	After laying and prior to backfilling
(d) Water main test and placing in service	Water Department to be notified prior to filling and testing.
(e) Sewer installation and testing	Sewer Commissioners or their designated agent to be notified.
(f) Drains	After installation and prior to backfilling.
(g) Highway Base Grade and compaction.	14 day notice before paving. Grade Stakes to be set. Manhole and catch basin frames, gate boxes to be at grade.
(h) Finished items. Paving, and seeding, drain easements, guard rails, sidewalk, utilities, trenches, backfilling, and street signs.	14 days after completion of work bounds, loam
(i) Before all money is released 18 months after final completion as determined by the Planning Board.	

- (2) Inspection approval of work and release of bonds shall not relieve the developer of the obligation and requirement to correct work and or replace materials that are not in accordance with Planning Board Rules and Regulations or provide maintenance for a period of eighteen (18) months. In order to demonstrate compliance with requirements, the Board shall have the right to make test or inspection holes at such points as they may require. These test and inspection holes shall be approximately one and one-half (1 1/2) feet square. The location shall be as selected by the Board, shall not be more than three (3) for any street up to one-thousand (1,000) feet in length and a proportional number for any street longer than 1,000 feet. The developer shall be notified so that he or his agent may be present during the preparation of the test holes. These test holes shall be filled and completely patched at the expense of the developer. In the event the test holes indicate that the work was not done in accordance with requirements, the developer at his own expense shall prepare additional inspection holes to establish the limits of work that was completed in a satisfactory manner.

(3) The Planning Board's consultant engineer shall inspect the drainage system upon completion and shall certify that it meets the specifications of the approved plan and is functioning per the standards set out in the drainage calculations. The consultant engineer shall have grades shot to verify that the drainage swales and detention ponds are at the designated grades and have the capacity called out in the approved plans and associated documents. This shall be done before the as builts are prepared. The cost of this inspection shall be the responsibility of the subdivider. A letter to the Planning Board stating that the drainage facilities are ready for final inspection shall trigger this operation. The consultant engineer may require the subdivider to do test borings to verify that the drainage system has been built as approved.

7. O. LOAMING AND SEEDING

All areas between the exterior street lines and the curb lines of the pavement thereon which are not occupied by sidewalks shall be loamed and seeded with eight (8) inches of topsoil (depth after compaction). Topsoil shall be natural topsoil loam, free from brush, stumps, roots and other objectionable matter and shall be free of all stones over two (2) inches in size. The loamed area shall be worked, limed, fertilized, seeded with a perennial seed, and watered as necessary to secure a good catch.

7. P. SLOPES AND WALLS

Wherever the grade of the approved street differs from the grade of the adjacent land or where otherwise necessary for public safety, in the area beyond the sidewalk, if applicable, or the landscaped planting strip, or the shoulder, the developer shall erect retaining walls and guard rail fences or provide slopes no steeper than 1 foot vertical to 3 feet horizontal in fill and 1 foot vertical to 2 feet horizontal in cut to ensure proper protection and lateral support. Where possible, a retaining wall shall be constructed outside the right-of-way on private property.

No retaining wall shall have a height above finished grade greater than four (4) feet. Where necessary, a series of retaining walls may be constructed in a terraced effect provided the horizontal distance between the outside face of one wall is at least four (4) feet from that of the next wall.

Landscaping, which will not act to disturb the wall's stability, shall be provided on slopes and on the terraces between retaining walls to reduce the visual impact of the construction. Such walls, fences, slopes and planting shall be subject to the Board's approval as to location, design and dimensions and shall be constructed in a manner satisfactory to the Town Engineer.

Any waiver to this provision shall require that the applicable construction plans be designed and stamped by a professional structural or civil engineer.

7. Q. ERROSION CONTROL

All slopes or cuts sloping to a subdivision roadway or to an associated appurtenance shall be stabilized during all phases of construction. Erosion control techniques shall be those described in the attached version of DEP's Nonpoint Source Management Manual "Mega Manual" (Attachment1).

SECTION 8: DEFINITIONS

BANK GRAVEL:

Gravel as obtained from the pit or bank and usually includes some sand and/or silt.

BITUMINOUS PAVING:

A pavement which has a wearing surface composed of mineral aggregate, mineral filler, and bituminous material.

BOARD:

Shall mean the Planning Board of Billerica, Massachusetts.

BORROW:

Unprocessed earth materials usually obtained near the location where it is used.

BOULDERS:

Weathered pieces of rock larger than 6 or 8 inches in diameter

CONCENTRATION TIME:

The time required for the runoff to become established and flow from the most remote part of the drainage area to the point under consideration.

CULVERT:

A transverse or cross drain.

CURB INLET:

An inlet grate with an opening or openings in a vertical plane.

DEAD-END STREET SYSTEM:

A complex of interconnected deadened streets sharing only a single common access.

DRAIN:

A channel or pipe that carries drainage water.

ELEVATION REFERENCE:

The datum plane for elevation measurements. The town-wide reference in Billerica is the United States Coast and Geodetic Survey datum of 1929

FRENCH DRAIN:

A subsurface drain made by back-filling a trench with coarse material, the space between the material serves to provide for the flow of the liquid.

GRAVEL:

Mineral soil particles with a size in the range from 1/8 inch to six (6) or eight (8) inches in diameter.

HORIZONTAL CURVE:

The portion of the highway line along which a change in alignment occurs in the vertical plane.

INTERCEPTOR DRAIN:

A subsurface drain made with perforated pipe, or pipe laid with open joints with the back-fill material coarse enough to allow the easy passage of water and prevent migration into the drainage system, and fine enough to prevent the intrusion of fine-grained soil.

LOT:

Shall mean an area of land in one ownership, with definite boundaries, used, or available for use, as the site of one or more buildings.

PERMANENT MONUMENT:

Granite or reinforced concrete monuments as described in Section 7.H. Nails, spikes or nails in stakes are expertly excluded.

RATIONAL METHOD:

In the rational method, the quantity of stormwater runoff is determined using the following formula. $Q=CIA$, where **Q** is the peak runoff rate in cubic feet per second (cfs) from the drainage area. **C** is the runoff coefficient (dimensionless). **I** is the average rainfall intensity in in./hr. and **A** is the drainage area in acres.

NOTE: An examination of this formula will indicate that the dimensional units on each side of the equation do not correspond. The formula is correct since rainfall at a uniform rate of one inch per hour applied to one acre is equivalent to 1 cfs (actually 1.008 cfs).

ROADWAY:

The roadway is the traveled way to be distinguished from the right-of- way which is the entire strip of land including roadway, shoulders, curbing extending from the property line on one side to the property line on the other side.

ROCK:

The consolidated solid mineral matter in the surface of the earth, or pieces that have been broken and removed.

SAND:

Soil particles in the size range from 0.08" to 0.003" (2 to 0.075mm).

SEWER:

A pipe or conduit that carries wastewater or drainage water.

SEWER, BRANCH:

A sewer that receives wastewater from a relatively small area and discharges into a main sewer serving more than one branch sewer area.

SEWER, BUILDING:

In plumbing, the extension from the building drain to the public sewer or other place of disposal; also called house connection.

SEWER, INTERCEPTING:

A sewer that receives flow from a number of transverse sewers or outlets and conducts such waters to a point for treatment or disposal.

SEWER, LATERAL:

A sewer that discharges into a branch or other sewer and has no other common sewer tributary to it.

SEWER, MAIN:

In larger systems, the principal sewer to which branch sewers and submains are tributary; also called trunk sewer. In small systems, a sewer to which one or more branch sewers are tributary. In plumbing, the public sewer to which the house or building sewer is connected.

SEWER, OUTFALL:

A sewer that receives wastewater from collecting system or from a treatment plant and carries it to a point of final discharge.

SEWER, SANITARY:

A sewer that carries wastewater..

SEWER, STORM:

Also called **storm drain**. A sewer that carries storm water, surface water and the discharge from subsurface drains, but does not carry wastewater.

SEWER, SUBMAIN:

A sewer into which the wastewater from two or more lateral sewers is discharged and which subsequently discharges into a main, a trunk, or other collector.

SIGHT DISTANCE:

Sight distance is the length of road visible ahead to the driver of a vehicle.

SILT:

Soil particles in the size range from .003" to 0.00008" (0.075 to 0.002mm).

SOIL:

The unconsolidated material on the surface of the earth and usually considered to be capable of supporting plant growth.

STONE: Weathered pieces of rock.

STATION:

Locations along the line of the road spaced 100 feet apart starting with zero at the beginning are called stations.

STORMWATER RUNOFF

The portion of the precipitation which flows over the ground surface during, and for a short time after a storm.

STREET ALIGNMENT:

Alignment is sometimes referred to as the ground plan of the road, but most frequently it is considered to be the sequence of straight lines and curves which defines the location and direction of the road.

STREET CENTER LINE:

A line that is parallel and equidistant to the right of way sidelines. It begins at the projection to the center point of the intersection of the right of way to the nearest street and continues along the right of way to the center of the turnaround radius or center point of the next intersecting street.

SUBDIVISION shall mean the division of a tract of land into two or more lots and shall include re-subdivision, and, when appropriate to the context, shall relate to the process of subdivision of the land or territory subdivided; provided, however, that the division of a tract of land into two or more lots shall not be deemed to constitute a subdivision within the meaning of the subdivision control law if, at the time when it is made, every lot within the tract so divided has frontage on (a) a public way, or (b) a way shown on a plan theretofore approved in accordance with the subdivision control law, or (c) a way in existence when the subdivision control law became effective in the Town of Billerica, having in the opinion of the Planning Board, sufficient width, suitable grades and adequate construction to provide for the needs of vehicular traffic in relation to the proposed use of land abutting thereon or served thereby, and for the installation of municipal services to serve such land and the buildings erected or to be erected thereon.

SUBDRAIN:

A subsurface drain used to lower the water table.

TRIBUTARY AREA:

When the surface runoff contributes to the flow at a particular location the area is said to be tributary to the location.

VERTICAL CURVE:

The portion of the highway line along which a change in alignment occurs in the vertical plane.

WASTEWATER:

The spent water of a community otherwise referred to as sewage. From the standpoint of source, it may be a combination of the liquid and water carried wastes from residences, commercial buildings, industrial plants, and institutions.

SECTION 9 /FIGURES

- 1. Rainfall Frequency-Duration-Intensity Curve**
- 2. Typical Roadway Section**
- 3. Specs for URD Trench**
- 4. Light Standard Specifications**
- 5. Rainfall Table**
- 6. The “Megamanual” BMP’s**
- 7. Excerpt from “The Megamanual”**

* Copies of the above are available from the Planning Board Office. Contact us at 978-671-0962 for additional information.

FORMS*

- 1.** Form A – Application for endorsement of a plan believed not to require approval
- 2.** Form A checklist – Checklist for approvals not required
- 3.** Form B – Application for approval of a definitive plan
- 4.** Form B checklist - Checklist for a definitive subdivision plan submittal
- 5.** Form B-1 – Application for approval of a preliminary plan
- 6.** Form B-1 checklist – Checklist for a preliminary subdivision plan submittal
- 7.** Form B-2 – Application for approval of a plan
- 8.** Form B-2 checklist – Checklist for approval of a plan
- 9.** Form D-1 – Assignment form
- 10.** Form E-1 – Certificate of performance
- 11.** Form F – Certificate of approval
- 12.** Form H – Performance secured by a surety company
- 13.** Form K – Performance secured by a lender's agreement
- 14.** Form K – Instructions
- 15.** Standard Definitive Subdivision Conditions

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The following forms are updated and added to from time to time. They do not represent an official part of the Subdivision Rules and Regulations. You can find the forms in the Document Section of the Planning Boards website.